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ORTECH
a Kontrol Energy Company

Report:

Covanta Durham York Renewable Energy Limited Partnership
Durham York Energy Centre 2017 Compliance Emission Testing in Accordance with Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX

Date: November 22, 2017



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Revision History

Version	Date	Summary Changes/Purpose of Revision
1	November 22, 2017	None

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EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between October 10 and October 13, 2017. The emission testing program was performed to satisfy the requirements of the Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX. Section 7(1) of the ECA states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter". This program is the fifth comprehensive Schedule E source testing program conducted at the facility; the initial source testing program was conducted in September/October 2015, a voluntary test program was conducted in May 2016, the second compliance test program was conducted in October/November 2016, and a voluntary test program was conducted in May 2017.

Source testing was performed on the Baghouse (BH) Outlet of Boiler No. 1 and BH Outlet of Boiler No. 2 for the test contaminants listed in Schedule D of the ECA. Although not a requirement of the ECA, at the request of Covanta and per the Pre-Test Plan submitted to and approved by the MOECC additional dioxin and furan testing was conducted at the Quench Inlet to the air pollution control (APC) system concurrently with the dioxin and furan tests performed at the Baghouse Outlet on each unit.

Triplicate emission tests were completed for particulate matter, metals, semi-volatile organic compounds, acid gases, volatile organic compounds, aldehydes and combustion gases at the BH Outlet of each Boiler. Triplicate emission tests were also completed for dioxins, furans and dioxin-like PCBs at the Quench Inlet of each Boiler. The contaminant groups included in the emission test program and the reference test methods used are summarized below:

Test Groups	Reference Method
Particulate and Metals	US EPA Method 29
$PM_{2.5}$/PM_{10} and Condensable Particulate	US EPA Methods 201A and 202
Semi-Volatile Organic Compounds	Environment Canada Method EPS 1/RM/2
Volatile Organic Compounds	US EPA SW-846 Method 0030
Aldehydes	CARB Method 430 with Ashland Modification
Halides and Ammonia	US EPA Method 26A
Combustion Gases:	
Oxygen and Carbon Dioxide	Facility CEM
Carbon Monoxide	Facility CEM
Sulphur Dioxide	Facility CEM
Nitrogen Oxides	Facility CEM
Total Hydrocarbons	ORTECH per US EPA Method 25A

Schedule C of ECA No. 7306-8FDKNX lists in-stack limits for the emissions of various compounds. In-stack emissions limits are given for particulate matter, mercury, cadmium, lead, dioxins and furans and organic matter for comparison with the results from compliance source testing. In-stack emission limits are also given for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide calculated as the rolling arithmetic average of data measured by a continuous emission monitoring system (CEMS).

Since relative accuracy and system bias testing was conducted in the Fall of 2017, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the days when isokinetic testing was performed at each unit (October 10 to October 13, 2017) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH between October 10 and October 11, 2017 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

Consistent with the approach commonly required by the MOECC for compliance emission testing programs, the following results are conservative in the sense that when the analytical result is reported to be below the detection limit, the full detection limit is used to calculate emission data and is shown by a "<" symbol. Also, when one or both Boiler results are reported to be below the detection limit, the detection limit was used to conservatively estimate the total emission rate for the Main Stack.

The MOECC "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provides an updated framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. This document was replaced by "Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", published on January 4, 2017, however the dioxin and furan toxicity equivalent calculation methodology remains the same. The dioxins, furans and dioxin-like PCBs toxicity equivalent emission data was also calculated using half the detection limit for those compounds not detected. The half detection limit data was used to assess against the dispersion modelling Point of Impingement limit. The toxicity equivalent concentrations calculated using the full detection limit, for those compounds less than the reportable detection limit, were used to assess against the in-stack limit detailed in Schedule C of the ECA.

The average results for the tests conducted at Boiler No. 1, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	385	-
Average Combustion Zone Temp. (°C)*	-	-	-	1222	-
Steam (tonnes/day)*	-	-	-	803	-
MSW Combusted (tonnes/day)*	-	-	-	212	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	674	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4283	-
Filterable Particulate (mg/Rm^3) (1)	1.43	2.32	0.45	1.40	9
PM_{10} with Condensable (mg/Rm^3) (1)	<5.03	<4.23	<7.39	<5.55	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<4.97	4.17	<7.19	<5.44	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.11	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	<0.27	0.30	0.33	<0.30	-
Cadmium (µg/Rm^3) (1)	0.060	0.071	0.030	0.053	7
Lead (µg/Rm^3) (1)	0.36	0.40	0.27	0.34	50
Mercury (µg/Rm^3) (1)	0.25	0.23	0.19	0.22	15
Antimony (µg/Rm^3) (1)	0.099	0.068	0.062	0.076	-
Arsenic (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Barium (µg/Rm^3) (1)	1.97	1.90	1.47	1.78	-
Beryllium (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Chromium (µg/Rm^3) (1)	1.19	0.85	0.48	0.84	-
Cobalt (µg/Rm^3) (1)	0.11	0.14	<0.045	<0.097	-
Copper (µg/Rm^3) (1)	1.40	1.35	0.95	1.24	-
Molybdenum (µg/Rm^3) (1)	4.15	4.53	5.11	4.60	-
Nickel (µg/Rm^3) (1)	1.44	1.34	0.63	1.14	-
Selenium (µg/Rm^3) (1)	<0.22	<0.23	<0.23	<0.23	-
Silver (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Thallium (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Vanadium (µg/Rm^3) (1)	<0.022	<0.023	<0.023	<0.023	-
Zinc (µg/Rm^3) (1)	4.93	4.24	3.14	4.10	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<5.63	<6.60	<5.57	<5.94	60
Total Chlorobenzenes (ng/Rm^3) (1)	<240	<206	<311	<252	-
Total Chlorophenols (ng/Rm^3) (1)	<153	<152	<167	<157	-
Total PAHs (ng/Rm^3) (1)	<255	<254	<342	<284	-
Total VOCs (µg/Rm^3) (1) (4)	<353	<352	<373	<359	-
Quench Inlet Dioxins and Furans (pg TEQ/Rm^3) (3)	1018	1149	1242	1136	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.6	0.1	0.1	0.3	50

* based on process data provided by Covanta

(1) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(2) dry basis as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

The average results for the tests conducted at Boiler No. 2, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	385	-
Average Combustion Zone Temp. (°C)*	-	-	-	1266	-
Steam (tonnes/day)*	-	-	-	800	-
MSW Combusted (tonnes/day)*	-	-	-	213	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	722	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4433	-
Filterable Particulate (mg/Rm^3) (1)	1.34	<0.25	<0.38	<0.66	9
PM_{10} with Condensable (mg/Rm^3) (1)	<4.31	4.47	<3.74	<4.18	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<4.18	4.27	<3.55	<4.00	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	0.28	0.34	0.30	0.31	-
Cadmium (µg/Rm^3) (1)	0.049	<0.021	0.024	<0.031	7
Lead (µg/Rm^3) (1)	0.61	0.59	0.22	0.48	50
Mercury (µg/Rm^3) (1)	0.19	0.19	0.15	0.18	15
Antimony (µg/Rm^3) (1)	0.099	0.066	<0.045	<0.070	-
Arsenic (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Barium (µg/Rm^3) (1)	2.72	0.32	0.24	1.09	-
Beryllium (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Chromium (µg/Rm^3) (1)	1.11	1.03	0.51	0.88	-
Cobalt (µg/Rm^3) (1)	0.12	0.074	<0.045	<0.078	-
Copper (µg/Rm^3) (1)	2.76	1.89	0.63	1.76	-
Molybdenum (µg/Rm^3) (1)	4.51	4.84	5.11	4.82	-
Nickel (µg/Rm^3) (1)	1.44	0.80	0.48	0.91	-
Selenium (µg/Rm^3) (1)	<0.22	<0.21	<0.22	<0.22	-
Silver (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Thallium (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Vanadium (µg/Rm^3) (1)	<0.022	<0.021	<0.022	<0.022	-
Zinc (µg/Rm^3) (1)	8.76	2.83	1.11	4.23	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<10.7	<9.41	<10.2	<10.1	60
Total Chlorobenzenes (ng/Rm^3) (1)	<287	<183	<447	<306	-
Total Chlorophenols (ng/Rm^3) (1)	<140	<144	<142	<142	-
Total PAHs (ng/Rm^3) (1)	<418	<358	<276	<350	-
Total VOCs (µg/Rm^3) (1) (4)	<349	<316	<351	<339	-
Quench Inlet Dioxins and Furans (pg TEQ/Rm^3) (3)	1052	871	1457	1127	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.1	0	0	0.03	50

* based on process data provided by Covanta

(1) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(2) dry basis as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

A summary of the minimum, average and maximum concentrations for the combustion gases measured by the DYEC CEMS with in-stack limits listed in the ECA is provided below for the two units.

Boiler No.	Parameter	Minimum	Average	Maximum	In-Stack Limit
Boiler No. 1	Carbon Monoxide (mg/Rm^3) (1)	6.3	11.5	16.8	40
	Hydrogen Chloride (mg/Rm^3) (2)	1.6	2.0	2.3	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	112	113	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	2.4	5.4	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	7.5	12.2	19.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	4.6	5.1	5.5	9
	Nitrogen Oxides (mg/Rm^3) (2)	111	111	112	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	1.7	3.8	35

(1) 4-hour average measured by DYEC CEMS, dry at 25°C and 1 atmosphere adjusted to 11% oxygen by volume
(2) 24-hour average measured by DYEC CEMS, dry at 25°C and 1 atmosphere adjusted to 11% oxygen by volume

The emission data measured at each Boiler BH Outlet during the testing program was combined and used to assess the emissions from the Main Stack against the current point of impingement criteria detailed in Ontario Regulation 419/05.

The CALPUFF dispersion modelling (using Version 6.263 as requested by the MOECC) for the October 2017 emission testing program was performed by Golder Associates. A summary of the results are provided in the tables appended to this report (Appendix 29) based on calculated ground level Point of Impingement (POI) concentrations for the average total Main Stack emissions. As shown in the tables, the calculated impingement concentrations for all of the contaminants were well below the relevant MOECC standards.

In summary, the key results of the emission testing program are:

- The facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation during the stack test periods. Testing was conducted at a steam production rate of greater than 791 tonnes of steam per day for each Boiler (approximately 98.0% of maximum continuous rating). The maximum continuous rating for the facility is 1614.7 tonnes of steam per day for the two Boilers combined (33.64 tonnes of steam per hour or 807.4 tonnes per day for each Boiler).

- The in-stack concentrations of the components listed in the ECA were all below the concentration limits provided in Schedule C of the ECA.

- Using CALPUFF dispersion modelling techniques, the predicted maximum point of impingement concentrations, based on the average test results for both boilers, show DYEC to be operating well below all current standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines and upper risk thresholds.

Tables referenced in this report for the tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet are provided in Appendix 1 and Appendix 2, respectively. Tables for the additional testing conducted at the Boiler No. 1 Quench Inlet and Boiler No. 2 Quench Inlet are provided in Appendix 3 and Appendix 4, respectively.

1. INTRODUCTION

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between October 10 and October 13, 2017. The emission testing program was performed to satisfy the requirements of the Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX. Section 7(1) of the ECA states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter". This program is the fifth comprehensive Schedule E source testing program conducted at the facility; the initial source testing program was conducted in September/October 2015, a voluntary test program was conducted in May 2016, the second compliance test program was conducted in October/November 2016, and a voluntary test program was conducted in May 2017.

Source testing was performed on the Baghouse (BH) Outlet of Boiler No. 1 and BH Outlet of Boiler No. 2 for the test contaminants listed in Schedule D of the ECA. Although not a requirement of the ECA, at the request of Covanta and per the Pre-Test Plan submitted to and approved by the MOECC additional dioxin and furan testing was conducted at the Quench Inlet to the air pollution control (APC) system concurrently with the dioxin and furan tests performed at the Baghouse Outlet on each unit.

Prior to commencing the test program, a Pre-Test Plan detailing the sampling methodology was prepared and submitted to the MOECC for review and approval. Provided in Appendix 5 is a copy of the Pre-Test Plan acceptance letter received from the MOECC, dated July 31, 2017, indicating acceptance of the proposed sampling strategy. A copy of the Amended Environmental Compliance Approval is also provided in Appendix 5.

Triplicate emission tests were completed for each of the test parameters listed in Schedule D of the ECA between October 10 and October 13, 2017.

2. PROCESS DESCRIPTION

DYEC is a thermal treatment facility with a maximum thermal treatment rate of 140,000 tonnes/year of municipal solid waste (MSW), as established by the Amended ECA. The maximum continuous rating (MCR) for the facility is defined as 218 tonnes per day, per unit, of MSW with a heat content of 13 MJ/kg per train. The steam production MCR is 33.64 tonnes per hour for each Boiler.

The facility was built to operate on a continuous basis; 24 hours/day, seven days/weeks, 365 days/year. Waste may be delivered six days per week between 7:00 am to 7:00 pm. The proposed operating schedule may be adjusted depending on demand and facility needs within the established setup indicated in the ECA (i.e., waste can only be received from Monday to Saturday – excluding statutory holidays, and between 7:00 am and 7:00 pm – ECA's Condition 4(1)(b)).

MSW arrives at the facility via covered refuse trucks and is deposited in a storage pit within the receiving building. Facility operators manage MSW by moving and mixing MSW within the storage pit with the overhead grapple cranes. The MSW is lifted from the pit by crane and fed into the fuel hopper for each thermal treatment train.

The facility consists of two thermal treatment trains, each equipped with independently operated boilers/furnaces and air pollution control equipment. The treated exhaust gases are vented to a common 87.6 m stack and released to atmosphere.

2.1 Control Equipment

Flue gasses pass through a dry recirculating type scrubber for acid control and a fabric filter for particulate control. A Selective Non-Catalytic Reduction System (SNCR) with ammonia injection is used for NO_X control. Powdered carbon is injected for mercury, and dioxin and furan control between the dry recirculating type scrubber and the fabric filter.

2.2 Continuous Emission Monitoring Systems

Continuous Emissions Monitors are installed in the vertical ductwork between the economizer and dry recirculating type scrubber (location referred to as the Quench Inlet), and in the vertical ductwork between the fabric filter and the ID fan (location referred to as the BH Outlet).

A summary of the CEMS installed at each location is provided below:

Unit	Location	Analyzer Manufacturer	Model No.	Serial No.	Parameter	Range
1	Quench Inlet	Environmental SA	MIR 9000	2684	CO (Low)	0-500 ppm
					CO (High)	0-2000 ppm
					HCl	0-1500 ppm
					O_2 (Dry)	0-25%
		Ametek	RM CEM O_2/IQ	10217710-2	O_2 (Wet)	0-25%
1	BH Outlet	Environmental SA	MIR 9000	2686	NO_X	0-500 ppm
					SO_2	0-200 ppm
					HCl	0-100 ppm
					HF	0-100 ppm
					O_2 (Dry)	0-25%
					CO_2	0-25%
		Ametek	RM CEM O_2/IQ	10217710-1	O_2 (Wet)	0-25%
		Tethys	EXM400	F130304	NH_3	0-50 ppm
		OSI	OFS-2000W	13020629	Flow	0-40 m/s
		Teledyne	Light Hawk 560	5602492	Opacity	0-100%
		Environmental SA	Graphite 52M	647	THC	0-100 ppm
		Environmental SA	Amesa	1825-269	Dioxin/Furan	0-10 ng/m^3
2	Quench Inlet	Environmental SA	MIR 9000	2685	CO (Low)	0-500 ppm
					CO (High)	0-2000 ppm
					HCl	0-1500 ppm
					O_2 (Dry)	0-25%
		Ametek	RM CEM O2/IQ	10218084-1	O_2 (Wet)	0-25%
2	BH Outlet	Environmental SA	MIR 9000	2687	NO_X	0-500 ppm
					SO_2	0-200 ppm
					HCl	0-100 ppm
					HF	0-100 ppm
					O_2 (Dry)	0-25%
					CO_2	0-25%
		Ametek	RM CEM O2/IQ	10218084-2	O_2 (Wet)	0-25%
		Tethys	EXM400	F130303	NH_3	0-50 ppm
		OSI	OFS-2000W	13020633	Flow	0-40 m/s
		Teledyne	Light Hawk 560	5602493	Opacity	0-100%
		Environmental SA	Graphite 52M	648	THC	0-100 ppm
		Environmental SA	Amesa	1825-284	Dioxin/Furan	0-10 ng/m^3

3. SAMPLING LOCATIONS

The BH Outlet sampling ports are located on the vertical circular ductwork between the baghouse outlet and the ID Fan inlet. There are two 6-inch ports, located 90 degrees apart, at the same elevation and a single 4-inch port located approximately 0.8 m upstream of the 6-inch ports. The two 6-inch sampling ports were used for isokinetic sampling and the 4-inch ports were used for all non-isokinetic sampling.

The BH Outlet duct has an inside diameter of 1.37 meters (54 inches) at the sampling ports. The two 6-inch ports are approximately 4.4 duct diameters (6.1 meters) downstream and 0.68 duct diameters (0.94 meters) upstream from the nearest flow disturbances.

The Quench Inlet sampling ports are located on the circular ductwork between the Boiler Outlet and the Recirculating Type Dry Scrubber Inlet. There are two 6-inch ports, located 90 degrees apart, at the same height. The Quench Inlet duct has a diameter of 1.37 meters (54 inches) at the sampling ports. The ports are located approximately 3.8 duct diameters (5.2 meters) downstream and 4.7 duct diameters (6.4 meters) upstream from the nearest flow disturbances.

The sampling ports are located at a “non-ideal” location as defined by the Ontario Source Testing Code. An “ideal” location is defined as being at least eight stack diameters downstream and at least two stack diameters upstream of flow disturbances.

Cyclonic flow checks were performed by ORTECH at the BH Outlet and Quench Inlet sampling locations on each Boiler on September 22, 2015. The cyclonic flow checks were performed using an S-type pitot tube and manometer following the procedures detailed in Ontario Source Testing Code Method 1. Briefly, the pitot tube was positioned at each sampling point so that the planes of the face openings were parallel to the cross-sectional axis of the duct. The pitot tube was then rotated about its longitudinal axis until the manometer reading was zero. The absolute value of the rotational angle was recorded to the nearest degree at each point. The average of the recorded angles was calculated at each location. If the average angle is less than 15°, cyclonic flow is not present and sampling may proceed as normal.

The results for the cyclonic flow checks are summarized below:

Sampling Location	Performance Specification	Average Angle (°)	Cyclonic Flow Present
Boiler No. 1 Quench Inlet	Average <15°	6.6	No
Boiler No. 2 Quench Inlet	Average <15°	8.4	No
Boiler No. 1 BH Outlet	Average <15°	8.8	No
Boiler No. 2 BH Outlet	Average <15°	8.1	No

In addition, reverse flow was not observed at any point at any of the four sample locations during the cyclonic flow checks or during any test.

4. SAMPLING PROCEDURES

4.1 General

This section outlines the sampling procedures as well as pre-test and on site internal quality assurance/quality control (QA/QC) procedures which were utilized in the testing program. The procedures described in this section ensured that representative samples were collected and that the integrity of the collected samples was maintained. The use of these sampling procedures significantly reduced the possibility of sample contamination from external sources. Sample handling and documentation requirements were key factors in this program.

Triplicate emission tests were completed for particulate matter, metals, semi-volatile organic compounds, acid gases, volatile organic compounds, aldehydes and combustion gases at the BH Outlet of each Boiler. Triplicate emission tests were also completed for dioxins, furans and dioxin-like PCBs at the Quench Inlet of each Boiler. The contaminant groups included in the emission test program and the reference test methods used are summarized below:

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Particulate and Metals	US EPA Method 29
$PM_{2.5}$/PM_{10} and Condensable Particulate	US EPA Methods 201A and 202
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Volatile Organic Compounds	US EPA SW-846 Method 0030
Aldehydes	CARB Method 430 with Ashland Modification
Halides and Ammonia	US EPA Method 26A
Combustion Gases:	
Oxygen and Carbon Dioxide	Facility CEM
Carbon Monoxide	Facility CEM
Sulphur Dioxide	Facility CEM
Nitrogen Oxides	Facility CEM
Total Hydrocarbons	ORTECH per US EPA Method 25A

Since relative accuracy and system bias testing was performed in the Fall of 2017, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the days when isokinetic testing was performed at each unit (October 10 to October 13, 2017) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH between October 10 and October 11, 2017 was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

4.2 Particulate and Metals

Particulate and metals were sampled using the sampling procedures outlined in US EPA Method 29. Major components of the sampling train were as follows:

- A glass nozzle and probe liner assembly
- A quartz fiber filter with a low metal background
- The first and second impingers were initially empty to collect moisture
- The third and fourth impingers initially contained 100 mL each of 5% nitric acid/10% hydrogen peroxide solution to collect metals
- The fifth impinger was initially empty
- The sixth and seventh impingers initially contained 100 mL each of 4% potassium permanganate/10% sulphuric acid solution to collect mercury
- The eighth impinger contained silica gel

Each test for particulate matter and metals involved the collection of stack gas sampled isokinetically at twelve points centered on equal areas along each of two traverses (at 90° to each other) of the BH Outlet duct. Each of the twenty-four points was sampled for 7.5 minutes for a total actual sampling time of one hundred and eighty minutes.

At 2.5 minute time increments throughout each test the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

The particulate and metals field data sheets are provided in Appendix 6.

At the start and finish of sampling each traverse the sampling train was leak-checked. A valid leak-check as specified by the sampling method is a leakage rate of less than 0.00057 cubic meters per minute (m^3/min) or 4% of the estimated sampling rate, whichever is less. All of the leak-checks, as detailed on the field data sheets, were acceptable.

A blank train was prepared and samples recovered in a manner identical to the test sampling trains for each Boiler.

4.3 Particle Size Distribution

Particle Size Distribution (PSD) tests were performed at each of the BH Outlet sample locations in accordance with the test procedures described in US EPA Method 201A using PM_{10} and $PM_{2.5}$ combined cyclone heads and US EPA Method 202. Sampling was conducted for approximately one hundred and twenty minutes at six points across each traverse of the duct using isokinetic dwell time sampling. At approximately ten minute time increments throughout each test the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the PSD tests are provided in Appendix 7.

A blank train was prepared and samples recovered in a manner identical to the test sampling trains for each Boiler.

4.4 Semi-Volatile Organic Compounds

Semi-volatile organic compounds (SVOC), including dioxins and furans, polychlorinated biphenyls (PCBs), chlorobenzenes (CBs), chlorophenols (CPs) and polycyclic aromatic hydrocarbons (PAHs) were sampled at the BH Outlet of each Boiler using the sampling train and sampling procedures outlined in Environment Canada Report EPS 1/RM/2. Sampling for dioxins, furans and dioxin-like PCBs was also conducted at the Quench Inlet of each Boiler. Major components of the sampling train were as follows:

- A glass nozzle and probe liner assembly
- A clean and proven glass fiber filter
- Amberlite XAD-2 sorbent resin was used in a trap to collect semi-volatile organics
- The first impinger was initially empty
- The second impinger contained 100 mL of ethylene glycol
- The third impinger was initially empty
- The fourth impinger contained silica gel

All test train and auxiliary glassware were cleaned according to the methods as outlined in Environment Canada EPS 1/RM/2 except that the methods were modified by combining proofing extracts prior to analysis for the target analytes.

Each test for semi-volatile organic compounds at the BH Outlet involved the collection of stack gas sampled isokinetically at twelve points centered on equal areas along each of two traverses (at 90° to each other) of the duct. Each of the twenty-four points was sampled for ten minutes for a total actual sampling time of two hundred and forty minutes.

Each test for semi-volatile organic compounds at the Quench Inlet involved the collection of stack gas sampled isokinetically at twelve points centered on equal areas along each of two traverses (at 90° to each other) of the duct. Each of the twenty-four points was sampled for seven and a half minutes for a total actual sampling time of one hundred and eighty minutes. Due to the high particulate loading each test at the Quench Inlet locations required a total of two filters; one filter per traverse.

At five minute time increments at the BH Outlet and 2.5 minute time increments at the Quench Inlet the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger outlet temperatures
- XAD-2 trap outlet temperature
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the SVOC tests are provided in Appendix 8.

At the start and finish of sampling each traverse, and before and after each filter change during the Quench Inlet tests, the sampling train was leak-checked. A valid leak-check as specified by the sampling method is a leakage rate of less than 0.00057 m^3/min or 4% of the estimated average sampling rate, whichever is less. All of the leak-checks for the tests reported, as detailed on the field data sheets, were acceptable.

A blank train was prepared in a manner identical to the test trains for each Boiler. It was assembled, transported and left at the sampling site for a period of time equal to the test trains. The blank train was treated at the sampling site in the same manner as the test trains and a gas volume was drawn through the blank train approximately equal to the leak-check volume for the test trains.

4.5 Acid Gases

Hydrogen fluoride, hydrogen chloride and ammonia were sampled together using the sampling train and sampling procedures outlined in US EPA Method 26A. Major components of the test train were as follows:

- A glass nozzle and probe liner assembly
- The first and second impingers contained 100 ml of 0.1N H_2SO_4
- The third impinger was initially empty
- The fourth impinger contained silica gel

Each test for acid gases involved the collection of stack gas sampled isokinetically at a single point in the duct for sixty minutes.

At five minute time increments throughout each test the following information was measured and recorded on field data sheets:

- Elapsed sampling time
- Dry gas meter volume
- Pitot tube pressure
- Stack gas temperature
- Probe, oven and impinger temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the acid gases tests are provided in Appendix 9.

At the start and finish of each test the sampling train was leak-checked. A valid leak-check as specified by the sampling method is a leakage rate of less than 0.00057 m^3/min or 4% of the estimated average sampling rate, whichever is less.

A blank train was prepared and samples recovered in a manner identical to the test sampling trains for each Boiler.

4.6 Volatile Organic Compounds

Volatile Organic Compound (VOC) sampling was performed in accordance with US EPA SW-846 Method 0030. Briefly, the sampling method involved withdrawing a sample of the stack gas through a heated glass lined sampling probe containing a glass wool plug to remove particulate material. The sample was then passed through a water cooled condenser and a Tenax GC adsorbent tube, as the primary volatile organic collection device. Condensate was collected in an initial condensate trap and the sample was then drawn through a second condenser and a combined secondary Tenax GC/charcoal adsorbent tube, as the secondary volatile organic collection device. The sampled gas stream then passed through a silica gel trap to remove any remaining traces of moisture prior to the rotameter, pump and dry gas meter.

During each test, three twenty minute runs were completed at an approximate flowrate of 1 L/min. A fourth run was also conducted during each test and the tube pair was archived in case a sample was lost during desorption or analysis. Analyses from the three runs performed were combined and used to calculate test average results.

At five minute time increments throughout sampling each pair of tubes, the following information was measured and recorded:

- Elapsed sampling time
- Dry gas meter volume
- Stack gas temperature
- Probe and first condenser outlet temperatures
- Dry gas meter temperatures
- Control module orifice pressure
- Sampling pump vacuum

The sampling train components were cleaned using the procedures in US EPA SW-846 Method 0030, Volatile Organic Sampling Train (VOST).

Field data sheets for the VOST tests are provided in Appendix 10.

Blank tube samples analyzed for the program included three pairs of field blank tubes, a trip blank pair of tubes and one laboratory blank pair of tubes.

4.7 Aldehydes

Some of the compounds listed as VOC's (acetaldehyde, formaldehyde and acrolein) are more commonly classified as aldehydes. These compounds were captured in a separate test train in accordance with CARB Method 430 with the Ashland Modification.

Major components of the test train were as follows:

- A Teflon probe liner assembly was used.
- The first, second and third impingers contained approximately 15 ml each of 0.05% 2,4-dinitrophenylhydrazine (DNPH) in 2N HCl with 2 ml of toluene
- The fourth impinger was initially empty
- The fifth impinger contained silica gel

A single test for aldehydes involved the collection of gas sampled at a single point in the duct at a sampling flowrate of approximately 0.5 liters per minute for sixty minutes.

At five minute time increments throughout each test, the following information was measured and recorded for the train:

- Elapsed sampling time
- Dry gas meter volume
- Stack gas temperature
- Probe, oven and impinger outlet temperatures
- Dry gas meter temperature
- Control module orifice pressure
- Sampling pump vacuum

Field data sheets for the aldehyde tests are provided in Appendix 11.

4.8 Combustion Gases

In Fall 2017, relative accuracy and system bias testing was conducted on the Continuous Emission Monitoring Systems (CEMS) installed at the Quench Inlet and BH Outlet of each Boiler. Covanta informed ORTECH that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA. Therefore, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide.

Combustion gases, including carbon dioxide, carbon monoxide, hydrogen chloride, nitrogen oxides, oxygen, sulphur dioxide and total hydrocarbons, were measured continuously at the BH Outlet during the emission testing program by the DYEC CEMs. Oxygen was also measured continuously by the DYEC CEMS at the Quench Inlet.

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. The data measured by the DYEC CEMS, from October 10 at 09:00 to October 13, 2017 at 14:00, was used to assess against the in-stack emission limit stated in the ECA for each Boiler.

A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the calculated 1-hour average data to compare to the in-stack emission limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data to compare to the in-stack emission limit stated in the ECA.

Total hydrocarbon concentrations were measured by ORTECH following the procedures detailed in US EPA Method 25A. Triplicate one-hour tests were conducted at the Quench Inlet and BH Outlet of each Boiler on October 10 and October 11, 2017, respectively. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA.

5. SAMPLE RECOVERY AND ANALYSIS

All sample analysis was performed by ALS Canada Ltd. Copies of Sample Logs/Chain of Custody Forms for all samples submitted for chemical analysis are provided in Appendix 12.

5.1 Particulate and Metals

Before loading of the field test trains commenced, recovery data sheets were prepared to record initial weights of the test train components. These sheets were also used during sample recovery to record final weights and determine moisture gains and sample volumes. The particulate and metals train recovery data sheets are provided in Appendix 13.

Following the conclusion of each test performed with the metals train, the probe was disconnected and all openings sealed with Teflon tape. The test trains, including the probes, were taken to the on-site ORTECH mobile laboratory for sample recovery. The train recovery procedure is briefly described as follows.

The test trains were visually inspected to ensure that no damage occurred during transportation. The condition of the test train was noted. Filter and impinger content colors were recorded. The filter housing was disassembled and the filter carefully transferred to its pre-test petri dish with the use of Teflon coated tweezers.

All the impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content.

The front half of the sampling train was brushed and rinsed thoroughly with acetone. A nylon bristle probe brush was used to assist in dislodging particulate material which may have adhered to the inside surfaces of the nozzle and probe assembly. The front half was then rinsed in triplicate using 0.1 N nitric acid but no brushing was performed.

The contents of the first five impingers were combined. Triplicate rinses of the impingers and connecting glassware back to and including the Teflon filter support was performed with 0.1 N nitric acid and combined with the impinger solution sample.

The contents of the sixth and seventh impingers were combined. The impingers with connecting glassware were then rinsed in triplicate with approximately 100 mL of fresh potassium permanganate solution followed by a triplicate rinse with 100 mL of distilled, de-ionized water. All of the glassware rinses were added to the sample container.

Any brown residue which was present in the sixth and seventh impingers was removed by incrementally rinsing with small amounts of 8 N hydrochloric acid. These acid rinses were added to a separate sample bottle which initially contained 150 mL of distilled, de-ionized water. The impingers were then rinsed with distilled, de-ionized water into the same sample container.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were delivered to the analytical laboratory for analysis.

The test samples were prepared and analyzed for metals according to US EPA Method 29 (modified). It should be noted that the metals sampling and analysis procedures are only validated for the 17 metals listed in US EPA Method 29. However, the method was used for all metals listed in Schedule D of the ECA including Sb, As, Ba, Be, Cd, Co, Cr, Cu, Pb, Hg, Mo, Ni, Se, Ag, Tl, V and Zn.

The inorganic analytical reports are provided in Appendix 14.

5.2 Particle Size Distribution

Prior to loading the field test trains, recovery data sheets were prepared to record initial weights of the test train components. These sheets were also used during sample recovery to record final weights and determine moisture gains and sample volumes. The train recovery data sheets are provided in Appendix 15.

The particle size distribution (PSD) samples were recovered in much the same way as the particulate samples from the particulate and metals trains. Following the conclusion of each test performed with the PSD trains, the probe was disconnected and all openings sealed with Teflon tape. The sample recoveries were performed in the on-site ORTECH sample recovery trailer.

The test trains were visually inspected to ensure that no damage during movement had occurred. The recovery procedure is briefly described as follows.

The condition of the test train was noted and the filter and impinger colours were recorded. The nozzle, PM_{10} cyclone walls, collection cup and outside of the exit stem was brushed and rinsed thoroughly with acetone into a glass sample container to determine particulate greater than PM_{10}. The PM_{10} cup and connecting parts were rinsed with acetone in a glass sample container to determine particulate less than PM_{10} but greater than $PM_{2.5}$. The $PM_{2.5}$ cup and connecting parts up to the back-up filter were rinsed with acetone into a glass sample container to determine particulate less than $PM_{2.5}$. The back-up filter was transferred to its original petri dish.

The impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content. The back half of the sampling train was then purged with nitrogen at 14 lpm for 1 hour as soon as possible after the completion of each test.

The back-half of the sampling train was recovered following the procedures detailed in US EPA Method 202 for condensable particulate. The contents of the first impinger were poured into a glass sample bottle and rinses of the impinger and connecting glassware were performed with water which was added to the sample. The glassware was then rinsed with acetone and the rinse was repeated in duplicate with hexane. The acetone and hexane rinses were combined into a single glass sample bottle.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were delivered to the analytical laboratory for analysis.

The particle size and condensable particulate matter results are presented with the inorganic analytical reports provided in Appendix 14.

5.3 Semi-Volatile Organic Compounds

Prior to loading the field test trains, recovery data sheets were prepared to record initial weights of the test train components. These sheets were also used during sample recovery to record final weights and determine moisture gains and sample volumes. The train recovery data sheets are provided in Appendix 16.

Following the conclusion of each test performed with the semi-volatile organics train, the probe was disconnected and all openings sealed with Teflon tape. The test trains, including the probes, were taken to the on-site ORTECH mobile laboratory for sample recovery. The train recovery procedure is briefly described as follows.

The condition of the test train was noted. Filter, XAD-2 trap and impinger content colours were recorded. The filter housing was disassembled and the filter carefully transferred, with the use of Teflon coated tweezers, to a piece of pre-cleaned aluminum foil. Each filter was then folded in half onto itself within the foil, the foil ends crimped, then placed in a pre-cleaned glass petri dish. Both the foil containing the filter(s) and the glass Petri dish were labeled.

All of the impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content.

The front half of the sampling train, up to but not including the trap, was brushed and rinsed thoroughly with acetone. A Teflon probe brush was used to assist in dislodging particulate material that may have adhered to the inside surfaces of the cyclone bypass and filter top assembly. This front half rinse was then repeated using hexane, with no brushing, and all rinsing was combined with the probe rinse sample.

The XAD-2 trap was drained of excess cooling water and weighed. The ends were then sealed with Teflon tape and the trap was labeled and wrapped in aluminum foil.

The contents of the first three impingers were combined in a pre-cleaned amber glass sample bottle. Triplicate rinses of the impingers and connecting glassware back to and including the trap bottom u-tube were performed first with HPLC water, which was added to the impinger solution sample, and then with acetone followed by hexane. The acetone and hexane rinses were combined in a separate sample bottle from the impinger solutions.

Due to the design of ORTECH's glassware, the filter bottom, filter bottom u-tube and trap inlet stem were not soaked for five minutes in each of acetone and hexane. Instead, these pieces of glassware were given extra rinses with each of the solvents. Also, since ORTECH uses a one piece trap and condenser, the five minute soak of this component was performed by the analytical laboratory.

Each sample container was sealed and labeled once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form then refrigerated until they were delivered to ALS for analysis.

Semi-volatile organic analyses were performed on single composite extracts for each test according to EPS 1/RM/3 and EPS 1/RM/23. These methods were modified slightly to include other semi-volatile organic compounds following the Environment Canada NITEP/Mid-Connecticut combustion test procedures. These analytical improvements have been implemented over many years and have been identified and approved through laboratory accreditation and acceptance by the MOECC.

The SVOC analytical reports are provided in Appendix 17.

5.4 Acid Gases

Following the conclusion of each test performed with the acid gas train, the probe was disconnected and all openings sealed with Teflon tape. The test trains were taken to the on-site ORTECH mobile laboratory for sample recovery. The train recovery procedure is briefly described as follows.

The test trains were visually inspected to ensure that no damage occurred during transportation. The condition of the test train was noted and the impinger content colors were recorded. All the impingers were wiped dry on the outside then weighed and the results used to determine the stack gas moisture content.

The contents of the first three impingers were combined. Triplicate rinses of the impingers and connecting glassware back to and including the Teflon filter support was performed with high purity water and combined with the impinger solution sample.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were transported to the laboratory for analysis.

Analysis for hydrogen fluoride, hydrogen chloride and ammonia was performed via ion chromatography.

Train recovery data sheets are provided in Appendix 18. The acid gases analytical results are presented with inorganic analytical reports in Appendix 14.

5.5 Volatile Organics Train Recovery

Following the conclusion of each tube pair run performed with the volatile organic sampling train (VOST), the tubes were removed from the train, capped and placed in appropriately labeled test tubes which were also capped. The tubes were sent to ALS for volatile organic compound (VOC) analysis.

The VOST samples were analyzed via SW846 Method 5041A/8260B. Briefly, after spiking with internal and surrogate standards, the traps were thermally desorbed through a clam shell heater then through a chilled aqueous purge to remove the bulk of the moisture onto a secondary trap. These secondary traps are further dried using a counter current flow of helium. The secondary traps are then thermally desorbed into a VOC sample concentrator and again the VOCs are thermally transferred/concentrated onto a GC column. The VOC compounds are separated via gas chromatography (GC) and analyzed via GC/MS.

The condensate collected from each tube pair run was carefully transferred to a glass bottle and combined as a single sample for each sampling location. The condensate samples were archived for future analysis if necessary.

The VOST analytical report is provided in Appendix 19.

5.6 Aldehydes

Following the conclusion of each test performed with the Aldehyde Train the probe was disconnected and all openings were sealed with Teflon tape. The test train was then recovered on site in the ORTECH sample recovery trailer. The train recovery procedure is briefly described as follows.

The condition of the test train was noted. All the impingers were wiped dry and weighed. The contents of the impingers were transferred into a glass sample container. The probe and impingers were rinsed with a small amount of DNPH followed by a small amount of toluene into the same sample container.

Each sample container was sealed, labeled and the fluid level marked (where appropriate) once that portion of the recovery was completed. The samples were then checked against the master sample log/chain of custody form and refrigerated until they were transported to the laboratory for analysis.

Analysis for formaldehyde, acetaldehyde and acrolein was performed via HPLC. The sample recovery data sheets are provided in Appendix 20 and the analytical results are presented in Appendix 21.

6. INTERNAL AND EXTERNAL QA/QC PROGRAM

6.1 General

As with other emission testing programs conducted by ORTECH, a comprehensive internal quality assurance/quality control (QA/QC) program was included.

Blank sampling trains were recovered and analyzed or reagent blanks were analyzed using the same procedures as the test trains to provide background concentrations of the emission test components.

6.2 Pre-Test Activities

Prior to the commencement of the emission testing program, the following activities were performed:

- Preparation, pre-cleaning and proofing of the manual stack sampling trains and sample containers.
- Preparation and quality checks of chemicals, reagents, filters and XAD-2 adsorbent resin.
- Calibration of all sampling and monitoring equipment.
- Development (and review) of data acquisition, data reduction and summary procedures.
- Development of internal QA/QC field data sheets.
- Review of equipment calibration logs.
- Review of proposed field and laboratory procedures.

All proving data for the Semi-Volatile Organics Train glassware and auxiliary equipment was deemed acceptable prior to the test program.

A proof rinse of the sampling probes was collected and archived for future analysis if necessary.

For each batch of VOST tubes, a minimum of 1 pair in 10 was analyzed to demonstrate an absence of significant background contaminants from the tubes prior to the test program.

The proof data for the semi-volatile organics glassware and VOST tubes is provided in Appendix 22.

All equipment used in the field testing program was calibrated and checked prior to the field testing program. Pertinent equipment calibration data is supplied in Appendix 23.

As part of ORTECH's internal QA/QC, data acquisition, data reduction and summary procedures were already in place and periodic spot checks of the computer programs were performed using known data sets.

6.3 Emission Testing QA/QC Results

Prior to the field testing program, preliminary data was acquired to perform the required calculations for choosing a nozzle size to permit isokinetic sampling.

The internal diameter of each duct was verified and the appropriate number of sampling points was marked on each sampling probe.

The following general QA/QC criteria were satisfied for each of the test trains where applicable:

- All sampling equipment was cleaned and proven clean (where applicable) prior to the commencement of the field testing program.
- All sampling equipment passed a visual and operational check prior to use in the field.
- Oil filled manometer gauges which had been properly leveled and zeroed were used to measure the velocity pressure.
- All sampling data was recorded in ink on preformatted data sheets at least once every 5 minutes and at least twice during sampling each traverse point.
- Any unusual occurrences were noted during each test on the appropriate data form.
- The field team leader reviewed all calibration and sampling data forms daily.
- Only tapered edge sampling nozzles and S-type pitot tubes that had been visually inspected and caliper measured, and deemed acceptable, were used for sampling.
- Each leg of the S-type pitot was leak-checked before the start of testing. The leak-checks were all acceptable (no leak detected).
- Each entire sampling train met acceptable leak-check criteria before and after each test, and during any move from one sampling traverse to another. If a test did not meet the leak-check criteria the test was voided and repeated.
- The S-type pitot tube and sampling nozzle were maintained parallel to the flow during testing and care was taken to ensure that they did not scrape the ports when being inserted and removed from the stack.
- The probe and filter components were maintained at 120°C $\pm$ 14°C during testing. If the probe or filter temperature was outside of the acceptable range the test was halted until the temperature could be brought back into the acceptable range.
- Covanta was responsible for monitoring process operations during testing and notified ORTECH when testing was to proceed.

6.4 Sample Recovery, Handling and Custody

ORTECH's sample identification scheme and system for handling and processing samples was initiated as part of ORTECH's sample tracking system for stack emission samples. All samples were identified by a unique sample number comprised of a series of numbers and letters. A master sample log/chain of custody form was maintained by the QA/QC designate and was made available to the ORTECH personnel designated to perform the sample recovery for a specific sampling train. Once a sample was collected it was labeled and checked against the sample log by the QA/QC designate.

The information contained within the sample number and the sample log enabled the sampling, recovery, data reduction and report writing personnel to easily determine the test date, test number, test type and train sample identification for a given sample. To ensure continuity, the analytical laboratory was requested to use the ORTECH number for sample identification.

The ORTECH personnel responsible for delivering samples used the master sample log/chain of custody form to document the transfer of the samples to the analytical laboratory. Appropriate care was taken when shipping the samples in order to maintain sample integrity. Once the samples and master sample log/chain of custody forms were received by the analytical laboratory, the laboratory personnel verified that all samples had been received and their integrity maintained. The laboratory personnel then signed the master log and made a photocopy which ORTECH personnel received as a record of the chain of custody for the samples.

6.5 Analytical Results

It should be noted that due to the design of ORTECH's semi-volatile organic sampling train glassware, the filter bottom, filter bottom u-tube and trap inlet stems are not soaked with each of the required solvents (acetone and hexane) during test train recovery. Instead, these components of the test train were given additional rinses with each of the required solvents. Also, because ORTECH uses a one piece condenser and XAD-2 trap, this component of the test train was Teflon sealed and wrapped with foil prior to being transported to the analytical laboratory where it was given the required five minute soaking with each of acetone and hexane. This is consistent with all SVOC test programs conducted by ORTECH and the modification was documented in the Pre-Test Plan approved by the MOECC.

Analyses for the present emission testing program were performed using acceptable laboratory procedures in accordance with the specified analytical protocols. Adherence to the prescribed QA/QC procedures ensured data of consistent and measurable quality. Analytical quality control focused on the use of control standards to provide a measure of analytical accuracy. Replicate analysis (usually duplicate analysis) of the same sample was used as a means of determining precision of the various analytical procedures. Also specific acceptance criteria were defined for various analytical operations including calibrations, control standard analysis, drift checks, blanks, etc.

The following general QA/QC procedures were incorporated into the analytical effort:

- the on-site Field Supervisor reviewed all data and QA/QC data on a daily basis for completeness and acceptability
- master sample logs were maintained for all samples collected
- analytical QA/QC data was tabulated by the analytical laboratories using appropriate charts or forms
- all hard copy raw data was maintained in organized files

Specific analytical QA/QC procedures are presented in the analytical reports and are briefly summarized below.

6.5.1 Metals Sample Analysis QA/QC

The analysis of the Method 29 stack samples involved sample digestion followed by Inductively Coupled Argon Plasma Mass Spectroscopy (ICP-MS) analysis. The analysis for mercury employed cold vapour atomic absorption (CVAA). The analytical QA/QC is described as follows and the results are provided in the analytical report.

ICPMS Analysis

The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. Specific QA/QC results are summarized below:

- One duplicate sample analysis was performed for the test program. The relative percent difference was less than 16.0% well within the acceptable limit of less than ±20%, for elements that are greater than 5 times the minimum detection limit.
- A blank spike (performed as a pre-digestion spike) was analyzed with the test samples. All of the recovery results were between 85-111%, except for antimony, beryllium, cadmium, chromium manganese and vanadium in the back half samples (76-84%). The acceptable limit is 85-115% of the true value.
- A matrix spike (performed as a post digestion spike) was analyzed with the test samples. All of the recovery results were between 73-112%. The acceptable limit is 70-130% of the true value.

The following general analytical QA/QC requirements must also be met or the samples are re-analyzed:

- An instrument calibration check standard was analyzed immediately after the calibration curve and must be within 90%-110% of the actual concentrations.
- Instrument calibration blank check sample were analyzed with every 10 samples and must be within three times the minimum detection limit.
- A continuing calibration check is run every 10 samples and must be within 85%-115% of the actual concentrations.
- Instrument (interference) check sample for ICP-MS analysis was analyzed before and after each analytical run. The value(s) found for the interference check sample must be within 80%-120% of the true value.

Antimony, copper, molybdenum and nickel were observed by the analytical laboratory in the method blank at levels greater than three times the limit of reporting. Antimony and lead were also observed by the analytical laboratory in the reagent blank at levels slightly greater than the limit of reporting. The test sample data may be biased high for these compounds as a result of this potential background.

Mercury Analysis

The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. Specific QA/QC results are summarized below:

- One duplicate sample analysis was performed for each fraction. The relative percent difference was less than 17.3% within the acceptable limit of less than ±20%, for fractions that are greater than 5 times the minimum detection limit.
- A blank spike (performed as a pre-digestion spike) was analyzed with the test samples. All of the recovery results were between 99-105% within the acceptable limit of 90-110% of the true value.
- A matrix spike (performed as a post digestion spike) was analyzed with the test samples. All of the recovery results were between 97-103% within the acceptable limit of 85-115% of the true value.

The following general analytical QA/QC requirements must also be met or the samples are re-analyzed:

- A 5 point calibration was performed.
- An instrument check calibration standard was analyzed immediately after the calibration and must be within 90%-110% of the actual concentration
- One mid-range calibration standard was analyzed after 10 samples and at the end of the run and must be within 85%-115% of the actual concentration.
- Instrument calibration blank check sample is analyzed with every 10 samples and must be within three times the minimum detection limit.

6.5.2 Acid Gas Sample Analysis QA/QC

Analyses of the acid gas samples from the Method 26A sampling train was performed by Ion Chromatography (IC). The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. Specific QA/QC results are summarized below:

- All of the hydrogen chloride and hydrogen fluoride analyses were conducted in duplicate. One duplicate sample analysis was also performed for ammonia. The relative percent difference was less than 3.3%, well within the acceptable limit of less than ±20% for compounds that are greater than 5 times the minimum detection limit.
- A blank spike sample was analyzed with the test samples. The recovery results for the blank spike sample were 98% for hydrogen chloride, 99% for hydrogen fluoride and 105% for ammonia, within the acceptable range of 90-110%.
- A matrix spike (spike confirmation) sample was analyzed with every 20 samples to confirm the identity of each peak. The recovery results of the matrix spike sample were 97% for hydrogen chloride, 102% for hydrogen fluoride and 99% for ammonia, within the acceptable range of 80-120%.

The following general analytical QA/QC requirements must also be met or the samples are re-analyzed:

- A 6 point calibration bracketing the expected range.
- An instrument check calibration standard was analyzed immediately after the calibration and must be within 90%-110% of the actual concentration.
- A complete set of calibration standards were analyzed at the end of the analysis and must be within 10% of the true value.
- One mid-range calibration standard was analyzed after 10 samples and at the end of the run and must be within 90%-110% of the actual concentration.
- Instrument calibration blank check samples were analyzed with every 10 samples and must be within three times the minimum detection limit for each ion.

6.5.3 Aldehyde Sample Analysis QA/QC

Analysis for formaldehyde, acetaldehyde and acrolein was performed via Liquid Chromatography (LC). Laboratory control samples and a spike sample were analyzed with the test samples. The spike sample was spiked with 8 µg each of acetaldehyde, formaldehyde and acrolein by the laboratory. The recoveries for the travel spike were <20 µg for acrolein, 4.2 µg (52.1%) for formaldehyde and 0.79 µg (9.9%) for acetaldehyde. The spike did not contain toluene, as required by the Ashland Modification to the method, and this may have contributed to the low spike recovery.

The concentrations of acetaldehyde and formaldehyde detected in the blank samples were similar to, and in some cases greater than, the concentrations detected in the test samples. The test results for acetaldehyde and formaldehyde may be elevated due to the high blank results.

The test and blank samples were diluted prior to analysis for acrolein due to the presence of acetone in the samples, which elutes next to the acrolein peak during analysis. Acetone is a common laboratory solvent and is readily adsorbed by the DNPH impinger solution. The source of the acetone background, whether associated with sampling or laboratory analysis, was not determined. As a result the detection limits for acrolein were elevated by a factor of 10 resulting in higher emission data than previous emission testing programs. Acrolein was not detected in any of the samples in quantities greater than the detection limit and the detection limit was used to calculate emission data.

6.5.4 SVOC Sample Analysis QA/QC

The combined filter, probe rinse, Amberlite XAD-2 cartridge, impinger solutions and associated rinse and soaking solutions for each of the semi-volatile organics trains were analyzed together as one sample per test.

Staff at ALS added extraction standards to all samples prior to extraction. Clean-up standards were added just prior to the clean-up process. Recoveries of the clean-up standards provide an indication on the losses that occur during the extract clean-up. The analytical report includes the lists of the field spike, extraction and clean-up standards used. The analysis of samples involved complex sample extraction and cleanup, followed by HRMS/MS analysis.

Recovery of the dioxin and furan and dioxin-like PCBs field spike standards were between 65-152% which indicates good extraction efficiency and provides a high degree of confidence in the results obtained from the dioxin and furan test trains.

The analytical laboratory report identifies responses in the chlorinated diphenylether channel that elute at a similar retention time to select hexachlorodibenzofuran isomers for some of the test results. This response may produce a positive bias on these isomers and has been identified in previous test programs conducted at the facility. This response was not seen in the blank train samples or in the laboratory blank which indicates that it is not an artifact in the solvents, glassware, XAD-2 or the instrument used for analysis. The analytical laboratory indicates that the impact of chlorinated diphenylether on the test results is minimal and does not impact data quality.

BH Outlet No. 2 Test No. 3 and the BH Outlet No. 1 blank sample showed an absence of the field spike. There was no other evidence that these traps were not spiked prior to sampling. While this represents some concern with respect to the validity of the data for these two samples, it should be noted that despite the absence of field standard recoveries there is reasonable recovery of the extraction standards both for the chlorophenol analyses and for other SVOCs. Therefore, there is no evidence for any compromise in the laboratory post sampling processing of these samples. Nor has there been evidence for field spike recovery losses on the other SVOC analyses on these samples.

6.5.5 Volatile Organic Compound Analysis QA/QC

Prior to sampling VOST tube pairs were cleaned and conditioned under helium sweep (approximately 50 mL/min flow) through each tube in an oven at 280°C for at least 12 hours. One VOST pair was analyzed and proven clean for every 10 pairs cleaned. VOST tubes were end-capped and stored sealed in individual screw-capped vials at 4°C between conditioning and shipment to the field.

Three field blanks, a trip blank and a laboratory method blank were analyzed with the test sample tubes. VOST tubes were desorbed and analyzed, combined as pairs, according to SW846 Method 5041A/8260B.

The analytical report includes the field standards, internal standards and surrogate standards used. The surrogate recoveries for each of the surrogates should be between 50-150%. The recoveries for each sample were between 79-119%.

7. RESULTS AND DISCUSSION

Emission tests were completed for particulate matter, particle size distribution, condensable particulate matter, metals, semi-volatile organic compounds, aldehydes, acid gases and volatile organic compounds at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet.

Although not a requirement of the ECA, at the request of Covanta and per the Pre-Test Plan submitted to and approved by the MOECC additional dioxin and furan testing was conducted at the Quench Inlet to the air pollution control (APC) system concurrently with the dioxin and furan tests performed at the Baghouse Outlet on each unit.

Combustion gases, including hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide were measured during the emission testing program (October 10 to October 13, 2017) by the DYEC CEMS. Total hydrocarbon concentrations were also measured by ORTECH on October 10 and October 11, 2017.

Tables referenced in this report for the tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet are provided in Appendix 1 and Appendix 2, respectively. Tables for the additional testing conducted at the Boiler No. 1 Quench Inlet and Boiler No. 2 Quench Inlet are provided in Appendix 3 and Appendix 4, respectively.

Detailed test schedules are provided in Table 1 and Table 2 of Appendix 1 and Appendix 2 for Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet, respectively. Detailed test schedules are provided in Table 1 of Appendix 3 and Appendix 4 for Boiler No. 1 Quench Inlet and Boiler No. 2 Quench Inlet, respectively.

7.1 Stack Gas Sampling Parameters

Emission test calculations for the particulate and metals, particle size, acid gases, and SVOC tests conducted are provided in Appendix 24 to Appendix 27, respectively.

Stack gas sampling parameters for the tests conducted at each location are summarized in Table 3 for the BH Outlet (Appendix 1 and Appendix 2) and Table 2 for the Quench Inlet (Appendix 3 and Appendix 4). These parameters include calibration data, nozzle diameter, dry gas volume sampled and average percentage of isokineticity for each test.

7.2 Stack Gas Physical Parameters

Stack gas physical parameters for tests conducted at each location are presented in Table 4 for the BH Outlet (Appendix 1 and Appendix 2) and Table 3 for the Quench Inlet (Appendix 3 and Appendix 4). The average values from the isokinetic tests at each site are summarized below:

Stack Gas Parameter	Boiler No. 1 Quench Inlet	Boiler No. 1 BH Outlet*	Boiler No. 2 Quench Inlet	Boiler No. 2 BH Outlet*
Gas Temperature (°C)	167	142	168	141
Moisture by Volume (%)	15.8	16.3	16.6	16.3
Velocity (m/s)	17.8	17.0	17.6	17.4
Static Pressure (kPa)	-0.61	-2.48	-0.61	-2.29
Absolute Pressure (kPa)	101.0	98.9	101.0	99.1
Carbon Dioxide by Volume (%)**	11.0	10.9	11.2	11.1
Oxygen by Volume (%)**	7.76	8.56	7.53	7.99

* Excludes Acid Gases tests as testing was conducted at a single point in the duct
** dry basis, measured by DYEC CEMS

7.3 Volumetric Flowrate Data

Stack gas volumetric flowrates for the tests conducted at each location are presented in Table 5 for the BH Outlet (Appendix 1 and Appendix 2) and Table 4 for the Quench Inlet (Appendix 3 and Appendix 4). The average flowrate values from the tests at each site are summarized below:

Volumetric Flowrate	Boiler No. 1 Quench Inlet	Boiler No. 1 BH Outlet*	Boiler No. 2 Quench Inlet	Boiler No. 2 BH Outlet*
Actual Flowrate (m^3/s)	26.3	25.5	26.0	25.7
Dry Reference Flowrate (Rm^3/s)**	15.0	15.1	14.6	15.1
Dry Adjusted Flowrate (Rm^3/s)***	19.8	18.8	19.7	19.7
Wet Reference Flowrate (Rm^3/s)**	17.8	17.9	17.5	18.1

* Excludes Acid Gases tests as testing was conducted at a single point in the duct
** at 25°C and 1 atmosphere
*** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

7.4 Particulate Emission Data

Filterable particulate emission data obtained from each of the particulate and metals tests conducted at the BH Outlet of each Boiler is presented in Table 6 (Appendix 1 and Appendix 2). Average filterable particulate emission data for each BH Outlet location is summarized below:

Particulate Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	1.01	<0.51
Dry Reference Conc. (mg/Rm^3)*	1.73	<0.87
Dry Adjusted Conc. (mg/Rm^3)**	1.40	<0.66
Wet Reference Conc. (mg/Rm^3)*	1.44	<0.72
Emission Rate (mg/s)	26.4	<12.9

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The ECA stipulates maximum in-stack limits for the emissions of various compounds including particulate matter. The particulate dry adjusted concentration at the Boiler No. 1 BH Outlet (1.40 mg/Rm^3, adjusted to 11% oxygen) and the Boiler No. 2 BH Outlet (<0.66 mg/Rm^3, adjusted to 11% oxygen) were well below the maximum limit (9 mg/Rm^3, adjusted to 11% oxygen) stated in the ECA.

The amount of particulate matter detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 1 BH Outlet was 0.9 mg and 0.4 mg, respectively. The amount of particulate detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 2 BH Outlet was 0.8 mg and 0.1 mg, respectively. Although these levels are significant relative to the amount detected in the test trains, the blank analysis was not subtracted from the test sample analyses during calculation of the particulate emission data.

Particle size distribution tests were also conducted at the BH Outlet of each Boiler. PM_{10} and $PM_{2.5}$ emission data is detailed in Table 7 (Appendix 1 and Appendix 2) for each location. Average emission data for each BH Outlet location is summarized below:

PM_{10} and $PM_{2.5}$ Emission Parameter	PM_{10}		$PM_{2.5}$	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	<0.13	<0.25	<0.050	<0.11
Dry Reference Conc. (mg/Rm^3)*	<0.22	<0.42	<0.084	<0.19
Dry Adjusted Conc. (mg/Rm^3)**	<0.18	<0.33	<0.068	<0.15
Wet Reference Conc. (mg/Rm^3)*	<0.19	<0.35	<0.071	<0.16
Emission Rate (mg/s)	<3.33	<6.21	<1.24	<2.89

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Condensable particulate emission data obtained from the back-half of each of the particle size distribution tests conducted at the BH Outlet for each Boiler is presented in Table 8 (Appendix 1 and Appendix 2). Average condensable particulate emission data for each BH Outlet location is summarized below:

Condensable Particulate Emission Parameter	Inorganic Fraction		Organic Fraction	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	2.65	1.72	1.29	1.21
Dry Reference Conc. (mg/Rm^3)*	4.48	2.92	2.18	2.04
Dry Adjusted Conc. (mg/Rm^3)**	3.62	2.26	1.76	1.59
Wet Reference Conc. (mg/Rm^3)*	3.77	2.45	1.83	1.72
Emission Rate (mg/s)	66.7	43.1	32.3	30.3

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The amount of condensable particulate detected in the blank sampling train for Boiler No. 1 was 1.2 mg for the inorganic fraction and 1.3 mg for the organic fraction. The amount of condensable particulate detected in the blank sampling train for Boiler No. 2 was 0.6 mg for the inorganic fraction and 1.4 mg for the organic fraction. Although these levels are significant relative to the amount detected in the test trains, the blank analysis was not subtracted from the test sample analyses during calculation of the condensable particulate emission data.

The average PM_{10} and $PM_{2.5}$ results, including condensable particulate matter, are summarized below for each Boiler:

PM_{10} and $PM_{2.5}$ + Condensable Emission Parameter	PM_{10} + Condensable		$PM_{2.5}$ + Condensable	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m^3)	<4.07	<3.18	<3.99	<3.04
Dry Reference Conc. (mg/Rm^3)*	<6.88	<5.38	<6.74	<5.15
Dry Adjusted Conc. (mg/Rm^3)**	<5.56	<4.18	<5.45	<4.00
Wet Reference Conc. (mg/Rm^3)*	<5.79	<4.52	<5.67	<4.33
Emission Rate (mg/s)	<102	<79.6	<100	<76.3

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

7.5 Acid Gases

Hydrogen chloride, hydrogen fluoride and ammonia emission data for the tests conducted at the BH Outlet of each Boiler are presented in Table 9 (Appendix 1 and Appendix 2). Hydrogen fluoride was not detected in any of the test samples in quantities greater than the detection limit. The detection limit was used to calculate hydrogen fluoride emission data. Hydrogen chloride and ammonia were detected in quantities greater than the detection limit in at least one test sample collected at each location.

Average hydrogen chloride, hydrogen fluoride and ammonia emission data for the tests conducted at the BH Outlet of each Boiler is summarized below:

Acid Gases Emission Parameter	Hydrogen Chloride		Hydrogen Fluoride		Ammonia	
	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
Actual Conc. (mg/m^3)	3.11	2.75	<0.078	<0.081	<0.22	0.24
Dry Reference Conc. (mg/Rm^3)*	5.35	4.70	<0.13	<0.14	<0.37	0.41
Dry Adjusted Conc. (mg/Rm^3)**	4.35	3.57	<0.11	<0.11	<0.30	0.31
Wet Reference Conc. (mg/Rm^3)*	4.46	3.90	<0.11	<0.12	<0.31	0.34
Emission Rate (mg/s)	82.6	70.8	<2.07	<2.09	<5.72	6.11
Dry Adjusted Conc. (ppm)**	2.92	2.40	<0.13	<0.13	<0.43	0.44

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Hydrogen chloride, hydrogen fluoride and ammonia were not detected in the blank samples in quantities greater than the detection limit. The blank analysis was not subtracted from the test sample analyses during calculation of the emission data.

7.6 Combustion Gas Emission Data

Combustion gases, including carbon dioxide, carbon monoxide, hydrogen chloride, nitrogen oxides, oxygen and sulphur dioxide, were measured continuously at the BH Outlet during the emission testing program by the DYEC CEMs. Carbon monoxide and oxygen were also measured at the Quench Inlet by the DYEC CEMS. The oxygen, carbon dioxide and carbon monoxide concentrations for each test period were used to calculate the molecular weight of the gas stream. The oxygen concentration data was also used to correct the dry reference concentration data to 11% oxygen.

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. DYEC CEMS data was provided from October 10 at 09:00 to October 13, 2017 at 14:00 for each Boiler. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limit stated in the ECA.

The minimum, average and maximum 1-hour, 4-hour and 24-hour combustion gas data measured by the DYEC CEMS is summarized in Table 10 (Appendix 1 and Appendix 2). The maximum concentration, along with the in-stack limit stated in the ECA, is summarized in the following table for each component.

Combustion Gases Emission Parameter		In-Stack ECA Limit	Maximum Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Oxygen (%, 1-hr)	-	9.85	8.70
	Carbon Dioxide (kg/Rm^3, 1-hr)**	-	0.20	0.21
	Carbon Monoxide (mg/Rm^3, 4-hr)*	≤ 40	16.8	19.0
	Sulphur Dioxide (mg/Rm^3, 24-hr)*	≤ 35	5.4	3.8
	Nitrogen Oxides (mg/Rm^3, 24-hr)*	≤ 121	113	112
	Hydrogen Chloride (mg/Rm^3, 24-hr)*	≤ 9	2.3	5.5
	Total Hydrocarbons (mg/Rm^3, 1-hr)*	-	0	0
Quench Inlet	Oxygen (%, 1-hr)	≥ 6	9	8

* dry at reference conditions, adjusted to 11% oxygen
** dry at reference conditions

Total hydrocarbon concentration data was measured by ORTECH on October 10 and October 11, 2017 at the Quench Inlet and BH Outlet sampling locations, respectively. The results of the total hydrocarbons tests are summarized in Table 10 (Appendix 1 and Appendix 2) for the BH Outlet sampling locations and in Table 5 (Appendix 3 and Appendix 4) for the Quench Inlet sampling locations. The average THC concentration for each location, along with the in-stack limit stated in the ECA, is summarized in the following table.

Combustion Gases Emission Parameter		Limit	Average Concentration	
			Boiler No. 1	Boiler No. 2
BH Outlet	Total Hydrocarbons (1-minute)*	-	0.1	0.7
	Total Hydrocarbons (10-minute)**	-	0.1	0.7
Quench Inlet	Total Hydrocarbons (1-minute)*	-	0.3	0.03
	Total Hydrocarbons (10-minute)**	50	0.2	0

* ppm dry basis, expressed as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

** ppm dry basis, expressed as equivalent methane (average of each 60 minute test calculated using the 10-minute rolling average)

The one-minute average total hydrocarbon data and the 10-minute total hydrocarbon data measured by ORTECH and expressed on a dry basis as equivalent methane is provided in Appendix 28.

7.7 Metal Emission Data

Metal analytical results for the tests performed at the BH Outlet of each Boiler are given in Tables 11, 12 and 13 (Appendix 1 and Appendix 2) for Test No. 1, Test No. 2 and Test No. 3, respectively. Metal concentrations and emission rates are shown in Tables 14, 15 and 16 (Appendix 1 and Appendix 2) for Test No. 1, Test No. 2 and Test No. 3, respectively.

Summaries of the metal actual concentrations, dry reference concentrations, dry adjusted concentrations, wet reference concentrations, and emission rates including the coefficients of variation for the tests performed are provided in Tables 17, 18, 19, 20 and 21 (Appendix 1 and Appendix 2), respectively. Table 22 (Appendix 1 and Appendix 2) summarizes the average metal emission data for the tests performed.

Table 23 (Appendix 1 and Appendix 2) summarizes the results from the blank metals trains. The amount of metals detected in the blank trains was significant when compared to the amounts collected in the test trains since most of the metals in the test trains were at or near the detection limit. The emission data was not corrected for the blank data.

The metals analysis of the Method 29 test trains was performed on two separate analytical fractions, the probe and filter hydrofluoric acid digest and analysis of the train impingers and associated rinses. In instances where all analyses were reported to be below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, and the remaining fraction was assigned a value of zero. In instances where any given fraction was detected that value was used to calculate emission data, and the remaining undetected fraction were assigned a value of zero.

The ECA stipulates maximum in-stack limits for the emissions of various compounds including cadmium and lead.

The average cadmium emission data is summarized below:

Cadmium Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.039	<0.024
Dry Reference Conc. (µg/Rm^3)*	0.066	<0.041
Dry Adjusted Conc. (µg/Rm^3)**	0.053	<0.031
Wet Reference Conc. (µg/Rm^3)*	0.055	<0.034
Emission Rate (mg/s)	0.0010	<0.00062

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average lead emission data is summarized below:

Lead Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.25	0.37
Dry Reference Conc. (µg/Rm^3)*	0.43	0.62
Dry Adjusted Conc. (µg/Rm^3)**	0.34	0.48
Wet Reference Conc. (µg/Rm^3)*	0.36	0.52
Emission Rate (mg/s)	0.0065	0.0094

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The cadmium and lead dry adjusted concentrations were well below the maximum in-stack emission limits stated in the ECA (7 µg/Rm^3, adjusted to 11% oxygen for cadmium and 50 µg/Rm^3, adjusted to 11% oxygen for lead).

7.8 Mercury Emission Data

Mercury analysis, concentration and emission data are also summarized in the metals emission tables. Mercury was detected in samples from each test, specifically in the impinger sample analysis, and as is the case with all other analyses the mercury analytical results are not blank corrected.

The average mercury emission data is summarized below:

Mercury Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	0.16	0.14
Dry Reference Conc. (µg/Rm^3)*	0.27	0.24
Dry Adjusted Conc. (µg/Rm^3)**	0.22	0.18
Wet Reference Conc. (µg/Rm^3)*	0.23	0.20
Emission Rate (mg/s)	0.0042	0.0036

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The mercury dry adjusted concentrations were well below the maximum in-stack emission limit stated in the ECA of 15 µg/Rm^3, adjusted to 11% oxygen.

7.9 Semi-Volatile Organic Emission Data

The combined filter and probe rinse, and combined Amberlite XAD-2 cartridge and impinger solutions for each of the semi-volatile organics trains were analyzed together (one analysis per test) for semi-volatile organic compounds including select dioxins, furans, dioxin-like polychlorinated biphenyls (PCBs), chlorobenzenes (CBs), chlorophenols (CPs) and polycyclic aromatic hydrocarbons (PAHs) at the BH Outlet of each Boiler, and for dioxins, furans and dioxin-like PCBs at the Quench Inlet of each Boiler.

7.9.1 Dioxins and Furans Emission Data

Dioxins and furans are groups of chemically related chlorinated organic compounds or congeners. There are seventy-five dioxin congeners and one hundred and thirty five furan congeners. The individual congeners all have different molecular structures and they may also have different molecular formulae. Individual congeners, which have the same molecular formula but different molecular structure, are referred to as isomers. Groups of isomers are referred to as congener groups or homologues. The basic dioxin and furan molecules have the molecular formulae $C_{12}H_8O_2$ and $C_{12}H_8O$, respectively. In chlorinated dioxin and furans, between one and eight chlorine atoms may replace an equal number of hydrogen atoms in the basic molecule.

The following table lists the chlorinated dioxin and furan congener groups, and the number of isomers present in each group:

Congener Group Abbreviation		Number of Chlorine Atoms Per Molecule	Molecular Formula	Number of Isomers Per Congener Group
Dioxins	M1CDD	1	$C_{12}H_7ClO_2$	2
	D2CDD	2	$C_{12}H_6Cl_2O_2$	10
	T3CDD	3	$C_{12}H_5Cl_3O_2$	14
	T4CDD	4	$C_{12}H_4Cl_4O_2$	22
	P5CDD	5	$C_{12}H_3Cl_5O_2$	14
	H6CDD	6	$C_{12}H_2Cl_6O_2$	10
	H7CDD	7	$C_{12}H_1Cl_7O_2$	2
	O8CDD	8	$C_{12}Cl_8O_2$	1
Furans	M1CDF	1	$C_{12}H_7ClO$	4
	D2CDF	2	$C_{12}H_6Cl_2O$	16
	T3CDF	3	$C_{12}H_5Cl_3O$	28
	T4CDF	4	$C_{12}H_4Cl_4O$	38
	P5CDF	5	$C_{12}H_3Cl_5O$	28
	H6CDF	6	$C_{12}H_2Cl_6O$	16
	H7CDF	7	$C_{12}H_1Cl_7O$	4
	O8CDF	8	$C_{12}Cl_8O$	1

In Ontario, the MOECC normally requires that only the higher tetra to octa (T4CDD to O8CDD) dioxin congeners and the higher tetra to octa (T4CDF to O8CDF) furan congeners are included in air emission testing. This is because the lower mono to tri congener groups (M1CDD to T3CDD and M1CDF to T3CDF) are considered to be generally less toxic than the higher congener groups and the test procedures have not been validated for these lower groups. In addition, it is acceptable to the MOECC to use only specific isomers in the higher congener groups to compare emission data with the MOECC criteria for dioxin and furan emissions.

Dioxin and furan congener group analytical results and emission data for the tests performed at the BH Outlet of each Boiler are given in Table 24 to Table 32 (Appendix 1 and Appendix 2). Dioxin and furan congener group analytical results and emission data for the tests performed at the Quench Inlet of each Boiler are given in Table 6 to Table 14 (Appendix 3 and Appendix 4). The results are shown as congener groups from T4CDF to O8CDF and T4CDD to O8CDD, as normally required by the MOECC.

The average dioxin congener group emission data for each location is summarized below:

Dioxin Congener Emission Parameter	Boiler No. 1		Boiler No. 2	
	Quench Inlet	BH Outlet	Quench Inlet	BH Outlet
Actual Conc. (ng/m^3)	6.72	0.28	6.26	1.14
Dry Reference Conc. (ng/Rm^3)*	11.8	0.48	11.1	1.92
Dry Adjusted Conc. (ng/Rm^3)**	8.93	0.38	8.26	1.46
Wet Reference Conc. (ng/Rm^3)*	10.0	0.40	9.30	1.61
Emission Rate (ng/s)	177	7.24	163	29.9

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average furan congener group emission data for each location is summarized below:

Furan Congener Emission Parameter	Boiler No. 1		Boiler No. 2	
	Quench Inlet	BH Outlet	Quench Inlet	BH Outlet
Actual Conc. (ng/m^3)	43.3	<0.034	42.8	0.12
Dry Reference Conc. (ng/Rm^3)*	76.2	<0.058	76.3	0.21
Dry Adjusted Conc. (ng/Rm^3)**	57.6	<0.046	56.6	0.16
Wet Reference Conc. (ng/Rm^3)*	64.2	<0.049	63.6	0.17
Emission Rate (ng/s)	1142	<0.88	1113	3.22

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The amounts of dioxin and furan congeners detected in the blank sampling trains and in the laboratory blank were insignificant when compared to the amounts detected in the test trains. The blank sampling train analytical results are shown in Table 33 (Appendix 1 and Appendix 2) for the BH Outlet and Table 15 (Appendix 3 and Appendix 4) for the Quench Inlet. The blank analyses were not subtracted from the test sample analyses during calculation of the dioxin and furan congener emission data.

Dioxin, furan and dioxin-like PCB specific isomer analytical results and emission data for the tests performed are given in Table 34 to Table 42 (Appendix 1 and 2) for the BH Outlets and Table 16 to Table 24 (Appendix 3 and Appendix 4) for the Quench Inlets. The isomers included in these tables are considered the most toxic of all the dioxin and furan isomers. They are characterized by having chlorine atoms located at the 2, 3, 7 and 8 positions of the basic dioxin and furan molecules.

The blank sampling train analytical results are shown in Table 43 (Appendix 1 and Appendix 2) for the BH Outlet and Table 25 (Appendix 3 and Appendix 4) for the Quench Inlet. The blank analyses were not subtracted from the test sample analyses during the calculation of the dioxin and furan isomer emission data.

Several schemes have been proposed for calculating dioxin and furan toxic equivalents (TEQ's) in which different factors have been assigned to the various isomers and congener groups. Calculations in this report are based on the methods preferred by the MOECC, which use WHO and NATO/CCMS (1989) toxicity equivalence factors (TEFs).

The purpose in calculating dioxin and furan emission rates as toxic equivalents is to provide a means of assessing and comparing the effects of dioxin and furan emission rates for different emission sources. In these calculations, 2,3,7,8-T4CDD, the most toxic of all the dioxin and furan isomers, is assigned an arbitrary value of 1.0 for a toxic equivalency factor.

Then, other dioxin and furan isomers are assigned toxic equivalency factors which are based on their relative toxicity compared with 2,3,7,8-T4CDD. Emission rates for each isomer are multiplied by their assigned factor and the products are summed to provide the toxic equivalency emission rate.

Dioxin and furan TEQ emission data is given in Table 44 to Table 49 (Appendix 1 and Appendix 2) for the BH Outlet and Table 26 to Table 31 (Appendix 3 and Appendix 4) for the Quench Inlet.

The MOECC "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 – Air Pollution – Local Air Quality", dated April 2012, provided a new framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. This document was replaced by "Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", published on January 4, 2017, however the dioxin and furan toxicity equivalent calculation methodology remains the same.

Tables 44 to 49 (Appendix 1 and Appendix 2) for the BH Outlet and Tables 26 to 31 (Appendix 3 and Appendix 4) for the Quench Inlet show the dioxins, furans and dioxin-like PCBs toxicity equivalent emission data calculated using the full detection limit for those compounds not detected. Table 50 (Appendix 1 and Appendix 2) for the BH Outlet and Table 32 (Appendix 3 and Appendix 4) for the Quench Inlet show the dioxins, furans and dioxin-like PCBs toxicity equivalent emission data calculated using half the detection limit for those compounds not detected.

The average dioxin, furan and dioxin-like PCBs toxicity equivalent emission data, calculated using the WHO toxicity equivalence factors and half the detection limit is summarized below. Per the MOECC standards and guidelines referenced above, dioxin, furan and dioxin-like PCB toxicity equivalent emission data calculated using the WHO toxicity equivalence factors and half the detection limit are used for dispersion modelling analysis for comparison with the point of impingement criteria discussed in Section 8.

Dioxin and Furan Isomer Emission Parameter	Boiler No. 1 Quench Inlet	Boiler No. 1 BH Outlet	Boiler No. 2 Quench Inlet	Boiler No. 2 BH Outlet
Actual Conc. (pg TEQ/m^3)	795	3.24	797	6.50
Dry Reference Conc. (pg TEQ/Rm^3)*	1399	5.48	1420	11.0
Dry Adjusted Conc. (pg TEQ/Rm^3)**	1055	4.36	1053	8.35
Wet Reference Conc. (pg TEQ/Rm^3)*	1178	4.62	1184	9.22
Emission Rate (ng TEQ/s)	20.9	0.083	20.7	0.17

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average dioxin and furan dry adjusted toxicity equivalent concentration, calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit (Table 46B in Appendix 1 and Appendix 2, and Table 28B in Appendix 3 and Appendix 4) is summarized below. Dioxin and furan toxicity equivalent emission data for the BH Outlet, calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit, is used for comparison with the in-stack emission limit specified in the ECA.

Dioxin and Furan Isomer Emission Parameter	Boiler No. 1 Quench Inlet	Boiler No. 1 BH Outlet	Boiler No. 2 Quench Inlet	Boiler No. 2 BH Outlet
Dry Adjusted Conc. (pg TEQ/Rm^3)*	1136	<5.94	1127	<10.1

* at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The dioxin and furan dry adjusted TEQ concentration at the BH Outlet of each Boiler was well below the maximum in-stack emission limit stated in the ECA of 60 pgTEQ/Rm^3, adjusted to 11% oxygen.

7.9.2 Chlorobenzene and Chlorophenol Emission Data

As with dioxins and furans, chlorobenzenes and chlorophenols are groups of compounds that have different molecular structures and may also have different numbers of chlorine atoms in the basic molecule. Chlorobenzenes have the structure of the benzene molecule except that between one and six chlorine atoms are substituted for an equal number of hydrogen atoms in the benzene ring. Benzene has the molecular formula C_6H_6. Chlorobenzene congener groups have the molecular formulae C_6H_5Cl, $C_6H_4Cl_2$, $C_6H_3Cl_3$, $C_6H_2Cl_4$, C_6HCl_5 and C_6Cl_6. Chlorophenols have the structure of the phenol molecule except that between one and five chlorine atoms are substituted for an equal number of hydrogen atoms in the benzene ring. Phenol has the molecular formula C_6H_5OH. Chlorophenol congener groups have the molecular formulae C_6H_4ClOH, $C_6H_3Cl_2OH$, $C_6H_2Cl_3OH$, C_6HCl_4OH and C_6Cl_5OH.

Chlorobenzene congener and isomer analytical results and emission data are given in Table 51 to Table 59 (Appendix 1 and Appendix 2) for the BH Outlet.

Amounts collected were assumed to be equivalent to the detection limit, where the analytical results were below the detection limit.

The average total chlorobenzene emission data is presented below:

Chlorobenzenes Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<187	<238
Dry Reference Conc. (ng/Rm^3)*	<316	<402
Dry Adjusted Conc. (ng/Rm^3)**	<252	<306
Wet Reference Conc. (ng/Rm^3)*	<266	<338
Emission Rate (µg/s)	<4.79	<6.26

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Blank sampling train and laboratory blank analytical results for chlorobenzenes are given in Table 60 (Appendix 1 and Appendix 2). The blank analyses were not subtracted from the test sample analyses during the calculation of chlorobenzene emission data.

Chlorophenol congener and isomer analytical results and emission data is given in Table 61 to Table 69 (Appendix 1 and Appendix 2) for the BH Outlet of each Boiler.

Amounts collected were assumed to be equivalent to the detection limit, where the analytical results were below the detection limits (<DL).

The average total chlorophenol emission data is presented below:

Chlorophenol Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<117	<110
Dry Reference Conc. (ng/Rm^3)*	<198	<186
Dry Adjusted Conc. (ng/Rm^3)**	<157	<142
Wet Reference Conc. (ng/Rm^3)*	<166	<157
Emission Rate (µg/s)	<2.99	<2.90

* at 25°C and 1 atmosphere
** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Blank sampling train and laboratory blank analytical results for chlorophenols are given in Table 70 (Appendix 1 and Appendix 2). The blank analyses were not subtracted from the test sample analyses during the calculation of chlorophenol emission data.

7.9.3 Polycyclic Aromatic Hydrocarbon Emission Data

The SVOC samples from the BH Outlet sampling location on each Boiler were also analyzed for select polycyclic aromatic hydrocarbon (PAH) compounds.

Analytical results and PAH emission data for the tests performed are provided in Table 71, 72 and Table 73 (Appendix 1 and Appendix 2) for Test No. 1, Test No. 2 and Test No. 3, respectively. PAH actual concentrations, dry reference concentrations, dry adjusted concentrations, wet reference concentrations, and emission rates are shown in Tables 74 to 78 (Appendix 1 and Appendix 2), respectively. A summary of the average emission data is given in Table 79 (Appendix 1 and Appendix 2).

The average total PAH emission data is presented below:

Total PAH Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (ng/m^3)	<210	<273
Dry Reference Conc. (ng/Rm^3)*	<355	<459
Dry Adjusted Conc. (ng/Rm^3)**	<284	<350
Wet Reference Conc. (ng/Rm^3)*	<299	<387
Emission Rate (µg/s)	<5.38	<7.17

* at 25°C and 1 atmosphere
** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Table 80 (Appendix 1 and Appendix 2) summarizes the lab blank and blank train PAH analyses. The blank train sample analyses were not subtracted from the test train sample analyses for the purposes of emission rate calculations.

7.10 Aldehydes

Acetaldehyde, formaldehyde and acrolein emission data for the tests conducted at the BH Outlet of each Boiler is presented in Table 81 (Appendix 1 and Appendix 2).

The test and blank samples were diluted prior to analysis for acrolein due to the presence of acetone in the samples, which elutes next to the acrolein peak during analysis. Acetone is a common laboratory solvent and is readily adsorbed by the DNPH impinger solution. The source of the acetone background, whether associated with sampling or laboratory analysis, was not determined. As a result the detection limits for acrolein were elevated by a factor of 10 resulting in higher emission data than previous emission testing programs. Acrolein was not detected in any of the samples in quantities greater than the detection limit and the detection limit was used to calculate emission data.

Average acetaldehyde, formaldehyde and acrolein emission data for the tests conducted at the BH Outlet of each Boiler is summarized below:

Aldehydes Emission Parameter	Acetaldehyde		Formaldehyde		Acrolein	
	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	14.8	20.8	23.2	29.4	<197	<172
Dry Reference Conc. (µg/Rm^3)*	25.1	35.1	39.2	49.6	<333	<291
Dry Adjusted Conc. (µg/Rm^3)**	20.0	26.8	31.3	37.8	<265	<222
Wet Reference Conc. (µg/Rm^3)*	21.2	29.6	33.1	41.7	<281	<245
Emission Rate (mg/s)	0.38	0.55	0.59	0.77	<5.00	<4.54

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Acetaldehyde and formaldehyde were detected in the blank samples in quantities similar to those found in the test samples. The blank analysis was not subtracted from the test sample analyses during calculation of the emission data.

7.11 Volatile Organic Emission Data

Three twenty minute runs were completed for each test at the BH Outlet of each Boiler at an approximate flowrate of one liter per minute for 20 minutes for volatile organic compounds. One backup pair of tubes was collected for each test and archived in case a sample was lost during the extraction process by the analytical laboratory.

Volatile organic analysis data for the tests is provided in Table 82, 83 and Table 84 for Test No. 1, Test No. 2 and Test No. 3, respectively. These tables indicate the total amount of each compound collected in the combined adsorbent tube samples from each volatile organics sampling train run. Emission data for the tests performed are provided in Table 85, 86 and 87 (Appendix 1 and Appendix 2) for Test No. 1, Test No. 2 and Test No. 3, respectively. The average test results of volatile organic actual concentrations, dry reference concentrations, dry adjusted concentrations, wet reference concentrations, and emission rates are shown in Table 88 to 92 (Appendix 1 and Appendix 2), respectively. The average volatile organic emission data is summarized in Table 93 (Appendix 1 and Appendix 2).

For the purpose of determining average and total analytical results for the VOC compounds, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

The average total VOC emission data collected from the VOST sampling train is presented below:

VOC Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (µg/m^3)	<31.8	<40.8
Dry Reference Conc. (µg/Rm^3)*	<53.9	<68.1
Dry Adjusted Conc. (µg/Rm^3)**	<42.9	<52.3
Wet Reference Conc. (µg/Rm^3)*	<45.3	<57.7
Emission Rate (mg/s)	<0.82	<1.07

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The average total VOC emission data, including acetaldehyde, formaldehyde and acrolein, per the list provided in Schedule D of the ECA is presented below:

VOC Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Dry Reference Conc. (µg/Rm^3)*	<451	<444
Dry Adjusted Conc. (µg/Rm^3)**	<359	<339
Emission Rate (mg/s)	<6.79	<6.93

* at 25°C and 1 atmosphere

** at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

The total VOC emission data is higher than previous emission testing programs primarily due to the elevated detection limit for acrolein as discussed in the previous section.

Analysis of blank adsorbent tubes is provided in Table 94 (Appendix 1 and Appendix 2). The field blank tubes were taken to the test site and uncapped in order to expose the tubes to the ambient environment at the sampling location. The blank adsorbent tube results were below the detection limit for all target compounds. Test sample analyses were not blank corrected during the calculation of the emission data.

8. DISPERSION MODELLING

The emission data measured during the testing program was used to assess emissions from the main stack against the point of impingement criteria detailed in Ontario Regulation 419/05 or the applicable MOECC guideline.

Dispersion modelling was completed using the CALPUFF model (using Version 6.263 as requested by the MOECC) by Golder Associates. The dispersion modelling results are detailed in Appendix 29. Golder Associates can provide the dispersion modelling zip files upon request.

The predicted ground level Point of Impingement (POI) concentrations, calculated based on the average total emission rate, for each contaminant included in the October 2017 emission testing program was well below the applicable standard, guideline or upper risk threshold. The contaminant with the highest predicted concentration relative to the standard was nitrogen oxides (21% of the standard), all other contaminants were less than 5% of the relevant standard.

9. FACILITY PROCESS DATA

Continuous Emission Monitoring (CEM) data was supplied by DYEC personnel for the emission test program. The 1-hour CEM System data was provided for the following process parameters at the BH Outlet sampling locations:

- Hydrogen Chloride (mg/Rm^3, adjusted to 11% oxygen)
- Nitrogen Oxides (mg/Rm^3, adjusted to 11% oxygen)
- Sulphur Dioxide (mg/Rm^3, adjusted to 11% oxygen)
- Carbon Monoxide (mg/Rm^3, adjusted to 11% oxygen)
- Oxygen (% volume, dry)
- Carbon Dioxide (kg/Rm^3)
- Total Hydrocarbons (mg/Rm^3, adjusted to 11% oxygen)

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs during each isokinetic test day at each Boiler. DYEC CEMS data was provided from October 10 at 09:00 to October 13, 2017 at 14:00 for each Boiler. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limits stated in the ECA. A 4-hour rolling average was determined for carbon monoxide using the calculated 1-hour average data for the isokinetic test days at each unit to compare to the in-stack limit stated in the ECA.

The combustion gas concentrations, expressed as 1-hour average concentrations, 4-hour rolling average and 24-hour rolling average where applicable, at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet are provided in Appendix 30.

1-minute CEM data provided by DYEC was used to calculate the average oxygen, carbon dioxide and carbon monoxide concentrations for each isokinetic test period. The average oxygen, carbon dioxide and carbon monoxide concentrations were used to calculate the molecular weight of the gas stream. The average oxygen concentrations were also used to adjust the dry reference concentration data to 11% oxygen. The 1-minute data for the isokinetic test periods has been retained by ORTECH and can be provided upon request.

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The facility process data was also supplied by DYEC personnel for each test day. Hourly process data has been retained by Covanta and can be provided upon request. The process data is summarized below:

Test Date	Total Power Output* (MWh/d)	Aux. Fuel Combusted (m^3/d)		Avg. Combustion Zone Temp. (°C)		Steam (tonnes/d)		MSW Combusted (tonnes/d)		NO_X Reagent Inj. Rate (liters/d)		Carbon Inj. Rate (kg/d)		Lime Inj. Rate (kg/d)	
		Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
Oct. 10/17	383	0	0	1215	1271	801	798	211	214	778	604	126	126	4418	4431
Oct. 11/17	379	0	0	1213	1269	799	797	211	211	613	750	126	126	4263	4443
Oct. 12/17	388	0	0	1235	1266	804	791	213	213	637	741	126	126	4276	4598
Oct. 13/17	390	0	0	1224	1256	808	812	212	214	666	794	126	126	4175	4258
Average	385	0	0	1222	1266	803	800	212	213	674	722	126	126	4283	4433

* Gross turbine output

10. CONCLUSIONS

The main conclusions which can be drawn from the present emission testing program are:

- During the stack test periods the facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation. Testing was conducted at a steam production rate of greater than 791 tonnes of steam per day for each Boiler. The maximum continuous rating for the facility is 1614.7 tonnes of steam per day for the two Boilers combined (33.64 tonnes of steam per hour or 807.4 tonnes per day for each Boiler).

- The in-stack concentrations of the components listed in the ECA were all below the concentration limits provided in the ECA.

- Using CALPUFF dispersion modelling techniques (using Version 6.263 as requested by the MOECC), the predicted maximum point of impingement concentrations, based on the average test results for both boilers, show DYEC to be operating well below the current standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines and upper risk thresholds.

Schedule C of ECA No. 7306-8FDKNX lists in-stack limits for the emissions of various compounds. Emissions limits are given for particulate matter, mercury, cadmium, lead, dioxins and furans and organic matter as the results from compliance source testing. Emission limits are also given for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide calculated as the rolling arithmetic average of data measured by a CEMS.

The Fall 2017 relative accuracy and system bias testing was conducted on the Continuous Emission Monitoring Systems (CEMS) installed at the Scrubber Inlet and BH Outlet of each Boiler prior to the compliance testing program. Covanta informed ORTECH that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA. Therefore, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the isokinetic test days at each unit was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA.

Total hydrocarbon concentration data was measured by ORTECH on October 10 and October 11, 2017 at the Quench Inlet and BH Outlet sampling locations, respectively. The total hydrocarbon data measured by ORTECH at the Quench Inlet sample locations was well below the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

The average results for the tests conducted at Boiler No. 1, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	385	-
Average Combustion Zone Temp. (°C)*	-	-	-	1222	-
Steam (tonnes/day)*	-	-	-	803	-
MSW Combusted (tonnes/day)*	-	-	-	212	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	674	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4283	-
Filterable Particulate (mg/Rm^3) (1)	1.43	2.32	0.45	1.40	9
PM_{10} with Condensable (mg/Rm^3) (1)	<5.03	<4.23	<7.39	<5.55	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<4.97	4.17	<7.19	<5.44	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.11	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	<0.27	0.30	0.33	<0.30	-
Cadmium (µg/Rm^3) (1)	0.060	0.071	0.030	0.053	7
Lead (µg/Rm^3) (1)	0.36	0.40	0.27	0.34	50
Mercury (µg/Rm^3) (1)	0.25	0.23	0.19	0.22	15
Antimony (µg/Rm^3) (1)	0.099	0.068	0.062	0.076	-
Arsenic (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Barium (µg/Rm^3) (1)	1.97	1.90	1.47	1.78	-
Beryllium (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Chromium (µg/Rm^3) (1)	1.19	0.85	0.48	0.84	-
Cobalt (µg/Rm^3) (1)	0.11	0.14	<0.045	<0.097	-
Copper (µg/Rm^3) (1)	1.40	1.35	0.95	1.24	-
Molybdenum (µg/Rm^3) (1)	4.15	4.53	5.11	4.60	-
Nickel (µg/Rm^3) (1)	1.44	1.34	0.63	1.14	-
Selenium (µg/Rm^3) (1)	<0.22	<0.23	<0.23	<0.23	-
Silver (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Thallium (µg/Rm^3) (1)	<0.045	<0.046	<0.045	<0.045	-
Vanadium (µg/Rm^3) (1)	<0.022	<0.023	<0.023	<0.023	-
Zinc (µg/Rm^3) (1)	4.93	4.24	3.14	4.10	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<5.63	<6.60	<5.57	<5.94	60
Total Chlorobenzenes (ng/Rm^3) (1)	<240	<206	<311	<252	-
Total Chlorophenols (ng/Rm^3) (1)	<153	<152	<167	<157	-
Total PAHs (ng/Rm^3) (1)	<255	<254	<342	<284	-
Total VOCs (µg/Rm^3) (1) (4)	<353	<352	<373	<359	-
Quench Inlet Dioxins and Furans (pg TEQ/Rm^3) (3)	1018	1149	1242	1136	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.6	0.1	0.1	0.3	50

* based on process data provided by Covanta

(1) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(2) dry basis as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

The average results for the tests conducted at Boiler No. 2, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Test No. 1	Test No. 2	Test No. 3	Average	In-Stack Limit
Total Power Output (MWh/day)*	-	-	-	385	-
Average Combustion Zone Temp. (°C)*	-	-	-	1266	-
Steam (tonnes/day)*	-	-	-	800	-
MSW Combusted (tonnes/day)*	-	-	-	213	-
NOx Reagent Injection Rate (liters/day)*	-	-	-	722	-
Carbon Injection (kg/day)*	-	-	-	126	-
Lime Injection (kg/day)*	-	-	-	4433	-
Filterable Particulate (mg/Rm^3) (1)	1.34	<0.25	<0.38	<0.66	9
PM_{10} with Condensable (mg/Rm^3) (1)	<4.31	4.47	<3.74	<4.18	-
$PM_{2.5}$ with Condensable (mg/Rm^3) (1)	<4.18	4.27	<3.55	<4.00	-
Hydrogen Fluoride (mg/Rm^3) (1)	<0.10	<0.11	<0.11	<0.11	-
Ammonia (mg/Rm^3) (1)	0.28	0.34	0.30	0.31	-
Cadmium (µg/Rm^3) (1)	0.049	<0.021	0.024	<0.031	7
Lead (µg/Rm^3) (1)	0.61	0.59	0.22	0.48	50
Mercury (µg/Rm^3) (1)	0.19	0.19	0.15	0.18	15
Antimony (µg/Rm^3) (1)	0.099	0.066	<0.045	<0.070	-
Arsenic (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Barium (µg/Rm^3) (1)	2.72	0.32	0.24	1.09	-
Beryllium (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Chromium (µg/Rm^3) (1)	1.11	1.03	0.51	0.88	-
Cobalt (µg/Rm^3) (1)	0.12	0.074	<0.045	<0.078	-
Copper (µg/Rm^3) (1)	2.76	1.89	0.63	1.76	-
Molybdenum (µg/Rm^3) (1)	4.51	4.84	5.11	4.82	-
Nickel (µg/Rm^3) (1)	1.44	0.80	0.48	0.91	-
Selenium (µg/Rm^3) (1)	<0.22	<0.21	<0.22	<0.22	-
Silver (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Thallium (µg/Rm^3) (1)	<0.043	<0.042	<0.045	<0.043	-
Vanadium (µg/Rm^3) (1)	<0.022	<0.021	<0.022	<0.022	-
Zinc (µg/Rm^3) (1)	8.76	2.83	1.11	4.23	-
Dioxins and Furans (pg TEQ/Rm^3) (3)	<10.7	<9.41	<10.2	<10.1	60
Total Chlorobenzenes (ng/Rm^3) (1)	<287	<183	<447	<306	-
Total Chlorophenols (ng/Rm^3) (1)	<140	<144	<142	<142	-
Total PAHs (ng/Rm^3) b	<418	<358	<276	<350	-
Total VOCs (µg/Rm^3) (1) (4)	<349	<316	<351	<339	-
Quench Inlet Dioxins and Furans (pg TEQ/Rm^3) (3)	1052	871	1457	1127	-
Quench Inlet Organic Matter (THC) (ppm, dry) (2)	0.1	0	0	0.03	50

* based on process data provided by Covanta

(1) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(2) dry basis as equivalent methane (average of each 60 minute test with data recorded in 1-minute intervals)

(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

(4) Includes all components from the volatile organic compounds test list in the ECA (i.e. Volatile Organic Sampling Train and Aldehyde Sampling train components).

A summary of the minimum, average and maximum concentrations for the combustion gases measured by the DYEC CEMS with in-stack limits listed in the ECA is provided below for the two units.

Boiler No.	Parameter	Minimum	Average	Maximum	In-Stack Limit
Boiler No. 1	Carbon Monoxide (mg/Rm^3) (1)	6.3	11.5	16.8	40
	Hydrogen Chloride (mg/Rm^3) (2)	1.6	2.0	2.3	9
	Nitrogen Oxides (mg/Rm^3) (2)	110	112	113	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	2.4	5.4	35
Boiler No. 2	Carbon Monoxide (mg/Rm^3) (1)	7.5	12.2	19.0	40
	Hydrogen Chloride (mg/Rm^3) (2)	4.6	5.1	5.5	9
	Nitrogen Oxides (mg/Rm^3) (2)	111	111	112	121
	Sulphur Dioxide (mg/Rm^3) (2)	0	1.7	3.8	35

(1) 4-hour average measured by DYEC CEMS, dry at 25°C and 1 atmosphere adjusted to 11% oxygen by volume
(2) 24-hour average measured by DYEC CEMS, dry at 25°C and 1 atmosphere adjusted to 11% oxygen by volume

APPENDIX 1

Boiler No. 1 BH Outlet
Data Tables
(96 pages)

TABLE 1
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Isokinetic Sampling Train Test Schedules

Particulate and Metals Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 10, 2017	9:38	13:08	180
2	October 10, 2017	14:04	17:30	180
3	October 12, 2017	9:20	13:13	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 11, 2017	8:29	10:32	119.6
2	October 11, 2017	11:39	13:41	119
3	October 11, 2017	14:50	16:51	119

Acid Gases Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 10, 2017	9:42	11:00	60
2	October 10, 2017	11:41	12:41	60
3	October 10, 2017	14:06	15:06	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 12, 2017	9:19	13:42	240
2	October 12, 2017	14:53	19:04	240
3	October 13, 2017	8:38	12:50	240

* Actual sampling time excluding leak-checks, traverse changes and process down time.

TABLE 2
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Organic Compounds Test Schedules

Acrolein and Aldehydes Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	October 12, 2017	14:56	15:56	60
2	October 12, 2017	16:29	17:29	60
3	October 13, 2017	8:42	9:42	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	October 12, 2017	9:22	9:42	20
	2	October 12, 2017	9:54	10:14	20
	3	October 12, 2017	10:21	10:41	20
	4	October 12, 2017	10:49	11:09	20
2	1	October 12, 2017	11:19	11:39	20
	2	October 12, 2017	11:54	12:14	20
	3	October 12, 2017	12:27	12:47	20
	4	October 12, 2017	12:56	13:16	20
3	1	October 13, 2017	10:49	11:09	20
	2	October 13, 2017	11:15	11:35	20
	3	October 13, 2017	11:41	12:01	20
	4	October 13, 2017	12:08	12:28	20

Total Hydrocarbons Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	October 11, 2017	9:03	10:30	60
2	October 11, 2017	10:13	11:13	60
3	October 11, 2017	11:18	12:18	60

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Stack Gas Sampling Parameters

Particulate and Metals Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.847	0.996	6.36	3.645	100.5
2	0.847	0.996	6.36	3.567	101.8
3	0.847	1.006	6.36	3.473	99.4

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.846	0.996	4.50	1.195	106.0
2	0.846	0.996	4.50	1.197	105.7
3	0.846	0.996	4.50	1.184	103.1

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.847	1.006	6.44	1.284	100.9
2	0.847	1.006	6.44	1.273	101.5
3	0.847	1.006	6.44	1.241	99.7

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.844	0.996	6.49	4.949	100.5
2	0.844	0.996	6.49	4.827	100.4
3	0.844	0.996	6.49	4.848	99.0

* Dry at 25°C and 1 atmosphere

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Stack Gas Physical Parameters

Particulate and Metals Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	142	16.6	18.1	-2.49	98.5	10.6	8.74
2	142	16.9	17.6	-2.49	98.5	10.6	8.67
3	141	15.6	17.1	-2.51	99.2	11.1	8.34
Average	142	16.4	17.6	-2.50	98.7	10.8	8.58

Particle Size Distribution Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	16.3	16.8	-2.39	99.1	10.9	8.57
2	141	15.9	16.9	-2.49	99.0	10.9	8.60
3	142	15.5	17.1	-2.49	98.9	10.8	8.68
Average	141	15.9	16.9	-2.46	99.0	10.8	8.62

Acid Gases Trains **

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	15.2	18.3	-2.49	98.5	10.5	8.93
2	140	15.8	18.1	-2.49	98.5	10.7	8.59
3	140	15.6	18.0	-2.49	98.5	10.7	8.49
Average	140	15.5	18.1	-2.49	98.5	10.7	8.67

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	16.2	17.5	-2.51	99.2	11.1	8.35
2	142	15.7	17.0	-2.47	99.1	11.0	8.37
3	142	15.8	17.4	-2.48	98.9	10.8	8.69
Average	142	15.9	17.3	-2.48	99.1	11.0	8.47

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically at a single point in the duct.

TABLE 5
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Stack Gas Volumetric Flowrates

Particulate and Metals Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	26.8	15.6	19.2	18.7
2	26.0	15.1	18.6	18.1
3	25.2	15.0	19.1	17.8
Average	26.0	15.2	18.9	18.2

Particle Size Distribution Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	24.9	14.7	18.3	17.5
2	25.0	14.8	18.4	17.6
3	25.3	15.0	18.5	17.8
Average	25.1	14.8	18.4	17.6

Acid Gases Trains ***

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	27.0	16.0	19.4	18.9
2	26.8	15.8	19.7	18.8
3	26.5	15.7	19.7	18.6
Average	26.8	15.8	19.6	18.8

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.9	15.3	19.4	18.2
2	25.2	14.9	18.9	17.7
3	25.7	15.2	18.7	18.0
Average	25.6	15.1	19.0	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

*** Sampling was conducted isokinetically at a single point in the duct. Volumetric flowrates from the corresponding particulate and metals tests were used to calculate emission data.

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Particulate Emission Data

Test No.	Particulate Collected			Dry Gas Volume Sampled	Particulate Concentration				Particulate Emission Rate
	Probe Rinse	Main Filter	Total		Actual	Dry Reference	Dry Adjusted	Wet Reference	
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	1.2	5.2	6.40	3.645	1.02	1.76	1.43	1.47	27.4
2	1.9	8.3	10.2	3.567	1.66	2.86	2.32	2.38	43.1
3	1.7	0.3	2.00	3.473	0.34	0.58	0.45	0.49	8.65
Average					1.01	1.73	1.40	1.44	26.4
Blank	0.4	0.9							

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
$PM_{2.5}$ and PM_{10} Emission Data

$PM_{2.5}$

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	$PM_{2.5}$ Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.1	1.195	<0.049	<0.084	<0.067	<0.070	<1.23
2	0.1	1.197	0.049	0.084	0.067	0.070	1.24
3	<0.1	1.184	<0.050	<0.084	<0.068	<0.071	<1.27
Average			<0.050	<0.084	<0.068	<0.071	<1.24
Blank	<0.1						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.2	1.195	<0.099	<0.17	<0.13	<0.14	<2.46
2	<0.2	1.197	<0.099	<0.17	<0.13	<0.14	<2.47
3	<0.4	1.184	<0.20	<0.34	<0.27	<0.28	<5.07
Average			<0.13	<0.22	<0.18	<0.19	<3.33
Blank	<0.2						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data. The back-up filter was excluded from the calculations as the analytical results indicated that the filter lost weight in for all samples including the blank.

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Condensable Particulate Emission Data

Inorganic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Inorganic Condensable Particulate Concentration				Emission Rate mg/s
			Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	
1	4.5	1.195	2.22	3.77	3.02	3.16	55.4
2	3.5	1.197	1.73	2.92	2.35	2.46	43.3
3	8.0	1.184	4.01	6.76	5.48	5.69	101
Average			2.65	4.48	3.62	3.77	66.7
Blank	1.2						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration				Emission Rate mg/s
			Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	
1	2.8	1.195	1.38	2.34	1.88	1.97	34.4
2	2.6	1.197	1.29	2.17	1.75	1.83	32.1
3	2.4	1.184	1.20	2.03	1.64	1.71	30.4
Average			1.29	2.18	1.76	1.83	32.3
Blank	1.3						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Halides and Ammonia Emission Data

Hydrogen Chloride

Test No.	HCl Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Chloride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HCl Emission Rate mg/s
1	6.61	1.284	3.00	5.15	4.18	4.29	80.3
2	6.88	1.273	3.15	5.40	4.39	4.51	84.3
3	6.83	1.241	3.20	5.50	4.47	4.59	83.1
Average			3.11	5.35	4.35	4.46	82.6
Blank	<0.201						

Hydrogen Fluoride

Test No.	HF Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Fluoride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HF Emission Rate mg/s
1	<0.168	1.284	<0.076	<0.13	<0.11	<0.11	<2.04
2	<0.174	1.273	<0.080	<0.14	<0.11	<0.11	<2.13
3	<0.168	1.241	<0.079	<0.14	<0.11	<0.11	<2.04
Average			<0.078	<0.13	<0.11	<0.11	<2.07
Blank	<0.114						

Ammonia

Test No.	Ammonia Collected mg	Dry Volume Sampled Rm^3*	Ammonia Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Ammonia Emission Rate mg/s
1	<0.434	1.284	<0.20	<0.34	<0.27	<0.28	<5.27
2	0.471	1.273	0.22	0.37	0.30	0.31	5.77
3	0.502	1.241	0.23	0.40	0.33	0.34	6.11
Average			<0.22	<0.37	<0.30	<0.31	<5.72
Blank	<0.288						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 10
Covanta - Durham York Energy Centre
Boiler No. 1
Combustion Gas Analyses

Data measured by the DYEC CEMS from October 10 to October 13, 2017

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.94	8.65	9.85
BH Outlet	Carbon Dioxide (kg/Rm^3, 1 hr Avg) *	0.17	0.19	0.20
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	6	12	24
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	6.3	11.5	16.8
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	2	35
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	2.4	5.4
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	103	111	127
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	110	112	113
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	1	2	3
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	1.6	2.0	2.3
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0	0
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	9

Data measured by the ORTECH CEMS on October 11, 2017

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.2	0.8
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0	0.4
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0	0.2
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.1	

* Reference conditions, dry basis adjusted to 11% oxygen

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Analyses Test No. 1

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.44	<0.1	0.44
Arsenic	<1	<0.2	<0.20
Barium	7.03	1.83	8.86
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.15	0.12	0.27
Chromium	3.91	1.44	5.35
Cobalt	0.48	<0.1	0.48
Copper	1.44	4.85	6.29
Lead	0.93	0.69	1.62
Manganese	1.47	15.6	17.1
Mercury *	<0.015	1.11	1.11
Molybdenum	18.6	<0.1	18.6
Nickel	4.28	2.20	6.48
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	12.4	9.71	22.1
Total			<90.6

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Analyses Test No. 2

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.30	<0.1	0.30
Arsenic	<1	<0.2	<0.20
Barium	6.38	1.98	8.36
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.22	0.094	0.31
Chromium	3.02	0.70	3.72
Cobalt	0.48	0.14	0.61
Copper	2.86	3.08	5.94
Lead	0.86	0.88	1.74
Manganese	1.70	2.06	3.76
Mercury *	<0.015	1.00	1.00
Molybdenum	19.9	<0.1	19.9
Nickel	4.39	1.49	5.88
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	10.6	8.01	18.6
Total			<72.0

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Analyses Test No. 3

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.27	<0.1	0.27
Arsenic	<1	<0.2	<0.20
Barium	5.15	1.33	6.48
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.13	<0.05	0.13
Chromium	1.79	0.32	2.11
Cobalt	<0.2	<0.1	<0.20
Copper	2.46	1.75	4.21
Lead	0.66	0.54	1.20
Manganese	0.81	0.94	1.75
Mercury *	<0.015	0.83	0.83
Molybdenum	22.6	<0.1	22.6
Nickel	1.79	1.01	2.80
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	7.81	6.09	13.9
Total			<58.4

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 14
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 1

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.44	0.071	0.12	0.099	0.10	0.0019
Arsenic	<0.20	<0.032	<0.055	<0.045	<0.046	<0.00086
Barium	8.86	1.41	2.43	1.97	2.03	0.038
Beryllium	<0.20	<0.032	<0.055	<0.045	<0.046	<0.00086
Cadmium	0.27	0.043	0.073	0.060	0.061	0.0011
Chromium	5.35	0.85	1.47	1.19	1.22	0.023
Cobalt	0.48	0.077	0.13	0.11	0.11	0.0021
Copper	6.29	1.00	1.73	1.40	1.44	0.027
Lead	1.62	0.26	0.45	0.36	0.37	0.0069
Manganese	17.1	2.73	4.68	3.81	3.91	0.073
Mercury	1.11	0.18	0.30	0.25	0.25	0.0048
Molybdenum	18.6	2.97	5.10	4.15	4.26	0.080
Nickel	6.48	1.03	1.78	1.44	1.48	0.028
Selenium	<1.00	<0.16	<0.27	<0.22	<0.23	<0.0043
Silver	<0.20	<0.032	<0.055	<0.045	<0.046	<0.00086
Thallium	<0.20	<0.032	<0.055	<0.045	<0.046	<0.00086
Vanadium	<0.10	<0.016	<0.027	<0.022	<0.023	<0.00043
Zinc	22.1	3.53	6.07	4.93	5.06	0.095
Total	<90.6	<14.5	<24.9	<20.2	<20.7	<0.39

Dry Gas Volume Sampled (Rm^3*) :	3.645
Actual Flowrate (m^3/s) :	26.8
Dry Reference Flowrate (Rm^3/s*) :	15.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.2
Wet Reference Flowrate (Rm^3/s*) :	18.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 15
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 2

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.30	0.048	0.083	0.068	0.069	0.0013
Arsenic	<0.20	<0.033	<0.056	<0.046	<0.047	<0.00085
Barium	8.36	1.36	2.34	1.90	1.96	0.035
Beryllium	<0.20	<0.033	<0.056	<0.046	<0.047	<0.00085
Cadmium	0.31	0.051	0.087	0.071	0.073	0.0013
Chromium	3.72	0.61	1.04	0.85	0.87	0.016
Cobalt	0.61	0.10	0.17	0.14	0.14	0.0026
Copper	5.94	0.97	1.67	1.35	1.39	0.025
Lead	1.74	0.28	0.49	0.40	0.41	0.0074
Manganese	3.76	0.61	1.05	0.86	0.88	0.016
Mercury	1.00	0.16	0.28	0.23	0.23	0.0042
Molybdenum	19.9	3.24	5.58	4.53	4.65	0.084
Nickel	5.88	0.96	1.65	1.34	1.38	0.025
Selenium	<1.00	<0.16	<0.28	<0.23	<0.23	<0.0042
Silver	<0.20	<0.033	<0.056	<0.046	<0.047	<0.00085
Thallium	<0.20	<0.033	<0.056	<0.046	<0.047	<0.00085
Vanadium	<0.10	<0.016	<0.028	<0.023	<0.023	<0.00042
Zinc	18.6	3.03	5.22	4.24	4.35	0.079
Total	<72.0	<11.7	<20.2	<16.4	<16.8	<0.30

Dry Gas Volume Sampled (Rm^3*) :	3.567
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	15.1
Dry Adjusted Flowrate (Rm^3/s**) :	18.6
Wet Reference Flowrate (Rm^3/s*) :	18.1

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 16
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Metals Emission Data Test No. 3

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.27	0.047	0.079	0.062	0.066	0.0012
Arsenic	<0.20	<0.034	<0.058	<0.045	<0.049	<0.00086
Barium	6.48	1.11	1.87	1.47	1.57	0.028
Beryllium	<0.20	<0.034	<0.058	<0.045	<0.049	<0.00086
Cadmium	0.13	0.022	0.038	0.030	0.032	0.00057
Chromium	2.11	0.36	0.61	0.48	0.51	0.0091
Cobalt	<0.20	<0.034	<0.058	<0.045	<0.049	<0.00086
Copper	4.21	0.72	1.21	0.95	1.02	0.018
Lead	1.20	0.20	0.34	0.27	0.29	0.0052
Manganese	1.75	0.30	0.50	0.40	0.43	0.0076
Mercury	0.83	0.14	0.24	0.19	0.20	0.0036
Molybdenum	22.6	3.87	6.51	5.11	5.48	0.098
Nickel	2.80	0.48	0.81	0.63	0.68	0.012
Selenium	<1.00	<0.17	<0.29	<0.23	<0.24	<0.0043
Silver	<0.20	<0.034	<0.058	<0.045	<0.049	<0.00086
Thallium	<0.20	<0.034	<0.058	<0.045	<0.049	<0.00086
Vanadium	<0.10	<0.017	<0.029	<0.023	<0.024	<0.00043
Zinc	13.9	2.38	4.00	3.14	3.37	0.060
Total	<58.4	<10.0	<16.8	<13.2	<14.2	<0.25

Dry Gas Volume Sampled (Rm^3*) :	3.473
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	15.0
Dry Adjusted Flowrate (Rm^3/s**) :	19.1
Wet Reference Flowrate (Rm^3/s*) :	17.8

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 17
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Actual Concentrations

Metal	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/m³	µg/m³	µg/m³	µg/m³	%
Antimony	0.071	0.048	0.047	0.055	24.1
Arsenic	<0.032	<0.033	<0.034	<0.033	3.7
Barium	1.41	1.36	1.11	1.30	12.5
Beryllium	<0.032	<0.033	<0.034	<0.033	3.7
Cadmium	0.043	0.051	0.022	0.039	37.6
Chromium	0.85	0.61	0.36	0.61	40.6
Cobalt	0.077	0.10	<0.034	<0.070	47.3
Copper	1.00	0.97	0.72	0.90	17.1
Lead	0.26	0.28	0.20	0.25	16.1
Manganese	2.73	0.61	0.30	1.21	109
Mercury	0.18	0.16	0.14	0.16	11.2
Molybdenum	2.97	3.24	3.87	3.36	13.8
Nickel	1.03	0.96	0.48	0.82	36.5
Selenium	<0.16	<0.16	<0.17	<0.16	3.7
Silver	<0.032	<0.033	<0.034	<0.033	3.7
Thallium	<0.032	<0.033	<0.034	<0.033	3.7
Vanadium	<0.016	<0.016	<0.017	<0.016	3.7
Zinc	3.53	3.03	2.38	2.98	19.3
Total	<14.5	<11.7	<10.0	<12.1	18.6

TABLE 18
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Dry Reference Concentrations

Metal	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.12	0.083	0.079	0.094	24.8
Arsenic	<0.055	<0.056	<0.058	<0.056	2.4
Barium	2.43	2.34	1.87	2.21	13.7
Beryllium	<0.055	<0.056	<0.058	<0.056	2.4
Cadmium	0.073	0.087	0.038	0.066	38.5
Chromium	1.47	1.04	0.61	1.04	41.4
Cobalt	0.13	0.17	<0.058	<0.12	48.1
Copper	1.73	1.67	1.21	1.53	18.3
Lead	0.45	0.49	0.34	0.43	17.3
Manganese	4.68	1.05	0.50	2.08	109
Mercury	0.30	0.28	0.24	0.27	12.3
Molybdenum	5.10	5.58	6.51	5.73	12.5
Nickel	1.78	1.65	0.81	1.41	37.4
Selenium	<0.27	<0.28	<0.29	<0.28	2.4
Silver	<0.055	<0.056	<0.058	<0.056	2.4
Thallium	<0.055	<0.056	<0.058	<0.056	2.4
Vanadium	<0.027	<0.028	<0.029	<0.028	2.4
Zinc	6.07	5.22	4.00	5.10	20.4
Total	<24.9	<20.2	<16.8	<20.6	19.6

* At 25°C and 1 atmosphere

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Dry Adjusted Concentrations

Metal	Dry Adjusted Concentration				Coefficient
	Test No. 1 µg/Rm³**	Test No. 2 µg/Rm³**	Test No. 3 µg/Rm³**	Average µg/Rm³**	of Variation %
Antimony	0.099	0.068	0.062	0.076	26.0
Arsenic	<0.045	<0.046	<0.045	<0.045	1.1
Barium	1.97	1.90	1.47	1.78	15.5
Beryllium	<0.045	<0.046	<0.045	<0.045	1.1
Cadmium	0.060	0.071	0.030	0.053	39.8
Chromium	1.19	0.85	0.48	0.84	42.7
Cobalt	0.11	0.14	<0.045	<0.097	49.2
Copper	1.40	1.35	0.95	1.24	20.0
Lead	0.36	0.40	0.27	0.34	19.0
Manganese	3.81	0.86	0.40	1.69	110
Mercury	0.25	0.23	0.19	0.22	14.0
Molybdenum	4.15	4.53	5.11	4.60	10.6
Nickel	1.44	1.34	0.63	1.14	38.7
Selenium	<0.22	<0.23	<0.23	<0.23	1.1
Silver	<0.045	<0.046	<0.045	<0.045	1.1
Thallium	<0.045	<0.046	<0.045	<0.045	1.1
Vanadium	<0.022	<0.023	<0.023	<0.023	1.1
Zinc	4.93	4.24	3.14	4.10	21.9
Total	<20.2	<16.4	<13.2	<16.6	21.1

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Wet Reference Concentrations

Metal	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.10	0.069	0.066	0.079	24.4
Arsenic	<0.046	<0.047	<0.049	<0.047	3.0
Barium	2.03	1.96	1.57	1.85	13.2
Beryllium	<0.046	<0.047	<0.049	<0.047	3.0
Cadmium	0.061	0.073	0.032	0.055	38.1
Chromium	1.22	0.87	0.51	0.87	41.0
Cobalt	0.11	0.14	<0.049	<0.10	47.8
Copper	1.44	1.39	1.02	1.28	17.8
Lead	0.37	0.41	0.29	0.36	16.8
Manganese	3.91	0.88	0.43	1.74	109
Mercury	0.25	0.23	0.20	0.23	11.8
Molybdenum	4.26	4.65	5.48	4.80	13.0
Nickel	1.48	1.38	0.68	1.18	37.0
Selenium	<0.23	<0.23	<0.24	<0.24	3.0
Silver	<0.046	<0.047	<0.049	<0.047	3.0
Thallium	<0.046	<0.047	<0.049	<0.047	3.0
Vanadium	<0.023	<0.023	<0.024	<0.024	3.0
Zinc	5.06	4.35	3.37	4.26	19.9
Total	<20.7	<16.8	<14.2	<17.2	19.1

* At 25°C and 1 atmosphere

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Emission Rates

Metal	Emission Rate				Coefficient
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s	of Variation %
Antimony	0.0019	0.0013	0.0012	0.0014	27.1
Arsenic	<0.00086	<0.00085	<0.00086	<0.00086	1.0
Barium	0.038	0.035	0.028	0.034	15.3
Beryllium	<0.00086	<0.00085	<0.00086	<0.00086	1.0
Cadmium	0.0011	0.0013	0.00057	0.0010	38.9
Chromium	0.023	0.016	0.0091	0.016	43.3
Cobalt	0.0021	0.0026	<0.00086	<0.0018	48.2
Copper	0.027	0.025	0.018	0.023	19.7
Lead	0.0069	0.0074	0.0052	0.0065	18.0
Manganese	0.073	0.016	0.0076	0.032	111
Mercury	0.0048	0.0042	0.0036	0.0042	14.1
Molybdenum	0.080	0.084	0.098	0.087	10.7
Nickel	0.028	0.025	0.012	0.022	38.6
Selenium	<0.0043	<0.0042	<0.0043	<0.0043	1.0
Silver	<0.00086	<0.00085	<0.00086	<0.00086	1.0
Thallium	<0.00086	<0.00085	<0.00086	<0.00086	1.0
Vanadium	<0.00043	<0.00042	<0.00043	<0.00043	1.0
Zinc	0.095	0.079	0.060	0.078	22.3
Total	<0.39	<0.30	<0.25	<0.31	21.7

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Metal Emission Data

Metal	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.055	0.094	0.076	0.079	0.0014
Arsenic	<0.033	<0.056	<0.045	<0.047	<0.00086
Barium	1.30	2.21	1.78	1.85	0.034
Beryllium	<0.033	<0.056	<0.045	<0.047	<0.00086
Cadmium	0.039	0.066	0.053	0.055	0.0010
Chromium	0.61	1.04	0.84	0.87	0.016
Cobalt	<0.070	<0.121	<0.097	<0.101	<0.0018
Copper	0.90	1.53	1.24	1.28	0.023
Lead	0.25	0.43	0.34	0.36	0.0065
Manganese	1.21	2.08	1.69	1.74	0.032
Mercury	0.16	0.27	0.22	0.23	0.0042
Molybdenum	3.36	5.73	4.60	4.80	0.087
Nickel	0.82	1.41	1.14	1.18	0.022
Selenium	<0.16	<0.28	<0.23	<0.24	<0.0043
Silver	<0.033	<0.056	<0.045	<0.047	<0.00086
Thallium	<0.033	<0.056	<0.045	<0.047	<0.00086
Vanadium	<0.016	<0.028	<0.023	<0.024	<0.00043
Zinc	2.98	5.10	4.10	4.26	0.078
Total	<12.1	<20.6	<16.6	<17.2	<0.31

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 23
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Train Metal Analyses

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	<5	1.46	1.46
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	<1	0.24	0.24
Cobalt	<0.2	<0.1	<0.20
Copper	<1	1.88	1.88
Lead	<0.5	0.33	0.33
Manganese	0.54	0.35	0.89
Mercury *	<0.015	0.29	0.29
Molybdenum	23.0	<0.1	23.0
Nickel	1.59	0.77	2.36
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	<6	<3	<6.00
Total			<38.8

* Includes the permanganate impingers.

Note: "<" indicates that the analyte was not detected. Where all values are reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate the total collected in the blank, the remaining fractions are assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate the total collected in the blank.

TABLE 24
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 1

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	270	0.032	0.055	0.043	0.046	0.83
Pentachlorodibenzo-p-dioxins	336	0.040	0.068	0.054	0.057	1.04
Hexachlorodibenzo-p-dioxins	717	0.086	0.14	0.11	0.12	2.22
Heptachlorodibenzo-p-dioxins	814	0.097	0.16	0.13	0.14	2.52
Octachlorodibenzo-p-dioxin	540	0.064	0.11	0.086	0.092	1.67
Total	2677	0.32	0.54	0.43	0.45	8.28

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	74.1	0.0088	0.015	0.012	0.013	0.23
Pentachlorodibenzofurans	92.6	0.011	0.019	0.015	0.016	0.29
Hexachlorodibenzofurans	123	0.015	0.025	0.020	0.021	0.38
Heptachlorodibenzofurans	<9.8	<0.0012	<0.0020	<0.0016	<0.0017	<0.030
Octachlorodibenzofuran	78.0	0.0093	0.016	0.012	0.013	0.24
Total	<378	<0.045	<0.076	<0.060	<0.064	<1.17

Dry Gas Volume Sampled (Rm^3*) :	4.949
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 25
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 2

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	315	0.039	0.065	0.051	0.055	0.97
Pentachlorodibenzo-p-dioxins	35.6	0.0044	0.0074	0.0058	0.0062	0.11
Hexachlorodibenzo-p-dioxins	747	0.092	0.15	0.12	0.13	2.31
Heptachlorodibenzo-p-dioxins	329	0.040	0.068	0.054	0.057	1.02
Octachlorodibenzo-p-dioxin	437	0.054	0.091	0.071	0.076	1.35
Total	1864	0.23	0.39	0.30	0.33	5.75

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	<7.5	<0.00092	<0.0016	<0.0012	<0.0013	<0.023
Pentachlorodibenzofurans	63.9	0.0078	0.013	0.010	0.011	0.20
Hexachlorodibenzofurans	15.2	0.0019	0.0031	0.0025	0.0027	0.047
Heptachlorodibenzofurans	106	0.013	0.022	0.017	0.018	0.33
Octachlorodibenzofuran	63.9	0.0078	0.013	0.010	0.011	0.20
Total	<257	<0.031	<0.053	<0.042	<0.045	<0.79

Dry Gas Volume Sampled (Rm^3*) :	4.827
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 26
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	152	0.019	0.031	0.025	0.026	0.48
Pentachlorodibenzo-p-dioxins	284	0.035	0.059	0.048	0.049	0.89
Hexachlorodibenzo-p-dioxins	657	0.080	0.14	0.11	0.11	2.06
Heptachlorodibenzo-p-dioxins	773	0.094	0.16	0.13	0.13	2.42
Octachlorodibenzo-p-dioxin	586	0.071	0.12	0.098	0.10	1.84
Total	2452	0.30	0.51	0.41	0.43	7.69

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	<8.2	<0.0010	<0.0017	<0.0014	<0.0014	<0.026
Pentachlorodibenzofurans	58.8	0.0072	0.012	0.0099	0.010	0.18
Hexachlorodibenzofurans	45.2	0.0055	0.0093	0.0076	0.0079	0.14
Heptachlorodibenzofurans	32.0	0.0039	0.0066	0.0054	0.0056	0.10
Octachlorodibenzofuran	<76	<0.0093	<0.016	<0.013	<0.013	<0.24
Total	<220	<0.027	<0.045	<0.037	<0.038	<0.69

Dry Gas Volume Sampled (Rm^3*) :	4.848
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.032	0.039	0.019	0.030	34.4
Pentachlorodibenzo-p-dioxins	0.040	0.0044	0.035	0.026	73.0
Hexachlorodibenzo-p-dioxins	0.086	0.092	0.080	0.086	6.6
Heptachlorodibenzo-p-dioxins	0.097	0.040	0.094	0.077	41.5
Octachlorodibenzo-p-dioxin	0.064	0.054	0.071	0.063	14.3
Total	0.32	0.23	0.30	0.28	17.0

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.0088	<0.00092	<0.0010	<0.0036	127
Pentachlorodibenzofurans	0.011	0.0078	0.0072	0.0087	23.9
Hexachlorodibenzofurans	0.015	0.0019	0.0055	0.0074	89.8
Heptachlorodibenzofurans	<0.0012	0.013	0.0039	<0.0060	103
Octachlorodibenzofuran	0.0093	0.0078	<0.0093	<0.0088	9.6
Total	<0.045	<0.031	<0.027	<0.034	27.5

TABLE 28
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Dry Reference Concentrations

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.055	0.065	0.031	0.050	34.4
Pentachlorodibenzo-p-dioxins	0.068	0.0074	0.059	0.045	73.0
Hexachlorodibenzo-p-dioxins	0.14	0.15	0.14	0.15	6.6
Heptachlorodibenzo-p-dioxins	0.16	0.068	0.16	0.13	41.5
Octachlorodibenzo-p-dioxin	0.11	0.091	0.12	0.11	14.3
Total	0.54	0.39	0.51	0.48	17.0

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.015	<0.0016	<0.0017	<0.0061	127
Pentachlorodibenzofurans	0.019	0.013	0.012	0.015	24.0
Hexachlorodibenzofurans	0.025	0.0031	0.0093	0.012	89.9
Heptachlorodibenzofurans	<0.0020	0.022	0.0066	<0.010	103
Octachlorodibenzofuran	0.016	0.013	<0.016	<0.015	9.6
Total	<0.076	<0.053	<0.045	<0.058	27.6

* At 25°C and 1 atmosphere

TABLE 29
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Dioxins

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.043	0.051	0.025	0.040	33.1
Pentachlorodibenzo-p-dioxins	0.054	0.0058	0.048	0.036	73.0
Hexachlorodibenzo-p-dioxins	0.11	0.12	0.11	0.12	5.2
Heptachlorodibenzo-p-dioxins	0.13	0.054	0.13	0.10	42.0
Octachlorodibenzo-p-dioxin	0.086	0.071	0.098	0.085	15.8
Total	0.43	0.30	0.41	0.38	17.5

Furans

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.012	<0.0012	<0.0014	<0.0048	126
Pentachlorodibenzofurans	0.015	0.010	0.0099	0.012	22.9
Hexachlorodibenzofurans	0.020	0.0025	0.0076	0.0099	88.9
Heptachlorodibenzofurans	<0.0016	0.017	0.0054	<0.0081	102
Octachlorodibenzofuran	0.012	0.010	<0.013	<0.012	10.5
Total	<0.060	<0.042	<0.037	<0.046	26.4

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 30
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Wet Reference Concentrations

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.046	0.055	0.026	0.042	34.3
Pentachlorodibenzo-p-dioxins	0.057	0.0062	0.049	0.038	73.0
Hexachlorodibenzo-p-dioxins	0.12	0.13	0.11	0.12	6.5
Heptachlorodibenzo-p-dioxins	0.14	0.057	0.13	0.11	41.5
Octachlorodibenzo-p-dioxin	0.092	0.076	0.10	0.090	14.5
Total	0.45	0.33	0.43	0.40	17.0

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.013	<0.0013	<0.0014	<0.0051	127
Pentachlorodibenzofurans	0.016	0.011	0.010	0.012	23.8
Hexachlorodibenzofurans	0.021	0.0027	0.0079	0.010	89.7
Heptachlorodibenzofurans	<0.0017	0.018	0.0056	<0.0086	103
Octachlorodibenzofuran	0.013	0.011	<0.013	<0.013	9.7
Total	<0.064	<0.045	<0.038	<0.049	27.4

* At 25°C and 1 atmosphere

TABLE 31
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Congener Group Emission Rates

Dioxins

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.83	0.97	0.48	0.76	33.6
Pentachlorodibenzo-p-dioxins	1.04	0.11	0.89	0.68	73.4
Hexachlorodibenzo-p-dioxins	2.22	2.31	2.06	2.19	5.7
Heptachlorodibenzo-p-dioxins	2.52	1.02	2.42	1.99	42.4
Octachlorodibenzo-p-dioxin	1.67	1.35	1.84	1.62	15.3
Total	8.28	5.75	7.69	7.24	18.2

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	0.23	<0.023	<0.026	<0.093	128
Pentachlorodibenzofurans	0.29	0.20	0.18	0.22	24.9
Hexachlorodibenzofurans	0.38	0.047	0.14	0.19	90.6
Heptachlorodibenzofurans	<0.030	0.33	0.10	<0.15	102
Octachlorodibenzofuran	0.24	0.20	<0.24	<0.23	10.9
Total	<1.17	<0.79	<0.69	<0.88	28.4

TABLE 32
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Congener Group Emission Data

Dioxins

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	0.030	0.050	0.040	0.042	0.76
Pentachlorodibenzo-p-dioxins	0.026	0.045	0.036	0.038	0.68
Hexachlorodibenzo-p-dioxins	0.086	0.15	0.12	0.12	2.19
Heptachlorodibenzo-p-dioxins	0.077	0.13	0.10	0.11	1.99
Octachlorodibenzo-p-dioxin	0.063	0.11	0.085	0.090	1.62
Total	0.28	0.48	0.38	0.40	7.24

Furans

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	<0.0036	<0.0061	<0.0048	<0.0051	<0.093
Pentachlorodibenzofurans	0.0087	0.015	0.012	0.012	0.22
Hexachlorodibenzofurans	0.0074	0.012	0.0099	0.010	0.19
Heptachlorodibenzofurans	<0.0060	<0.010	<0.0081	<0.0086	<0.15
Octachlorodibenzofuran	<0.0088	<0.015	<0.012	<0.013	<0.23
Total	<0.034	<0.058	<0.046	<0.049	<0.88

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 33
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Dioxin and Furan Congener Group Analyses

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<9.0	<7.5
Pentachlorodibenzo-p-dioxins	<6.2	<3.4
Hexachlorodibenzo-p-dioxins	<3.9	<2.9
Heptachlorodibenzo-p-dioxins	<3.6	<2.5
Octachlorodibenzo-p-dioxin	<51	<4.8
Total	<73.7	<21.1

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	259	<4.8
Pentachlorodibenzofurans	152	<4.2
Hexachlorodibenzofurans	71.8	<2.5
Heptachlorodibenzofurans	<8.3	<2.3
Octachlorodibenzofuran	<8.7	<4.4
Total	<500	<18.2

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 34
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<8.8	<1.05	<1.78	<1.40	<1.49	<0.027
12378-pentachlorodibenzo-p-dioxin	8.61	1.03	1.74	1.37	1.46	0.027
123478-hexachlorodibenzo-p-dioxin	<14	<1.67	<2.83	<2.23	<2.38	<0.043
123678-hexachlorodibenzo-p-dioxin	<37	<4.42	<7.48	<5.90	<6.28	<0.11
123789-hexachlorodibenzo-p-dioxin	<20	<2.39	<4.04	<3.19	<3.40	<0.062
1234678-heptachlorodibenzo-p-dioxin	395	47.1	79.8	62.9	67.1	1.22
Octachlorodibenzo-p-dioxin	540	64.5	109	86.1	91.7	1.67
2378-tetrachlorodibenzofuran	<3.0	<0.36	<0.61	<0.48	<0.51	<0.0093
12378-pentachlorodibenzofuran	<9.1	<1.09	<1.84	<1.45	<1.55	<0.028
23478-pentachlorodibenzofuran	10.9	1.30	2.20	1.74	1.85	0.034
123478-hexachlorodibenzofuran	<8.9	<1.06	<1.80	<1.42	<1.51	<0.028
123678-hexachlorodibenzofuran	<11	<1.31	<2.22	<1.75	<1.87	<0.034
234678-hexachlorodibenzofuran	11.5	1.37	2.32	1.83	1.95	0.036
123789-hexachlorodibenzofuran	<3.2	<0.38	<0.65	<0.51	<0.54	<0.0099
1234678-heptachlorodibenzofuran	<71	<8.47	<14.3	<11.3	<12.1	<0.22
1234789-heptachlorodibenzofuran	<17	<2.03	<3.44	<2.71	<2.89	<0.053
Octachlorodibenzofuran	78.0	9.31	15.8	12.4	13.2	0.24
PCB 81	<30	<3.58	<6.06	<4.78	<5.10	<0.093
PCB 77	60.9	7.27	12.3	9.7	10.3	0.19
PCB 123	<110	<13.1	<22.2	<17.5	<18.7	<0.34
PCB 118	973	116	197	155	165	3.01
PCB 114	32.8	3.92	6.63	5.23	5.57	0.10
PCB 105	315	37.6	63.6	50.2	53.5	0.97
PCB 126	<14	<1.67	<2.83	<2.23	<2.38	<0.043
PCB 167	<11	<1.31	<2.22	<1.75	<1.87	<0.034
PCB 156	<18	<2.15	<3.64	<2.87	<3.06	<0.056
PCB 157	<12	<1.43	<2.42	<1.91	<2.04	<0.037
PCB 169	<14	<1.67	<2.83	<2.23	<2.38	<0.043
PCB 189	<4.9	<0.58	<0.99	<0.78	<0.83	<0.015
Total Dioxins & Furans Only	<1247	<149	<252	<199	<212	<3.86
Total PCBs Only	<1596	<190	<322	<254	<271	<4.93
Total Dioxins & Furans and PCBs	<2843	<339	<574	<453	<483	<8.79

Dry Gas Volume Sampled (Rm^3*) :	4.949
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 35
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<13	<1.59	<2.69	<2.12	<2.27	<0.040
12378-pentachlorodibenzo-p-dioxin	<13	<1.59	<2.69	<2.12	<2.27	<0.040
123478-hexachlorodibenzo-p-dioxin	<12	<1.47	<2.49	<1.96	<2.09	<0.037
123678-hexachlorodibenzo-p-dioxin	27.3	3.34	5.66	4.46	4.76	0.084
123789-hexachlorodibenzo-p-dioxin	<19	<2.33	<3.94	<3.10	<3.31	<0.059
1234678-heptachlorodibenzo-p-dioxin	329	40.3	68.2	53.7	57.4	1.02
Octachlorodibenzo-p-dioxin	437	53.5	90.5	71.4	76.2	1.35
2378-tetrachlorodibenzofuran	<2.2	<0.27	<0.46	<0.36	<0.38	<0.0068
12378-pentachlorodibenzofuran	8.77	1.07	1.82	1.43	1.53	0.027
23478-pentachlorodibenzofuran	13.1	1.60	2.71	2.14	2.28	0.040
123478-hexachlorodibenzofuran	<13	<1.59	<2.69	<2.12	<2.27	<0.040
123678-hexachlorodibenzofuran	<9.1	<1.11	<1.89	<1.49	<1.59	<0.028
234678-hexachlorodibenzofuran	8.44	1.03	1.75	1.38	1.47	0.026
123789-hexachlorodibenzofuran	<2.6	<0.32	<0.54	<0.42	<0.45	<0.0080
1234678-heptachlorodibenzofuran	70.8	8.67	14.7	11.6	12.3	0.22
1234789-heptachlorodibenzofuran	8.86	1.09	1.84	1.45	1.55	0.027
Octachlorodibenzofuran	63.9	7.83	13.2	10.4	11.1	0.20
PCB 81	<21	<2.57	<4.35	<3.43	<3.66	<0.065
PCB 77	67.6	8.28	14.0	11.0	11.8	0.21
PCB 123	<150	<18.4	<31.1	<24.5	<26.2	<0.46
PCB 118	1340	164	278	219	234	4.14
PCB 114	49.8	6.10	10.3	8.13	8.68	0.15
PCB 105	389	47.6	80.6	63.5	67.8	1.20
PCB 126	<27	<3.31	<5.59	<4.41	<4.71	<0.083
PCB 167	<11	<1.35	<2.28	<1.80	<1.92	<0.034
PCB 156	<27	<3.31	<5.59	<4.41	<4.71	<0.083
PCB 157	<7.8	<0.96	<1.62	<1.27	<1.36	<0.024
PCB 169	<8.7	<1.07	<1.80	<1.42	<1.52	<0.027
PCB 189	<3.3	<0.40	<0.68	<0.54	<0.58	<0.010
Total Dioxins & Furans Only	<1051	<129	<218	<172	<183	<3.24
Total PCBs Only	<2102	<258	<436	<343	<367	<6.49
Total Dioxins & Furans and PCBs	<3153	<386	<653	<515	<550	<9.73

Dry Gas Volume Sampled (Rm^3*) :	4.827
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 36
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<9.5	<1.16	<1.96	<1.59	<1.65	<0.030
12378-pentachlorodibenzo-p-dioxin	<7.0	<0.85	<1.44	<1.17	<1.22	<0.022
123478-hexachlorodibenzo-p-dioxin	<7.7	<0.94	<1.59	<1.29	<1.34	<0.024
123678-hexachlorodibenzo-p-dioxin	34.9	4.26	7.20	5.85	6.08	0.11
123789-hexachlorodibenzo-p-dioxin	<19	<2.32	<3.92	<3.19	<3.31	<0.060
1234678-heptachlorodibenzo-p-dioxin	341	41.6	70.3	57.2	59.4	1.07
Octachlorodibenzo-p-dioxin	586	71.5	121	98.3	102	1.84
2378-tetrachlorodibenzofuran	<2.0	<0.24	<0.41	<0.34	<0.35	<0.0063
12378-pentachlorodibenzofuran	<5.3	<0.65	<1.09	<0.89	<0.92	<0.017
23478-pentachlorodibenzofuran	<11	<1.34	<2.27	<1.84	<1.92	<0.034
123478-hexachlorodibenzofuran	<9.5	<1.16	<1.96	<1.59	<1.65	<0.030
123678-hexachlorodibenzofuran	<8.5	<1.04	<1.75	<1.43	<1.48	<0.027
234678-hexachlorodibenzofuran	11.9	1.45	2.45	2.00	2.07	0.037
123789-hexachlorodibenzofuran	<2.5	<0.30	<0.52	<0.42	<0.44	<0.0078
1234678-heptachlorodibenzofuran	<70	<8.54	<14.4	<11.7	<12.2	<0.22
1234789-heptachlorodibenzofuran	<11	<1.34	<2.27	<1.84	<1.92	<0.034
Octachlorodibenzofuran	<76	<9.27	<15.7	<12.7	<13.2	<0.24
PCB 81	<30	<3.66	<6.19	<5.03	<5.23	<0.094
PCB 77	91.3	11.1	18.8	15.3	15.9	0.29
PCB 123	<270	<32.9	<55.7	<45.3	<47.0	<0.85
PCB 118	2160	264	446	362	376	6.77
PCB 114	<78	<9.52	<16.1	<13.1	<13.6	<0.24
PCB 105	804	98.1	166	135	140	2.52
PCB 126	<29	<3.54	<5.98	<4.86	<5.05	<0.091
PCB 167	<10	<1.22	<2.06	<1.68	<1.74	<0.031
PCB 156	<49	<5.98	<10.1	<8.22	<8.54	<0.15
PCB 157	<8.5	<1.04	<1.75	<1.43	<1.48	<0.027
PCB 169	<6.6	<0.81	<1.36	<1.11	<1.15	<0.021
PCB 189	<4.0	<0.49	<0.83	<0.67	<0.70	<0.013
Total Dioxins & Furans Only	<1213	<148	<250	<203	<211	<3.80
Total PCBs Only	<3540	<432	<730	<594	<617	<11.1
Total Dioxins & Furans and PCBs	<4753	<580	<980	<797	<828	<14.9

Dry Gas Volume Sampled (Rm^3*) :	4.848
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 37
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<1.05	<1.59	<1.16	<1.27	22.6
12378-pentachlorodibenzo-p-dioxin	1.03	<1.59	<0.85	<1.16	33.3
123478-hexachlorodibenzo-p-dioxin	<1.67	<1.47	<0.94	<1.36	27.8
123678-hexachlorodibenzo-p-dioxin	<4.42	3.34	4.26	<4.01	14.4
123789-hexachlorodibenzo-p-dioxin	<2.39	<2.33	<2.32	<2.34	1.6
1234678-heptachlorodibenzo-p-dioxin	47.1	40.3	41.6	43.0	8.5
Octachlorodibenzo-p-dioxin	64.5	53.5	71.5	63.2	14.3
2378-tetrachlorodibenzofuran	<0.36	<0.27	<0.24	<0.29	20.6
12378-pentachlorodibenzofuran	<1.09	1.07	<0.65	<0.94	26.8
23478-pentachlorodibenzofuran	1.30	1.60	<1.34	<1.42	11.6
123478-hexachlorodibenzofuran	<1.06	<1.59	<1.16	<1.27	22.2
123678-hexachlorodibenzofuran	<1.31	<1.11	<1.04	<1.15	12.3
234678-hexachlorodibenzofuran	1.37	1.03	1.45	1.29	17.3
123789-hexachlorodibenzofuran	<0.38	<0.32	<0.30	<0.34	12.3
1234678-heptachlorodibenzofuran	<8.47	8.67	<8.54	<8.56	1.2
1234789-heptachlorodibenzofuran	<2.03	1.09	<1.34	<1.49	32.9
Octachlorodibenzofuran	9.31	7.83	<9.27	<8.80	9.6
PCB 81	<3.58	<2.57	<3.66	<3.27	18.5
PCB 77	7.27	8.28	11.1	8.90	22.6
PCB 123	<13.1	<18.4	<32.9	<21.5	47.8
PCB 118	116	164	264	181	41.5
PCB 114	3.92	6.10	<9.52	<6.51	43.4
PCB 105	37.6	47.6	98.1	61.1	53.0
PCB 126	<1.67	<3.31	<3.54	<2.84	35.9
PCB 167	<1.31	<1.35	<1.22	<1.29	5.1
PCB 156	<2.15	<3.31	<5.98	<3.81	51.5
PCB 157	<1.43	<0.96	<1.04	<1.14	22.3
PCB 169	<1.67	<1.07	<0.81	<1.18	37.6
PCB 189	<0.58	<0.40	<0.49	<0.49	18.4
Total Dioxins & Furans Only	<149	<129	<148	<142	8.0
Total PCBs Only	<190	<258	<432	<293	42.5
Total Dioxins & Furans and PCBs	<339	<386	<580	<435	29.3

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 38
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.78	<2.69	<1.96	<2.14	22.6
12378-pentachlorodibenzo-p-dioxin	1.74	<2.69	<1.44	<1.96	33.3
123478-hexachlorodibenzo-p-dioxin	<2.83	<2.49	<1.59	<2.30	27.8
123678-hexachlorodibenzo-p-dioxin	<7.48	5.66	7.20	<6.78	14.5
123789-hexachlorodibenzo-p-dioxin	<4.04	<3.94	<3.92	<3.97	1.7
1234678-heptachlorodibenzo-p-dioxin	79.8	68.2	70.3	72.8	8.5
Octachlorodibenzo-p-dioxin	109	90.5	121	107	14.3
2378-tetrachlorodibenzofuran	<0.61	<0.46	<0.41	<0.49	20.7
12378-pentachlorodibenzofuran	<1.84	1.82	<1.09	<1.58	26.8
23478-pentachlorodibenzofuran	2.20	2.71	<2.27	<2.40	11.6
123478-hexachlorodibenzofuran	<1.80	<2.69	<1.96	<2.15	22.2
123678-hexachlorodibenzofuran	<2.22	<1.89	<1.75	<1.95	12.4
234678-hexachlorodibenzofuran	2.32	1.75	2.45	2.18	17.3
123789-hexachlorodibenzofuran	<0.65	<0.54	<0.52	<0.57	12.3
1234678-heptachlorodibenzofuran	<14.3	14.7	<14.4	<14.5	1.1
1234789-heptachlorodibenzofuran	<3.44	1.84	<2.27	<2.51	32.9
Octachlorodibenzofuran	15.8	13.2	<15.7	<14.9	9.6
PCB 81	<6.06	<4.35	<6.19	<5.53	18.5
PCB 77	12.3	14.0	18.8	15.0	22.5
PCB 123	<22.2	<31.1	<55.7	<36.3	47.7
PCB 118	197	278	446	307	41.4
PCB 114	6.63	10.3	<16.1	<11.0	43.3
PCB 105	63.6	80.6	166	103	53.0
PCB 126	<2.83	<5.59	<5.98	<4.80	35.8
PCB 167	<2.22	<2.28	<2.06	<2.19	5.1
PCB 156	<3.64	<5.59	<10.1	<6.45	51.5
PCB 157	<2.42	<1.62	<1.75	<1.93	22.4
PCB 169	<2.83	<1.80	<1.36	<2.00	37.7
PCB 189	<0.99	<0.68	<0.83	<0.83	18.4
Total Dioxins & Furans Only	<252	<218	<250	<240	8.0
Total PCBs Only	<322	<436	<730	<496	42.4
Total Dioxins & Furans and PCBs	<574	<653	<980	<736	29.3

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 39
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.40	<2.12	<1.59	<1.71	21.9
12378-pentachlorodibenzo-p-dioxin	1.37	<2.12	<1.17	<1.56	32.2
123478-hexachlorodibenzo-p-dioxin	<2.23	<1.96	<1.29	<1.83	26.5
123678-hexachlorodibenzo-p-dioxin	<5.90	4.46	5.85	<5.40	15.1
123789-hexachlorodibenzo-p-dioxin	<3.19	<3.10	<3.19	<3.16	1.5
1234678-heptachlorodibenzo-p-dioxin	62.9	53.7	57.2	58.0	8.0
Octachlorodibenzo-p-dioxin	86.1	71.4	98.3	85.2	15.8
2378-tetrachlorodibenzofuran	<0.48	<0.36	<0.34	<0.39	19.6
12378-pentachlorodibenzofuran	<1.45	1.43	<0.89	<1.26	25.4
23478-pentachlorodibenzofuran	1.74	2.14	<1.84	<1.91	10.9
123478-hexachlorodibenzofuran	<1.42	<2.12	<1.59	<1.71	21.5
123678-hexachlorodibenzofuran	<1.75	<1.49	<1.43	<1.55	11.2
234678-hexachlorodibenzofuran	1.83	1.38	2.00	1.74	18.4
123789-hexachlorodibenzofuran	<0.51	<0.42	<0.42	<0.45	11.3
1234678-heptachlorodibenzofuran	<11.3	11.6	<11.7	<11.5	1.8
1234789-heptachlorodibenzofuran	<2.71	1.45	<1.84	<2.00	32.3
Octachlorodibenzofuran	12.4	10.4	<12.7	<11.9	10.5
PCB 81	<4.78	<3.43	<5.03	<4.41	19.5
PCB 77	9.70	11.0	15.3	12.0	24.4
PCB 123	<17.5	<24.5	<45.3	<29.1	49.6
PCB 118	155	219	362	245	43.2
PCB 114	5.23	8.13	<13.1	<8.81	45.0
PCB 105	50.2	63.5	135	82.8	54.9
PCB 126	<2.23	<4.41	<4.86	<3.83	36.7
PCB 167	<1.75	<1.80	<1.68	<1.74	3.5
PCB 156	<2.87	<4.41	<8.22	<5.16	53.3
PCB 157	<1.91	<1.27	<1.43	<1.54	21.7
PCB 169	<2.23	<1.42	<1.11	<1.59	36.6
PCB 189	<0.78	<0.54	<0.67	<0.66	18.3
Total Dioxins & Furans Only	<199	<172	<203	<191	8.9
Total PCBs Only	<254	<343	<594	<397	44.3
Total Dioxins & Furans and PCBs	<453	<515	<797	<588	31.2

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 40
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.49	<2.27	<1.65	<1.81	22.6
12378-pentachlorodibenzo-p-dioxin	1.46	<2.27	<1.22	<1.65	33.2
123478-hexachlorodibenzo-p-dioxin	<2.38	<2.09	<1.34	<1.94	27.6
123678-hexachlorodibenzo-p-dioxin	<6.28	4.76	6.08	<5.71	14.5
123789-hexachlorodibenzo-p-dioxin	<3.40	<3.31	<3.31	<3.34	1.5
1234678-heptachlorodibenzo-p-dioxin	67.1	57.4	59.4	61.3	8.4
Octachlorodibenzo-p-dioxin	91.7	76.2	102	90.0	14.5
2378-tetrachlorodibenzofuran	<0.51	<0.38	<0.35	<0.41	20.5
12378-pentachlorodibenzofuran	<1.55	1.53	<0.92	<1.33	26.6
23478-pentachlorodibenzofuran	1.85	2.28	<1.92	<2.02	11.6
123478-hexachlorodibenzofuran	<1.51	<2.27	<1.65	<1.81	22.2
123678-hexachlorodibenzofuran	<1.87	<1.59	<1.48	<1.65	12.2
234678-hexachlorodibenzofuran	1.95	1.47	2.07	1.83	17.4
123789-hexachlorodibenzofuran	<0.54	<0.45	<0.44	<0.48	12.1
1234678-heptachlorodibenzofuran	<12.1	12.3	<12.2	<12.2	1.2
1234789-heptachlorodibenzofuran	<2.89	1.55	<1.92	<2.12	32.8
Octachlorodibenzofuran	13.2	11.1	<13.2	<12.5	9.7
PCB 81	<5.10	<3.66	<5.23	<4.66	18.6
PCB 77	10.3	11.8	15.9	12.7	22.7
PCB 123	<18.7	<26.2	<47.0	<30.6	48.0
PCB 118	165	234	376	258	41.7
PCB 114	5.57	8.68	<13.6	<9.28	43.5
PCB 105	53.5	67.8	140	87.1	53.2
PCB 126	<2.38	<4.71	<5.05	<4.05	36.0
PCB 167	<1.87	<1.92	<1.74	<1.84	4.9
PCB 156	<3.06	<4.71	<8.54	<5.43	51.7
PCB 157	<2.04	<1.36	<1.48	<1.63	22.2
PCB 169	<2.38	<1.52	<1.15	<1.68	37.5
PCB 189	<0.83	<0.58	<0.70	<0.70	18.3
Total Dioxins & Furans Only	<212	<183	<211	<202	8.1
Total PCBs Only	<271	<367	<617	<418	42.7
Total Dioxins & Furans and PCBs	<483	<550	<828	<620	29.5

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 41
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.027	<0.040	<0.030	<0.032	21.1
12378-pentachlorodibenzo-p-dioxin	0.027	<0.040	<0.022	<0.030	31.9
123478-hexachlorodibenzo-p-dioxin	<0.043	<0.037	<0.024	<0.035	28.0
123678-hexachlorodibenzo-p-dioxin	<0.11	0.084	0.11	<0.10	15.7
123789-hexachlorodibenzo-p-dioxin	<0.062	<0.059	<0.060	<0.060	2.7
1234678-heptachlorodibenzo-p-dioxin	1.22	1.02	1.07	1.10	9.7
Octachlorodibenzo-p-dioxin	1.67	1.35	1.84	1.62	15.3
2378-tetrachlorodibenzofuran	<0.0093	<0.0068	<0.0063	<0.0074	21.6
12378-pentachlorodibenzofuran	<0.028	0.027	<0.017	<0.024	26.6
23478-pentachlorodibenzofuran	0.034	0.040	<0.034	<0.036	10.2
123478-hexachlorodibenzofuran	<0.028	<0.040	<0.030	<0.032	20.7
123678-hexachlorodibenzofuran	<0.034	<0.028	<0.027	<0.030	13.2
234678-hexachlorodibenzofuran	0.036	0.026	0.037	0.033	18.4
123789-hexachlorodibenzofuran	<0.0099	<0.0080	<0.0078	<0.0086	13.2
1234678-heptachlorodibenzofuran	<0.22	0.22	<0.22	<0.22	0.2
1234789-heptachlorodibenzofuran	<0.053	0.027	<0.034	<0.038	34.1
Octachlorodibenzofuran	0.24	0.20	<0.24	<0.23	10.9
PCB 81	<0.093	<0.065	<0.094	<0.084	19.7
PCB 77	0.19	0.21	0.29	0.23	22.7
PCB 123	<0.34	<0.46	<0.85	<0.55	48.0
PCB 118	3.01	4.14	6.77	4.64	41.6
PCB 114	0.10	0.15	<0.24	<0.17	43.5
PCB 105	0.97	1.20	2.52	1.57	53.4
PCB 126	<0.043	<0.083	<0.091	<0.073	35.3
PCB 167	<0.034	<0.034	<0.031	<0.033	4.6
PCB 156	<0.056	<0.08	<0.15	<0.10	51.8
PCB 157	<0.037	<0.024	<0.027	<0.029	23.6
PCB 169	<0.043	<0.027	<0.021	<0.030	38.6
PCB 189	<0.015	<0.010	<0.013	<0.013	19.7
Total Dioxins & Furans Only	<3.86	<3.24	<3.80	<3.63	9.3
Total PCBs Only	<4.93	<6.49	<11.1	<7.51	42.7
Total Dioxins & Furans and PCBs	<8.79	<9.73	<14.9	<11.1	29.5

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 42
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.27	<2.14	<1.71	<1.81	<0.032
12378-pentachlorodibenzo-p-dioxin	<1.16	<1.96	1.56	<1.65	<0.030
123478-hexachlorodibenzo-p-dioxin	<1.36	<2.30	1.83	<1.94	<0.035
123678-hexachlorodibenzo-p-dioxin	<4.01	<6.78	5.40	<5.71	<0.10
123789-hexachlorodibenzo-p-dioxin	<2.34	<3.97	3.16	<3.34	<0.060
1234678-heptachlorodibenzo-p-dioxin	43.0	72.8	58.0	61.3	1.10
Octachlorodibenzo-p-dioxin	63.2	107	85.2	90.0	1.62
2378-tetrachlorodibenzofuran	<0.29	<0.49	<0.39	<0.41	<0.0074
12378-pentachlorodibenzofuran	<0.94	<1.58	1.26	<1.33	<0.024
23478-pentachlorodibenzofuran	<1.42	<2.40	1.91	<2.02	<0.036
123478-hexachlorodibenzofuran	<1.27	<2.15	1.71	<1.81	<0.032
123678-hexachlorodibenzofuran	<1.15	<1.95	<1.55	<1.65	<0.030
234678-hexachlorodibenzofuran	1.29	2.18	1.74	1.83	0.033
123789-hexachlorodibenzofuran	<0.34	<0.57	<0.45	<0.48	<0.0086
1234678-heptachlorodibenzofuran	<8.56	<14.5	11.5	<12.2	<0.22
1234789-heptachlorodibenzofuran	<1.49	<2.51	2.00	<2.12	<0.038
Octachlorodibenzofuran	<8.80	<14.9	11.9	<12.5	<0.23
PCB 81	<3.27	<5.53	<4.41	<4.66	<0.084
PCB 77	8.90	15.0	12.0	12.7	0.23
PCB 123	<21.5	<36.3	<29.1	<30.6	<0.55
PCB 118	181	307	245	258	4.64
PCB 114	<6.51	<11.0	<8.81	<9.28	<0.17
PCB 105	61.1	103	82.8	87.1	1.57
PCB 126	<2.84	<4.80	<3.83	<4.05	<0.073
PCB 167	<1.29	<2.19	<1.74	<1.84	<0.033
PCB 156	<3.81	<6.45	<5.16	<5.43	<0.10
PCB 157	<1.14	<1.93	<1.54	<1.63	<0.029
PCB 169	<1.18	<2.00	<1.59	<1.68	<0.030
PCB 189	<0.49	<0.83	<0.66	<0.70	<0.013
Total Dioxins & Furans Only	<142	<240	<191	<202	<3.63
Total PCBs Only	<293	<496	<397	<418	<7.51
Total Dioxins & Furans and PCBs	<435	<736	<588	<620	<11.1

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 43
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<9.0	<7.5
12378-pentachlorodibenzo-p-dioxin	<6.2	<3.4
123478-hexachlorodibenzo-p-dioxin	<3.9	<2.9
123678-hexachlorodibenzo-p-dioxin	<3.7	<2.8
123789-hexachlorodibenzo-p-dioxin	<3.7	<2.8
1234678-heptachlorodibenzo-p-dioxin	<20	<2.5
Octachlorodibenzo-p-dioxin	<51	<4.8
2378-tetrachlorodibenzofuran	23.1	<4.8
12378-pentachlorodibenzofuran	23.1	<4.2
23478-pentachlorodibenzofuran	<10	<4.0
123478-hexachlorodibenzofuran	<12	<2.2
123678-hexachlorodibenzofuran	13.7	<1.9
234678-hexachlorodibenzofuran	<9.0	<2.0
123789-hexachlorodibenzofuran	<11	<2.5
1234678-heptachlorodibenzofuran	<32	<1.7
1234789-heptachlorodibenzofuran	<8.3	<2.3
Octachlorodibenzofuran	<8.7	<4.4
PCB 81	<15	<2.1
PCB 77	21.6	<2.4
PCB 123	<41	<2.7
PCB 118	180	2.73
PCB 114	<4.3	<2.4
PCB 105	<69	<2.6
PCB 126	<5.1	<2.9
PCB 167	<2.7	<2.9
PCB 156	<8.6	<3.5
PCB 157	<2.9	<3.3
PCB 169	<3.3	<3.7
PCB 189	<1.1	<0.63
Total Dioxins & Furans Only	<248	<56.7
Total PCBs Only	<355	<31.9
Total Dioxins & Furans and PCBs	<603	<88.6

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 44
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.05	<1.59	<1.16	<1.27
12378-pentachlorodibenzo-p-dioxin	1.000	1.03	<1.59	<0.85	<1.16
123478-hexachlorodibenzo-p-dioxin	0.100	<0.17	<0.15	<0.094	<0.14
123678-hexachlorodibenzo-p-dioxin	0.100	<0.44	0.33	0.43	<0.40
123789-hexachlorodibenzo-p-dioxin	0.100	<0.24	<0.23	<0.23	<0.23
1234678-heptachlorodibenzo-p-dioxin	0.010	0.47	0.40	0.42	0.43
Octachlorodibenzo-p-dioxin	0.0003	0.019	0.016	0.021	0.019
2378-tetrachlorodibenzofuran	0.100	<0.036	<0.027	<0.024	<0.029
12378-pentachlorodibenzofuran	0.030	<0.033	<0.032	<0.019	<0.028
23478-pentachlorodibenzofuran	0.300	0.39	0.48	<0.40	<0.42
123478-hexachlorodibenzofuran	0.100	<0.11	<0.16	<0.12	<0.13
123678-hexachlorodibenzofuran	0.100	<0.13	<0.11	<0.10	<0.12
234678-hexachlorodibenzofuran	0.100	0.14	0.10	0.15	0.13
123789-hexachlorodibenzofuran	0.100	<0.038	<0.032	<0.030	<0.034
1234678-heptachlorodibenzofuran	0.010	<0.085	0.087	<0.085	<0.086
1234789-heptachlorodibenzofuran	0.010	<0.020	0.011	<0.013	<0.015
Octachlorodibenzofuran	0.0003	0.0028	0.0023	<0.0028	<0.0026
PCB 81	0.0003	<0.0011	<0.00077	<0.0011	<0.00098
PCB 77	0.0001	0.00073	0.00083	0.0011	0.00089
PCB 123	0.00003	<0.00039	<0.00055	<0.0010	<0.00064
PCB 118	0.00003	0.0035	0.0049	0.0079	0.0054
PCB 114	0.00003	0.00012	0.00018	<0.00029	<0.00020
PCB 105	0.00003	0.0011	0.0014	0.0029	0.0018
PCB 126	0.100	<0.17	<0.33	<0.35	<0.28
PCB 167	0.00003	<0.000039	<0.000040	<0.000037	<0.000039
PCB 156	0.00003	<0.000064	<0.00010	<0.00018	<0.00011
PCB 157	0.00003	<0.000043	<0.000029	<0.000031	<0.000034
PCB 169	0.030	<0.050	<0.032	<0.024	<0.035
PCB 189	0.00003	<0.000018	<0.000012	<0.000015	<0.000015
Total Dioxins & Furans Only		<4.40	<5.36	<4.15	<4.64
Total PCBs Only		<0.22	<0.37	<0.39	<0.33
Total Dioxins & Furans and PCBs		<4.62	<5.74	<4.54	<4.96

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 45
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.78	<2.69	<1.96	<2.14
12378-pentachlorodibenzo-p-dioxin	1.000	1.74	<2.69	<1.44	<1.96
123478-hexachlorodibenzo-p-dioxin	0.100	<0.28	<0.25	<0.16	<0.23
123678-hexachlorodibenzo-p-dioxin	0.100	<0.75	0.57	0.72	<0.68
123789-hexachlorodibenzo-p-dioxin	0.100	<0.40	<0.39	<0.39	<0.40
1234678-heptachlorodibenzo-p-dioxin	0.010	0.80	0.68	0.70	0.73
Octachlorodibenzo-p-dioxin	0.0003	0.033	0.027	0.036	0.032
2378-tetrachlorodibenzofuran	0.100	<0.061	<0.046	<0.041	<0.049
12378-pentachlorodibenzofuran	0.030	<0.055	0.055	<0.033	<0.047
23478-pentachlorodibenzofuran	0.300	0.66	0.81	<0.68	<0.72
123478-hexachlorodibenzofuran	0.100	<0.18	<0.27	<0.20	<0.22
123678-hexachlorodibenzofuran	0.100	<0.22	<0.19	<0.18	<0.20
234678-hexachlorodibenzofuran	0.100	0.23	0.17	0.25	0.22
123789-hexachlorodibenzofuran	0.100	<0.065	<0.054	<0.052	<0.057
1234678-heptachlorodibenzofuran	0.010	<0.14	0.15	<0.14	<0.14
1234789-heptachlorodibenzofuran	0.010	<0.034	0.018	<0.023	<0.025
Octachlorodibenzofuran	0.0003	0.0047	0.0040	<0.0047	<0.0045
PCB 81	0.0003	<0.0018	<0.0013	<0.0019	<0.0017
PCB 77	0.0001	0.0012	0.0014	0.0019	0.0015
PCB 123	0.00003	<0.00067	<0.00093	<0.0017	<0.0011
PCB 118	0.00003	0.0059	0.0083	0.013	0.0092
PCB 114	0.00003	0.00020	0.00031	<0.00048	<0.00033
PCB 105	0.00003	0.0019	0.0024	0.0050	0.0031
PCB 126	0.100	<0.28	<0.56	<0.60	<0.48
PCB 167	0.00003	<0.000067	<0.000068	<0.000062	<0.000066
PCB 156	0.00003	<0.00011	<0.00017	<0.00030	<0.00019
PCB 157	0.00003	<0.000073	<0.000048	<0.000053	<0.000058
PCB 169	0.030	<0.085	<0.054	<0.041	<0.060
PCB 189	0.00003	<0.000030	<0.000021	<0.000025	<0.000025
Total Dioxins & Furans Only		<7.44	<9.07	<7.01	<7.84
Total PCBs Only		<0.38	<0.63	<0.66	<0.56
Total Dioxins & Furans and PCBs		<7.82	<9.70	<7.67	<8.40

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.40	<2.12	<1.59	<1.71
12378-pentachlorodibenzo-p-dioxin	1.000	1.37	<2.12	<1.17	<1.56
123478-hexachlorodibenzo-p-dioxin	0.100	<0.22	<0.20	<0.13	<0.18
123678-hexachlorodibenzo-p-dioxin	0.100	<0.59	0.45	0.59	<0.54
123789-hexachlorodibenzo-p-dioxin	0.100	<0.32	<0.31	<0.32	<0.32
1234678-heptachlorodibenzo-p-dioxin	0.010	0.63	0.54	0.57	0.58
Octachlorodibenzo-p-dioxin	0.0003	0.026	0.021	0.029	0.026
2378-tetrachlorodibenzofuran	0.100	<0.048	<0.036	<0.034	<0.039
12378-pentachlorodibenzofuran	0.030	<0.044	0.043	<0.027	<0.038
23478-pentachlorodibenzofuran	0.300	0.52	0.64	<0.55	<0.57
123478-hexachlorodibenzofuran	0.100	<0.14	<0.21	<0.16	<0.17
123678-hexachlorodibenzofuran	0.100	<0.18	<0.15	<0.14	<0.16
234678-hexachlorodibenzofuran	0.100	0.18	0.14	0.20	0.17
123789-hexachlorodibenzofuran	0.100	<0.051	<0.042	<0.042	<0.045
1234678-heptachlorodibenzofuran	0.010	<0.11	0.12	<0.12	<0.12
1234789-heptachlorodibenzofuran	0.010	<0.027	0.014	<0.018	<0.020
Octachlorodibenzofuran	0.0003	0.0037	0.0031	<0.0038	<0.0036
PCB 81	0.0003	<0.0014	<0.0010	<0.0015	<0.0013
PCB 77	0.0001	0.00097	0.0011	0.0015	0.0012
PCB 123	0.00003	<0.00053	<0.00073	<0.0014	<0.00087
PCB 118	0.00003	0.0047	0.0066	0.011	0.0074
PCB 114	0.00003	0.00016	0.00024	<0.00039	<0.00026
PCB 105	0.00003	0.0015	0.0019	0.0040	0.0025
PCB 126	0.100	<0.22	<0.44	<0.49	<0.38
PCB 167	0.00003	<0.000053	<0.000054	<0.000050	<0.000052
PCB 156	0.00003	<0.000086	<0.00013	<0.00025	<0.00015
PCB 157	0.00003	<0.000057	<0.000038	<0.000043	<0.000046
PCB 169	0.030	<0.067	<0.043	<0.033	<0.048
PCB 189	0.00003	<0.000023	<0.000016	<0.000020	<0.000020
Total Dioxins & Furans Only		<5.87	<7.15	<5.7	<6.24
Total PCBs Only		<0.30	<0.50	<0.54	<0.44
Total Dioxins & Furans and PCBs		<6.17	<7.65	<6.24	<6.68

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46A
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	0.70	1.06	0.80	0.85
12378-pentachlorodibenzo-p-dioxin	1.000	1.37	1.06	0.59	1.01
123478-hexachlorodibenzo-p-dioxin	0.100	0.11	0.10	0.06	0.091
123678-hexachlorodibenzo-p-dioxin	0.100	0.29	0.45	0.59	0.44
123789-hexachlorodibenzo-p-dioxin	0.100	0.16	0.16	0.16	0.16
1234678-heptachlorodibenzo-p-dioxin	0.010	0.63	0.54	0.57	0.58
Octachlorodibenzo-p-dioxin	0.0003	0.026	0.021	0.029	0.026
2378-tetrachlorodibenzofuran	0.100	0.024	0.018	0.017	0.020
12378-pentachlorodibenzofuran	0.030	0.022	0.043	0.013	0.026
23478-pentachlorodibenzofuran	0.300	0.52	0.64	0.28	0.48
123478-hexachlorodibenzofuran	0.100	0.071	0.11	0.080	0.086
123678-hexachlorodibenzofuran	0.100	0.088	0.074	0.071	0.078
234678-hexachlorodibenzofuran	0.100	0.18	0.14	0.20	0.17
123789-hexachlorodibenzofuran	0.100	0.025	0.021	0.021	0.023
1234678-heptachlorodibenzofuran	0.010	0.057	0.12	0.059	0.077
1234789-heptachlorodibenzofuran	0.010	0.014	0.014	0.0092	0.012
Octachlorodibenzofuran	0.0003	0.0037	0.0031	0.0019	0.0029
PCB 81	0.0003	0.00072	0.00051	0.00075	0.00066
PCB 77	0.0001	0.00097	0.0011	0.0015	0.0012
PCB 123	0.00003	0.00026	0.00037	0.00068	0.00044
PCB 118	0.00003	0.0047	0.0066	0.011	0.0074
PCB 114	0.00003	0.00016	0.00024	0.00020	0.00020
PCB 105	0.00003	0.0015	0.0019	0.0040	0.0025
PCB 126	0.100	0.11	0.22	0.24	0.19
PCB 167	0.00003	0.000026	0.000027	0.000025	0.000026
PCB 156	0.00003	0.000043	0.000066	0.00012	0.000077
PCB 157	0.00003	0.000029	0.000019	0.000021	0.000023
PCB 169	0.030	0.033	0.021	0.017	0.024
PCB 189	0.00003	0.000012	0.0000081	0.000010	0.000010
Total Dioxins & Furans Only		4.30	4.56	3.54	4.13
Total PCBs Only		0.15	0.25	0.28	0.23
Total Dioxins & Furans and PCBs		4.46	4.81	3.82	4.36

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 46B
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.40	<2.12	<1.59	<1.71
12378-pentachlorodibenzo-p-dioxin	0.500	0.69	<1.06	<0.59	<0.78
123478-hexachlorodibenzo-p-dioxin	0.100	<0.22	<0.20	<0.13	<0.18
123678-hexachlorodibenzo-p-dioxin	0.100	<0.59	0.45	0.59	<0.54
123789-hexachlorodibenzo-p-dioxin	0.100	<0.32	<0.31	<0.32	<0.32
1234678-heptachlorodibenzo-p-dioxin	0.010	0.63	0.54	0.57	0.58
Octachlorodibenzo-p-dioxin	0.001	0.086	0.071	0.098	0.085
2378-tetrachlorodibenzofuran	0.100	<0.048	<0.036	<0.034	<0.039
12378-pentachlorodibenzofuran	0.050	<0.073	0.072	<0.044	<0.063
23478-pentachlorodibenzofuran	0.500	0.87	1.07	<0.92	<0.95
123478-hexachlorodibenzofuran	0.100	<0.14	<0.21	<0.16	<0.17
123678-hexachlorodibenzofuran	0.100	<0.18	<0.15	<0.14	<0.16
234678-hexachlorodibenzofuran	0.100	0.18	0.14	0.20	0.17
123789-hexachlorodibenzofuran	0.100	<0.051	<0.042	<0.042	<0.045
1234678-heptachlorodibenzofuran	0.010	<0.11	0.12	<0.12	<0.12
1234789-heptachlorodibenzofuran	0.010	<0.027	0.014	<0.018	<0.020
Octachlorodibenzofuran	0.001	0.012	0.010	<0.013	<0.012
Total Dioxins & Furans		<5.63	<6.60	<5.57	<5.94
In-Stack Emission Limit					60

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

NATO/CCMS (1989) Toxicity Equivalency Factors

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 47
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.49	<2.27	<1.65	<1.81
12378-pentachlorodibenzo-p-dioxin	1.000	1.46	<2.27	<1.22	<1.65
123478-hexachlorodibenzo-p-dioxin	0.100	<0.24	<0.21	<0.13	<0.19
123678-hexachlorodibenzo-p-dioxin	0.100	<0.63	0.48	0.61	<0.57
123789-hexachlorodibenzo-p-dioxin	0.100	<0.34	<0.33	<0.33	<0.33
1234678-heptachlorodibenzo-p-dioxin	0.010	0.67	0.57	0.59	0.61
Octachlorodibenzo-p-dioxin	0.0003	0.028	0.023	0.031	0.027
2378-tetrachlorodibenzofuran	0.100	<0.051	<0.038	<0.035	<0.041
12378-pentachlorodibenzofuran	0.030	<0.046	0.046	<0.028	<0.040
23478-pentachlorodibenzofuran	0.300	0.56	0.69	<0.57	<0.61
123478-hexachlorodibenzofuran	0.100	<0.15	<0.23	<0.17	<0.18
123678-hexachlorodibenzofuran	0.100	<0.19	<0.16	<0.15	<0.16
234678-hexachlorodibenzofuran	0.100	0.20	0.15	0.21	0.18
123789-hexachlorodibenzofuran	0.100	<0.054	<0.045	<0.044	<0.048
1234678-heptachlorodibenzofuran	0.010	<0.12	0.12	<0.12	<0.12
1234789-heptachlorodibenzofuran	0.010	<0.029	0.015	<0.019	<0.021
Octachlorodibenzofuran	0.0003	0.0040	0.0033	<0.0040	<0.0038
PCB 81	0.0003	<0.0015	<0.0011	<0.0016	<0.0014
PCB 77	0.0001	0.0010	0.0012	0.0016	0.0013
PCB 123	0.00003	<0.00056	<0.00078	<0.0014	<0.00092
PCB 118	0.00003	0.0050	0.0070	0.011	0.0078
PCB 114	0.00003	0.00017	0.00026	<0.00041	<0.00028
PCB 105	0.00003	0.0016	0.0020	0.0042	0.0026
PCB 126	0.100	<0.24	<0.47	<0.51	<0.40
PCB 167	0.00003	<0.000056	<0.000058	<0.000052	<0.000055
PCB 156	0.00003	<0.000092	<0.00014	<0.00026	<0.00016
PCB 157	0.00003	<0.000061	<0.000041	<0.000044	<0.000049
PCB 169	0.030	<0.071	<0.046	<0.034	<0.050
PCB 189	0.00003	<0.000025	<0.000017	<0.000021	<0.000021
Total Dioxins & Furans Only		<6.26	<7.64	<5.92	<6.60
Total PCBs Only		<0.32	<0.53	<0.56	<0.47
Total Dioxins & Furans and PCBs		<6.58	<8.17	<6.48	<7.07

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 48
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.027	<0.040	<0.030	<0.032
12378-pentachlorodibenzo-p-dioxin	1.000	0.027	<0.040	<0.022	<0.030
123478-hexachlorodibenzo-p-dioxin	0.100	<0.0043	<0.0037	<0.0024	<0.0035
123678-hexachlorodibenzo-p-dioxin	0.100	<0.011	0.0084	0.011	<0.010
123789-hexachlorodibenzo-p-dioxin	0.100	<0.0062	<0.0059	<0.0060	<0.0060
1234678-heptachlorodibenzo-p-dioxin	0.010	0.012	0.010	0.011	0.011
Octachlorodibenzo-p-dioxin	0.0003	0.00050	0.00040	0.00055	0.00049
2378-tetrachlorodibenzofuran	0.100	<0.00093	<0.00068	<0.00063	<0.00074
12378-pentachlorodibenzofuran	0.030	<0.00084	0.00081	<0.00050	<0.00072
23478-pentachlorodibenzofuran	0.300	0.010	0.012	<0.010	<0.011
123478-hexachlorodibenzofuran	0.100	<0.0028	<0.0040	<0.0030	<0.0032
123678-hexachlorodibenzofuran	0.100	<0.0034	<0.0028	<0.0027	<0.0030
234678-hexachlorodibenzofuran	0.100	0.0036	0.0026	0.0037	0.0033
123789-hexachlorodibenzofuran	0.100	<0.00099	<0.00080	<0.00078	<0.00086
1234678-heptachlorodibenzofuran	0.010	<0.0022	0.0022	<0.0022	<0.0022
1234789-heptachlorodibenzofuran	0.010	<0.00053	0.00027	<0.00034	<0.00038
Octachlorodibenzofuran	0.0003	0.000072	0.000059	<0.000071	<0.000068
PCB 81	0.0003	<0.000028	<0.000019	<0.000028	<0.000025
PCB 77	0.0001	0.000019	0.000021	0.000029	0.000023
PCB 123	0.00003	<0.000010	<0.000014	<0.000025	<0.000016
PCB 118	0.00003	0.000090	0.00012	0.00020	0.00014
PCB 114	0.00003	0.0000030	0.0000046	<0.0000073	<0.0000050
PCB 105	0.00003	0.000029	0.000036	0.000076	0.000047
PCB 126	0.100	<0.0043	<0.0083	<0.0091	<0.0073
PCB 167	0.00003	<0.0000010	<0.0000010	<0.00000094	<0.00000099
PCB 156	0.00003	<0.0000017	<0.0000025	<0.0000046	<0.0000029
PCB 157	0.00003	<0.0000011	<0.00000072	<0.00000080	<0.00000088
PCB 169	0.030	<0.0013	<0.00081	<0.00062	<0.00091
PCB 189	0.00003	<0.00000045	<0.00000031	<0.00000038	<0.00000038
Total Dioxins & Furans Only		<0.11	<0.14	<0.11	<0.12
Total PCBs Only		<0.0058	<0.0094	<0.010	<0.0084
Total Dioxins & Furans and PCBs		<0.12	<0.14	<0.12	<0.13

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 49
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using the Full Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<1.27	<2.14	<1.71	<1.81	<0.032
12378-pentachlorodibenzo-p-dioxin	<1.16	<1.96	<1.56	<1.65	<0.030
123478-hexachlorodibenzo-p-dioxin	<0.14	<0.23	<0.18	<0.19	<0.0035
123678-hexachlorodibenzo-p-dioxin	<0.40	<0.68	<0.54	<0.57	<0.010
123789-hexachlorodibenzo-p-dioxin	<0.23	<0.40	<0.32	<0.33	<0.0060
1234678-heptachlorodibenzo-p-dioxin	0.43	0.73	0.58	0.61	0.011
Octachlorodibenzo-p-dioxin	0.019	0.032	0.026	0.027	0.00049
2378-tetrachlorodibenzofuran	<0.029	<0.049	<0.039	<0.041	<0.00074
12378-pentachlorodibenzofuran	<0.028	<0.047	<0.038	<0.040	<0.00072
23478-pentachlorodibenzofuran	<0.42	<0.72	<0.57	<0.61	<0.011
123478-hexachlorodibenzofuran	<0.13	<0.22	<0.17	<0.18	<0.0032
123678-hexachlorodibenzofuran	<0.12	<0.20	<0.16	<0.16	<0.0030
234678-hexachlorodibenzofuran	0.13	0.22	0.17	0.18	0.0033
123789-hexachlorodibenzofuran	<0.034	<0.057	<0.045	<0.048	<0.00086
1234678-heptachlorodibenzofuran	<0.086	<0.14	<0.12	<0.12	<0.0022
1234789-heptachlorodibenzofuran	<0.015	<0.025	<0.020	<0.021	<0.00038
Octachlorodibenzofuran	<0.0026	<0.0045	<0.0036	<0.0038	<0.000068
PCB 81	<0.00098	<0.0017	<0.0013	<0.0014	<0.000025
PCB 77	0.00089	0.0015	0.0012	0.0013	0.000023
PCB 123	<0.00064	<0.0011	<0.00087	<0.00092	<0.000016
PCB 118	0.0054	0.0092	0.0074	0.0078	0.00014
PCB 114	<0.00020	<0.00033	<0.00026	<0.00028	<0.0000050
PCB 105	0.0018	0.0031	0.0025	0.0026	0.000047
PCB 126	<0.28	<0.48	<0.38	<0.40	<0.0073
PCB 167	<0.000039	<0.000066	<0.000052	<0.000055	<0.00000099
PCB 156	<0.00011	<0.00019	<0.00015	<0.00016	<0.0000029
PCB 157	<0.000034	<0.000058	<0.000046	<0.000049	<0.00000088
PCB 169	<0.035	<0.060	<0.048	<0.050	<0.00091
PCB 189	<0.000015	<0.000025	<0.000020	<0.000021	<0.00000038
Total Dioxins & Furans Only	<4.64	<7.84	<6.24	<6.60	<0.12
Total PCBs Only	<0.33	<0.56	<0.44	<0.47	<0.0084
Total Dioxins & Furans and PCBs	<4.96	<8.40	<6.68	<7.07	<0.13

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 50
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.63	1.07	0.85	0.90	0.016
12378-pentachlorodibenzo-p-dioxin	0.75	1.27	1.01	1.07	0.019
123478-hexachlorodibenzo-p-dioxin	0.068	0.12	0.091	0.10	0.0017
123678-hexachlorodibenzo-p-dioxin	0.33	0.55	0.44	0.47	0.0084
123789-hexachlorodibenzo-p-dioxin	0.12	0.20	0.16	0.17	0.0030
1234678-heptachlorodibenzo-p-dioxin	0.43	0.73	0.58	0.61	0.011
Octachlorodibenzo-p-dioxin	0.019	0.032	0.026	0.027	0.00049
2378-tetrachlorodibenzofuran	0.015	0.025	0.020	0.021	0.00037
12378-pentachlorodibenzofuran	0.019	0.033	0.026	0.028	0.00049
23478-pentachlorodibenzofuran	0.36	0.61	0.48	0.51	0.0091
123478-hexachlorodibenzofuran	0.064	0.11	0.086	0.091	0.0016
123678-hexachlorodibenzofuran	0.058	0.098	0.078	0.082	0.0015
234678-hexachlorodibenzofuran	0.13	0.22	0.17	0.18	0.0033
123789-hexachlorodibenzofuran	0.017	0.028	0.023	0.024	0.00043
1234678-heptachlorodibenzofuran	0.057	0.097	0.077	0.082	0.0015
1234789-heptachlorodibenzofuran	0.0092	0.016	0.012	0.013	0.00024
Octachlorodibenzofuran	0.0022	0.0037	0.0029	0.0031	0.000056
PCB 81	0.00049	0.00083	0.00066	0.00070	0.000013
PCB 77	0.00089	0.0015	0.0012	0.0013	0.000023
PCB 123	0.00032	0.00054	0.00044	0.00046	0.0000082
PCB 118	0.0054	0.0092	0.0074	0.0078	0.00014
PCB 114	0.00015	0.00025	0.00020	0.00021	0.0000038
PCB 105	0.0018	0.0031	0.0025	0.0026	0.000047
PCB 126	0.14	0.24	0.19	0.20	0.0036
PCB 167	0.000019	0.000033	0.000026	0.000028	0.00000050
PCB 156	0.000057	0.000097	0.000077	0.000082	0.0000015
PCB 157	0.000017	0.000029	0.000023	0.000024	0.00000044
PCB 169	0.018	0.030	0.024	0.025	0.00045
PCB 189	0.0000074	0.000012	0.000010	0.000011	0.00000019
Total Dioxins & Furans Only	3.07	5.20	4.13	4.38	0.079
Total PCBs Only	0.17	0.29	0.23	0.24	0.0043
Total Dioxins & Furans and PCBs	3.24	5.48	4.36	4.62	0.083

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 51
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Data for Chlorobenzenes
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	993	119	201	158	169	3.07
1,3-Dichlorobenzene	187	22.3	37.8	29.8	31.8	0.58
1,4-Dichlorobenzene	97.4	11.6	19.7	15.5	16.5	0.30
1,2-Dichlorobenzene	105	12.5	21.2	16.7	17.8	0.32
Total Dichlorobenzene	389	46.5	78.7	62.1	66.1	1.20
1,3,5-trichlorobenzene	13.7	1.64	2.77	2.18	2.33	0.042
1,2,4-trichlorobenzene	43.7	5.22	8.83	6.96	7.42	0.14
1,2,3-trichlorobenzene	23.4	2.79	4.73	3.73	3.97	0.072
Total Trichlorobenzene	80.8	9.64	16.3	12.9	13.7	0.25
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<1.19	<2.02	<1.59	<1.70	<0.031
1,2,3,4-tetrachlorobenzene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Total Tetrachlorobenzene	<20.0	<2.39	<4.04	<3.19	<3.40	<0.062
Pentachlorobenzene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Hexachlorobenzene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Total Chlorobenzenes	<1503	<179	<304	<240	<255	<4.65

Dry Gas Volume Sampled (Rm^3*) :	4.949
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 52
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	832	102	172	136	145	2.57
1,3-Dichlorobenzene	158	19.4	32.7	25.8	27.6	0.49
1,4-Dichlorobenzene	81.6	10.0	16.9	13.3	14.2	0.25
1,2-Dichlorobenzene	88.2	10.8	18.3	14.4	15.4	0.27
Total Dichlorobenzene	328	40.2	67.9	53.5	57.2	1.01
1,3,5-trichlorobenzene	12.1	1.48	2.51	1.98	2.11	0.037
1,2,4-trichlorobenzene	40.0	4.90	8.29	6.53	6.98	0.12
1,2,3-trichlorobenzene	12.3	1.51	2.55	2.01	2.15	0.038
Total Trichlorobenzene	64.4	7.89	13.3	10.5	11.2	0.20
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<1.22	<2.07	<1.63	<1.74	<0.031
1,2,3,4-tetrachlorobenzene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Total Tetrachlorobenzene	<20.0	<2.45	<4.14	<3.27	<3.49	<0.062
Pentachlorobenzene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Hexachlorobenzene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Total Chlorobenzenes	<1264	<155	<262	<206	<220	<3.90

Dry Gas Volume Sampled (Rm^3*) :	4.827
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 53
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Data for Chlorobenzenes
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1300	159	268	218	226	4.08
1,3-Dichlorobenzene	219	26.7	45.2	36.7	38.1	0.69
1,4-Dichlorobenzene	95.3	11.6	19.7	16.0	16.6	0.30
1,2-Dichlorobenzene	126	15.4	26.0	21.1	21.9	0.40
Total Dichlorobenzene	440	53.7	90.8	73.8	76.7	1.38
1,3,5-trichlorobenzene	16.7	2.04	3.44	2.80	2.91	0.052
1,2,4-trichlorobenzene	42.4	5.17	8.75	7.11	7.39	0.13
1,2,3-trichlorobenzene	13.6	1.66	2.81	2.28	2.37	0.043
Total Trichlorobenzene	72.7	8.87	15.0	12.2	12.7	0.23
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	10.3	1.26	2.12	1.73	1.79	0.032
1,2,3,4-tetrachlorobenzene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Total Tetrachlorobenzene	<20.3	<2.48	<4.19	<3.40	<3.54	<0.064
Pentachlorobenzene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Hexachlorobenzene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Total Chlorobenzenes	<1853	<226	<382	<311	<323	<5.81

Dry Gas Volume Sampled (Rm^3*) :	4.848
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 54
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Monochlorobenzene	119	102	159	126	23.1
1,3-Dichlorobenzene	22.3	19.4	26.7	22.8	16.3
1,4-Dichlorobenzene	11.6	10.0	11.6	11.1	8.5
1,2-Dichlorobenzene	12.5	10.8	15.4	12.9	17.9
Total Dichlorobenzene	46.5	40.2	53.7	46.8	14.5
1,3,5-trichlorobenzene	1.64	1.48	2.04	1.72	16.7
1,2,4-trichlorobenzene	5.22	4.90	5.17	5.10	3.4
1,2,3-trichlorobenzene	2.79	1.51	1.66	1.99	35.4
Total Trichlorobenzene	9.64	7.89	8.87	8.80	10.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.19	<1.22	1.26	<1.23	2.6
1,2,3,4-tetrachlorobenzene	<1.19	<1.22	<1.22	<1.21	1.4
Total Tetrachlorobenzene	<2.39	<2.45	<2.48	<2.44	1.9
Pentachlorobenzene	<1.19	<1.22	<1.22	<1.21	1.4
Hexachlorobenzene	<1.19	<1.22	<1.22	<1.21	1.4
Total Chlorobenzenes	<179	<155	<226	<187	19.4

TABLE 55
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dry Reference Concentrations for Chlorobenzenes

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	201	172	268	214	23.0
1,3-Dichlorobenzene	37.8	32.7	45.2	38.6	16.2
1,4-Dichlorobenzene	19.7	16.9	19.7	18.7	8.5
1,2-Dichlorobenzene	21.2	18.3	26.0	21.8	17.8
Total Dichlorobenzene	78.7	67.9	90.8	79.1	14.5
1,3,5-trichlorobenzene	2.77	2.51	3.44	2.91	16.7
1,2,4-trichlorobenzene	8.83	8.29	8.75	8.62	3.4
1,2,3-trichlorobenzene	4.73	2.55	2.81	3.36	35.5
Total Trichlorobenzene	16.3	13.3	15.0	14.9	10.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<2.02	<2.07	2.12	<2.07	2.5
1,2,3,4-tetrachlorobenzene	<2.02	<2.07	<2.06	<2.05	1.3
Total Tetrachlorobenzene	<4.04	<4.14	<4.19	<4.12	1.8
Pentachlorobenzene	<2.02	<2.07	<2.06	<2.05	1.3
Hexachlorobenzene	<2.02	<2.07	<2.06	<2.05	1.3
Total Chlorobenzenes	<304	<262	<382	<316	19.3

* At 25°C and 1 atmosphere

TABLE 56
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Dry Adjusted Concentrations for Chlorobenzenes

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation %
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	
Monochlorobenzene	158	136	218	171	24.9
1,3-Dichlorobenzene	29.8	25.8	36.7	30.8	17.9
1,4-Dichlorobenzene	15.5	13.3	16.0	14.9	9.5
1,2-Dichlorobenzene	16.7	14.4	21.1	17.4	19.6
Total Dichlorobenzene	62.1	53.5	73.8	63.1	16.1
1,3,5-trichlorobenzene	2.18	1.98	2.80	2.32	18.5
1,2,4-trichlorobenzene	6.96	6.53	7.11	6.87	4.4
1,2,3-trichlorobenzene	3.73	2.01	2.28	2.67	34.6
Total Trichlorobenzene	12.9	10.5	12.2	11.9	10.2
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.59	<1.63	1.73	<1.65	4.1
1,2,3,4-tetrachlorobenzene	<1.59	<1.63	<1.68	<1.63	2.5
Total Tetrachlorobenzene	<3.19	<3.27	<3.40	<3.29	3.3
Pentachlorobenzene	<1.59	<1.63	<1.68	<1.63	2.5
Hexachlorobenzene	<1.59	<1.63	<1.68	<1.63	2.5
Total Chlorobenzenes	<240	<206	<311	<252	21.1

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 57
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Wet Reference Concentrations for Chlorobenzenes

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	169	145	226	180	23.2
1,3-Dichlorobenzene	31.8	27.6	38.1	32.5	16.4
1,4-Dichlorobenzene	16.5	14.2	16.6	15.8	8.6
1,2-Dichlorobenzene	17.8	15.4	21.9	18.4	18.0
Total Dichlorobenzene	66.1	57.2	76.7	66.7	14.7
1,3,5-trichlorobenzene	2.33	2.11	2.91	2.45	16.9
1,2,4-trichlorobenzene	7.42	6.98	7.39	7.26	3.4
1,2,3-trichlorobenzene	3.97	2.15	2.37	2.83	35.3
Total Trichlorobenzene	13.7	11.2	12.7	12.5	10.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.70	<1.74	1.79	<1.75	2.7
1,2,3,4-tetrachlorobenzene	<1.70	<1.74	<1.74	<1.73	1.5
Total Tetrachlorobenzene	<3.40	<3.49	<3.54	<3.47	2.0
Pentachlorobenzene	<1.70	<1.74	<1.74	<1.73	1.5
Hexachlorobenzene	<1.70	<1.74	<1.74	<1.73	1.5
Total Chlorobenzenes	<255	<220	<323	<266	19.5

* At 25°C and 1 atmosphere

TABLE 58
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Emission Rates for Chlorobenzenes

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Monochlorobenzene	3.07	2.57	4.08	3.24	23.7
1,3-Dichlorobenzene	0.58	0.49	0.69	0.58	17.0
1,4-Dichlorobenzene	0.30	0.25	0.30	0.28	9.8
1,2-Dichlorobenzene	0.32	0.27	0.40	0.33	18.6
Total Dichlorobenzene	1.20	1.01	1.38	1.20	15.4
1,3,5-trichlorobenzene	0.042	0.037	0.052	0.044	17.4
1,2,4-trichlorobenzene	0.14	0.12	0.13	0.13	4.7
1,2,3-trichlorobenzene	0.072	0.038	0.043	0.051	36.6
Total Trichlorobenzene	0.25	0.20	0.23	0.23	11.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.031	<0.031	0.032	<0.031	2.6
1,2,3,4-tetrachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.9
Total Tetrachlorobenzene	<0.062	<0.062	<0.064	<0.062	1.7
Pentachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.9
Hexachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.9
Total Chlorobenzenes	<4.65	<3.90	<5.81	<4.79	20.1

TABLE 59
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Emission Data for Chlorobenzenes

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	126	214	171	180	3.24
1,3-Dichlorobenzene	22.8	38.6	30.8	32.5	0.58
1,4-Dichlorobenzene	11.1	18.7	14.9	15.8	0.28
1,2-Dichlorobenzene	12.9	21.8	17.4	18.4	0.33
Total Dichlorobenzene	46.8	79.1	63.1	66.7	1.20
1,3,5-trichlorobenzene	1.72	2.91	2.32	2.45	0.044
1,2,4-trichlorobenzene	5.10	8.62	6.87	7.26	0.13
1,2,3-trichlorobenzene	1.99	3.36	2.67	2.83	0.051
Total Trichlorobenzene	8.80	14.9	11.9	12.5	0.23
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.23	<2.07	<1.65	<1.75	<0.031
1,2,3,4-tetrachlorobenzene	<1.21	<2.05	<1.63	<1.73	<0.031
Total Tetrachlorobenzene	<2.44	<4.12	<3.29	<3.47	<0.062
Pentachlorobenzene	<1.21	<2.05	<1.63	<1.73	<0.031
Hexachlorobenzene	<1.21	<2.05	<1.63	<1.73	<0.031
Total Chlorobenzenes	<187	<316	<252	<266	<4.79

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 60
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorobenzene Blank Analyses

Isomers and Congener Group Totals	Blank Train Total ng	Laboratory Blank Total ng
Monochlorobenzene	<10	<10
1,3-Dichlorobenzene	<10	<10
1,4-Dichlorobenzene	22.3	11.2
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<42.3	<31.2
1,3,5-trichlorobenzene	<10	<10
1,2,4-trichlorobenzene	<10	<10
1,2,3-trichlorobenzene	<10	<10
Total Trichlorobenzene	<30.0	<30.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<10
1,2,3,4-tetrachlorobenzene	<10	<10
Total Tetrachlorobenzene	<20.0	<20.0
Pentachlorobenzene	<10	<10
Hexachlorobenzene	<10	<10
Total Chlorobenzenes	<122	<111

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 61
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	108	12.9	21.8	17.2	18.3	0.33
3-monochlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
4-monochlorophenol	59.4	7.09	12.0	9.47	10.1	0.18
Total Monochlorophenols	<217	<25.9	<43.9	<34.6	<36.9	<0.67
2,6-dichlorophenol	57.9	6.91	11.7	9.23	9.84	0.18
2,4 & 2,5-dichlorophenol	59.9	7.15	12.1	9.55	10.2	0.19
3,5-dichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
2,3-dichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
3,4-dichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
Total Dichlorophenols	<268	<32.0	<54.1	<42.7	<45.5	<0.83
2,4,6-trichlorophenol	76.9	9.18	15.5	12.3	13.1	0.24
2,3,6-trichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
2,3,5-trichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
2,4,5-trichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
2,3,4-trichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
3,4,5-trichlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
Total Trichlorophenols	<327	<39.0	<66.1	<52.1	<55.5	<1.01
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
2,3,4,5-tetrachlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
Total Tetrachlorophenols	<100	<11.9	<20.2	<15.9	<17.0	<0.31
Pentachlorophenol	<50	<5.97	<10.1	<7.97	<8.49	<0.15
Total Chlorophenols	<962	<115	<194	<153	<163	<2.97

Dry Gas Volume Sampled (Rm^3*) :	4.949
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 62
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	94.9	11.6	19.7	15.5	16.6	0.29
3-monochlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
4-monochlorophenol	63.5	7.78	13.2	10.4	11.1	0.20
Total Monochlorophenols	<208	<25.5	<43.2	<34.0	<36.3	<0.64
2,6-dichlorophenol	51.2	6.27	10.6	8.36	8.93	0.16
2,4 & 2,5-dichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
3,5-dichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
2,3-dichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
3,4-dichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
Total Dichlorophenols	<251	<30.8	<52.0	<41.0	<43.8	<0.78
2,4,6-trichlorophenol	73.8	9.04	15.3	12.1	12.9	0.23
2,3,6-trichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
2,3,5-trichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
2,4,5-trichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
2,3,4-trichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
3,4,5-trichlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
Total Trichlorophenols	<324	<39.7	<67.1	<52.9	<56.5	<1.00
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
2,3,4,5-tetrachlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
Total Tetrachlorophenols	<100	<12.2	<20.7	<16.3	<17.4	<0.31
Pentachlorophenol	<50	<6.12	<10.4	<8.17	<8.72	<0.15
Total Chlorophenols	<933	<114	<193	<152	<163	<2.88

Dry Gas Volume Sampled (Rm^3*) :	4.827
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 63
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	119	14.5	24.5	20.0	20.7	0.37
3-monochlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
4-monochlorophenol	74.4	9.08	15.3	12.5	13.0	0.23
Total Monochlorophenols	<243	<29.7	<50.2	<40.8	<42.4	<0.76
2,6-dichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
2,4 & 2,5-dichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
3,5-dichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
2,3-dichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
3,4-dichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
Total Dichlorophenols	<250	<30.5	<51.6	<41.9	<43.5	<0.78
2,4,6-trichlorophenol	100	12.2	20.6	16.8	17.4	0.31
2,3,6-trichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
2,3,5-trichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
2,4,5-trichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
2,3,4-trichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
3,4,5-trichlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
Total Trichlorophenols	<350	<42.7	<72.2	<58.7	<61.0	<1.10
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
2,3,4,5-tetrachlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
Total Tetrachlorophenols	<100	<12.2	<20.6	<16.8	<17.4	<0.31
Pentachlorophenol	<50	<6.10	<10.3	<8.38	<8.71	<0.16
Total Chlorophenols	<993	<121	<205	<167	<173	<3.11

Dry Gas Volume Sampled (Rm^3*) :	4.848
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 64
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	12.9	11.6	14.5	13.0	11.1
3-monochlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
4-monochlorophenol	7.09	7.78	9.08	7.98	12.6
Total Monochlorophenols	<25.9	<25.5	<29.7	<27.1	8.5
2,6-dichlorophenol	6.91	6.27	<6.10	<6.43	6.7
2,4 & 2,5-dichlorophenol	7.15	<6.12	<6.10	<6.46	9.3
3,5-dichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
2,3-dichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
3,4-dichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
Total Dichlorophenols	<32.0	<30.8	<30.5	<31.1	2.5
2,4,6-trichlorophenol	9.18	9.04	12.2	10.1	17.6
2,3,6-trichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
2,3,5-trichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
2,4,5-trichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
2,3,4-trichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
3,4,5-trichlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
Total Trichlorophenols	<39.0	<39.7	<42.7	<40.5	4.9
2,3,5,6/2,3,4,6-tetrachlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
2,3,4,5-tetrachlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
Total Tetrachlorophenols	<11.9	<12.2	<12.2	<12.1	1.4
Pentachlorophenol	<5.97	<6.12	<6.10	<6.06	1.4
Total Chlorophenols	<115	<114	<121	<117	3.3

TABLE 65
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	21.8	19.7	24.5	22.0	11.1
3-monochlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
4-monochlorophenol	12.0	13.2	15.3	13.5	12.6
Total Monochlorophenols	<43.9	<43.2	<50.2	<45.8	8.4
2,6-dichlorophenol	11.7	10.6	<10.3	<10.9	6.7
2,4 & 2,5-dichlorophenol	12.1	<10.4	<10.3	<10.9	9.3
3,5-dichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
2,3-dichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
3,4-dichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
Total Dichlorophenols	<54.1	<52.0	<51.6	<52.6	2.6
2,4,6-trichlorophenol	15.5	15.3	20.6	17.2	17.6
2,3,6-trichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
2,3,5-trichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
2,4,5-trichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
2,3,4-trichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
3,4,5-trichlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
Total Trichlorophenols	<66.1	<67.1	<72.2	<68.4	4.8
2,3,5,6/2,3,4,6-tetrachlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
2,3,4,5-tetrachlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
Total Tetrachlorophenols	<20.2	<20.7	<20.6	<20.5	1.3
Pentachlorophenol	<10.1	<10.4	<10.3	<10.3	1.3
Total Chlorophenols	<194	<193	<205	<198	3.2

* At 25°C and 1 atmosphere

TABLE 66
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	17.2	15.5	20.0	17.6	12.8
3-monochlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
4-monochlorophenol	9.47	10.4	12.5	10.8	14.3
Total Monochlorophenols	<34.6	<34.0	<40.8	<36.5	10.3
2,6-dichlorophenol	9.23	8.36	<8.38	<8.66	5.7
2,4 & 2,5-dichlorophenol	9.55	<8.17	<8.38	<8.70	8.5
3,5-dichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
2,3-dichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
3,4-dichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
Total Dichlorophenols	<42.7	<41.0	<41.9	<41.9	2.0
2,4,6-trichlorophenol	12.3	12.1	16.8	13.7	19.5
2,3,6-trichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
2,3,5-trichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
2,4,5-trichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
2,3,4-trichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
3,4,5-trichlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
Total Trichlorophenols	<52.1	<52.9	<58.7	<54.6	6.6
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
2,3,4,5-tetrachlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
Total Tetrachlorophenols	<15.9	<16.3	<16.8	<16.3	2.5
Pentachlorophenol	<7.97	<8.17	<8.38	<8.17	2.5
Total Chlorophenols	<153	<152	<167	<157	5.0

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 67
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	18.3	16.6	20.7	18.5	11.3
3-monochlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
4-monochlorophenol	10.1	11.1	13.0	11.4	12.8
Total Monochlorophenols	<36.9	<36.3	<42.4	<38.6	8.7
2,6-dichlorophenol	9.84	8.93	<8.71	<9.16	6.5
2,4 & 2,5-dichlorophenol	10.2	<8.72	<8.71	<9.20	9.2
3,5-dichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
2,3-dichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
3,4-dichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
Total Dichlorophenols	<45.5	<43.8	<43.5	<44.3	2.4
2,4,6-trichlorophenol	13.1	12.9	17.4	14.5	17.8
2,3,6-trichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
2,3,5-trichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
2,4,5-trichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
2,3,4-trichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
3,4,5-trichlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
Total Trichlorophenols	<55.5	<56.5	<61.0	<57.7	5.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
2,3,4,5-tetrachlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
Total Tetrachlorophenols	<17.0	<17.4	<17.4	<17.3	1.5
Pentachlorophenol	<8.49	<8.72	<8.71	<8.64	1.5
Total Chlorophenols	<163	<163	<173	<166	3.5

* At 25°C and 1 atmosphere

TABLE 68
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Isomer and Congener Group Emission Rates

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
2-monochlorophenol	0.33	0.29	0.37	0.33	12.0
3-monochlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
4-monochlorophenol	0.18	0.20	0.23	0.20	12.6
Total Monochlorophenols	<0.67	<0.64	<0.76	<0.69	9.0
2,6-dichlorophenol	0.18	0.16	<0.16	<0.16	7.6
2,4 & 2,5-dichlorophenol	0.19	<0.15	<0.16	<0.17	10.4
3,5-dichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
2,3-dichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
3,4-dichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
Total Dichlorophenols	<0.83	<0.78	<0.78	<0.80	3.5
2,4,6-trichlorophenol	0.24	0.23	0.31	0.26	18.1
2,3,6-trichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
2,3,5-trichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
2,4,5-trichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
2,3,4-trichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
3,4,5-trichlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
Total Trichlorophenols	<1.01	<1.00	<1.10	<1.04	5.2
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
2,3,4,5-tetrachlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
Total Tetrachlorophenols	<0.31	<0.31	<0.31	<0.31	0.9
Pentachlorophenol	<0.15	<0.15	<0.16	<0.16	0.9
Total Chlorophenols	<2.97	<2.88	<3.11	<2.99	3.9

TABLE 69
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Emission Data for Chlorophenol Isomer and Congener Groups

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	13.0	22.0	17.6	18.5	0.33
3-monochlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
4-monochlorophenol	7.98	13.5	10.8	11.4	0.20
Total Monochlorophenols	<27.1	<45.8	<36.5	<38.6	<0.69
2,6-dichlorophenol	<6.43	<10.9	<8.66	<9.16	<0.16
2,4 & 2,5-dichlorophenol	<6.46	<10.9	<8.70	<9.20	<0.17
3,5-dichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
2,3-dichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
3,4-dichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
Total Dichlorophenols	<31.1	<52.6	<41.9	<44.3	<0.80
2,4,6-trichlorophenol	10.1	17.2	13.7	14.5	0.26
2,3,6-trichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
2,3,5-trichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
2,4,5-trichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
2,3,4-trichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
3,4,5-trichlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
Total Trichlorophenols	<40.5	<68.4	<54.6	<57.7	<1.04
2,3,5,6/2,3,4,6-tetrachlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
2,3,4,5-tetrachlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
Total Tetrachlorophenols	<12.1	<20.5	<16.3	<17.3	<0.31
Pentachlorophenol	<6.06	<10.3	<8.17	<8.64	<0.16
Total Chlorophenols	<117	<198	<157	<166	<2.99

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 70
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Chlorophenol Blank Analyses

Congener Group	Lab Blank Total ng	Blank Train Total ng
2-monochlorophenol	<50	<50
3-monochlorophenol	<50	<50
4-monochlorophenol	<50	<50
Total Monochlorophenols	<150	<150
2,6-dichlorophenol	60.2	<50
2,4 & 2,5-dichlorophenol	72	<50
3,5-dichlorophenol	<50	<50
2,3-dichlorophenol	<50	<50
3,4-dichlorophenol	<50	<50
Total Dichlorophenols	<282	<250
2,4,6-trichlorophenol	<50	<50
2,3,6-trichlorophenol	<50	<50
2,3,5-trichlorophenol	<50	<50
2,4,5-trichlorophenol	<50	<50
2,3,4-trichlorophenol	<50	<50
3,4,5-trichlorophenol	<50	<50
Total Trichlorophenols	<300	<300
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<50
2,3,4,5-tetrachlorophenol	<50	<50
Total Tetrachlorophenols	<100	<100
Pentachlorophenol	53.2	<50
Total Chlorophenols	<885	<850

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 71
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 1

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	13.0	1.55	2.63	2.07	2.21	0.040
Acenaphthylene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Anthracene	22.2	2.65	4.49	3.54	3.77	0.069
Benzo(a)Anthracene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Benzo(b)Fluoranthene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Benzo(k/j)Fluoranthene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Benzo(a)fluorene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Benzo(b)fluorene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Benzo(g,h,i)Perylene	166	19.8	33.5	26.5	28.2	0.51
Benzo(a)Pyrene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Benzo(e)Pyrene	37.6	4.49	7.60	5.99	6.39	0.12
Biphenyl	31.0	3.70	6.26	4.94	5.27	0.096
2-Chloronaphthalene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Coronene	<50	<5.97	<10.1	<7.97	<8.49	<0.15
Dibenzo(a,c/a,h)Anthracene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Dibenzo(a,e)pyrene	<50	<5.97	<10.1	<7.97	<8.49	<0.15
9,10-dimethylanthracene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
7,12-Dimethylbenzo(a)anthracene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Fluoranthene	49.1	5.86	9.92	7.82	8.34	0.15
Fluorene	15.5	1.85	3.13	2.47	2.63	0.048
Indeno(1,2,3-cd)Pyrene	31.8	3.80	6.43	5.07	5.40	0.098
2-methylanthracene	16.9	2.02	3.41	2.69	2.87	0.052
3-Methylcholanthrene	<50	<5.97	<10.1	<7.97	<8.49	<0.15
1-Methylnaphthalene	171	20.4	34.6	27.3	29.0	0.53
2-Methylnaphthalene	32.7	3.90	6.61	5.21	5.55	0.10
1-Methylphenanthrene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
9-Methylphenanthrene	11.1	1.32	2.24	1.77	1.89	0.034
Naphthalene	149	17.8	30.1	23.7	25.3	0.46
Perylene	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Phenanthrene	114	13.6	23.0	18.2	19.4	0.35
Picene	<50	<5.97	<10.1	<7.97	<8.49	<0.15
Pyrene	81.8	9.76	16.5	13.0	13.9	0.25
Tetralin	286	34.1	57.8	45.6	48.6	0.88
m-terphenyl	<10	<1.19	<2.02	<1.59	<1.70	<0.031
o-Terphenyl	<10	<1.19	<2.02	<1.59	<1.70	<0.031
p-terphenyl	<10	<1.19	<2.02	<1.59	<1.70	<0.031
Total	<1599	<191	<323	<255	<272	<4.94

Dry Gas Volume Sampled (Rm^3*) :	4.949
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 72
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 2

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Acenaphthylene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Anthracene	22.5	2.76	4.66	3.67	3.92	0.069
Benzo(a)Anthracene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Benzo(b)Fluoranthene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Benzo(k/j)Fluoranthene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Benzo(a)fluorene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Benzo(b)fluorene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Benzo(g,h,i)Perylene	85.8	10.5	17.8	14.0	15.0	0.26
Benzo(a)Pyrene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Benzo(e)Pyrene	18.1	2.22	3.75	2.96	3.16	0.056
Biphenyl	23.9	2.93	4.95	3.90	4.17	0.074
2-Chloronaphthalene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<15.5	<1.90	<3.21	<2.53	<2.70	<0.048
Coronene	<50	<6.12	<10.4	<8.17	<8.72	<0.15
Dibenzo(a,c/a,h)Anthracene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Dibenzo(a,e)pyrene	<50	<6.12	<10.4	<8.17	<8.72	<0.15
9,10-dimethylanthracene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
7,12-Dimethylbenzo(a)anthracene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Fluoranthene	53.6	6.57	11.1	8.75	9.35	0.17
Fluorene	41.4	5.07	8.58	6.76	7.22	0.13
Indeno(1,2,3-cd)Pyrene	20.6	2.52	4.27	3.36	3.59	0.064
2-methylanthracene	23.3	2.85	4.83	3.81	4.06	0.072
3-Methylcholanthrene	<50	<6.12	<10.4	<8.17	<8.72	<0.15
1-Methylnaphthalene	165	20.2	34.2	26.9	28.8	0.51
2-Methylnaphthalene	30.3	3.71	6.28	4.95	5.28	0.094
1-Methylphenanthrene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
9-Methylphenanthrene	13.9	1.70	2.88	2.27	2.42	0.043
Naphthalene	141	17.3	29.2	23.0	24.6	0.44
Perylene	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Phenanthrene	193	23.6	40.0	31.5	33.7	0.60
Picene	<50	<6.12	<10.4	<8.17	<8.72	<0.15
Pyrene	56.6	6.93	11.7	9.24	9.87	0.17
Tetralin	280	34.3	58.0	45.7	48.8	0.86
m-terphenyl	<10	<1.22	<2.07	<1.63	<1.74	<0.031
o-Terphenyl	<10	<1.22	<2.07	<1.63	<1.74	<0.031
p-terphenyl	<10	<1.22	<2.07	<1.63	<1.74	<0.031
Total	<1555	<190	<322	<254	<271	<4.80

Dry Gas Volume Sampled (Rm^3*) :	4.827
Actual Flowrate (m^3/s) :	25.2
Dry Reference Flowrate (Rm^3/s*) :	14.9
Dry Adjusted Flowrate (Rm^3/s**) :	18.9
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 73
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	20.2	2.46	4.17	3.39	3.52	0.063
Acenaphthylene	11.2	1.37	2.31	1.88	1.95	0.035
Anthracene	26.2	3.20	5.40	4.39	4.56	0.082
Benzo(a)Anthracene	10.2	1.24	2.10	1.71	1.78	0.032
Benzo(b)Fluoranthene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Benzo(k/j)Fluoranthene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Benzo(a)fluorene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Benzo(b)fluorene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Benzo(g,h,i)Perylene	234	28.5	48.3	39.2	40.8	0.73
Benzo(a)Pyrene	23.2	2.83	4.79	3.89	4.04	0.073
Benzo(e)Pyrene	123	15.0	25.4	20.6	21.4	0.39
Biphenyl	45.0	5.49	9.28	7.54	7.84	0.14
2-Chloronaphthalene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<17.9	<2.18	<3.69	<3.00	<3.12	<0.056
Coronene	<50	<6.10	<10.3	<8.38	<8.71	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Dibenzo(a,e)pyrene	<50	<6.10	<10.3	<8.38	<8.71	<0.16
9,10-dimethylanthracene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
7,12-Dimethylbenzo(a)anthracene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Fluoranthene	103	12.6	21.2	17.3	17.9	0.32
Fluorene	22.8	2.78	4.70	3.82	3.97	0.071
Indeno(1,2,3-cd)Pyrene	39.9	4.87	8.23	6.69	6.95	0.13
2-methylanthracene	27.0	3.29	5.57	4.53	4.70	0.085
3-Methylcholanthrene	<50	<6.10	<10.3	<8.38	<8.71	<0.16
1-Methylnaphthalene	168	20.5	34.7	28.2	29.3	0.53
2-Methylnaphthalene	37.4	4.56	7.71	6.27	6.51	0.12
1-Methylphenanthrene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
9-Methylphenanthrene	15.1	1.84	3.11	2.53	2.63	0.047
Naphthalene	140	17.1	28.9	23.5	24.4	0.44
Perylene	<10	<1.22	<2.06	<1.68	<1.74	<0.031
Phenanthrene	150	18.3	30.9	25.1	26.1	0.47
Picene	<50	<6.10	<10.3	<8.38	<8.71	<0.16
Pyrene	202	24.6	41.7	33.9	35.2	0.63
Tetralin	283	34.5	58.4	47.4	49.3	0.89
m-terphenyl	10.6	1.29	2.19	1.78	1.85	0.033
o-Terphenyl	<10	<1.22	<2.06	<1.68	<1.74	<0.031
p-terphenyl	19.3	2.35	3.98	3.24	3.36	0.061
Total	<2039	<249	<421	<342	<355	<6.39

Dry Gas Volume Sampled (Rm^3*) :	4.848
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 74
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	1.55	<1.22	2.46	<1.75	36.8
Acenaphthylene	<1.19	<1.22	1.37	<1.26	7.3
Anthracene	2.65	2.76	3.20	2.87	10.1
Benzo(a)Anthracene	<1.19	<1.22	1.24	<1.22	2.1
Benzo(b)Fluoranthene	<1.19	<1.22	<1.22	<1.21	1.4
Benzo(k/j)Fluoranthene	<1.19	<1.22	<1.22	<1.21	1.4
Benzo(a)fluorene	<1.19	<1.22	<1.22	<1.21	1.4
Benzo(b)fluorene	<1.19	<1.22	<1.22	<1.21	1.4
Benzo(g,h,i)Perylene	19.8	10.5	28.5	19.6	46.0
Benzo(a)Pyrene	<1.19	<1.22	2.83	<1.75	53.5
Benzo(e)Pyrene	4.49	2.22	15.0	7.24	94.3
Biphenyl	3.70	2.93	5.49	4.04	32.5
2-Chloronaphthalene	<1.19	<1.22	<1.22	<1.21	1.4
Chrysene/Triphenylene/Benzo(b)anthracene	<1.19	<1.90	<2.18	<1.76	29.0
Coronene	<5.97	<6.12	<6.10	<6.06	1.4
Dibenzo(a,c/a,h)Anthracene	<1.19	<1.22	<1.22	<1.21	1.4
Dibenzo(a,e)pyrene	<5.97	<6.12	<6.10	<6.06	1.4
9,10-dimethylanthracene	<1.19	<1.22	<1.22	<1.21	1.4
7,12-Dimethylbenzo(a)anthracene	<1.19	<1.22	<1.22	<1.21	1.4
Fluoranthene	5.86	6.57	12.6	8.33	44.2
Fluorene	1.85	5.07	2.78	3.23	51.2
Indeno(1,2,3-cd)Pyrene	3.80	2.52	4.87	3.73	31.5
2-methylanthracene	2.02	2.85	3.29	2.72	23.8
3-Methylcholanthrene	<5.97	<6.12	<6.10	<6.06	1.4
1-Methylnaphthalene	20.4	20.2	20.5	20.4	0.7
2-Methylnaphthalene	3.90	3.71	4.56	4.06	11.0
1-Methylphenanthrene	<1.19	<1.22	<1.22	<1.21	1.4
9-Methylphenanthrene	1.32	1.70	1.84	1.62	16.5
Naphthalene	17.8	17.3	17.1	17.4	2.1
Perylene	<1.19	<1.22	<1.22	<1.21	1.4
Phenanthrene	13.6	23.6	18.3	18.5	27.1
Picene	<5.97	<6.12	<6.10	<6.06	1.4
Pyrene	9.76	6.93	24.6	13.8	69.0
Tetralin	34.1	34.3	34.5	34.3	0.6
m-terphenyl	<1.19	<1.22	1.29	<1.24	4.1
o-Terphenyl	<1.19	<1.22	<1.22	<1.21	1.4
p-terphenyl	<1.19	<1.22	2.35	<1.59	41.6
Total	<191	<190	<249	<210	16.0

TABLE 75
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	2.63	<2.07	4.17	<2.96	36.7
Acenaphthylene	<2.02	<2.07	2.31	<2.13	7.2
Anthracene	4.49	4.66	5.40	4.85	10.1
Benzo(a)Anthracene	<2.02	<2.07	2.10	<2.07	2.0
Benzo(b)Fluoranthene	<2.02	<2.07	<2.06	<2.05	1.3
Benzo(k/j)Fluoranthene	<2.02	<2.07	<2.06	<2.05	1.3
Benzo(a)fluorene	<2.02	<2.07	<2.06	<2.05	1.3
Benzo(b)fluorene	<2.02	<2.07	<2.06	<2.05	1.3
Benzo(g,h,i)Perylene	33.5	17.8	48.3	33.2	45.9
Benzo(a)Pyrene	<2.02	<2.07	4.79	<2.96	53.5
Benzo(e)Pyrene	7.60	3.75	25.4	12.2	94.2
Biphenyl	6.26	4.95	9.28	6.83	32.5
2-Chloronaphthalene	<2.02	<2.07	<2.06	<2.05	1.3
Chrysene/Triphenylene/Benzo(b)anthracene	<2.02	<3.21	<3.69	<2.97	28.9
Coronene	<10.1	<10.4	<10.3	<10.3	1.3
Dibenzo(a,c/a,h)Anthracene	<2.02	<2.07	<2.06	<2.05	1.3
Dibenzo(a,e)pyrene	<10.1	<10.4	<10.3	<10.3	1.3
9,10-dimethylanthracene	<2.02	<2.07	<2.06	<2.05	1.3
7,12-Dimethylbenzo(a)anthracene	<2.02	<2.07	<2.06	<2.05	1.3
Fluoranthene	9.92	11.1	21.2	14.1	44.2
Fluorene	3.13	8.58	4.70	5.47	51.2
Indeno(1,2,3-cd)Pyrene	6.43	4.27	8.23	6.31	31.5
2-methylanthracene	3.41	4.83	5.57	4.60	23.8
3-Methylcholanthrene	<10.1	<10.4	<10.3	<10.3	1.3
1-Methylnaphthalene	34.6	34.2	34.7	34.5	0.7
2-Methylnaphthalene	6.61	6.28	7.71	6.87	11.0
1-Methylphenanthrene	<2.02	<2.07	<2.06	<2.05	1.3
9-Methylphenanthrene	2.24	2.88	3.11	2.75	16.4
Naphthalene	30.1	29.2	28.9	29.4	2.2
Perylene	<2.02	<2.07	<2.06	<2.05	1.3
Phenanthrene	23.0	40.0	30.9	31.3	27.1
Picene	<10.1	<10.4	<10.3	<10.3	1.3
Pyrene	16.5	11.7	41.7	23.3	69.0
Tetralin	57.8	58.0	58.4	58.1	0.5
m-terphenyl	<2.02	<2.07	2.19	<2.09	4.1
o-Terphenyl	<2.02	<2.07	<2.06	<2.05	1.3
p-terphenyl	<2.02	<2.07	3.98	<2.69	41.5
Total	<323	<322	<421	<355	15.9

* At 25°C and 1 atmosphere

TABLE 76
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	2.07	<1.63	3.39	<2.36	38.6
Acenaphthylene	<1.59	<1.63	1.88	<1.70	9.0
Anthracene	3.54	3.67	4.39	3.87	11.9
Benzo(a)Anthracene	<1.59	<1.63	1.71	<1.65	3.6
Benzo(b)Fluoranthene	<1.59	<1.63	<1.68	<1.63	2.5
Benzo(k/j)Fluoranthene	<1.59	<1.63	<1.68	<1.63	2.5
Benzo(a)fluorene	<1.59	<1.63	<1.68	<1.63	2.5
Benzo(b)fluorene	<1.59	<1.63	<1.68	<1.63	2.5
Benzo(g,h,i)Perylene	26.5	14.0	39.2	26.6	47.5
Benzo(a)Pyrene	<1.59	<1.63	3.89	<2.37	55.4
Benzo(e)Pyrene	5.99	2.96	20.6	9.86	95.8
Biphenyl	4.94	3.90	7.54	5.46	34.3
2-Chloronaphthalene	<1.59	<1.63	<1.68	<1.63	2.5
Chrysene/Triphenylene/Benzo(b)anthracene	<1.59	<2.53	<3.00	<2.38	30.2
Coronene	<7.97	<8.17	<8.38	<8.17	2.5
Dibenzo(a,c/a,h)Anthracene	<1.59	<1.63	<1.68	<1.63	2.5
Dibenzo(a,e)pyrene	<7.97	<8.17	<8.38	<8.17	2.5
9,10-dimethylanthracene	<1.59	<1.63	<1.68	<1.63	2.5
7,12-Dimethylbenzo(a)anthracene	<1.59	<1.63	<1.68	<1.63	2.5
Fluoranthene	7.82	8.75	17.3	11.3	46.1
Fluorene	2.47	6.76	3.82	4.35	50.4
Indeno(1,2,3-cd)Pyrene	5.07	3.36	6.69	5.04	33.0
2-methylanthracene	2.69	3.81	4.53	3.68	25.1
3-Methylcholanthrene	<7.97	<8.17	<8.38	<8.17	2.5
1-Methylnaphthalene	27.3	26.9	28.2	27.5	2.3
2-Methylnaphthalene	5.21	4.95	6.27	5.48	12.8
1-Methylphenanthrene	<1.59	<1.63	<1.68	<1.63	2.5
9-Methylphenanthrene	1.77	2.27	2.53	2.19	17.7
Naphthalene	23.7	23.0	23.5	23.4	1.5
Perylene	<1.59	<1.63	<1.68	<1.63	2.5
Phenanthrene	18.2	31.5	25.1	24.9	26.8
Picene	<7.97	<8.17	<8.38	<8.17	2.5
Pyrene	13.0	9.24	33.9	18.7	70.8
Tetralin	45.6	45.7	47.4	46.3	2.2
m-terphenyl	<1.59	<1.63	1.78	<1.67	5.8
o-Terphenyl	<1.59	<1.63	<1.68	<1.63	2.5
p-terphenyl	<1.59	<1.63	3.24	<2.15	43.5
Total	<255	<254	<342	<284	17.8

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 77
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Wet Reference Concentrations

Compound	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	2.21	<1.74	3.52	<2.49	37.0
Acenaphthylene	<1.70	<1.74	1.95	<1.80	7.5
Anthracene	3.77	3.92	4.56	4.09	10.3
Benzo(a)Anthracene	<1.70	<1.74	1.78	<1.74	2.3
Benzo(b)Fluoranthene	<1.70	<1.74	<1.74	<1.73	1.5
Benzo(k/j)Fluoranthene	<1.70	<1.74	<1.74	<1.73	1.5
Benzo(a)fluorene	<1.70	<1.74	<1.74	<1.73	1.5
Benzo(b)fluorene	<1.70	<1.74	<1.74	<1.73	1.5
Benzo(g,h,i)Perylene	28.2	15.0	40.8	28.0	46.1
Benzo(a)Pyrene	<1.70	<1.74	4.04	<2.49	53.7
Benzo(e)Pyrene	6.39	3.16	21.4	10.3	94.4
Biphenyl	5.27	4.17	7.84	5.76	32.7
2-Chloronaphthalene	<1.70	<1.74	<1.74	<1.73	1.5
Chrysene/Triphenylene/Benzo(b)anthracene	<1.70	<2.70	<3.12	<2.51	29.1
Coronene	<8.49	<8.72	<8.71	<8.64	1.5
Dibenzo(a,c/a,h)Anthracene	<1.70	<1.74	<1.74	<1.73	1.5
Dibenzo(a,e)pyrene	<8.49	<8.72	<8.71	<8.64	1.5
9,10-dimethylanthracene	<1.70	<1.74	<1.74	<1.73	1.5
7,12-Dimethylbenzo(a)anthracene	<1.70	<1.74	<1.74	<1.73	1.5
Fluoranthene	8.34	9.35	17.9	11.9	44.4
Fluorene	2.63	7.22	3.97	4.61	51.2
Indeno(1,2,3-cd)Pyrene	5.40	3.59	6.95	5.31	31.6
2-methylanthracene	2.87	4.06	4.70	3.88	24.0
3-Methylcholanthrene	<8.49	<8.72	<8.71	<8.64	1.5
1-Methylnaphthalene	29.0	28.8	29.3	29.0	0.8
2-Methylnaphthalene	5.55	5.28	6.51	5.78	11.2
1-Methylphenanthrene	<1.70	<1.74	<1.74	<1.73	1.5
9-Methylphenanthrene	1.89	2.42	2.63	2.31	16.6
Naphthalene	25.3	24.6	24.4	24.8	2.0
Perylene	<1.70	<1.74	<1.74	<1.73	1.5
Phenanthrene	19.4	33.7	26.1	26.4	27.1
Picene	<8.49	<8.72	<8.71	<8.64	1.5
Pyrene	13.9	9.87	35.2	19.7	69.2
Tetralin	48.6	48.8	49.3	48.9	0.7
m-terphenyl	<1.70	<1.74	1.85	<1.76	4.3
o-Terphenyl	<1.70	<1.74	<1.74	<1.73	1.5
p-terphenyl	<1.70	<1.74	3.36	<2.27	41.8
Total	<272	<271	<355	<299	16.2

* At 25°C and 1 atmosphere

TABLE 78
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Rates

Compound	Emission Rate				Coefficient
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	of Variation %
Acenaphthene	0.040	<0.031	0.063	<0.045	37.3
Acenaphthylene	<0.031	<0.031	0.035	<0.032	7.6
Anthracene	0.069	0.069	0.082	0.073	10.3
Benzo(a)Anthracene	<0.031	<0.031	0.032	<0.031	2.0
Benzo(b)Fluoranthene	<0.031	<0.031	<0.031	<0.031	0.9
Benzo(k/j)Fluoranthene	<0.031	<0.031	<0.031	<0.031	0.9
Benzo(a)fluorene	<0.031	<0.031	<0.031	<0.031	0.9
Benzo(b)fluorene	<0.031	<0.031	<0.031	<0.031	0.9
Benzo(g,h,i)Perylene	0.51	0.26	0.73	0.50	46.5
Benzo(a)Pyrene	<0.031	<0.031	0.073	<0.045	53.9
Benzo(e)Pyrene	0.12	0.056	0.39	0.19	94.4
Biphenyl	0.096	0.074	0.14	0.10	33.1
2-Chloronaphthalene	<0.031	<0.031	<0.031	<0.031	0.9
Chrysene/Triphenylene/Benzo(b)anthracene	<0.031	<0.048	<0.056	<0.045	28.6
Coronene	<0.15	<0.15	<0.16	<0.16	0.9
Dibenzo(a,c/a,h)Anthracene	<0.031	<0.031	<0.031	<0.031	0.9
Dibenzo(a,e)pyrene	<0.15	<0.15	<0.16	<0.16	0.9
9,10-dimethylanthracene	<0.031	<0.031	<0.031	<0.031	0.9
7,12-Dimethylbenzo(a)anthracene	<0.031	<0.031	<0.031	<0.031	0.9
Fluoranthene	0.15	0.17	0.32	0.21	44.6
Fluorene	0.048	0.13	0.071	0.082	49.8
Indeno(1,2,3-cd)Pyrene	0.098	0.064	0.13	0.096	32.2
2-methylanthracene	0.052	0.072	0.085	0.070	23.5
3-Methylcholanthrene	<0.15	<0.15	<0.16	<0.16	0.9
1-Methylnaphthalene	0.53	0.51	0.53	0.52	2.0
2-Methylnaphthalene	0.10	0.094	0.12	0.10	11.7
1-Methylphenanthrene	<0.031	<0.031	<0.031	<0.031	0.9
9-Methylphenanthrene	0.034	0.043	0.047	0.042	16.0
Naphthalene	0.46	0.44	0.44	0.44	3.1
Perylene	<0.031	<0.031	<0.031	<0.031	0.9
Phenanthrene	0.35	0.60	0.47	0.47	25.7
Picene	<0.15	<0.15	<0.16	<0.16	0.9
Pyrene	0.25	0.17	0.63	0.35	69.4
Tetralin	0.88	0.86	0.89	0.88	1.4
m-terphenyl	<0.031	<0.031	0.033	<0.032	4.3
o-Terphenyl	<0.031	<0.031	<0.031	<0.031	0.9
p-terphenyl	<0.031	<0.031	0.061	<0.041	42.0
Total	<4.94	<4.80	<6.39	<5.38	16.4

TABLE 79
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Polycyclic Aromatic Hydrocarbon Emission Data

Compound	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<1.75	<2.96	<2.36	<2.49	<0.045
Acenaphthylene	<1.26	<2.13	<1.70	<1.80	<0.032
Anthracene	2.87	4.85	3.87	4.09	0.073
Benzo(a)Anthracene	<1.22	<2.07	<1.65	<1.74	<0.031
Benzo(b)Fluoranthene	<1.21	<2.05	<1.63	<1.73	<0.031
Benzo(k/j)Fluoranthene	<1.21	<2.05	<1.63	<1.73	<0.031
Benzo(a)fluorene	<1.21	<2.05	<1.63	<1.73	<0.031
Benzo(b)fluorene	<1.21	<2.05	<1.63	<1.73	<0.031
Benzo(g,h,i)Perylene	19.6	33.2	26.6	28.0	0.50
Benzo(a)Pyrene	<1.75	<2.96	<2.37	<2.49	<0.045
Benzo(e)Pyrene	7.24	12.2	9.86	10.3	0.19
Biphenyl	4.04	6.83	5.46	5.76	0.10
2-Chloronaphthalene	<1.21	<2.05	<1.63	<1.73	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<1.76	<2.97	<2.38	<2.51	<0.045
Coronene	<6.06	<10.3	<8.17	<8.64	<0.16
Dibenzo(a,c/a,h)Anthracene	<1.21	<2.05	<1.63	<1.73	<0.031
Dibenzo(a,e)pyrene	<6.06	<10.3	<8.17	<8.64	<0.16
9,10-dimethylanthracene	<1.21	<2.05	<1.63	<1.73	<0.031
7,12-Dimethylbenzo(a)anthracene	<1.21	<2.05	<1.63	<1.73	<0.031
Fluoranthene	8.33	14.1	11.3	11.9	0.21
Fluorene	3.23	5.47	4.35	4.61	0.082
Indeno(1,2,3-cd)Pyrene	3.73	6.31	5.04	5.31	0.096
2-methylanthracene	2.72	4.60	3.68	3.88	0.070
3-Methylcholanthrene	<6.06	<10.3	<8.17	<8.64	<0.16
1-Methylnaphthalene	20.4	34.5	27.5	29.0	0.52
2-Methylnaphthalene	4.06	6.87	5.48	5.78	0.10
1-Methylphenanthrene	<1.21	<2.05	<1.63	<1.73	<0.031
9-Methylphenanthrene	1.62	2.75	2.19	2.31	0.042
Naphthalene	17.4	29.4	23.4	24.8	0.44
Perylene	<1.21	<2.05	<1.63	<1.73	<0.031
Phenanthrene	18.5	31.3	24.9	26.4	0.47
Picene	<6.06	<10.3	<8.17	<8.64	<0.16
Pyrene	13.8	23.3	18.7	19.7	0.35
Tetralin	34.3	58.1	46.3	48.9	0.88
m-terphenyl	<1.24	<2.09	<1.67	<1.76	<0.032
o-Terphenyl	<1.21	<2.05	<1.63	<1.73	<0.031
p-terphenyl	<1.59	<2.69	<2.15	<2.27	<0.041
Total	<210	<355	<284	<299	<5.38

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 80
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Polycyclic Aromatic Hydrocarbon Analyses

Compound	Blank Train ng	Laboratory Blank ng
Acenaphthene	<10	<10
Acenaphthylene	<10	<10
Anthracene	<10	<10
Benzo(a)Anthracene	<10	<10
Benzo(b)Fluoranthene	<10	<10
Benzo(k/j)Fluoranthene	<10	<10
Benzo(a)fluorene	<10	<10
Benzo(b)fluorene	<10	<10
Benzo(g,h,i)Perylene	43.2	<10
Benzo(a)Pyrene	<10	<10
Benzo(e)Pyrene	<10	<10
Biphenyl	<10	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene/Benzo(b)anthracene	<10	<10
Coronene	<50	<50
Dibenzo(a,c/a,h)Anthracene	<10	<10
Dibenzo(a,e)pyrene	<50	<50
9,10-dimethylanthracene	<10	<10
7,12-Dimethylbenzo(a)anthracene	<10	<10
Fluoranthene	11.0	<10
Fluorene	14.3	<10
Indeno(1,2,3-cd)Pyrene	<10	<10
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	160	158
2-Methylnaphthalene	10.8	<10
1-Methylphenanthrene	<10	<10
9-Methylphenanthrene	<10	<10
Naphthalene	70.0	49.3
Perylene	<10	<10
Phenanthrene	22.8	<10
Picene	<50	<50
Pyrene	12.6	<10
Tetralin	121	416
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<906	<1123

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 81
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Acetaldehyde, Formaldehyde and Acrolein Emission Data

Acetaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual $\mu g/m^3$	Acetaldehyde Concentration Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acetaldehyde Emission Rate mg/s
1	0.74	0.0301	14.5	24.6	19.4	20.7	0.37
2	0.75	0.0304	14.6	24.7	19.4	20.8	0.37
3	0.77	0.0296	15.4	26.0	21.2	22.0	0.40
Average			14.8	25.1	20.0	21.2	0.38
Blank	0.82						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual $\mu g/m^3$	Formaldehyde Concentration Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Formaldehyde Emission Rate mg/s
1	0.73	0.0301	14.3	24.3	19.1	20.4	0.36
2	1.4	0.0304	27.2	46.1	36.3	38.8	0.69
3	1.4	0.0296	28.0	47.3	38.5	40.0	0.72
Average			23.2	39.2	31.3	33.1	0.59
Blank	0.97						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Actual $\mu g/m^3$	Acrolein Concentration Dry Reference $\mu g/Rm^3$*	Dry Adjusted $\mu g/Rm^3$**	Wet Reference $\mu g/Rm^3$*	Acrolein Emission Rate mg/s
1	<10	0.0301	<196	<332	<262	<280	<4.95
2	<10	0.0304	<194	<329	<259	<277	<4.90
3	<10	0.0296	<200	<338	<275	<286	<5.14
Average			<197	<333	<265	<281	<5.00
Blank	<10						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

Sampling was conducted at a single point. Volumetric flowrates from the corresponding isokinetic SVOC tests were used to calculate emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 82
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 1A/1B	Run No. 2 Tube 2A/2B	Run No. 3 Tube 3A/3B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	<0.1	<0.10	-	<0.30
Benzene	0.090	0.051	<0.05	<0.064	35.9	<0.19
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.05	<0.05	<0.05	<0.050	-	<0.15
2-Butanone	<0.01	0.032	0.011	<0.017	71.3	<0.052
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.72	0.14	<0.1	<0.65	142	<1.95
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	0.010	<0.01	<0.010	2.7	<0.030
Toluene	<0.05	<0.05	<0.05	<0.050	-	<0.15
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.050	-	<0.15
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.47	<0.87	<0.81	<1.38	67.9	<4.15

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0205
Run No. 2	0.0203
Run No. 3	0.0210

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 83
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Analyses
Test No. 2

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 5A/5B	Run No. 3 Tube 7A/7B	Run No. 4 Tube 8A/8B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	<0.1	<0.10	-	<0.30
Benzene	<0.05	0.065	<0.05	<0.055	15.4	<0.16
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.05	<0.05	<0.05	<0.050	-	<0.15
2-Butanone	<0.01	0.018	0.012	<0.013	33.4	<0.040
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	0.093	0.097	<0.067	73.7	<0.20
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	0.13	0.25	<0.1	<0.16	48.8	<0.48
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	<0.05	<0.05	<0.05	<0.050	-	<0.15
1,1,1-Trichloroethane	<0.01	0.040	0.040	<0.030	57.9	<0.090
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.050	-	<0.15
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<0.84	<1.10	<0.93	<0.96	13.4	<2.87

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0209
Run No. 3	0.0200
Run No. 4	0.0197

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 84
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Analyses
Test No. 3

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 9A/9B	Run No. 2 Tube 10A/10B	Run No. 4 Tube 12A/12B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	<0.1	<0.10	-	<0.30
Benzene	0.24	<0.05	<0.05	<0.11	96.8	<0.34
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.05	<0.05	<0.05	<0.050	-	<0.15
2-Butanone	0.041	0.014	<0.01	<0.021	78.3	<0.064
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	0.15	0.17	<0.1	<0.14	26.6	<0.43
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Toluene	<0.05	<0.05	<0.05	<0.050	-	<0.15
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.050	-	<0.15
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<1.08	<0.89	<0.81	<0.93	15.2	<2.78

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0191
Run No. 2	0.0194
Run No. 4	0.0204

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 85
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Data
Test No. 1

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.30	<2.87	<4.85	<3.83	<4.08	<0.074
Benzene	<0.19	<1.83	<3.10	<2.44	<2.61	<0.047
Bromodichloromethane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Bromoform	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Bromomethane	<0.27	<2.58	<4.37	<3.44	<3.67	<0.067
1,3-Butadiene	<0.15	<1.43	<2.43	<1.91	<2.04	<0.037
2-Butanone	<0.052	<0.50	<0.85	<0.67	<0.71	<0.013
Carbon Tetrachloride	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Chloroform	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Cumene (Isopropylbenzene)	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
Dibromochloromethane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Dichlorodifluoromethane	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
trans,1,2-Dichloroethene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
1,1-Dichloroethene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
1,2-Dichloropropane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Ethylbenzene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Ethylene Dibromide	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
Methylene Chloride	<1.95	<18.7	<31.6	<24.9	<26.6	<0.48
Styrene	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
Tetrachloroethene	<0.030	<0.29	<0.49	<0.39	<0.41	<0.0075
Toluene	<0.15	<1.43	<2.43	<1.91	<2.04	<0.037
1,1,1-Trichloroethane	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Trichlorotrifluoroethane	<0.15	<1.43	<2.43	<1.91	<2.04	<0.037
Trichlorofluoromethane	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
M&P-Xylene	<0.090	<0.86	<1.46	<1.15	<1.22	<0.022
O-Xylene	<0.030	<0.29	<0.49	<0.38	<0.41	<0.0074
Vinyl Chloride	<0.060	<0.57	<0.97	<0.77	<0.82	<0.015
Total	<4.15	<39.6	<67.1	<52.9	<56.4	<1.03

Dry Gas Volume Sampled (Rm^3*) :	0.0618
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 86
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Data
Test No. 2

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.30	<2.93	<4.95	<3.91	<4.16	<0.076
Benzene	<0.16	<1.61	<2.72	<2.14	<2.28	<0.042
Bromodichloromethane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Bromoform	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Bromomethane	<0.27	<2.63	<4.46	<3.51	<3.75	<0.068
1,3-Butadiene	<0.15	<1.46	<2.48	<1.95	<2.08	<0.038
2-Butanone	<0.040	<0.39	<0.66	<0.52	<0.56	<0.010
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Chloroform	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Cumene (Isopropylbenzene)	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
Dibromochloromethane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Dichlorodifluoromethane	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
trans,1,2-Dichloroethene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
1,1-Dichloroethene	<0.20	<1.95	<3.31	<2.61	<2.78	<0.051
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Ethylbenzene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Ethylene Dibromide	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
Methylene Chloride	<0.48	<4.70	<7.95	<6.27	<6.68	<0.12
Styrene	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
Tetrachloroethene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Toluene	<0.15	<1.46	<2.48	<1.95	<2.08	<0.038
1,1,1-Trichloroethane	<0.090	<0.88	<1.49	<1.18	<1.25	<0.023
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Trichlorotrifluoroethane	<0.15	<1.46	<2.48	<1.95	<2.08	<0.038
Trichlorofluoromethane	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
M&P-Xylene	<0.090	<0.88	<1.49	<1.17	<1.25	<0.023
O-Xylene	<0.030	<0.29	<0.50	<0.39	<0.42	<0.0076
Vinyl Chloride	<0.060	<0.59	<0.99	<0.78	<0.83	<0.015
Total	<2.87	<28.0	<47.3	<37.3	<39.8	<0.72

Dry Gas Volume Sampled (Rm^3*) :	0.0606
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	15.3
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	18.2

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 87
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Data
Test No. 3

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.30	<3.01	<5.09	<4.14	<4.30	<0.077
Benzene	<0.34	<3.41	<5.77	<4.69	<4.88	<0.088
Bromodichloromethane	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Bromoform	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Bromomethane	<0.27	<2.71	<4.58	<3.72	<3.87	<0.070
1,3-Butadiene	<0.15	<1.51	<2.55	<2.07	<2.15	<0.039
2-Butanone	<0.064	<0.65	<1.09	<0.89	<0.92	<0.017
Carbon Tetrachloride	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Chloroform	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Cumene (Isopropylbenzene)	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
Dibromochloromethane	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Dichlorodifluoromethane	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
1,2-Dichloroethane	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
trans,1,2-Dichloroethene	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
1,1-Dichloroethene	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
1,2-Dichloropropane	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Ethylbenzene	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Ethylene Dibromide	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
Methylene Chloride	<0.43	<4.28	<7.23	<5.88	<6.11	<0.11
Styrene	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
Tetrachloroethene	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Toluene	<0.15	<1.51	<2.55	<2.07	<2.15	<0.039
1,1,1-Trichloroethane	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Trichlorotrifluoroethane	<0.15	<1.51	<2.55	<2.07	<2.15	<0.039
Trichlorofluoromethane	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
M&P-Xylene	<0.090	<0.90	<1.53	<1.24	<1.29	<0.023
O-Xylene	<0.030	<0.30	<0.51	<0.41	<0.43	<0.0077
Vinyl Chloride	<0.060	<0.60	<1.02	<0.83	<0.86	<0.015
Total	<2.78	<27.9	<47.2	<38.4	<39.8	<0.72

Dry Gas Volume Sampled (Rm^3*) :	0.0589
Actual Flowrate (m^3/s) :	25.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	18.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 88
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Actual Concentrations

Compound	Actual Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Acetone	<2.87	<2.93	<3.01	<2.93
Benzene	<1.83	<1.61	<3.41	<2.28
Bromodichloromethane	<0.29	<0.29	<0.30	<0.29
Bromoform	<0.29	<0.29	<0.30	<0.29
Bromomethane	<2.58	<2.63	<2.71	<2.64
1,3-Butadiene	<1.43	<1.46	<1.51	<1.47
2-Butanone	<0.50	<0.39	<0.65	<0.51
Carbon Tetrachloride	<0.29	<0.29	<0.30	<0.29
Chloroform	<0.29	<0.29	<0.30	<0.29
Cumene (Isopropylbenzene)	<0.57	<0.59	<0.60	<0.59
Dibromochloromethane	<0.29	<0.29	<0.30	<0.29
Dichlorodifluoromethane	<0.57	<0.59	<0.60	<0.59
1,2-Dichloroethane	<0.29	<0.29	<0.30	<0.29
trans,1,2-Dichloroethene	<0.29	<0.29	<0.30	<0.29
1,1-Dichloroethene	<0.29	<1.95	<0.30	<0.85
1,2-Dichloropropane	<0.29	<0.29	<0.30	<0.29
Ethylbenzene	<0.29	<0.29	<0.30	<0.29
Ethylene Dibromide	<0.57	<0.59	<0.60	<0.59
Mesitylene (1,3,5-Trimethylbenzene)	<0.57	<0.59	<0.60	<0.59
Methylene Chloride	<18.7	<4.70	<4.28	<9.21
Styrene	<0.57	<0.59	<0.60	<0.59
Tetrachloroethene	<0.29	<0.29	<0.30	<0.29
Toluene	<1.43	<1.46	<1.51	<1.47
1,1,1-Trichloroethane	<0.29	<0.88	<0.30	<0.49
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.29	<0.30	<0.29
Trichlorotrifluoroethane	<1.43	<1.46	<1.51	<1.47
Trichlorofluoromethane	<0.57	<0.59	<0.60	<0.59
M&P-Xylene	<0.86	<0.88	<0.90	<0.88
O-Xylene	<0.29	<0.29	<0.30	<0.29
Vinyl Chloride	<0.57	<0.59	<0.60	<0.59
Total	<39.6	<28.0	<27.9	<31.8

TABLE 89
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Dry Reference Concentrations

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	<4.85	<4.95	<5.09	<4.96
Benzene	<3.10	<2.72	<5.77	<3.86
Bromodichloromethane	<0.49	<0.50	<0.51	<0.50
Bromoform	<0.49	<0.50	<0.51	<0.50
Bromomethane	<4.37	<4.46	<4.58	<4.47
1,3-Butadiene	<2.43	<2.48	<2.55	<2.48
2-Butanone	<0.85	<0.66	<1.09	<0.87
Carbon Tetrachloride	<0.49	<0.50	<0.51	<0.50
Chloroform	<0.49	<0.50	<0.51	<0.50
Cumene (Isopropylbenzene)	<0.97	<0.99	<1.02	<0.99
Dibromochloromethane	<0.49	<0.50	<0.51	<0.50
Dichlorodifluoromethane	<0.97	<0.99	<1.02	<0.99
1,2-Dichloroethane	<0.49	<0.50	<0.51	<0.50
trans,1,2-Dichloroethene	<0.49	<0.50	<0.51	<0.50
1,1-Dichloroethene	<0.49	<3.31	<0.51	<1.43
1,2-Dichloropropane	<0.49	<0.50	<0.51	<0.50
Ethylbenzene	<0.49	<0.50	<0.51	<0.50
Ethylene Dibromide	<0.97	<0.99	<1.02	<0.99
Mesitylene (1,3,5-Trimethylbenzene)	<0.97	<0.99	<1.02	<0.99
Methylene Chloride	<31.6	<7.95	<7.23	<15.6
Styrene	<0.97	<0.99	<1.02	<0.99
Tetrachloroethene	<0.49	<0.50	<0.51	<0.50
Toluene	<2.43	<2.48	<2.55	<2.48
1,1,1-Trichloroethane	<0.49	<1.49	<0.51	<0.83
Trichloroethene/1,1,2-Trichloroethene	<0.49	<0.50	<0.51	<0.50
Trichlorotrifluoroethane	<2.43	<2.48	<2.55	<2.48
Trichlorofluoromethane	<0.97	<0.99	<1.02	<0.99
M&P-Xylene	<1.46	<1.49	<1.53	<1.49
O-Xylene	<0.49	<0.50	<0.51	<0.50
Vinyl Chloride	<0.97	<0.99	<1.02	<0.99
Total	<67.1	<47.3	<47.2	<53.9

* At 25°C and 1 atmosphere

TABLE 90
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	<3.83	<3.91	<4.14	<3.96
Benzene	<2.44	<2.14	<4.69	<3.09
Bromodichloromethane	<0.38	<0.39	<0.41	<0.40
Bromoform	<0.38	<0.39	<0.41	<0.40
Bromomethane	<3.44	<3.51	<3.72	<3.56
1,3-Butadiene	<1.91	<1.95	<2.07	<1.98
2-Butanone	<0.67	<0.52	<0.89	<0.69
Carbon Tetrachloride	<0.38	<0.39	<0.41	<0.40
Chloroform	<0.38	<0.39	<0.41	<0.40
Cumene (Isopropylbenzene)	<0.77	<0.78	<0.83	<0.79
Dibromochloromethane	<0.38	<0.39	<0.41	<0.40
Dichlorodifluoromethane	<0.77	<0.78	<0.83	<0.79
1,2-Dichloroethane	<0.38	<0.39	<0.41	<0.40
trans,1,2-Dichloroethene	<0.38	<0.39	<0.41	<0.40
1,1-Dichloroethene	<0.38	<2.61	<0.41	<1.13
1,2-Dichloropropane	<0.38	<0.39	<0.41	<0.40
Ethylbenzene	<0.38	<0.39	<0.41	<0.40
Ethylene Dibromide	<0.77	<0.78	<0.83	<0.79
Mesitylene (1,3,5-Trimethylbenzene)	<0.77	<0.78	<0.83	<0.79
Methylene Chloride	<24.9	<6.27	<5.88	<12.4
Styrene	<0.77	<0.78	<0.83	<0.79
Tetrachloroethene	<0.39	<0.39	<0.41	<0.40
Toluene	<1.91	<1.95	<2.07	<1.98
1,1,1-Trichloroethane	<0.38	<1.18	<0.41	<0.66
Trichloroethene/1,1,2-Trichloroethene	<0.38	<0.39	<0.41	<0.40
Trichlorotrifluoroethane	<1.91	<1.95	<2.07	<1.98
Trichlorofluoromethane	<0.77	<0.78	<0.83	<0.79
M&P-Xylene	<1.15	<1.17	<1.24	<1.19
O-Xylene	<0.38	<0.39	<0.41	<0.40
Vinyl Chloride	<0.77	<0.78	<0.83	<0.79
Total	<52.9	<37.3	<38.4	<42.9

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 91
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Wet Reference Concentrations

Compound	Wet Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	<4.08	<4.16	<4.30	<4.18
Benzene	<2.61	<2.28	<4.88	<3.26
Bromodichloromethane	<0.41	<0.42	<0.43	<0.42
Bromoform	<0.41	<0.42	<0.43	<0.42
Bromomethane	<3.67	<3.75	<3.87	<3.76
1,3-Butadiene	<2.04	<2.08	<2.15	<2.09
2-Butanone	<0.71	<0.56	<0.92	<0.73
Carbon Tetrachloride	<0.41	<0.42	<0.43	<0.42
Chloroform	<0.41	<0.42	<0.43	<0.42
Cumene (Isopropylbenzene)	<0.82	<0.83	<0.86	<0.84
Dibromochloromethane	<0.41	<0.42	<0.43	<0.42
Dichlorodifluoromethane	<0.82	<0.83	<0.86	<0.84
1,2-Dichloroethane	<0.41	<0.42	<0.43	<0.42
trans,1,2-Dichloroethene	<0.41	<0.42	<0.43	<0.42
1,1-Dichloroethene	<0.41	<2.78	<0.43	<1.21
1,2-Dichloropropane	<0.41	<0.42	<0.43	<0.42
Ethylbenzene	<0.41	<0.42	<0.43	<0.42
Ethylene Dibromide	<0.82	<0.83	<0.86	<0.84
Mesitylene (1,3,5-Trimethylbenzene)	<0.82	<0.83	<0.86	<0.84
Methylene Chloride	<26.6	<6.68	<6.11	<13.1
Styrene	<0.82	<0.83	<0.86	<0.84
Tetrachloroethene	<0.41	<0.42	<0.43	<0.42
Toluene	<2.04	<2.08	<2.15	<2.09
1,1,1-Trichloroethane	<0.41	<1.25	<0.43	<0.70
Trichloroethene/1,1,2-Trichloroethene	<0.41	<0.42	<0.43	<0.42
Trichlorotrifluoroethane	<2.04	<2.08	<2.15	<2.09
Trichlorofluoromethane	<0.82	<0.83	<0.86	<0.84
M&P-Xylene	<1.22	<1.25	<1.29	<1.25
O-Xylene	<0.41	<0.42	<0.43	<0.42
Vinyl Chloride	<0.82	<0.83	<0.86	<0.84
Total	<56.4	<39.8	<39.8	<45.3

* At 25°C and 1 atmosphere

TABLE 92
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organic Emission Rates

Compound	Emission Rate			
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s
Acetone	<0.074	<0.076	<0.077	<0.076
Benzene	<0.047	<0.042	<0.088	<0.059
Bromodichloromethane	<0.0074	<0.0076	<0.0077	<0.0076
Bromoform	<0.0074	<0.0076	<0.0077	<0.0076
Bromomethane	<0.067	<0.068	<0.070	<0.068
1,3-Butadiene	<0.037	<0.038	<0.039	<0.038
2-Butanone	<0.013	<0.010	<0.017	<0.013
Carbon Tetrachloride	<0.0074	<0.0076	<0.0077	<0.0076
Chloroform	<0.0074	<0.0076	<0.0077	<0.0076
Cumene (Isopropylbenzene)	<0.015	<0.015	<0.015	<0.015
Dibromochloromethane	<0.0074	<0.0076	<0.0077	<0.0076
Dichlorodifluoromethane	<0.015	<0.015	<0.015	<0.015
1,2-Dichloroethane	<0.0074	<0.0076	<0.0077	<0.0076
trans,1,2-Dichloroethene	<0.0074	<0.0076	<0.0077	<0.0076
1,1-Dichloroethene	<0.0074	<0.051	<0.0077	<0.022
1,2-Dichloropropane	<0.0074	<0.0076	<0.0077	<0.0076
Ethylbenzene	<0.0074	<0.0076	<0.0077	<0.0076
Ethylene Dibromide	<0.015	<0.015	<0.015	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.015	<0.015	<0.015	<0.015
Methylene Chloride	<0.48	<0.12	<0.11	<0.24
Styrene	<0.015	<0.015	<0.015	<0.015
Tetrachloroethene	<0.0075	<0.0076	<0.0077	<0.0076
Toluene	<0.037	<0.038	<0.039	<0.038
1,1,1-Trichloroethane	<0.0074	<0.023	<0.0077	<0.013
Trichloroethene/1,1,2-Trichloroethene	<0.0074	<0.0076	<0.0077	<0.0076
Trichlorotrifluoroethane	<0.037	<0.038	<0.039	<0.038
Trichlorofluoromethane	<0.015	<0.015	<0.015	<0.015
M&P-Xylene	<0.022	<0.023	<0.023	<0.023
O-Xylene	<0.0074	<0.0076	<0.0077	<0.0076
Vinyl Chloride	<0.015	<0.015	<0.015	<0.015
Total	<1.03	<0.72	<0.72	<0.82

TABLE 93
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Summary of Volatile Organic Emission Data

Compound	Actual Concentration $\mu g/m^3$	Dry Reference Concentration $\mu g/Rm^3$*	Dry Adjusted Concentration $\mu g/Rm^3$*	Wet Reference Concentration $\mu g/Rm^3$*	Emission Rate mg/s
Acetone	<2.93	<4.96	<3.96	<4.18	<0.076
Benzene	<2.28	<3.86	<3.09	<3.26	<0.059
Bromodichloromethane	<0.29	<0.50	<0.40	<0.42	<0.0076
Bromoform	<0.29	<0.50	<0.40	<0.42	<0.0076
Bromomethane	<2.64	<4.47	<3.56	<3.76	<0.068
1,3-Butadiene	<1.47	<2.48	<1.98	<2.09	<0.038
2-Butanone	<0.51	<0.87	<0.69	<0.73	<0.013
Carbon Tetrachloride	<0.29	<0.50	<0.40	<0.42	<0.0076
Chloroform	<0.29	<0.50	<0.40	<0.42	<0.0076
Cumene (Isopropylbenzene)	<0.59	<0.99	<0.79	<0.84	<0.015
Dibromochloromethane	<0.29	<0.50	<0.40	<0.42	<0.0076
Dichlorodifluoromethane	<0.59	<0.99	<0.79	<0.84	<0.015
1,2-Dichloroethane	<0.29	<0.50	<0.40	<0.42	<0.0076
trans,1,2-Dichloroethene	<0.29	<0.50	<0.40	<0.42	<0.0076
1,1-Dichloroethene	<0.85	<1.43	<1.13	<1.21	<0.022
1,2-Dichloropropane	<0.29	<0.50	<0.40	<0.42	<0.0076
Ethylbenzene	<0.29	<0.50	<0.40	<0.42	<0.0076
Ethylene Dibromide	<0.59	<0.99	<0.79	<0.84	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.59	<0.99	<0.79	<0.84	<0.015
Methylene Chloride	<9.21	<15.6	<12.4	<13.1	<0.24
Styrene	<0.59	<0.99	<0.79	<0.84	<0.015
Tetrachloroethene	<0.29	<0.50	<0.40	<0.42	<0.0076
Toluene	<1.47	<2.48	<1.98	<2.09	<0.038
1,1,1-Trichloroethane	<0.49	<0.83	<0.66	<0.70	<0.013
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.50	<0.40	<0.42	<0.0076
Trichlorotrifluoroethane	<1.47	<2.48	<1.98	<2.09	<0.038
Trichlorofluoromethane	<0.59	<0.99	<0.79	<0.84	<0.015
M&P-Xylene	<0.88	<1.49	<1.19	<1.25	<0.023
O-Xylene	<0.29	<0.50	<0.40	<0.42	<0.0076
Vinyl Chloride	<0.59	<0.99	<0.79	<0.84	<0.015
Total	<31.8	<53.9	<42.9	<45.3	<0.82

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 94
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Blank Volatile Organic Analyses

Compound	Field Blank 1 Tube 15A/15B	Field Blank 2 Tube 30A/30B	Field Blank 3 Tube 13A/13B	Trip Blank Tube 14A/14B	Method Blank
	µg	µg	µg	µg	µg
Acetone	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	<0.05	<0.05	<0.05	<0.05	<0.05
Bromodichloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Bromoform	<0.01	<0.01	<0.01	<0.01	<0.01
Bromomethane	<0.09	<0.09	<0.09	<0.09	<0.09
1,3-Butadiene	<0.05	<0.05	<0.05	<0.05	<0.05
2-Butanone	0.038	<0.01	0.012	<0.01	<0.01
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.01	<0.01
Chloroform	<0.01	<0.01	<0.01	<0.01	<0.01
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02	<0.02
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Methylene Chloride	<0.1	<0.1	<0.1	<0.1	<0.1
Styrene	<0.02	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.02	<0.02
M&P-Xylene	<0.03	<0.03	<0.03	<0.03	<0.03
O-Xylene	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	<0.02	<0.02	<0.02	<0.02	<0.02
Total	<0.84	<0.81	<0.81	<0.81	<0.81

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

APPENDIX 2

Boiler No. 2 BH Outlet
Data Tables
(96 pages)

TABLE 1
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Isokinetic Sampling Train Test Schedules

Particulate and Metals Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 11, 2017	8:27	11:40	180
2	October 11, 2017	12:32	15:40	180
3	October 12, 2017	14:53	18:38	180

Particle Size Distribution Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 10, 2017	10:49	12:54	120
2	October 10, 2017	14:30	16:32	118.8
3	October 10, 2017	17:35	19:38	119

Acid Gases Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 11, 2017	8:30	9:30	60
2	October 11, 2017	10:26	11:26	60
3	October 11, 2017	12:34	13:34	60

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 12, 2017	9:18	13:39	240
2	October 12, 2017	14:52	19:10	240
3	October 13, 2017	8:36	13:02	240

* Actual sampling time excluding leak-checks, traverse changes and process down time.

TABLE 2
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Organic Compounds Test Schedules

Acrolein and Aldehydes Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	October 12, 2017	13:25	14:25	60
2	October 12, 2017	15:13	16:13	60
3	October 13, 2017	8:27	9:27	60

Volatile Organic Compounds Trains

Test Number	Tube Pair	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	1	October 12, 2017	9:18	9:38	20
	2	October 12, 2017	9:45	10:05	20
	3	October 12, 2017	10:12	10:32	20
	4	October 12, 2017	10:38	10:58	20
2	1	October 12, 2017	11:06	11:26	20
	2	October 12, 2017	11:31	11:51	20
	3	October 12, 2017	11:57	12:18	21
	4	October 12, 2017	12:24	12:44	20
3	1	October 13, 2017	10:24	10:44	20
	2	October 13, 2017	10:54	11:14	20
	3	October 13, 2017	11:21	11:41	20
	4	October 13, 2017	11:49	12:09	20

Total Hydrocarbons Trains

Test Number	Test Date	Sampling Period Start	Sampling Period Finish	Sampling Time min
1	October 11, 2017	12:54	13:54	60
2	October 11, 2017	14:01	15:01	60
3	October 11, 2017	15:10	16:10	60

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Stack Gas Sampling Parameters

Particulate and Metals Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.847	0.985	6.36	3.507	101.2
2	0.847	0.985	6.36	3.609	101.1
3	0.847	0.985	6.36	3.424	99.9

Particle Size Distribution Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.846	0.987	4.50	1.162	103.2
2	0.846	0.987	4.50	1.208	106.3
3	0.846	0.987	4.50	1.198	104.9

Acid Gases Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.847	0.987	6.44	1.266	101.9
2	0.847	0.987	6.44	1.273	101.2
3	0.847	0.987	6.44	1.259	101.6

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.847	0.987	6.44	5.021	100.2
2	0.847	0.987	6.44	4.974	100.8
3	0.847	0.987	6.44	4.977	101.1

* Dry at 25°C and 1 atmosphere

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Stack Gas Physical Parameters

Particulate and Metals Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	17.3	17.3	-2.27	99.2	11.2	7.83
2	142	16.8	17.7	-2.27	99.2	11.2	7.91
3	141	16.6	17.0	-2.29	99.3	11.2	7.94
Average	141	16.9	17.3	-2.27	99.2	11.2	7.89

Particle Size Distribution Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	16.8	16.8	-2.29	98.7	11.2	7.84
2	141	16.1	17.1	-2.29	98.7	10.8	8.26
3	140	15.5	17.0	-2.29	98.7	10.7	8.30
Average	141	16.1	17.0	-2.29	98.7	10.9	8.13

Acid Gases Trains **

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	141	16.7	18.0	-2.27	99.3	11.2	7.90
2	141	16.2	18.2	-2.27	99.2	11.3	7.78
3	140	15.7	17.7	-2.27	99.2	11.2	7.91
Average	140	16.2	18.0	-2.27	99.2	11.2	7.86

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	139	15.3	17.8	-2.34	99.4	11.1	8.05
2	141	16.1	17.8	-2.29	99.3	11.3	7.91
3	140	16.3	17.8	-2.28	99.1	11.3	7.85
Average	140	15.9	17.8	-2.30	99.3	11.2	7.94

* Dry basis, measured by the DYEC CEMS

** Sampling was conducted isokinetically at a single point in the duct.

TABLE 5
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Stack Gas Volumetric Flowrates

Particulate and Metals Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	25.5	14.9	19.7	18.0
2	26.2	15.4	20.1	18.4
3	25.0	14.8	19.3	17.7
Average	25.6	15.0	19.7	18.0

Particle Size Distribution Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	24.9	14.5	19.1	17.5
2	25.2	14.9	19.0	17.7
3	25.2	15.0	19.1	17.7
Average	25.1	14.8	19.1	17.6

Acid Gases Trains ***

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	26.7	15.7	20.6	18.8
2	26.8	15.8	21.0	18.9
3	26.2	15.6	20.5	18.5
Average	26.6	15.7	20.7	18.8

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	26.3	15.8	20.5	18.6
2	26.3	15.5	20.4	18.5
3	26.3	15.5	20.5	18.5
Average	26.3	15.6	20.4	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

*** Sampling was conducted isokinetically at a single point in the duct. Volumetric flowrates from the corresponding particulate and metals tests were used to calculate emission data.

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Particulate Emission Data

Test No.	Particulate Collected			Dry Gas Volume Sampled	Particulate Concentration				Particulate Emission Rate
	Probe Rinse	Main Filter	Total		Actual	Dry Reference	Dry Adjusted	Wet Reference	
	mg	mg	mg	Rm^3*	mg/m^3	mg/Rm^3*	mg/Rm^3**	mg/Rm^3*	mg/s
1	2.0	4.2	6.20	3.507	1.03	1.77	1.34	1.46	26.3
2	1.1	<0.1	<1.20	3.609	<0.20	<0.33	<0.25	<0.28	<5.10
3	1.6	<0.1	<1.70	3.424	<0.29	<0.50	<0.38	<0.41	<7.32
Average					<0.51	<0.87	<0.66	<0.72	<12.9
Blank	0.1	0.8							

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
$PM_{2.5}$ and PM_{10} Emission Data

$PM_{2.5}$

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	$PM_{2.5}$ Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.1	1.162	<0.050	<0.086	<0.065	<0.071	<1.25
2	0.5	1.208	0.24	0.41	0.32	0.35	6.17
3	<0.1	1.198	<0.050	<0.083	<0.066	<0.071	<1.25
Average			<0.11	<0.19	<0.15	<0.16	<2.89
Blank	<0.1						

PM_{10}

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	PM_{10} Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Emission Rate mg/s
1	<0.3	1.162	<0.15	<0.26	<0.20	<0.21	<3.74
2	0.8	1.208	0.39	0.66	0.52	0.56	9.87
3	<0.4	1.198	<0.20	<0.33	<0.26	<0.28	<5.01
Average			<0.25	<0.42	<0.33	<0.35	<6.21
Blank	<0.2						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data
The back-up filter was excluded from the calculations as the analytical results indicated that the filter lost weight in for all samples including the blank.

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Condensable Particulate Emission Data

Inorganic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Inorganic Condensable Particulate Concentration				Emission Rate mg/s
			Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	
1	4.1	1.162	2.05	3.53	2.67	2.92	51.2
2	3.8	1.208	1.86	3.15	2.46	2.65	46.9
3	2.5	1.198	1.24	2.09	1.64	1.77	31.3
Average			1.72	2.92	2.26	2.45	43.1
Blank	0.6						

Organic Condensable Particulate

Test No.	Total Collected mg	Dry Volume Sampled Rm^3*	Organic Condensable Particulate Concentration				Emission Rate mg/s
			Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	
1	2.2	1.162	1.10	1.89	1.44	1.57	27.5
2	2.3	1.208	1.13	1.90	1.49	1.60	28.4
3	2.8	1.198	1.39	2.34	1.84	1.98	35.1
Average			1.21	2.04	1.59	1.72	30.3
Blank	1.4						

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Halides and Ammonia Emission Data

Hydrogen Chloride

Test No.	HCl Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Chloride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HCl Emission Rate mg/s
1	6.16	1.266	2.84	4.87	3.68	4.03	72.5
2	5.87	1.273	2.69	4.61	3.49	3.82	68.7
3	5.82	1.259	2.72	4.62	3.54	3.87	71.2
Average			2.75	4.70	3.57	3.90	70.8
Blank	<0.197						

Hydrogen Fluoride

Test No.	HF Collected mg	Dry Volume Sampled Rm^3*	Hydrogen Fluoride Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	HF Emission Rate mg/s
1	<0.175	1.266	<0.081	<0.14	<0.10	<0.11	<2.06
2	<0.179	1.273	<0.082	<0.14	<0.11	<0.12	<2.10
3	<0.174	1.259	<0.081	<0.14	<0.11	<0.12	<2.13
Average			<0.081	<0.14	<0.11	<0.12	<2.09
Blank	<0.112						

Ammonia

Test No.	Ammonia Collected mg	Dry Volume Sampled Rm^3*	Ammonia Concentration Actual mg/m^3	Dry Reference mg/Rm^3*	Dry Adjusted mg/Rm^3**	Wet Reference mg/Rm^3*	Ammonia Emission Rate mg/s
1	0.469	1.266	0.22	0.37	0.28	0.31	5.52
2	0.572	1.273	0.26	0.45	0.34	0.37	6.70
3	0.500	1.259	0.23	0.40	0.30	0.33	6.12
Average			0.24	0.41	0.31	0.34	6.11
Blank	<0.283						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 10
Covanta - Durham York Energy Centre
Boiler No. 2
Combustion Gas Analyses

Data measured by the DYEC CEMS from October 10 to October 13, 2017

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.32	8.13	8.70
BH Outlet	Carbon Dioxide (kg/Rm^3, 1 hr Avg) *	0.19	0.20	0.21
BH Outlet	Carbon Monoxide (mg/Rm^3, 1 hr Avg) *	6	12	25
BH Outlet	Carbon Monoxide (mg/Rm^3, 4 hr Avg) *	7.5	12.2	19.0
BH Outlet	Sulphur Dioxide (mg/Rm^3, 1 hr Avg) *	0	1	25
BH Outlet	Sulphur Dioxide (mg/Rm^3, 24 hr Avg) *	0	1.7	3.8
BH Outlet	Nitrogen Oxides (mg/Rm^3, 1 hr Avg) *	98	111	127
BH Outlet	Nitrogen Oxides (mg/Rm^3, 24 hr Avg) *	111	111	112
BH Outlet	Hydrogen Chloride (mg/Rm^3, 1 hr Avg) *	4	5	7
BH Outlet	Hydrogen Chloride (mg/Rm^3, 24 hr Avg) *	4.6	5.1	5.5
BH Outlet	Total Hydrocarbons (mg/Rm^3, 1 hr Avg) *	0	0	0
Quench Inlet	Oxygen (%, 1 hr Avg)	7	8	8

Data measured by the ORTECH CEMS on October 11, 2017

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.8	1.8
BH Outlet	2	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.7	1.5
BH Outlet	3	Total Hydrocarbons (ppm dry, 1-min Avg)	0	0.5	1.8
Average		Total Hydrocarbons (ppm dry, 1-min Avg)		0.7	

* Reference conditions, dry basis adjusted to 11% oxygen

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Analyses Test No. 1

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.46	<0.1	0.46
Arsenic	<1	<0.2	<0.20
Barium	11.2	1.40	12.6
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.23	<0.05	0.23
Chromium	4.49	0.67	5.16
Cobalt	0.54	<0.1	0.54
Copper	9.22	3.57	12.8
Lead	2.12	0.72	2.84
Manganese	4.58	1.39	5.97
Mercury *	<0.015	0.90	0.90
Molybdenum	20.9	<0.1	20.9
Nickel	5.57	1.13	6.70
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	15.1	25.5	40.6
Total			<112

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Analyses Test No. 2

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	0.31	<0.1	0.31
Arsenic	<1	<0.2	<0.20
Barium	<5	1.51	1.51
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	4.20	0.65	4.85
Cobalt	<0.2	0.35	0.35
Copper	7.65	1.27	8.92
Lead	2.20	0.59	2.79
Manganese	1.80	0.74	2.54
Mercury *	<0.015	0.90	0.90
Molybdenum	22.8	<0.1	22.8
Nickel	3.09	0.68	3.77
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	7.43	5.90	13.3
Total			<64.1

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Analyses Test No. 3

Metal	Probe & Filter Hydrofluoric Acid Digest	Impingers & Rinses	Total Collected
	µg	µg	µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	<5	1.07	1.07
Beryllium	<0.2	<0.1	<0.20
Cadmium	0.11	<0.05	0.11
Chromium	2.05	0.24	2.29
Cobalt	<0.2	<0.1	<0.20
Copper	1.85	0.95	2.80
Lead	0.61	0.39	1.00
Manganese	0.67	1.00	1.66
Mercury *	<0.015	0.69	0.69
Molybdenum	22.8	<0.1	22.8
Nickel	1.73	0.43	2.16
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	<6	4.94	4.94
Total			<41.8

* Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected. Where all values were reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate emission data, the remaining fractions were assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate emission data.

TABLE 14
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Emission Data Test No. 1

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.46	0.076	0.13	0.099	0.11	0.0019
Arsenic	<0.20	<0.033	<0.057	<0.043	<0.047	<0.00085
Barium	12.6	2.10	3.59	2.72	2.97	0.054
Beryllium	<0.20	<0.033	<0.057	<0.043	<0.047	<0.00085
Cadmium	0.23	0.038	0.065	0.049	0.054	0.00096
Chromium	5.16	0.86	1.47	1.11	1.22	0.022
Cobalt	0.54	0.089	0.15	0.12	0.13	0.0023
Copper	12.8	2.13	3.65	2.76	3.02	0.054
Lead	2.84	0.47	0.81	0.61	0.67	0.012
Manganese	5.97	0.99	1.70	1.29	1.41	0.025
Mercury	0.90	0.15	0.26	0.19	0.21	0.0038
Molybdenum	20.9	3.48	5.96	4.51	4.93	0.089
Nickel	6.70	1.12	1.91	1.44	1.58	0.028
Selenium	<1.00	<0.17	<0.29	<0.22	<0.24	<0.0042
Silver	<0.20	<0.033	<0.057	<0.043	<0.047	<0.00085
Thallium	<0.20	<0.033	<0.057	<0.043	<0.047	<0.00085
Vanadium	<0.10	<0.017	<0.029	<0.022	<0.024	<0.00042
Zinc	40.6	6.76	11.6	8.76	9.58	0.17
Total	<112	<18.6	<31.8	<24.1	<26.3	<0.47

Dry Gas Volume Sampled (Rm³*) :	3.507
Actual Flowrate (m³/s) :	25.5
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.7
Wet Reference Flowrate (Rm³/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 15
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Emission Data Test No. 2

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	0.31	0.051	0.087	0.066	0.073	0.0013
Arsenic	<0.20	<0.033	<0.055	<0.042	<0.046	<0.00085
Barium	1.51	0.25	0.42	0.32	0.35	0.0064
Beryllium	<0.20	<0.033	<0.055	<0.042	<0.046	<0.00085
Cadmium	<0.10	<0.016	<0.028	<0.021	<0.023	<0.00043
Chromium	4.85	0.79	1.34	1.03	1.12	0.021
Cobalt	0.35	0.057	0.096	0.074	0.080	0.0015
Copper	8.92	1.45	2.47	1.89	2.07	0.038
Lead	2.79	0.45	0.77	0.59	0.65	0.012
Manganese	2.54	0.41	0.70	0.54	0.59	0.011
Mercury	0.90	0.15	0.25	0.19	0.21	0.0038
Molybdenum	22.8	3.71	6.32	4.84	5.29	0.097
Nickel	3.77	0.61	1.04	0.80	0.87	0.016
Selenium	<1.00	<0.16	<0.28	<0.21	<0.23	<0.0043
Silver	<0.20	<0.033	<0.055	<0.042	<0.046	<0.00085
Thallium	<0.20	<0.033	<0.055	<0.042	<0.046	<0.00085
Vanadium	<0.10	<0.016	<0.028	<0.021	<0.023	<0.00043
Zinc	13.3	2.17	3.69	2.83	3.09	0.057
Total	<64.1	<10.4	<17.7	<13.6	<14.9	<0.27

Dry Gas Volume Sampled (Rm^3*) :	3.609
Actual Flowrate (m^3/s) :	26.2
Dry Reference Flowrate (Rm^3/s*) :	15.4
Dry Adjusted Flowrate (Rm^3/s**) :	20.1
Wet Reference Flowrate (Rm^3/s*) :	18.4

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 16
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Metals Emission Data Test No. 3

Metal	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.20	<0.035	<0.058	<0.045	<0.049	<0.00086
Arsenic	<0.20	<0.035	<0.058	<0.045	<0.049	<0.00086
Barium	1.07	0.19	0.31	0.24	0.26	0.0046
Beryllium	<0.20	<0.035	<0.058	<0.045	<0.049	<0.00086
Cadmium	0.11	0.019	0.032	0.024	0.026	0.00047
Chromium	2.29	0.40	0.67	0.51	0.56	0.0099
Cobalt	<0.20	<0.035	<0.058	<0.045	<0.049	<0.00086
Copper	2.80	0.48	0.82	0.63	0.68	0.012
Lead	1.00	0.17	0.29	0.22	0.24	0.0043
Manganese	1.66	0.29	0.48	0.37	0.41	0.0072
Mercury	0.69	0.12	0.20	0.15	0.17	0.0030
Molybdenum	22.8	3.94	6.66	5.11	5.57	0.099
Nickel	2.16	0.37	0.63	0.48	0.53	0.0093
Selenium	<1.00	<0.17	<0.29	<0.22	<0.24	<0.0043
Silver	<0.20	<0.035	<0.058	<0.045	<0.049	<0.00086
Thallium	<0.20	<0.035	<0.058	<0.045	<0.049	<0.00086
Vanadium	<0.10	<0.017	<0.029	<0.022	<0.024	<0.00043
Zinc	4.94	0.85	1.44	1.11	1.21	0.021
Total	<41.8	<7.23	<12.2	<9.37	<10.2	<0.18

Dry Gas Volume Sampled (Rm^3*) :	3.424
Actual Flowrate (m^3/s) :	25.0
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.3
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 17
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Actual Concentrations

Metal	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/m³	µg/m³	µg/m³	µg/m³	%
Antimony	0.076	0.051	<0.035	<0.054	39.0
Arsenic	<0.033	<0.033	<0.035	<0.033	3.0
Barium	2.10	0.25	0.19	0.84	129
Beryllium	<0.033	<0.033	<0.035	<0.033	3.0
Cadmium	0.038	<0.016	0.019	<0.024	48.7
Chromium	0.86	0.79	0.40	0.68	36.6
Cobalt	0.089	0.057	<0.035	<0.060	45.8
Copper	2.13	1.45	0.48	1.36	61.0
Lead	0.47	0.45	0.17	0.37	45.7
Manganese	0.99	0.41	0.29	0.57	66.8
Mercury	0.15	0.15	0.12	0.14	12.0
Molybdenum	3.48	3.71	3.94	3.71	6.2
Nickel	1.12	0.61	0.37	0.70	54.1
Selenium	<0.17	<0.16	<0.17	<0.17	3.0
Silver	<0.033	<0.033	<0.035	<0.033	3.0
Thallium	<0.033	<0.033	<0.035	<0.033	3.0
Vanadium	<0.017	<0.016	<0.017	<0.017	3.0
Zinc	6.76	2.17	0.85	3.26	95.1
Total	<18.6	<10.4	<7.23	<12.1	48.5

TABLE 18
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Dry Reference Concentrations

Metal	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.13	0.087	<0.058	<0.092	39.6
Arsenic	<0.057	<0.055	<0.058	<0.057	2.6
Barium	3.59	0.42	0.31	1.44	129
Beryllium	<0.057	<0.055	<0.058	<0.057	2.6
Cadmium	0.065	<0.028	0.032	<0.041	49.3
Chromium	1.47	1.34	0.67	1.16	37.1
Cobalt	0.15	0.096	<0.058	<0.10	46.4
Copper	3.65	2.47	0.82	2.31	61.4
Lead	0.81	0.77	0.29	0.62	46.1
Manganese	1.70	0.70	0.48	0.96	67.4
Mercury	0.26	0.25	0.20	0.24	12.6
Molybdenum	5.96	6.32	6.66	6.31	5.5
Nickel	1.91	1.04	0.63	1.19	54.7
Selenium	<0.29	<0.28	<0.29	<0.28	2.6
Silver	<0.057	<0.055	<0.058	<0.057	2.6
Thallium	<0.057	<0.055	<0.058	<0.057	2.6
Vanadium	<0.029	<0.028	<0.029	<0.028	2.6
Zinc	11.6	3.69	1.44	5.57	95.5
Total	<31.8	<17.7	<12.2	<20.6	49.1

* At 25°C and 1 atmosphere

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Dry Adjusted Concentrations

Metal	Dry Adjusted Concentration				Coefficient
	Test No. 1 µg/Rm³**	Test No. 2 µg/Rm³**	Test No. 3 µg/Rm³**	Average µg/Rm³**	of Variation %
Antimony	0.099	0.066	<0.045	<0.070	38.8
Arsenic	<0.043	<0.042	<0.045	<0.043	2.8
Barium	2.72	0.32	0.24	1.09	129
Beryllium	<0.043	<0.042	<0.045	<0.043	2.8
Cadmium	0.049	<0.021	0.024	<0.031	48.4
Chromium	1.11	1.03	0.51	0.88	36.7
Cobalt	0.12	0.074	<0.045	<0.078	45.6
Copper	2.76	1.89	0.63	1.76	60.9
Lead	0.61	0.59	0.22	0.48	45.8
Manganese	1.29	0.54	0.37	0.73	66.6
Mercury	0.19	0.19	0.15	0.18	12.1
Molybdenum	4.51	4.84	5.11	4.82	6.2
Nickel	1.44	0.80	0.48	0.91	53.9
Selenium	<0.22	<0.21	<0.22	<0.22	2.8
Silver	<0.043	<0.042	<0.045	<0.043	2.8
Thallium	<0.043	<0.042	<0.045	<0.043	2.8
Vanadium	<0.022	<0.021	<0.022	<0.022	2.8
Zinc	8.76	2.83	1.11	4.23	94.8
Total	<24.1	<13.6	<9.37	<15.7	48.3

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Wet Reference Concentrations

Metal	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	µg/Rm³*	µg/Rm³*	µg/Rm³*	µg/Rm³*	%
Antimony	0.11	0.073	<0.049	<0.077	39.0
Arsenic	<0.047	<0.046	<0.049	<0.047	2.6
Barium	2.97	0.35	0.26	1.20	129
Beryllium	<0.047	<0.046	<0.049	<0.047	2.6
Cadmium	0.054	<0.023	0.026	<0.034	48.6
Chromium	1.22	1.12	0.56	0.97	36.8
Cobalt	0.13	0.080	<0.049	<0.085	45.8
Copper	3.02	2.07	0.68	1.92	61.0
Lead	0.67	0.65	0.24	0.52	45.9
Manganese	1.41	0.59	0.41	0.80	66.7
Mercury	0.21	0.21	0.17	0.20	12.3
Molybdenum	4.93	5.29	5.57	5.26	6.0
Nickel	1.58	0.87	0.53	0.99	54.1
Selenium	<0.24	<0.23	<0.24	<0.24	2.6
Silver	<0.047	<0.046	<0.049	<0.047	2.6
Thallium	<0.047	<0.046	<0.049	<0.047	2.6
Vanadium	<0.024	<0.023	<0.024	<0.024	2.6
Zinc	9.58	3.09	1.21	4.63	95.0
Total	<26.3	<14.9	<10.2	<17.1	48.4

* At 25°C and 1 atmosphere

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Emission Rates

Metal	Emission Rate				Coefficient
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s	of Variation %
Antimony	0.0019	0.0013	<0.00086	<0.0014	39.2
Arsenic	<0.00085	<0.00085	<0.00086	<0.00086	0.9
Barium	0.054	0.0064	0.0046	0.022	129
Beryllium	<0.00085	<0.00085	<0.00086	<0.00086	0.9
Cadmium	0.00096	<0.00043	0.00047	<0.00062	48.4
Chromium	0.022	0.021	0.0099	0.018	37.7
Cobalt	0.0023	0.0015	<0.00086	<0.0015	46.0
Copper	0.054	0.038	0.012	0.035	61.1
Lead	0.012	0.012	0.0043	0.0094	46.8
Manganese	0.025	0.011	0.0072	0.014	66.6
Mercury	0.0038	0.0038	0.0030	0.0036	13.7
Molybdenum	0.089	0.097	0.099	0.095	5.6
Nickel	0.028	0.016	0.0093	0.018	54.0
Selenium	<0.0042	<0.0043	<0.0043	<0.0043	0.9
Silver	<0.00085	<0.00085	<0.00086	<0.00086	0.9
Thallium	<0.00085	<0.00085	<0.00086	<0.00086	0.9
Vanadium	<0.00042	<0.00043	<0.00043	<0.00043	0.9
Zinc	0.17	0.057	0.021	0.084	94.6
Total	<0.47	<0.27	<0.18	<0.31	48.5

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Metal Emission Data

Metal	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	µg/m³	µg/Rm³*	µg/Rm³**	µg/Rm³*	mg/s
Antimony	<0.054	<0.092	<0.070	<0.077	<0.0014
Arsenic	<0.033	<0.057	<0.043	<0.047	<0.00086
Barium	0.84	1.44	1.09	1.20	0.022
Beryllium	<0.033	<0.057	<0.043	<0.047	<0.00086
Cadmium	<0.024	<0.041	<0.031	<0.034	<0.00062
Chromium	0.68	1.16	0.88	0.97	0.018
Cobalt	<0.060	<0.10	<0.078	<0.085	<0.0015
Copper	1.36	2.31	1.76	1.92	0.035
Lead	0.37	0.62	0.48	0.52	0.0094
Manganese	0.57	0.96	0.73	0.80	0.014
Mercury	0.14	0.24	0.18	0.20	0.0036
Molybdenum	3.71	6.31	4.82	5.26	0.095
Nickel	0.70	1.19	0.91	0.99	0.018
Selenium	<0.17	<0.28	<0.22	<0.24	<0.0043
Silver	<0.033	<0.057	<0.043	<0.047	<0.00086
Thallium	<0.033	<0.057	<0.043	<0.047	<0.00086
Vanadium	<0.017	<0.028	<0.022	<0.024	<0.00043
Zinc	3.26	5.57	4.23	4.63	0.084
Total	<12.1	<20.6	<15.7	<17.1	<0.31

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 23
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Train Metal Analyses

Metal	Probe & Filter Hydrofluoric Acid Digest µg	Impingers & Rinses µg	Total Collected µg
Antimony	<0.2	<0.1	<0.20
Arsenic	<1	<0.2	<0.20
Barium	<5	0.87	0.87
Beryllium	<0.2	<0.1	<0.20
Cadmium	<0.1	<0.05	<0.10
Chromium	<1	<0.15	<1.00
Cobalt	<0.2	<0.1	<0.20
Copper	<1	2.16	2.16
Lead	<0.5	0.28	0.28
Manganese	0.56	0.22	0.78
Mercury *	<0.015	0.25	0.25
Molybdenum	23.5	<0.1	23.5
Nickel	0.92	0.68	1.61
Selenium	<2	<1	<1.00
Silver	<0.2	<0.1	<0.20
Thallium	<0.2	<0.05	<0.20
Vanadium	<1	<0.1	<0.10
Zinc	<6	<3	<6.00
Total			<38.8

* Includes the permanganate impingers.

Note: "<" indicates that the analyte was not detected. Where all values are reported below the detection limit for a given metal, the value of the detection limit for the fraction most likely to contain that metal was used to calculate the total collected in the blank, the remaining fractions are assigned a value of zero. In instances where only one fraction was below the detection limit, that fraction was assigned a value of zero to calculate the total collected in the blank.

TABLE 24
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 1

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	146	0.017	0.029	0.022	0.025	0.46
Pentachlorodibenzo-p-dioxins	435	0.052	0.087	0.067	0.074	1.37
Hexachlorodibenzo-p-dioxins	1920	0.23	0.38	0.29	0.32	6.04
Heptachlorodibenzo-p-dioxins	3250	0.39	0.65	0.50	0.55	10.2
Octachlorodibenzo-p-dioxin	3880	0.46	0.77	0.60	0.66	12.2
Total	9631	1.15	1.92	1.48	1.63	30.3

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	189	0.023	0.038	0.029	0.032	0.59
Pentachlorodibenzofurans	140	0.017	0.028	0.021	0.024	0.44
Hexachlorodibenzofurans	317	0.038	0.063	0.049	0.054	1.00
Heptachlorodibenzofurans	329	0.039	0.066	0.051	0.056	1.04
Octachlorodibenzofuran	269	0.032	0.054	0.041	0.046	0.85
Total	1244	0.15	0.25	0.19	0.21	3.91

Dry Gas Volume Sampled (Rm^3*) :	5.021
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 25
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 2

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	205	0.024	0.041	0.031	0.035	0.64
Pentachlorodibenzo-p-dioxins	254	0.030	0.051	0.039	0.043	0.79
Hexachlorodibenzo-p-dioxins	1630	0.19	0.33	0.25	0.27	5.08
Heptachlorodibenzo-p-dioxins	3160	0.37	0.64	0.48	0.53	9.85
Octachlorodibenzo-p-dioxin	3790	0.45	0.76	0.58	0.64	11.8
Total	9039	1.07	1.82	1.38	1.52	28.2

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	19.7	0.0023	0.0040	0.0030	0.0033	0.061
Pentachlorodibenzofurans	17.0	0.0020	0.0034	0.0026	0.0029	0.053
Hexachlorodibenzofurans	236	0.028	0.047	0.036	0.040	0.74
Heptachlorodibenzofurans	301	0.036	0.061	0.046	0.051	0.94
Octachlorodibenzofuran	273	0.032	0.055	0.042	0.046	0.85
Total	847	0.10	0.17	0.13	0.14	2.64

Dry Gas Volume Sampled (Rm^3*) :	4.974
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.4
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 26
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	137	0.016	0.028	0.021	0.023	0.43
Pentachlorodibenzo-p-dioxins	410	0.049	0.082	0.062	0.069	1.28
Hexachlorodibenzo-p-dioxins	1860	0.22	0.37	0.28	0.31	5.79
Heptachlorodibenzo-p-dioxins	3400	0.40	0.68	0.52	0.57	10.6
Octachlorodibenzo-p-dioxin	4230	0.50	0.85	0.64	0.71	13.2
Total	10037	1.19	2.02	1.52	1.69	31.3

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	43.6	0.0052	0.0088	0.0066	0.0073	0.14
Pentachlorodibenzofurans	45.1	0.0053	0.0091	0.0069	0.0076	0.14
Hexachlorodibenzofurans	250	0.030	0.050	0.038	0.042	0.78
Heptachlorodibenzofurans	372	0.044	0.075	0.057	0.063	1.16
Octachlorodibenzofuran	286	0.034	0.057	0.043	0.048	0.89
Total	997	0.12	0.20	0.15	0.17	3.10

Dry Gas Volume Sampled (Rm^3*) :	4.977
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.017	0.024	0.016	0.019	22.5
Pentachlorodibenzo-p-dioxins	0.052	0.030	0.049	0.044	27.1
Hexachlorodibenzo-p-dioxins	0.23	0.19	0.22	0.21	8.9
Heptachlorodibenzo-p-dioxins	0.39	0.37	0.40	0.39	3.6
Octachlorodibenzo-p-dioxin	0.46	0.45	0.50	0.47	5.7
Total	1.15	1.07	1.19	1.14	5.3

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.023	0.0023	0.0052	0.010	109
Pentachlorodibenzofurans	0.017	0.0020	0.0053	0.0080	96.2
Hexachlorodibenzofurans	0.038	0.028	0.030	0.032	16.8
Heptachlorodibenzofurans	0.039	0.036	0.044	0.040	10.6
Octachlorodibenzofuran	0.032	0.032	0.034	0.033	2.8
Total	0.15	0.10	0.12	0.12	20.1

TABLE 28
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Dry Reference Concentrations

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.029	0.041	0.028	0.033	23.0
Pentachlorodibenzo-p-dioxins	0.087	0.051	0.082	0.073	26.5
Hexachlorodibenzo-p-dioxins	0.38	0.33	0.37	0.36	8.1
Heptachlorodibenzo-p-dioxins	0.65	0.64	0.68	0.66	3.8
Octachlorodibenzo-p-dioxin	0.77	0.76	0.85	0.79	6.0
Total	1.92	1.82	2.02	1.92	5.2

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.038	0.0040	0.0088	0.017	109
Pentachlorodibenzofurans	0.028	0.0034	0.0091	0.013	95.2
Hexachlorodibenzofurans	0.063	0.047	0.050	0.054	15.6
Heptachlorodibenzofurans	0.066	0.061	0.075	0.067	10.8
Octachlorodibenzofuran	0.054	0.055	0.057	0.055	3.6
Total	0.25	0.17	0.20	0.21	19.0

* At 25°C and 1 atmosphere

TABLE 29
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Dioxins

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.022	0.031	0.021	0.025	22.8
Pentachlorodibenzo-p-dioxins	0.067	0.039	0.062	0.056	26.9
Hexachlorodibenzo-p-dioxins	0.29	0.25	0.28	0.28	8.6
Heptachlorodibenzo-p-dioxins	0.50	0.48	0.52	0.50	3.4
Octachlorodibenzo-p-dioxin	0.60	0.58	0.64	0.61	5.5
Total	1.48	1.38	1.52	1.46	5.0

Furans

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	0.029	0.0030	0.0066	0.013	109
Pentachlorodibenzofurans	0.021	0.0026	0.0069	0.010	96.1
Hexachlorodibenzofurans	0.049	0.036	0.038	0.041	16.6
Heptachlorodibenzofurans	0.051	0.046	0.057	0.051	10.4
Octachlorodibenzofuran	0.041	0.042	0.043	0.042	2.7
Total	0.19	0.13	0.15	0.16	19.9

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 30
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Wet Reference Concentrations

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.025	0.035	0.023	0.027	22.6
Pentachlorodibenzo-p-dioxins	0.074	0.043	0.069	0.062	26.9
Hexachlorodibenzo-p-dioxins	0.32	0.27	0.31	0.30	8.6
Heptachlorodibenzo-p-dioxins	0.55	0.53	0.57	0.55	3.6
Octachlorodibenzo-p-dioxin	0.66	0.64	0.71	0.67	5.7
Total	1.63	1.52	1.69	1.61	5.2

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.032	0.0033	0.0073	0.014	109
Pentachlorodibenzofurans	0.024	0.0029	0.0076	0.011	95.9
Hexachlorodibenzofurans	0.054	0.040	0.042	0.045	16.5
Heptachlorodibenzofurans	0.056	0.051	0.063	0.056	10.6
Octachlorodibenzofuran	0.046	0.046	0.048	0.047	3.0
Total	0.21	0.14	0.17	0.17	19.8

* At 25°C and 1 atmosphere

TABLE 31
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Emission Rates

Dioxins

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	0.46	0.64	0.43	0.51	22.5
Pentachlorodibenzo-p-dioxins	1.37	0.79	1.28	1.15	27.1
Hexachlorodibenzo-p-dioxins	6.04	5.08	5.79	5.64	8.9
Heptachlorodibenzo-p-dioxins	10.2	9.85	10.6	10.2	3.6
Octachlorodibenzo-p-dioxin	12.2	11.8	13.2	12.4	5.7
Total	30.3	28.2	31.3	29.9	5.3

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	0.59	0.061	0.14	0.26	109
Pentachlorodibenzofurans	0.44	0.053	0.14	0.21	96.2
Hexachlorodibenzofurans	1.00	0.74	0.78	0.84	16.8
Heptachlorodibenzofurans	1.04	0.94	1.16	1.04	10.6
Octachlorodibenzofuran	0.85	0.85	0.89	0.86	2.8
Total	3.91	2.64	3.10	3.22	20.1

TABLE 32
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Congener Group Emission Data

Dioxins

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	0.019	0.033	0.025	0.027	0.51
Pentachlorodibenzo-p-dioxins	0.044	0.073	0.056	0.062	1.15
Hexachlorodibenzo-p-dioxins	0.21	0.36	0.28	0.30	5.64
Heptachlorodibenzo-p-dioxins	0.39	0.66	0.50	0.55	10.2
Octachlorodibenzo-p-dioxin	0.47	0.79	0.61	0.67	12.4
Total	1.14	1.92	1.46	1.61	29.9

Furans

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	0.010	0.017	0.013	0.014	0.26
Pentachlorodibenzofurans	0.0080	0.013	0.010	0.011	0.21
Hexachlorodibenzofurans	0.032	0.054	0.041	0.045	0.84
Heptachlorodibenzofurans	0.040	0.067	0.051	0.056	1.04
Octachlorodibenzofuran	0.033	0.055	0.042	0.047	0.86
Total	0.12	0.21	0.16	0.17	3.22

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 33
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Dioxin and Furan Congener Group Analyses

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<8.8	<7.5
Pentachlorodibenzo-p-dioxins	<4.1	<3.4
Hexachlorodibenzo-p-dioxins	<3.9	<2.9
Heptachlorodibenzo-p-dioxins	<4.3	<2.5
Octachlorodibenzo-p-dioxin	37.5	<4.8
Total	<58.6	<21.1

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<5.5	<4.8
Pentachlorodibenzofurans	<4.2	<4.2
Hexachlorodibenzofurans	<3.6	<2.5
Heptachlorodibenzofurans	4.47	<2.3
Octachlorodibenzofuran	<5.7	<4.4
Total	<23.5	<18.2

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 34
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<9.0	<1.08	<1.79	<1.38	<1.52	<0.028
12378-pentachlorodibenzo-p-dioxin	<7.8	<0.93	<1.55	<1.20	<1.32	<0.025
123478-hexachlorodibenzo-p-dioxin	<26	<3.11	<5.18	<3.99	<4.40	<0.082
123678-hexachlorodibenzo-p-dioxin	84.0	10.1	16.7	12.9	14.2	0.26
123789-hexachlorodibenzo-p-dioxin	40.4	4.83	8.05	6.20	6.83	0.13
1234678-heptachlorodibenzo-p-dioxin	1530	183	305	235	259	4.81
Octachlorodibenzo-p-dioxin	3880	464	773	596	656	12.2
2378-tetrachlorodibenzofuran	<6.6	<0.79	<1.31	<1.01	<1.12	<0.021
12378-pentachlorodibenzofuran	<7.3	<0.87	<1.45	<1.12	<1.24	<0.023
23478-pentachlorodibenzofuran	17.6	2.11	3.51	2.70	2.98	0.055
123478-hexachlorodibenzofuran	21.4	2.56	4.26	3.28	3.62	0.067
123678-hexachlorodibenzofuran	28.8	3.45	5.74	4.42	4.87	0.091
234678-hexachlorodibenzofuran	43.1	5.16	8.58	6.62	7.29	0.14
123789-hexachlorodibenzofuran	3.77	0.45	0.75	0.58	0.64	0.012
1234678-heptachlorodibenzofuran	218	26.1	43.4	33.5	36.9	0.69
1234789-heptachlorodibenzofuran	44.8	5.36	8.92	6.88	7.58	0.14
Octachlorodibenzofuran	269	32.2	53.6	41.3	45.5	0.85
PCB 81	10.3	1.23	2.05	1.58	1.74	0.032
PCB 77	57.9	6.93	11.5	8.89	9.80	0.18
PCB 123	<78	<9.33	<15.5	<12.0	<13.2	<0.25
PCB 118	700	83.8	139	107	118	2.20
PCB 114	33.9	4.06	6.75	5.20	5.74	0.11
PCB 105	244	29.2	48.6	37.5	41.3	0.77
PCB 126	<20	<2.39	<3.98	<3.07	<3.38	<0.063
PCB 167	<6.9	<0.83	<1.37	<1.06	<1.17	<0.022
PCB 156	25.9	3.10	5.16	3.98	4.38	0.082
PCB 157	<7.4	<0.89	<1.47	<1.14	<1.25	<0.023
PCB 169	<8.0	<0.96	<1.59	<1.23	<1.35	<0.025
PCB 189	11.4	1.36	2.27	1.75	1.93	0.036
Total Dioxins & Furans Only	<6238	<746	<1242	<957	<1055	<19.6
Total PCBs Only	<1204	<144	<240	<185	<204	<3.79
Total Dioxins & Furans and PCBs	<7441	<890	<1482	<1142	<1259	<23.4

Dry Gas Volume Sampled (Rm^3*) :	5.021
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 35
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<9.9	<1.17	<1.99	<1.51	<1.67	<0.031
12378-pentachlorodibenzo-p-dioxin	<6.3	<0.75	<1.27	<0.96	<1.06	<0.020
123478-hexachlorodibenzo-p-dioxin	37.3	4.42	7.50	5.70	6.28	0.12
123678-hexachlorodibenzo-p-dioxin	66.7	7.90	13.4	10.2	11.2	0.21
123789-hexachlorodibenzo-p-dioxin	<13	<1.5	<2.61	<1.99	<2.19	<0.041
1234678-heptachlorodibenzo-p-dioxin	1450	172	292	221	244	4.52
Octachlorodibenzo-p-dioxin	3790	449	762	579	638	11.8
2378-tetrachlorodibenzofuran	<5.0	<0.59	<1.01	<0.76	<0.84	<0.016
12378-pentachlorodibenzofuran	<4.6	<0.55	<0.92	<0.70	<0.77	<0.014
23478-pentachlorodibenzofuran	<9.3	<1.10	<1.87	<1.42	<1.57	<0.029
123478-hexachlorodibenzofuran	31.3	3.71	6.29	4.78	5.27	0.098
123678-hexachlorodibenzofuran	29.3	3.47	5.89	4.48	4.94	0.091
234678-hexachlorodibenzofuran	<36	<4.27	<7.24	<5.50	<6.06	<0.11
123789-hexachlorodibenzofuran	<2.3	<0.27	<0.46	<0.35	<0.39	<0.0072
1234678-heptachlorodibenzofuran	249	29.5	50.1	38.0	41.9	0.78
1234789-heptachlorodibenzofuran	51.7	6.13	10.4	7.90	8.71	0.16
Octachlorodibenzofuran	273	32.3	54.9	41.7	46.0	0.85
PCB 81	<11	<1.30	<2.21	<1.68	<1.85	<0.034
PCB 77	<72	<8.53	<14.5	<11.0	<12.1	<0.22
PCB 123	<210	<24.9	<42.2	<32.1	<35.4	<0.65
PCB 118	1580	187	318	241	266	4.92
PCB 114	56.6	6.71	11.4	8.65	9.53	0.18
PCB 105	481	57.0	96.7	73.5	81.0	1.50
PCB 126	<27	<3.20	<5.43	<4.12	<4.55	<0.084
PCB 167	<9.0	<1.07	<1.81	<1.37	<1.52	<0.028
PCB 156	<46	<5.45	<9.25	<7.03	<7.75	<0.14
PCB 157	<13	<1.54	<2.61	<1.99	<2.19	<0.041
PCB 169	<6.1	<0.72	<1.23	<0.93	<1.03	<0.019
PCB 189	8.46	1.00	1.70	1.29	1.43	0.026
Total Dioxins & Furans Only	<6065	<719	<1219	<926	<1022	<18.9
Total PCBs Only	<2520	<299	<507	<385	<425	<7.85
Total Dioxins & Furans and PCBs	<8585	<1017	<1726	<1311	<1446	<26.8

Dry Gas Volume Sampled (Rm^3*) :	4.974
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.4
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 36
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<8.5	<1.01	<1.71	<1.29	<1.43	<0.026
12378-pentachlorodibenzo-p-dioxin	7.04	0.83	1.41	1.07	1.19	0.022
123478-hexachlorodibenzo-p-dioxin	41.6	4.93	8.36	6.32	7.00	0.13
123678-hexachlorodibenzo-p-dioxin	<90	<10.7	<18.1	<13.7	<15.2	<0.28
123789-hexachlorodibenzo-p-dioxin	51.7	6.12	10.4	7.85	8.70	0.16
1234678-heptachlorodibenzo-p-dioxin	1590	188	319	242	268	4.95
Octachlorodibenzo-p-dioxin	4230	501	850	643	712	13.2
2378-tetrachlorodibenzofuran	<2.4	<0.28	<0.48	<0.36	<0.40	<0.0075
12378-pentachlorodibenzofuran	<7.1	<0.84	<1.43	<1.08	<1.20	<0.022
23478-pentachlorodibenzofuran	10.7	1.27	2.15	1.63	1.80	0.033
123478-hexachlorodibenzofuran	17.6	2.08	3.54	2.67	2.96	0.055
123678-hexachlorodibenzofuran	23.6	2.79	4.74	3.59	3.97	0.073
234678-hexachlorodibenzofuran	33.1	3.92	6.65	5.03	5.57	0.10
123789-hexachlorodibenzofuran	<2.8	<0.33	<0.56	<0.43	<0.47	<0.0087
1234678-heptachlorodibenzofuran	234	27.7	47.0	35.5	39.4	0.73
1234789-heptachlorodibenzofuran	51.7	6.12	10.4	7.85	8.70	0.16
Octachlorodibenzofuran	286	33.9	57.5	43.4	48.1	0.89
PCB 81	<21	<2.49	<4.22	<3.19	<3.54	<0.065
PCB 77	55.0	6.51	11.1	8.36	9.26	0.17
PCB 123	<150	<17.8	<30.1	<22.8	<25.3	<0.47
PCB 118	1070	127	215	163	180	3.33
PCB 114	<46	<5.45	<9.24	<6.99	<7.74	<0.14
PCB 105	409	48.4	82.2	62.1	68.9	1.27
PCB 126	<13	<1.54	<2.61	<1.97	<2.19	<0.040
PCB 167	<9.3	<1.10	<1.87	<1.41	<1.57	<0.029
PCB 156	42.0	4.97	8.44	6.38	7.07	0.13
PCB 157	<12	<1.42	<2.41	<1.82	<2.02	<0.037
PCB 169	<6.1	<0.72	<1.23	<0.93	<1.03	<0.019
PCB 189	<5.2	<0.62	<1.04	<0.79	<0.88	<0.016
Total Dioxins & Furans Only	<6688	<792	<1344	<1016	<1126	<20.8
Total PCBs Only	<1839	<218	<369	<279	<310	<5.73
Total Dioxins & Furans and PCBs	<8526	<1010	<1713	<1295	<1435	<26.6

Dry Gas Volume Sampled (Rm^3*) :	4.977
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 37
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<1.08	<1.17	<1.01	<1.09	7.7
12378-pentachlorodibenzo-p-dioxin	<0.93	<0.75	0.83	<0.84	11.2
123478-hexachlorodibenzo-p-dioxin	<3.11	4.42	4.93	<4.15	22.6
123678-hexachlorodibenzo-p-dioxin	10.1	7.90	<10.7	<9.54	15.2
123789-hexachlorodibenzo-p-dioxin	4.83	<1.5	6.12	<4.17	56.7
1234678-heptachlorodibenzo-p-dioxin	183	172	188	181	4.7
Octachlorodibenzo-p-dioxin	464	449	501	471	5.7
2378-tetrachlorodibenzofuran	<0.79	<0.59	<0.28	<0.56	45.9
12378-pentachlorodibenzofuran	<0.87	<0.55	<0.84	<0.75	24.0
23478-pentachlorodibenzofuran	2.11	<1.10	1.27	<1.49	36.1
123478-hexachlorodibenzofuran	2.56	3.71	2.08	2.78	30.0
123678-hexachlorodibenzofuran	3.45	3.47	2.79	3.24	11.9
234678-hexachlorodibenzofuran	5.16	<4.27	3.92	<4.45	14.4
123789-hexachlorodibenzofuran	0.45	<0.27	<0.33	<0.35	25.9
1234678-heptachlorodibenzofuran	26.1	29.5	27.7	27.8	6.2
1234789-heptachlorodibenzofuran	5.36	6.13	6.12	5.87	7.5
Octachlorodibenzofuran	32.2	32.3	33.9	32.8	2.8
PCB 81	1.23	<1.30	<2.49	<1.67	42.1
PCB 77	6.93	<8.53	6.51	<7.32	14.6
PCB 123	<9.33	<24.9	<17.8	<17.3	44.9
PCB 118	83.8	187	127	133	39.2
PCB 114	4.06	6.71	<5.45	<5.40	24.5
PCB 105	29.2	57.0	48.4	44.9	31.7
PCB 126	<2.39	<3.20	<1.54	<2.38	34.9
PCB 167	<0.83	<1.07	<1.10	<1.00	15.0
PCB 156	3.10	<5.45	4.97	<4.51	27.6
PCB 157	<0.89	<1.54	<1.42	<1.28	27.2
PCB 169	<0.96	<0.72	<0.72	<0.80	16.9
PCB 189	1.36	1.00	<0.62	<0.99	37.6
Total Dioxins & Furans Only	<746	<719	<792	<752	4.9
Total PCBs Only	<144	<299	<218	<220	35.1
Total Dioxins & Furans and PCBs	<890	<1017	<1010	<972	7.3

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 38
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.79	<1.99	<1.71	<1.83	7.9
12378-pentachlorodibenzo-p-dioxin	<1.55	<1.27	1.41	<1.41	10.2
123478-hexachlorodibenzo-p-dioxin	<5.18	7.50	8.36	<7.01	23.5
123678-hexachlorodibenzo-p-dioxin	16.7	13.4	<18.1	<16.1	15.0
123789-hexachlorodibenzo-p-dioxin	8.05	<2.61	10.4	<7.02	56.8
1234678-heptachlorodibenzo-p-dioxin	305	292	319	305	4.6
Octachlorodibenzo-p-dioxin	773	762	850	795	6.0
2378-tetrachlorodibenzofuran	<1.31	<1.01	<0.48	<0.93	45.0
12378-pentachlorodibenzofuran	<1.45	<0.92	<1.43	<1.27	23.5
23478-pentachlorodibenzofuran	3.51	<1.87	2.15	<2.51	34.9
123478-hexachlorodibenzofuran	4.26	6.29	3.54	4.70	30.4
123678-hexachlorodibenzofuran	5.74	5.89	4.74	5.46	11.4
234678-hexachlorodibenzofuran	8.58	<7.24	6.65	<7.49	13.2
123789-hexachlorodibenzofuran	0.75	<0.46	<0.56	<0.59	24.7
1234678-heptachlorodibenzofuran	43.4	50.1	47.0	46.8	7.1
1234789-heptachlorodibenzofuran	8.92	10.4	10.4	9.90	8.6
Octachlorodibenzofuran	53.6	54.9	57.5	55.3	3.6
PCB 81	2.05	<2.21	<4.22	<2.83	42.7
PCB 77	11.5	<14.5	11.1	<12.4	15.0
PCB 123	<15.5	<42.2	<30.1	<29.3	45.6
PCB 118	139	318	215	224	39.9
PCB 114	6.75	11.4	<9.24	<9.12	25.4
PCB 105	48.6	96.7	82.2	75.8	32.5
PCB 126	<3.98	<5.43	<2.61	<4.01	35.1
PCB 167	<1.37	<1.81	<1.87	<1.68	16.0
PCB 156	5.16	<9.25	8.44	<7.62	28.4
PCB 157	<1.47	<2.61	<2.41	<2.17	28.1
PCB 169	<1.59	<1.23	<1.23	<1.35	15.7
PCB 189	2.27	1.70	<1.04	<1.67	36.7
Total Dioxins & Furans Only	<1242	<1219	<1344	<1268	5.2
Total PCBs Only	<240	<507	<369	<372	35.9
Total Dioxins & Furans and PCBs	<1482	<1726	<1713	<1640	8.4

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 39
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.38	<1.51	<1.29	<1.40	8.0
12378-pentachlorodibenzo-p-dioxin	<1.20	<0.96	1.07	<1.08	10.9
123478-hexachlorodibenzo-p-dioxin	<3.99	5.70	6.32	<5.34	22.6
123678-hexachlorodibenzo-p-dioxin	12.9	10.2	<13.7	<12.3	14.9
123789-hexachlorodibenzo-p-dioxin	6.20	<1.99	7.85	<5.35	56.6
1234678-heptachlorodibenzo-p-dioxin	235	221	242	233	4.4
Octachlorodibenzo-p-dioxin	596	579	643	606	5.5
2378-tetrachlorodibenzofuran	<1.01	<0.76	<0.36	<0.71	45.8
12378-pentachlorodibenzofuran	<1.12	<0.70	<1.08	<0.97	23.8
23478-pentachlorodibenzofuran	2.70	<1.42	1.63	<1.92	35.9
123478-hexachlorodibenzofuran	3.28	4.78	2.67	3.58	30.3
123678-hexachlorodibenzofuran	4.42	4.48	3.59	4.16	12.0
234678-hexachlorodibenzofuran	6.62	<5.50	5.03	<5.71	14.3
123789-hexachlorodibenzofuran	0.58	<0.35	<0.43	<0.45	25.7
1234678-heptachlorodibenzofuran	33.5	38.0	35.5	35.7	6.4
1234789-heptachlorodibenzofuran	6.88	7.90	7.85	7.54	7.7
Octachlorodibenzofuran	41.3	41.7	43.4	42.1	2.7
PCB 81	1.58	<1.68	<3.19	<2.15	41.9
PCB 77	8.89	<11.0	8.36	<9.41	14.8
PCB 123	<12.0	<32.1	<22.8	<22.3	45.2
PCB 118	107	241	163	170	39.5
PCB 114	5.20	8.65	<6.99	<6.95	24.8
PCB 105	37.5	73.5	62.1	57.7	31.9
PCB 126	<3.07	<4.12	<1.97	<3.06	35.2
PCB 167	<1.06	<1.37	<1.41	<1.28	15.1
PCB 156	<3.98	<7.03	<6.38	<5.79	27.7
PCB 157	<1.14	<1.99	<1.82	<1.65	27.4
PCB 169	<1.23	<0.93	<0.93	<1.03	16.8
PCB 189	1.75	1.29	<0.79	<1.28	37.6
Total Dioxins & Furans Only	<957	<926	<1016	<967	4.7
Total PCBs Only	<185	<385	<279	<283	35.4
Total Dioxins & Furans and PCBs	<1142	<1311	<1295	<1250	7.5

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 40
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.52	<1.67	<1.43	<1.54	7.7
12378-pentachlorodibenzo-p-dioxin	<1.32	<1.06	1.19	<1.19	10.9
123478-hexachlorodibenzo-p-dioxin	<4.40	6.28	7.00	<5.89	22.8
123678-hexachlorodibenzo-p-dioxin	14.2	11.2	<15.2	<13.5	15.1
123789-hexachlorodibenzo-p-dioxin	6.83	<2.19	8.70	<5.91	56.8
1234678-heptachlorodibenzo-p-dioxin	259	244	268	257	4.6
Octachlorodibenzo-p-dioxin	656	638	712	669	5.7
2378-tetrachlorodibenzofuran	<1.12	<0.84	<0.40	<0.79	45.6
12378-pentachlorodibenzofuran	<1.24	<0.77	<1.20	<1.07	23.9
23478-pentachlorodibenzofuran	2.98	<1.57	1.80	<2.12	35.7
123478-hexachlorodibenzofuran	3.62	5.27	2.96	3.95	30.1
123678-hexachlorodibenzofuran	4.87	4.94	3.97	4.59	11.7
234678-hexachlorodibenzofuran	7.29	<6.06	5.57	<6.31	14.0
123789-hexachlorodibenzofuran	0.64	<0.39	<0.47	<0.50	25.5
1234678-heptachlorodibenzofuran	36.9	41.9	39.4	39.4	6.4
1234789-heptachlorodibenzofuran	7.58	8.71	8.70	8.33	7.8
Octachlorodibenzofuran	45.5	46.0	48.1	46.5	3.0
PCB 81	1.74	<1.85	<3.54	<2.38	42.3
PCB 77	9.80	<12.1	9.26	<10.4	14.7
PCB 123	<13.2	<35.4	<25.3	<24.6	45.1
PCB 118	118	266	180	188	39.4
PCB 114	5.74	9.53	<7.74	<7.67	24.8
PCB 105	41.3	81.0	68.9	63.7	32.0
PCB 126	<3.38	<4.55	<2.19	<3.37	35.0
PCB 167	<1.17	<1.52	<1.57	<1.42	15.3
PCB 156	<4.38	<7.75	<7.07	<6.40	27.8
PCB 157	<1.25	<2.19	<2.02	<1.82	27.4
PCB 169	<1.35	<1.03	<1.03	<1.14	16.6
PCB 189	1.93	1.43	<0.88	<1.41	37.4
Total Dioxins & Furans Only	<1055	<1022	<1126	<1068	5.0
Total PCBs Only	<204	<425	<310	<313	35.3
Total Dioxins & Furans and PCBs	<1259	<1446	<1435	<1380	7.6

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 41
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.028	<0.031	<0.026	<0.029	7.7
12378-pentachlorodibenzo-p-dioxin	<0.025	<0.020	0.022	<0.022	11.2
123478-hexachlorodibenzo-p-dioxin	<0.082	0.12	0.13	<0.11	22.6
123678-hexachlorodibenzo-p-dioxin	0.26	0.21	<0.28	<0.25	15.2
123789-hexachlorodibenzo-p-dioxin	0.13	<0.041	0.16	<0.11	56.7
1234678-heptachlorodibenzo-p-dioxin	4.81	4.52	4.95	4.76	4.7
Octachlorodibenzo-p-dioxin	12.2	11.8	13.2	12.4	5.7
2378-tetrachlorodibenzofuran	<0.021	<0.016	<0.0075	<0.015	45.9
12378-pentachlorodibenzofuran	<0.023	<0.014	<0.022	<0.020	24.0
23478-pentachlorodibenzofuran	0.055	<0.029	0.033	<0.039	36.1
123478-hexachlorodibenzofuran	0.067	0.098	0.055	0.073	30.0
123678-hexachlorodibenzofuran	0.091	0.091	0.073	0.085	11.9
234678-hexachlorodibenzofuran	0.14	<0.11	0.10	<0.12	14.4
123789-hexachlorodibenzofuran	0.012	<0.0072	<0.0087	<0.0093	25.9
1234678-heptachlorodibenzofuran	0.69	0.78	0.73	0.73	6.2
1234789-heptachlorodibenzofuran	0.14	0.16	0.16	0.15	7.5
Octachlorodibenzofuran	0.85	0.85	0.89	0.86	2.8
PCB 81	0.032	<0.034	<0.065	<0.044	42.1
PCB 77	0.18	<0.22	0.17	<0.19	14.6
PCB 123	<0.25	<0.65	<0.47	<0.46	44.9
PCB 118	2.20	4.92	3.33	3.49	39.2
PCB 114	0.11	0.18	<0.14	<0.14	24.5
PCB 105	0.77	1.50	1.27	1.18	31.7
PCB 126	<0.063	<0.084	<0.040	<0.063	34.9
PCB 167	<0.022	<0.028	<0.029	<0.026	15.0
PCB 156	<0.082	<0.14	<0.13	<0.12	27.6
PCB 157	<0.023	<0.041	<0.037	<0.034	27.2
PCB 169	<0.025	<0.019	<0.019	<0.021	16.9
PCB 189	0.036	0.026	<0.016	<0.026	37.6
Total Dioxins & Furans Only	<19.6	<18.9	<20.8	<19.8	4.9
Total PCBs Only	<3.79	<7.85	<5.73	<5.79	35.1
Total Dioxins & Furans and PCBs	<23.4	<26.8	<26.6	<25.6	7.3

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 42
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<1.09	<1.83	<1.40	<1.54	<0.029
12378-pentachlorodibenzo-p-dioxin	<0.84	<1.41	<1.08	<1.19	<0.022
123478-hexachlorodibenzo-p-dioxin	<4.15	<7.01	<5.34	<5.89	<0.11
123678-hexachlorodibenzo-p-dioxin	<9.54	<16.1	<12.3	<13.5	<0.25
123789-hexachlorodibenzo-p-dioxin	<4.17	<7.02	<5.35	<5.91	<0.11
1234678-heptachlorodibenzo-p-dioxin	181	305	233	257	4.76
Octachlorodibenzo-p-dioxin	471	795	606	669	12.4
2378-tetrachlorodibenzofuran	<0.56	<0.93	<0.71	<0.79	<0.015
12378-pentachlorodibenzofuran	<0.75	<1.27	<0.97	<1.07	<0.020
23478-pentachlorodibenzofuran	<1.49	<2.51	<1.92	<2.12	<0.039
123478-hexachlorodibenzofuran	2.78	4.70	3.58	3.95	0.073
123678-hexachlorodibenzofuran	3.24	5.46	4.16	4.59	0.085
234678-hexachlorodibenzofuran	<4.45	<7.49	<5.71	<6.31	<0.12
123789-hexachlorodibenzofuran	<0.35	<0.59	<0.45	<0.50	<0.0093
1234678-heptachlorodibenzofuran	27.8	46.8	35.7	39.4	0.73
1234789-heptachlorodibenzofuran	5.87	9.90	7.54	8.33	0.15
Octachlorodibenzofuran	32.8	55.3	42.1	46.5	0.86
PCB 81	<1.67	<2.83	<2.15	<2.38	<0.044
PCB 77	<7.32	<12.4	<9.41	<10.4	<0.19
PCB 123	<17.3	<29.3	<22.3	<24.6	<0.46
PCB 118	133	224	170	188	3.49
PCB 114	<5.40	<9.12	<6.95	<7.67	<0.14
PCB 105	44.9	75.8	57.7	63.7	1.18
PCB 126	<2.38	<4.01	<3.06	<3.37	<0.063
PCB 167	<1.00	<1.68	<1.28	<1.42	<0.026
PCB 156	<4.51	<7.62	<5.79	<6.40	<0.12
PCB 157	<1.28	<2.17	<1.65	<1.82	<0.034
PCB 169	<0.80	<1.35	<1.03	<1.14	<0.021
PCB 189	<0.99	<1.67	<1.28	<1.41	<0.026
Total Dioxins & Furans Only	<752	<1268	<967	<1068	<19.8
Total PCBs Only	<220	<372	<283	<313	<5.79
Total Dioxins & Furans and PCBs	<972	<1640	<1250	<1380	<25.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 43
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train pg	Laboratory Blank pg
2378-tetrachlorodibenzo-p-dioxin	<8.8	<7.5
12378-pentachlorodibenzo-p-dioxin	<4.1	<3.4
123478-hexachlorodibenzo-p-dioxin	<3.9	<2.9
123678-hexachlorodibenzo-p-dioxin	<3.7	<2.8
123789-hexachlorodibenzo-p-dioxin	<3.7	<2.8
1234678-heptachlorodibenzo-p-dioxin	<4.3	<2.5
Octachlorodibenzo-p-dioxin	37.5	<4.8
2378-tetrachlorodibenzofuran	<5.5	<4.8
12378-pentachlorodibenzofuran	<4.2	<4.2
23478-pentachlorodibenzofuran	<4.1	<4.0
123478-hexachlorodibenzofuran	<3.1	<2.2
123678-hexachlorodibenzofuran	<2.7	<1.9
234678-hexachlorodibenzofuran	<3.0	<2.0
123789-hexachlorodibenzofuran	<3.6	<2.5
1234678-heptachlorodibenzofuran	4.47	<1.7
1234789-heptachlorodibenzofuran	<2.8	<2.3
Octachlorodibenzofuran	<5.7	<4.4
PCB 81	<5.1	<2.1
PCB 77	<9.4	<2.4
PCB 123	<6.9	<2.7
PCB 118	95.8	2.73
PCB 114	<5.2	<2.4
PCB 105	<26	<2.6
PCB 126	<6.0	<2.9
PCB 167	<3.0	<2.9
PCB 156	<3.2	<3.5
PCB 157	<3.3	<3.3
PCB 169	<3.7	<3.7
PCB 189	<3.1	<0.63
Total Dioxins & Furans Only	<105	<56.7
Total PCBs Only	<171	<31.9
Total Dioxins & Furans and PCBs	<276	<88.6

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 44
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.08	<1.17	<1.01	<1.09
12378-pentachlorodibenzo-p-dioxin	1.000	<0.93	<0.75	0.83	<0.84
123478-hexachlorodibenzo-p-dioxin	0.100	<0.31	0.44	0.49	<0.42
123678-hexachlorodibenzo-p-dioxin	0.100	1.01	0.79	<1.07	<0.95
123789-hexachlorodibenzo-p-dioxin	0.100	0.48	<0.15	0.61	<0.42
1234678-heptachlorodibenzo-p-dioxin	0.010	1.83	1.72	1.88	1.81
Octachlorodibenzo-p-dioxin	0.0003	0.14	0.13	0.15	0.14
2378-tetrachlorodibenzofuran	0.100	<0.079	<0.059	<0.028	<0.056
12378-pentachlorodibenzofuran	0.030	<0.026	<0.016	<0.025	<0.023
23478-pentachlorodibenzofuran	0.300	0.63	<0.33	0.38	<0.45
123478-hexachlorodibenzofuran	0.100	0.26	0.37	0.21	0.28
123678-hexachlorodibenzofuran	0.100	0.34	0.35	0.28	0.32
234678-hexachlorodibenzofuran	0.100	0.52	<0.43	0.39	<0.44
123789-hexachlorodibenzofuran	0.100	0.045	<0.027	<0.033	<0.035
1234678-heptachlorodibenzofuran	0.010	0.26	0.30	0.28	0.28
1234789-heptachlorodibenzofuran	0.010	0.054	0.061	0.061	0.059
Octachlorodibenzofuran	0.0003	0.0097	0.0097	0.010	0.0098
PCB 81	0.0003	0.00037	<0.00039	<0.00075	<0.00050
PCB 77	0.0001	0.00069	<0.00085	0.00065	<0.00073
PCB 123	0.00003	<0.00028	<0.00075	<0.00053	<0.00052
PCB 118	0.00003	0.0025	0.0056	0.0038	0.0040
PCB 114	0.00003	0.00012	0.00020	<0.00016	<0.00016
PCB 105	0.00003	0.00088	0.0017	0.0015	0.0013
PCB 126	0.100	<0.24	<0.32	<0.15	<0.24
PCB 167	0.00003	<0.000025	<0.000032	<0.000033	<0.000030
PCB 156	0.00003	<0.000093	<0.00016	<0.00015	<0.00014
PCB 157	0.00003	<0.000027	<0.000046	<0.000043	<0.000038
PCB 169	0.030	<0.029	<0.022	<0.022	<0.024
PCB 189	0.00003	0.000041	0.000030	<0.000018	<0.000030
Total Dioxins & Furans Only		<8.00	<7.10	<7.74	<7.61
Total PCBs Only		<0.27	<0.35	<0.18	<0.27
Total Dioxins & Furans and PCBs		<8.28	<7.45	<7.92	<7.88

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 45
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.79	<1.99	<1.71	<1.83
12378-pentachlorodibenzo-p-dioxin	1.000	<1.55	<1.27	1.41	<1.41
123478-hexachlorodibenzo-p-dioxin	0.100	<0.52	0.75	0.84	<0.70
123678-hexachlorodibenzo-p-dioxin	0.100	1.67	1.34	<1.81	<1.61
123789-hexachlorodibenzo-p-dioxin	0.100	0.80	<0.26	1.04	<0.70
1234678-heptachlorodibenzo-p-dioxin	0.010	3.05	2.92	3.19	3.05
Octachlorodibenzo-p-dioxin	0.0003	0.23	0.23	0.25	0.24
2378-tetrachlorodibenzofuran	0.100	<0.13	<0.10	<0.048	<0.093
12378-pentachlorodibenzofuran	0.030	<0.044	<0.028	<0.043	<0.038
23478-pentachlorodibenzofuran	0.300	1.05	<0.56	0.64	<0.75
123478-hexachlorodibenzofuran	0.100	0.43	0.63	0.35	0.47
123678-hexachlorodibenzofuran	0.100	0.57	0.59	0.47	0.55
234678-hexachlorodibenzofuran	0.100	0.86	<0.72	0.67	<0.75
123789-hexachlorodibenzofuran	0.100	0.075	<0.046	<0.056	<0.059
1234678-heptachlorodibenzofuran	0.010	0.43	0.50	0.47	0.47
1234789-heptachlorodibenzofuran	0.010	0.089	0.10	0.10	0.099
Octachlorodibenzofuran	0.0003	0.016	0.016	0.017	0.017
PCB 81	0.0003	0.00062	<0.00066	<0.0013	<0.00085
PCB 77	0.0001	0.0012	<0.0014	0.0011	<0.0012
PCB 123	0.00003	<0.00047	<0.0013	<0.00090	<0.00088
PCB 118	0.00003	0.0042	0.0095	0.0064	0.0067
PCB 114	0.00003	0.00020	0.00034	<0.00028	<0.00027
PCB 105	0.00003	0.0015	0.0029	0.0025	0.0023
PCB 126	0.100	<0.40	<0.54	<0.26	<0.40
PCB 167	0.00003	<0.000041	<0.000054	<0.000056	<0.000051
PCB 156	0.00003	<0.00015	<0.00028	<0.00025	<0.00023
PCB 157	0.00003	<0.000044	<0.000078	<0.000072	<0.000065
PCB 169	0.030	<0.048	<0.037	<0.037	<0.040
PCB 189	0.00003	0.000068	0.000051	<0.000031	<0.000050
Total Dioxins & Furans Only		<13.3	<12.1	<13.1	<12.8
Total PCBs Only		<0.45	<0.60	<0.31	<0.45
Total Dioxins & Furans and PCBs		<13.8	<12.6	<13.4	<13.3

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.38	<1.51	<1.29	<1.40
12378-pentachlorodibenzo-p-dioxin	1.000	<1.20	<0.96	1.07	<1.08
123478-hexachlorodibenzo-p-dioxin	0.100	<0.40	0.57	0.63	<0.53
123678-hexachlorodibenzo-p-dioxin	0.100	1.29	1.02	<1.37	<1.23
123789-hexachlorodibenzo-p-dioxin	0.100	0.62	<0.20	0.79	<0.53
1234678-heptachlorodibenzo-p-dioxin	0.010	2.35	2.21	2.42	2.33
Octachlorodibenzo-p-dioxin	0.0003	0.18	0.17	0.19	0.18
2378-tetrachlorodibenzofuran	0.100	<0.10	<0.076	<0.036	<0.071
12378-pentachlorodibenzofuran	0.030	<0.034	<0.021	<0.032	<0.029
23478-pentachlorodibenzofuran	0.300	0.81	<0.43	0.49	<0.57
123478-hexachlorodibenzofuran	0.100	0.33	0.48	0.27	0.36
123678-hexachlorodibenzofuran	0.100	0.44	0.45	0.36	0.42
234678-hexachlorodibenzofuran	0.100	0.66	<0.55	0.50	<0.57
123789-hexachlorodibenzofuran	0.100	0.058	<0.035	<0.043	<0.045
1234678-heptachlorodibenzofuran	0.010	0.33	0.38	0.36	0.36
1234789-heptachlorodibenzofuran	0.010	0.069	0.079	0.079	0.075
Octachlorodibenzofuran	0.0003	0.012	0.013	0.013	0.013
PCB 81	0.0003	0.00047	<0.00050	<0.00096	<0.00065
PCB 77	0.0001	0.00089	<0.0011	0.00084	<0.00094
PCB 123	0.00003	<0.00036	<0.00096	<0.00068	<0.00067
PCB 118	0.00003	0.0032	0.0072	0.0049	0.0051
PCB 114	0.00003	0.00016	0.00026	<0.00021	<0.00021
PCB 105	0.00003	0.0011	0.0022	0.0019	0.0017
PCB 126	0.100	<0.31	<0.41	<0.20	<0.31
PCB 167	0.00003	<0.000032	<0.000041	<0.000042	<0.000038
PCB 156	0.00003	<0.00012	<0.00021	<0.00019	<0.00017
PCB 157	0.00003	<0.000034	<0.000060	<0.000055	<0.000049
PCB 169	0.030	<0.037	<0.028	<0.028	<0.031
PCB 189	0.00003	0.000052	0.000039	<0.000024	<0.000038
Total Dioxins & Furans Only		<10.3	<9.16	<9.93	<9.78
Total PCBs Only		<0.35	<0.45	<0.24	<0.35
Total Dioxins & Furans and PCBs		<10.6	<9.61	<10.2	<10.1

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 46A
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	0.69	0.76	0.65	0.70
12378-pentachlorodibenzo-p-dioxin	1.000	0.60	0.48	1.07	0.72
123478-hexachlorodibenzo-p-dioxin	0.100	0.20	0.57	0.63	0.47
123678-hexachlorodibenzo-p-dioxin	0.100	1.29	1.02	0.68	1.00
123789-hexachlorodibenzo-p-dioxin	0.100	0.62	0.10	0.79	0.50
1234678-heptachlorodibenzo-p-dioxin	0.010	2.35	2.21	2.42	2.33
Octachlorodibenzo-p-dioxin	0.0003	0.18	0.17	0.19	0.18
2378-tetrachlorodibenzofuran	0.100	0.051	0.038	0.018	0.036
12378-pentachlorodibenzofuran	0.030	0.017	0.011	0.016	0.015
23478-pentachlorodibenzofuran	0.300	0.81	0.21	0.49	0.50
123478-hexachlorodibenzofuran	0.100	0.33	0.48	0.27	0.36
123678-hexachlorodibenzofuran	0.100	0.44	0.45	0.36	0.42
234678-hexachlorodibenzofuran	0.100	0.66	0.27	0.50	0.48
123789-hexachlorodibenzofuran	0.100	0.058	0.018	0.021	0.032
1234678-heptachlorodibenzofuran	0.010	0.33	0.38	0.36	0.36
1234789-heptachlorodibenzofuran	0.010	0.069	0.079	0.079	0.075
Octachlorodibenzofuran	0.0003	0.012	0.013	0.013	0.013
PCB 81	0.0003	0.00047	0.00025	0.00048	0.00040
PCB 77	0.0001	0.00089	0.00055	0.00084	0.00076
PCB 123	0.00003	0.00018	0.00048	0.00068	0.00045
PCB 118	0.00003	0.0032	0.0072	0.0049	0.0051
PCB 114	0.00003	0.00016	0.00026	0.00010	0.00017
PCB 105	0.00003	0.0011	0.0022	0.0019	0.0017
PCB 126	0.100	0.15	0.21	0.10	0.15
PCB 167	0.00003	0.000016	0.000021	0.000021	0.000019
PCB 156	0.00003	0.00012	0.00011	0.00019	0.00014
PCB 157	0.00003	0.000017	0.000030	0.000027	0.000025
PCB 169	0.030	0.018	0.014	0.014	0.015
PCB 189	0.00003	0.000026	0.000039	0.000012	0.000026
Total Dioxins & Furans Only		8.71	7.27	8.54	8.17
Total PCBs Only		0.18	0.23	0.12	0.18
Total Dioxins & Furans and PCBs		8.89	7.50	8.67	8.35

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 46B
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.38	<1.51	<1.29	<1.40
12378-pentachlorodibenzo-p-dioxin	0.500	<0.60	<0.48	0.53	<0.54
123478-hexachlorodibenzo-p-dioxin	0.100	<0.40	0.57	0.63	<0.53
123678-hexachlorodibenzo-p-dioxin	0.100	1.29	1.02	<1.37	<1.23
123789-hexachlorodibenzo-p-dioxin	0.100	0.62	<0.20	0.79	<0.53
1234678-heptachlorodibenzo-p-dioxin	0.010	2.35	2.21	2.42	2.33
Octachlorodibenzo-p-dioxin	0.001	0.60	0.58	0.64	0.61
2378-tetrachlorodibenzofuran	0.100	<0.10	<0.076	<0.036	<0.071
12378-pentachlorodibenzofuran	0.050	<0.056	<0.035	<0.054	<0.048
23478-pentachlorodibenzofuran	0.500	1.35	<0.71	0.81	<0.96
123478-hexachlorodibenzofuran	0.100	0.33	0.48	0.27	0.36
123678-hexachlorodibenzofuran	0.100	0.44	0.45	0.36	0.42
234678-hexachlorodibenzofuran	0.100	0.66	<0.55	0.50	<0.57
123789-hexachlorodibenzofuran	0.100	0.058	<0.035	<0.043	<0.045
1234678-heptachlorodibenzofuran	0.010	0.33	0.38	0.36	0.36
1234789-heptachlorodibenzofuran	0.010	0.069	0.079	0.079	0.075
Octachlorodibenzofuran	0.001	0.041	0.042	0.043	0.042
Total Dioxins & Furans		<10.7	<9.41	<10.2	<10.1
In-Stack Emission Limit					60

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

NATO/CCMS (1989) Toxicity Equivalency Factors

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 47
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.52	<1.67	<1.43	<1.54
12378-pentachlorodibenzo-p-dioxin	1.000	<1.32	<1.06	1.19	<1.19
123478-hexachlorodibenzo-p-dioxin	0.100	<0.44	0.63	0.70	<0.59
123678-hexachlorodibenzo-p-dioxin	0.100	1.42	1.12	<1.52	<1.35
123789-hexachlorodibenzo-p-dioxin	0.100	0.68	<0.22	0.87	<0.59
1234678-heptachlorodibenzo-p-dioxin	0.010	2.59	2.44	2.68	2.57
Octachlorodibenzo-p-dioxin	0.0003	0.20	0.19	0.21	0.20
2378-tetrachlorodibenzofuran	0.100	<0.11	<0.084	<0.040	<0.079
12378-pentachlorodibenzofuran	0.030	<0.037	<0.023	<0.036	<0.032
23478-pentachlorodibenzofuran	0.300	0.89	<0.47	0.54	<0.63
123478-hexachlorodibenzofuran	0.100	0.36	0.53	0.30	0.40
123678-hexachlorodibenzofuran	0.100	0.49	0.49	0.40	0.46
234678-hexachlorodibenzofuran	0.100	0.73	<0.61	0.56	<0.63
123789-hexachlorodibenzofuran	0.100	0.064	<0.039	<0.047	<0.050
1234678-heptachlorodibenzofuran	0.010	0.37	0.42	0.39	0.39
1234789-heptachlorodibenzofuran	0.010	0.076	0.087	0.087	0.083
Octachlorodibenzofuran	0.0003	0.014	0.014	0.014	0.014
PCB 81	0.0003	0.00052	<0.00056	<0.0011	<0.00071
PCB 77	0.0001	0.00098	<0.0012	0.00093	<0.0010
PCB 123	0.00003	<0.00040	<0.0011	<0.00076	<0.00074
PCB 118	0.00003	0.0036	0.0080	0.0054	0.0056
PCB 114	0.00003	0.00017	0.00029	<0.00023	<0.00023
PCB 105	0.00003	0.0012	0.0024	0.0021	0.0019
PCB 126	0.100	<0.34	<0.45	<0.22	<0.34
PCB 167	0.00003	<0.000035	<0.000045	<0.000047	<0.000042
PCB 156	0.00003	<0.00013	<0.00023	<0.00021	<0.00019
PCB 157	0.00003	<0.000038	<0.000066	<0.000061	<0.000055
PCB 169	0.030	<0.041	<0.031	<0.031	<0.034
PCB 189	0.00003	0.000058	0.000043	<0.000026	<0.000042
Total Dioxins & Furans Only		<11.3	<10.1	<11.0	<10.8
Total PCBs Only		<0.39	<0.50	<0.26	<0.38
Total Dioxins & Furans and PCBs		<11.7	<10.6	<11.3	<11.2

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 48
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.028	<0.031	<0.026	<0.029
12378-pentachlorodibenzo-p-dioxin	1.000	<0.025	<0.020	0.022	<0.022
123478-hexachlorodibenzo-p-dioxin	0.100	<0.0082	0.012	0.013	<0.011
123678-hexachlorodibenzo-p-dioxin	0.100	0.026	0.021	<0.028	<0.025
123789-hexachlorodibenzo-p-dioxin	0.100	0.013	<0.0041	0.016	<0.011
1234678-heptachlorodibenzo-p-dioxin	0.010	0.048	0.045	0.050	0.048
Octachlorodibenzo-p-dioxin	0.0003	0.0037	0.0035	0.0040	0.0037
2378-tetrachlorodibenzofuran	0.100	<0.0021	<0.0016	<0.00075	<0.0015
12378-pentachlorodibenzofuran	0.030	<0.00069	<0.00043	<0.00066	<0.00059
23478-pentachlorodibenzofuran	0.300	0.017	<0.0087	0.010	<0.012
123478-hexachlorodibenzofuran	0.100	0.0067	0.0098	0.0055	0.0073
123678-hexachlorodibenzofuran	0.100	0.0091	0.0091	0.0073	0.0085
234678-hexachlorodibenzofuran	0.100	0.014	<0.011	0.010	<0.012
123789-hexachlorodibenzofuran	0.100	0.0012	<0.00072	<0.00087	<0.00093
1234678-heptachlorodibenzofuran	0.010	0.0069	0.0078	0.0073	0.0073
1234789-heptachlorodibenzofuran	0.010	0.0014	0.0016	0.0016	0.0015
Octachlorodibenzofuran	0.0003	0.00025	0.00026	0.00027	0.00026
PCB 81	0.0003	0.0000097	<0.000010	<0.000020	<0.000013
PCB 77	0.0001	0.000018	<0.000022	0.000017	<0.000019
PCB 123	0.00003	<0.0000074	<0.000020	<0.000014	<0.000014
PCB 118	0.00003	0.000066	0.00015	0.00010	0.00010
PCB 114	0.00003	0.0000032	0.0000053	<0.0000043	<0.0000043
PCB 105	0.00003	0.000023	0.000045	0.000038	0.000035
PCB 126	0.100	<0.0063	<0.0084	<0.0040	<0.0063
PCB 167	0.00003	<0.00000065	<0.00000084	<0.00000087	<0.00000079
PCB 156	0.00003	<0.0000024	<0.0000043	<0.0000039	<0.0000036
PCB 157	0.00003	<0.00000070	<0.0000012	<0.0000011	<0.0000010
PCB 169	0.030	<0.00076	<0.00057	<0.00057	<0.00063
PCB 189	0.00003	0.0000011	0.00000079	<0.00000049	<0.00000078
Total Dioxins & Furans Only		<0.21	<0.19	<0.20	<0.20
Total PCBs Only		<0.0072	<0.0092	<0.0048	<0.0071
Total Dioxins & Furans and PCBs		<0.22	<0.20	<0.21	<0.21

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 49
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using the Full Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<1.09	<1.83	<1.40	<1.54	<0.029
12378-pentachlorodibenzo-p-dioxin	<0.84	<1.41	<1.08	<1.19	<0.022
123478-hexachlorodibenzo-p-dioxin	<0.42	<0.70	<0.53	<0.59	<0.011
123678-hexachlorodibenzo-p-dioxin	<0.95	<1.61	<1.23	<1.35	<0.025
123789-hexachlorodibenzo-p-dioxin	<0.42	<0.70	<0.53	<0.59	<0.011
1234678-heptachlorodibenzo-p-dioxin	1.81	3.05	2.33	2.57	0.048
Octachlorodibenzo-p-dioxin	0.14	0.24	0.18	0.20	0.0037
2378-tetrachlorodibenzofuran	<0.056	<0.093	<0.071	<0.079	<0.0015
12378-pentachlorodibenzofuran	<0.023	<0.038	<0.029	<0.032	<0.00059
23478-pentachlorodibenzofuran	<0.45	<0.75	<0.57	<0.63	<0.012
123478-hexachlorodibenzofuran	0.28	0.47	0.36	0.40	0.0073
123678-hexachlorodibenzofuran	0.32	0.55	0.42	0.46	0.0085
234678-hexachlorodibenzofuran	<0.44	<0.75	<0.57	<0.63	<0.012
123789-hexachlorodibenzofuran	<0.035	<0.059	<0.045	<0.050	<0.00093
1234678-heptachlorodibenzofuran	0.28	0.47	0.36	0.39	0.0073
1234789-heptachlorodibenzofuran	0.059	0.099	0.075	0.083	0.0015
Octachlorodibenzofuran	0.0098	0.017	0.013	0.014	0.00026
PCB 81	<0.00050	<0.00085	<0.00065	<0.00071	<0.000013
PCB 77	<0.00073	<0.0012	<0.00094	<0.0010	<0.000019
PCB 123	<0.00052	<0.00088	<0.00067	<0.00074	<0.000014
PCB 118	0.0040	0.0067	0.0051	0.0056	0.00010
PCB 114	<0.00016	<0.00027	<0.00021	<0.00023	<0.0000043
PCB 105	0.0013	0.0023	0.0017	0.0019	0.000035
PCB 126	<0.24	<0.40	<0.31	<0.34	<0.0063
PCB 167	<0.000030	<0.000051	<0.000038	<0.000042	<0.00000079
PCB 156	<0.00014	<0.00023	<0.00017	<0.00019	<0.0000036
PCB 157	<0.000038	<0.000065	<0.000049	<0.000055	<0.0000010
PCB 169	<0.024	<0.040	<0.031	<0.034	<0.00063
PCB 189	<0.000030	<0.000050	<0.000038	<0.000042	<0.00000078
Total Dioxins & Furans Only	<7.61	<12.8	<9.78	<10.8	<0.20
Total PCBs Only	<0.27	<0.45	<0.35	<0.38	<0.0071
Total Dioxins & Furans and PCBs	<7.88	<13.3	<10.1	<11.2	<0.21

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 50
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m^3	Dry Reference Concentration pg TEQ/Rm^3*	Dry Adjusted Concentration pg TEQ/Rm^3**	Wet Reference Concentration pg TEQ/Rm^3*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.54	0.92	0.70	0.77	0.014
12378-pentachlorodibenzo-p-dioxin	0.56	0.94	0.72	0.79	0.015
123478-hexachlorodibenzo-p-dioxin	0.36	0.61	0.47	0.52	0.0096
123678-hexachlorodibenzo-p-dioxin	0.78	1.31	1.00	1.10	0.020
123789-hexachlorodibenzo-p-dioxin	0.39	0.66	0.50	0.55	0.010
1234678-heptachlorodibenzo-p-dioxin	1.81	3.05	2.33	2.57	0.048
Octachlorodibenzo-p-dioxin	0.14	0.24	0.18	0.20	0.0037
2378-tetrachlorodibenzofuran	0.028	0.047	0.036	0.039	0.00073
12378-pentachlorodibenzofuran	0.011	0.019	0.015	0.016	0.00030
23478-pentachlorodibenzofuran	0.39	0.66	0.50	0.56	0.010
123478-hexachlorodibenzofuran	0.28	0.47	0.36	0.40	0.0073
123678-hexachlorodibenzofuran	0.32	0.55	0.42	0.46	0.0085
234678-hexachlorodibenzofuran	0.37	0.63	0.48	0.53	0.0098
123789-hexachlorodibenzofuran	0.025	0.042	0.032	0.036	0.00066
1234678-heptachlorodibenzofuran	0.28	0.47	0.36	0.39	0.0073
1234789-heptachlorodibenzofuran	0.059	0.099	0.075	0.083	0.0015
Octachlorodibenzofuran	0.0098	0.017	0.013	0.014	0.00026
PCB 81	0.00031	0.00053	0.00040	0.00044	0.0000082
PCB 77	0.00059	0.00099	0.00076	0.00084	0.000016
PCB 123	0.00035	0.00059	0.00045	0.00050	0.0000092
PCB 118	0.0040	0.0067	0.0051	0.0056	0.00010
PCB 114	0.00013	0.00023	0.00017	0.00019	0.0000035
PCB 105	0.0013	0.0023	0.0017	0.0019	0.000035
PCB 126	0.12	0.20	0.15	0.17	0.0031
PCB 167	0.000015	0.000025	0.000019	0.000021	0.00000039
PCB 156	0.00011	0.00018	0.00014	0.00015	0.0000028
PCB 157	0.000019	0.000032	0.000025	0.000027	0.00000051
PCB 169	0.012	0.020	0.015	0.017	0.00032
PCB 189	0.000020	0.000034	0.000026	0.000028	0.00000052
Total Dioxins & Furans Only	6.36	10.7	8.17	9.03	0.17
Total PCBs Only	0.14	0.23	0.18	0.20	0.0036
Total Dioxins & Furans and PCBs	6.50	11.0	8.35	9.22	0.17

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 51
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	1310	157	261	201	222	4.12
1,3-Dichlorobenzene	213	25.5	42.4	32.7	36.0	0.67
1,4-Dichlorobenzene	106	12.7	21.1	16.3	17.9	0.33
1,2-Dichlorobenzene	123	14.7	24.5	18.9	20.8	0.39
Total Dichlorobenzene	442	52.9	88.0	67.8	74.8	1.39
1,3,5-trichlorobenzene	15.2	1.82	3.03	2.33	2.57	0.048
1,2,4-trichlorobenzene	45.8	5.48	9.12	7.03	7.75	0.14
1,2,3-trichlorobenzene	19.3	2.31	3.84	2.96	3.27	0.061
Total Trichlorobenzene	80.3	9.61	16.0	12.3	13.6	0.25
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<1.20	<1.99	<1.54	<1.69	<0.031
1,2,3,4-tetrachlorobenzene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Total Tetrachlorobenzene	<20.0	<2.39	<3.98	<3.07	<3.38	<0.063
Pentachlorobenzene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Hexachlorobenzene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Total Chlorobenzenes	<1872	<224	<373	<287	<317	<5.89

Dry Gas Volume Sampled (Rm^3*) :	5.021
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 52
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	731	86.6	147	112	123	2.28
1,3-Dichlorobenzene	171	20.3	34.4	26.1	28.8	0.53
1,4-Dichlorobenzene	89.6	10.6	18.0	13.7	15.1	0.28
1,2-Dichlorobenzene	97.6	11.6	19.6	14.9	16.4	0.30
Total Dichlorobenzene	358	42.4	72.0	54.7	60.3	1.12
1,3,5-trichlorobenzene	12.9	1.53	2.59	1.97	2.17	0.040
1,2,4-trichlorobenzene	42.8	5.07	8.60	6.54	7.21	0.13
1,2,3-trichlorobenzene	11.7	1.39	2.35	1.79	1.97	0.036
Total Trichlorobenzene	67.4	7.99	13.6	10.3	11.4	0.21
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<1.18	<2.01	<1.53	<1.68	<0.031
1,2,3,4-tetrachlorobenzene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Total Tetrachlorobenzene	<20.0	<2.37	<4.02	<3.06	<3.37	<0.062
Pentachlorobenzene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Hexachlorobenzene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Total Chlorobenzenes	<1197	<142	<241	<183	<202	<3.73

Dry Gas Volume Sampled (Rm^3*) :	4.974
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.4
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 53
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Monochlorobenzene	2190	259	440	333	369	6.82
1,3-Dichlorobenzene	301	35.6	60.5	45.7	50.7	0.94
1,4-Dichlorobenzene	122	14.4	24.5	18.5	20.5	0.38
1,2-Dichlorobenzene	176	20.8	35.4	26.7	29.6	0.55
Total Dichlorobenzene	599	70.9	120	91.0	101	1.87
1,3,5-trichlorobenzene	21.8	2.58	4.38	3.31	3.67	0.068
1,2,4-trichlorobenzene	59.2	7.01	11.9	8.99	9.97	0.18
1,2,3-trichlorobenzene	33.4	3.96	6.71	5.07	5.62	0.10
Total Trichlorobenzene	114	13.5	23.0	17.4	19.3	0.36
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	10.2	1.21	2.05	1.55	1.72	0.032
1,2,3,4-tetrachlorobenzene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Total Tetrachlorobenzene	<20.2	<2.39	<4.06	<3.07	<3.40	<0.063
Pentachlorobenzene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Hexachlorobenzene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Total Chlorobenzenes	<2944	<349	<591	<447	<496	<9.17

Dry Gas Volume Sampled (Rm^3*) :	4.977
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 54
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Actual Concentrations for Chlorobenzenes

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Monochlorobenzene	157	86.6	259	168	51.8
1,3-Dichlorobenzene	25.5	20.3	35.6	27.1	28.8
1,4-Dichlorobenzene	12.7	10.6	14.4	12.6	15.2
1,2-Dichlorobenzene	14.7	11.6	20.8	15.7	30.0
Total Dichlorobenzene	52.9	42.4	70.9	55.4	26.0
1,3,5-trichlorobenzene	1.82	1.53	2.58	1.98	27.5
1,2,4-trichlorobenzene	5.48	5.07	7.01	5.85	17.5
1,2,3-trichlorobenzene	2.31	1.39	3.96	2.55	51.0
Total Trichlorobenzene	9.61	7.99	13.5	10.4	27.5
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.20	<1.18	1.21	<1.20	1.0
1,2,3,4-tetrachlorobenzene	<1.20	<1.18	<1.18	<1.19	0.6
Total Tetrachlorobenzene	<2.39	<2.37	<2.39	<2.38	0.6
Pentachlorobenzene	<1.20	<1.18	<1.18	<1.19	0.6
Hexachlorobenzene	<1.20	<1.18	<1.18	<1.19	0.6
Total Chlorobenzenes	<224	<142	<349	<238	43.7

TABLE 55
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Reference Concentrations for Chlorobenzenes

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	261	147	440	283	52.3
1,3-Dichlorobenzene	42.4	34.4	60.5	45.8	29.2
1,4-Dichlorobenzene	21.1	18.0	24.5	21.2	15.3
1,2-Dichlorobenzene	24.5	19.6	35.4	26.5	30.4
Total Dichlorobenzene	88.0	72.0	120	93.5	26.3
1,3,5-trichlorobenzene	3.03	2.59	4.38	3.33	28.0
1,2,4-trichlorobenzene	9.12	8.60	11.9	9.87	17.9
1,2,3-trichlorobenzene	3.84	2.35	6.71	4.30	51.5
Total Trichlorobenzene	16.0	13.6	23.0	17.5	28.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.99	<2.01	2.05	<2.02	1.5
1,2,3,4-tetrachlorobenzene	<1.99	<2.01	<2.01	<2.00	0.5
Total Tetrachlorobenzene	<3.98	<4.02	<4.06	<4.02	0.9
Pentachlorobenzene	<1.99	<2.01	<2.01	<2.00	0.5
Hexachlorobenzene	<1.99	<2.01	<2.01	<2.00	0.5
Total Chlorobenzenes	<373	<241	<591	<402	44.1

* At 25°C and 1 atmosphere

TABLE 56
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Adjusted Concentrations for Chlorobenzenes

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation %
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	
Monochlorobenzene	201	112	333	215	51.7
1,3-Dichlorobenzene	32.7	26.1	45.7	34.8	28.6
1,4-Dichlorobenzene	16.3	13.7	18.5	16.2	15.0
1,2-Dichlorobenzene	18.9	14.9	26.7	20.2	29.8
Total Dichlorobenzene	67.8	54.7	91.0	71.2	25.8
1,3,5-trichlorobenzene	2.33	1.97	3.31	2.54	27.3
1,2,4-trichlorobenzene	7.03	6.54	8.99	7.52	17.3
1,2,3-trichlorobenzene	2.96	1.79	5.07	3.27	50.9
Total Trichlorobenzene	12.3	10.3	17.4	13.3	27.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.54	<1.53	1.55	<1.54	0.7
1,2,3,4-tetrachlorobenzene	<1.54	<1.53	<1.52	<1.53	0.5
Total Tetrachlorobenzene	<3.07	<3.06	<3.07	<3.06	0.3
Pentachlorobenzene	<1.54	<1.53	<1.52	<1.53	0.5
Hexachlorobenzene	<1.54	<1.53	<1.52	<1.53	0.5
Total Chlorobenzenes	<287	<183	<447	<306	43.5

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 57
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Wet Reference Concentrations for Chlorobenzenes

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Monochlorobenzene	222	123	369	238	52.0
1,3-Dichlorobenzene	36.0	28.8	50.7	38.5	28.9
1,4-Dichlorobenzene	17.9	15.1	20.5	17.9	15.3
1,2-Dichlorobenzene	20.8	16.4	29.6	22.3	30.1
Total Dichlorobenzene	74.8	60.3	101	78.7	26.1
1,3,5-trichlorobenzene	2.57	2.17	3.67	2.80	27.6
1,2,4-trichlorobenzene	7.75	7.21	9.97	8.31	17.6
1,2,3-trichlorobenzene	3.27	1.97	5.62	3.62	51.2
Total Trichlorobenzene	13.6	11.4	19.3	14.7	27.7
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.69	<1.68	1.72	<1.70	1.0
1,2,3,4-tetrachlorobenzene	<1.69	<1.68	<1.68	<1.69	0.3
Total Tetrachlorobenzene	<3.38	<3.37	<3.40	<3.38	0.5
Pentachlorobenzene	<1.69	<1.68	<1.68	<1.69	0.3
Hexachlorobenzene	<1.69	<1.68	<1.68	<1.69	0.3
Total Chlorobenzenes	<317	<202	<496	<338	43.8

* At 25°C and 1 atmosphere

TABLE 58
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Rates for Chlorobenzenes

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
Monochlorobenzene	4.12	2.28	6.82	4.41	51.8
1,3-Dichlorobenzene	0.67	0.53	0.94	0.71	28.8
1,4-Dichlorobenzene	0.33	0.28	0.38	0.33	15.2
1,2-Dichlorobenzene	0.39	0.30	0.55	0.41	30.0
Total Dichlorobenzene	1.39	1.12	1.87	1.46	26.0
1,3,5-trichlorobenzene	0.048	0.040	0.068	0.052	27.5
1,2,4-trichlorobenzene	0.14	0.13	0.18	0.15	17.5
1,2,3-trichlorobenzene	0.061	0.036	0.10	0.067	51.0
Total Trichlorobenzene	0.25	0.21	0.36	0.27	27.5
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.031	<0.031	0.032	<0.031	1.0
1,2,3,4-tetrachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.6
Total Tetrachlorobenzene	<0.063	<0.062	<0.063	<0.063	0.6
Pentachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.6
Hexachlorobenzene	<0.031	<0.031	<0.031	<0.031	0.6
Total Chlorobenzenes	<5.89	<3.73	<9.17	<6.26	43.7

TABLE 59
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Emission Data for Chlorobenzenes

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Monochlorobenzene	168	283	215	238	4.41
1,3-Dichlorobenzene	27.1	45.8	34.8	38.5	0.71
1,4-Dichlorobenzene	12.6	21.2	16.2	17.9	0.33
1,2-Dichlorobenzene	15.7	26.5	20.2	22.3	0.41
Total Dichlorobenzene	55.4	93.5	71.2	78.7	1.46
1,3,5-trichlorobenzene	1.98	3.33	2.54	2.80	0.052
1,2,4-trichlorobenzene	5.85	9.87	7.52	8.31	0.15
1,2,3-trichlorobenzene	2.55	4.30	3.27	3.62	0.067
Total Trichlorobenzene	10.4	17.5	13.3	14.7	0.27
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<1.20	<2.02	<1.54	<1.70	<0.031
1,2,3,4-tetrachlorobenzene	<1.19	<2.00	<1.53	<1.69	<0.031
Total Tetrachlorobenzene	<2.38	<4.02	<3.06	<3.38	<0.063
Pentachlorobenzene	<1.19	<2.00	<1.53	<1.69	<0.031
Hexachlorobenzene	<1.19	<2.00	<1.53	<1.69	<0.031
Total Chlorobenzenes	<238	<402	<306	<338	<6.26

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 60
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorobenzene Blank Analyses

Isomers and Congener Group Totals	Blank Train Total ng	Laboratory Blank Total ng
Monochlorobenzene	<10	<10
1,3-Dichlorobenzene	<10	<10
1,4-Dichlorobenzene	19.9	11.2
1,2-Dichlorobenzene	<10	<10
Total Dichlorobenzene	<39.9	<31.2
1,3,5-trichlorobenzene	<10	<10
1,2,4-trichlorobenzene	<10	<10
1,2,3-trichlorobenzene	<10	<10
Total Trichlorobenzene	<30.0	<30.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<10	<10
1,2,3,4-tetrachlorobenzene	<10	<10
Total Tetrachlorobenzene	<20.0	<20.0
Pentachlorobenzene	<10	<10
Hexachlorobenzene	<10	<10
Total Chlorobenzenes	<120	<111

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 61
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	94.9	11.4	18.9	14.6	16.1	0.30
3-monochlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
4-monochlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Total Monochlorophenols	<195	<23.3	<38.8	<29.9	<33.0	<0.61
2,6-dichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
2,4 & 2,5-dichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
3,5-dichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
2,3-dichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
3,4-dichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Total Dichlorophenols	<250	<29.9	<49.8	<38.4	<42.3	<0.79
2,4,6-trichlorophenol	66.8	7.99	13.3	10.3	11.3	0.21
2,3,6-trichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
2,3,5-trichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
2,4,5-trichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
2,3,4-trichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
3,4,5-trichlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Total Trichlorophenols	<317	<37.9	<63.1	<48.6	<53.6	<1.00
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
2,3,4,5-tetrachlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Total Tetrachlorophenols	<100	<12.0	<19.9	<15.4	<16.9	<0.31
Pentachlorophenol	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Total Chlorophenols	<912	<109	<182	<140	<154	<2.87

Dry Gas Volume Sampled (Rm^3*) :	5.021
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 62
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	98.4	11.7	19.8	15.0	16.6	0.31
3-monochlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
4-monochlorophenol	57.1	6.77	11.5	8.72	9.62	0.18
Total Monochlorophenols	<206	<24.3	<41.3	<31.4	<34.6	<0.64
2,6-dichlorophenol	60.7	7.19	12.2	9.27	10.2	0.19
2,4 & 2,5-dichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
3,5-dichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
2,3-dichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
3,4-dichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
Total Dichlorophenols	<261	<30.9	<52.4	<39.8	<43.9	<0.81
2,4,6-trichlorophenol	74.2	8.79	14.9	11.3	12.5	0.23
2,3,6-trichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
2,3,5-trichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
2,4,5-trichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
2,3,4-trichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
3,4,5-trichlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
Total Trichlorophenols	<324	<38.4	<65.2	<49.5	<54.6	<1.01
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
2,3,4,5-tetrachlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
Total Tetrachlorophenols	<100	<11.8	<20.1	<15.3	<16.8	<0.31
Pentachlorophenol	<50	<5.92	<10.1	<7.64	<8.42	<0.16
Total Chlorophenols	<940	<111	<189	<144	<158	<2.93

Dry Gas Volume Sampled (Rm^3*) :	4.974
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.4
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 63
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
2-monochlorophenol	127	15.0	25.5	19.3	21.4	0.40
3-monochlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
4-monochlorophenol	52	6.16	10.4	7.90	8.75	0.16
Total Monochlorophenols	<229	<27.1	<46.0	<34.8	<38.6	<0.71
2,6-dichlorophenol	54.5	6.45	11.0	8.28	9.17	0.17
2,4 & 2,5-dichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
3,5-dichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
2,3-dichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
3,4-dichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
Total Dichlorophenols	<255	<30.1	<51.1	<38.7	<42.8	<0.79
2,4,6-trichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
2,3,6-trichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
2,3,5-trichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
2,4,5-trichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
2,3,4-trichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
3,4,5-trichlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
Total Trichlorophenols	<300	<35.5	<60.3	<45.6	<50.5	<0.93
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
2,3,4,5-tetrachlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
Total Tetrachlorophenols	<100	<11.8	<20.1	<15.2	<16.8	<0.31
Pentachlorophenol	<50	<5.92	<10.0	<7.60	<8.42	<0.16
Total Chlorophenols	<934	<111	<188	<142	<157	<2.91

Dry Gas Volume Sampled (Rm^3*) :	4.977
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 64
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	11.4	11.7	15.0	12.7	16.1
3-monochlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
4-monochlorophenol	<5.98	6.77	6.16	<6.30	6.5
Total Monochlorophenols	<23.3	<24.3	<27.1	<24.9	7.9
2,6-dichlorophenol	<5.98	7.19	6.45	<6.54	9.3
2,4 & 2,5-dichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
3,5-dichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
2,3-dichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
3,4-dichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
Total Dichlorophenols	<29.9	<30.9	<30.1	<30.3	1.7
2,4,6-trichlorophenol	7.99	8.79	<5.92	<7.57	19.6
2,3,6-trichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
2,3,5-trichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
2,4,5-trichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
2,3,4-trichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
3,4,5-trichlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
Total Trichlorophenols	<37.9	<38.4	<35.5	<37.3	4.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
2,3,4,5-tetrachlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
Total Tetrachlorophenols	<12.0	<11.8	<11.8	<11.9	0.6
Pentachlorophenol	<5.98	<5.92	<5.92	<5.94	0.6
Total Chlorophenols	<109	<111	<111	<110	1.1

TABLE 65
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	18.9	19.8	25.5	21.4	16.8
3-monochlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
4-monochlorophenol	<9.96	11.5	10.4	<10.6	7.3
Total Monochlorophenols	<38.8	<41.3	<46.0	<42.0	8.7
2,6-dichlorophenol	<9.96	12.2	11.0	<11.0	10.2
2,4 & 2,5-dichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
3,5-dichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
2,3-dichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
3,4-dichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
Total Dichlorophenols	<49.8	<52.4	<51.1	<51.1	2.6
2,4,6-trichlorophenol	13.3	14.9	<10.0	<12.8	19.5
2,3,6-trichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
2,3,5-trichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
2,4,5-trichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
2,3,4-trichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
3,4,5-trichlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
Total Trichlorophenols	<63.1	<65.2	<60.3	<62.9	3.9
2,3,5,6/2,3,4,6-tetrachlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
2,3,4,5-tetrachlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
Total Tetrachlorophenols	<19.9	<20.1	<20.1	<20.0	0.5
Pentachlorophenol	<9.96	<10.1	<10.0	<10.0	0.5
Total Chlorophenols	<182	<189	<188	<186	2.1

* At 25°C and 1 atmosphere

TABLE 66
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	14.6	15.0	19.3	16.3	16.0
3-monochlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
4-monochlorophenol	<7.68	8.72	7.90	<8.10	6.8
Total Monochlorophenols	<29.9	<31.4	<34.8	<32.0	7.8
2,6-dichlorophenol	<7.68	9.27	8.28	<8.41	9.6
2,4 & 2,5-dichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
3,5-dichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
2,3-dichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
3,4-dichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
Total Dichlorophenols	<38.4	<39.8	<38.7	<39.0	2.0
2,4,6-trichlorophenol	10.3	11.3	<7.60	<9.73	19.8
2,3,6-trichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
2,3,5-trichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
2,4,5-trichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
2,3,4-trichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
3,4,5-trichlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
Total Trichlorophenols	<48.6	<49.5	<45.6	<47.9	4.3
2,3,5,6/2,3,4,6-tetrachlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
2,3,4,5-tetrachlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
Total Tetrachlorophenols	<15.4	<15.3	<15.2	<15.3	0.5
Pentachlorophenol	<7.68	<7.64	<7.60	<7.64	0.5
Total Chlorophenols	<140	<144	<142	<142	1.3

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 67
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	16.1	16.6	21.4	18.0	16.3
3-monochlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
4-monochlorophenol	<8.46	9.62	8.75	<8.94	6.7
Total Monochlorophenols	<33.0	<34.6	<38.6	<35.4	8.1
2,6-dichlorophenol	<8.46	10.2	9.17	<9.29	9.6
2,4 & 2,5-dichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
3,5-dichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
2,3-dichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
3,4-dichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
Total Dichlorophenols	<42.3	<43.9	<42.8	<43.0	1.9
2,4,6-trichlorophenol	11.3	12.5	<8.42	<10.7	19.5
2,3,6-trichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
2,3,5-trichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
2,4,5-trichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
2,3,4-trichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
3,4,5-trichlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
Total Trichlorophenols	<53.6	<54.6	<50.5	<52.9	4.0
2,3,5,6/2,3,4,6-tetrachlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
2,3,4,5-tetrachlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
Total Tetrachlorophenols	<16.9	<16.8	<16.8	<16.9	0.3
Pentachlorophenol	<8.46	<8.42	<8.42	<8.43	0.3
Total Chlorophenols	<154	<158	<157	<157	1.4

* At 25°C and 1 atmosphere

TABLE 68
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Emission Rates

Specific Isomer	Emission Rate Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	Coefficient of Variation %
2-monochlorophenol	0.30	0.31	0.40	0.33	16.1
3-monochlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
4-monochlorophenol	<0.16	0.18	0.16	<0.17	6.5
Total Monochlorophenols	<0.61	<0.64	<0.71	<0.66	7.9
2,6-dichlorophenol	<0.16	0.19	0.17	<0.17	9.3
2,4 & 2,5-dichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
3,5-dichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
2,3-dichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
3,4-dichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
Total Dichlorophenols	<0.79	<0.81	<0.79	<0.80	1.7
2,4,6-trichlorophenol	0.21	0.23	<0.16	<0.20	19.6
2,3,6-trichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
2,3,5-trichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
2,4,5-trichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
2,3,4-trichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
3,4,5-trichlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
Total Trichlorophenols	<1.00	<1.01	<0.93	<0.98	4.1
2,3,5,6/2,3,4,6-tetrachlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
2,3,4,5-tetrachlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
Total Tetrachlorophenols	<0.31	<0.31	<0.31	<0.31	0.6
Pentachlorophenol	<0.16	<0.16	<0.16	<0.16	0.6
Total Chlorophenols	<2.87	<2.93	<2.91	<2.90	1.1

TABLE 69
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Emission Data for Chlorophenol Isomer and Congener Groups

Specific Isomer	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
2-monochlorophenol	12.7	21.4	16.3	18.0	0.33
3-monochlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
4-monochlorophenol	<6.30	<10.6	<8.10	<8.94	<0.17
Total Monochlorophenols	<24.9	<42.0	<32.0	<35.4	<0.66
2,6-dichlorophenol	<6.54	<11.0	<8.41	<9.29	<0.17
2,4 & 2,5-dichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
3,5-dichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
2,3-dichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
3,4-dichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
Total Dichlorophenols	<30.3	<51.1	<39.0	<43.0	<0.80
2,4,6-trichlorophenol	<7.57	<12.8	<9.73	<10.7	<0.20
2,3,6-trichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
2,3,5-trichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
2,4,5-trichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
2,3,4-trichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
3,4,5-trichlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
Total Trichlorophenols	<37.3	<62.9	<47.9	<52.9	<0.98
2,3,5,6/2,3,4,6-tetrachlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
2,3,4,5-tetrachlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
Total Tetrachlorophenols	<11.9	<20.0	<15.3	<16.9	<0.31
Pentachlorophenol	<5.94	<10.0	<7.64	<8.43	<0.16
Total Chlorophenols	<110	<186	<142	<157	<2.90

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 70
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Blank Analyses

Congener Group	Lab Blank Total ng	Blank Train Total ng
2-monochlorophenol	<50	73.8
3-monochlorophenol	<50	<50
4-monochlorophenol	<50	<50
Total Monochlorophenols	<150	<174
2,6-dichlorophenol	60.2	53.2
2,4 & 2,5-dichlorophenol	72	<50
3,5-dichlorophenol	<50	52.4
2,3-dichlorophenol	<50	<50
3,4-dichlorophenol	<50	<50
Total Dichlorophenols	<282	<256
2,4,6-trichlorophenol	<50	<50
2,3,6-trichlorophenol	<50	<50
2,3,5-trichlorophenol	<50	<50
2,4,5-trichlorophenol	<50	<50
2,3,4-trichlorophenol	<50	<50
3,4,5-trichlorophenol	<50	<50
Total Trichlorophenols	<300	<300
2,3,5,6/2,3,4,6-tetrachlorophenol	<50	<50
2,3,4,5-tetrachlorophenol	<50	<50
Total Tetrachlorophenols	<100	<100
Pentachlorophenol	53.2	<50
Total Chlorophenols	<885	<879

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 71
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 1

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	19.8	2.37	3.94	3.04	3.35	0.062
Acenaphthylene	134	16.0	26.7	20.6	22.7	0.42
Anthracene	29.7	3.55	5.92	4.56	5.02	0.093
Benzo(a)Anthracene	14.2	1.70	2.83	2.18	2.40	0.045
Benzo(b)Fluoranthene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Benzo(k/j)Fluoranthene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Benzo(a)fluorene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Benzo(b)fluorene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Benzo(g,h,i)Perylene	423	50.6	84.2	64.9	71.6	1.33
Benzo(a)Pyrene	19.8	2.37	3.94	3.04	3.35	0.062
Benzo(e)Pyrene	107	12.8	21.3	16.4	18.1	0.34
Biphenyl	51.3	6.14	10.2	7.87	8.68	0.16
2-Chloronaphthalene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<16.6	<1.99	<3.31	<2.55	<2.81	<0.052
Coronene	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Dibenzo(a,e)pyrene	<50	<5.98	<9.96	<7.68	<8.46	<0.16
9,10-dimethylanthracene	<73.3	<8.77	<14.6	<11.3	<12.4	<0.23
7,12-Dimethylbenzo(a)anthracene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Fluoranthene	119	14.2	23.7	18.3	20.1	0.37
Fluorene	57.0	6.82	11.4	8.75	9.64	0.18
Indeno(1,2,3-cd)Pyrene	135	16.2	26.9	20.7	22.8	0.42
2-methylanthracene	13.4	1.60	2.67	2.06	2.27	0.042
3-Methylcholanthrene	<50	<5.98	<9.96	<7.68	<8.46	<0.16
1-Methylnaphthalene	196	23.5	39.0	30.1	33.2	0.62
2-Methylnaphthalene	52.9	6.33	10.5	8.12	8.95	0.17
1-Methylphenanthrene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
9-Methylphenanthrene	10.2	1.22	2.03	1.57	1.73	0.032
Naphthalene	292	34.9	58.2	44.8	49.4	0.92
Perylene	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Phenanthrene	218	26.1	43.4	33.5	36.9	0.69
Picene	<50	<5.98	<9.96	<7.68	<8.46	<0.16
Pyrene	188	22.5	37.4	28.9	31.8	0.59
Tetralin	232	27.8	46.2	35.6	39.3	0.73
m-terphenyl	<10	<1.20	<1.99	<1.54	<1.69	<0.031
o-Terphenyl	<10	<1.20	<1.99	<1.54	<1.69	<0.031
p-terphenyl	<10	<1.20	<1.99	<1.54	<1.69	<0.031
Total	<2722	<326	<542	<418	<461	<8.57

Dry Gas Volume Sampled (Rm^3*) :	5.021
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 72
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 2

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Acenaphthylene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Anthracene	17.8	2.11	3.58	2.72	3.00	0.055
Benzo(a)Anthracene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Benzo(b)Fluoranthene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Benzo(k/j)Fluoranthene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Benzo(a)fluorene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Benzo(b)fluorene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Benzo(g,h,i)Perylene	368	43.6	74.0	56.2	62.0	1.15
Benzo(a)Pyrene	16.1	1.91	3.24	2.46	2.71	0.050
Benzo(e)Pyrene	112	13.3	22.5	17.1	18.9	0.35
Biphenyl	40.7	4.82	8.18	6.22	6.86	0.13
2-Chloronaphthalene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<12.2	<1.45	<2.45	<1.86	<2.06	<0.038
Coronene	<50	<5.92	<10.1	<7.64	<8.42	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Dibenzo(a,e)pyrene	<50	<5.92	<10.1	<7.64	<8.42	<0.16
9,10-dimethylanthracene	<37.7	<4.47	<7.58	<5.76	<6.35	<0.12
7,12-Dimethylbenzo(a)anthracene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Fluoranthene	78.3	9.28	15.7	12.0	13.2	0.24
Fluorene	31.1	3.68	6.25	4.75	5.24	0.097
Indeno(1,2,3-cd)Pyrene	133	15.8	26.7	20.3	22.4	0.41
2-methylanthracene	27.3	3.23	5.49	4.17	4.60	0.085
3-Methylcholanthrene	<50	<5.92	<10.1	<7.64	<8.42	<0.16
1-Methylnaphthalene	174	20.6	35.0	26.6	29.3	0.54
2-Methylnaphthalene	41.8	4.95	8.40	6.39	7.04	0.13
1-Methylphenanthrene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
9-Methylphenanthrene	19.5	2.31	3.92	2.98	3.28	0.061
Naphthalene	212	25.1	42.6	32.4	35.7	0.66
Perylene	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Phenanthrene	215	25.5	43.2	32.8	36.2	0.67
Picene	<50	<5.92	<10.1	<7.64	<8.42	<0.16
Pyrene	151	17.9	30.4	23.1	25.4	0.47
Tetralin	303	35.9	60.9	46.3	51.0	0.94
m-terphenyl	<10	<1.18	<2.01	<1.53	<1.68	<0.031
o-Terphenyl	<10	<1.18	<2.01	<1.53	<1.68	<0.031
p-terphenyl	<10	<1.18	<2.01	<1.53	<1.68	<0.031
Total	<2341	<277	<471	<358	<394	<7.29

Dry Gas Volume Sampled (Rm^3*) :	4.974
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.4
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 73
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Data
Test No. 3

Compound	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	µg/s
Acenaphthene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Acenaphthylene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Anthracene	14.0	1.66	2.81	2.13	2.36	0.044
Benzo(a)Anthracene	18.4	2.18	3.70	2.80	3.10	0.057
Benzo(b)Fluoranthene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Benzo(k/j)Fluoranthene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Benzo(a)fluorene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Benzo(b)fluorene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Benzo(g,h,i)Perylene	264	31.3	53.0	40.1	44.4	0.82
Benzo(a)Pyrene	21.8	2.58	4.38	3.31	3.67	0.068
Benzo(e)Pyrene	80.4	9.52	16.2	12.2	13.5	0.25
Biphenyl	53.6	6.35	10.8	8.14	9.02	0.17
2-Chloronaphthalene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<17.6	<2.08	<3.54	<2.67	<2.96	<0.055
Coronene	<50	<5.92	<10.0	<7.60	<8.42	<0.16
Dibenzo(a,c/a,h)Anthracene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Dibenzo(a,e)pyrene	<50	<5.92	<10.0	<7.60	<8.42	<0.16
9,10-dimethylanthracene	<18.5	<2.19	<3.72	<2.81	<3.11	<0.058
7,12-Dimethylbenzo(a)anthracene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Fluoranthene	89.6	10.6	18.0	13.6	15.1	0.28
Fluorene	13.1	1.55	2.63	1.99	2.21	0.041
Indeno(1,2,3-cd)Pyrene	88.4	10.5	17.8	13.4	14.9	0.28
2-methylanthracene	18.2	2.16	3.66	2.76	3.06	0.057
3-Methylcholanthrene	<50	<5.92	<10.0	<7.60	<8.42	<0.16
1-Methylnaphthalene	163	19.3	32.8	24.8	27.4	0.51
2-Methylnaphthalene	22.9	2.71	4.60	3.48	3.86	0.071
1-Methylphenanthrene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
9-Methylphenanthrene	11.6	1.37	2.33	1.76	1.95	0.036
Naphthalene	125	14.8	25.1	19.0	21.0	0.39
Perylene	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Phenanthrene	97.7	11.6	19.6	14.8	16.4	0.30
Picene	<50	<5.92	<10.0	<7.60	<8.42	<0.16
Pyrene	125	14.8	25.1	19.0	21.0	0.39
Tetralin	232	27.5	46.6	35.2	39.1	0.72
m-terphenyl	<10	<1.18	<2.01	<1.52	<1.68	<0.031
o-Terphenyl	<10	<1.18	<2.01	<1.52	<1.68	<0.031
p-terphenyl	<10	<1.18	<2.01	<1.52	<1.68	<0.031
Total	<1815	<215	<365	<276	<306	<5.65

Dry Gas Volume Sampled (Rm^3*) :	4.977
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 74
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Acenaphthene	2.37	<1.18	<1.18	<1.58	43.3
Acenaphthylene	16.0	<1.18	<1.18	<6.13	140
Anthracene	3.55	2.11	1.66	2.44	40.6
Benzo(a)Anthracene	1.70	<1.18	2.18	<1.69	29.5
Benzo(b)Fluoranthene	<1.20	<1.18	<1.18	<1.19	0.6
Benzo(k/j)Fluoranthene	<1.20	<1.18	<1.18	<1.19	0.6
Benzo(a)fluorene	<1.20	<1.18	<1.18	<1.19	0.6
Benzo(b)fluorene	<1.20	<1.18	<1.18	<1.19	0.6
Benzo(g,h,i)Perylene	50.6	43.6	31.3	41.8	23.4
Benzo(a)Pyrene	2.37	1.91	2.58	2.29	15.1
Benzo(e)Pyrene	12.8	13.3	9.52	11.9	17.2
Biphenyl	6.14	4.82	6.35	5.77	14.3
2-Chloronaphthalene	<1.20	<1.18	<1.18	<1.19	0.6
Chrysene/Triphenylene/Benzo(b)anthracene	<1.99	<1.45	<2.08	<1.84	18.7
Coronene	<5.98	<5.92	<5.92	<5.94	0.6
Dibenzo(a,c/a,h)Anthracene	<1.20	<1.18	<1.18	<1.19	0.6
Dibenzo(a,e)pyrene	<5.98	<5.92	<5.92	<5.94	0.6
9,10-dimethylanthracene	<8.77	<4.47	<2.19	<5.14	65.0
7,12-Dimethylbenzo(a)anthracene	<1.20	<1.18	<1.18	<1.19	0.6
Fluoranthene	14.2	9.28	10.6	11.4	22.6
Fluorene	6.82	3.68	1.55	4.02	65.9
Indeno(1,2,3-cd)Pyrene	16.2	15.8	10.5	14.1	22.5
2-methylanthracene	1.60	3.23	2.16	2.33	35.6
3-Methylcholanthrene	<5.98	<5.92	<5.92	<5.94	0.6
1-Methylnaphthalene	23.5	20.6	19.3	21.1	10.0
2-Methylnaphthalene	6.33	4.95	2.71	4.66	39.1
1-Methylphenanthrene	<1.20	<1.18	<1.18	<1.19	0.6
9-Methylphenanthrene	1.22	2.31	1.37	1.63	36.1
Naphthalene	34.9	25.1	14.8	25.0	40.4
Perylene	<1.20	<1.18	<1.18	<1.19	0.6
Phenanthrene	26.1	25.5	11.6	21.0	39.0
Picene	<5.98	<5.92	<5.92	<5.94	0.6
Pyrene	22.5	17.9	14.8	18.4	21.0
Tetralin	27.8	35.9	27.5	30.4	15.8
m-terphenyl	<1.20	<1.18	<1.18	<1.19	0.6
o-Terphenyl	<1.20	<1.18	<1.18	<1.19	0.6
p-terphenyl	<1.20	<1.18	<1.18	<1.19	0.6
Total	<326	<277	<215	<273	20.4

TABLE 75
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	3.94	<2.01	<2.01	<2.65	42.1
Acenaphthylene	26.7	<2.01	<2.01	<10.2	139
Anthracene	5.92	3.58	2.81	4.10	39.4
Benzo(a)Anthracene	2.83	<2.01	3.70	<2.85	29.6
Benzo(b)Fluoranthene	<1.99	<2.01	<2.01	<2.00	0.5
Benzo(k/j)Fluoranthene	<1.99	<2.01	<2.01	<2.00	0.5
Benzo(a)fluorene	<1.99	<2.01	<2.01	<2.00	0.5
Benzo(b)fluorene	<1.99	<2.01	<2.01	<2.00	0.5
Benzo(g,h,i)Perylene	84.2	74.0	53.0	70.4	22.6
Benzo(a)Pyrene	3.94	3.24	4.38	3.85	15.0
Benzo(e)Pyrene	21.3	22.5	16.2	20.0	16.9
Biphenyl	10.2	8.18	10.8	9.72	14.0
2-Chloronaphthalene	<1.99	<2.01	<2.01	<2.00	0.5
Chrysene/Triphenylene/Benzo(b)anthracene	<3.31	<2.45	<3.54	<3.10	18.4
Coronene	<9.96	<10.1	<10.0	<10.0	0.5
Dibenzo(a,c/a,h)Anthracene	<1.99	<2.01	<2.01	<2.00	0.5
Dibenzo(a,e)pyrene	<9.96	<10.1	<10.0	<10.0	0.5
9,10-dimethylanthracene	<14.6	<7.58	<3.72	<8.63	63.9
7,12-Dimethylbenzo(a)anthracene	<1.99	<2.01	<2.01	<2.00	0.5
Fluoranthene	23.7	15.7	18.0	19.1	21.4
Fluorene	11.4	6.25	2.63	6.75	64.9
Indeno(1,2,3-cd)Pyrene	26.9	26.7	17.8	23.8	22.0
2-methylanthracene	2.67	5.49	3.66	3.94	36.3
3-Methylcholanthrene	<9.96	<10.1	<10.0	<10.0	0.5
1-Methylnaphthalene	39.0	35.0	32.8	35.6	9.0
2-Methylnaphthalene	10.5	8.40	4.60	7.85	38.3
1-Methylphenanthrene	<1.99	<2.01	<2.01	<2.00	0.5
9-Methylphenanthrene	2.03	3.92	2.33	2.76	36.8
Naphthalene	58.2	42.6	25.1	42.0	39.4
Perylene	<1.99	<2.01	<2.01	<2.00	0.5
Phenanthrene	43.4	43.2	19.6	35.4	38.6
Picene	<9.96	<10.1	<10.0	<10.0	0.5
Pyrene	37.4	30.4	25.1	31.0	20.0
Tetralin	46.2	60.9	46.6	51.2	16.3
m-terphenyl	<1.99	<2.01	<2.01	<2.00	0.5
o-Terphenyl	<1.99	<2.01	<2.01	<2.00	0.5
p-terphenyl	<1.99	<2.01	<2.01	<2.00	0.5
Total	<542	<471	<365	<459	19.5

* At 25°C and 1 atmosphere

TABLE 76
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	3.04	<1.53	<1.52	<2.03	43.1
Acenaphthylene	20.6	<1.53	<1.52	<7.87	140
Anthracene	4.56	2.72	2.13	3.13	40.5
Benzo(a)Anthracene	2.18	<1.53	2.80	<2.17	29.2
Benzo(b)Fluoranthene	<1.54	<1.53	<1.52	<1.53	0.5
Benzo(k/j)Fluoranthene	<1.54	<1.53	<1.52	<1.53	0.5
Benzo(a)fluorene	<1.54	<1.53	<1.52	<1.53	0.5
Benzo(b)fluorene	<1.54	<1.53	<1.52	<1.53	0.5
Benzo(g,h,i)Perylene	64.9	56.2	40.1	53.8	23.4
Benzo(a)Pyrene	3.04	2.46	3.31	2.94	14.8
Benzo(e)Pyrene	16.4	17.1	12.2	15.2	17.4
Biphenyl	7.87	6.22	8.14	7.41	14.1
2-Chloronaphthalene	<1.54	<1.53	<1.52	<1.53	0.5
Chrysene/Triphenylene/Benzo(b)anthracene	<2.55	<1.86	<2.67	<2.36	18.5
Coronene	<7.68	<7.64	<7.60	<7.64	0.5
Dibenzo(a,c/a,h)Anthracene	<1.54	<1.53	<1.52	<1.53	0.5
Dibenzo(a,e)pyrene	<7.68	<7.64	<7.60	<7.64	0.5
9,10-dimethylanthracene	<11.3	<5.76	<2.81	<6.61	64.8
7,12-Dimethylbenzo(a)anthracene	<1.54	<1.53	<1.52	<1.53	0.5
Fluoranthene	18.3	12.0	13.6	14.6	22.4
Fluorene	8.75	4.75	1.99	5.16	65.8
Indeno(1,2,3-cd)Pyrene	20.7	20.3	13.4	18.2	22.6
2-methylanthracene	2.06	4.17	2.76	3.00	35.9
3-Methylcholanthrene	<7.68	<7.64	<7.60	<7.64	0.5
1-Methylnaphthalene	30.1	26.6	24.8	27.1	10.0
2-Methylnaphthalene	8.12	6.39	3.48	5.99	39.1
1-Methylphenanthrene	<1.54	<1.53	<1.52	<1.53	0.5
9-Methylphenanthrene	1.57	2.98	1.76	2.10	36.4
Naphthalene	44.8	32.4	19.0	32.1	40.3
Perylene	<1.54	<1.53	<1.52	<1.53	0.5
Phenanthrene	33.5	32.8	14.8	27.0	39.1
Picene	<7.68	<7.64	<7.60	<7.64	0.5
Pyrene	28.9	23.1	19.0	23.6	21.0
Tetralin	35.6	46.3	35.2	39.0	16.1
m-terphenyl	<1.54	<1.53	<1.52	<1.53	0.5
o-Terphenyl	<1.54	<1.53	<1.52	<1.53	0.5
p-terphenyl	<1.54	<1.53	<1.52	<1.53	0.5
Total	<418	<358	<276	<350	20.4

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 77
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Wet Reference Concentrations

Compound	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	3.35	<1.68	<1.68	<2.24	43.0
Acenaphthylene	22.7	<1.68	<1.68	<8.68	140
Anthracene	5.02	3.00	2.36	3.46	40.2
Benzo(a)Anthracene	2.40	<1.68	3.10	<2.39	29.5
Benzo(b)Fluoranthene	<1.69	<1.68	<1.68	<1.69	0.3
Benzo(k/j)Fluoranthene	<1.69	<1.68	<1.68	<1.69	0.3
Benzo(a)fluorene	<1.69	<1.68	<1.68	<1.69	0.3
Benzo(b)fluorene	<1.69	<1.68	<1.68	<1.69	0.3
Benzo(g,h,i)Perylene	71.6	62.0	44.4	59.3	23.2
Benzo(a)Pyrene	3.35	2.71	3.67	3.24	15.0
Benzo(e)Pyrene	18.1	18.9	13.5	16.8	17.1
Biphenyl	8.68	6.86	9.02	8.19	14.2
2-Chloronaphthalene	<1.69	<1.68	<1.68	<1.69	0.3
Chrysene/Triphenylene/Benzo(b)anthracene	<2.81	<2.06	<2.96	<2.61	18.6
Coronene	<8.46	<8.42	<8.42	<8.43	0.3
Dibenzo(a,c/a,h)Anthracene	<1.69	<1.68	<1.68	<1.69	0.3
Dibenzo(a,e)pyrene	<8.46	<8.42	<8.42	<8.43	0.3
9,10-dimethylanthracene	<12.4	<6.35	<3.11	<7.29	64.7
7,12-Dimethylbenzo(a)anthracene	<1.69	<1.68	<1.68	<1.69	0.3
Fluoranthene	20.1	13.2	15.1	16.1	22.2
Fluorene	9.64	5.24	2.21	5.70	65.7
Indeno(1,2,3-cd)Pyrene	22.8	22.4	14.9	20.0	22.3
2-methylanthracene	2.27	4.60	3.06	3.31	35.8
3-Methylcholanthrene	<8.46	<8.42	<8.42	<8.43	0.3
1-Methylnaphthalene	33.2	29.3	27.4	30.0	9.7
2-Methylnaphthalene	8.95	7.04	3.86	6.62	38.9
1-Methylphenanthrene	<1.69	<1.68	<1.68	<1.69	0.3
9-Methylphenanthrene	1.73	3.28	1.95	2.32	36.3
Naphthalene	49.4	35.7	21.0	35.4	40.1
Perylene	<1.69	<1.68	<1.68	<1.69	0.3
Phenanthrene	36.9	36.2	16.4	29.8	38.9
Picene	<8.46	<8.42	<8.42	<8.43	0.3
Pyrene	31.8	25.4	21.0	26.1	20.7
Tetralin	39.3	51.0	39.1	43.1	15.9
m-terphenyl	<1.69	<1.68	<1.68	<1.69	0.3
o-Terphenyl	<1.69	<1.68	<1.68	<1.69	0.3
p-terphenyl	<1.69	<1.68	<1.68	<1.69	0.3
Total	<461	<394	<306	<387	20.1

* At 25°C and 1 atmosphere

TABLE 78
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Polycyclic Aromatic Hydrocarbon Emission Rates

Compound	Emission Rate				Coefficient of Variation
	Test No. 1 µg/s	Test No. 2 µg/s	Test No. 3 µg/s	Average µg/s	%
Acenaphthene	0.062	<0.031	<0.031	<0.042	43.3
Acenaphthylene	0.42	<0.031	<0.031	<0.16	140
Anthracene	0.093	0.055	0.044	0.064	40.6
Benzo(a)Anthracene	0.045	<0.031	0.057	<0.044	29.5
Benzo(b)Fluoranthene	<0.031	<0.031	<0.031	<0.031	0.6
Benzo(k/j)Fluoranthene	<0.031	<0.031	<0.031	<0.031	0.6
Benzo(a)fluorene	<0.031	<0.031	<0.031	<0.031	0.6
Benzo(b)fluorene	<0.031	<0.031	<0.031	<0.031	0.6
Benzo(g,h,i)Perylene	1.33	1.15	0.82	1.10	23.4
Benzo(a)Pyrene	0.062	0.050	0.068	0.060	15.1
Benzo(e)Pyrene	0.34	0.35	0.25	0.31	17.2
Biphenyl	0.16	0.13	0.17	0.15	14.3
2-Chloronaphthalene	<0.031	<0.031	<0.031	<0.031	0.6
Chrysene/Triphenylene/Benzo(b)anthracene	<0.052	<0.038	<0.055	<0.048	18.7
Coronene	<0.16	<0.16	<0.16	<0.16	0.6
Dibenzo(a,c/a,h)Anthracene	<0.031	<0.031	<0.031	<0.031	0.6
Dibenzo(a,e)pyrene	<0.16	<0.16	<0.16	<0.16	0.6
9,10-dimethylanthracene	<0.23	<0.12	<0.058	<0.14	65.0
7,12-Dimethylbenzo(a)anthracene	<0.031	<0.031	<0.031	<0.031	0.6
Fluoranthene	0.37	0.24	0.28	0.30	22.6
Fluorene	0.18	0.097	0.041	0.11	65.9
Indeno(1,2,3-cd)Pyrene	0.42	0.41	0.28	0.37	22.5
2-methylanthracene	0.042	0.085	0.057	0.061	35.6
3-Methylcholanthrene	<0.16	<0.16	<0.16	<0.16	0.6
1-Methylnaphthalene	0.62	0.54	0.51	0.56	10.0
2-Methylnaphthalene	0.17	0.13	0.071	0.12	39.1
1-Methylphenanthrene	<0.031	<0.031	<0.031	<0.031	0.6
9-Methylphenanthrene	0.032	0.061	0.036	0.043	36.1
Naphthalene	0.92	0.66	0.39	0.66	40.4
Perylene	<0.031	<0.031	<0.031	<0.031	0.6
Phenanthrene	0.69	0.67	0.30	0.55	39.0
Picene	<0.16	<0.16	<0.16	<0.16	0.6
Pyrene	0.59	0.47	0.39	0.48	21.0
Tetralin	0.73	0.94	0.72	0.80	15.8
m-terphenyl	<0.031	<0.031	<0.031	<0.031	0.6
o-Terphenyl	<0.031	<0.031	<0.031	<0.031	0.6
p-terphenyl	<0.031	<0.031	<0.031	<0.031	0.6
Total	<8.57	<7.29	<5.65	<7.17	20.4

TABLE 79
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Polycyclic Aromatic Hydrocarbon Emission Data

Compound	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate µg/s
Acenaphthene	<1.58	<2.65	<2.03	<2.24	<0.042
Acenaphthylene	<6.13	<10.2	<7.87	<8.68	<0.16
Anthracene	2.44	4.10	3.13	3.46	0.064
Benzo(a)Anthracene	<1.69	<2.85	<2.17	<2.39	<0.044
Benzo(b)Fluoranthene	<1.19	<2.00	<1.53	<1.69	<0.031
Benzo(k/j)Fluoranthene	<1.19	<2.00	<1.53	<1.69	<0.031
Benzo(a)fluorene	<1.19	<2.00	<1.53	<1.69	<0.031
Benzo(b)fluorene	<1.19	<2.00	<1.53	<1.69	<0.031
Benzo(g,h,i)Perylene	41.8	70.4	53.8	59.3	1.10
Benzo(a)Pyrene	2.29	3.85	2.94	3.24	0.060
Benzo(e)Pyrene	11.9	20.0	15.2	16.8	0.31
Biphenyl	5.77	9.72	7.41	8.19	0.15
2-Chloronaphthalene	<1.19	<2.00	<1.53	<1.69	<0.031
Chrysene/Triphenylene/Benzo(b)anthracene	<1.84	<3.10	<2.36	<2.61	<0.048
Coronene	<5.94	<10.0	<7.64	<8.43	<0.16
Dibenzo(a,c/a,h)Anthracene	<1.19	<2.00	<1.53	<1.69	<0.031
Dibenzo(a,e)pyrene	<5.94	<10.0	<7.64	<8.43	<0.16
9,10-dimethylanthracene	<5.14	<8.63	<6.61	<7.29	<0.14
7,12-Dimethylbenzo(a)anthracene	<1.19	<2.00	<1.53	<1.69	<0.031
Fluoranthene	11.4	19.1	14.6	16.1	0.30
Fluorene	4.02	6.75	5.16	5.70	0.11
Indeno(1,2,3-cd)Pyrene	14.1	23.8	18.2	20.0	0.37
2-methylanthracene	2.33	3.94	3.00	3.31	0.061
3-Methylcholanthrene	<5.94	<10.0	<7.64	<8.43	<0.16
1-Methylnaphthalene	21.1	35.6	27.1	30.0	0.56
2-Methylnaphthalene	4.66	7.85	5.99	6.62	0.12
1-Methylphenanthrene	<1.19	<2.00	<1.53	<1.69	<0.031
9-Methylphenanthrene	1.63	2.76	2.10	2.32	0.043
Naphthalene	25.0	42.0	32.1	35.4	0.66
Perylene	<1.19	<2.00	<1.53	<1.69	<0.031
Phenanthrene	21.0	35.4	27.0	29.8	0.55
Picene	<5.94	<10.0	<7.64	<8.43	<0.16
Pyrene	18.4	31.0	23.6	26.1	0.48
Tetralin	30.4	51.2	39.0	43.1	0.80
m-terphenyl	<1.19	<2.00	<1.53	<1.69	<0.031
o-Terphenyl	<1.19	<2.00	<1.53	<1.69	<0.031
p-terphenyl	<1.19	<2.00	<1.53	<1.69	<0.031
Total	<273	<459	<350	<387	<7.17

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 80
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Polycyclic Aromatic Hydrocarbon Analyses

Compound	Blank Train ng	Laboratory Blank ng
Acenaphthene	<10	<10
Acenaphthylene	<10	<10
Anthracene	<10	<10
Benzo(a)Anthracene	<10	<10
Benzo(b)Fluoranthene	<10	<10
Benzo(k/j)Fluoranthene	<10	<10
Benzo(a)fluorene	<10	<10
Benzo(b)fluorene	<10	<10
Benzo(g,h,i)Perylene	38.3	<10
Benzo(a)Pyrene	<10	<10
Benzo(e)Pyrene	10.0	<10
Biphenyl	<10	<10
2-Chloronaphthalene	<10	<10
Chrysene/Triphenylene/Benzo(b)anthracene	<10	<10
Coronene	<50	<50
Dibenzo(a,c/a,h)Anthracene	<10	<10
Dibenzo(a,e)pyrene	<50	<50
9,10-dimethylanthracene	<10	<10
7,12-Dimethylbenzo(a)anthracene	<10	<10
Fluoranthene	26.2	<10
Fluorene	<10	<10
Indeno(1,2,3-cd)Pyrene	<10	<10
2-methylanthracene	<10	<10
3-Methylcholanthrene	<50	<50
1-Methylnaphthalene	159	158
2-Methylnaphthalene	17.4	<10
1-Methylphenanthrene	10.0	<10
9-Methylphenanthrene	<10	<10
Naphthalene	81.1	49.3
Perylene	<10	<10
Phenanthrene	31.9	<10
Picene	<50	<50
Pyrene	35.1	<10
Tetralin	202	416
m-terphenyl	<10	<10
o-Terphenyl	<10	<10
p-terphenyl	<10	<10
Total	<1041	<1123

"<" indicates that the amount detected is less than the detection limit. In these cases the value of the detection limit was used to calculate the total collected.

TABLE 81
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Acetaldehyde, Formaldehyde and Acrolein Emission Data

Acetaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acetaldehyde Concentration Actual µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acetaldehyde Emission Rate mg/s
1	1.1	0.0374	17.7	29.4	22.7	25.0	0.46
2	1.1	0.0343	18.9	32.1	24.4	26.9	0.50
3	1.4	0.0318	25.9	44.0	33.3	36.9	0.68
Average			20.8	35.1	26.8	29.6	0.55
Blank	0.49						

Formaldehyde

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Formaldehyde Concentration Actual µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Formaldehyde Emission Rate mg/s
1	1.6	0.0374	25.7	42.8	32.9	36.3	0.68
2	1.7	0.0343	29.2	49.5	37.6	41.5	0.77
3	1.8	0.0318	33.3	56.6	42.8	47.4	0.88
Average			29.4	49.6	37.8	41.7	0.77
Blank	0.88						

Acrolein

Test No.	Total Collected µg	Dry Volume Sampled Rm^3*	Acrolein Concentration Actual µg/m^3	Dry Reference µg/Rm^3*	Dry Adjusted µg/Rm^3**	Wet Reference µg/Rm^3*	Acrolein Emission Rate mg/s
1	<10	0.0374	<161	<267	<206	<227	<4.22
2	<10	0.0343	<172	<291	<221	<244	<4.52
3	<10	0.0318	<185	<314	<238	<263	<4.87
Average			<172	<291	<222	<245	<4.54
Blank	<10						

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

Sampling was conducted at a single point. Volumetric flowrates from the corresponding isokinetic tests were used to calculate emission data.

* At 25 °C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 82
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 16A/16B	Run No. 2 Tube 17A/17B	Run No. 4 Tube 19A/19B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	0.16	<0.1	<0.1	<0.12	30.8	<0.36
Benzene	<0.05	<0.05	<0.05	<0.050	-	<0.15
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.05	<0.05	<0.05	<0.050	-	<0.15
2-Butanone	0.027	0.019	0.030	0.025	23.2	0.075
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	0.010	<0.01	<0.010	0.5	<0.030
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	0.011	<0.01	<0.01	<0.010	4.2	<0.031
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	1.54	2.80	0.48	1.61	72.3	4.82
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	0.012	0.012	<0.012	11.7	<0.035
Toluene	0.11	<0.05	<0.05	<0.069	47.2	<0.21
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.050	-	<0.15
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	0.038	<0.03	<0.03	<0.033	14.1	<0.098
O-Xylene	0.012	<0.01	<0.01	<0.011	11.2	<0.032
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<2.40	<3.52	<1.21	<2.38	48.6	<7.13

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0210
Run No. 2	0.0213
Run No. 4	0.0209

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 83
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 2

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 20A/20B	Run No. 3 Tube 22A/22B	Run No. 4 Tube 23A/23B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	<0.1	<0.10	-	<0.30
Benzene	0.15	0.057	0.051	0.086	64.2	0.26
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.05	<0.05	<0.05	<0.050	-	<0.15
2-Butanone	0.033	0.024	0.039	0.032	23.7	0.096
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	<0.01	0.090	<0.037	126	<0.11
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	<0.1	<0.1	<0.1	<0.10	-	<0.30
Styrene	<0.02	<0.02	<0.02	<0.020	-	<0.060
Tetrachloroethene	<0.01	0.012	<0.01	<0.011	10.2	<0.032
Toluene	<0.05	<0.05	<0.05	<0.050	-	<0.15
1,1,1-Trichloroethane	<0.01	<0.01	0.072	<0.031	117	<0.092
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.050	-	<0.15
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<0.93	<0.83	<0.98	<0.92	8.3	<2.75

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0212
Run No. 3	0.0213
Run No. 4	0.0218

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 84
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Analyses
Test No. 3

Compound	Cartridge Amount Collected				Coefficient	Total
	Run No. 1 Tube 24A/24B	Run No. 2 Tube 25A/25B	Run No. 4 Tube 26A/26B	Average	of Variation	Collected
	µg	µg	µg	µg	%	µg
Acetone	<0.1	<0.1	<0.1	<0.10	-	<0.30
Benzene	<0.05	0.22	<0.05	<0.11	92.7	<0.32
Bromodichloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromoform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Bromomethane	<0.09	<0.09	<0.09	<0.090	-	<0.27
1,3-Butadiene	<0.05	<0.05	<0.05	<0.050	-	<0.15
2-Butanone	0.033	0.050	0.015	0.033	53.2	0.099
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.010	-	<0.030
Chloroform	<0.01	<0.01	<0.01	<0.010	-	<0.030
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Dibromochloromethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylbenzene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.020	-	<0.060
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.020	-	<0.060
Methylene Chloride	<0.1	<0.1	<0.1	<0.10	-	<0.30
Styrene	<0.02	0.28	<0.02	<0.11	140	<0.32
Tetrachloroethene	0.017	<0.01	0.013	<0.013	25.7	<0.040
Toluene	<0.05	<0.05	<0.05	<0.050	-	<0.15
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.050	-	<0.15
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.020	-	<0.060
M&P-Xylene	<0.03	<0.03	<0.03	<0.030	-	<0.090
O-Xylene	<0.01	<0.01	<0.01	<0.010	-	<0.030
Vinyl Chloride	<0.02	<0.02	<0.02	<0.020	-	<0.060
Total	<0.84	<1.28	<0.82	<0.98	26.5	<2.94

Dry Gas Volume Sampled (Rm^3*) :

Run No. 1	0.0204
Run No. 2	0.0194
Run No. 4	0.0203

* At 25°C and 1 atmosphere.

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

TABLE 85
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 1

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.36	<3.47	<5.77	<4.45	<4.90	<0.091
Benzene	<0.15	<1.43	<2.37	<1.83	<2.02	<0.037
Bromodichloromethane	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Bromoform	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Bromomethane	<0.27	<2.57	<4.27	<3.29	<3.63	<0.067
1,3-Butadiene	<0.15	<1.43	<2.37	<1.83	<2.02	<0.037
2-Butanone	0.075	0.72	1.19	0.92	1.01	0.019
Carbon Tetrachloride	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Chloroform	<0.030	<0.29	<0.48	<0.37	<0.40	<0.0075
Cumene (Isopropylbenzene)	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
Dibromochloromethane	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Dichlorodifluoromethane	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
trans,1,2-Dichloroethene	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
1,1-Dichloroethene	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
1,2-Dichloropropane	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Ethylbenzene	<0.031	<0.29	<0.49	<0.37	<0.41	<0.0077
Ethylene Dibromide	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
Methylene Chloride	4.82	45.8	76.3	58.8	64.8	1.21
Styrene	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
Tetrachloroethene	<0.035	<0.33	<0.55	<0.42	<0.47	<0.0087
Toluene	<0.21	<1.96	<3.26	<2.51	<2.77	<0.052
1,1,1-Trichloroethane	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.47	<0.37	<0.40	<0.0075
Trichlorotrifluoroethane	<0.15	<1.43	<2.37	<1.83	<2.02	<0.037
Trichlorofluoromethane	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
M&P-Xylene	<0.098	<0.93	<1.55	<1.20	<1.32	<0.024
O-Xylene	<0.032	<0.30	<0.51	<0.39	<0.43	<0.0080
Vinyl Chloride	<0.060	<0.57	<0.95	<0.73	<0.81	<0.015
Total	<7.13	<67.8	<113	<87.0	<95.9	<1.78

Dry Gas Volume Sampled (Rm^3*) :	0.0632
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 86
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 2

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.30	<2.81	<4.67	<3.60	<3.97	<0.074
Benzene	0.26	2.40	3.99	3.08	3.39	0.063
Bromodichloromethane	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Bromoform	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Bromomethane	<0.27	<2.53	<4.20	<3.24	<3.57	<0.066
1,3-Butadiene	<0.15	<1.40	<2.34	<1.80	<1.98	<0.037
2-Butanone	0.096	0.90	1.49	1.15	1.27	0.024
Carbon Tetrachloride	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Chloroform	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Cumene (Isopropylbenzene)	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
Dibromochloromethane	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Dichlorodifluoromethane	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
1,2-Dichloroethane	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
trans,1,2-Dichloroethene	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
1,1-Dichloroethene	<0.11	<1.03	<1.71	<1.32	<1.45	<0.027
1,2-Dichloropropane	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Ethylbenzene	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Ethylene Dibromide	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
Methylene Chloride	<0.30	<2.81	<4.67	<3.60	<3.97	<0.074
Styrene	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
Tetrachloroethene	<0.032	<0.30	<0.50	<0.38	<0.42	<0.0078
Toluene	<0.15	<1.40	<2.34	<1.80	<1.98	<0.037
1,1,1-Trichloroethane	<0.092	<0.86	<1.43	<1.10	<1.22	<0.023
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Trichlorotrifluoroethane	<0.15	<1.40	<2.34	<1.80	<1.98	<0.037
Trichlorofluoromethane	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
M&P-Xylene	<0.090	<0.84	<1.40	<1.08	<1.19	<0.022
O-Xylene	<0.030	<0.28	<0.47	<0.36	<0.40	<0.0074
Vinyl Chloride	<0.060	<0.56	<0.93	<0.72	<0.79	<0.015
Total	<2.75	<25.7	<42.7	<32.9	<36.3	<0.68

Dry Gas Volume Sampled (Rm^3*) :	0.0642
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.8
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 87
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Data
Test No. 3

Compound	Total Collected µg	Actual Concentration µg/m^3	Dry Reference Concentration µg/Rm^3*	Dry Adjusted Concentration µg/Rm^3**	Wet Reference Concentration µg/Rm^3*	Emission Rate mg/s
Acetone	<0.30	<2.94	<4.99	<3.77	<4.18	<0.077
Benzene	<0.32	<3.16	<5.37	<4.06	<4.50	<0.083
Bromodichloromethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Bromoform	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Bromomethane	<0.27	<2.65	<4.49	<3.40	<3.76	<0.070
1,3-Butadiene	<0.15	<1.47	<2.50	<1.89	<2.09	<0.039
2-Butanone	0.099	0.97	1.64	1.24	1.37	0.025
Carbon Tetrachloride	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Chloroform	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Cumene (Isopropylbenzene)	<0.060	<0.59	<1.00	<0.75	<0.84	<0.015
Dibromochloromethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Dichlorodifluoromethane	<0.060	<0.59	<1.00	<0.75	<0.84	<0.015
1,2-Dichloroethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
trans,1,2-Dichloroethene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
1,1-Dichloroethene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
1,2-Dichloropropane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Ethylbenzene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Ethylene Dibromide	<0.060	<0.59	<1.00	<0.75	<0.84	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.060	<0.59	<1.00	<0.75	<0.84	<0.015
Methylene Chloride	<0.30	<2.94	<4.99	<3.77	<4.18	<0.077
Styrene	<0.32	<3.09	<5.24	<3.96	<4.39	<0.081
Tetrachloroethene	<0.040	<0.39	<0.66	<0.50	<0.56	<0.010
Toluene	<0.15	<1.47	<2.50	<1.89	<2.09	<0.039
1,1,1-Trichloroethane	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Trichloroethene/1,1,2-Trichloroethene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Trichlorotrifluoroethane	<0.15	<1.47	<2.50	<1.89	<2.09	<0.039
Trichlorofluoromethane	<0.060	<0.59	<1.00	<0.75	<0.84	<0.015
M&P-Xylene	<0.090	<0.88	<1.50	<1.13	<1.25	<0.023
O-Xylene	<0.030	<0.29	<0.50	<0.38	<0.42	<0.0077
Vinyl Chloride	<0.060	<0.59	<1.00	<0.75	<0.84	<0.015
Total	<2.94	<28.8	<48.8	<36.9	<40.9	<0.76

Dry Gas Volume Sampled (Rm^3*) :	0.0601
Actual Flowrate (m^3/s) :	26.3
Dry Reference Flowrate (Rm^3/s*) :	15.5
Dry Adjusted Flowrate (Rm^3/s**) :	20.5
Wet Reference Flowrate (Rm^3/s*) :	18.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 88
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Actual Concentrations

Compound	Actual Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Acetone	<3.47	<2.81	<2.94	<3.07
Benzene	<1.43	2.40	<3.16	<2.33
Bromodichloromethane	<0.29	<0.28	<0.29	<0.29
Bromoform	<0.29	<0.28	<0.29	<0.29
Bromomethane	<2.57	<2.53	<2.65	<2.58
1,3-Butadiene	<1.43	<1.40	<1.47	<1.43
2-Butanone	0.72	0.90	0.97	0.86
Carbon Tetrachloride	<0.29	<0.28	<0.29	<0.29
Chloroform	<0.29	<0.28	<0.29	<0.29
Cumene (Isopropylbenzene)	<0.57	<0.56	<0.59	<0.57
Dibromochloromethane	<0.29	<0.28	<0.29	<0.29
Dichlorodifluoromethane	<0.57	<0.56	<0.59	<0.57
1,2-Dichloroethane	<0.29	<0.28	<0.29	<0.29
trans,1,2-Dichloroethene	<0.29	<0.28	<0.29	<0.29
1,1-Dichloroethene	<0.29	<1.03	<0.29	<0.53
1,2-Dichloropropane	<0.29	<0.28	<0.29	<0.29
Ethylbenzene	<0.29	<0.28	<0.29	<0.29
Ethylene Dibromide	<0.57	<0.56	<0.59	<0.57
Mesitylene (1,3,5-Trimethylbenzene)	<0.57	<0.56	<0.59	<0.57
Methylene Chloride	45.8	<2.81	<2.94	<17.2
Styrene	<0.57	<0.56	<3.09	<1.41
Tetrachloroethene	<0.33	<0.30	<0.39	<0.34
Toluene	<1.96	<1.40	<1.47	<1.61
1,1,1-Trichloroethane	<0.29	<0.86	<0.29	<0.48
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.28	<0.29	<0.29
Trichlorotrifluoroethane	<1.43	<1.40	<1.47	<1.43
Trichlorofluoromethane	<0.57	<0.56	<0.59	<0.57
M&P-Xylene	<0.93	<0.84	<0.88	<0.89
O-Xylene	<0.30	<0.28	<0.29	<0.29
Vinyl Chloride	<0.57	<0.56	<0.59	<0.57
Total	<67.8	<25.7	<28.8	<40.8

TABLE 89
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Dry Reference Concentrations

Compound	Dry Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	<5.77	<4.67	<4.99	<5.14
Benzene	<2.37	3.99	<5.37	<3.91
Bromodichloromethane	<0.47	<0.47	<0.50	<0.48
Bromoform	<0.47	<0.47	<0.50	<0.48
Bromomethane	<4.27	<4.20	<4.49	<4.32
1,3-Butadiene	<2.37	<2.34	<2.50	<2.40
2-Butanone	1.19	1.49	1.64	1.44
Carbon Tetrachloride	<0.47	<0.47	<0.50	<0.48
Chloroform	<0.48	<0.47	<0.50	<0.48
Cumene (Isopropylbenzene)	<0.95	<0.93	<1.00	<0.96
Dibromochloromethane	<0.47	<0.47	<0.50	<0.48
Dichlorodifluoromethane	<0.95	<0.93	<1.00	<0.96
1,2-Dichloroethane	<0.47	<0.47	<0.50	<0.48
trans,1,2-Dichloroethene	<0.47	<0.47	<0.50	<0.48
1,1-Dichloroethene	<0.47	<1.71	<0.50	<0.89
1,2-Dichloropropane	<0.47	<0.47	<0.50	<0.48
Ethylbenzene	<0.49	<0.47	<0.50	<0.48
Ethylene Dibromide	<0.95	<0.93	<1.00	<0.96
Mesitylene (1,3,5-Trimethylbenzene)	<0.95	<0.93	<1.00	<0.96
Methylene Chloride	76.3	<4.67	<4.99	<28.6
Styrene	<0.95	<0.93	<5.24	<2.37
Tetrachloroethene	<0.55	<0.50	<0.66	<0.57
Toluene	<3.26	<2.34	<2.50	<2.70
1,1,1-Trichloroethane	<0.47	<1.43	<0.50	<0.80
Trichloroethene/1,1,2-Trichloroethene	<0.47	<0.47	<0.50	<0.48
Trichlorotrifluoroethane	<2.37	<2.34	<2.50	<2.40
Trichlorofluoromethane	<0.95	<0.93	<1.00	<0.96
M&P-Xylene	<1.55	<1.40	<1.50	<1.48
O-Xylene	<0.51	<0.47	<0.50	<0.49
Vinyl Chloride	<0.95	<0.93	<1.00	<0.96
Total	<113	<42.7	<48.8	<68.1

* At 25°C and 1 atmosphere

TABLE 90
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Dry Adjusted Concentrations

Compound	Dry Adjusted Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	<4.45	<3.60	<3.77	<3.94
Benzene	<1.83	3.08	<4.06	<2.99
Bromodichloromethane	<0.37	<0.36	<0.38	<0.37
Bromoform	<0.37	<0.36	<0.38	<0.37
Bromomethane	<3.29	<3.24	<3.40	<3.31
1,3-Butadiene	<1.83	<1.80	<1.89	<1.84
2-Butanone	0.92	1.15	1.24	1.10
Carbon Tetrachloride	<0.37	<0.36	<0.38	<0.37
Chloroform	<0.37	<0.36	<0.38	<0.37
Cumene (Isopropylbenzene)	<0.73	<0.72	<0.75	<0.74
Dibromochloromethane	<0.37	<0.36	<0.38	<0.37
Dichlorodifluoromethane	<0.73	<0.72	<0.75	<0.74
1,2-Dichloroethane	<0.37	<0.36	<0.38	<0.37
trans,1,2-Dichloroethene	<0.37	<0.36	<0.38	<0.37
1,1-Dichloroethene	<0.37	<1.32	<0.38	<0.69
1,2-Dichloropropane	<0.37	<0.36	<0.38	<0.37
Ethylbenzene	<0.37	<0.36	<0.38	<0.37
Ethylene Dibromide	<0.73	<0.72	<0.75	<0.74
Mesitylene (1,3,5-Trimethylbenzene)	<0.73	<0.72	<0.75	<0.74
Methylene Chloride	58.8	<3.60	<3.77	<22.1
Styrene	<0.73	<0.72	<3.96	<1.80
Tetrachloroethene	<0.42	<0.38	<0.50	<0.44
Toluene	<2.51	<1.80	<1.89	<2.07
1,1,1-Trichloroethane	<0.37	<1.10	<0.38	<0.62
Trichloroethene/1,1,2-Trichloroethene	<0.37	<0.36	<0.38	<0.37
Trichlorotrifluoroethane	<1.83	<1.80	<1.89	<1.84
Trichlorofluoromethane	<0.73	<0.72	<0.75	<0.74
M&P-Xylene	<1.20	<1.08	<1.13	<1.14
O-Xylene	<0.39	<0.36	<0.38	<0.38
Vinyl Chloride	<0.73	<0.72	<0.75	<0.74
Total	<87.0	<32.9	<36.9	<52.3

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 91
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Wet Reference Concentrations

Compound	Wet Reference Concentration			
	Test No. 1	Test No. 2	Test No. 3	Average
	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*	µg/Rm^3*
Acetone	<4.90	<3.97	<4.18	<4.35
Benzene	<2.02	3.39	<4.50	<3.30
Bromodichloromethane	<0.40	<0.40	<0.42	<0.41
Bromoform	<0.40	<0.40	<0.42	<0.41
Bromomethane	<3.63	<3.57	<3.76	<3.65
1,3-Butadiene	<2.02	<1.98	<2.09	<2.03
2-Butanone	1.01	1.27	1.37	1.22
Carbon Tetrachloride	<0.40	<0.40	<0.42	<0.41
Chloroform	<0.40	<0.40	<0.42	<0.41
Cumene (Isopropylbenzene)	<0.81	<0.79	<0.84	<0.81
Dibromochloromethane	<0.40	<0.40	<0.42	<0.41
Dichlorodifluoromethane	<0.81	<0.79	<0.84	<0.81
1,2-Dichloroethane	<0.40	<0.40	<0.42	<0.41
trans,1,2-Dichloroethene	<0.40	<0.40	<0.42	<0.41
1,1-Dichloroethene	<0.40	<1.45	<0.42	<0.76
1,2-Dichloropropane	<0.40	<0.40	<0.42	<0.41
Ethylbenzene	<0.41	<0.40	<0.42	<0.41
Ethylene Dibromide	<0.81	<0.79	<0.84	<0.81
Mesitylene (1,3,5-Trimethylbenzene)	<0.81	<0.79	<0.84	<0.81
Methylene Chloride	64.8	<3.97	<4.18	<24.3
Styrene	<0.81	<0.79	<4.39	<2.00
Tetrachloroethene	<0.47	<0.42	<0.56	<0.48
Toluene	<2.77	<1.98	<2.09	<2.28
1,1,1-Trichloroethane	<0.40	<1.22	<0.42	<0.68
Trichloroethene/1,1,2-Trichloroethene	<0.40	<0.40	<0.42	<0.41
Trichlorotrifluoroethane	<2.02	<1.98	<2.09	<2.03
Trichlorofluoromethane	<0.81	<0.79	<0.84	<0.81
M&P-Xylene	<1.32	<1.19	<1.25	<1.25
O-Xylene	<0.43	<0.40	<0.42	<0.42
Vinyl Chloride	<0.81	<0.79	<0.84	<0.81
Total	<95.9	<36.3	<40.9	<57.7

* At 25°C and 1 atmosphere

TABLE 92
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organic Emission Rates

Compound	Emission Rate			
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s
Acetone	<0.091	<0.074	<0.077	<0.081
Benzene	<0.037	0.063	<0.083	<0.061
Bromodichloromethane	<0.0075	<0.0074	<0.0077	<0.0075
Bromoform	<0.0075	<0.0074	<0.0077	<0.0075
Bromomethane	<0.067	<0.066	<0.070	<0.068
1,3-Butadiene	<0.037	<0.037	<0.039	<0.038
2-Butanone	0.019	0.024	0.025	0.023
Carbon Tetrachloride	<0.0075	<0.0074	<0.0077	<0.0075
Chloroform	<0.0075	<0.0074	<0.0077	<0.0075
Cumene (Isopropylbenzene)	<0.015	<0.015	<0.015	<0.015
Dibromochloromethane	<0.0075	<0.0074	<0.0077	<0.0075
Dichlorodifluoromethane	<0.015	<0.015	<0.015	<0.015
1,2-Dichloroethane	<0.0075	<0.0074	<0.0077	<0.0075
trans,1,2-Dichloroethene	<0.0075	<0.0074	<0.0077	<0.0075
1,1-Dichloroethene	<0.0075	<0.027	<0.0077	<0.014
1,2-Dichloropropane	<0.0075	<0.0074	<0.0077	<0.0075
Ethylbenzene	<0.0077	<0.0074	<0.0077	<0.0076
Ethylene Dibromide	<0.015	<0.015	<0.015	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.015	<0.015	<0.015	<0.015
Methylene Chloride	1.21	<0.074	<0.077	<0.45
Styrene	<0.015	<0.015	<0.081	<0.037
Tetrachloroethene	<0.0087	<0.0078	<0.010	<0.0089
Toluene	<0.052	<0.037	<0.039	<0.042
1,1,1-Trichloroethane	<0.0075	<0.023	<0.0077	<0.013
Trichloroethene/1,1,2-Trichloroethene	<0.0075	<0.0074	<0.0077	<0.0075
Trichlorotrifluoroethane	<0.037	<0.037	<0.039	<0.038
Trichlorofluoromethane	<0.015	<0.015	<0.015	<0.015
M&P-Xylene	<0.024	<0.022	<0.023	<0.023
O-Xylene	<0.0080	<0.0074	<0.0077	<0.0077
Vinyl Chloride	<0.015	<0.015	<0.015	<0.015
Total	<1.78	<0.68	<0.76	<1.07

TABLE 93
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Volatile Organic Emission Data

Compound	Actual Concentration $\mu g/m^3$	Dry Reference Concentration $\mu g/Rm^3$*	Dry Adjusted Concentration $\mu g/Rm^3$*	Wet Reference Concentration $\mu g/Rm^3$*	Emission Rate mg/s
Acetone	<3.07	<5.14	<3.94	<4.35	<0.081
Benzene	<2.33	<3.91	<2.99	<3.30	<0.061
Bromodichloromethane	<0.29	<0.48	<0.37	<0.41	<0.0075
Bromoform	<0.29	<0.48	<0.37	<0.41	<0.0075
Bromomethane	<2.58	<4.32	<3.31	<3.65	<0.068
1,3-Butadiene	<1.43	<2.40	<1.84	<2.03	<0.038
2-Butanone	0.86	1.44	1.10	1.22	0.023
Carbon Tetrachloride	<0.29	<0.48	<0.37	<0.41	<0.0075
Chloroform	<0.29	<0.48	<0.37	<0.41	<0.0075
Cumene (Isopropylbenzene)	<0.57	<0.96	<0.74	<0.81	<0.015
Dibromochloromethane	<0.29	<0.48	<0.37	<0.41	<0.0075
Dichlorodifluoromethane	<0.57	<0.96	<0.74	<0.81	<0.015
1,2-Dichloroethane	<0.29	<0.48	<0.37	<0.41	<0.0075
trans,1,2-Dichloroethene	<0.29	<0.48	<0.37	<0.41	<0.0075
1,1-Dichloroethene	<0.53	<0.89	<0.69	<0.76	<0.014
1,2-Dichloropropane	<0.29	<0.48	<0.37	<0.41	<0.0075
Ethylbenzene	<0.29	<0.48	<0.37	<0.41	<0.0076
Ethylene Dibromide	<0.57	<0.96	<0.74	<0.81	<0.015
Mesitylene (1,3,5-Trimethylbenzene)	<0.57	<0.96	<0.74	<0.81	<0.015
Methylene Chloride	<17.2	<28.6	<22.1	<24.3	<0.45
Styrene	<1.41	<2.37	<1.80	<2.00	<0.037
Tetrachloroethene	<0.34	<0.57	<0.44	<0.48	<0.0089
Toluene	<1.61	<2.70	<2.07	<2.28	<0.042
1,1,1-Trichloroethane	<0.48	<0.80	<0.62	<0.68	<0.013
Trichloroethene/1,1,2-Trichloroethene	<0.29	<0.48	<0.37	<0.41	<0.0075
Trichlorotrifluoroethane	<1.43	<2.40	<1.84	<2.03	<0.038
Trichlorofluoromethane	<0.57	<0.96	<0.74	<0.81	<0.015
M&P-Xylene	<0.89	<1.48	<1.14	<1.25	<0.023
O-Xylene	<0.29	<0.49	<0.38	<0.42	<0.0077
Vinyl Chloride	<0.57	<0.96	<0.74	<0.81	<0.015
Total	<40.8	<68.1	<52.3	<57.7	<1.07

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 94
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Volatile Organic Analyses

Compound	Field Blank 1 Tube 15A/15B	Field Blank 2 Tube 30A/30B	Field Blank 3 Tube 13A/13B	Trip Blank Tube 14A/14B	Method Blank
	µg	µg	µg	µg	µg
Acetone	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	<0.05	<0.05	<0.05	<0.05	<0.05
Bromodichloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Bromoform	<0.01	<0.01	<0.01	<0.01	<0.01
Bromomethane	<0.09	<0.09	<0.09	<0.09	<0.09
1,3-Butadiene	<0.05	<0.05	<0.05	<0.05	<0.05
2-Butanone	0.038	<0.01	0.012	<0.01	<0.01
Carbon Tetrachloride	<0.01	<0.01	<0.01	<0.01	<0.01
Chloroform	<0.01	<0.01	<0.01	<0.01	<0.01
Cumene (Isopropylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorodifluoromethane	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
trans,1,2-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,1-Dichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichloropropane	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02	<0.02
Mesitylene (1,3,5-Trimethylbenzene)	<0.02	<0.02	<0.02	<0.02	<0.02
Methylene Chloride	<0.1	<0.1	<0.1	<0.1	<0.1
Styrene	<0.02	<0.02	<0.02	<0.02	<0.02
Tetrachloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	<0.01	<0.01	<0.01	<0.01	<0.01
Trichloroethene/1,1,2-Trichloroethene	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorotrifluoroethane	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	<0.02	<0.02	<0.02	<0.02	<0.02
M&P-Xylene	<0.03	<0.03	<0.03	<0.03	<0.03
O-Xylene	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	<0.02	<0.02	<0.02	<0.02	<0.02
Total	<0.84	<0.81	<0.81	<0.81	<0.81

Note: "<" indicates that the analyte was not detected. Any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

APPENDIX 3

Boiler No. 1 Quench Inlet
Data Tables
(34 pages)

TABLE 1
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Test Schedule

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 12, 2017	9:38	13:18	180
2	October 12, 2017	15:01	18:40	180
3	October 13, 2017	8:33	12:23	180

Total Hydrocarbons Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 10, 2017	10:25	11:25	60
2	October 10, 2017	11:45	12:45	60
3	October 10, 2017	12:50	13:50	60

* Actual sampling time excluding leak-checks, traverse changes and process down time.

TABLE 2
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Stack Gas Sampling Parameters

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.846	1.004	6.04	3.166	102.2
2	0.846	1.004	6.04	3.196	101.9
3	0.846	1.004	6.04	3.220	101.4

* Dry at 25°C and 1 atmosphere

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Stack Gas Physical Parameters

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	167	16.2	17.6	-0.62	101.1	11.1	7.61
2	167	15.4	17.7	-0.62	101.0	11.0	7.65
3	167	15.7	18.1	-0.59	100.8	10.8	8.02
Average	167	15.8	17.8	-0.61	101.0	11.0	7.76

* Dry basis, measured by the DYEC CEMS

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Stack Gas Volumetric Flowrates

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	26.1	14.8	19.8	17.6
2	26.2	15.0	20.0	17.7
3	26.7	15.2	19.7	18.0
Average	26.3	15.0	19.8	17.8

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 5
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Total Hydrocarbons Analyses

Total Hydrocarbons as 1-Minute Average Data

Test No.	Parameter	Minimum	Average	Maximum
1	Total Hydrocarbons (ppm dry)	0	0.6	1.7
2	Total Hydrocarbons (ppm dry)	0	0.1	1.5
3	Total Hydrocarbons (ppm dry)	0	0.1	0.2
Average	Total Hydrocarbons (ppm dry)		0.3	

Total Hydrocarbons as 10-Minute Rolling Average Data

Test No.	Parameter	Minimum	Average	Maximum
1	Total Hydrocarbons (ppm dry)	0	0.6	1.3
2	Total Hydrocarbons (ppm dry)	0	0.1	0.6
3	Total Hydrocarbons (ppm dry)	0	0	0.1
Average	Total Hydrocarbons (ppm dry)		0.2	

Note: Total hydrocarbons reported on a dry basis as equivalent methane

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Emission Data
Test No. 1

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	7280	1.30	2.30	1.71	1.93	33.9
Pentachlorodibenzo-p-dioxins	7100	1.27	2.24	1.67	1.88	33.1
Hexachlorodibenzo-p-dioxins	7040	1.26	2.22	1.66	1.86	32.8
Heptachlorodibenzo-p-dioxins	7530	1.35	2.38	1.77	1.99	35.1
Octachlorodibenzo-p-dioxin	10000	1.79	3.16	2.35	2.65	46.6
Total	38950	6.97	12.3	9.16	10.3	182

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	107000	19.1	33.8	25.2	28.3	499
Pentachlorodibenzofurans	54100	9.68	17.1	12.7	14.3	252
Hexachlorodibenzofurans	24900	4.46	7.86	5.86	6.59	116
Heptachlorodibenzofurans	13400	2.40	4.23	3.15	3.55	62.5
Octachlorodibenzofuran	1900	0.34	0.60	0.45	0.50	8.86
Total	201300	36.0	63.6	47.3	53.3	938

Dry Gas Volume Sampled (Rm^3*) :	3.166
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Emission Data
Test No. 2

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	6800	1.21	2.13	1.59	1.80	31.8
Pentachlorodibenzo-p-dioxins	5920	1.06	1.85	1.38	1.57	27.7
Hexachlorodibenzo-p-dioxins	5830	1.04	1.82	1.36	1.54	27.3
Heptachlorodibenzo-p-dioxins	6550	1.17	2.05	1.53	1.73	30.6
Octachlorodibenzo-p-dioxin	7690	1.37	2.41	1.80	2.03	36.0
Total	32790	5.85	10.3	7.67	8.67	153

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	113000	20.2	35.4	26.4	29.9	529
Pentachlorodibenzofurans	60800	10.9	19.0	14.2	16.1	284
Hexachlorodibenzofurans	31400	5.60	9.82	7.34	8.30	147
Heptachlorodibenzofurans	15600	2.78	4.88	3.65	4.13	73.0
Octachlorodibenzofuran	2020	0.36	0.63	0.47	0.53	9.45
Total	222820	39.8	69.7	52.1	58.9	1042

Dry Gas Volume Sampled (Rm^3*) :	3.196
Actual Flowrate (m^3/s) :	26.2
Dry Reference Flowrate (Rm^3/s*) :	15.0
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	10400	1.83	3.23	2.48	2.72	48.9
Pentachlorodibenzo-p-dioxins	8800	1.55	2.73	2.10	2.30	41.4
Hexachlorodibenzo-p-dioxins	6690	1.18	2.08	1.60	1.75	31.5
Heptachlorodibenzo-p-dioxins	6930	1.22	2.15	1.65	1.81	32.6
Octachlorodibenzo-p-dioxin	8870	1.56	2.75	2.12	2.32	41.7
Total	41690	7.35	12.9	10.0	10.9	196

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	181000	31.9	56.2	43.2	47.4	852
Pentachlorodibenzofurans	78300	13.8	24.3	18.7	20.5	368
Hexachlorodibenzofurans	31000	5.47	9.63	7.40	8.11	146
Heptachlorodibenzofurans	14900	2.63	4.63	3.56	3.90	70.1
Octachlorodibenzofuran	2130	0.38	0.66	0.51	0.56	10.0
Total	307330	54.2	95.4	73.4	80.4	1446

Dry Gas Volume Sampled (Rm^3*) :	3.220
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	19.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	1.30	1.21	1.83	1.45	23.1
Pentachlorodibenzo-p-dioxins	1.27	1.06	1.55	1.29	19.2
Hexachlorodibenzo-p-dioxins	1.26	1.04	1.18	1.16	9.6
Heptachlorodibenzo-p-dioxins	1.35	1.17	1.22	1.25	7.4
Octachlorodibenzo-p-dioxin	1.79	1.37	1.56	1.58	13.3
Total	6.97	5.85	7.35	6.72	11.6

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	19.1	20.2	31.9	23.7	29.9
Pentachlorodibenzofurans	9.68	10.9	13.8	11.4	18.6
Hexachlorodibenzofurans	4.46	5.60	5.47	5.18	12.1
Heptachlorodibenzofurans	2.40	2.78	2.63	2.60	7.5
Octachlorodibenzofuran	0.34	0.36	0.38	0.36	5.0
Total	36.0	39.8	54.2	43.3	22.1

TABLE 10
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Dry Reference Concentrations

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	2.30	2.13	3.23	2.55	23.2
Pentachlorodibenzo-p-dioxins	2.24	1.85	2.73	2.28	19.4
Hexachlorodibenzo-p-dioxins	2.22	1.82	2.08	2.04	9.9
Heptachlorodibenzo-p-dioxins	2.38	2.05	2.15	2.19	7.7
Octachlorodibenzo-p-dioxin	3.16	2.41	2.75	2.77	13.6
Total	12.3	10.3	12.9	11.8	11.9

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	33.8	35.4	56.2	41.8	29.9
Pentachlorodibenzofurans	17.1	19.0	24.3	20.1	18.6
Hexachlorodibenzofurans	7.86	9.82	9.63	9.11	11.9
Heptachlorodibenzofurans	4.23	4.88	4.63	4.58	7.1
Octachlorodibenzofuran	0.60	0.63	0.66	0.63	4.9
Total	63.6	69.7	95.4	76.2	22.2

* At 25°C and 1 atmosphere

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Dioxins

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	1.71	1.59	2.48	1.93	25.1
Pentachlorodibenzo-p-dioxins	1.67	1.38	2.10	1.72	21.0
Hexachlorodibenzo-p-dioxins	1.66	1.36	1.60	1.54	10.1
Heptachlorodibenzo-p-dioxins	1.77	1.53	1.65	1.65	7.3
Octachlorodibenzo-p-dioxin	2.35	1.80	2.12	2.09	13.3
Total	9.16	7.67	10.0	8.93	13.0

Furans

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	25.2	26.4	43.2	31.6	31.9
Pentachlorodibenzofurans	12.7	14.2	18.7	15.2	20.4
Hexachlorodibenzofurans	5.86	7.34	7.40	6.87	12.7
Heptachlorodibenzofurans	3.15	3.65	3.56	3.45	7.6
Octachlorodibenzofuran	0.45	0.47	0.51	0.48	6.5
Total	47.3	52.1	73.4	57.6	24.1

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Wet Reference Concentrations

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	1.93	1.80	2.72	2.15	23.3
Pentachlorodibenzo-p-dioxins	1.88	1.57	2.30	1.92	19.3
Hexachlorodibenzo-p-dioxins	1.86	1.54	1.75	1.72	9.5
Heptachlorodibenzo-p-dioxins	1.99	1.73	1.81	1.85	7.2
Octachlorodibenzo-p-dioxin	2.65	2.03	2.32	2.33	13.1
Total	10.3	8.67	10.9	10.0	11.6

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	28.3	29.9	47.4	35.2	30.1
Pentachlorodibenzofurans	14.3	16.1	20.5	17.0	18.8
Hexachlorodibenzofurans	6.59	8.30	8.11	7.67	12.3
Heptachlorodibenzofurans	3.55	4.13	3.90	3.86	7.6
Octachlorodibenzofuran	0.50	0.53	0.56	0.53	5.2
Total	53.3	58.9	80.4	64.2	22.3

* At 25°C and 1 atmosphere

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Congener Group Emission Rates

Dioxins

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	33.9	31.8	48.9	38.2	24.4
Pentachlorodibenzo-p-dioxins	33.1	27.7	41.4	34.1	20.3
Hexachlorodibenzo-p-dioxins	32.8	27.3	31.5	30.5	9.5
Heptachlorodibenzo-p-dioxins	35.1	30.6	32.6	32.8	6.8
Octachlorodibenzo-p-dioxin	46.6	36.0	41.7	41.4	12.9
Total	182	153	196	177	12.3

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	499	529	852	626	31.2
Pentachlorodibenzofurans	252	284	368	302	19.9
Hexachlorodibenzofurans	116	147	146	136	12.8
Heptachlorodibenzofurans	62.5	73.0	70.1	68.5	7.9
Octachlorodibenzofuran	8.86	9.45	10.0	9.44	6.2
Total	938	1042	1446	1142	23.5

TABLE 14
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Summary of Dioxin and Furan Congener Group Emission Data

Dioxins

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzo-p-dioxins	1.45	2.55	1.93	2.15	38.2
Pentachlorodibenzo-p-dioxins	1.29	2.28	1.72	1.92	34.1
Hexachlorodibenzo-p-dioxins	1.16	2.04	1.54	1.72	30.5
Heptachlorodibenzo-p-dioxins	1.25	2.19	1.65	1.85	32.8
Octachlorodibenzo-p-dioxin	1.58	2.77	2.09	2.33	41.4
Total	6.72	11.8	8.93	10.0	177

Furans

Congener Group	Actual Concentration ng/m³	Dry Reference Concentration ng/Rm³*	Dry Adjusted Concentration ng/Rm³**	Wet Reference Concentration ng/Rm³*	Emission Rate ng/s
Tetrachlorodibenzofurans	23.7	41.8	31.6	35.2	626
Pentachlorodibenzofurans	11.4	20.1	15.2	17.0	302
Hexachlorodibenzofurans	5.18	9.11	6.87	7.67	136
Heptachlorodibenzofurans	2.60	4.58	3.45	3.86	68.5
Octachlorodibenzofuran	0.36	0.63	0.48	0.53	9.44
Total	43.3	76.2	57.6	64.2	1142

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 15
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Blank Dioxin and Furan Congener Group Analyses

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<9.0	<10
Pentachlorodibenzo-p-dioxins	<6.2	<4.2
Hexachlorodibenzo-p-dioxins	<3.9	<4.7
Heptachlorodibenzo-p-dioxins	<3.6	<3.5
Octachlorodibenzo-p-dioxin	<51	<7.0
Total	<73.7	<29.4

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	259	<7.1
Pentachlorodibenzofurans	152	<4.9
Hexachlorodibenzofurans	71.8	<3.3
Heptachlorodibenzofurans	<8.3	<4.2
Octachlorodibenzofuran	<76	<5.8
Total	<567	<25.3

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 16
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	568	102	179	134	150	2.65
12378-pentachlorodibenzo-p-dioxin	720	129	227	169	191	3.36
123478-hexachlorodibenzo-p-dioxin	431	77.1	136	101	114	2.01
123678-hexachlorodibenzo-p-dioxin	587	105	185	138	155	2.74
123789-hexachlorodibenzo-p-dioxin	534	95.6	169	126	141	2.49
1234678-heptachlorodibenzo-p-dioxin	3610	646	1140	849	955	16.8
Octachlorodibenzo-p-dioxin	10000	1790	3159	2352	2646	46.6
2378-tetrachlorodibenzofuran	3500	626	1105	823	926	16.3
12378-pentachlorodibenzofuran	3640	651	1150	856	963	17.0
23478-pentachlorodibenzofuran	3390	607	1071	797	897	15.8
123478-hexachlorodibenzofuran	2830	506	894	666	749	13.2
123678-hexachlorodibenzofuran	3040	544	960	715	804	14.2
234678-hexachlorodibenzofuran	2240	401	708	527	593	10.4
123789-hexachlorodibenzofuran	536	95.9	169	126	142	2.50
1234678-heptachlorodibenzofuran	9960	1782	3146	2343	2635	46.4
1234789-heptachlorodibenzofuran	664	119	210	156	176	3.10
Octachlorodibenzofuran	1900	340	600	447	503	8.86
PCB 81	180	32.2	56.9	42.3	47.6	0.84
PCB 77	993	178	314	234	263	4.63
PCB 123	<740	<132	<234	<174	<196	<3.45
PCB 118	3600	644	1137	847	953	16.8
PCB 114	311	55.7	98.2	73.2	82.3	1.45
PCB 105	1400	251	442	329	370	6.53
PCB 126	463	82.9	146	109	123	2.16
PCB 167	<150	<26.8	<47.4	<35.3	<39.7	<0.70
PCB 156	308	55.1	97.3	72.4	81.5	1.44
PCB 157	174	31.1	55.0	40.9	46.0	0.81
PCB 169	<150	<26.8	<47.4	<35.3	<39.7	<0.70
PCB 189	239	42.8	75.5	56.2	63.2	1.11
Total Dioxins & Furans Only	48150	8617	15208	11326	12740	224
Total PCBs Only	<8708	<1558	<2750	<2048	<2304	<40.6
Total Dioxins & Furans and PCBs	<56858	<10176	<17959	<13374	<15044	<265

Dry Gas Volume Sampled (Rm^3*) :	3.166
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 17
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	589	105	184	138	156	2.76
12378-pentachlorodibenzo-p-dioxin	812	145	254	190	215	3.80
123478-hexachlorodibenzo-p-dioxin	351	62.6	110	82.1	92.8	1.64
123678-hexachlorodibenzo-p-dioxin	477	85.1	149	112	126	2.23
123789-hexachlorodibenzo-p-dioxin	562	100	176	131	149	2.63
1234678-heptachlorodibenzo-p-dioxin	3150	562	986	736	833	14.7
Octachlorodibenzo-p-dioxin	7690	1372	2406	1798	2033	36.0
2378-tetrachlorodibenzofuran	3610	644	1130	844	955	16.9
12378-pentachlorodibenzofuran	4210	751	1317	984	1113	19.7
23478-pentachlorodibenzofuran	4020	717	1258	940	1063	18.8
123478-hexachlorodibenzofuran	3530	630	1105	825	933	16.5
123678-hexachlorodibenzofuran	3740	667	1170	874	989	17.5
234678-hexachlorodibenzofuran	2530	452	792	591	669	11.8
123789-hexachlorodibenzofuran	555	99.1	174	130	147	2.60
1234678-heptachlorodibenzofuran	11300	2017	3536	2642	2988	52.9
1234789-heptachlorodibenzofuran	879	157	275	205	232	4.11
Octachlorodibenzofuran	2020	361	632	472	534	9.45
PCB 81	<110	<19.6	<34.4	<25.7	<29.1	<0.51
PCB 77	872	156	273	204	231	4.08
PCB 123	<660	<118	<207	<154	<175	<3.09
PCB 118	3160	564	989	739	836	14.8
PCB 114	274	48.9	85.7	64.1	72.5	1.28
PCB 105	1350	241	422	316	357	6.31
PCB 126	434	77.5	136	101	115	2.03
PCB 167	96.7	17.3	30.3	22.6	25.6	0.45
PCB 156	276	49.3	86.4	64.5	73.0	1.29
PCB 157	163	29.1	51.0	38.1	43.1	0.76
PCB 169	<150	<26.8	<46.9	<35.1	<39.7	<0.70
PCB 189	206	36.8	64.5	48.2	54.5	0.96
Total Dioxins & Furans Only	50025	8928	15652	11694	13228	234
Total PCBs Only	<7752	<1383	<2425	<1812	<2050	<36.3
Total Dioxins & Furans and PCBs	<57777	<10311	<18078	<13506	<15278	<270

Dry Gas Volume Sampled (Rm^3*) :	3.196
Actual Flowrate (m^3/s) :	26.2
Dry Reference Flowrate (Rm^3/s*) :	15.0
Dry Adjusted Flowrate (Rm^3/s**) :	20.0
Wet Reference Flowrate (Rm^3/s*) :	17.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 18
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	761	134	236	182	199	3.58
12378-pentachlorodibenzo-p-dioxin	1040	183	323	248	272	4.89
123478-hexachlorodibenzo-p-dioxin	422	74.4	131	101	110	1.99
123678-hexachlorodibenzo-p-dioxin	606	107	188	145	159	2.85
123789-hexachlorodibenzo-p-dioxin	599	106	186	143	157	2.82
1234678-heptachlorodibenzo-p-dioxin	3360	593	1043	802	879	15.8
Octachlorodibenzo-p-dioxin	8870	1564	2755	2117	2321	41.7
2378-tetrachlorodibenzofuran	5370	947	1668	1282	1405	25.3
12378-pentachlorodibenzofuran	5420	956	1683	1294	1418	25.5
23478-pentachlorodibenzofuran	3510	619	1090	838	918	16.5
123478-hexachlorodibenzofuran	3480	614	1081	831	911	16.4
123678-hexachlorodibenzofuran	3740	660	1161	893	979	17.6
234678-hexachlorodibenzofuran	2550	450	792	609	667	12.0
123789-hexachlorodibenzofuran	605	107	188	144	158	2.85
1234678-heptachlorodibenzofuran	10800	1905	3354	2578	2826	50.8
1234789-heptachlorodibenzofuran	801	141	249	191	210	3.77
Octachlorodibenzofuran	2130	376	661	508	557	10.0
PCB 81	163	28.7	50.6	38.9	42.7	0.77
PCB 77	881	155	274	210	231	4.15
PCB 123	<870	<153	<270	<208	<228	<4.09
PCB 118	2270	400	705	542	594	10.7
PCB 114	289	51.0	89.8	69.0	75.6	1.36
PCB 105	1120	198	348	267	293	5.27
PCB 126	508	89.6	158	121	133	2.39
PCB 167	117	20.6	36.3	27.9	30.6	0.55
PCB 156	276	48.7	85.7	65.9	72.2	1.30
PCB 157	199	35.1	61.8	47.5	52.1	0.94
PCB 169	<180	<31.7	<55.9	<43.0	<47.1	<0.85
PCB 189	256	45.1	79.5	61.1	67.0	1.20
Total Dioxins & Furans Only	54064	9534	16790	12906	14147	254
Total PCBs Only	<7129	<1257	<2214	<1702	<1866	<33.5
Total Dioxins & Furans and PCBs	<61193	<10791	<19004	<14607	<16013	<288

Dry Gas Volume Sampled (Rm^3*) :	3.220
Actual Flowrate (m^3/s) :	26.7
Dry Reference Flowrate (Rm^3/s*) :	15.2
Dry Adjusted Flowrate (Rm^3/s**) :	19.7
Wet Reference Flowrate (Rm^3/s*) :	18.0

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	102	105	134	114	15.7
12378-pentachlorodibenzo-p-dioxin	129	145	183	152	18.4
123478-hexachlorodibenzo-p-dioxin	77.1	62.6	74.4	71.4	10.8
123678-hexachlorodibenzo-p-dioxin	105	85.1	107	99.0	12.2
123789-hexachlorodibenzo-p-dioxin	95.6	100	106	101	5.0
1234678-heptachlorodibenzo-p-dioxin	646	562	593	600	7.1
Octachlorodibenzo-p-dioxin	1790	1372	1564	1575	13.3
2378-tetrachlorodibenzofuran	626	644	947	739	24.4
12378-pentachlorodibenzofuran	651	751	956	786	19.7
23478-pentachlorodibenzofuran	607	717	619	648	9.4
123478-hexachlorodibenzofuran	506	630	614	583	11.5
123678-hexachlorodibenzofuran	544	667	660	624	11.1
234678-hexachlorodibenzofuran	401	452	450	434	6.6
123789-hexachlorodibenzofuran	95.9	99.1	107	101	5.5
1234678-heptachlorodibenzofuran	1782	2017	1905	1901	6.2
1234789-heptachlorodibenzofuran	119	157	141	139	13.8
Octachlorodibenzofuran	340	361	376	359	5.0
PCB 81	32.2	<19.6	28.7	<26.9	24.2
PCB 77	178	156	155	163	7.9
PCB 123	<132	<118	<153	<135	13.3
PCB 118	644	564	400	536	23.2
PCB 114	55.7	48.9	51.0	51.8	6.7
PCB 105	251	241	198	230	12.3
PCB 126	82.9	77.5	89.6	83.3	7.3
PCB 167	<26.8	17.3	20.6	<21.6	22.5
PCB 156	55.1	49.3	48.7	51.0	7.0
PCB 157	31.1	29.1	35.1	31.8	9.6
PCB 169	<26.8	<26.8	<31.7	<28.5	10.0
PCB 189	42.8	36.8	45.1	41.6	10.4
Total Dioxins & Furans Only	8617	8928	9534	9026	5.2
Total PCBs Only	<1558	<1383	<1257	<1400	10.8
Total Dioxins & Furans and PCBs	<10176	<10311	<10791	<10426	3.1

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	179	184	236	200	15.8
12378-pentachlorodibenzo-p-dioxin	227	254	323	268	18.4
123478-hexachlorodibenzo-p-dioxin	136	110	131	126	11.1
123678-hexachlorodibenzo-p-dioxin	185	149	188	174	12.5
123789-hexachlorodibenzo-p-dioxin	169	176	186	177	4.9
1234678-heptachlorodibenzo-p-dioxin	1140	986	1043	1056	7.4
Octachlorodibenzo-p-dioxin	3159	2406	2755	2773	13.6
2378-tetrachlorodibenzofuran	1105	1130	1668	1301	24.4
12378-pentachlorodibenzofuran	1150	1317	1683	1383	19.7
23478-pentachlorodibenzofuran	1071	1258	1090	1140	9.0
123478-hexachlorodibenzofuran	894	1105	1081	1026	11.2
123678-hexachlorodibenzofuran	960	1170	1161	1097	10.8
234678-hexachlorodibenzofuran	708	792	792	764	6.4
123789-hexachlorodibenzofuran	169	174	188	177	5.5
1234678-heptachlorodibenzofuran	3146	3536	3354	3345	5.8
1234789-heptachlorodibenzofuran	210	275	249	245	13.4
Octachlorodibenzofuran	600	632	661	631	4.9
PCB 81	56.9	<34.4	50.6	<47.3	24.5
PCB 77	314	273	274	287	8.1
PCB 123	<234	<207	<270	<237	13.5
PCB 118	1137	989	705	944	23.3
PCB 114	98.2	85.7	89.8	91.2	7.0
PCB 105	442	422	348	404	12.3
PCB 126	146	136	158	147	7.5
PCB 167	<47.4	30.3	36.3	<38.0	22.8
PCB 156	97.3	86.4	85.7	89.8	7.2
PCB 157	55.0	51.0	61.8	55.9	9.8
PCB 169	<47.4	<46.9	<55.9	<50.1	10.1
PCB 189	75.5	64.5	79.5	73.1	10.7
Total Dioxins & Furans Only	15208	15652	16790	15884	5.1
Total PCBs Only	<2750	<2425	<2214	<2463	11.0
Total Dioxins & Furans and PCBs	<17959	<18078	<19004	<18347	3.1

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	134	138	182	151	17.6
12378-pentachlorodibenzo-p-dioxin	169	190	248	202	20.2
123478-hexachlorodibenzo-p-dioxin	101	82.1	101	94.7	11.6
123678-hexachlorodibenzo-p-dioxin	138	112	145	131	13.4
123789-hexachlorodibenzo-p-dioxin	126	131	143	133	6.6
1234678-heptachlorodibenzo-p-dioxin	849	736	802	796	7.1
Octachlorodibenzo-p-dioxin	2352	1798	2117	2089	13.3
2378-tetrachlorodibenzofuran	823	844	1282	983	26.3
12378-pentachlorodibenzofuran	856	984	1294	1045	21.5
23478-pentachlorodibenzofuran	797	940	838	858	8.5
123478-hexachlorodibenzofuran	666	825	831	774	12.1
123678-hexachlorodibenzofuran	715	874	893	827	11.8
234678-hexachlorodibenzofuran	527	591	609	576	7.5
123789-hexachlorodibenzofuran	126	130	144	133	7.3
1234678-heptachlorodibenzofuran	2343	2642	2578	2521	6.2
1234789-heptachlorodibenzofuran	156	205	191	184	13.8
Octachlorodibenzofuran	447	472	508	476	6.5
PCB 81	42.3	<25.7	38.9	<35.7	24.6
PCB 77	234	204	210	216	7.2
PCB 123	<174	<154	<208	<179	15.1
PCB 118	847	739	542	709	21.8
PCB 114	73.2	64.1	69.0	68.7	6.6
PCB 105	329	316	267	304	10.7
PCB 126	109	101	121	111	9.1
PCB 167	<35.3	22.6	27.9	<28.6	22.3
PCB 156	72.4	64.5	65.9	67.6	6.3
PCB 157	40.9	38.1	47.5	42.2	11.4
PCB 169	<35.3	<35.1	<43.0	<37.8	11.9
PCB 189	56.2	48.2	61.1	55.2	11.9
Total Dioxins & Furans Only	11326	11694	12906	11975	6.9
Total PCBs Only	<2048	<1812	<1702	<1854	9.5
Total Dioxins & Furans and PCBs	<13374	<13506	<14607	<13829	4.9

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	150	156	199	168	15.9
12378-pentachlorodibenzo-p-dioxin	191	215	272	226	18.6
123478-hexachlorodibenzo-p-dioxin	114	92.8	110	106	10.7
123678-hexachlorodibenzo-p-dioxin	155	126	159	147	12.2
123789-hexachlorodibenzo-p-dioxin	141	149	157	149	5.2
1234678-heptachlorodibenzo-p-dioxin	955	833	879	889	6.9
Octachlorodibenzo-p-dioxin	2646	2033	2321	2333	13.1
2378-tetrachlorodibenzofuran	926	955	1405	1095	24.5
12378-pentachlorodibenzofuran	963	1113	1418	1165	19.9
23478-pentachlorodibenzofuran	897	1063	918	959	9.4
123478-hexachlorodibenzofuran	749	933	911	864	11.6
123678-hexachlorodibenzofuran	804	989	979	924	11.2
234678-hexachlorodibenzofuran	593	669	667	643	6.8
123789-hexachlorodibenzofuran	142	147	158	149	5.7
1234678-heptachlorodibenzofuran	2635	2988	2826	2816	6.3
1234789-heptachlorodibenzofuran	176	232	210	206	13.9
Octachlorodibenzofuran	503	534	557	531	5.2
PCB 81	47.6	<29.1	42.7	<39.8	24.1
PCB 77	263	231	231	241	7.7
PCB 123	<196	<175	<228	<199	13.4
PCB 118	953	836	594	794	23.0
PCB 114	82.3	72.5	75.6	76.8	6.5
PCB 105	370	357	293	340	12.1
PCB 126	123	115	133	123	7.4
PCB 167	<39.7	25.6	30.6	<32.0	22.4
PCB 156	81.5	73.0	72.2	75.6	6.8
PCB 157	46.0	43.1	52.1	47.1	9.7
PCB 169	<39.7	<39.7	<47.1	<42.2	10.2
PCB 189	63.2	54.5	67.0	61.6	10.4
Total Dioxins & Furans Only	12740	13228	14147	13372	5.3
Total PCBs Only	<2304	<2050	<1866	<2073	10.6
Total Dioxins & Furans and PCBs	<15044	<15278	<16013	<15445	3.3

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 23
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	2.65	2.76	3.58	2.99	17.0
12378-pentachlorodibenzo-p-dioxin	3.36	3.80	4.89	4.02	19.7
123478-hexachlorodibenzo-p-dioxin	2.01	1.64	1.99	1.88	10.9
123678-hexachlorodibenzo-p-dioxin	2.74	2.23	2.85	2.61	12.7
123789-hexachlorodibenzo-p-dioxin	2.49	2.63	2.82	2.65	6.2
1234678-heptachlorodibenzo-p-dioxin	16.8	14.7	15.8	15.8	6.6
Octachlorodibenzo-p-dioxin	46.6	36.0	41.7	41.4	12.9
2378-tetrachlorodibenzofuran	16.3	16.9	25.3	19.5	25.7
12378-pentachlorodibenzofuran	17.0	19.7	25.5	20.7	21.0
23478-pentachlorodibenzofuran	15.8	18.8	16.5	17.0	9.2
123478-hexachlorodibenzofuran	13.2	16.5	16.4	15.4	12.2
123678-hexachlorodibenzofuran	14.2	17.5	17.6	16.4	11.9
234678-hexachlorodibenzofuran	10.4	11.8	12.0	11.4	7.5
123789-hexachlorodibenzofuran	2.50	2.60	2.85	2.65	6.8
1234678-heptachlorodibenzofuran	46.4	52.9	50.8	50.0	6.6
1234789-heptachlorodibenzofuran	3.10	4.11	3.77	3.66	14.1
Octachlorodibenzofuran	8.86	9.45	10.0	9.44	6.2
PCB 81	0.84	<0.51	0.77	<0.71	24.1
PCB 77	4.63	4.08	4.15	4.28	7.0
PCB 123	<3.45	<3.09	<4.09	<3.54	14.4
PCB 118	16.8	14.8	10.7	14.1	22.1
PCB 114	1.45	1.28	1.36	1.36	6.2
PCB 105	6.53	6.31	5.27	6.04	11.1
PCB 126	2.16	2.03	2.39	2.19	8.3
PCB 167	<0.70	0.45	0.55	<0.57	21.9
PCB 156	1.44	1.29	1.30	1.34	6.1
PCB 157	0.81	0.76	0.94	0.84	10.7
PCB 169	<0.70	<0.70	<0.85	<0.75	11.3
PCB 189	1.11	0.96	1.20	1.09	11.1
Total Dioxins & Furans Only	224	234	254	238	6.4
Total PCBs Only	<40.6	<36.3	<33.5	<36.8	9.7
Total Dioxins & Furans and PCBs	<265	<270	<288	<274	4.4

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 24
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	114	200	151	168	2.99
12378-pentachlorodibenzo-p-dioxin	152	268	202	226	4.02
123478-hexachlorodibenzo-p-dioxin	71.4	126	94.7	106	1.88
123678-hexachlorodibenzo-p-dioxin	99.0	174	131	147	2.61
123789-hexachlorodibenzo-p-dioxin	101	177	133	149	2.65
1234678-heptachlorodibenzo-p-dioxin	600	1056	796	889	15.8
Octachlorodibenzo-p-dioxin	1575	2773	2089	2333	41.4
2378-tetrachlorodibenzofuran	739	1301	983	1095	19.5
12378-pentachlorodibenzofuran	786	1383	1045	1165	20.7
23478-pentachlorodibenzofuran	648	1140	858	959	17.0
123478-hexachlorodibenzofuran	583	1026	774	864	15.4
123678-hexachlorodibenzofuran	624	1097	827	924	16.4
234678-hexachlorodibenzofuran	434	764	576	643	11.4
123789-hexachlorodibenzofuran	101	177	133	149	2.65
1234678-heptachlorodibenzofuran	1901	3345	2521	2816	50.0
1234789-heptachlorodibenzofuran	139	245	184	206	3.66
Octachlorodibenzofuran	359	631	476	531	9.44
PCB 81	<26.9	<47.3	<35.7	<39.8	<0.71
PCB 77	163	287	216	241	4.28
PCB 123	<135	<237	<179	<199	<3.54
PCB 118	536	944	709	794	14.1
PCB 114	51.8	91.2	68.7	76.8	1.36
PCB 105	230	404	304	340	6.04
PCB 126	83.3	147	111	123	2.19
PCB 167	<21.6	<38.0	<28.6	<32.0	<0.57
PCB 156	51.0	89.8	67.6	75.6	1.34
PCB 157	31.8	55.9	42.2	47.1	0.84
PCB 169	<28.5	<50.1	<37.8	<42.2	<0.75
PCB 189	41.6	73.1	55.2	61.6	1.09
Total Dioxins & Furans Only	9026	15884	11975	13372	238
Total PCBs Only	<1400	<2463	<1854	<2073	<36.8
Total Dioxins & Furans and PCBs	<10426	<18347	<13829	<15445	<274

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 25
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<9.0	<10
12378-pentachlorodibenzo-p-dioxin	<6.2	<4.2
123478-hexachlorodibenzo-p-dioxin	<3.9	<4.7
123678-hexachlorodibenzo-p-dioxin	<3.7	<4.5
123789-hexachlorodibenzo-p-dioxin	<3.7	<4.5
1234678-heptachlorodibenzo-p-dioxin	<20	<3.5
Octachlorodibenzo-p-dioxin	<51	<7.0
2378-tetrachlorodibenzofuran	23.1	<7.1
12378-pentachlorodibenzofuran	23.1	<4.9
23478-pentachlorodibenzofuran	<10	<4.8
123478-hexachlorodibenzofuran	<12	<2.9
123678-hexachlorodibenzofuran	13.7	<2.5
234678-hexachlorodibenzofuran	<9.0	<2.7
123789-hexachlorodibenzofuran	<11	<3.3
1234678-heptachlorodibenzofuran	<32	<3.0
1234789-heptachlorodibenzofuran	<8.3	<4.2
Octachlorodibenzofuran	<8.7	<5.8
PCB 81	<15	<2.5
PCB 77	21.6	<2.9
PCB 123	<41	<3.6
PCB 118	180	<2.7
PCB 114	<4.3	<3.5
PCB 105	<69	<3.4
PCB 126	<5.1	<3.8
PCB 167	<2.7	<2.6
PCB 156	<8.6	<2.8
PCB 157	<2.9	<3.0
PCB 169	<3.3	<3.5
PCB 189	<1.1	<1.4
Total Dioxins & Furans Only	<248	<79.6
Total PCBs Only	<355	<35.7
Total Dioxins & Furans and PCBs	<603	<115

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 26
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	102	105	134	114
12378-pentachlorodibenzo-p-dioxin	1.000	129	145	183	152
123478-hexachlorodibenzo-p-dioxin	0.100	7.71	6.26	7.44	7.14
123678-hexachlorodibenzo-p-dioxin	0.100	10.5	8.51	10.7	9.90
123789-hexachlorodibenzo-p-dioxin	0.100	9.56	10.0	10.6	10.1
1234678-heptachlorodibenzo-p-dioxin	0.010	6.46	5.62	5.93	6.00
Octachlorodibenzo-p-dioxin	0.0003	0.54	0.41	0.47	0.47
2378-tetrachlorodibenzofuran	0.100	62.6	64.4	94.7	73.9
12378-pentachlorodibenzofuran	0.030	19.5	22.5	28.7	23.6
23478-pentachlorodibenzofuran	0.300	182	215	186	194
123478-hexachlorodibenzofuran	0.100	50.6	63.0	61.4	58.3
123678-hexachlorodibenzofuran	0.100	54.4	66.7	66.0	62.4
234678-hexachlorodibenzofuran	0.100	40.1	45.2	45.0	43.4
123789-hexachlorodibenzofuran	0.100	9.59	9.91	10.7	10.1
1234678-heptachlorodibenzofuran	0.010	17.8	20.2	19.0	19.0
1234789-heptachlorodibenzofuran	0.010	1.19	1.57	1.41	1.39
Octachlorodibenzofuran	0.0003	0.10	0.11	0.11	0.11
PCB 81	0.0003	0.0097	<0.0059	0.0086	<0.0081
PCB 77	0.0001	0.018	0.016	0.016	0.016
PCB 123	0.00003	<0.0040	<0.0035	<0.0046	<0.0040
PCB 118	0.00003	0.019	0.017	0.012	0.016
PCB 114	0.00003	0.0017	0.0015	0.0015	0.0016
PCB 105	0.00003	0.0075	0.0072	0.0059	0.0069
PCB 126	0.100	8.29	7.75	8.96	8.33
PCB 167	0.00003	<0.00081	0.00052	0.00062	<0.00065
PCB 156	0.00003	0.0017	0.0015	0.0015	0.0015
PCB 157	0.00003	0.00093	0.00087	0.0011	0.00095
PCB 169	0.030	<0.81	<0.80	<0.95	<0.85
PCB 189	0.00003	0.0013	0.0011	0.0014	0.0012
Total Dioxins & Furans Only		703	790	865	786
Total PCBs Only		<9.16	<8.60	<10.0	<9.24
Total Dioxins & Furans and PCBs		<712	<798	<875	<795

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	179	184	236	200
12378-pentachlorodibenzo-p-dioxin	1.000	227	254	323	268
123478-hexachlorodibenzo-p-dioxin	0.100	13.6	11.0	13.1	12.6
123678-hexachlorodibenzo-p-dioxin	0.100	18.5	14.9	18.8	17.4
123789-hexachlorodibenzo-p-dioxin	0.100	16.9	17.6	18.6	17.7
1234678-heptachlorodibenzo-p-dioxin	0.010	11.4	9.86	10.4	10.6
Octachlorodibenzo-p-dioxin	0.0003	0.95	0.72	0.83	0.83
2378-tetrachlorodibenzofuran	0.100	111	113	167	130
12378-pentachlorodibenzofuran	0.030	34.5	39.5	50.5	41.5
23478-pentachlorodibenzofuran	0.300	321	377	327	342
123478-hexachlorodibenzofuran	0.100	89.4	110	108	103
123678-hexachlorodibenzofuran	0.100	96.0	117	116	110
234678-hexachlorodibenzofuran	0.100	70.8	79.2	79.2	76.4
123789-hexachlorodibenzofuran	0.100	16.9	17.4	18.8	17.7
1234678-heptachlorodibenzofuran	0.010	31.5	35.4	33.5	33.5
1234789-heptachlorodibenzofuran	0.010	2.10	2.75	2.49	2.45
Octachlorodibenzofuran	0.0003	0.18	0.19	0.20	0.19
PCB 81	0.0003	0.017	<0.010	0.015	<0.014
PCB 77	0.0001	0.031	0.027	0.027	0.029
PCB 123	0.00003	<0.0070	<0.0062	<0.0081	<0.0071
PCB 118	0.00003	0.034	0.030	0.021	0.028
PCB 114	0.00003	0.0029	0.0026	0.0027	0.0027
PCB 105	0.00003	0.013	0.013	0.010	0.012
PCB 126	0.100	14.6	13.6	15.8	14.7
PCB 167	0.00003	<0.0014	0.00091	0.0011	<0.0011
PCB 156	0.00003	0.0029	0.0026	0.0026	0.0027
PCB 157	0.00003	0.0016	0.0015	0.0019	0.0017
PCB 169	0.030	<1.42	<1.41	<1.68	<1.50
PCB 189	0.00003	0.0023	0.0019	0.0024	0.0022
Total Dioxins & Furans Only		1241	1385	1524	1383
Total PCBs Only		<16.2	<15.1	<17.5	<16.3
Total Dioxins & Furans and PCBs		<1257	<1400	<1541	<1399

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 28A
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	134	138	182	151
12378-pentachlorodibenzo-p-dioxin	1.000	169	190	248	202
123478-hexachlorodibenzo-p-dioxin	0.100	10.1	8.21	10.1	9.47
123678-hexachlorodibenzo-p-dioxin	0.100	13.8	11.2	14.5	13.1
123789-hexachlorodibenzo-p-dioxin	0.100	12.6	13.1	14.3	13.3
1234678-heptachlorodibenzo-p-dioxin	0.010	8.49	7.36	8.02	7.96
Octachlorodibenzo-p-dioxin	0.0003	0.71	0.54	0.64	0.63
2378-tetrachlorodibenzofuran	0.100	82.3	84.4	128	98.3
12378-pentachlorodibenzofuran	0.030	25.7	29.5	38.8	31.3
23478-pentachlorodibenzofuran	0.300	239	282	251	258
123478-hexachlorodibenzofuran	0.100	66.6	82.5	83.1	77.4
123678-hexachlorodibenzofuran	0.100	71.5	87.4	89.3	82.7
234678-hexachlorodibenzofuran	0.100	52.7	59.1	60.9	57.6
123789-hexachlorodibenzofuran	0.100	12.6	13.0	14.4	13.3
1234678-heptachlorodibenzofuran	0.010	23.4	26.4	25.8	25.2
1234789-heptachlorodibenzofuran	0.010	1.56	2.05	1.91	1.84
Octachlorodibenzofuran	0.0003	0.13	0.14	0.15	0.14
PCB 81	0.0003	0.013	0.0039	0.012	0.0094
PCB 77	0.0001	0.023	0.020	0.021	0.022
PCB 123	0.00003	0.0026	0.0023	0.0031	0.0027
PCB 118	0.00003	0.025	0.022	0.016	0.021
PCB 114	0.00003	0.0022	0.0019	0.0021	0.0021
PCB 105	0.00003	0.0099	0.0095	0.0080	0.0091
PCB 126	0.100	10.9	10.1	12.1	11.1
PCB 167	0.00003	0.00053	0.00068	0.00084	0.00068
PCB 156	0.00003	0.0022	0.0019	0.0020	0.0020
PCB 157	0.00003	0.0012	0.0011	0.0014	0.0013
PCB 169	0.030	0.53	0.53	0.64	0.57
PCB 189	0.00003	0.0017	0.0014	0.0018	0.0017
Total Dioxins & Furans Only		924	1034	1171	1043
Total PCBs Only		11.5	10.7	12.8	11.7
Total Dioxins & Furans and PCBs		936	1045	1184	1055

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 28B
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00	134	138	182	151
12378-pentachlorodibenzo-p-dioxin	0.50	84.7	94.9	124	101
123478-hexachlorodibenzo-p-dioxin	0.10	10.1	8.21	10.1	9.47
123678-hexachlorodibenzo-p-dioxin	0.10	13.8	11.2	14.5	13.1
123789-hexachlorodibenzo-p-dioxin	0.10	12.6	13.1	14.3	13.3
1234678-heptachlorodibenzo-p-dioxin	0.01	8.49	7.36	8.02	7.96
Octachlorodibenzo-p-dioxin	0.001	2.35	1.80	2.12	2.09
2378-tetrachlorodibenzofuran	0.10	82.3	84.4	128	98.3
12378-pentachlorodibenzofuran	0.05	42.8	49.2	64.7	52.2
23478-pentachlorodibenzofuran	0.50	399	470	419	429
123478-hexachlorodibenzofuran	0.10	66.6	82.5	83.1	77.4
123678-hexachlorodibenzofuran	0.10	71.5	87.4	89.3	82.7
234678-hexachlorodibenzofuran	0.10	52.7	59.1	60.9	57.6
123789-hexachlorodibenzofuran	0.10	12.6	13.0	14.4	13.3
1234678-heptachlorodibenzofuran	0.01	23.4	26.4	25.8	25.2
1234789-heptachlorodibenzofuran	0.01	1.56	2.05	1.91	1.84
Octachlorodibenzofuran	0.001	0.45	0.47	0.51	0.48
Total Dioxins & Furans		1018	1149	1242	1136

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 28
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	134	138	182	151
12378-pentachlorodibenzo-p-dioxin	1.000	169	190	248	202
123478-hexachlorodibenzo-p-dioxin	0.100	10.1	8.21	10.1	9.47
123678-hexachlorodibenzo-p-dioxin	0.100	13.8	11.2	14.5	13.1
123789-hexachlorodibenzo-p-dioxin	0.100	12.6	13.1	14.3	13.3
1234678-heptachlorodibenzo-p-dioxin	0.010	8.49	7.36	8.02	7.96
Octachlorodibenzo-p-dioxin	0.0003	0.71	0.54	0.64	0.63
2378-tetrachlorodibenzofuran	0.100	82.3	84.4	128	98.3
12378-pentachlorodibenzofuran	0.030	25.7	29.5	38.8	31.3
23478-pentachlorodibenzofuran	0.300	239	282	251	258
123478-hexachlorodibenzofuran	0.100	66.6	82.5	83.1	77.4
123678-hexachlorodibenzofuran	0.100	71.5	87.4	89.3	82.7
234678-hexachlorodibenzofuran	0.100	52.7	59.1	60.9	57.6
123789-hexachlorodibenzofuran	0.100	12.6	13.0	14.4	13.3
1234678-heptachlorodibenzofuran	0.010	23.4	26.4	25.8	25.2
1234789-heptachlorodibenzofuran	0.010	1.56	2.05	1.91	1.84
Octachlorodibenzofuran	0.0003	0.13	0.14	0.15	0.14
PCB 81	0.0003	0.013	<0.0077	0.012	<0.011
PCB 77	0.0001	0.023	0.020	0.021	0.022
PCB 123	0.00003	<0.0052	<0.0046	<0.0062	<0.0054
PCB 118	0.00003	0.025	0.022	0.016	0.021
PCB 114	0.00003	0.0022	0.0019	0.0021	0.0021
PCB 105	0.00003	0.0099	0.0095	0.0080	0.0091
PCB 126	0.100	10.9	10.1	12.1	11.1
PCB 167	0.00003	<0.0011	0.00068	0.00084	<0.00086
PCB 156	0.00003	0.0022	0.0019	0.0020	0.0020
PCB 157	0.00003	0.0012	0.0011	0.0014	0.0013
PCB 169	0.030	<1.06	<1.05	<1.29	<1.13
PCB 189	0.00003	0.0017	0.0014	0.0018	0.0017
Total Dioxins & Furans Only		924	1034	1171	1043
Total PCBs Only		<12.0	<11.3	<13.5	<12.3
Total Dioxins & Furans and PCBs		<936	<1046	<1185	<1056

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 29
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	150	156	199	168
12378-pentachlorodibenzo-p-dioxin	1.000	191	215	272	226
123478-hexachlorodibenzo-p-dioxin	0.100	11.4	9.28	11.0	10.6
123678-hexachlorodibenzo-p-dioxin	0.100	15.5	12.6	15.9	14.7
123789-hexachlorodibenzo-p-dioxin	0.100	14.1	14.9	15.7	14.9
1234678-heptachlorodibenzo-p-dioxin	0.010	9.55	8.33	8.79	8.89
Octachlorodibenzo-p-dioxin	0.0003	0.79	0.61	0.70	0.70
2378-tetrachlorodibenzofuran	0.100	92.6	95.5	141	110
12378-pentachlorodibenzofuran	0.030	28.9	33.4	42.5	34.9
23478-pentachlorodibenzofuran	0.300	269	319	276	288
123478-hexachlorodibenzofuran	0.100	74.9	93.3	91.1	86.4
123678-hexachlorodibenzofuran	0.100	80.4	98.9	97.9	92.4
234678-hexachlorodibenzofuran	0.100	59.3	66.9	66.7	64.3
123789-hexachlorodibenzofuran	0.100	14.2	14.7	15.8	14.9
1234678-heptachlorodibenzofuran	0.010	26.4	29.9	28.3	28.2
1234789-heptachlorodibenzofuran	0.010	1.76	2.32	2.10	2.06
Octachlorodibenzofuran	0.0003	0.15	0.16	0.17	0.16
PCB 81	0.0003	0.014	<0.0087	0.013	<0.012
PCB 77	0.0001	0.026	0.023	0.023	0.024
PCB 123	0.00003	<0.0059	<0.0052	<0.0068	<0.0060
PCB 118	0.00003	0.029	0.025	0.018	0.024
PCB 114	0.00003	0.0025	0.0022	0.0023	0.0023
PCB 105	0.00003	0.011	0.011	0.0088	0.010
PCB 126	0.100	12.3	11.5	13.3	12.3
PCB 167	0.00003	<0.0012	0.00077	0.00092	<0.00096
PCB 156	0.00003	0.0024	0.0022	0.0022	0.0023
PCB 157	0.00003	0.0014	0.0013	0.0016	0.0014
PCB 169	0.030	<1.19	<1.19	<1.41	<1.26
PCB 189	0.00003	0.0019	0.0016	0.0020	0.0018
Total Dioxins & Furans Only		1040	1170	1284	1165
Total PCBs Only		<13.5	<12.7	<14.8	<13.7
Total Dioxins & Furans and PCBs		<1053	<1183	<1299	<1178

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 30
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	2.65	2.76	3.58	2.99
12378-pentachlorodibenzo-p-dioxin	1.000	3.36	3.80	4.89	4.02
123478-hexachlorodibenzo-p-dioxin	0.100	0.20	0.16	0.20	0.19
123678-hexachlorodibenzo-p-dioxin	0.100	0.27	0.22	0.29	0.26
123789-hexachlorodibenzo-p-dioxin	0.100	0.25	0.26	0.28	0.26
1234678-heptachlorodibenzo-p-dioxin	0.010	0.17	0.15	0.16	0.16
Octachlorodibenzo-p-dioxin	0.0003	0.014	0.011	0.013	0.012
2378-tetrachlorodibenzofuran	0.100	1.63	1.69	2.53	1.95
12378-pentachlorodibenzofuran	0.030	0.51	0.59	0.77	0.62
23478-pentachlorodibenzofuran	0.300	4.74	5.64	4.95	5.11
123478-hexachlorodibenzofuran	0.100	1.32	1.65	1.64	1.54
123678-hexachlorodibenzofuran	0.100	1.42	1.75	1.76	1.64
234678-hexachlorodibenzofuran	0.100	1.04	1.18	1.20	1.14
123789-hexachlorodibenzofuran	0.100	0.25	0.26	0.28	0.26
1234678-heptachlorodibenzofuran	0.010	0.46	0.53	0.51	0.50
1234789-heptachlorodibenzofuran	0.010	0.031	0.041	0.038	0.037
Octachlorodibenzofuran	0.0003	0.0027	0.0028	0.0030	0.0028
PCB 81	0.0003	0.00025	<0.00015	0.00023	<0.00021
PCB 77	0.0001	0.00046	0.00041	0.00041	0.00043
PCB 123	0.00003	<0.00010	<0.000093	<0.00012	<0.00011
PCB 118	0.00003	0.00050	0.00044	0.00032	0.00042
PCB 114	0.00003	0.000043	0.000038	0.000041	0.000041
PCB 105	0.00003	0.00020	0.00019	0.00016	0.00018
PCB 126	0.100	0.22	0.20	0.24	0.22
PCB 167	0.00003	<0.000021	0.000014	0.000017	<0.000017
PCB 156	0.00003	0.000043	0.000039	0.000039	0.000040
PCB 157	0.00003	0.000024	0.000023	0.000028	0.000025
PCB 169	0.030	<0.021	<0.021	<0.025	<0.022
PCB 189	0.00003	0.000033	0.000029	0.000036	0.000033
Total Dioxins & Furans Only		18.3	20.7	23.1	20.7
Total PCBs Only		<0.24	<0.23	<0.27	<0.24
Total Dioxins & Furans and PCBs		<18.6	<20.9	<23.4	<20.9

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 31
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using the Full Detection Limit

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm³**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	114	200	151	168	2.99
12378-pentachlorodibenzo-p-dioxin	152	268	202	226	4.02
123478-hexachlorodibenzo-p-dioxin	7.14	12.6	9.47	10.6	0.19
123678-hexachlorodibenzo-p-dioxin	9.90	17.4	13.1	14.7	0.26
123789-hexachlorodibenzo-p-dioxin	10.1	17.7	13.3	14.9	0.26
1234678-heptachlorodibenzo-p-dioxin	6.00	10.6	7.96	8.89	0.16
Octachlorodibenzo-p-dioxin	0.47	0.83	0.63	0.70	0.012
2378-tetrachlorodibenzofuran	73.9	130	98.3	110	1.95
12378-pentachlorodibenzofuran	23.6	41.5	31.3	34.9	0.62
23478-pentachlorodibenzofuran	194	342	258	288	5.11
123478-hexachlorodibenzofuran	58.3	103	77.4	86.4	1.54
123678-hexachlorodibenzofuran	62.4	110	82.7	92.4	1.64
234678-hexachlorodibenzofuran	43.4	76.4	57.6	64.3	1.14
123789-hexachlorodibenzofuran	10.1	17.7	13.3	14.9	0.26
1234678-heptachlorodibenzofuran	19.0	33.5	25.2	28.2	0.50
1234789-heptachlorodibenzofuran	1.39	2.45	1.84	2.06	0.037
Octachlorodibenzofuran	0.11	0.19	0.14	0.16	0.0028
PCB 81	<0.0081	<0.014	<0.011	<0.012	<0.00021
PCB 77	0.016	0.029	0.022	0.024	0.00043
PCB 123	<0.0040	<0.0071	<0.0054	<0.0060	<0.00011
PCB 118	0.016	0.028	0.021	0.024	0.00042
PCB 114	0.0016	0.0027	0.0021	0.0023	0.000041
PCB 105	0.0069	0.012	0.0091	0.010	0.00018
PCB 126	8.33	14.7	11.1	12.3	0.22
PCB 167	<0.00065	<0.0011	<0.00086	<0.00096	<0.000017
PCB 156	0.0015	0.0027	0.0020	0.0023	0.000040
PCB 157	0.00095	0.0017	0.0013	0.0014	0.000025
PCB 169	<0.85	<1.50	<1.13	<1.26	<0.022
PCB 189	0.0012	0.0022	0.0017	0.0018	0.000033
Total Dioxins & Furans Only	786	1383	1043	1165	20.7
Total PCBs Only	<9.24	<16.3	<12.3	<13.7	<0.24
Total Dioxins & Furans and PCBs	<795	<1399	<1056	<1178	<20.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 32
Covanta - Durham York Energy Centre
Boiler No. 1 Quench Inlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m^3	Dry Reference Concentration pg TEQ/Rm^3*	Dry Adjusted Concentration pg TEQ/Rm^3**	Wet Reference Concentration pg TEQ/Rm^3*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	114	200	151	168	2.99
12378-pentachlorodibenzo-p-dioxin	152	268	202	226	4.02
123478-hexachlorodibenzo-p-dioxin	7.14	12.6	9.47	10.6	0.19
123678-hexachlorodibenzo-p-dioxin	9.90	17.4	13.1	14.7	0.26
123789-hexachlorodibenzo-p-dioxin	10.1	17.7	13.3	14.9	0.26
1234678-heptachlorodibenzo-p-dioxin	6.00	10.6	7.96	8.89	0.16
Octachlorodibenzo-p-dioxin	0.47	0.83	0.63	0.70	0.012
2378-tetrachlorodibenzofuran	73.9	130	98.3	110	1.95
12378-pentachlorodibenzofuran	23.6	41.5	31.3	34.9	0.62
23478-pentachlorodibenzofuran	194	342	258	288	5.11
123478-hexachlorodibenzofuran	58.3	103	77.4	86.4	1.54
123678-hexachlorodibenzofuran	62.4	110	82.7	92.4	1.64
234678-hexachlorodibenzofuran	43.4	76.4	57.6	64.3	1.14
123789-hexachlorodibenzofuran	10.1	17.7	13.3	14.9	0.26
1234678-heptachlorodibenzofuran	19.0	33.5	25.2	28.2	0.50
1234789-heptachlorodibenzofuran	1.39	2.45	1.84	2.06	0.037
Octachlorodibenzofuran	0.11	0.19	0.14	0.16	0.0028
PCB 81	0.0071	0.012	0.0094	0.010	0.00019
PCB 77	0.016	0.029	0.022	0.024	0.00043
PCB 123	0.0020	0.0036	0.0027	0.0030	0.000053
PCB 118	0.016	0.028	0.021	0.024	0.00042
PCB 114	0.0016	0.0027	0.0021	0.0023	0.000041
PCB 105	0.0069	0.012	0.0091	0.010	0.00018
PCB 126	8.33	14.7	11.1	12.3	0.22
PCB 167	0.00051	0.00090	0.00068	0.00076	0.000014
PCB 156	0.0015	0.0027	0.0020	0.0023	0.000040
PCB 157	0.00095	0.0017	0.0013	0.0014	0.000025
PCB 169	0.43	0.75	0.57	0.63	0.011
PCB 189	0.0012	0.0022	0.0017	0.0018	0.000033
Total Dioxins & Furans Only	786	1383	1043	1165	20.7
Total PCBs Only	8.81	15.5	11.7	13.1	0.23
Total Dioxins & Furans and PCBs	795	1399	1055	1178	20.9

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

APPENDIX 4

Boiler No. 2 Quench Inlet
Data Tables
(34 pages)

TABLE 1
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Test Schedule

Semi-Volatile Organic Compounds Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 12, 2017	9:19	13:14	180
2	October 12, 2017	14:54	18:47	180
3	October 13, 2017	8:36	12:34	180

Total Hydrocarbons Trains

Test Number	Test Date	Sampling Period		Sampling Time*
		Start	Finish	min
1	October 10, 2017	14:50	15:50	60
2	October 10, 2017	15:55	16:55	60
3	October 10, 2017	17:00	18:00	60

* Actual sampling time excluding leak-checks, traverse changes and process down time.

TABLE 2
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Stack Gas Sampling Parameters

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter Factor	Nozzle Diameter mm	Gas Volume Sampled Rm^3 *	Percentage of Isokineticity %
1	0.847	1.021/0.978**	6.10	3.207	101.5
2	0.847	0.978	6.10	3.213	103.0
3	0.847	0.978	6.10	3.114	101.4

* Dry at 25°C and 1 atmosphere

** Dry gas meter was changed after the first traverse of the test.

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Stack Gas Physical Parameters

Semi-Volatile Organics Trains

Test No.	Gas Temp.	Moisture by Volume	Gas Velocity	Static Pressure	Absolute Pressure	Carbon Dioxide by Volume	Oxygen by Volume
	°C	%	m/s	kPa	kPa	% *	% *
1	168	16.0	17.7	-0.64	101.1	11.1	7.57
2	169	16.4	17.6	-0.64	101.0	11.3	7.50
3	168	17.3	17.5	-0.56	100.8	11.3	7.52
Average	168	16.6	17.6	-0.61	101.0	11.2	7.53

* Dry basis, measured by the DYEC CEMS

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Stack Gas Volumetric Flowrates

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m^3/s	Dry Reference Flowrate Rm^3/s *	Dry Adjusted Flowrate Rm^3/s **	Wet Reference Flowrate Rm^3/s*
1	26.1	14.8	19.9	17.6
2	26.0	14.6	19.8	17.5
3	25.9	14.4	19.4	17.4
Average	26.0	14.6	19.7	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 5
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Total Hydrocarbons Analyses

Total Hydrocarbons as 1-Minute Average Data

Test No.	Parameter	Minimum	Average	Maximum
1	Total Hydrocarbons (ppm dry)	0	0.1	1.2
2	Total Hydrocarbons (ppm dry)	0	0	0.9
3	Total Hydrocarbons (ppm dry)	0	0	0.6
Average	Total Hydrocarbons (ppm dry)		0.03	

Total Hydrocarbons as 10-Minute Rolling Average Data

Test No.	Parameter	Minimum	Average	Maximum
1	Total Hydrocarbons (ppm dry)	0	0	0.2
2	Total Hydrocarbons (ppm dry)	0	0	0.1
3	Total Hydrocarbons (ppm dry)	0	0	0.1
Average	Total Hydrocarbons (ppm dry)		0	

Note: Total hydrocarbons reported on a dry basis as equivalent methane

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Emission Data
Test No. 1

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	10500	1.86	3.27	2.44	2.75	48.5
Pentachlorodibenzo-p-dioxins	7970	1.41	2.49	1.85	2.09	36.8
Hexachlorodibenzo-p-dioxins	6660	1.18	2.08	1.54	1.75	30.7
Heptachlorodibenzo-p-dioxins	5850	1.03	1.82	1.36	1.53	27.0
Octachlorodibenzo-p-dioxin	6480	1.15	2.02	1.50	1.70	29.9
Total	37460	6.62	11.7	8.69	9.82	173

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	133000	23.5	41.5	30.8	34.9	614
Pentachlorodibenzofurans	63500	11.2	19.8	14.7	16.7	293
Hexachlorodibenzofurans	21200	3.75	6.61	4.92	5.56	97.8
Heptachlorodibenzofurans	10300	1.82	3.21	2.39	2.70	47.5
Octachlorodibenzofuran	1220	0.22	0.38	0.28	0.32	5.63
Total	229220	40.5	71.5	53.2	60.1	1058

Dry Gas Volume Sampled (Rm^3*) :	3.207
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Emission Data
Test No. 2

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	9100	1.59	2.83	2.09	2.36	41.4
Pentachlorodibenzo-p-dioxins	7690	1.34	2.39	1.76	2.00	34.9
Hexachlorodibenzo-p-dioxins	5700	1.00	1.77	1.31	1.48	25.9
Heptachlorodibenzo-p-dioxins	5180	0.91	1.61	1.19	1.35	23.5
Octachlorodibenzo-p-dioxin	5200	0.91	1.62	1.19	1.35	23.6
Total	32870	5.74	10.2	7.54	8.54	149

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	106000	18.5	33.0	24.3	27.5	482
Pentachlorodibenzofurans	48900	8.55	15.2	11.2	12.7	222
Hexachlorodibenzofurans	20000	3.50	6.22	4.59	5.19	90.9
Heptachlorodibenzofurans	9820	1.72	3.06	2.25	2.55	44.6
Octachlorodibenzofuran	1060	0.19	0.33	0.24	0.28	4.82
Total	185780	32.5	57.8	42.6	48.2	844

Dry Gas Volume Sampled (Rm^3*) :	3.213
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 8
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Emission Data
Test No. 3

Dioxins

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	10700	1.91	3.44	2.55	2.84	49.5
Pentachlorodibenzo-p-dioxins	7900	1.41	2.54	1.88	2.10	36.5
Hexachlorodibenzo-p-dioxins	5820	1.04	1.87	1.39	1.55	26.9
Heptachlorodibenzo-p-dioxins	5560	0.99	1.79	1.33	1.48	25.7
Octachlorodibenzo-p-dioxin	5870	1.05	1.89	1.40	1.56	27.1
Total	35850	6.40	11.5	8.55	9.53	166

Furans

Congener Group	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	189000	33.7	60.7	45.1	50.2	874
Pentachlorodibenzofurans	81700	14.6	26.2	19.5	21.7	378
Hexachlorodibenzofurans	27500	4.91	8.83	6.56	7.31	127
Heptachlorodibenzofurans	11100	1.98	3.56	2.65	2.95	51.3
Octachlorodibenzofuran	1330	0.24	0.43	0.32	0.35	6.15
Total	310630	55.5	99.8	74.0	82.6	1436

Dry Gas Volume Sampled (Rm^3*) :	3.114
Actual Flowrate (m^3/s) :	25.9
Dry Reference Flowrate (Rm^3/s*) :	14.4
Dry Adjusted Flowrate (Rm^3/s**) :	19.4
Wet Reference Flowrate (Rm^3/s*) :	17.4

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Actual Concentrations

Dioxins

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	1.86	1.59	1.91	1.79	9.6
Pentachlorodibenzo-p-dioxins	1.41	1.34	1.41	1.39	2.7
Hexachlorodibenzo-p-dioxins	1.18	1.00	1.04	1.07	8.9
Heptachlorodibenzo-p-dioxins	1.03	0.91	0.99	0.98	6.7
Octachlorodibenzo-p-dioxin	1.15	0.91	1.05	1.03	11.5
Total	6.62	5.74	6.40	6.26	7.3

Furans

Congener Group	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	23.5	18.5	33.7	25.3	30.7
Pentachlorodibenzofurans	11.2	8.55	14.6	11.5	26.4
Hexachlorodibenzofurans	3.75	3.50	4.91	4.05	18.6
Heptachlorodibenzofurans	1.82	1.72	1.98	1.84	7.3
Octachlorodibenzofuran	0.22	0.19	0.24	0.21	12.3
Total	40.5	32.5	55.5	42.8	27.2

TABLE 10
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Dry Reference Concentrations

Dioxins

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	3.27	2.83	3.44	3.18	9.8
Pentachlorodibenzo-p-dioxins	2.49	2.39	2.54	2.47	2.9
Hexachlorodibenzo-p-dioxins	2.08	1.77	1.87	1.91	8.1
Heptachlorodibenzo-p-dioxins	1.82	1.61	1.79	1.74	6.5
Octachlorodibenzo-p-dioxin	2.02	1.62	1.89	1.84	11.1
Total	11.7	10.2	11.5	11.1	7.1

Furans

Congener Group	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	41.5	33.0	60.7	45.1	31.5
Pentachlorodibenzofurans	19.8	15.2	26.2	20.4	27.1
Hexachlorodibenzofurans	6.61	6.22	8.83	7.22	19.5
Heptachlorodibenzofurans	3.21	3.06	3.56	3.28	7.9
Octachlorodibenzofuran	0.38	0.33	0.43	0.38	12.8
Total	71.5	57.8	99.8	76.3	28.0

* At 25°C and 1 atmosphere

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Dioxins

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	2.44	2.09	2.55	2.36	10.2
Pentachlorodibenzo-p-dioxins	1.85	1.76	1.88	1.83	3.3
Hexachlorodibenzo-p-dioxins	1.54	1.31	1.39	1.41	8.5
Heptachlorodibenzo-p-dioxins	1.36	1.19	1.33	1.29	6.9
Octachlorodibenzo-p-dioxin	1.50	1.19	1.40	1.37	11.5
Total	8.69	7.54	8.55	8.26	7.5

Furans

Congener Group	Dry Adjusted Concentration Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	Coefficient of Variation %
Tetrachlorodibenzofurans	30.8	24.3	45.1	33.4	31.7
Pentachlorodibenzofurans	14.7	11.2	19.5	15.1	27.4
Hexachlorodibenzofurans	4.92	4.59	6.56	5.35	19.7
Heptachlorodibenzofurans	2.39	2.25	2.65	2.43	8.2
Octachlorodibenzofuran	0.28	0.24	0.32	0.28	13.1
Total	53.2	42.6	74.0	56.6	28.2

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Wet Reference Concentrations

Dioxins

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	2.75	2.36	2.84	2.65	9.6
Pentachlorodibenzo-p-dioxins	2.09	2.00	2.10	2.06	2.8
Hexachlorodibenzo-p-dioxins	1.75	1.48	1.55	1.59	8.7
Heptachlorodibenzo-p-dioxins	1.53	1.35	1.48	1.45	6.7
Octachlorodibenzo-p-dioxin	1.70	1.35	1.56	1.54	11.4
Total	9.82	8.54	9.53	9.30	7.3

Furans

Congener Group	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	34.9	27.5	50.2	37.5	30.9
Pentachlorodibenzofurans	16.7	12.7	21.7	17.0	26.6
Hexachlorodibenzofurans	5.56	5.19	7.31	6.02	18.8
Heptachlorodibenzofurans	2.70	2.55	2.95	2.73	7.4
Octachlorodibenzofuran	0.32	0.28	0.35	0.32	12.4
Total	60.1	48.2	82.6	63.6	27.4

* At 25°C and 1 atmosphere

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Congener Group Emission Rates

Dioxins

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzo-p-dioxins	48.5	41.4	49.5	46.4	9.5
Pentachlorodibenzo-p-dioxins	36.8	34.9	36.5	36.1	2.8
Hexachlorodibenzo-p-dioxins	30.7	25.9	26.9	27.8	9.2
Heptachlorodibenzo-p-dioxins	27.0	23.5	25.7	25.4	6.9
Octachlorodibenzo-p-dioxin	29.9	23.6	27.1	26.9	11.7
Total	173	149	166	163	7.4

Furans

Congener Group	Emission Rate Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	Coefficient of Variation %
Tetrachlorodibenzofurans	614	482	874	656	30.4
Pentachlorodibenzofurans	293	222	378	298	26.2
Hexachlorodibenzofurans	97.8	90.9	127	105	18.3
Heptachlorodibenzofurans	47.5	44.6	51.3	47.8	7.0
Octachlorodibenzofuran	5.63	4.82	6.15	5.53	12.1
Total	1058	844	1436	1113	27.0

TABLE 14
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Summary of Dioxin and Furan Congener Group Emission Data

Dioxins

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	1.79	3.18	2.36	2.65	46.4
Pentachlorodibenzo-p-dioxins	1.39	2.47	1.83	2.06	36.1
Hexachlorodibenzo-p-dioxins	1.07	1.91	1.41	1.59	27.8
Heptachlorodibenzo-p-dioxins	0.98	1.74	1.29	1.45	25.4
Octachlorodibenzo-p-dioxin	1.03	1.84	1.37	1.54	26.9
Total	6.26	11.1	8.26	9.30	163

Furans

Congener Group	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	25.3	45.1	33.4	37.5	656
Pentachlorodibenzofurans	11.5	20.4	15.1	17.0	298
Hexachlorodibenzofurans	4.05	7.22	5.35	6.02	105
Heptachlorodibenzofurans	1.84	3.28	2.43	2.73	47.8
Octachlorodibenzofuran	0.21	0.38	0.28	0.32	5.53
Total	42.8	76.3	56.6	63.6	1113

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

TABLE 15
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Blank Dioxin and Furan Congener Group Analyses

Dioxins

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzo-p-dioxins	<8.8	<10
Pentachlorodibenzo-p-dioxins	<4.1	<4.2
Hexachlorodibenzo-p-dioxins	<3.9	<4.7
Heptachlorodibenzo-p-dioxins	<4.3	<3.5
Octachlorodibenzo-p-dioxin	37.5	<7.0
Total	<58.6	<29.4

Furans

Congener Group	Blank Train pg	Laboratory Blank pg
Tetrachlorodibenzofurans	<5.5	<7.1
Pentachlorodibenzofurans	<4.2	<4.9
Hexachlorodibenzofurans	<3.6	<3.3
Heptachlorodibenzofurans	4.47	<4.2
Octachlorodibenzofuran	<5.7	<5.8
Total	<23.5	<25.3

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 16
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	715	126	223	166	187	3.30
12378-pentachlorodibenzo-p-dioxin	894	158	279	207	234	4.13
123478-hexachlorodibenzo-p-dioxin	369	65.2	115	85.6	96.8	1.70
123678-hexachlorodibenzo-p-dioxin	507	89.6	158	118	133	2.34
123789-hexachlorodibenzo-p-dioxin	535	94.6	167	124	140	2.47
1234678-heptachlorodibenzo-p-dioxin	2860	506	892	663	750	13.2
Octachlorodibenzo-p-dioxin	6480	1146	2021	1503	1699	29.9
2378-tetrachlorodibenzofuran	4450	787	1388	1032	1167	20.5
12378-pentachlorodibenzofuran	4620	817	1441	1071	1211	21.3
23478-pentachlorodibenzofuran	3090	546	964	717	810	14.3
123478-hexachlorodibenzofuran	3260	576	1017	756	855	15.0
123678-hexachlorodibenzofuran	3210	568	1001	744	842	14.8
234678-hexachlorodibenzofuran	1990	352	621	461	522	9.18
123789-hexachlorodibenzofuran	479	84.7	149	111	126	2.21
1234678-heptachlorodibenzofuran	7550	1335	2354	1751	1980	34.8
1234789-heptachlorodibenzofuran	570	101	178	132	149	2.63
Octachlorodibenzofuran	1220	216	380	283	320	5.63
PCB 81	180	31.8	56.1	41.7	47.2	0.83
PCB 77	828	146	258	192	217	3.82
PCB 123	<860	<152	<268	<199	<226	<3.97
PCB 118	4230	748	1319	981	1109	19.5
PCB 114	307	54.3	95.7	71.2	80.5	1.42
PCB 105	1850	327	577	429	485	8.54
PCB 126	486	85.9	152	113	127	2.24
PCB 167	<72	<12.7	<22.5	<16.7	<18.9	<0.33
PCB 156	280	49.5	87.3	64.9	73.4	1.29
PCB 157	153	27.1	47.7	35.5	40.1	0.71
PCB 169	<140	<24.8	<43.7	<32.5	<36.7	<0.65
PCB 189	149	26.3	46.5	34.6	39.1	0.69
Total Dioxins & Furans Only	42799	7568	13345	9925	11222	198
Total PCBs Only	<9535	<1686	<2973	<2211	<2500	<44.0
Total Dioxins & Furans and PCBs	<52334	<9254	<16319	<12137	<13723	<242

Dry Gas Volume Sampled (Rm^3*) :	3.207
Actual Flowrate (m^3/s) :	26.1
Dry Reference Flowrate (Rm^3/s*) :	14.8
Dry Adjusted Flowrate (Rm^3/s**) :	19.9
Wet Reference Flowrate (Rm^3/s*) :	17.6

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 17
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	593	104	185	136	154	2.69
12378-pentachlorodibenzo-p-dioxin	846	148	263	194	220	3.84
123478-hexachlorodibenzo-p-dioxin	318	55.6	99.0	73.0	82.6	1.45
123678-hexachlorodibenzo-p-dioxin	426	74.5	133	97.8	111	1.94
123789-hexachlorodibenzo-p-dioxin	479	83.7	149	110	124	2.18
1234678-heptachlorodibenzo-p-dioxin	2520	440	784	578	654	11.5
Octachlorodibenzo-p-dioxin	5200	909	1618	1193	1350	23.6
2378-tetrachlorodibenzofuran	3840	671	1195	881	997	17.4
12378-pentachlorodibenzofuran	3630	634	1130	833	943	16.5
23478-pentachlorodibenzofuran	2470	432	769	567	641	11.2
123478-hexachlorodibenzofuran	2720	475	847	624	706	12.4
123678-hexachlorodibenzofuran	2760	482	859	633	717	12.5
234678-hexachlorodibenzofuran	1620	283	504	372	421	7.36
123789-hexachlorodibenzofuran	385	67.3	120	88.4	100	1.75
1234678-heptachlorodibenzofuran	7230	1264	2250	1659	1877	32.9
1234789-heptachlorodibenzofuran	511	89.3	159	117	133	2.32
Octachlorodibenzofuran	1060	185	330	243	275	4.82
PCB 81	<350	<61.2	<109	<80.3	<90.9	<1.59
PCB 77	1150	201	358	264	299	5.23
PCB 123	<1100	<192	<342	<252	<286	<5.00
PCB 118	4880	853	1519	1120	1267	22.2
PCB 114	295	51.6	91.8	67.7	76.6	1.34
PCB 105	1840	322	573	422	478	8.36
PCB 126	430	75.2	134	98.7	112	1.95
PCB 167	<96	<16.8	<29.9	<22.0	<24.9	<0.44
PCB 156	232	40.5	72.2	53.2	60.2	1.05
PCB 157	112	19.6	34.9	25.7	29.1	0.51
PCB 169	150	26.2	46.7	34.4	38.9	0.68
PCB 189	124	21.7	38.6	28.5	32.2	0.56
Total Dioxins & Furans Only	36608	6398	11394	8401	9506	166
Total PCBs Only	<10759	<1880	<3349	<2469	<2794	<48.9
Total Dioxins & Furans and PCBs	<47367	<8278	<14742	<10871	<12299	<215

Dry Gas Volume Sampled (Rm^3*) :	3.213
Actual Flowrate (m^3/s) :	26.0
Dry Reference Flowrate (Rm^3/s*) :	14.6
Dry Adjusted Flowrate (Rm^3/s**) :	19.8
Wet Reference Flowrate (Rm^3/s*) :	17.5

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 18
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	938	167	301	224	249	4.34
12378-pentachlorodibenzo-p-dioxin	919	164	295	219	244	4.25
123478-hexachlorodibenzo-p-dioxin	317	56.6	102	75.6	84.2	1.47
123678-hexachlorodibenzo-p-dioxin	454	81.1	146	108	121	2.10
123789-hexachlorodibenzo-p-dioxin	519	92.7	167	124	138	2.40
1234678-heptachlorodibenzo-p-dioxin	2650	473	851	632	704	12.3
Octachlorodibenzo-p-dioxin	5870	1048	1885	1399	1560	27.1
2378-tetrachlorodibenzofuran	6580	1175	2113	1568	1749	30.4
12378-pentachlorodibenzofuran	5960	1064	1914	1421	1584	27.6
23478-pentachlorodibenzofuran	5120	914	1644	1220	1361	23.7
123478-hexachlorodibenzofuran	3340	596	1073	796	888	15.4
123678-hexachlorodibenzofuran	3430	612	1101	818	912	15.9
234678-hexachlorodibenzofuran	2190	391	703	522	582	10.1
123789-hexachlorodibenzofuran	540	96.4	173	129	144	2.50
1234678-heptachlorodibenzofuran	7990	1427	2566	1905	2123	36.9
1234789-heptachlorodibenzofuran	632	113	203	151	168	2.92
Octachlorodibenzofuran	1330	237	427	317	353	6.15
PCB 81	<240	<42.9	<77.1	<57.2	<63.8	<1.11
PCB 77	1030	184	331	246	274	4.76
PCB 123	<880	<157	<283	<210	<234	<4.07
PCB 118	2690	480	864	641	715	12.4
PCB 114	241	43.0	77.4	57.4	64.0	1.11
PCB 105	1200	214	385	286	319	5.55
PCB 126	634	113	204	151	168	2.93
PCB 167	<65	<11.6	<20.9	<15.5	<17.3	<0.30
PCB 156	252	45.0	80.9	60.1	67.0	1.17
PCB 157	140	25.0	45.0	33.4	37.2	0.65
PCB 169	<180	<32.1	<57.8	<42.9	<47.8	<0.83
PCB 189	170	30.4	54.6	40.5	45.2	0.79
Total Dioxins & Furans Only	48779	8709	15664	11627	12964	226
Total PCBs Only	<7722	<1379	<2480	<1841	<2052	<35.7
Total Dioxins & Furans and PCBs	<56501	<10088	<18144	<13468	<15016	<261

Dry Gas Volume Sampled (Rm³*) :	3.114
Actual Flowrate (m³/s) :	25.9
Dry Reference Flowrate (Rm³/s*) :	14.4
Dry Adjusted Flowrate (Rm³/s**) :	19.4
Wet Reference Flowrate (Rm³/s*) :	17.4

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Actual Concentrations

Specific Isomer	Actual Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	126	104	167	133	24.4
12378-pentachlorodibenzo-p-dioxin	158	148	164	157	5.2
123478-hexachlorodibenzo-p-dioxin	65.2	55.6	56.6	59.1	9.0
123678-hexachlorodibenzo-p-dioxin	89.6	74.5	81.1	81.7	9.3
123789-hexachlorodibenzo-p-dioxin	94.6	83.7	92.7	90.3	6.4
1234678-heptachlorodibenzo-p-dioxin	506	440	473	473	6.9
Octachlorodibenzo-p-dioxin	1146	909	1048	1034	11.5
2378-tetrachlorodibenzofuran	787	671	1175	878	30.1
12378-pentachlorodibenzofuran	817	634	1064	838	25.7
23478-pentachlorodibenzofuran	546	432	914	631	40.0
123478-hexachlorodibenzofuran	576	475	596	549	11.8
123678-hexachlorodibenzofuran	568	482	612	554	11.9
234678-hexachlorodibenzofuran	352	283	391	342	16.0
123789-hexachlorodibenzofuran	84.7	67.3	96.4	82.8	17.7
1234678-heptachlorodibenzofuran	1335	1264	1427	1342	6.1
1234789-heptachlorodibenzofuran	101	89.3	113	101	11.7
Octachlorodibenzofuran	216	185	237	213	12.3
PCB 81	31.8	<61.2	<42.9	<45.3	32.7
PCB 77	146	201	184	177	15.8
PCB 123	<152	<192	<157	<167	13.1
PCB 118	748	853	480	694	27.7
PCB 114	54.3	51.6	43.0	49.6	11.8
PCB 105	327	322	214	288	22.1
PCB 126	85.9	75.2	113	91.4	21.4
PCB 167	<12.7	<16.8	<11.6	<13.7	19.9
PCB 156	49.5	40.5	45.0	45.0	10.0
PCB 157	27.1	19.6	25.0	23.9	16.2
PCB 169	<24.8	26.2	<32.1	<27.7	14.1
PCB 189	26.3	21.7	30.4	26.1	16.6
Total Dioxins & Furans Only	7568	6398	8709	7558	15.3
Total PCBs Only	<1686	<1880	<1379	<1648	15.3
Total Dioxins & Furans and PCBs	<9254	<8278	<10088	<9207	9.8

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific Isomer	Dry Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	223	185	301	236	25.2
12378-pentachlorodibenzo-p-dioxin	279	263	295	279	5.7
123478-hexachlorodibenzo-p-dioxin	115	99.0	102	105	8.2
123678-hexachlorodibenzo-p-dioxin	158	133	146	145	8.8
123789-hexachlorodibenzo-p-dioxin	167	149	167	161	6.3
1234678-heptachlorodibenzo-p-dioxin	892	784	851	842	6.4
Octachlorodibenzo-p-dioxin	2021	1618	1885	1841	11.1
2378-tetrachlorodibenzofuran	1388	1195	2113	1565	30.9
12378-pentachlorodibenzofuran	1441	1130	1914	1495	26.4
23478-pentachlorodibenzofuran	964	769	1644	1125	40.8
123478-hexachlorodibenzofuran	1017	847	1073	979	12.0
123678-hexachlorodibenzofuran	1001	859	1101	987	12.3
234678-hexachlorodibenzofuran	621	504	703	609	16.4
123789-hexachlorodibenzofuran	149	120	173	148	18.2
1234678-heptachlorodibenzofuran	2354	2250	2566	2390	6.7
1234789-heptachlorodibenzofuran	178	159	203	180	12.2
Octachlorodibenzofuran	380	330	427	379	12.8
PCB 81	56.1	<109	<77.1	<80.7	32.9
PCB 77	258	358	331	316	16.3
PCB 123	<268	<342	<283	<298	13.2
PCB 118	1319	1519	864	1234	27.2
PCB 114	95.7	91.8	77.4	88.3	10.9
PCB 105	577	573	385	512	21.4
PCB 126	152	134	204	163	22.2
PCB 167	<22.5	<29.9	<20.9	<24.4	19.7
PCB 156	87.3	72.2	80.9	80.1	9.5
PCB 157	47.7	34.9	45.0	42.5	15.9
PCB 169	<43.7	46.7	<57.8	<49.4	15.1
PCB 189	46.5	38.6	54.6	46.5	17.2
Total Dioxins & Furans Only	13345	11394	15664	13468	15.9
Total PCBs Only	<2973	<3349	<2480	<2934	14.9
Total Dioxins & Furans and PCBs	<16319	<14742	<18144	<16402	10.4

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific Isomer	Dry Adjusted Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	166	136	224	175	25.4
12378-pentachlorodibenzo-p-dioxin	207	194	219	207	6.0
123478-hexachlorodibenzo-p-dioxin	85.6	73.0	75.6	78.0	8.5
123678-hexachlorodibenzo-p-dioxin	118	97.8	108	108	9.2
123789-hexachlorodibenzo-p-dioxin	124	110	124	119	6.8
1234678-heptachlorodibenzo-p-dioxin	663	578	632	624	6.9
Octachlorodibenzo-p-dioxin	1503	1193	1399	1365	11.5
2378-tetrachlorodibenzofuran	1032	881	1568	1161	31.1
12378-pentachlorodibenzofuran	1071	833	1421	1108	26.7
23478-pentachlorodibenzofuran	717	567	1220	835	41.0
123478-hexachlorodibenzofuran	756	624	796	725	12.4
123678-hexachlorodibenzofuran	744	633	818	732	12.7
234678-hexachlorodibenzofuran	461	372	522	452	16.7
123789-hexachlorodibenzofuran	111	88.4	129	109	18.5
1234678-heptachlorodibenzofuran	1751	1659	1905	1772	7.0
1234789-heptachlorodibenzofuran	132	117	151	133	12.5
Octachlorodibenzofuran	283	243	317	281	13.1
PCB 81	41.7	<80.3	<57.2	<59.8	32.5
PCB 77	192	264	246	234	16.0
PCB 123	<199	<252	<210	<221	12.7
PCB 118	981	1120	641	914	26.9
PCB 114	71.2	67.7	57.4	65.4	10.9
PCB 105	429	422	286	379	21.3
PCB 126	113	98.7	151	121	22.5
PCB 167	<16.7	<22.0	<15.5	<18.1	19.3
PCB 156	64.9	53.2	60.1	59.4	9.9
PCB 157	35.5	25.7	33.4	31.5	16.3
PCB 169	<32.5	34.4	<42.9	<36.6	15.2
PCB 189	34.6	28.5	40.5	34.5	17.5
Total Dioxins & Furans Only	9925	8401	11627	9985	16.2
Total PCBs Only	<2211	<2469	<1841	<2174	14.5
Total Dioxins & Furans and PCBs	<12137	<10871	<13468	<12158	10.7

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific Isomer	Wet Reference Concentration				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	187	154	249	197	24.6
12378-pentachlorodibenzo-p-dioxin	234	220	244	233	5.3
123478-hexachlorodibenzo-p-dioxin	96.8	82.6	84.2	87.9	8.8
123678-hexachlorodibenzo-p-dioxin	133	111	121	121	9.2
123789-hexachlorodibenzo-p-dioxin	140	124	138	134	6.4
1234678-heptachlorodibenzo-p-dioxin	750	654	704	703	6.8
Octachlorodibenzo-p-dioxin	1699	1350	1560	1536	11.4
2378-tetrachlorodibenzofuran	1167	997	1749	1304	30.2
12378-pentachlorodibenzofuran	1211	943	1584	1246	25.9
23478-pentachlorodibenzofuran	810	641	1361	937	40.1
123478-hexachlorodibenzofuran	855	706	888	816	11.8
123678-hexachlorodibenzofuran	842	717	912	823	12.0
234678-hexachlorodibenzofuran	522	421	582	508	16.0
123789-hexachlorodibenzofuran	126	100	144	123	17.8
1234678-heptachlorodibenzofuran	1980	1877	2123	1993	6.2
1234789-heptachlorodibenzofuran	149	133	168	150	11.8
Octachlorodibenzofuran	320	275	353	316	12.4
PCB 81	47.2	<90.9	<63.8	<67.3	32.8
PCB 77	217	299	274	263	15.9
PCB 123	<226	<286	<234	<248	13.1
PCB 118	1109	1267	715	1030	27.6
PCB 114	80.5	76.6	64.0	73.7	11.7
PCB 105	485	478	319	427	22.0
PCB 126	127	112	168	136	21.6
PCB 167	<18.9	<24.9	<17.3	<20.4	19.8
PCB 156	73.4	60.2	67.0	66.9	9.9
PCB 157	40.1	29.1	37.2	35.5	16.1
PCB 169	<36.7	38.9	<47.8	<41.2	14.3
PCB 189	39.1	32.2	45.2	38.8	16.7
Total Dioxins & Furans Only	11222	9506	12964	11231	15.4
Total PCBs Only	<2500	<2794	<2052	<2449	15.2
Total Dioxins & Furans and PCBs	<13723	<12299	<15016	<13679	9.9

* At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 23
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Specific Isomer Emission Rates

Specific Isomer	Emission Rate				Coefficient of Variation
	Test No. 1	Test No. 2	Test No. 3	Average	
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	3.30	2.69	4.34	3.44	24.1
12378-pentachlorodibenzo-p-dioxin	4.13	3.84	4.25	4.07	5.1
123478-hexachlorodibenzo-p-dioxin	1.70	1.45	1.47	1.54	9.3
123678-hexachlorodibenzo-p-dioxin	2.34	1.94	2.10	2.12	9.6
123789-hexachlorodibenzo-p-dioxin	2.47	2.18	2.40	2.35	6.5
1234678-heptachlorodibenzo-p-dioxin	13.2	11.5	12.3	12.3	7.1
Octachlorodibenzo-p-dioxin	29.9	23.6	27.1	26.9	11.7
2378-tetrachlorodibenzofuran	20.5	17.4	30.4	22.8	29.7
12378-pentachlorodibenzofuran	21.3	16.5	27.6	21.8	25.5
23478-pentachlorodibenzofuran	14.3	11.2	23.7	16.4	39.6
123478-hexachlorodibenzofuran	15.0	12.4	15.4	14.3	11.7
123678-hexachlorodibenzofuran	14.8	12.5	15.9	14.4	11.8
234678-hexachlorodibenzofuran	9.18	7.36	10.1	8.89	15.8
123789-hexachlorodibenzofuran	2.21	1.75	2.50	2.15	17.5
1234678-heptachlorodibenzofuran	34.8	32.9	36.9	34.9	5.9
1234789-heptachlorodibenzofuran	2.63	2.32	2.92	2.63	11.4
Octachlorodibenzofuran	5.63	4.82	6.15	5.53	12.1
PCB 81	0.83	<1.59	<1.11	<1.18	32.7
PCB 77	3.82	5.23	4.76	4.60	15.5
PCB 123	<3.97	<5.00	<4.07	<4.35	13.1
PCB 118	19.5	22.2	12.4	18.0	27.9
PCB 114	1.42	1.34	1.11	1.29	12.2
PCB 105	8.54	8.36	5.55	7.48	22.4
PCB 126	2.24	1.95	2.93	2.38	21.1
PCB 167	<0.33	<0.44	<0.30	<0.36	19.9
PCB 156	1.29	1.05	1.17	1.17	10.2
PCB 157	0.71	0.51	0.65	0.62	16.3
PCB 169	<0.65	0.68	<0.83	<0.72	13.7
PCB 189	0.69	0.56	0.79	0.68	16.4
Total Dioxins & Furans Only	198	166	226	196	15.1
Total PCBs Only	<44.0	<48.9	<35.7	<42.9	15.5
Total Dioxins & Furans and PCBs	<242	<215	<261	<239	9.6

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 24
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration pg/m³	Dry Reference Concentration pg/Rm³*	Dry Adjusted Concentration pg/Rm³**	Wet Reference Concentration pg/Rm³*	Emission Rate ng/s
2378-tetrachlorodibenzo-p-dioxin	133	236	175	197	3.44
12378-pentachlorodibenzo-p-dioxin	157	279	207	233	4.07
123478-hexachlorodibenzo-p-dioxin	59.1	105	78.0	87.9	1.54
123678-hexachlorodibenzo-p-dioxin	81.7	145	108	121	2.12
123789-hexachlorodibenzo-p-dioxin	90.3	161	119	134	2.35
1234678-heptachlorodibenzo-p-dioxin	473	842	624	703	12.3
Octachlorodibenzo-p-dioxin	1034	1841	1365	1536	26.9
2378-tetrachlorodibenzofuran	878	1565	1161	1304	22.8
12378-pentachlorodibenzofuran	838	1495	1108	1246	21.8
23478-pentachlorodibenzofuran	631	1125	835	937	16.4
123478-hexachlorodibenzofuran	549	979	725	816	14.3
123678-hexachlorodibenzofuran	554	987	732	823	14.4
234678-hexachlorodibenzofuran	342	609	452	508	8.89
123789-hexachlorodibenzofuran	82.8	148	109	123	2.15
1234678-heptachlorodibenzofuran	1342	2390	1772	1993	34.9
1234789-heptachlorodibenzofuran	101	180	133	150	2.63
Octachlorodibenzofuran	213	379	281	316	5.53
PCB 81	<45.3	<80.7	<59.8	<67.3	<1.18
PCB 77	177	316	234	263	4.60
PCB 123	<167	<298	<221	<248	<4.35
PCB 118	694	1234	914	1030	18.0
PCB 114	49.6	88.3	65.4	73.7	1.29
PCB 105	288	512	379	427	7.48
PCB 126	91.4	163	121	136	2.38
PCB 167	<13.7	<24.4	<18.1	<20.4	<0.36
PCB 156	45.0	80.1	59.4	66.9	1.17
PCB 157	23.9	42.5	31.5	35.5	0.62
PCB 169	<27.7	<49.4	<36.6	<41.2	<0.72
PCB 189	26.1	46.5	34.5	38.8	0.68
Total Dioxins & Furans Only	7558	13468	9985	11231	196
Total PCBs Only	<1648	<2934	<2174	<2449	<42.9
Total Dioxins & Furans and PCBs	<9207	<16402	<12158	<13679	<239

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 25
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific Isomer	Blank Train	Laboratory Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<8.8	<10
12378-pentachlorodibenzo-p-dioxin	<4.1	<4.2
123478-hexachlorodibenzo-p-dioxin	<3.9	<4.7
123678-hexachlorodibenzo-p-dioxin	<3.7	<4.5
123789-hexachlorodibenzo-p-dioxin	<3.7	<4.5
1234678-heptachlorodibenzo-p-dioxin	<4.3	<3.5
Octachlorodibenzo-p-dioxin	37.5	<7.0
2378-tetrachlorodibenzofuran	<5.5	<7.1
12378-pentachlorodibenzofuran	<4.2	<4.9
23478-pentachlorodibenzofuran	<4.1	<4.8
123478-hexachlorodibenzofuran	<3.1	<2.9
123678-hexachlorodibenzofuran	<2.7	<2.5
234678-hexachlorodibenzofuran	<3.0	<2.7
123789-hexachlorodibenzofuran	<3.6	<3.3
1234678-heptachlorodibenzofuran	4.47	<3.0
1234789-heptachlorodibenzofuran	<2.8	<4.2
Octachlorodibenzofuran	<5.7	<5.8
PCB 81	<5.1	<2.5
PCB 77	<9.4	<2.9
PCB 123	<6.9	<3.6
PCB 118	95.8	<2.7
PCB 114	<5.2	<3.5
PCB 105	<26	<3.4
PCB 126	<6.0	<3.8
PCB 167	<3.0	<2.6
PCB 156	<3.2	<2.8
PCB 157	<3.3	<3.0
PCB 169	<3.7	<3.5
PCB 189	<3.1	<1.4
Total Dioxins & Furans Only	<105	<79.6
Total PCBs Only	<171	<35.7
Total Dioxins & Furans and PCBs	<276	<115

"<" indicates that the amount detected is less than the detection limit
In these cases the value of the detection limit was used to calculate the total collected.

TABLE 26
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific Isomer	Toxicity Equivalency Factor	Actual Concentration Test No. 1 pg TEQ/m³	Test No. 2 pg TEQ/m³	Test No. 3 pg TEQ/m³	Average pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	126	104	167	133
12378-pentachlorodibenzo-p-dioxin	1.000	158	148	164	157
123478-hexachlorodibenzo-p-dioxin	0.100	6.52	5.56	5.66	5.91
123678-hexachlorodibenzo-p-dioxin	0.100	8.96	7.45	8.11	8.17
123789-hexachlorodibenzo-p-dioxin	0.100	9.46	8.37	9.27	9.03
1234678-heptachlorodibenzo-p-dioxin	0.010	5.06	4.40	4.73	4.73
Octachlorodibenzo-p-dioxin	0.0003	0.34	0.27	0.31	0.31
2378-tetrachlorodibenzofuran	0.100	78.7	67.1	117	87.8
12378-pentachlorodibenzofuran	0.030	24.5	19.0	31.9	25.2
23478-pentachlorodibenzofuran	0.300	164	130	274	189
123478-hexachlorodibenzofuran	0.100	57.6	47.5	59.6	54.9
123678-hexachlorodibenzofuran	0.100	56.8	48.2	61.2	55.4
234678-hexachlorodibenzofuran	0.100	35.2	28.3	39.1	34.2
123789-hexachlorodibenzofuran	0.100	8.47	6.73	9.64	8.28
1234678-heptachlorodibenzofuran	0.010	13.3	12.6	14.3	13.4
1234789-heptachlorodibenzofuran	0.010	1.01	0.89	1.13	1.01
Octachlorodibenzofuran	0.0003	0.065	0.056	0.071	0.064
PCB 81	0.0003	0.0095	<0.018	<0.013	<0.014
PCB 77	0.0001	0.015	0.020	0.018	0.018
PCB 123	0.00003	<0.0046	<0.0058	<0.0047	<0.0050
PCB 118	0.00003	0.022	0.026	0.014	0.021
PCB 114	0.00003	0.0016	0.0015	0.0013	0.0015
PCB 105	0.00003	0.0098	0.0096	0.0064	0.0086
PCB 126	0.100	8.59	7.52	11.3	9.14
PCB 167	0.00003	<0.00038	<0.00050	<0.00035	<0.00041
PCB 156	0.00003	0.0015	0.0012	0.0013	0.0014
PCB 157	0.00003	0.00081	0.00059	0.00075	0.00072
PCB 169	0.030	<0.74	0.79	<0.96	<0.83
PCB 189	0.00003	0.00079	0.00065	0.00091	0.00078
Total Dioxins & Furans Only		754	638	968	787
Total PCBs Only		<9.40	<8.39	<12.3	<10.0
Total Dioxins & Furans and PCBs		<764	<646	<981	<797

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Dry Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	223	185	301	236
12378-pentachlorodibenzo-p-dioxin	1.000	279	263	295	279
123478-hexachlorodibenzo-p-dioxin	0.100	11.5	9.90	10.2	10.5
123678-hexachlorodibenzo-p-dioxin	0.100	15.8	13.3	14.6	14.5
123789-hexachlorodibenzo-p-dioxin	0.100	16.7	14.9	16.7	16.1
1234678-heptachlorodibenzo-p-dioxin	0.010	8.92	7.84	8.51	8.42
Octachlorodibenzo-p-dioxin	0.0003	0.61	0.49	0.57	0.55
2378-tetrachlorodibenzofuran	0.100	139	120	211	157
12378-pentachlorodibenzofuran	0.030	43.2	33.9	57.4	44.8
23478-pentachlorodibenzofuran	0.300	289	231	493	338
123478-hexachlorodibenzofuran	0.100	102	84.7	107	97.9
123678-hexachlorodibenzofuran	0.100	100	85.9	110	98.7
234678-hexachlorodibenzofuran	0.100	62.1	50.4	70.3	60.9
123789-hexachlorodibenzofuran	0.100	14.9	12.0	17.3	14.8
1234678-heptachlorodibenzofuran	0.010	23.5	22.5	25.7	23.9
1234789-heptachlorodibenzofuran	0.010	1.78	1.59	2.03	1.80
Octachlorodibenzofuran	0.0003	0.11	0.10	0.13	0.11
PCB 81	0.0003	0.017	<0.033	<0.023	<0.024
PCB 77	0.0001	0.026	0.036	0.033	0.032
PCB 123	0.00003	<0.0080	<0.010	<0.0085	<0.0089
PCB 118	0.00003	0.040	0.046	0.026	0.037
PCB 114	0.00003	0.0029	0.0028	0.0023	0.0026
PCB 105	0.00003	0.017	0.017	0.012	0.015
PCB 126	0.100	15.2	13.4	20.4	16.3
PCB 167	0.00003	<0.00067	<0.00090	<0.00063	<0.00073
PCB 156	0.00003	0.0026	0.0022	0.0024	0.0024
PCB 157	0.00003	0.0014	0.0010	0.0013	0.0013
PCB 169	0.030	<1.31	1.40	<1.73	<1.48
PCB 189	0.00003	0.0014	0.0012	0.0016	0.0014
Total Dioxins & Furans Only		1330	1135	1742	1403
Total PCBs Only		<16.6	<14.9	<22.2	<17.9
Total Dioxins & Furans and PCBs		<1347	<1150	<1764	<1420

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 28
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	166	136	224	175
12378-pentachlorodibenzo-p-dioxin	1.000	207	194	219	207
123478-hexachlorodibenzo-p-dioxin	0.100	8.56	7.30	7.56	7.80
123678-hexachlorodibenzo-p-dioxin	0.100	11.8	9.78	10.8	10.8
123789-hexachlorodibenzo-p-dioxin	0.100	12.4	11.0	12.4	11.9
1234678-heptachlorodibenzo-p-dioxin	0.010	6.63	5.78	6.32	6.24
Octachlorodibenzo-p-dioxin	0.0003	0.45	0.36	0.42	0.41
2378-tetrachlorodibenzofuran	0.100	103	88.1	157	116
12378-pentachlorodibenzofuran	0.030	32.1	25.0	42.6	33.3
23478-pentachlorodibenzofuran	0.300	215	170	366	250
123478-hexachlorodibenzofuran	0.100	75.6	62.4	79.6	72.5
123678-hexachlorodibenzofuran	0.100	74.4	63.3	81.8	73.2
234678-hexachlorodibenzofuran	0.100	46.1	37.2	52.2	45.2
123789-hexachlorodibenzofuran	0.100	11.1	8.84	12.9	10.9
1234678-heptachlorodibenzofuran	0.010	17.5	16.6	19.0	17.7
1234789-heptachlorodibenzofuran	0.010	1.32	1.17	1.51	1.33
Octachlorodibenzofuran	0.0003	0.085	0.073	0.095	0.084
PCB 81	0.0003	0.013	<0.024	<0.017	<0.018
PCB 77	0.0001	0.019	0.026	0.025	0.023
PCB 123	0.00003	<0.0060	<0.0076	<0.0063	<0.0066
PCB 118	0.00003	0.029	0.034	0.019	0.027
PCB 114	0.00003	0.0021	0.0020	0.0017	0.0020
PCB 105	0.00003	0.013	0.013	0.0086	0.011
PCB 126	0.100	11.3	9.87	15.1	12.1
PCB 167	0.00003	<0.00050	<0.00066	<0.00046	<0.00054
PCB 156	0.00003	0.0019	0.0016	0.0018	0.0018
PCB 157	0.00003	0.0011	0.00077	0.0010	0.00095
PCB 169	0.030	<0.97	1.03	<1.29	<1.10
PCB 189	0.00003	0.0010	0.00085	0.0012	0.0010
Total Dioxins & Furans Only		989	837	1293	1040
Total PCBs Only		<12.3	<11.0	<16.5	<13.3
Total Dioxins & Furans and PCBs		<1002	<848	<1309	<1053

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 28A
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using Half the Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	166	136	224	175
12378-pentachlorodibenzo-p-dioxin	1.000	207	194	219	207
123478-hexachlorodibenzo-p-dioxin	0.100	8.56	7.30	7.56	7.80
123678-hexachlorodibenzo-p-dioxin	0.100	11.8	9.78	10.8	10.8
123789-hexachlorodibenzo-p-dioxin	0.100	12.4	11.0	12.4	11.9
1234678-heptachlorodibenzo-p-dioxin	0.010	6.63	5.78	6.32	6.24
Octachlorodibenzo-p-dioxin	0.0003	0.45	0.36	0.42	0.41
2378-tetrachlorodibenzofuran	0.100	103	88.1	157	116
12378-pentachlorodibenzofuran	0.030	32.1	25.0	42.6	33.3
23478-pentachlorodibenzofuran	0.300	215	170	366	250
123478-hexachlorodibenzofuran	0.100	75.6	62.4	79.6	72.5
123678-hexachlorodibenzofuran	0.100	74.4	63.3	81.8	73.2
234678-hexachlorodibenzofuran	0.100	46.1	37.2	52.2	45.2
123789-hexachlorodibenzofuran	0.100	11.1	8.84	12.9	10.9
1234678-heptachlorodibenzofuran	0.010	17.5	16.6	19.0	17.7
1234789-heptachlorodibenzofuran	0.010	1.32	1.17	1.51	1.33
Octachlorodibenzofuran	0.0003	0.085	0.073	0.095	0.084
PCB 81	0.0003	0.013	0.012	0.0086	0.011
PCB 77	0.0001	0.019	0.026	0.025	0.023
PCB 123	0.00003	0.0030	0.0038	0.0031	0.0033
PCB 118	0.00003	0.029	0.034	0.019	0.027
PCB 114	0.00003	0.0021	0.0020	0.0017	0.0020
PCB 105	0.00003	0.013	0.013	0.0086	0.011
PCB 126	0.100	11.3	9.87	15.1	12.1
PCB 167	0.00003	0.00025	0.00033	0.00023	0.00027
PCB 156	0.00003	0.0019	0.0016	0.0018	0.0018
PCB 157	0.00003	0.0011	0.00077	0.0010	0.00095
PCB 169	0.030	0.49	1.03	0.64	0.72
PCB 189	0.00003	0.0010	0.00085	0.0012	0.0010
Total Dioxins & Furans Only		989	837	1293	1040
Total PCBs Only		11.8	11.0	15.8	12.9
Total Dioxins & Furans and PCBs		1001	848	1309	1053

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

TABLE 28B
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations
Calculated Using the Full Detection Limit

Specific Isomer	Toxicity Equivalency Factor	Dry Adjusted Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.00	166	136	224	175
12378-pentachlorodibenzo-p-dioxin	0.50	104	97.1	110	103
123478-hexachlorodibenzo-p-dioxin	0.10	8.56	7.30	7.56	7.80
123678-hexachlorodibenzo-p-dioxin	0.10	11.8	9.78	10.8	10.8
123789-hexachlorodibenzo-p-dioxin	0.10	12.4	11.0	12.4	11.9
1234678-heptachlorodibenzo-p-dioxin	0.01	6.63	5.78	6.32	6.24
Octachlorodibenzo-p-dioxin	0.001	1.50	1.19	1.40	1.37
2378-tetrachlorodibenzofuran	0.10	103	88.1	157	116
12378-pentachlorodibenzofuran	0.05	53.6	41.7	71.0	55.4
23478-pentachlorodibenzofuran	0.50	358	283	610	417
123478-hexachlorodibenzofuran	0.10	75.6	62.4	79.6	72.5
123678-hexachlorodibenzofuran	0.10	74.4	63.3	81.8	73.2
234678-hexachlorodibenzofuran	0.10	46.1	37.2	52.2	45.2
123789-hexachlorodibenzofuran	0.10	11.1	8.84	12.9	10.9
1234678-heptachlorodibenzofuran	0.01	17.5	16.6	19.0	17.7
1234789-heptachlorodibenzofuran	0.01	1.32	1.17	1.51	1.33
Octachlorodibenzofuran	0.001	0.28	0.24	0.32	0.28
Total Dioxins & Furans		1052	871	1457	1127

* At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 29
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific Isomer	Toxicity Equivalency Factor	Wet Reference Concentration Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	187	154	249	197
12378-pentachlorodibenzo-p-dioxin	1.000	234	220	244	233
123478-hexachlorodibenzo-p-dioxin	0.100	9.68	8.26	8.42	8.79
123678-hexachlorodibenzo-p-dioxin	0.100	13.3	11.1	12.1	12.1
123789-hexachlorodibenzo-p-dioxin	0.100	14.0	12.4	13.8	13.4
1234678-heptachlorodibenzo-p-dioxin	0.010	7.50	6.54	7.04	7.03
Octachlorodibenzo-p-dioxin	0.0003	0.51	0.41	0.47	0.46
2378-tetrachlorodibenzofuran	0.100	117	99.7	175	130
12378-pentachlorodibenzofuran	0.030	36.3	28.3	47.5	37.4
23478-pentachlorodibenzofuran	0.300	243	192	408	281
123478-hexachlorodibenzofuran	0.100	85.5	70.6	88.8	81.6
123678-hexachlorodibenzofuran	0.100	84.2	71.7	91.2	82.3
234678-hexachlorodibenzofuran	0.100	52.2	42.1	58.2	50.8
123789-hexachlorodibenzofuran	0.100	12.6	10.0	14.4	12.3
1234678-heptachlorodibenzofuran	0.010	19.8	18.8	21.2	19.9
1234789-heptachlorodibenzofuran	0.010	1.49	1.33	1.68	1.50
Octachlorodibenzofuran	0.0003	0.096	0.083	0.11	0.095
PCB 81	0.0003	0.014	<0.027	<0.019	<0.020
PCB 77	0.0001	0.022	0.030	0.027	0.026
PCB 123	0.00003	<0.0068	<0.0086	<0.0070	<0.0074
PCB 118	0.00003	0.033	0.038	0.021	0.031
PCB 114	0.00003	0.0024	0.0023	0.0019	0.0022
PCB 105	0.00003	0.015	0.014	0.0096	0.013
PCB 126	0.100	12.7	11.2	16.8	13.6
PCB 167	0.00003	<0.00057	<0.00075	<0.00052	<0.00061
PCB 156	0.00003	0.0022	0.0018	0.0020	0.0020
PCB 157	0.00003	0.0012	0.00087	0.0011	0.0011
PCB 169	0.030	<1.10	1.17	<1.44	<1.23
PCB 189	0.00003	0.0012	0.00097	0.0014	0.0012
Total Dioxins & Furans Only		1119	947	1441	1169
Total PCBs Only		<13.9	<12.5	<18.4	<14.9
Total Dioxins & Furans and PCBs		<1133	<960	<1460	<1184

* At 25°C and 1 atmosphere

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 30
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific Isomer	Toxicity Equivalency Factor	Emission Rate Test No. 1 ng TEQ/s	Test No. 2 ng TEQ/s	Test No. 3 ng TEQ/s	Average ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	3.30	2.69	4.34	3.44
12378-pentachlorodibenzo-p-dioxin	1.000	4.13	3.84	4.25	4.07
123478-hexachlorodibenzo-p-dioxin	0.100	0.17	0.14	0.15	0.15
123678-hexachlorodibenzo-p-dioxin	0.100	0.23	0.19	0.21	0.21
123789-hexachlorodibenzo-p-dioxin	0.100	0.25	0.22	0.24	0.23
1234678-heptachlorodibenzo-p-dioxin	0.010	0.13	0.11	0.12	0.12
Octachlorodibenzo-p-dioxin	0.0003	0.0090	0.0071	0.0081	0.0081
2378-tetrachlorodibenzofuran	0.100	2.05	1.74	3.04	2.28
12378-pentachlorodibenzofuran	0.030	0.64	0.49	0.83	0.65
23478-pentachlorodibenzofuran	0.300	4.28	3.37	7.10	4.92
123478-hexachlorodibenzofuran	0.100	1.50	1.24	1.54	1.43
123678-hexachlorodibenzofuran	0.100	1.48	1.25	1.59	1.44
234678-hexachlorodibenzofuran	0.100	0.92	0.74	1.01	0.89
123789-hexachlorodibenzofuran	0.100	0.22	0.17	0.25	0.22
1234678-heptachlorodibenzofuran	0.010	0.35	0.33	0.37	0.35
1234789-heptachlorodibenzofuran	0.010	0.026	0.023	0.029	0.026
Octachlorodibenzofuran	0.0003	0.0017	0.0014	0.0018	0.0017
PCB 81	0.0003	0.00025	<0.00048	<0.00033	<0.00035
PCB 77	0.0001	0.00038	0.00052	0.00048	0.00046
PCB 123	0.00003	<0.00012	<0.00015	<0.00012	<0.00013
PCB 118	0.00003	0.00059	0.00067	0.00037	0.00054
PCB 114	0.00003	0.000043	0.000040	0.000033	0.000039
PCB 105	0.00003	0.00026	0.00025	0.00017	0.00022
PCB 126	0.100	0.22	0.20	0.29	0.24
PCB 167	0.00003	<0.000010	<0.000013	<0.0000090	<0.000011
PCB 156	0.00003	0.000039	0.000032	0.000035	0.000035
PCB 157	0.00003	0.000021	0.000015	0.000019	0.000019
PCB 169	0.030	<0.019	0.020	<0.025	<0.022
PCB 189	0.00003	0.000021	0.000017	0.000024	0.000020
Total Dioxins & Furans Only		19.7	16.6	25.1	20.4
Total PCBs Only		<0.25	<0.22	<0.32	<0.26
Total Dioxins & Furans and PCBs		<19.9	<16.8	<25.4	<20.7

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 31
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using the Full Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m³	Dry Reference Concentration pg TEQ/Rm³*	Dry Adjusted Concentration pg TEQ/Rm³**	Wet Reference Concentration pg TEQ/Rm³*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	133	236	175	197	3.44
12378-pentachlorodibenzo-p-dioxin	157	279	207	233	4.07
123478-hexachlorodibenzo-p-dioxin	5.91	10.5	7.80	8.79	0.15
123678-hexachlorodibenzo-p-dioxin	8.17	14.5	10.8	12.1	0.21
123789-hexachlorodibenzo-p-dioxin	9.03	16.1	11.9	13.4	0.23
1234678-heptachlorodibenzo-p-dioxin	4.73	8.42	6.24	7.03	0.12
Octachlorodibenzo-p-dioxin	0.31	0.55	0.41	0.46	0.0081
2378-tetrachlorodibenzofuran	87.8	157	116	130	2.28
12378-pentachlorodibenzofuran	25.2	44.8	33.3	37.4	0.65
23478-pentachlorodibenzofuran	189	338	250	281	4.92
123478-hexachlorodibenzofuran	54.9	97.9	72.5	81.6	1.43
123678-hexachlorodibenzofuran	55.4	98.7	73.2	82.3	1.44
234678-hexachlorodibenzofuran	34.2	60.9	45.2	50.8	0.89
123789-hexachlorodibenzofuran	8.28	14.8	10.9	12.3	0.22
1234678-heptachlorodibenzofuran	13.4	23.9	17.7	19.9	0.35
1234789-heptachlorodibenzofuran	1.01	1.80	1.33	1.50	0.026
Octachlorodibenzofuran	0.064	0.11	0.084	0.095	0.0017
PCB 81	<0.014	<0.024	<0.018	<0.020	<0.00035
PCB 77	0.018	0.032	0.023	0.026	0.00046
PCB 123	<0.0050	<0.0089	<0.0066	<0.0074	<0.00013
PCB 118	0.021	0.037	0.027	0.031	0.00054
PCB 114	0.0015	0.0026	0.0020	0.0022	0.000039
PCB 105	0.0086	0.015	0.011	0.013	0.00022
PCB 126	9.14	16.3	12.1	13.6	0.24
PCB 167	<0.00041	<0.00073	<0.00054	<0.00061	<0.000011
PCB 156	0.0014	0.0024	0.0018	0.0020	0.000035
PCB 157	0.00072	0.0013	0.00095	0.0011	0.000019
PCB 169	<0.83	<1.48	<1.10	<1.23	<0.022
PCB 189	0.00078	0.0014	0.0010	0.0012	0.000020
Total Dioxins & Furans Only	787	1403	1040	1169	20.4
Total PCBs Only	<10.0	<17.9	<13.3	<14.9	<0.26
Total Dioxins & Furans and PCBs	<797	<1420	<1053	<1184	<20.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: "<" indicates that the analyte was not detected and the value of the detection limit was used to calculate the emission data.

TABLE 32
Covanta - Durham York Energy Centre
Boiler No. 2 Quench Inlet
Summary of Dioxin and Furan Toxicity Equivalent Emission Data
Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration pg TEQ/m^3	Dry Reference Concentration pg TEQ/Rm^3*	Dry Adjusted Concentration pg TEQ/Rm^3**	Wet Reference Concentration pg TEQ/Rm^3*	Emission Rate ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	133	236	175	197	3.44
12378-pentachlorodibenzo-p-dioxin	157	279	207	233	4.07
123478-hexachlorodibenzo-p-dioxin	5.91	10.5	7.80	8.79	0.15
123678-hexachlorodibenzo-p-dioxin	8.17	14.5	10.8	12.1	0.21
123789-hexachlorodibenzo-p-dioxin	9.03	16.1	11.9	13.4	0.23
1234678-heptachlorodibenzo-p-dioxin	4.73	8.42	6.24	7.03	0.12
Octachlorodibenzo-p-dioxin	0.31	0.55	0.41	0.46	0.0081
2378-tetrachlorodibenzofuran	87.8	157	116	130	2.28
12378-pentachlorodibenzofuran	25.2	44.8	33.3	37.4	0.65
23478-pentachlorodibenzofuran	189	338	250	281	4.92
123478-hexachlorodibenzofuran	54.9	97.9	72.5	81.6	1.43
123678-hexachlorodibenzofuran	55.4	98.7	73.2	82.3	1.44
234678-hexachlorodibenzofuran	34.2	60.9	45.2	50.8	0.89
123789-hexachlorodibenzofuran	8.28	14.8	10.9	12.3	0.22
1234678-heptachlorodibenzofuran	13.4	23.9	17.7	19.9	0.35
1234789-heptachlorodibenzofuran	1.01	1.80	1.33	1.50	0.026
Octachlorodibenzofuran	0.064	0.11	0.084	0.095	0.0017
PCB 81	0.0084	0.015	0.011	0.012	0.00022
PCB 77	0.018	0.032	0.023	0.026	0.00046
PCB 123	0.0025	0.0045	0.0033	0.0037	0.000065
PCB 118	0.021	0.037	0.027	0.031	0.00054
PCB 114	0.0015	0.0026	0.0020	0.0022	0.000039
PCB 105	0.0086	0.015	0.011	0.013	0.00022
PCB 126	9.14	16.3	12.1	13.6	0.24
PCB 167	0.00021	0.00037	0.00027	0.00031	0.0000053
PCB 156	0.0014	0.0024	0.0018	0.0020	0.000035
PCB 157	0.00072	0.0013	0.00095	0.0011	0.000019
PCB 169	0.55	0.97	0.72	0.81	0.014
PCB 189	0.00078	0.0014	0.0010	0.0012	0.000020
Total Dioxins & Furans Only	787	1403	1040	1169	20.4
Total PCBs Only	9.75	17.4	12.9	14.5	0.25
Total Dioxins & Furans and PCBs	797	1420	1053	1184	20.7

* At 25°C and 1 atmosphere

** At 25°C and 1 atmosphere, adjusted to 11% oxygen by volume

World Health Organization Toxicity Equivalency Factors as detailed in O. Reg. 419/05.

Note: The value of half the detection limit was used to calculate emission data for those analytes not detected.

APPENDIX 5

Pre-Test Plan Acceptance Letter and
ECA No. 7306-8FDKNX
(96 pages)

Ministry of the Environment & Climate Change
Standards Development Branch

40 St. Clair Avenue West
Toronto ON M4V 1M2
www.ene.gov.on.ca

Ministère de l'Environnement et de l'Action en matière de changement climatique
Direction de l'élaboration des normes
40, avenue St. Clair ouest
Toronto, ON M4V 1M2
www.ene.gov.on.ca

Ontario

Via email: tsanderson@ortech.ca
File No.: CR:SA:109541:17

2017/07/31

Ms. Tina Sanderson
ORTECH Consulting Inc.
804 Southdown Rd.
Mississauga, Ontario
L5J 2Y4

Re.: Pre Test Plan for source testing to be conducted at Durham-York Energy Centre. Environmental Compliance Approval No. 7306-8FDKNX.

Dear Ms. Sanderson:

We reviewed your pre-test plan (ORTECH Project 21800), dated 2017/07/27, prepared and submitted on behalf of Covanta Durham-York Renewable Energy L.P., and referring to source testing to be conducted at Durham-York Energy Centre's Energy-From-Waste facility.

The testing is required by Condition 7(1) of the Environmental Compliance Approval No. 7306-8FDKNX, issued on 2011/06/28.

***Target Sources*:**

- Municipal Solid Waste Combustor Unit 1 (Baghouse Outlet Duct)
- Municipal Solid Waste Combustor Unit 2 (Baghouse Outlet Duct)

Note: *Voluntary Dioxin and Furan testing will be undertaken at the Inlet to the air pollution control (APC) system concurrently with the Dioxin and Furan tests to be performed at the Baghouse Outlet.*

***Target contaminants*:**

- Total Suspended Particulate Matter (TSP),
- PM10,
- PM2.5,
- PM condensable,
- Metals (17 selected metals, as listed in the ECA's Schedule "D"),
- Semivolatile Organic Compounds (17 dioxins and furans isomers, 12 dioxin-like PCBs, 39 selected PAHs, 12 chlorobenzenes, and19 chlorophenols) – as listed in ECA's Schedule "D",

- Volatile Organic Compounds (33 selected VOCs, as listed in the ECA's Schedule "D"),
- Aldehydes (acetaldehyde, acrolein and formaldehyde,),
- Halides (hydrogen fluoride and hydrogen chloride),
- Ammonia
- Nitrogen oxides (NOx),
- Sulphur dioxide (SO_2),
- Combustion gases (oxygen, CO, and CO_2), and
- Total organic matter (THC).

Reference methods:

1. TSP: OSTC Method ON-5,
2. $PM_{2.5}/PM_{10}$: US EPA 40CFR60 Method 201A,
3. PM condensable: US EPA 40CFR60 Method 202,
4. Metals: US EPA 40CFR60 Method 29,
5. SVOCs: Environment Canada's Report EPS 1/RM/2,
6. VOCs: US EPA SW-846 Method 0030,
7. Aldehydes: State of California Method CARB 430 (with Ashland modification),
8. Halides & Ammonia: US EPA 40CFR60 Method 26A,
9. NOx: DYEC CEM,
10. SO_2: DYEC CEM,
11. CO_2: DYEC CEM,
12. O_2: DYEC CEM,
13. CO: DYEC CEM,
14. THC: US EPA 40CFR60 Method 25A, and
15. Stack Gas Parameters: Ontario Source Testing Code's Method ON-1 to ON-4.

Notes:

The sampling strategy for the determination of aldehydes is discussed in the pre-test plan (page 6). Note that the Ashland modification of method CARB430 stated concerns regarding acrolein collection using the standard CARB430 approach. For the efficient collection of acrolein, it recommends the use of three midget impingers, instead of two, and the addition of toluene to the DNPH solution at an 8:2 ratio.

Brief Process Description:

The DYEC is an energy-from-waste facility built with a maximum thermal/combustion processing rate of 140,000 tonnes per year of municipals solid waste (MSW). The facility operates on a continuous basis, hours/day, 7 days/week, 365 days/year, with the waste delivered initially set at 6 days per week between 07:00 and 19:00 hours.

The facility consists of two thermal treatment lines, each equipped and operated independently operated boilers/furnaces and air pollution control equipment. Each thermal treatment line has a

maximum continuous rating (MCR) of 218 t/d of MSW, with a heat content of 13 MJ/kg, and a steam MCR of 33.64 tonnes/hour, to generate 20 MW of electricity (nominal capacity).

MSW arrives at the facility via covered refuse trucks and is deposited in a storage pit within the receiving building. Facility operators manage MSW by moving and mixing MSW within the storage pit with the overhead grapple cranes. The MSW is lifted from the pit by crane and fed into the fuel hopper for each thermal treatment train.

Each thermal treatment line is equipped with independent air pollution control equipment; consisting of a Selective Non-Catalytic Reduction System with ammonia injection (for NOx control), an activated carbon injection system (to reduce mercury and dioxins in flue gas), a dry recirculation lime injection scrubber (to control acid gases), and a pulse jet type baghouse (to control particulate emissions).

The treated exhaust gases from both lines are vented to the atmosphere via a common exhaust stack, having an exit diameter of 1.71 metres, extending 87.6 metres above grade.

***Operating Conditions during the source testing program*:**

It is indicated in the pre-test plan that the sources testing will be conducted at each of the two thermal treatment lines at the maximum load achievable at the time of testing.

It is important to note that in order to meet the ECA's source testing condition requiring the facility to be operating under conditions which yield the worst case emissions within the approved operating range of the Facility; each thermal treatment line must be operated at no less than 90% of the stated maximum continuous rate of 218 t/d of MSW.

DYEC's personnel will be responsible for the monitoring, collection, compilation and reporting of the pertinent process data during the test program, in order to establish MSW processing levels that can be properly correlated to the magnitude of the emissions of the contaminants of interest being exhausted from the process.

The process parameters to be monitored and recorded include:

- Power output (MWh/d)
- Auxiliary fuel combusted (m^3/d)
- Average combustion zone temperature (°C)
- Steam generated (t/d)
- MSW combusted (t/d)
- NOx reagent injection rate (L/d)
- Carbon injection rate (kg/d)
- Lime injection rate (kg/d)
- DYEC CEMs (printouts to be appended to the source testing report)

As indicated in the 2016 pre-test plan, the additional process parameters listed below were required to be included in the source testing report; but were not. Along with the above

mentioned process parameters, they are required to establish the operating conditions of the thermal units, as defined by the ECA. The additional process information follows:

- The reporting of the baghouses inlet temperature and pressure drop.
- Any upset conditions during the source testing program (including actions taken to correct it, if applicable).

DYEC CEMs printouts were required to be included in the final report, but they were not included, but for averages that could not be validated without the printouts.

For this 2017 source testing program, we require digital data (in Excel) of DYEC and ORTECH's CEMS output. In the case of DYEC CEMS output, we require the 1-munute averages for the full days when source testing was conducted, to confirm that the in-stack emissions and process parameters were within the ECA requirements, in order to validate that the thermal treatment units and associated air pollution control equipment were operating as expected by the MOECC.

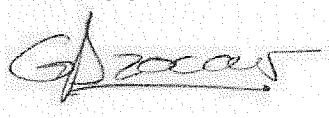
Our review indicated that the pre-test plan is acceptable provided that DYEC targets process worst case emissions scenario (ECA's stated nominal/maximum MSW combustion capacity, as we define in this letter), the proposed aldehydes reference methodology incorporates the Ashland modification to Method CARB 430, and CEMS output and process information is provided based on the indicated parameters, measurement frequency (1-minute average), and mode of reporting (digitally).

We noted the sampling schedule for the week of October 10, 2017, with testing starting on October 10 and extending for four consecutive days. If changes in the sampling schedule occur, please notify the MOECC's York-Durham District Office, and the Technology Standards Section.

Just a reminder that the source testing report is required to be submitted only in electronic format to the Technology Standards Section; and in electronic and hardcopy formats to the MOECC's York-Durham District Office.

If you have any questions with regard to this assessment, I can be reached by phone at 416-327-6403, or by email at guillermo.azocar@ontario.ca.

Sincerely yours,



Guillermo Azocar
Source Assessment Specialist
Technology Standards Section

(Doc.Mgmt # 5AA070107)

cc: M. Neild – Covanta DYEC L.P. (via email: mneild@covanta.com)
A. Huxter – Covanta DYEC L.P. (via email: ahuxter@covanta.com)
C. Hyde – MOECC York-Durham District Office (via email: chris.hyde@ontario.ca)
S. Thomas – MOECC York-Durham District Office (via email: sandra.thomas@ontario.ca)
P. Dunn – York-Durham District Office (via email: philip.dunn@ontario.ca)
M. Wojcik – MOECC EAB (via email: margaret.wojcik@ontario.ca)
T. Alexan Gorgy – MOECC SDB TSS (via email: tamer.alexangorgy@ontario.ca)
C. Ruddy -MOECC SDB TSS (via email: caitlyn.ruddy@ontario.ca)

File AQ-02 (Durham-York Energy Centre)

Ontario

Ministry of the Environment
Ministère de l'Environnement

CERTIFICATE OF APPROVAL
MULTI-MEDIA
Number 7306-8FDKNX
Issue Date: June 28, 2011

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
United States of America
07960

Site Location: Durham York Energy Centre
72 Osbourne Road
Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham

You have applied in accordance with Sections 9 and 27 of the Environmental Protection Act and Section 53 of the Ontario Water Resources Act for approval of:

A thermal treatment facility to be used for the receipt and manual and/or mechanical sorting of solid non-hazardous post-diversion municipal waste (Waste), temporary storage and thermal treatment of the Waste, abatement of the emissions from the processes and activities undertaken at the Site, handling, screening, sorting and/or conditioning of the residual wastes and management of the wastewater and the non-contact stormwater generated at the Site. The Facility's maximum Waste thermal treatment rate is 140,000 tonnes per year of Waste, the nominal electricity generation rate is 20 Megawatts and the nominal steam generation rate 72,000 kilograms per hour of steam.

The facility consists of the following major processes and support units:

(1) two (2) identical combustion trains, each having a nominal capacity of 218 tonnes of Waste per day venting into the atmosphere via a common exhaust stack, having an exit diameter of 1.71 metres, extending 87.6 metres above grade.

Each combustion train is an independent process train and it consists of the following main components:

(a) a stoker grate steam Boiler, having a design heat input of 118 Gigajoules per hour, equipped with a natural gas fired auxiliary Low NOx burner, having a nominal heat input of 59.5 Gigajoules per hour; and

(b) the following air pollution control equipment:

(i) a Selective Non Catalytic Reduction System (SNCR System) with ammonia injection for NOx control;
(ii) an activated carbon injection system, to reduce mercury and dioxins in flue gas;
(iii) a dry recirculation lime injection scrubber to control acid gases;
(iv) a pulse jet type baghouse to control particulate emissions;

(2) one (1) steam turbine generator set having a rated capacity of 20 Megawatts;

(3) waste and reagent storage as described in Condition 2.:

(4) fly ash conditioning system including two (2) surge bins, two (2) pugmills and seven (7) curing/storage bunkers;

(5) bottom ash sorting system including conveyors, screens, a rotary drum magnet and an eddy separator;

(6) one (1) emergency diesel generator, rated at 250 Kilowatts;

(7) natural gas-fired combustion equipment for comfort heating;

(8) a wastewater management system for collection, recirculation and reuse of the process water; and

(9) a stormwater management facility for collection, transmission and discharge of non-contact runoff at the Site, as described in the attached Schedule "G",

Note: Use of the site for any other type of waste is not approved under this Certificate, and requires obtaining a separate approval amending this Certificate.

For the purpose of this Provisional Certificate of Approval and the terms and conditions specified below, the following definitions apply:

"***Acoustic Assessment Report***" means the report, prepared in accordance with *Publication NPC-233* by Paul Niejadlik / Golder Associates Ltd. and dated March 2011 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility;

"**Acoustic Assessment Summary Table**" means a table summarizing the results of the Acoustic Assessment Report;

"**Acoustic Audit**" means an investigative procedure consisting of measurements of all noise emissions due to the operation of the Facility, assessed in comparison to the Performance Limits for the Facility regarding noise emissions, completed in accordance with the procedures set in the Ministry's *Publication NPC-103* and reported in accordance with the Ministry's *Publication NPC-233;*

"**Acoustic Audit Report**" means a report presenting the results of an Acoustic Audit, prepared in accordance with the Ministry's *Publication NPC-233;*

"**Acoustical Consultant**" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;

"**Air Standards Manager**" means the Manager, Human Toxicology and Air Standards Section, Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Human Toxicology and Air Standards Section, Standards Development Branch, as those duties relate to the conditions of this Certificate;

"**APC Building**" means the building at the Site where the APC Equipment and the reagent indoor storage tanks are located;

"**APC Equipment**" means all the air pollution control equipment at the Facility, including the SNCR System, the activated carbon injection system, the dry recirculation lime injection scrubber and the pulse jet type baghouse to control emissions from the combustion chamber of the Boilers, the dust collectors to control emissions from the Residue Building and the dust collectors to control emissions from the reagent storage silos;

"**Boiler Building**" means the building at the Site where the Boilers, turbine generator and the air cooled condenser(s) are located;

"**Boilers**" means the two (2) steam boilers firing the approved Waste described in this Certificate;

"**Bulky Unprocessable Items**" means the incoming Waste received at the Site that cannot be processed in the Equipment;

"**CEM Systems**" means the continuous monitoring and recording systems used to measure and record the temperature and the emissions from the Boilers as specified in the attached Schedule "F";

"**Certificate**" means this entire provisional Certificate of Approval, issued in accordance with Sections 39 and 9 of the *EPA* and Section 53 of the *OWRA,* and includes any schedules attached to it, the application and the supporting documentation listed in the attached Schedule "A;

"***40 CFR 60***" means title 40, part 60 under the Code of Federal Regulations (Air Programs, U.S. Environmental Protection Agency), revised as of July 1, 1990, published by the Office of the Federal Register, National Archives and Records, Administration in the United States of America;

"**Complaint**" means a complaint received either by the Owner or the District Manager that has been confirmed by staff of the Ministry and the cause of which is attributed to the Owner's activities at the Facility;

"**Commencement Date of Operation**" means the date when the approved Waste is first received at the Site;

"**Compound of Concern**" means a contaminant that, based on generally available information, may be emitted to the atmosphere in a quantity from any source at the Facility that is significant either in comparison to the relevant Ministry Point of Impingement Limit or if a Ministry Point of Impingement Limit is not available for the compound then, based on generally available toxicological information, the compound has the potential to cause an adverse effect as defined by the *EPA* at a Point of Impingement;

"**Controlled Shutdown**" means an immediate cut-off of all waste into the Boilers, while maintaining the operation of the combustion chamber and the APC Equipment within the Performance Requirements;

"**Description Section**" means the section on page one of the Certificate describing the Owner's operations and the Equipment located at the Facility and specifying the Facility Production Limit for the Facility;

"**Dioxins and Furans**" means polychlorinated dibenzo-dioxins and polychlorinated dibenzofurans;

"**Director**" means any person appointed in writing by the Minister of the Environment pursuant to section 5 of the *EPA* and pursuant to section 5 of the *OWRA* as a Director for the purposes of Part V of the *EPA,* section 9 of the *EPA* and section 53 of the *OWRA;*

"**District Manager**" means the District Manager of the York Durham District Office of the Ministry;

"**Emergency Shutdown**" means an immediate cut-off of all waste feed into the Boilers, followed by an accelerated extinction of all combustion in the Boilers, while maintaining the combustion temperature within the Performance Requirements, except when unreasonable;

"**Emission Summary Table**" means the table prepared in accordance with *O. Reg. 419/05* and the Procedure Document listing the appropriate Point of Impingement concentrations of each Compound of Concern from the Facility and providing comparison to the corresponding Ministry Point of Impingement Limit;

"*EAA*" means the Environmental Assessment Act, R.S.O. 1990, c. E.18, as amended;

"**EA Approval**" means the Notice of Approval to Proceed with the Undertaking signed by the Minister of the Environment on November 3, 2010, EA File No. 04-EA-02-08;

"*EPA*" means the Environmental Protection Act, R.S.O. 1990, c. E.19, as amended;

"**Equipment**" means equipment or processes associated with the thermal treatment of the approved Waste described in this Certificate and in the Supporting Documentation referred to herein and any other equipment or processes handling wastes and reagents;

"**ESDM Report**" means the Emission Summary and Dispersion Modelling Report prepared in accordance with the Procedure Document by Golder Associates and dated March 2011 submitted in support of the application, and includes any amendments to the ESDM Report listed in the attached Schedule "A" and all subsequent up-dated ESDM Reports as applicable;

"**Facility**" means the entire operation associated with thermal treatment of Waste located on the property where the Equipment is located;

"**Facility Production Limit**" means the production limit placed on the main product(s) or raw materials used by the Facility that represents the design capacity of the Facility and assists in the definition of the operations approved by the Director;

"**Grizzly Building**" means the building at the Site where the bottom ash is screened and where the oversized constituents of the bottom ash (grizzly overs) are temporarily stored prior to transport for subsequent storage in the Residue Building;

"**Independent Acoustical Consultant**" means an Acoustical Consultant who is not representing the Owner and was not involved in preparing the Acoustic Assessment Report or the design/implementation of Noise Control Measures for the Facility and/or Equipment. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment or the design/implementation of Noise Control Measures for the Facility and/or Equipment;

"**I-TEF**" means International Toxic Equivalency Factor derived for each dioxin and furan congener by comparing its toxicity to the toxicity of 2,3,7,8 tetrachloro dibenzo-p-dioxin, as recommended by the North Atlantic Treaty Organization Committee on Challenges to Modern Society (NATO CCMS) in 1989 and adopted by Canada in 1990;

"**I-TEQ**" means International Toxic Equivalent of dioxins and furans calculated using the I-TEFs, as recommended by the NATO CCMS in 1989 and adopted by Canada in 1990;

"**Manager**" means the Manager, Technology Standards Section, Standards Development Branch, who has been appointed under Section 5 of the *EPA* for the purposes of Section 11(1)2 of the *O. Reg. 419/05,* or any other person who represents and carries out the duties of the Manager,

Technology Standards Section, Standards Development Branch, as those duties relate to the conditions of this Certificate;

"**Ministry**" means the ministry of the government of Ontario responsible for the *EPA* and the *OWRA* and includes all officials, employees or other persons acting on its behalf or the Ontario Ministry of the Environment;

"**Municipality**" means the Municipality of Clarington;

"***NMA***" means the *Nutrient Management Act*, 2002, S.O. 2002, c. 4, as amended;

"**Noise Control Measures**" means measures to reduce the noise emission from the Facility and/or Equipment including, but not limited to silencers, acoustic louvers, enclosures, absorptive treatment, plenums and barriers;

"**LDR**" means the Lands Disposal Restrictions referred to in sections 74 through 85 of the *O. Reg. 347,* which prohibit the disposal of hazardous wastes on land until they have been treated to meet the treatment standards under the *O. Reg. 347;*

"**Leachate Toxicity Criteria**" means the concentrations of any of the contaminants listed in Schedule 4 at a concentration equal to or in excess of the concentration specified for that contaminant in Schedule 4 using the Toxicity Characteristic Leaching Procedure, defined in the *O. Reg. 347*;

"***O. Reg. 419/05***" means the *Ontario Regulation 419/05,* Air Pollution – Local Air Quality enacted under the *EPA,* as amended;

*"**O. Reg. 347**"* means the *Ontario Regulation 347,* R.R.O 1990 (General –Waste Management) enacted under the *EPA,* as amended;

"***OWRA***" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;

"**Owner**" means any person that is responsible for the establishment and operation of the Site being approved by this Certificate, and it includes The Regional Municipality of Durham, The Regional Municipality of York, and Covanta Durham York Renewable Energy Limited Partnership (operator), their successors and assignees;

"***PA***" means the *Pesticides Act*, R.S.O. 1990, c.P. 11, as amended;

"**Performance Requirements**" means the performance requirements and emission limits specified in the section of this Certificate entitled "Performance Requirements";

"**Point of Impingement**" means any point outside the Facility in the natural environment and as defined by s.2 of the *O. Reg. 419/05;*

"**Point of Reception**" means the Point of Reception as defined by *Publication NPC-205* and/or *Publication NPC-232*, as applicable;

"**Pre-test Information**" means the information outlined in Section 1.1 of the Source Testing Code;

"**Procedure Document**" means the Ministry's document entitled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July 2005, as amended;

"**Professional Engineer**" means a Professional Engineer as defined within the *Professional Engineers Act*, R.S.O. 1990, c. P.28, as amended;

"**Provincial Officer**" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA* or Section 5 of the *EPA* or Section 17 of the *PA* or Section 4 of the *NMA* or Section 8 of the *SDWA;*

"***Publication NPC-103***" means the Ministry's Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, dated August 1978, published by the Ministry, as amended;

"***Publication NPC-205***" means the Ministry's Publication NPC-205, entitled "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)", dated October, 1995, as amended;

"***Publication NPC-207***" means the Ministry's draft technical publication entitled "Impulse Vibration in Residential Buildings", dated November 1983, supplementing the Model Municipal Noise Control By-Law, Final Report, dated August 1978, published by the Ministry, as amended;

"***Publication NPC-232***" means the Ministry's Publication NPC-232, entitled "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)", dated October, 1995, as amended;

"***Publication NPC-233***" means the Ministry's Publication NPC-233, entitled "Information to be Submitted for Approval of Stationary Sources of Sound", dated October, 1995, as amended;

"**Rejected Waste**" means either municipal waste which cannot be processed at the Facility or waste which the Site is not approved to accept. Rejected Waste includes but is not limited to the Bulky Unprocessable Items and the Unacceptable Waste;

"**Regional Director**" means the Regional Director of the Central Region of the Ministry;

"**Regions**" means The Regional Municipality of Durham and The Regional Municipality of York;

"Report EPS 1/PG/7" means the Environment Canada Report EPS 1/PG/7, entitled "Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Generation", dated September, 1993, as amended;

"**Residual Waste**" means waste resulting from the Waste processing activities at the Site. Residual Waste is limited to the recovered ferrous metals, the recovered non-ferrous metals, the bottom ash (consisting of the ash fines and the grizzly overs) and the fly ash (untreated and following conditioning);

"**Residue Building**" means the building at the Site where the bottom ash and the fly ash are processed, temporarily stored and loaded in transport vehicles for off-site disposal;

"**Schedules**" means the following schedules "A", "B", "C", "D", "F" and "G", attached to the Certificate and forming part of the Certificate;

"***SDWA***" means the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, as amended;

"**Sensitive Receptor**" means any location where routine or normal activities occurring at reasonably expected times would experience adverse effect(s) from odour discharges from the Facility, including one or a combination of:

(a) private residences or public facilities where people sleep (e.g.: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.);

(b) institutional facilities (e.g.: schools, churches, community centres, day care centres, recreational centres, etc.);

(c) outdoor public recreational areas (e.g.: trailer parks, play grounds, picnic areas, etc.); and

(d) other outdoor public areas where there are continuous human activities (e.g.: commercial plazas and office buildings);

"**Site**" means the property where the Owner has located and operates the Facility and the Works and located at 72 Osbourne Road, 27, Concession Broken Front, Part 1 in the Municipality of Clarington, Regional Municipality of Durham;

"**Source Testing**" means monitoring, sampling and testing to measure emissions resulting from operating the Facility under conditions which yield the worst case emissions within the approved operating range of the Facility;

"***Source Testing Code***" means the Ministry's document entitled "Source Testing Code, Version 2, Report No. ARB-66-80", dated November 1980, as amended;

"**Stack**" means the stack that discharges emissions from the Boilers after those emissions have been controlled by the associated APC Equipment;

"**Substantial Completion**" has the same meaning as "substantial performance" in the *Construction Lien Act* R.S.O. 1990, c.C-30, as amended;

"**Supporting Documentation**" means the documents listed in the attached Schedule "A" of this Certificate which forms part of this Certificate;

"**Test Contaminants**" means the contaminants set out in the attached Schedule "D";

"**Tipping Building**" means the building at the Site where the incoming Waste is received, sorted and temporarily stored;

"**Total Power Failure**" means the loss of the external power supply and concurrent loss of all in-plant power generation;

"**Trained Personnel**" means one or more Site personnel trained in accordance with the requirements of Condition 9.;

"**Waste**" means municipal solid waste as defined in the *O. Reg. 347* and limited to the approved waste set out in Condition No. 2.(2);

"**Waste Processing Rate** means the mass of Waste fed into one of the Boilers;

"**Works**" means the sewage works described in the Owner's application, this Certificate and in the Supporting Documentation referred to herein, to the extent approved by this Certificate;

"**Unacceptable Waste**" means the incoming Waste received at the Site that does not meet the incoming Waste quality criteria set out in this Certificate, is of hazardous nature and requires caution when handling; and

"**Undiluted Gases**" means the flue gas stream which contains oxygen, carbon monoxide, total hydrocarbons and all contaminants in the same concentrations as they exist in the flue gas stream emerging from an individual piece of equipment, such as the combustion chamber of one Boiler or one baghouse, and into which gas stream no ambient air and/or no other gas stream originating from another piece of equipment, except for dilution air introduced within the CEM Systems, has been introduced.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

GENERAL PROVISIONS

1. GENERAL

Compliance

(1) The Owner shall ensure compliance with all the conditions of this Certificate and shall ensure that any person authorized to carry out work on or operate any aspect of the Site, including the Works, is notified of this Certificate and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Any person authorized to carry out work on or operate any aspect of the Site shall comply with the conditions of this Certificate.

Build in Accordance

(3) (a) Except as otherwise provided by this Certificate, the Site shall be designed, developed, built, operated, monitored, inspected and maintained in accordance with the following applications:

(i) Applications for a Certificate of Approval (Air) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of

Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the Supporting Documentation listed in the attached Schedule "A".

(ii) Applications for a Provisional Certificate of Approval (Waste Disposal Site) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the Supporting Documentation listed in the attached Schedule "A".

(iii) Applications for a Certificate of Approval of Municipal and Private Sewage Works dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the Supporting Documentation listed in the attached Schedule "A".

(b) (i) Any design optimization or modification that is inconsistent with the conceptual design set out in the Supporting Documentation in Schedule "A" shall be clearly identified, along with an explanation of the reasons for the change and submitted to the Director for approval.

(ii) If a change to the conceptual design is submitted to the Director for approval, no construction of the Site shall commence prior to the Director approving, in writing, the final conceptual design of the Site.

As-built Drawings

(4) (a) Within ninety (90) days of the completion of the initial successful Source Testing program, a set of as-built drawings showing the Facility and the Works and bearing the stamp of a Professional Engineer, shall be prepared and retained at the Site.

(b) These drawings shall be kept up-to-date through revisions undertaken from time to time and a copy shall be retained at the location of the Site or at the operational office of the Owner for the operational life of the Site.

(c) Notwithstanding provisions of Condition 1.(4)(b), an amendment to this Certificate shall be sought for changes to the as-built drawings, requiring approval.

(d) The as-built drawings shall be made available to Ministry staff upon request.

Interpretation

(5) Where there is a conflict between a provision of any document, including the application referred to in this Certificate and the conditions of this Certificate, the conditions in this Certificate shall take precedence.

(6) Where there is a conflict between the applications and a provision in any documents listed in Schedule "A", the applications shall take precedence, unless it is clear that the purpose of the document was to amend the applications and that the Ministry approved the amendment.

(7) Where there is a conflict between any two documents listed in Schedule "A", other than the applications, the document bearing the most recent date shall take precedence.

(8) The requirements of this Certificate are severable. If any requirement of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected thereby.

Other Legal Obligations

(9) The issuance of, and compliance with the conditions of this Certificate does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

(b) limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner to furnish any further information related to compliance with this Certificate.

Adverse Effects

(10) The Site shall be constructed, operated and maintained in a manner which ensures the health and safety of all persons and prevents adverse effects on the natural environment or on any persons.

(11) The Owner shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the approved operations at the Site, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

(12) Despite the Owner or any other person fulfilling any obligations imposed by this Certificate, the person remains responsible for any contravention of any other condition of this Certificate or any applicable statute, regulation, or other legal requirement resulting from any act or emission that caused the adverse effect to the natural environment or impairment of water quality.

(13) If at any time odours, pests, litter, dust, noise or other such negative effects are generated at this Site and cause an adverse effect, the Owner shall take immediate appropriate remedial action that may be necessary to alleviate the adverse effect, including suspension of all waste management activities if necessary.

Change of Ownership

(14) The Owner shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any changes:

(a) the ownership of the Site;
(b) the operator of the Site;
(c) the address of the Owner;
(d) the partners, where the Owner is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B.17, as amended, shall be included in the notification;
(e) the name of the corporation where the Owner is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C.39, as amended, shall be included in the notification.

(15) No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance. In the event of any change in ownership of the Site, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this Certificate, and the Owner shall provide a copy of the notification to the District Manager and the Director.

Inspections by the Ministry

(16) No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the *OWRA*, the *EPA*, the *PA*, the *SDWA* or the *NMA* of any place to which this Certificate relates, and without limiting the foregoing:

(a) to enter upon the premises where the approved processing is undertaken, or the location where the records required by the conditions of this Certificate are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this Certificate;
(c) to inspect the Site, related equipment and appurtenances;
(d) to inspect the practices, procedures, or operations required by the conditions of this Certificate;
(e) to conduct interviews with staff, contractors, agents and assignees of the Owner; and
(f) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this Certificate or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

Information

(17) Any information requested by the Ministry, concerning the operation of the Site and its operation under this Certificate, including but not limited to any records required to be kept by this Certificate, manuals, plans, records, data, procedures and supporting documentation shall be provided to the Ministry, in a timely manner, upon request.

(18) The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action, under this Certificate or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

(a) an approval, waiver, or justification by the Ministry of any act or omission of any person that contravenes any term or condition of this Certificate or any statute, regulation or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

(19) The Owner shall ensure that a copy of this Certificate, in its entirety and including all its Notices of Amendment and the Supporting Documentation listed in Schedule "A" are retained at the Site at all times.

2. **SERVICE AREA, APPROVED WASTE TYPES, RATES and STORAGE**

(1) The service area for the Site is the area within the jurisdictional boundaries of The Regional Municipality of Durham and The Regional Municipality of York.

(2) The operation of this Site is limited to:

(a) receipt, temporary storage, transfer and processing, including thermal treatment, of solid non-hazardous waste remaining after Waste Diversion required by the EA Approval, limited to Waste from the following sources:

(i) domestic waste and Industrial Commercial and Institutional waste from the Regions' curbside collection and/or from the Regions' waste management facilities; and

(ii) waste generated on-Site through activities not relating to the handling and processing of Waste (ie. office, lunch room, etc.);

(b) collection and management of the stormwater run-off generated at the Site.

(3) The following Unacceptable Waste is prohibited from being accepted at the Site:

(a) hazardous waste, as defined in the *O. Reg. 347;*
(b) wastes which have been source-separated for the purposes of diversion;

(c) international waste generated outside of Canada, but collected within the jurisdictional boundaries of The Regional Municipality of Durham and The Regional Municipality of York.

(4) Waste Receipt Rate:

(a) The maximum daily amount of Waste that is approved to be accepted at the Site shall not exceed 1,520 tonnes per day.

(5) Storage Restrictions:

Solids:

(a) A maximum of 7,350 cubic metres shall be stored inside the Waste pit within the Tipping Building as shown in the Supporting Documentation.

(b) Rejected Waste, limited to the Bulky Unprocessable Items removed from the incoming Waste in the Tipping Building shall be stored:

(i) in two (2) roll-off bins having a maximum total storage capacity of 30 cubic metres, located within the confines of the Tipping Building; and/or

(ii) in the appropriate dedicated bunkers, located within the confines of the Residue Building and described in Conditions 2.(5)(c), 2.(5)(d) and 2.(5)(d), below.

(c) A maximum of approximately 77 tonnes or 106 cubic metres of the Residual Waste, limited to the recovered ferrous metals, shall be stored in one (1) dedicated bunker, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of seven (7) days.

(d) A maximum of approximately 120 tonnes or 100 cubic metres of the Residual Waste, limited to the recovered non-ferrous metals, shall be stored in one (1) dedicated bunker, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of seven (7) days.

(e) A maximum of 630 tonnes of the Residual Waste, limited to bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of seven (7) days.

(f) A maximum of 700 tonnes of the Residual Waste, limited to the fly ash shall be stored in seven (7) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is limited to a maximum of thirty six (36) days.

(g) A maximum of 85 cubic metres of activated carbon for the carbon injection system shall be stored in one (1) outdoor tank, located adjacent to the APC Building.

(h) A maximum of 150 cubic metres of lime for the dry scrubber shall be stored in one (1) or more indoor tank(s), located within the confines of the APC Building.

(i) If required, recirculated residue shall be stored in one (1) or more indoor tank(s), located within the confines of the APC Building.

(j) A maximum of 35 tonnes or 25 cubic metres of cement for fly ash conditioning shall be stored in one (1) outdoor silo, located adjacent to the Residue Building.

(k) A maximum of 25 tonnes or 45 cubic metres of pozzolan for fly ash conditioning shall be stored in one (1) outdoor silo, located adjacent to the Residue Building.

Liquids:

(l) (i) A maximum of 36 cubic metres or 40 tonnes of aqueous ammonia for the SNCR System shall be stored in one (1) outdoor tank, located adjacent to the APC Building.

(ii) The Owner shall ensure that the aqueous ammonia storage tank is equipped with a liquid level monitoring device designed to provide a visual and an auditory alarm when the high level setpoint is reached.

(iii) The aqueous ammonia storage tank spill containment area and the loading area shall be designed in accordance with the requirements in the Ministry's document entitled *"Guidelines for Environmental Protection Measures at Chemical and Waste Storage Facilities"* dated May 2007, as amended.

(6) No outdoor storage of waste, including storage in vehicles, is approved under this Certificate.

(7) The Owner shall ensure that storage of all wastes is undertaken in a manner that does not cause an adverse effect or a hazard to the environment or any person.

(8) (a) Waste received at the Site shall be processed within four (4) days from its receipt at the Site.

(b) Emergency Waste storage duration extension:

(i) The Owner may store the incoming Waste inside the tipping pit within the confines of the Tipping Building for up-to seven (7) days from its receipt at the Site, on an emergency basis only.

(ii) Within twenty four (24) hours from the start of the emergency storage of the incoming Waste, the Owner shall notify, in writing, the District Manager that the incoming Waste is being stored longer then four (4) days.

(iii) Should there be public complaints about the extended incoming Waste storage, the Owner, in consultation with the District Manager, shall determine the cause of the complaints, propose appropriate abatement measures, including but not be limited to the removal and off-site disposal of the Waste contained in the tipping pit, and implement the said measures upon receiving written concurrence from the District Manager within the time frame acceptable to the District Manager.

(9) In the event that Waste cannot be processed at the Site and the Site is at its approved storage capacity, the Owner shall cease accepting additional Waste. Receipt of additional Waste may be resumed once such receipt complies with the waste storage limitations approved in this Certificate.

3. **SIGNS and SITE SECURITY**

(1) Prior to receipt of Waste at the Site, the Owner shall ensure that a sign is posted at the entrance to the Site. The sign shall be visible from the main road leading to the Site. The following information shall be included on the sign:

(a) name of the Owner;
(b) this Certificate number;
(c) hours during which the Site is open;
(d) waste types that are approved to be accepted at the Site;
(e) Owner's telephone number to which complaints may be directed;
(f) Owner's twenty-four hour emergency telephone number (if different from above);
(g) a warning against unauthorized access; and
(h) a warning against dumping at the Site.

(2) The Owner shall ensure that appropriate and visible signs are posted at the Site clearly identifying the wastes and the process reagents and stating warnings about the nature and any possible hazards of the wastes and the reagents.

(3) The Owner shall ensure that appropriate and visible signs are posted at the Site to prohibit smoking, open flames or sources of ignition from being allowed near any flammable materials storage areas.

(4) The Owner shall install and maintain appropriate and visible signs at the Site to direct vehicles to the Waste receiving and Residual Waste removal areas and to the reagent unloading areas.

(5) The Owner shall post appropriate and visible signs along the traffic route providing clear directions to the Site.

(6) The Owner shall ensure that the Site is fenced in and that all entrances are secured by lockable gates to restrict access only to authorized personnel when the Site is not open.

(7) The Owner shall ensure that access to the Site, with the exception of the area designated as a Public Information Centre, is regulated and that no unauthorized persons are permitted at the Site without the Trained Personnel escort.

(8) The Owner shall ensure that the Site is operated in a safe and secure manner, and that Waste, the Residual Waste and the Unacceptable Waste are properly handled, packaged or contained and stored so as not to pose any threat to the general public and the Site personnel.

4. SITE OPERATIONS

(1) Operating hours:

(a) The Site is approved to operate twenty-four (24) hours per day three hundred and sixty-five (365) days per year.

(b) Notwithstanding Condition 4.(1)(a), Waste shall only be received at the Site and the Residual Waste shall only be transferred from the Site between 7:00 a.m. and 7:00 p.m. Monday to Saturday. No receipt of the Waste or transfer of the Residual Waste shall be undertaken on statutory holidays.

(c) Emergency Receipt of Waste:

(i) The Owner may receive Waste at the Site outside of the operating hours specified in Condition 4.(1)(b), above, on an emergency basis only.

(ii) Within twenty four (24) hours from the receipt of Waste outside of the approved receiving hours, the Owner shall notify, in writing, the District Manager that Waste was received outside of the approved receiving hours.

(iii) Should there be complaints about Waste shipments outside of the approved hours, the Owner, in consultation with the District Manager, shall determine the cause of the complaint, propose appropriate abatement measures and implement the said measures upon receiving written concurrence from the District Manager within the time frame acceptable to the District Manager.

(2) Incoming Waste receipt:

(a) At the weigh scale, the Trained Personnel shall:

(i) inspect the required documentation prior to acceptance of the incoming Waste at the Site; and

(ii) inspect the incoming Waste with radiation detection equipment.

(b) In the Tipping Building, the Trained Personnel shall:

(i) visually inspect all incoming Waste being unloaded into the Waste pit; and

(ii) once per hour, or as accepted by the District Manager, unload the incoming Waste on the tipping floor for a manual visual inspection and sorting of the incoming Waste.

(c) The Owner shall only accept the incoming Waste that is delivered in vehicles that have been approved by the Ministry.

(d) The Owner shall ensure that all unloading of incoming Waste at the Site takes place entirely within the confines of the Tipping Building.

(3) **Unacceptable Waste handling:**

(a) In the event that waste that is not approved under this Certificate is inadvertently accepted at the Site, the Owner shall ensure that the Unacceptable Waste:

(i) is stored in a way that ensures that no adverse effects result from its storage;
(ii) is segregated from all other waste;
(iii) is handled and removed from the Site in accordance with the *O. Reg. 347* and the *EPA*; and
(iv) is removed from the Site within (4) days of its receipt or as acceptable to the District Manager.

(b) The Owner shall ensure that all loading of the Unacceptable Waste into transport vehicles is carried out entirely within the confines of the Tipping Building.

(4) **Waste Sorting:**

(a) The Trained Personnel shall remove the Bulky Unprocessable Items and Unacceptable Waste from the incoming Waste prior to charging of the Waste to the Boilers.

(b) All sorting of the incoming Waste at the Site shall be undertaken indoors, within the confines of the Tipping Building and/or the Refuse Building.

(5) **Residual Waste Handling and Disposal:**

(a) (i) Except for transportation of the Residual Waste between the Grizzly Building and the Residue Building, the Owner shall ensure that all

handling of the bottom ash and its segregated constituents, and of the fly ash, is undertaken within the confines of enclosed conveyors and enclosed buildings.

(ii) The Owner shall ensure that all loading of the Residual Waste into vehicles for its transport from the Site is carried out entirely within the confines of the Residue Building.

(b) (i) Different constituents of the Residual Waste shall not be comingled prior to the required compliance testing, unless all Residual Waste is to be disposed of at a Waste Disposal Site that is approved to accept hazardous waste.

(ii) The Owner shall ensure that the equipment used in handling of the hazardous wastes or that came in direct contact with the hazardous wastes is not used to handle other wastes.

(iii) On an emergency basis, the Owner may use equipment used to handle the hazardous wastes to handle other wastes provided that prior to such use the equipment has been thoroughly cleaned first.

(c) (i) Only haulers approved by the Ministry shall be used to transport the Residual Waste from the Site.

(ii) The Residual Waste shall be transported from the Site in appropriately covered vehicles that will not allow fugitive dust emissions to be emitted into the natural environment during the said transport.

d) Residual Waste generated at the Site shall be disposed of shall only be disposed of at an approved waste disposal site in accordance with the requirements in the *EPA* and the *O. Reg. 347* or at a location with the appropriate jurisdictional approval or a license, if required.

(e) Should the Residual Waste limited to the conditioned fly ash and/or the bottom ash be deemed a hazardous waste, the ash shall be disposed of at an approved waste disposal site in accordance with the Land Disposal Restrictions requirements in the *EPA* and the *O. Reg.* 347 or at a location with the appropriate jurisdictional approval or a license, if required.

(6) **Wastewater Management**

(a) The Owner shall ensure that all wastewater generated at the Site is contained within enclosed buildings, tanks, pipes and conveyors at the Site and the approved outdoor Wastewater Settling Basin.

(b) The Owner shall ensure that all wastewater generated at the Site is collected in leak-proof and sufficiently designed wastewater storage facilities:

(i) Wastewater Holding Tank, to collect the continuous reject water flow from the Boiler make-up water treatment system and the Boiler blowdown, having an approximate holding capacity of 100 cubic metres, located within the confines of the Boiler Building and venting to the atmosphere; and

(ii) Wastewater Settling Basin, to collect the wastewater from the floor drains in the buildings at the Site, except for the Tipping Building and the Residue Building, the ash discharger overflow and drain water, the Boiler and turbine-generator washdown water and the APC Equipment area washdown water, having an approximate holding capacity of 38 cubic metres, located outdoors, open to the atmosphere and equipped with a filter basket and an oil skimmer board.

(c) The wastewater pumps shall be located in the area designed in accordance with the Supporting Documentation to ensure that any potential leaks or drips are contained and directed to the Wastewater Settling Basin.

(d) (i) The wastewater level in the Wastewater Holding Tank shall be monitored and controlled to ensure that the wastewater inflow to the Tank does not cause the Tank overflow.

(ii) The wastewater level in the Wastewater Settling Basin shall be monitored and controlled to ensure that the atmospheric precipitation does not cause an overflow from the Basin.

(e) The Owner shall regularly empty, and clean as necessary, all sumps, wastewater storage/holding areas and equipment that are used to contain, collect and handling the wastewater generated at the Site.

(f) Should the Owner find it necessary to remove the wastewater from the Site, the wastewater shall only be disposed of at a Ministry-approved site in accordance with the site's certificate of approval or be discharged to the sanitary sewer in accordance with the agreement with the municipality accepting the discharge.

(g) The floors of the Tipping Building and the Residue Building shall be sufficiently sloped to facilitate the flow of the wastewater generated from the floor cleaning activities and from the truck washdown towards the designated wastewater collection area.

(h) The Owner shall ensure that the Wastewater Settling Basin is regularly cleaned out and that it does not become a source of odour emissions.

(7) All activities approved under this Certificate shall only be carried out by appropriately Trained Personnel.

5. EQUIPMENT and SITE INSPECTIONS and MAINTENANCE

Operation and Maintenance

(1) Prior to the receipt of the Waste at the Site, the Owner shall prepare and update as necessary, an Operation and Maintenance Manual for all the Equipment, the APC Equipment, the CEM Systems, the Works and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility. The Manual shall be prepared in accordance with the written manufacturer's and/or supplier's specifications and good engineering practice.

As a minimum, the Operation and Maintenance Manual shall specify:

(a) operation procedures of the Equipment, the APC Equipment, the CEM Systems, the Works, and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility, in accordance with manufacturers' recommendations and good engineering practices to achieve compliance with this Certificate, the *EPA,* the *OWRA* and their Regulations;
(b) calibration procedures for the CEM Systems as required by this Certificate;
(c) procedures for start-up and shutdown, including Controlled Shutdown and Emergency Shutdown;
(d) quality assurance procedures for the operation and calibration of the CEM Systems in accordance with *40 CFR 60,* Appendix F or *Report EPS 1/PG/7,* as appropriate;
(e) Waste receiving and screening procedures;
(f) Waste, Rejected Waste and Residual Waste handling procedures;
(g) testing and monitoring procedures as required by this Certificate;
(h) maintenance and preventative maintenance procedures as required by this Certificate;
(i) Facility inspection, including frequency of inspections, procedures;
(j) procedure for handling complaints as required by this Certificate.
(k) contingency measures to resolve upset conditions and/or minimize the environmental impacts from the Facility;
(l) emergency response procedures, including procedures for dealing with power failure, fire, explosion, spills and any other potential emergencies;
(m) procedures for record keeping activities as required by this Certificate;
(n) description of the responsibilities of the Site personnel and the personnel training protocols; and
(o) a list of personnel positions responsible for operation and maintenance, including supervisory personnel and personnel responsible for handling of the emergency situations, recording and reporting pursuant to the requirements of this Certificate, along with the training and experience required for the positions and a description of the responsibilities.

(2) A copy of this Operations and Maintenance Manual shall be kept at the Site, be accessible to the Site personnel at all times and be updated, as required. The Operations and Maintenance Manual shall be available for inspection by a Provincial Officer upon request.

(3) The Owner shall implement the operation, maintenance, preventative maintenance and calibration procedures set out in the Operations and Maintenance Manual required by this Certificate.

Critical Spare Parts

(4) (a) The Owner shall prepare a list of critical spare parts, update this list annually or more frequently, if necessary, to ensure that this list is maintained up-to-date and shall be available for inspection by a Provincial Officer upon request.

(b) The Owner shall ensure that the critical spare parts are available at the Site at all times or are immediately available from an off-Site supplier.

Inspections

(5) Prior to receipt of the Waste at the Site, the Owner shall prepare a comprehensive written inspection program which includes inspections of all aspects of the Site's operations including, but not limited to the following:

(a) buildings and the indoor waste storage facilities and presence of dust and odour and leaks in or near any openings, such as doorways, window, vent, louver or any other opening;
(b) outdoor Residual Waste transport equipment, and the presence of dust and leaks at or near transfer points or the equipment seams;
(c) the Equipment, the APC Equipment, the CEM Systems, the Works and any other equipment associated with managing of the Waste and with the control of environmental impacts from the Facility;
(d) spill containment areas, loading areas and the conditions around the Wastewater Settling Basin;
(e) security fencing, gates, barriers and signs;
(f) off-site nuisance impacts such as odour, dust, litter, etc.
(g) presence of stormwater pooling at the Site; and
(h) condition of the on-Site roads for presence of leaks and drips from the waste delivery trucks or excessive dust emissions.

(6) The inspections, except for the inspection of the Works, are to be undertaken daily by the Trained Personnel in accordance with the inspection program to ensure that the Facility is maintained in good working order at all times and that no off-Site impacts are occurring. Any deficiencies detected during these regular inspections must be promptly corrected.

Inspections and Maintenance of the Works

(7) The Owner shall inspect the Works at least once a year and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments and/or vegetation.

6. PERFORMANCE REQUIREMENTS

(1) The Owner shall, ensure that the Facility/Equipment is designed and operated in such a manner as to ensure that the following Performance Requirements are met:

(a) the maximum 10-minute average concentration of odour at the most impacted Sensitive Receptor, resulting from the operation of the Facility/Equipment, calculated in accordance with the procedures outlined in the attached Schedule "B", shall not exceed 1 odour unit;

(b) the noise emissions from the Facility shall comply with the limits set out in Ministry *Publication NPC-205;*

(c) the vibration emissions from the Facility shall comply with the limits set out in Ministry *Publication NPC-207.*

(2) The Owner shall ensure that the Boilers and the associated APC Equipment and the CEM Systems are designed and operated in such a manner as to ensure that the following Performance Requirements are met:

(a) (i) The temperature in the combustion zone of each Boiler shall reach a minimum of 1000 degrees Celsius (°C) for one second, prior to introduction of the Waste into the combustion chamber of the Boiler during the start-up, and thereafter maintained during the entire thermal treatment cycle and subsequent shutdown until all Waste combustion is completed.

(ii) Compliance with the minimum temperature requirement shall be demonstrated by direct measurement at the location where the combustion gases have achieved the residence time of one second at a minimum temperature of 1000°C (the Target Location) or by correlation of the required temperature of 1000°C for one second to the temperature measured downstream of the Target Location as proven by a method acceptable to the Director.

(b) The concentration of residual oxygen in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, as measured and recorded by the CEM System, shall not be less than 6 percent by volume on a dry basis.

(c) (i) The operational target for the concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler is 40 milligrams per dry cubic metre, as a 4-hour rolling average, normalized to 11 percent oxygen at a reference temperature of 25°C and a reference pressure of 101.3 kilopascals, as measured and recorded by the CEM System, for the period from and including initial commissioning of the facility to twelve months following the completion of the first Source Testing program.

(ii) The 4-hour average concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, as measured and recorded by the CEM System, shall not be more than 40 milligrams per dry cubic metre, normalized to 11 percent oxygen at a reference temperature of 25°C and a reference pressure of 101.3 kilopascals, after the first twelve months following the completion of the first Source Testing program.

(d) The emissions from the Boilers after those emissions have been controlled by the associated APC Equipment for discharge into the atmosphere via the Stack shall comply with the emission concentration limits listed in the attached Schedule "C", as measured by a CEM System or by Source Testing as applicable.

(e) The Boilers shall include combustion air control systems, which are capable of automatically adjusting the distribution and the quantity of combustion air, in such a manner that changes in the Waste Processing Rate and/or Waste composition or irregularities in the loading and/or combustion shall not adversely affect the performance of the Boilers.

(f) The Boilers shall provide and maintain a high degree of gas turbulence and mixing in the combustion chamber.

(g) The Boilers shall achieve the temperature, oxygen availability and turbulence requirements over the complete range of operating parameters, including feed rate, feed characteristics, combustion air, flue gas flow rate and heat losses.

(h) The inlet temperature into each baghouse of the APC Equipment of the Boilers shall not be less than 120°C and not more than 185°C.

(3) The Owner shall install and maintain visual and audible alarm systems to alert the Facility/Equipment operators of any potential deviation from the above Performance Requirements for parameters that are continuously monitored by applicable CEM Systems and shall forthwith take all reasonable actions to bring the Equipment/Facility into compliance with all Performance Conditions.

(4) In the event that the CEM Systems indicate that emissions from the Boilers and the Stack exceed any Performance Requirements in the attached Schedule "C" for a continuous three (3) hour period, the Owner shall forthwith cut-off all Waste feed into the affected Boiler and initiate an Emergency Shutdown, while maintaining a temperature of 1000°C, as practicable, in the combustion zone of the Boiler.

Residual Waste Compliance Criteria

(5) (a) The Residual Waste generated at the Site and destined for a non-hazardous waste disposal site in Ontario shall not meet any of the criteria from the definition of "hazardous waste" set out in the *O. Reg. 347.*

(b) The Residual Waste that meets any of the criteria from the definition of "hazardous waste" set out in the *O. Reg.* 347 shall be handled and disposed of in accordance with the LDR requirements set out in the *EPA* and the *O. Reg. 347.*

(6) The Residual Waste, limited to the bottom ash, destined for a non-hazardous waste disposal site shall meet the definition of "incinerator ash" set out in the *O. Reg. 347.*

7. TESTING, MONITORING and AUDITING

Source Testing

(1) The Owner shall perform annual Source Testing in accordance with the procedures and schedule outlined in the attached Schedule "E", to determine the rate of emission of the Test Contaminants from the Stack. The first Source Testing program shall be conducted not later than six (6) months after the Commencement Date of Operation of the Facility/Equipment and subsequent Source Testing program shall be conducted once (1) every calendar year thereafter.

Continuous Monitoring

(2) The Owner shall select, test and install appropriate CEM Systems and continuous recording devices in accordance with the requirements outlined in the attached Schedule "F" to conduct and maintain a program to continuously monitor, as a minimum, the following parameters prior to commencement of operation of the Boilers:

(a) the temperature at one (1) second downstream of the combustion zone of each Boiler where most of the combustion has been completed and the combustion temperature is fully developed;

(b) the inlet temperature of the gases into each baghouse of the APC Equipment of each Boiler;

(c) the concentration of carbon monoxide, oxygen and organic matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler;

(d) the opacity and moisture content of the flue gas and the concentration of oxygen, nitrogen oxides, sulphur dioxide, hydrogen chloride, hydrogen fluoride and ammonia in the Undiluted Gases leaving the baghouse of the APC Equipment of each Boiler.

Long-Term Sampling for Dioxins and Furans

(3) (a) The Owner shall develop, install, maintain and update as necessary a long-term sampling system, with a minimum monthly sampling frequency, to measure the concentration of Dioxins and Furans in the Undiluted Gases leaving the APC Equipment associated with each Boiler. The performance of

this sampling system will be evaluated during the annual Source Testing programs in accordance with the principles outlined by 40 CFR 60, Appendix B, Specification 4.

(b) The Owner shall evaluate the performance of the long-term sampling system in determining Dioxins and Furans emission trends and/or fluctuations as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers.

Ambient Air Monitoring

(4) (a) The Regions shall develop and implement the Ambient Air Monitoring and Reporting Plan, in accordance with the requirements set out in the EA Approval and as determined to be acceptable by the Regional Director.

(b) The Regions shall report the results of the Ambient Air Monitoring program to the Regional Director in accordance with the Ambient Air Monitoring and Reporting Plan and in accordance with the requirements of Condition 14.

(c) The Regions shall post the Ambient Air Monitoring and Reporting Plan and the results of the Ambient Air Monitoring program on the Owner's web site for the Facility in accordance with the requirements of the EA Approval and Condition 15.

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233* and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved Noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

Residual Waste Testing

(7) (a) A minimum of six (6) months prior to the Commencement Date of Operation, the Owner shall submit to the Director for approval, a Testing Protocol for testing of the bottom ash for compliance with the criteria set out in the "incinerator ash" definition from the *O. Reg.* 347 and for testing of the Residual Waste for compliance with the criteria set out in this Certificate.

(b) As a minimum, the Testing Protocol shall comply with the Ministry's regulatory requirements for sampling and testing of waste, including the requirements set out in the Ministry's document entitled "Principles of Sampling and Analysis of Waste for TCLP under Ontario Regulation 347", dated February 2002, as amended.

(c) The Testing Protocol shall include the rationale for the proposed methods and the following:

(i) a sampling protocol, including the proposed number of samples to be taken and their locations, to ensure that representative sample(s) are being tested for compliance with this Certificate;

(ii) sample(s) handling and preserving procedures;

(iii) analytical protocol for the applicable contaminants to ensure that appropriate analytical method(s) are being used for compliance testing required by this Certificate; and

(iv) a testing protocol for the bottom ash during the Site commissioning period.

(d) The Owner shall implement the Testing Protocol on the Commencement Date of Operation.

(8) For handling of the bottom ash as a solid non-hazardous waste, the Owner shall follow the following schedule for compliance testing:

(a) for the Site commissioning period, the bottom ash shall be tested in accordance with the Testing Protocol approved by the Director;

(b) for the period following the Site commissioning period, the bottom ash shall be tested for the content of the combustible materials on an annual basis, until the compliance testing results indicate that the bottom ash meets the "incinerator ash" definition from the *O. Reg. 347* for three (3) consecutive years, following which a triennial compliance testing event may be carried out;

(c) should any annual or triennial compliance testing event indicate that the bottom ash does not meet the "incinerator ash" definition, prior to each of the next three (3) shipments from the Site, compliance testing of each of the three (3) shipments shall be carried out. Once three (3) consecutive tests re - establish compliance with the "incinerator ash" definition from the *O. Reg. 347* and that the bottom ash does not exceed the Leachate Toxicity Criteria, the compliance testing schedule set out in Condition 7.(8)(b) may be resumed; and

(d) should the results of any compliance testing of the bottom ash indicate that the concentrations of the leachate toxic contaminants in the bottom ash equal to or exceed the Leachate Toxicity Criteria, the bottom ash shall be handled as a hazardous waste. Once three (3) consecutive tests re - establish that the bottom ash does not exceed the Leachate Toxicity Criteria, the bottom ash compliance testing schedule set out in Condition 7.(8)(b) may be resumed.

(9) (a) For handling of the bottom ash as a hazardous waste and for handling of the fly ash, prior to final disposal at a hazardous waste landfill site in Ontario, the Owner shall undertake any sampling and testing that would be required to comply with the LDR requirements set out in the *EPA* and the *O. Reg. 347.*

(b) The Owner shall follow the following schedule for compliance testing:

(i) prior to each of the first three (3) shipments of the ash from the Site, the ash shall be tested so that for the compliance with the LDR requirements can be demonstrated;

(ii) following the three (3) initial compliance testing events, the ash shall be tested on an annual basis, until the compliance testing results indicate that the ash meets the LDR requirements during the three (3) consecutive years, following which a triennial compliance testing may be carried out; and

(iii) should any annual or triennial compliance testing event indicate that the ash does not meet the LDR requirements, prior to next three (3) shipments from the Site, compliance testing of each of the three (3) shipments shall be carried out. Once three (3) consecutive tests re - establish compliance with the LDR requirements, the compliance testing schedule set out in Condition 7.(9)(b)(ii) may be resumed.

Soil Testing:

(10) (a) Within one hundred and twenty (120) days from the date of this Certificate, the Regions shall undertake the soil testing in accordance with the Soil Testing Plan required by this Certificate.

(b) The soil testing shall be repeated every three (3) years or as agreed upon in writing by the Regional Director.

Disposal of Residual Waste

(11) The Owners shall ensure that no portion of the Residual Waste undergoing compliance testing is transferred from the Site until the results of the compliance testing required by this Certificate demonstrate compliance with the relevant Ministry's requirements.

(12) Bottom ash that is not a hazardous waste, as defined in the *O. Reg. 347,* may be disposed of at an approved non-hazardous waste landfill site or at a site approved to accept such waste by an appropriate government agency of equivalent jurisdiction.

(13) Residual Waste shall be treated to comply with the LDR requirements set out in the *EPA* and the *O. Reg. 347* prior to disposal of at an approved hazardous waste landfill site or at a site approved to accept such waste by an appropriate government agency of equivalent jurisdiction.

Groundwater and Surface Water Monitoring

(14) (a) The Regions shall develop and implement the Groundwater and Surface Water Monitoring Plan, in accordance with the requirements set out in the EA Approval and as determined to be acceptable to the Regional Director.

(b) The Regions shall report the results of the Groundwater and Surface Water Monitoring program to the Regional Director and to the Director in accordance with the schedule set out in the EA Approval and in accordance with the requirements of Condition 14.

(c) The Regions shall post the Groundwater and Surface Water Monitoring Plan and the results of the Groundwater and Surface Water Monitoring program on the Owner's web site for the Facility in accordance with the requirements of the EA Approval and Condition 15.

8. NUISANCE IMPACT CONTROL and HOUSEKEEPING

Odour Management

(1) (a) The Owner shall maintain a negative air pressure atmosphere in the Tipping Building at all times to contain any potential odours within the confines of the Tipping Building.

(b) (i) Once per year, or as required by the District Manager, the Owner shall undertake a test to measure the worse case scenario negative air pressure atmosphere throughout the Tipping Building, while the activities approved in this Certificate are carried out in the Tipping Building.

(ii) Notwithstanding the requirements set out in Condition 8.(1)(b)(i), the Owner shall install sufficient instrumentation to measure the air flow into the Boilers and demonstrate that adequate air flow is maintained

to maintain a negative air pressure atmosphere throughout the Tipping Building.

(c) In the event that adequate negative air pressure cannot be maintained, the Owner shall implement any necessary additional odour containment and control measures, including, but not necessarily limited to, those in the required Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the entrance and exit doors into the Tipping Building, the Residue Building and the Grizzly Building are kept closed at all times except to permit the entry or exit of the respective waste transport vehicles and waste handling equipment into and out of these Buildings.

(3) The Owner shall ensure that, at all times, the air from the Tipping Building, the Residue Building, the Grizzly Building and from the Equipment is exhausted through an appropriate and fully functional APC Equipment approved by this Certificate.

(4) The Owner shall undertake appropriate housekeeping activities, including regular cleaning of the tipping floor to control potential sources of fugitive odour emissions.

(5) The Owner shall ensure that no Waste handling equipment or empty storage containers are stored outside, unless they have been washed to prevent fugitive odour emissions.

(6) The Owner shall regularly clean all equipment and storage areas that are used to handle, process and store waste at the Site, including the surfaces of the outdoor spill containment areas, as required.

(7) (i) Prior to the receipt of Waste at the Site, the Owner shall provide documentation which outlines the testing carried out by a licensed structural engineer to confirm the effectiveness of the containment in the buildings, conveyors and tanks and silos at the Site.

(ii) The testing shall be carried out and repeated as directed by the District Manager in accordance with the test protocol prepared in consultation with and approved by the District Manager.

(iii) These tests shall be repeated as directed or agreed by the District Manager.

(8) The Owner shall prepare and implement an Odour Management and Mitigation Plan in accordance with the requirements set out in the EA Approval and as determined to be acceptable to the Regional Director.

(9) (a) In addition to the requirements set out in the EA Approval, the Odour Management and Mitigation Plan shall include the following:

(i) identification of all potential sources of odourous emissions;

(ii) description of the preventative and control measures to minimize odourous emissions from the identified sources;
(iii) procedures for the implementation of the Odour Management and Mitigation Plan;
(iv) inspection and maintenance procedures to ensure effective implementation of the Odour Management and Mitigation Plan; and
(v) procedures for verification and recording the progress of the implementation of the Odour Management and Mitigation Plan.

(b) The Owner shall continue to submit an updated Odour Management and Mitigation Plan until such time as the Regional Director notifies the Owner in writing that further submissions are no longer required.

Vehicles and Traffic

(10) (a) The Owner shall ensure that all vehicles transporting waste to and from the Site are not leaking or dripping waste when arriving at or leaving the Site.

(b) Should the Owner become aware that the truck(s) delivering waste to the Site have leaked wastewater on the municipal roadways, the Owner shall immediately report the violation to the owner of the vehicle(s) and to the District Manager.

(c) The Owner shall ensure that the exterior of all vehicles delivering Waste to the Site or hauling waste from the Site is washed prior to the trucks' departure from the Site, if necessary.

(d) Any necessary truck washing shall occur only in the designated wash down area of the Tipping Building or the Residue Building.

(11) The Owner shall ensure that there is no queuing or parking of vehicles that are waiting to enter the Site on any roadway that is not a distinct part of the Site.

Litter

(12) The Owner shall:

(a) take all practical steps to prevent the escape of litter from the Site;
(b) pick up litter around the Site on a daily basis, or more frequently if necessary; and
(c) if necessary, erect litter fences around the areas causing a litter problem.

Dust

(13) The Owner shall ensure that all on-site roads and operations/yard areas are regularly swept/washed to prevent dust impacts off-Site.

Vermin and Vectors

(14) The Owner shall:

(a) implement necessary housekeeping procedures to eliminate sources and potential sources of attraction for vermin and vectors; and

(b) hire a qualified, licensed pest control professional to design and implement a pest control plan for the Site. The pest control plan shall remain in place, and be updated from time to time as necessary, until the Site has been closed and this Certificate has been revoked.

Visual Screening

(15) The Owner shall provide visual screening for the Site in accordance with the documentation included in the attached Schedule "A".

9. STAFF TRAINING

(1) (a) The Owner shall ensure that all operators of the Site are trained with respect to the following, as per the specific job requirements of each individual operator:

(i) terms and conditions of this Certificate and the requirements of the EA Approval;
(ii) operation and management of the Site, or area(s) within the Site, as per the specific job requirements of each individual operator, and which may include procedures for receiving, screening and identifying Waste, refusal, handling, processing and temporarily storing wastes, operation of the Equipment, the APC Equipment, the CEM System and the Works;
(iii) testing, monitoring and operating requirements;
(iv) maintenance and inspection procedures;
(v) recording procedures;
(vi) nuisance impact control and housekeeping procedures;
(vii) procedures for recording and responding to public complaints;
(viii) an outline of the responsibilities of Site personnel including roles and responsibilities during emergency situations;
(ix) the Contingency and Emergency Response Plan including exit locations and evacuation routing, and location of relevant equipment available for emergency situations;
(x) environmental, and occupational health and safety concerns pertaining to the wastes to be handled;
(xi) emergency first-aid information; and
(xii) relevant waste management legislation and regulations, including the *EPA*, the *OWRA*, the *O. Reg. 347*, the *O. Reg. 419/05* and the Ministry guidelines affecting thermal treatment facilities.

(2) The Owner shall ensure that all personnel are trained in the requirements of this Certificate relevant to the employee's position:

(a) upon commencing employment at the Site in a particular position;
(b) whenever items listed in Condition 9.(1) are changed or updated; and
(c) during the planned refresher training.

10. **COMPLAINTS / ODOUR-CONTAMINANT EMISSIONS RESPONSE PROCEDURE**

(1) The Owner or a designated representative of the Owner shall be available to receive public complaints caused by the operations at the Site twenty-four (24) hours per day, seven (7) days per week.

(2) If at any time, the Owner or the Ministry receives a complaint or the Owner or the Provincial Officer detects an emission of odour or any contaminant, (Emission Event), from the Site, in addition to the requirements set out in the EA approval, the Owner shall record all relevant information in the computerized tracking system and shall respond to the complaint/Emission Event according to the following procedure:

Step 1: Record of Complaint/Emission Event

(a) (i) The Owner shall record each complaint/Emission Event and each record shall include the following:

(A) name, address and the telephone number of the complainant, if known;
(B) time and date of the complaint/Emission Event;
(C) details of the complaint; and

(ii) After the complaint/Emission Event has been recorded in the tracking system, the Owner shall immediately report to the District Manager by phone or e-mail during office hours and to the Ministry's Spills Actions Centre at 1-800-268-6060 after office hours on the receipt of the complaint or occurrence of the Emission Event.

Step 2: Investigation and Handling of Complaint/Emission Event

(b) The Owner shall immediately initiate investigation of the complaint/Emission Event. As a minimum, the investigation shall include the following:

(i) determination of the activities being undertaken at the Site at the time of the complaint/Emission Event;
(ii) meteorological conditions including, but not limited to the ambient temperature, approximate wind speed and its direction.
(iii) determination if the complaint is attributed to activities being undertaken at the Site and if so, the possible cause(s) of the complaint/Emission Event; and

(iv) determination of the remedial action(s) to address the cause(s) of the Complaint/Emission Event, and the schedule for the implementation of the necessary remedial action(s).

(c) The Owner shall respond to the complainant, if known, and the response shall include the results of the investigation of the Complaint, the action(s) taken or planned to be taken to address the cause(s) of the Complaint, and if any follow-up response(s) will be provided.

(d) Upon completed investigation of the Complaint/Emission event, the Owner shall, within three (3) business days, submit a report to the District Manager on the Complaint, on the action(s) taken or planned to be taken to address the cause(s) of the Complaint and on all proposed action(s) to prevent recurrence of the Complaint/Emission Event in the future.

(3) If, in the opinion of the District Manager, failure of the APC Equipment and/or any other process or equipment upset or malfunction results in off-site Complaint/Emission Event, confirmed by the Owner or a Provincial Officer of the Ministry, the Owner shall, immediately upon notification from the District Manager, implement any necessary additional control measures, including, but not necessarily limited to, those in the Contingency and Emergency Response Plan required by this Certificate.

(4) If the District Manager deems the additional control measures taken as per condition 10.(3) to be unsuitable, insufficient or ineffective, the District Manager may direct the Owner, in writing, to take further measures to address the noted failure, upset or malfunction including pursuant to section 39 of the *EPA* requiring a reduction in the receipt of Waste, cessation of the receipt of Waste, removal and off-site disposal of Waste from the Tipping Building as well as making repairs or modifications to equipment or processes.

11. CONTINGENCY and EMERGENCY RESPONSE PLAN

(1) (a) The Owner shall develop and implement a Contingency and Emergency Response Plan in accordance with the requirements set out in the EA Approval.

(b) Notwithstanding the requirements set out in the EA Approval, the Contingency and Emergency Response Plan shall be prepared in consultation with the District Manager or designate, the local Municipality and the Fire Department.

(2) In addition to the requirements set out in the EA Approval, the Contingency and Emergency Response Plan, as a minimum, shall include the following:

(a) the Site plan clearly showing the equipment layout and all storage areas for wastes and reagents;

(b) a list of Site personnel responsible for the implementation of the contingency measures and various emergency response tasks and their training requirements;
(c) a list of equipment and materials required for the implementation of the contingency measures and the emergency situation response;
(d) maintenance and testing program for equipment required for the implementation of the contingency measures and the emergency situation response;
(e) procedures to be undertaken as part of the implementation of the contingency measures and the emergency situation response;
(f) names and telephone numbers of waste management companies available for emergency response;
(g) notification protocol, with names and telephone numbers of persons to be contacted, including the Owner, the Site personnel, the Ministry of the Environment Spills Action Centre and the York Durham District, the local Fire and Police Departments, the local Municipality, the local Medical Officer of Health, and the Ministry of Labour;
(h) procedures and actions to be taken should the incoming Waste not meet the applicable quality criteria specified in this Certificate;
(i) procedures and actions to be taken should the outgoing Residual Waste fail to meet the criteria specified in this Certificate;
(j) procedures and actions to be taken should the current disposal options for the outgoing Residual Waste become unavailable;
(k) design of the contingency measure, procedures and actions should the emissions from the Site, including the fugitive odour/dust emissions, cause occurrences of public Complaints;
(l) procedures and actions to be taken should the Owner be unable to maintain the negative pressure in the Tipping Building;
(m) procedures and actions to be taken should the occurrence of Complaints require the Owner to suspend the waste processing activities at the Site; and
(n) identification and risk assessment of all reasonably foreseeable incidents that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate, including but not limited to:
    (i) a breakdown of the Facility/Equipment or part of the Facility/Equipment, including the APC Equipment and the CEM Systems associated with the Boilers;
    (ii) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements;
    (iii) any change in process parameters which may result in non compliance with the Performance Requirements;
    (iv) power failure resulting in the use of the Emergency Diesel Generator or Total Power Failure; and
    (v) description of the preventative and control measures to minimize the occurrence or impacts of the above incidents; and
    (vi) procedures for corrective measures and timelines to take to address the above incidents in a timely manner to effectively prevent or minimize the discharge of any contaminant into the natural environment and continue to maintain compliance with the *EPA* , the Regulations and

this Certificate, including procedures for Waste Processing Rate reduction, waste feed cut-off, Controlled Shutdown or Emergency Shutdown of the Boilers as applicable.

(3) The Owner shall submit the finalized Contingency and Emergency Response Plan to the Director a minimum of one hundred and twenty (120) days prior to the Commencement Date of Operation, for approval.

(4) An up-to-date version of the Contingency and Emergency Response Plan shall be kept at the Site at all times, in a central location available to all staff, and it shall be available for inspection by a Provincial Officer upon request.

(5) The Owner shall ensure that the names and telephone numbers of the persons to be contacted in the event of an emergency situation are kept up-to-date, and that these numbers are prominently displayed at the Site and at all times available to all staff and emergency response personnel.

(6) The Contingency and Emergency Response Plan shall be reviewed on a regular basis and updated, as necessary. The revised version of the Contingency and Emergency Response Plan shall be submitted to the local Municipality and the Fire Department for comments and to the District Manager for comments and concurrence.

(7) The Owner shall implement the recommendations of the updated Contingency and Emergency Response Plan, immediately upon receipt of the written concurrence from the District Manager.

12. **EMERGENCY SITUATION RESPONSE and REPORTING**

(1) The Owner shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation at this Site and manage any emergency situation in accordance with the Contingency and Emergency Response Plan.

(2) The Owner shall ensure that the equipment and materials listed in the Contingency and Emergency Response Plan are immediately available at the Site, are in a good state of repair, and fully operational at all times.

(3) The Owner shall ensure that all Site personnel responsible for the emergency situation response are fully trained in the use of the equipment and related materials, and in the procedures to be employed in the event of an emergency.

(4) All Spills as defined in the *EPA* shall be immediately reported to the **Ministry's Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.

13. **SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER**

(1) The Owner shall notify the District Manager in writing, at least six (60) days prior to the scheduled date for the first receipt of Waste at the Site, as to whether or not the construction of the Facility has been carried out in accordance with this Certificate to a point of Substantial Completion.

(2) (a) The Owner shall forthwith notify the District Manager and the Spills Action Centre by telephone, when any of the following incidents occur that may result in a discharge into the natural environment of any contaminant in an amount, concentration or level in excess of that prescribed by the Regulations and/or imposed by this Certificate:

(i) CEM Systems indicate that the Boilers and associated APC Equipment have been out of compliance with the Performance Requirements triggering a Waste Processing Rate Reduction, Waste Feed cut-off, Controlled Shutdown or Emergency Shutdown as specified in the Emergency Response and Contingency Plan;
(ii) failure of the APC Equipment associated with the Boilers; and
(iii) power failure resulting in the use of the emergency diesel generator or Total Power Failure;

(b) In addition to fulfilling the notification requirements from the *EPA*, the Owner shall prepare and submit a written report to the District Manager with respect to any of the above said occurrences, within five (5) calendar days of the occurrence, in the following format:

(i) date of the occurrence;
(ii) general description of the occurrence;
(iii) duration of the occurrence;
(iv) effect of the occurrence on the emissions from the Facility;
(v) measures taken to alleviate the effect of the occurrence on the emissions from the Facility; and
(vi) measures taken to prevent the occurrence of the same or similar occurrence in the future.

(3) Should a Spill, as defined in the *EPA*, occur at the Site, in addition to fulfilling the requirements from the *EPA* and applicable regulations, the Owner shall submit to the District Manager a written report within three (3) calendar days outlining the nature of the Spill, remedial measure taken and the measures taken to prevent future occurrences at the Site.

(4) (a) Within ninety (90) days from the date of this Certificate, the Regions shall prepare and submit to the District Manager for concurrence, a Soil Testing Plan to monitor the impact of the Site operations at the locations where the ambient air monitoring is proposed by the Owner in accordance with the requirements set out in the EA Approval.

(b) (i) This Plan shall ensure that representative samples of the soil to be tested are collected in sufficient numbers and that the samples are properly preserved and tested so that reliable data on the soil characteristics is collected.

(ii) As a minimum, the Plan shall include testing for cadmium, lead, chromium, nickel, cobalt, copper, molybdenum, selenium, zinc and mercury, Dioxins and Furans.

(iii) This Plan shall comply with the Ministry's regulatory requirements for sampling and testing of soil and it shall include the rationale for the proposed methods.

(iv) This Plan be kept at the Site at all times and be available for inspection by a Provincial Officer upon request.

14. RECORDS KEEPING

(1) Any information requested by the Ministry concerning the Facility and its operation under this Certificate, including, but not limited to, any records required to be kept by this Certificate, shall be provided to the Ministry, upon request, in a timely manner.

(2) The Owner shall retain, for a minimum of seven (7) years from the date of their creation, except as noted below, all reports, records and information described in this Certificate.

Daily Activities

(3) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) date of record and the name and signature of the person completing the report;
(b) quantity and source of the incoming Waste received at the Site;
(c) records of the estimated quantity of Waste thermally treated in the Boilers;
(d) quantity of the Unacceptable Waste received at the Site by the end of the approved Waste receipt period and the type(s) of the Unacceptable Waste received;
(e) quantity and type of the Residual Waste shipped from the Site, including any required outgoing Residual Waste characterization results;
(f) destination and/or receiving site(s) for the Residual Waste shipped from the Site;
(g) quantity and type of any Rejected Waste accepted at the Site;
(h) destination and/or receiving site(s) for the Rejected Waste shipped from the Site;
(i) housekeeping activities, including litter collection and washing/cleaning activities, etc.
(j) amount of electricity produced;

(k) amount of excess electricity exported to the electrical grid.

Monitoring and Testing Records

(4) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) day and time of the activity;
(b) all original records produced by the recording devices associated with the CEM Systems;
(c) a summary of daily records of readings of the CEM Systems, including:
  (i) the daily minimum and maximum 4-hour average readings for carbon monoxide;
  (ii) the daily minimum and maximum one hour average readings for oxygen;
  (iii) the daily minimum and maximum 10-minute average readings for organic matter;
  (iv) the daily minimum and maximum 24-hour average readings for sulphur dioxide;
  (v) the daily minimum and maximum 24-hour average readings for nitrogen oxides;
  (vi) the daily minimum and maximum 24-hour average readings for hydrogen chloride;
  (vii) the daily minimum and maximum 6-minute average and 2-hour average opacity readings; and
  (viii) the daily minimum and maximum one-hour average readings for temperature measurements.
(d) records of all excursions from the applicable Performance Requirements as measured by the CEM Systems, duration of the excursions, reasons for the excursions and corrective measures taken to eliminate the excursions;
(e) all records produced during any Acoustic Audit;
(f) all records produced during any Source Testing;
(g) all records produced by the long term sampling program for Dioxins and Furans required by this Certificate;
(h) all records produced during the Residual Waste compliance testing;
(i) all records produced during the Soil Testing;
(j) all records produced during the Groundwater and Surface Water Monitoring required by this Certificate;
(k) all records produced during the Ambient Air Monitoring required by this Certificate;
(l) all records associated with radiation monitoring of the incoming Waste, including but not limited to:
  (i) transaction number;
  (ii) hauler;
  (iii) vehicle ID;
  (iv) alarm level;
  (v) maximum CPS;
  (vi) uSv/hr;

(vii) comment;
(viii) background CPS;
(ix) driver time in and out; and
(x) name of the Trainer Personnel that carried out the monitoring.

(m) results of the containment testing carried out in the buildings, conveyors, tanks and silos, as required;

(n) results the negative pressure in the Tipping Building carried out, as required.

Inspections/Maintenance/Repairs

(5) The Owner shall maintain an on-Site written or digital record of inspections and maintenance as required by this Certificate. As a minimum, the record shall include the following:

(a) the name and signature of the Trained Personnel that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered, including the need for a maintenance or repair activity;
(d) the recommendations for remedial action;
(e) the date, time and description of actions (repair or maintenance) undertaken;
(f) the name and signature of the Trained Personnel who undertook the remedial action; and
(g) an estimate of the quantity of any materials removed during cleaning of the Works.

Emergency Situations

(6) The Owner shall maintain an on-Site written or digital record of the emergency situations. As a minimum, the record shall include the following:

(a) the type of an emergency situation;
(b) description of how the emergency situation was handled;
(c) the type and amount of material spilled, if applicable;
(d) a description of how the material was cleaned up and stored, if generated; and
(e) the location and time of final disposal, if applicable; and
(f) description of the preventative and control measures undertaken to minimize the potential for re-occurrence of the emergency situation in the future.

Complaints Response Records

(7) The Owner shall establish and maintain a written or digital record of complaints received and the responses made as required by this Certificate.

Training

(8) The Owner shall maintain an on-Site written or digital record of training as required by this Certificate. As a minimum, the record shall include the following:

(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

Reports

(9) The Owner shall keep at the Site the following reports required by this Certificate:

(a) the ESDM Report
(b) the Acoustic Assessment Report;
(c) the Annual Report; and
(d) the Third Party Audit.

15. REPORTING

Annual Report

(1) By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:

(a) a summary of the quality and the quantity of the Wastes accepted at the Site, including the maximum amount of the Waste received annually and daily and the sources of the Waste;

(b) a summary of the quality and the quantity of the Residual Waste shipped from the Site, including the analytical data required to characterize the Residual Waste, the off-Site destinations for the Residual Waste and its subsequent use, if known;

(c) estimated material balance for each month documenting the maximum amount of wastes stored at the Site;

(d) annual water usage;

(e) annual amount of the electricity produced and the annual amount of the electricity exported to the electrical grid;

(f) summaries and conclusions from the records required by Conditions 14.(3) through 14.(8) of this Certificate;

(g) the Emission Summary Table and the Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;

(h) a summary of dates, duration and reasons for any environmental and operational problems, Boilers downtime, APC Equipment and CEM System malfunctions that may have negatively impacted the quality of the environment or any incidents triggered by the Emergency Response and

Contingency Plan and corrective measures taken to eliminate the environmental impacts of the incidents;

(i) a summary of the dates, duration and reasons for all excursions from the applicable Performance Requirements as measured by the CEM Systems or as reported by the annual Source Testing, reasons for the excursions and corrective measures taken to eliminate the excursions;

(j) results of the evaluation of the performance of the long-term sampling system in determining the Dioxins and Furans emission trends and/or fluctuations for the year reported on as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers;

(k) dates of all environmental complaints relating to the Site together with cause of the Complaints and actions taken to prevent future Complaints and/or events that could lead to future Complaints;

(l) any environmental and operational problems that could have negatively impacted the environment, discovered as a result of daily inspections or otherwise and any mitigative actions taken;

(m) a summary of any emergency situations that have occurred at the Site and how they were handled;

(n) the results and an interpretive analysis of the results of the groundwater and surface water, including an assessment of the need to amend the monitoring programs;

(o) summaries of the Advisory Committee meetings, including the issues raised by the public and their current status;

(p) any recommendations to improve the environmental and process performance of the Site in the future;

(q) statement of compliance with this Certificate, including compliance with the *O. Reg. 419/05* and all air emission limits based on the results of source testing, continuous monitoring and engineering calculations, as may be appropriate; and

(r) interpretation of the results and comparison to the results from previous Annual Reports to demonstrate the Facility's impact on the environment.

Third Party Audit

(2) (a) The Regions shall ensure that an independent technical review of the operations at the Site is undertaken in accordance with the requirements of the EA Approval.

(b) In addition to the Third Party Audit requirements set out in the EA approval, the Third Party Audit shall include the following:

(i) a review of the data from the monitoring and testing required by this Certificate;
(ii) a review of all complaints received about the operation of the Facility;
(iii) any recommendations for improving the operation of the Facility received from the Advisory Committee; and
(iv) a recommendation of any improvements that could be made to ensure that the operation of the Facility is optimized and is protective of the health and safety of people and the environment.

(3) The Regions shall submit a Written Audit Report on the results of the independent technical review to the Regional Director in accordance with the Audit Plan and retain a copy at the Site.

Soil Testing Report

(4) Within one (1) month of completion of each Soil Testing event, the Regions shall submit to the District Manager a Soil Testing Report, which includes the details on the sampling/testing procedures, the results of the testing and a comparison with the results obtained during the previous Soil Testing.

16. PUBLIC ACCESS TO DOCUMENTATION

(1) The Owner shall, at all times, maintain documentation that describes the current operations of the Facility. The Owner shall post the documentation at the website for the undertaking and during regular business hours, the Owner shall make the following documents available for inspection at the Site by any interested member of the public, upon submission to the Ministry for review:

(a) a current ESDM Report that demonstrates compliance with the Performance Limits for the Facility regarding all Compounds of Concern;

(b) a current Acoustic Assessment Report that demonstrates compliance with the Performance Limits for the Facility regarding noise emissions;

(c) the most recent Annual Report;

(d) the most current Third Party Audit Report;

(e) Odour Management and Mitigation Plan, prepared in accordance with the requirements of the EA Approval;

(f) Noise Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval; and

(g) Groundwater and Surface Water Monitoring and Reporting Plan, prepared in accordance with the requirements of the EA Approval.

(2) The Owner shall ensure that necessary hardware and software are provided at a location available to the public, to provide on-line real-time reporting of the operating parameter data for the Facility, including acceptable operating limits, stack emissions, and all other parameters for which continuous monitoring is required and that continuous records of the same be kept and made available to the public.

17. **ADVISORY COMMITTEE**

(1) The Regions shall establish an Advisory Committee in accordance with the requirements set out in the EA Approval.

18. **CLOSURE of the SITE**

(1) A minimum of nine (9) months prior to closure of the Site, the Owner shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Owner shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

SCHEDULE "A"

Supporting Documentation

(1) Applications for a Certificate of Approval (Air) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Emission Summary and Dispersion Modelling Report, dated March 2011, prepared by Golder Associates;

(b) Acoustic Assessment Report prepared by Golder Associates Ltd., dated March 2011 and signed by Paul Niejadlik.

(2) Applications for a Provisional Certificate of Approval (Waste Disposal Site) dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of York and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) Attachment #1 containing the "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.;

(b) Attachment #3 containing the "Public Consultation Report", dated March 2011, prepared by Golder Associates Ltd.;

(c) Attachment #4 containing the Host Community Agreement

(d) Attachment #5 containing the proof of legal name for Covanta Durham York Renewable Energy Limited Partnership; and

(e) A letter May 24, 2011 from Anthony Ciccone, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, providing additional technical information on the proposal and attaching a report entitled "Amendment #1 Durham York Energy Centre Design and Operations Report", dated May 2011;

(3) Applications for a Certificate of Approval of Municipal and Private Sewage Works dated March 2, 2011, each signed by Cliff Curtis, Commissioner of Works, The Regional Municipality of Durham, by Erin Mahoney, Commissioner of Environmental Services, The Regional Municipality of Durham and by Matthew R. Mulcahy, Senior Vice President, Business Development, Covanta Durham York Renewable Energy Limited Partnership, and the following supporting documentation:

(a) "Surface Water and Groundwater Technical Study Report" dated July 2009, prepared by Jacques Whitford, Markham, Ontario (CD Report).

(b) "Stormwater Design Model Output" prepared by Sigma Energy, dated March 2001 (CD Report).

(c) Clearance letter from Central Lake Ontario Conservation date February 22, 2011.

(d) A letter dated March 23, 2011, from Brian Bahor, Covanta Energy Corporation, to Stefanos Habtom, Ontario Ministry of the Environment, providing additional technical design information on the proposed stormwater management ponds.

SCHEDULE "B"

Procedure to calculate and record the 10-minute average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor

(a) Calculate and record one-hour average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor, employing CALPUFF atmospheric dispersion model or the dispersion model acceptable to the Director that employs at least five (5) years of hourly local meteorological data and that can provide results reported as individual one-hour average odour concentrations.

(b) Convert and record each of the one-hour average concentrations predicted over the five (5) years of hourly local meteorological data at the Point of Impingement and at the most impacted Sensitive Receptor to 10-minute average concentrations using the One-hour Average to 10-Minute Average Conversion described below; and

(c) Record and present the 10-Minute Average concentrations predicted to occur over a five (5) year period at the Point of Impingement and at the most impacted Sensitive Receptor in a histogram. The histogram shall identify all predicted 10-minute average odour concentration occurrences in terms of frequency, identifying the number of occurrences over the entire range of predicted odour concentration in increments of not more than 1/10 of one odour unit. The maximum 10-minute average concentration of odour at the Sensitive Receptor will be considered to be the maximum odour concentration at the most impacted Sensitive Receptor that occurs and is represented in the histogram, disregarding outlying data points on the histogram as agreed to by the Director.

One-hour Average To 10-minute Average Conversion

1. Use the following formula to convert and record one-hour average concentrations predicted by the CALPUFF atmospheric dispersion model or by the dispersion model acceptable to the Director to 10-minute average concentrations:

X10min = X60min*1.65

where X10min = 10-minute average concentration
X60min = one-hour average concentration

SCHEDULE "C"

PERFORMANCE REQUIREMENTS

In-Stack Emission Limits

Parameter	In-Stack Emission Limit	Verification of Compliance
Total Suspended Particulate Matter (filterable particulate measured in accordance with the Ontario Source Testing Code)	9 mg/Rm3	Results from compliance Source Testing
cadmium	7 µg/Rm3	Results from compliance Source Testing
lead	50 µg/Rm3	Results from compliance Source Testing
mercury	15 µg/Rm3	Results from compliance Source Testing
dioxins and furans	60 pg/Rm3	Results from compliance Source Testing; results expressed as I-TEQ
hydrochloric acid (HCl)	9 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
sulphur dioxide (SO2)	35 mg/Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
nitrogen oxides (NOx)	121 mg/ Rm3	Calculated as the rolling arithmetic average of 24 hours of data measured by a CEM System that provides data at least once every 15 minutes
organic matter (undiluted, expressed as equivalent methane)	50 ppmdv (33 mg/ Rm3)	Results from compliance source testing
carbon monoxide	35 ppmdv (40 mg/Rm3)	Calculated as the rolling arithmetic average of four (4) hours of data measured by a CEM System that provides data at least once every fifteen minutes, in accordance with condition 6 (2) (c)
opacity	10 percent	Calculated as the rolling arithmetic average of six (6) minutes of data measured by a CEM System that provides data at least once every minute
	5 percent	Calculated as the rolling arithmetic average of two (2) hours of data measured by a CEM System that provides data at least once every

		fifteen minutes

mg/Rm3- milligrams per reference cubic metre;

pg/Rm3 - picograms per reference cubic metre

ppmdv parts per million by dry volume,

µg/Rm3 - micrograms per reference cubic metre

R- reference conditions - 25 degrees Celsius, 101.3 kilopascals, dry basis, 11% oxygen

SCHEDULE "D"

TEST CONTAMINANTS

Hydrogen Chloride
Hydrogen Fluoride
Oxides of Nitrogen expressed as Nitrogen Dioxide
Sulphur Dioxide
Total Hydrocarbons, expressed as methane on wet basis
Carbon Dioxide
Total Suspended Particulate Matter (< 44 microns)
Total PM-10 including condensables
Total PM-2.5 including condensables

Metals

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Mercury
Molybdenum
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc

Schedule "D" - Cont'd

Chlorobenzenes	Chlorophenols
Monochlorobenzene (MCB)	2-monochlorophenol (2-MCP)
1,2-Dichlorobenzene (1,2-DCB)	3-monochlorophenol (3-MCP)
1,3-Dichlorobenzene (1,3-DCB)	4-monochlorophenol (4-MCP)
1,4-Dichlorobenzene (1,4-DCB)	2,3-dichlorophenol (2,3-DCP)
1,2,3-Trichlorobenzene (1,2,3-TCB)	2,4-dichlorophenol (2,4-DCP)
1,2,4-Trichlorobenzene (1,2,4-TCB)	2,5-dichlorophenol (2,5-DCP)
1,3,5-Trichlorobenzene (1,3,5-TCB)	2,6-dichlorophenol (2,6-DCP)
1,2,3,4-Tetrachlorobenzene (1,2,3,4-TeCB)	3,4-dichlorophenol (3,4-DCP)
1,2,3,5-Tetrachlorobenzene (1,2,3,5-TeCB)	3,5-dichlorophenol (3,5-DCP)
1,2,4,5-Tetrachlorobenzene (1,2,4,5-TeCB)	2,3,4-trichlorophenol (2,3,4-T3CP)
Pentachlorobenzene (PeCB)	2,3,5-trichlorophenol (2,3,5-T3CP)
Hexachlorobenzene (HxCB)	2,3,6-trichlorophenol (2,3,6-T3CP)
	2,4,5-trichlorophenol (2,4,5-T3CP)
	2,4,6-trichlorophenol (2,4,6-T3CP)
	3,4,5-trichlorophenol (3,4,5-T3CP)
	2,3,4,5-tetrachlorophenol (2,3,4,5-T4CP)
	2,3,4,6-tetrachlorophenol (2,3,4,6-T4CP)
	2,3,5,6-tetrachlorophenol (2,3,5,6-T4CP)
	Pentachlorophenol (PeCP)

Schedule "D" - Cont'd

Co-Planar PCBs (Dioxin-like PCBs)	Volatile Organic Matter
PCB-077 (3,3',4,4'-TCB)	Acetaldehyde
PCB-081 (3,4,4',5-TCB)	Acetone
PCB-105 (2,3,3',4,4'-PeCB)	Acrolein
PCB-114 (2,3,4,4',5-PeCB)	Benzene
PCB-118 (2,3',4,4',5-PeCB)	Bromodichloromethane
PCB-123 (2',3,4,4',5-PeCB)	Bromoform
PCB-126 (3,3',4,4',5-PeCB)	Bromomethane
PCB-156 (2,3,3',4,4',5-HxCB)	Butadiene, 1,3 -
PCB-157 (2,3,3',4,4',5'-HxCB)	Butanone, 2 -
PCB-167 (2,3',4,4',5,5'-HxCB)	Carbon Tetrachloride
PCB-169 (3,3',4,4',5,5'-HxCB)	Chloroform
PCB-189 (2,3,3',4,4',5,5'-HpCB)	Cumene
	Dibromochloromethane
	Dichlorodifluoromethane
	Dichloroethane, 1,2 -
	Dichloroethene, Trans - 1,2
	Dichloroethene, 1,1 -
	Dichloropropane, 1,2 -
	Ethylbenzene
	Ethylene Dibromide
	Formaldehyde
	Mesitylene
	Methylene Chloride
	Styrene
	Tetrachloroethene
	Toluene
	Trichloroethane, 1,1,1 -
	Trichloroethene
	Trichloroethylene, 1,1,2 -
	Trichlorotrifluoroethane
	Trichlorofluoromethane
	Xylenes, M-, P- and O-
	Vinyl Chloride

Schedule "D" - Cont'd

Polycyclic Organic Matter	Dioxin/Furan Isomers
Acenaphthylene	
Acenaphthene	2,3,7,8-Tetrachlorodibenzo-p-dioxin
Anthracene	1,2,3,7,8-Pentachlorodibenzo-p-dioxin
Benzo(a)anthracene	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
Benzo(b)fluoranthene	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
Benzo(k)fluoranthene	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
Benzo(a)fluorene	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
Benzo(b)fluorene	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin
Benzo(ghi)perylene	
Benzo(a)pyrene	2,3,7,8-Tetrachlorodibenzofuran
Benzo(e)pyrene	2,3,4,7,8-Pentachlorodibenzofuran
Biphenyl	1,2,3,7,8-Pentachlorodibenzofuran
2-Chloronaphthalene	1,2,3,4,7,8-Hexachlorodibenzofuran
Chrysene	1,2,3,6,7,8-Hexachlorodibenzofuran
Coronene	1,2,3,7,8,9-Hexachlorodibenzofuran
Dibenzo(a,c)anthracene	2,3,4,6,7,8-Hexachlorodibenzofuran
Dibenzo(a,h)anthracene	1,2,3,4,6,7,8-Heptachlorodibenzofuran
Dibenzo(a,e)pyrene	1,2,3,4,7,8,9-Heptachlorodibenzofuran
9,10-Dimethylanthracene	1,2,3,4,6,7,8,9-Octachlorodibenzofuran
7,12-Dimethylbenzo(a)anthracene	
Fluoranthene	
Fluorene	
Indeno(1,2,3-cd)pyrene	
2-Methylanthracene	
3-Methylcholanthrene	
1-Methylnaphthalene	
2-Methylnaphthalene	
1-Methylphenanthrene	
9-Methylphenanthrene	
Naphthalene	
Perylene	
Phenanthrene	
Picene	
Pyrene	
Tetralin	
M-terphenyl	
O-terphenyl	
P-terphenyl	
Triphenylene	

SCHEDULE "E"

SOURCE TESTING PROCEDURES

1. The Owner shall submit, to the Manager a test protocol including the Pre-Test Information required by the Source Testing Code, at least two (2) months prior to the scheduled Source Testing date.

2. (1) For the purpose of the Source Testing program, the Owner is temporarily permitted to operate the Boilers at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b) during the period of the Source Testing. The Owner shall ensure that the concentration of residual oxygen in the Undiluted Gases leaving the combustion zone of the Boilers, as measured and recorded by the CEM System, shall not be less than 5 percent by volume on a dry basis, during this Source Testing program.

   (2) If the Source Testing results demonstrate that compliance with the Performance Requirements can be maintained at a residual oxygen concentration below the performance limit outlined in Condition 6.(2)(b), the Owner may apply to the Director for approval to alter the required residual oxygen concentration.

3. The Owner shall finalize the test protocol in consultation with the Manager.

4. The Owner shall not commence the Source Testing until the Manager has accepted the test protocol.

5. The Owner shall complete the first Source Testing not later than six (6) months after Commencement of Operation of the Facility/Equipment.

6. The Owner shall conduct subsequent Source Testing at least once (1) every calendar year thereafter.

7. The Owner shall notify the District Manager and the Manager in writing of the location, date and time of any impending Source Testing required by this Certificate, at least fifteen (15) days prior to the Source Testing.

8. The Owner shall submit a report on the Source Testing programs to the District Manager and the Manager not later than three (3) months after completing each Source Testing program. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

   (1) an executive summary;
   (2) records of operating conditions; including process description, records of waste composition and feed rate during the Source Testing;
   (3) all records produced by the CEM Equipment;
   (4) procedures followed during the Source Testing and any deviation from the proposed test protocol and the reasons therefore;
   (5) the results of the analyses of the stack emissions;

(6) a summary table that compares the Source Testing results, the monitoring data and the records of operating conditions during the Source Testing to the requirements imposed by the *EPA*, the Regulation and/or the Performance Requirements;

(7) the results of dispersion calculations in accordance with the *O. Reg. 419/05*, indicating the maximum concentration of the Test Contaminants, at the Point of Impingement.

(8) an updated site wide emission source inventory to assess the aggregate point of impingement concentrations of the Test Contaminants.

9. The Owner shall ensure that the Source Testing Report is made available and easily accessible for review by the public at the Facility, immediately after the document is submitted to the Ministry.

10. The Director may not accept the results of the Source Testing if:

(1) the Source Testing Code or the requirements of the Manager were not followed; or

(2) the Owner did not notify the District Manager and the Manager of the Source Testing; or

(3) the Owner failed to provide a complete report on the Source Testing.

11. If the Director does not accept the results of the Source Testing, the Director may require re-testing.

SCHEDULE "F"

PARAMETER:
Temperature

LOCATION:
The sample point for the Continuous Temperature Monitor shall be located at a point where the temperature in the combustion zone of the Boilers has reached at least 1000°C for a period of not less than one second. Compliance shall be proven by direct measurement or/and a correlation between the measured temperature and the intended target proven by a method acceptable to the Director.

PERFORMANCE:
The Continuous Temperature Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	SPECIFICATION
1)	Type:	"K", "J" or other type or alternative measurement device with equivalent measurement accuracy and suitable to the temperature range being measured
2)	Accuracy:	± 1.5 percent of the minimum gas temperature

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor without a significant loss of accuracy and with a time resolution of 1 minutes or better. Temperature readings for record keeping and reporting purposes shall be kept as one-hour average values.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the time for each calendar quarter.

PARAMETER:
Carbon Monoxide

INSTALLATION:
The Continuous Carbon Monoxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of carbon monoxide in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (parts per million, ppm):	0 to ≥100 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Carbon Monoxide Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3) Calibration Error:	≤ 2.5 percent of actual concentration
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 5 percent of span value
7) Span Calibration Drift (24-hour):	≤5 percent of span value
8) Response Time (90 percent response to a step change):	≤180 seconds
9) Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Oxygen

INSTALLATION:
The Continuous Oxygen Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of oxygen in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler and in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (percentage):	0 - 20 or 0 - 25
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Oxygen Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (percentage):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤10 percent of the mean value of the reference method test data
3) Calibration Error:	0.25 percent O_2
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 0.5 percent O_2
7) Span Calibration Drift (24-hour):	≤ 0.5 percent O_2
8) Response Time (90 percent response to a step change):	≤ 90 seconds
9) Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Oxygen concentration readings for record keeping and reporting purposes shall be kept as one-hour average values.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Hydrogen Chloride

INSTALLATION:
The Continuous Hydrogen Chloride Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of hydrogen chloride in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Range (parts per million, ppm):	0 to ≥100 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Hydrogen Chloride Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤ 20 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3) Calibration Error:	≤ 2 percent of actual concentration
4) System Bias:	≤ 4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 5 percent of span value
7) Span Calibration Drift (24-hour):	≤ 5 percent of span value
8) Response Time (90 percent response to a step change):	≤ 240 seconds
9) Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
The monitor shall be calibrated daily at the sample point, to ensure that it meets the drift limits specified above, during the periods of the operation of the . The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 5 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Nitrogen Oxides

INSTALLATION:
The Continuous Nitrogen Oxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of nitrogen oxides in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1) Analyzer Operating Range (parts per million, ppm):	0 to ≥200 ppm
2) Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Nitrogen Oxides Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1) Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2) Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data
3) Calibration Error:	≤ 2 percent of actual concentration
4) System Bias:	≤4 percent of the mean value of the reference method test data
5) Procedure for Zero and Span Calibration Check:	all system components checked
6) Zero Calibration Drift (24-hour):	≤ 2.5 percent of span value
7) Span Calibration Drift (24-hour):	≤ 2.5 percent of span value
8) Response Time (90 percent response to a step change):	≤ 240 seconds
9) Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER:
Sulphur Dioxide

INSTALLATION:
The Continuous Sulphur Dioxide Monitor shall be installed at an accessible location where the measurements are representative of the actual concentration of sulphur dioxide in the Undiluted Gases leaving the APC Equipment associated with each Boiler, and shall meet the following installation specifications.

PARAMETERS	SPECIFICATION
1. Range (parts per million, ppm):	0 to ≥100 ppm
2. Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Sulphur Dioxide Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS	SPECIFICATION
1. Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2. Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data
3. Calibration Error:	≤ 2 percent of actual concentration
4. System Bias:	≤ 4 percent of the mean value of the reference method test data
5. Procedure for Zero and Span Calibration Check:	all system components checked
6. Zero Calibration Drift (24-hour):	≤ 2.5 percent of span value
7. Span Calibration Drift (24-hour):	≤ 2.5 percent of span value
8. Response Time (90 percent response to a step change):	≤ 200 seconds
9. Operational Test Period:	≥168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Total Hydrocarbons

INSTALLATION:
The Total Hydrocarbons Monitor shall be installed at an accessible location where the measurements are representative of the concentrations of Organic Matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler and shall meet the following installation specifications.

	PARAMETERS	SPECIFICATION
1.	Detector Type:	Flame Ionization
2.	Oven Temperature:	160°C minimum
3.	Flame Temperature:	1800 °C minimum at the corona of the hydrogen flame
4.	Range (parts per million, ppm):	0 to ≥200 ppm
5.	Calibration Gas:	propane in air or nitrogen
6.	Calibration Gas Ports:	close to the sample point

PERFORMANCE:
The Continuous Total Hydrocarbons Monitor shall meet the following minimum performance specifications for the following parameters.

	PARAMETERS	SPECIFICATION
1.	Span Value (nearest ppm equivalent):	2 times the average normal concentration of the source
2.	Relative Accuracy:	≤ 10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3.	System Bias:	≤ 4 percent of the mean value of the reference method test data
4.	Noise:	≤ 1 percent of span value on most sensitive range
5.	Repeatability:	≤ 1 percent of span value
6.	Linearity (response with propane in air):	≤ 3 percent of span value over all ranges
7.	Calibration Error:	≤ 2 percent of actual concentration
8.	Procedure for Zero and Span Calibration Check:	all system components checked on all ranges
9.	Zero Calibration Drift (24-hours):	≤ 2.5 percent of span value on all ranges
10.	Span Calibration Drift (24-hours):	≤ 2.5 percent of span value
11.	Response Time (90 percent response to a step change):	≤ 60 seconds
12.	Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Measurements of concentrations of organic matter (as methane) shall be kept as 10 minute average values for record keeping and reporting purposes.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter.

PARAMETER: Opacity

INSTALLATION: The Continuous Opacity Monitor shall be installed at an accessible location where the measurements are representative of the actual opacity of the Undiluted Gases leaving the APC Equipment associated with each Boiler and shall meet the following design and installation specifications.

PARAMETERS		SPECIFICATION
1)	Wavelength at Peak Spectral Response (nanometres, nm):	500 - 600
2)	Wavelength at Mean Spectral Response (nm):	500 - 600
3)	Detector Angle of View:	≤ 5 degrees
4)	Angle of Projection:	≤ 5 degrees
5)	Range (percent of opacity):	0 -100

PERFORMANCE:
The Continuous Opacity Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS		SPECIFICATION
1)	Span Value (percent opacity):	2 times the average normal opacity of the source
2)	Calibration Error:	≤3 percent opacity
3)	Attenuator Calibration:	≤2 percent opacity
4)	Response Time (95 percent response to a step change):	≤ 10 seconds
5)	Schedule for Zero and Calibration Checks:	daily minimum
6)	Procedure for Zero and Calibration Checks:	all system components checked
7)	Zero Calibration Drift (24-hours):	≤ 2 percent opacity
8)	Span Calibration Drift (24-hours):	≤ 2 percent opacity
9)	Conditioning Test Period:	≥ 168 hours without corrective maintenance
10)	Operational Test Period:	≥ 168 hours without corrective maintenance

CALIBRATION:
The monitor shall be calibrated, to ensure that it meets the drift limits specified above, during the periods of the operation of the Equipment. The results of all calibrations shall be recorded at the time of calibration.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 30 seconds or better.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent, thereafter.

PARAMETER:
Moisture, Hydrogen Fluoride and Ammonia

Selection and Installation

The Owner shall select and install a CEM System, to measure moisture content of the stack gases, the concentration of hydrogen fluoride and ammonia in the Undiluted Gases leaving the APC Equipment associated with each Boiler, as follows:

a) Design and Performance Specifications shall be in accordance with 40 CFR 60, Appendix B, Specification 4.

b) The Owner shall select the probe locations in compliance with 40 CFR 60, Appendix B, Specification 2.

Test Procedures

The Owner shall verify compliance with the Design and Performance Specifications in accordance with 40 CFR 60, Appendix B, Specification 4, with the reference method for the relative accuracy test being Method 4. of the Source Testing Code.

In furtherance of, but without limiting the generality of the foregoing, the mean difference between the calibration gas value and the analyzer response value at each of the four test concentrations shall be less than 5 percent of the measurement range.

SCHEDULE "G"

A stormwater management facility to service a 10.0 ha drainage area of the Durham York Energy Centre located on the west side of Osbourne Road and north of the CN Rail, Lot 27, Concession Broken Front, Part, Municipality of Clarington, Regional Municipality of Durham, designed to provide quality and quantity control of stormwater run-off by attenuating runoff from storm events up to 1:100 years return frequency to or below the pre-development levels, consisting of:

East Stormwater Management Pond (East SWM Pond)

A stormwater management facility to service a 5.7 ha drainage area comprising of the eastern part of the Durham York Energy Centre consisting of the following:

- one (1) approximately 128 m long drainage ditch collecting stormwater runoff from the north eastern part of the site, having an average horizontal slope of 1.56%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- one (1) approximately 199 m long drainage ditch collecting stormwater runoff from the eastern part of the site, having an average horizontal slope of 2.77%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- approximately fourteen (14) catch basins/maintenance holes and a total of 466.8 m long 450 mm diameter and 34.6 m of 600 mm diameter corrugated PE stormwater sewers conveying stormwater runoff collected from the north and north eastern part of the site, discharging to a forebay of a wet extended detention stormwater management pond described below;

- one (1) forebay with approximate bottom dimensions of 11.0 m wide and 34.8 m long and depth of 1.0 m, equipped with 600 mm diameter corrugated HDPE inlet pipe, a rip-rap covered inlet structure, and a forebay berm with top elevation of 95.0 m masl, discharging to a wet extended detention pond described below;

- one (1) wet extended detention stormwater management pond located at the south east part of the site, with approximate bottom dimensions of 21.0 m wide and 71.4 m long and a maximum depth of 2.7 m at 96.70 m masl elevation, having side slopes of 3H:1V and 5H:1V near the outlet structure, providing a permanent pool storage capacity of 1,008 m^3 at elevation 95.0 m masl, an active storage capacity of 3,099 m^3 at 96.70 m masl elevation, and total storage capacity of 4,107 m^3, equipped with an outlet structure consisting of a 150 mm diameter reverse slope inlet pipe with a gate valve and a 450 mm diameter perforated pipe riser fitted with 75 mm diameter orifice plate, a 75 mm diameter maintenance discharge pipe with a gate valve, and an emergency overflow structure at elevation 97.0 m masl, discharging through a 450 mm diameter outlet pipe to existing swale along the northern side of the CN Rail line to Tooley Creek and eventually to Lake Ontario;

West Stormwater Management Pond (West SWM Pond)

A stormwater management facility to service a 4.3 ha drainage area comprising of the western part of the Durham York Energy Centre consisting of the following:

- one (1) approximately 296 m long drainage ditch collecting stormwater runoff from the north western part of the site, having an average horizontal slope of 1.0%, depth of 0.5 m, bottom width of 1.0 m, and side slopes of 2.5H:1V, discharging to storm sewers described below;

- approximately five (5) catch basins/maintenance holes and a total of 272.2 m long 450 mm diameter corrugated PE stormwater sewers conveying stormwater runoff collected from the western part of the site, discharging to a forebay of a wet extended detention stormwater management pond described below;

- one (1) forebay with approximate bottom dimensions of 13.0 m wide and 26.0 m long and depth of 1.0 m, equipped with 450 mm diameter corrugated HDPE inlet pipe, a rip-rap covered inlet structure, and a forebay berm with top elevation of 95.0 m masl, discharging to a wet extended detention pond described below;

- one (1) wet extended detention stormwater management pond located at the south western part of the site, with approximate bottom dimensions of 13.0 m wide and 58.0 m long and a maximum depth of 2.5 m at 96.5 m masl elevation, having side slopes of 3H:1V and 5H:1V near the outlet structure, providing a permanent storage capacity of 623 m^3 at elevation 95.0 m masl, an active storage capacity of 2,054 m^3 at 96.50 m masl elevation, and total storage capacity of 2,677 m^3, equipped with an outlet structure consisting of a 150 mm diameter reverse slope inlet pipe with a gate valve and a 450 mm diameter perforated pipe riser fitted with 75 mm diameter orifice plate, a 75 mm diameter maintenance discharge pipe with a gate valve, and an emergency overflow structure at elevation 96.80 m masl, discharging through a 450 mm diameter outlet pipe to existing swale along the northern side of the CN Rail line to Tooley Creek and eventually to Lake Ontario;

including all associated controls and appurtenances.

The reasons for the imposition of these terms and conditions are as follows:

GENERAL

Conditions 1.(1), (2), (5), (6), (7), (8), (9), (10), (11), (12), (13), (17), (18) and (19) are included to clarify the legal rights and responsibilities of the Owner.

Conditions Nos.1.(3) and (4) are included to ensure that the Site is operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

Condition No. 1.(14) is included to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

Condition No.1.(15) is included to restrict potential transfer or encumbrance of the Site without the notification to the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate.

Condition No. 1.(16) is included to ensure that the appropriate Ministry staff has ready access to the operations of the Site which are approved under this Certificate. The Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *EPA*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.

SERVICE AREA, APPROVED WASTE TYPES, RATES and STORAGE

Condition No. 2. is included to specify the approved waste receipt rates, the approved waste types and the service area from which waste may be accepted at the Site based on the Owner's application and supporting documentation. Condition No. 2. is also included to specify the maximum amount of waste that is approved to be stored at the Site.

SIGNS and SITE SECURITY

Condition No. 3. is included to ensure that the Site's users, operators and the public are fully aware of important information and restrictions related to the operation of the Site. Condition No. 3. is also included to ensure that the Site is sufficiently secured, supervised and operated by properly trained personnel and to ensure controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site personnel is on duty.

SITE OPERATIONS

Condition No. 4. is included to outline the operational requirements for the Facility to ensure that the said operation does not result in an adverse effect or a hazard to the natural environment or any person.

EQUIPMENT and SITE INSPECTIONS and MAINTENANCE

Condition No. 5. is included to require the Site to be maintained and inspected thoroughly on a regular basis to ensure that the operations at the Site are undertaken in a manner which does not result in an adverse effect or a hazard to the health and safety of the environment or any person.

PERFORMANCE REQUIREMENTS

Condition No. 6 is included to set out the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility.

TESTING, MONITORING and AUDITING

Condition No. 7. is to require the Owner to gather accurate information on the operation of the Facility so that the environmental impact and subsequent compliance with the *EPA*, the *OWRA*, their Regulations and this Certificate can be verified.

NUISANCE IMPACT CONTROL and HOUSEKEEPING

Condition No. 8. is included to ensure that the Site is operated and maintained in an environmentally acceptable manner which does not result in a negative impact on the natural environment or any person. Condition No. 8 is also included to specify odour control measures to minimize a potential for odour emissions from the Site.

STAFF TRAINING

Condition No. 9. is included to ensure that staff are properly trained in the operation of the equipment and instrumentation used at the Site, in the emergency response procedures and on the requirements and restrictions related to the Site operations under this Certificate.

COMPLAINTS RECORDING PROCEDURE

Condition No.10. is included to require the Owner to respond to any environmental complaints resulting from the Facility appropriately and in a timely manner and that appropriate actions are taken to prevent any further incidents that may cause complaints in the future.

CONTINGENCY and EMERGENCY RESPONSE PLAN and EMERGENCY SITUATIONS RESPONSE AND REPORTING

Conditions Nos.11. and 12. are included to ensure that the Owner is prepared and properly equipped to take immediate action in the event of an emergency situation.

SUBMISSIONS to the REGIONAL DIRECTOR or DISTRICT MANAGER

Condition No. 13. is included to set out the requirements for the submissions to the District Manager and the Regional Director regarding the operation of the Facility and the activities required by this Certificate.

RECORDS KEEPING

Condition No.14. is included to ensure that detailed records of Site activities, inspections, monitoring and upsets are recorded and maintained for inspection and information purposes.

REPORTING

Condition No.15. is to ensure that regular review of site, operations and monitoring is carried out and findings documented by a third party for determining whether or not the Site is being operated in compliance with this Certificate of Approval, the EPA and its regulations and whether or not any changes should be considered.

PUBLIC ACCESS to DOCUMENTATION

Condition No.16. is included to ensure that the public has access to information on the operation of the Site in order to participate in the activities of the Advisory Committee in a meaningful and effective way.

ADVISORY COMMITTEE

Condition No.17. is included to require the Owner to establish a forum for the exchange of information and public dialogue on activities carried out at the Site and to ensure that the local residents are properly informed of the activities at the Site and that their concerns can be heard and acted upon , as necessary. Open communication with the public and local authorities is important in helping to maintain high standards for the operation of the Site and protection of the natural environment. Condition 16. is also included to ensure that the requirements of the EA Approval are fulfilled.

CLOSURE of the SITE

Condition No.18. is included to ensure that the final closure of the Site is completed in accordance with Ministry's standards.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, and in accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written Notice served upon me, the Environmental Review Tribunal, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act and Section 101 of the

Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 9 and 39, *Environmental Protection Act*
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted site is approved under Section 9 and Section 27 of the Environmental Protection Act and Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 28th day of June, 2011

Signature
Ian Parrott, P .Eng.
Director
Section 9, *EPA*
Section 39, *EPA*
Section 53, *OWRA*

MW,QN,SH/

c: District Manager, MOE York-Durham
Regional Director, MOE Central Region

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 1
Issue Date: August 12, 2014

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
United States of America
07960

Site Location: Durham York Energy Centre
72 Osbourne Rd Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment, , as follows:

1. The following definition has been added:

"Contingency and Emergency Response Plan" also means the document entitled "Spill Contingency and Emergency Response Plan";

2. The following Conditions are amended to read as follows:

2.(5)(b)(iii) The Owner may use equipment used to handle the hazardous wastes to handle other wastes provided that prior to such use the equipment has been thoroughly cleaned first.

4.(5)(e) A maximum of 630 tonnes of the Residual Waste, limited to the bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation. The storage duration is as follows:

(i) The storage duration is limited to a maximum of seven (7) days.

(ii) Should longer storage duration be required to accommodate the duration of the required compliance testing, a minimum of forty eight (48) hours before the storage extension is commenced, the Owner shall notify the District Manager of the required extension. The notification shall include the duration of the extension and the reasons.

3. The following Conditions are added:

7.(7) (e) The Owner shall carry out the required bottom and fly ash compliance testing in accordance with the document entitled "Ash Sampling and Testing Protocol", listed in the attached Schedule.

11.8 Containment evaluations performed under the Spill Contingency and Emergency Response Plan shall be conducted by the Owner in accordance to procedures agreed by the District Manager pursuant to Conditions 8.(7)(i),(ii) and (iii).

4. The following documents have been added to Schedule "A":

4. October 31, 2013 letter from Mirka Januszkiewicz, the Regional Municipality of Durham to Ian Parrott, Ministry of the Environment and Climate Change, requesting approval of the Ash Sampling and Testing Protocol and the document entitled "Durham York Energy Centre, Ash Sampling and Testing Protocol", prepared by by Golder Associates and dated June 2014.

5. Document entitled "Durham York Energy Centre, Spill Contingency & Emergency Response Plan" prepared by Covanta Durham York Renewable Energy Limited Partnership and dated January 13, 2014, excluding section entitled "Containment Evaluation".

6. Document entitled "Durham York Energy Centre, Protocol for the Measurement of Combustion Temperature and the Development of Time and Temperature Correlations", prepared by Covanta Durham York Renewable Energy Limited Partnership and dated June 2014.

7. Document entitled "Durham York Energy Centre, Noise Monitoring and Reporting Plan", prepared by Golder Associates and dated September 2011.

The reasons for this amendment to the Approval are as follows:

to approve the "Ash Sampling and Testing Protocol" as required Condition 7.(7)(a), the "Durham York Energy Centre, Spill Contingency & Emergency Response Plan", as required Condition 11.(3), "Durham York Energy Centre, Noise Monitoring and Reporting Plan" as required Condition 7.(5)(a) and "Durham York Energy Centre, Protocol for the Measurement of Combustion Temperature and the Development of Time and Temperature Correlations" as proposed by the applicant.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served

upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal 's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of August, 2014

Ian Parrott, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

MW/
c: District Manager, MOE York-Durham
n/a, The Regional Municipality of Durham

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 2
Issue Date: October 24, 2014

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and
The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership
445 South St
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Drive
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment , as follows:

1. The address of the Site has been changed to read as follows:

Durham York Energy Centre
1835 Energy Drive
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

2. The following definitions have been added:

" **Operator** " means any person other than the Regions' employees, authorized by the Regions as having the charge, management or control of any aspect of the Site and includes TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership, the partnership under the laws of Nova Scotia more particularly described in the October 6, 2014 letter from Joanna Rosengarten to the Ministry of Environment and Climate Change, and includes its successors and assignees, their successors and assignees;

" **Regions** " means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and it includes The Regional Municipality of Durham and The Regional Municipality of York, their successors and assignees;

2. The following definition has been amended to read as follows:

" **Site** " means the property referred to as Durham York Energy Centre where the Owner has located and operates the Facility and the Works and located at 1835 Energy Drive in the Municipality of Clarington, Regional Municipality of Durham;

" **Owner** " within the context of this Approval, means the Regions and the Operator;

3. The following Conditions have been amended to read as follows:

"General: Change of Ownership" Conditions 1.(14) and 1.(15):

(14) The Regions shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any changes:

(a) the ownership of the Site;
(b) the operator of the Site;
(c) the address of the Regions;
(d) the partners, where the Regions are or at any time become a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R.S.O. 1990, c. B.17, as amended, shall be included in the notification;
(e) the name of the corporation where the Regions are or at any time become a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C.39, as amended, shall be included in the notification.

(15) No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance. In the event of any change in ownership of the Site, other than change to a successor municipality, the Regions shall notify the successor of and provide the successor with a copy of this Approval, and the Regions shall provide a copy of the notification to the District Manager and the Director.

"Service Area, Approved Waste Types, Rates And Storage: Storage Restrictions" Condition 2.(5)(e):

2.(5)(e) (i) A maximum of 630 tonnes of the Residual Waste, limited to the bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation.

(ii) The storage duration of bottom ash in the bunkers is limited to a maximum of seven (7) days.

(iii) Should additional storage location(s) and a longer storage duration be required during testing, a minimum of forty eight (48) hours before the storage parameters are changed from those approved in Condition 2.(5)(e)(i) and (ii), the Owner shall notify the District Manager, in writing, of the proposed changes and provide the reasons for the changes.

"Site Operations: Residual Waste Handling and Disposal" Condition 4.(5)(b)(iii):

4.(5)(b)(iii) The Owner may use the equipment that comes in contact with the hazardous wastes to handle other wastes provided that prior to such use, the equipment has been cleaned, as confirmed by visual inspections, to ensure the removal of any hazardous waste residues and to prevent cross contamination.

"Closure of the Site" Conditions 18.(1) and 18.(2):

(1) A minimum of nine (9) months prior to closure of the Site, the Regions shall submit, for approval by the Director, a written Closure Plan for the Site. This Plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the Site and a schedule for completion of that work.

(2) Within ten (10) days after closure of the Site, the Regions shall notify the Director and the District Manager, in writing, that the Site is closed and that the approved Closure Plan has been implemented.

4. "Covanta Durham York Renewable Energy Limited Partnership" is replaced with "TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership, the partnership under the laws of Nova Scotia more particularly described in the October 6, 2014 letter from Joanna Rosengarten to the Ministry of Environment and Climate Change and includes its successors and assignees", in the Environmental Compliance Approval dated June 28, 2011 and in the Notice of Amendment dated August 12, 2014.

5. The following documents are added to Schedule "A":

8. Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Matthew R. Mulcahy, Covanta Durham York Renewable Energy Limited Partnership, Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Cliff Curtis, The Regional Municipality of Durham and Application for Environmental Compliance Approval Application dated May 23, 2014, signed by Laura McDowell, The Regional Municipality of York, including the following attached supporting documentation:

(a) revised Section 8.0 "Ash Handling and Associated System" and revised Section 10.0 "Potable Process and Wastewater" dated May 2014, of the document entitled "Design and Operations Report", dated March 2011, prepared by Golder Associates Ltd.

(b) Drawing No. M-2530, entitled "Piping & Instrumentation Diagram Bottom Ash Lime Slurry System"

(c) Drawing No. 70258-1-ME-GA-SK-001, entitled "Covanta Durham York Hydrated Lime System for Boiler Bottom Ash"

9. E-mail dated September 10, 2014 (2:26 p.m.) from Leon Brasowski, Covanta Durham York Renewable Energy Limited Partnership, to Margaret Wojcik, Ontario Ministry of the Environment and Climate Change, providing additional supporting documentation on the proposal, including an attachment entitled "M-1500^0360 Highlighted for MOE.pdf".

10. E-mail dated October 13, 2014 (3:23 p.m.) from Leon Brasowski, Covanta Durham York Renewable Energy Limited Partnership, to Ricki Allum, Ontario Ministry of the Environment and Climate Change, providing additional supporting documentation on the legal name of the applicant,

including an attachment entitled "Partnership Legal Clarification.pdf".

The reasons for this amendment to the Approval are as follows:

to approve the proposed Bottom Ash Lime Conditioning System, to correct the typographical errors in the Notice of Amendment dated August 12, 2014, to clarify the intent of the Residual Waste equipment cleaning condition and to allow different bottom ash storage conditions during testing.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal 's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of October, 2014

Tesfaye Gebrezghi, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

MW/
c: District Manager, MOE York-Durham
Leon Brasowski, Covanta Energy Corporation

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 3
Issue Date: December 23, 2015

The Regional Municipality of Durham
605 Rossland Road Level 5
Whitby, Ontario
L1N 6A3

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment , as follows:

The following Conditions are revoked:

7. TESTING, MONITORING and AUDITING

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233* and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address the information provided in the following documents:

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated May 8, 2015 and signed by Kathryn Katsiroumpas, P.Eng.; and

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated November 23, 2015 and signed by Kathryn Katsiroumpas, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and

M5G 1E5

Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 23rd day of December, 2015

Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

HM/
c: District Manager, MOECC York-Durham
Kathryn Katsiroumpas, Valcoustics Canada Ltd.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 4
Issue Date: February 24, 2016

The Regional Municipality of Durham
605 Rossland Road East, Level 5
Whitby, Ontario
L1N 6A3

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

TransRiver Canada Incorporated operating as Covanta Durham York Renewable Energy Limited Partnership
445 South Street
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for a Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment, , as follows:

The following Conditions are revoked:

7. **TESTING , MONITORING** and **AUDITING**

Noise Monitoring - Acoustic Audit

(5) The Owner:

(a) shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Acoustic Audit measurements shall be carried out in accordance with the procedures in *Publication NPC-103* and in accordance to the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director;

(b) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of *Publication NPC-233*

and the Noise Monitoring and Reporting Plan prepared in accordance with the requirements set out in the EA Approval and as approved by the Director, to the District Manager and the Director, not later than three (3) months after the commencement of operation of the Facility.

(6) The Director:

(a) may not accept the results of the Acoustic Audit if the requirements of *Publication NPC-233* or the approved Noise Monitoring and Reporting Plan were not followed;

(b) may require the Owner to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

All other Terms and Conditions remain the same.

The reason for this amendment to the Approval is to address the information provided in the following documents:

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated May 8, 2015 and signed by Kathryn Katsiroumpas, P.Eng.; and

Acoustic Audit Report prepared by Valcoustics Canada Ltd., dated November 23, 2015 and signed by Kathryn Katsiroumpas, P.Eng.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the
purposes of Part II.1 of the
Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of February, 2016

Ian Greason, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

HM/
c: District Manager, MOECC York-Durham
Kathryn Katsiroumpas, Valcoustics Canada Ltd.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 7306-8FDKNX
Notice No. 5
Issue Date: March 14, 2016

The Regional Municipality of Durham
605 Rossland Rd E 5th Floor
Whitby, Ontario
L1N 6A3

and

The Regional Municipality of York
17250 Yonge Street
Newmarket, Ontario
L3Y 6Z1

and

TransRiver Canada Incorporated, as general partner for and on behalf of Covanta Durham York Renewable Energy Limited Partnership
445 South St
Morristown, New Jersey
USA 07960

Site Location: Durham York Energy Centre
1835 Energy Dr Lot 27, Concession Broken Front, Part 1
Clarington Municipality, Regional Municipality of Durham
L1E 2R2

You are hereby notified that I have amended Approval No. 7306-8FDKNX issued on June 28, 2011 for Waste Disposal Site (Incineration), complete with an Energy from Waste Facility and associated equipment , as follows:

I. The following conditions have been amended to read as follows:

2 . SERVICE AREA, APPROVED WASTE TYPES, RATES and STORAGE

(5) Storage Restrictions:

Solids:

(c) A maximum of approximately 77 tonnes or 106 cubic metres of the Residual Waste, limited to the recovered ferrous metals, shall be stored in one (1) dedicated bunker, located within the confines of the Residue Building, described in the Supporting Documentation. (d) A maximum of approximately 120 tonnes or 100 cubic metres of the Residual Waste, limited to the recovered non-ferrous metals,

shall be stored in one (1) dedicated bunker, located within the confines of the Residue Building, described in the Supporting Documentation.

(e) A maximum of 630 tonnes of the Residual Waste, limited to bottom ash shall be stored in two (2) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation.

(f) A maximum of 700 tonnes of the Residual Waste, limited to the fly ash shall be stored in seven (7) dedicated bunkers, located within the confines of the Residue Building, described in the Supporting Documentation.

(j) A maximum of 65 cubic metres of cement for fly ash conditioning shall be stored in one (1) outdoor silo, located adjacent to the Residue Building.

(k) A maximum of 105 cubic metres of pozzolan for fly ash conditioning shall be stored in one (1) outdoor silo, located adjacent to the Residue Building.

Liquids: (l) (i) A maximum of 57 cubic metres of aqueous ammonia for the SNCR System shall be stored in one (1) outdoor tank, located adjacent to the Residue Building.

(8) (a) Waste received at the Site shall be processed within six (6) days from its receipt at the Site.

(b) Emergency storage of Waste requirements:

(i) On an emergency basis only, the storage duration of Waste inside the tipping pit may be extended beyond the limit set out in Condition 2.(8)(a), above, subject to compliance with the following requirements:

(A) prior to the start of the emergency storage of Waste, the Owner shall notify, in writing, the District Manager that the incoming Waste will be stored longer than six (6) days from its receipt;

(B) any additional information that the District Manager may require shall be submitted within a time period acceptable to the District Manager;

(C) the proposed preventative measures for emergency storage of Waste as identified in the Operations and Maintenance Manual shall be implemented upon commencement of the emergency storage of Waste and shall remain in effect for the entire duration of the emergency storage, unless otherwise advised by the District Manager; and

(D) the Owner shall notify, in writing, the District Manager when emergency storage is no longer required.

5. EQUIPMENT and SITE INSPECTIONS and MAINTENANCE

(p) all measures deemed necessary to prevent an occurrence of an adverse effect from the emergency storage of Waste.

II. The following section of Schedule "F" has been amended to read as follows:

PARAMETER:
Total Hydrocarbons

INSTALLATION:
The Total Hydrocarbons Monitor shall be installed at an accessible location where the measurements are representative of the concentrations of Organic Matter (as methane) in the Undiluted Gases leaving the combustion zone via the economizer outlet of each Boiler or at any other location that has been determined in consultation with the Ministry to be suitable/equivalent for the determination of Total Hydrocarbons leaving the combustion zone of each Boiler and has been approved by the Director. The Total Hydrocarbons Monitor shall meet the following installation specifications:

PARAMETERS SPECIFICATION

1. Detector Type: Flame Ionization
2. Oven Temperature: 160 o C minimum
3. Flame Temperature: 1800 o C minimum at the corona of the hydrogen flame
4. Range (parts per million, ppm): 0 to ³ 200 ppm
5. Calibration Gas: propane in air or nitrogen
6. Calibration Gas Ports: close to the sample point

PERFORMANCE:
The Continuous Total Hydrocarbons Monitor shall meet the following minimum performance specifications for the following parameters.

PARAMETERS SPECIFICATION

1. Span Value (nearest ppm equivalent): 2 times the average normal concentration of the source
2. Relative Accuracy: £ 10 percent of the mean value of the reference method test data or ± 5 ppm whichever is greater
3. System Bias: £ 4 percent of the mean value of the reference method test data
4. Noise: £ 1 percent of span value on most sensitive range
5. Repeatability: £ 1 percent of span value
6. Linearity (response with propane in air): £ 3 percent of span value over all ranges
7. Calibration Error: £ 2 percent of actual concentration
8. Procedure for Zero and Span Calibration Check: all system components checked on all ranges
9. Zero Calibration Drift (24-hours): £ 2.5 percent of span value on all ranges
10. Span Calibration Drift (24-hours): £ 2.5 percent of span value
11. Response Time (90 percent response £ 60 seconds to a step change):
12. Operational Test Period: ³ 168 hours without corrective

maintenance

CALIBRATION:
Daily calibration drift checks on the monitor shall be performed and recorded in accordance with the requirements of Report EPS 1/PG/7.

DATA RECORDER:
The data recorder must be capable of registering continuously the measurement of the monitor with an accuracy of 0.5 percent of a full scale reading or better and with a time resolution of 2 minutes or better. Measurements of concentrations of organic matter (as methane) shall be kept as 10 minute average values for record keeping and reporting purposes.

RELIABILITY:
The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 90 percent of the time for each calendar quarter during the first full year of operation, and 95 percent thereafter .

III. The following Item #4 in Schedule "A" has been amended to read as follows:

4. Letter dated October 31, 2013 from Mirka Januszkiewicz, The Regional Municipality of Durham to Ian Parrott, Ministry of the Environment and Climate Change, requesting approval of the Ash Sampling and Testing Protocol and the document entitled "Durham York Energy Centre, Ash Sampling and Testing Protocol", excluding a reference to the Loss-on-Ignition test method on page 6, prepared by Golder Associates and dated June 2014.

IV. The following document has been added to Schedule "A":

5. Letter dated February 29, 2016 from Leon Brasowski, TransRiver Canada Incorporated, to Dale Gable, Ministry of the Environment and Climate Change, requesting change to the total hydrocarbon monitor location as reviewed and accepted by the Ministry`s Standards Development Branch.

The reasons for this amendment to the Approval are as follows:

1. to remove the storage duration limits on storage of recovered ferrous and non-ferrous metals since such storage does not pose an environmental risk;

2. to increase the amounts of cement, pozzolan and aqueous ammonia approved for storage at the Site since the currently approved amounts result in partial filling of the tanks, necessitating more frequent deliveries resulting in increased truck traffic and a chance of interrupting fly ash and flue gas treatment;

3. to revise the protocol for an emergency storage of the incoming Waste so that the Owner is able to deal more effectively with emergency situations occurring at the Site while providing more flexibility to the Districting Manager to oversee management of such situations;

4. to remove a reference to an incorrect bottom ash testing method erroneously included within the text of the DYEC Ash Sampling and Testing Protocol included as Item #4 in Schedule "A" in order to ensure that only the approved testing method for compliance testing is referenced in the supporting documentation.

5. to approve the revised location of the Total Hydrocarbons Monitor following the Ministry's acceptance of the results of the test program in which two (2) Total Hydrocarbons Monitor monitors were operated in the existing and the proposed locations simultaneously.

This Notice shall constitute part of the approval issued under Approval No. 7306-8FDKNX dated June 28, 2011, as amended.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the
purposes of Part II.1 of the
Environmental Protection Act
Ministry of the Environment and
Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of March, 2016

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

MW/
c: District Manager, MOECC York-Durham

n/a, TransRiver Canada Incorporated operating as Covanta Durham York Renewable Energy Limited Partnership

APPENDIX 6

Particulate and Metals Field Data Sheets
(30 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	1 M29 Particulate/Metals
Test Date	Oct 10/17
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	64
Meter Box No.:	Team 2
Impinger Box No.:	13

Pitot Factor	.847	
DGMCF	0.996	
Barometric Pressure	29.32	"Hg
Static Pressure	-10.0	"H2O
Nozzle Size	.2505	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	12	inches

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter	5.2	mg
Probe	1.2	mg

Moisture Gain

CWTR	510.7	g
WCBDA	22.2	g

Combustion Gas Concentration

Oxygen	8.74	%
Carbon Dioxide	10.61	%
Carbon Monoxide	9.3	ppm

Measuring Device	MII Numbers
Probe / Pitot	574
Trendicator	
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env Can
Calipers	

Nozzle Measurements	
1	.2495
2	.2505
3	.2510
4	.2510
Average:	.2505

Site Diagram

Notes:

Field Data Sheet

Date:	Oct 10/17	Plant:	Covanta DYEC	Test No.:	T1 M29 Particulate/Metals	Page 2 of 5
		Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	391.73	.65	.66	288	256	262	55	247	75	73	1.4	3
	2.5	393.44	.68	.68	285	256	264	51	248	76	74	1.5	3
	5	395.08	.66	.67	283	255	264	50	247	76	73	1.5	3
2	7.5	396.73	.77	.72	284	255	263	49	246	76	74	1.8	3.5
	10	398.52	.73	.70	281	254	263	49	249	76	74	1.7	3.5
	12.5	400.19	.72	.70	288	256	264	50	250	77	74	1.8	3.5
3	15	402.00	.72	.70	288	255	264	48	250	77	74	1.8	3.5
	17.5	403.79	.71	.69	288	255	263	47	249	77	74	1.75	3.5
	20	405.59	.70	.69	288	255	263	47	248	77	74	1.6	3.5
4	22.5	407.35	.71	.69	288	255	263	47	249	77	74	1.6	3.5
	25	409.09	.71	.69	288	255	263	47	249	77	74	1.6	3.5
	27.5	410.82	.71	.69	288	254	263	48	250	77	74	1.6	3.5
5	30	412.53	.71	.69	288	255	263	49	250	78	75	1.6	3.5
	32.5	414.26	.71	.69	288	255	263	49	250	78	75	1.6	3.5
	35	416.01	.69	.68	288	255	264	49	250	78	75	1.6	3.5
6	37.5	417.73	.67	.67	287	255	263	49	250	78	75	~~1.6~~ 1.55	3.5
	40	419.42	.67	.67	287	255	263	49	247	78	75	1.55	3.5
	42.5	421.13	.67	.67	287	255	263	48	248	78	75	1.55	3.5
7	45	422.82	.66	.67	288	255	263	48	249	78	75	1.5	3.5
	47.5	424.52	.66	.67	288	255	263	48	249	78	75	1.5	3.5
	50	426.23	.66	.67	287	255	263	48	249	79	76	1.5	3.5

Traverse:	1					
Start Time:	09:38	Initial Leak Check:	.002	cfm@	15	"Hg
Finish Time:	:	Final Leak Check:		cfm@		"Hg

resumed @ 10:07
paused @ 09:48

Project No.: 21800
Operator: AS

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: T1 M29 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	427.90	.70	.69	288	255	263	48	249	78	75	~~1.6~~ 1.5	3.5
	55	429.65	.70	.69	~~288~~ 287	255	263	47	249	79	76	1.6	3.5
	57.5	431.40	.70	.69	287	255	263	47	249	79	76	1.6	3.5
9	60	433.15	.75 ~~.71~~	.71	287	255	263	48	250	79	76	1.7	4
	62.5	434.91	.75	.71	~~288~~ 287	255	263	48	251	79	76	1.7	4
	65	436.77	.74	.71	287	255	263	49	251	80	76	1.7	4
10	67.5	438.59	.83	.75	286	255	263	49	250	80	76	2.0	4
	70	440.49	.82	.75	287	255	264	49	252	80	77	2.0	4
	72.5	442.79	.83	.75	287	256	264	49	252	80	76	2.0	4
11	75	442.29	.85	.76	287	255	264	50	252	80	77	2.05	4
	77.5	446.25	.86	.77	287	255	263	49	253	80	76	2.05	4
	80	448.19	.87	.77	287	256	264	51	253	81	77	2.05	4
12	82.5	450.14	.86	~~.77~~ .76	288	255	263	52	253	80	77	2.05	4
	85	452.10	.86	.77	287	255	264	52	253	81	77	2.05	4
	87.5	454.04	.86	.77	287	255	263	52	252	80	77	2.05	4
	90	456.06											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 11:27	Final Leak Check: 0.01	cfm@ 15"	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: M29 T2 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	456.54	.83	.76	280	255	263	62	155	80	77	2.0	4
	2.5	458.40 ~~448~~	.77	.73	280	255	264	49	233	80	77	1.8	4
	5	460.29	.90	.78	285	255	264	48	247	80	77	2.1	4
2	7.5	462.23	.86	.77	286	255	263	47	248	80	77	2.0	4
	10	464.22	.84	.76	288	255	263	47	243	80	77	2.0	4
	12.5	466.14	.83	.75	288	255	263	48	246	80	77	2.0	4
3	15	468.05	.81	.74	284	255	263	47	227	80	77	1.9	4
	17.5	469.99	.82	.75	284	255	262	47	231	80	77	1.9	4
	20	471.86	.82	.75	284	255	263	47	243	80	77	1.9	4
4	22.5	473.75	.80	.74	286	255	263	45	246	80	77	1.9	4
	25	475.64	.75	.71	288	255	263	45	248	80	77	1.8	4
	27.5	477.47	.76	.72	289	254	263	45	246	80	77	1.8	4
5	30	479.27	.74	.71	288	254	263	46	251	80	77	1.75	4
	32.5	481.09	.74	.71	289	255	262	46	251	80	77	1.75	4
	35	482.89	.75	.71	289	255	263	46	251	81	77	1.75	4
6	37.5	484.67	.73	.70	289	255	263	47	251	80	77	1.7	4
	40	486.59	.72	.70	289	255	263	46	252	81	78	1.7	4
	42.5	488.26	.71	.70	288	255	262	47	251	80	78	1.7	4
7	45	490.04	.63	.66	288	255	263	47	251	81	78	1.5	4
	47.5	491.73 ~~492~~	.62	.65	288	255	259	47	248	81	77	1.5	4
	50	493.38	.62	.65	288	255	259	47	245	81	78	1.5	4

Traverse: 2				
Start Time: 11:38	Initial Leak Check: .004	cfm@ 15	"Hg	
Finish Time:	Final Leak Check:	cfm@	"Hg	

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: 12 m29 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	495.02	.67	.68	289	255	260	48	243	81	78	1.6	4
	55	496.74	.67	.68	289	255	260	47	243	81	78	1.6	4
	57.5	498.44	.67	.68	289	255	260	48	240	81	77	1.6	4
9	60	500.15	.69	.69	288	255	260	48	239	81	78	1.6	4
	62.5	501.88	.69	.69	288	255	260	48	238	81	78	1.6	4
	65	503.61	.73	.71	288	255	260	49	238	81	78	1.7	4
10	67.5	505.38	.74	.71	287	256	260	50	237	81	78	1.7	4
	70	507.16	.75	.72	287	255	260	49	236	81	77	1.7	4
	72.5	508.96	.75	.72	287	256	260	49	237	82	78	1.7	4
11	75	510.75	.75	.72	287	256	260	50	236	81	78	1.7	4
	77.5	512.52	.76	.72	287	256	261	51	236	82	78	1.7	4
	80	514.30	.75	.72	287	256	260	51	236	82	78	1.7	4
12	82.5	516.10	.73	.71	287	256	260	52	236	82	78	1.7	4
	85	517.98	.73	.71	287	256	260	53	236	82	78	1.7	4
	87.5	519.65	.73	.71	287	256	261	53	236	82	78	1.7	4
	90	521.45											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 13:08	Final Leak Check: 0.006	cfm@ 15	"Hg

P_g -10.0

Project No.: 21800

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2 m29	Particulate/Metals
Test Date	oct 10/17
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	6A
Meter Box No.:	9 Team 2
Impinger Box No.:	9

Pitot Factor	.847	
DGMCF	.906	
Barometric Pressure	29.82	"Hg
Static Pressure	-10.0	"H2O
Nozzle Size	.2505	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	12	inches

Particulate Gain

Filter	8.3	mg
Probe	1.9	mg

Moisture Gain

CWTR	507.6	~~516.7~~	g
WCBDA	26.5	~~22.2~~	g

Combustion Gas Concentration

Oxygen	8.67	%
Carbon Dioxide	10.58	%
Carbon Monoxide	9.~~72~~	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

see T

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Nozzle Measurements	
1	
2	
3	
4	
Average:	

see T1

Notes:

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: T2 M29 Particulate/Metals	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	21.91	.71	.70	288	245	261	63	76	81	79	1.6	4
	2.5	24.00 ~~23.~~	.78	.73	287	258	263	67	212	81	79	1.8	4
	5	25.86	.77	.73	287	257	265	64	220	81	79	1.8	4
2	7.5	27.72	.77	.73	287	256	264	62	213	81	79	1.8	4
	10	29.56	.77	.73	287	256	263	60	223	80	78	1.8	4
	12.5	31.39	.77	.73	287	256	263	59	225	81	79	1.8	4
3	15	33.25	.71	.70	286	255	263	58	227	80	78	1.7	4
	17.5	35.03	.70	.69	287	256	264	57	229	81	79	1.7	4
	20	36.83	.70	.69	287	256	264	57	229	81	79	1.7	4
4	22.5	38.62	.70	.69	288	256	264	56	230	81	79	1.7	4
	25	40.39	.70	.69	288	256	264	55	231	81	79	1.7	4
	27.5	42.17	.71	.70	288	256	265	56	232	82	79	1.7	4
5	30	43.96	.72	.70	288	256	264	56	232	81	79	1.7	4
	32.5	45.75	.70	.69	288	256	264	56	233	82	79	1.7	4
	35	47.52	.70	.69	288	256	264	55	233	82	79	1.7	4
6	37.5	49.29	.69	.68	288	256	264	55	233	83	79	1.7	4
	40	51.07	.70	.69	288	256	264	55	233	82	79	1.7	4
	42.5	52.84	.69	.69	289	256	264	56	234	83	79	1.7	4
7	45	54.60	.70	.69	289	256	264	55	231	83	80	1.7	4
	47.5	56.36	.64	~~.69~~ .66	289	256	264	54	233	83	80	1.6	4
	50	58.11	.62	.65 ~~.62~~	290	257	265	53	233	83	80	1.5	4

Traverse: #2		
Start Time: 14:00	Initial Leak Check: cfm@ "Hg	
Finish Time:	Final Leak Check: cfm@ "Hg	

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: M29 T2 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	59.76	.64	.66	290	257	264	53	233	83	80	1.5	4
	55	61.44	.66	.67	289	257	264	52	233	84	80	1.5	4
	57.5	63.13	.65	.67	290	257	265	52	234	84	80	1.5	4
9	60	64.81	.68	.68	289	256	264	51	234	83	80	1.6	4
	62.5	66.54	.67	.68	289	257	265	51	234	84	80	1.6	4
	65	68.28	.68	.68	289	257	265	51	235	85	81	1.6	4
10	67.5	70.03	.73	.71	290	257	265	51	236	85	81	1.7	4
	70	71.83	.78	.73	290	257	265	51	236	85	81	1.9	4
	72.5	73.68	.78	.73	289	257	265	50	236	85	81	1.9	4
11	75	75.55	.78	.73	289	258	265	50	237	85	81	1.9	4
	77.5	77.42	.79	.74	289	258	266	250	237	85	81	1.9	4
	80	79.29	.80	.74	288	258	265	50	237	85	81	1.9	4
12	82.5	81.16	.78	.73	289	258	266	51	237	86	81	1.8	4
	85	83.02	.78	.74	289	258	256	51	237	86	82	1.8	4
	87.5	84.90	.79	.74	289	258	266	51	238	86	81	1.8	4
	90	86.76											

Traverse: X 2				
Start Time: 15:34	Initial Leak Check:		cfm@	"Hg
Finish Time:	Final Leak Check:	0.003	cfm@ 14	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 10/17	Plant:	Covanta DYEC	Test No.:	M29 T2 Particulate/Metals	Page 4 of 5
		Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	87.22	.57	.63	287	256	264	65	148	85	82	1.3	4
	2.5	88.80	.57	.63	287	255	265	52	220	85	82	1.3	4
	5	90.38	.71	.70	287	257	266	49	225	85	82	1.7	4
2	7.5	92.14	.68	.69	287	256	266	48	229	85	82	1.6	4
	10	93.91	.65	.67	287	256	265	48	229	85	82	1.5	4
	12.5	95.66	.61	.65	288	256	266	48	229	85	82	1.3	4
3	15	97.33	.60	.65	286	256	265	49	229	85	82	1.4	4
	17.5	98.97	.60	.65	286	256	266	48	229	85	82	1.4	4
	20	100.63	.60	.65	287	256	266	49	227	85	82	1.4	4
4	22.5	102.27	.55	.62	288	257	266	50	232	86	83	~~1.4~~ 1.3	4
	25	103.85	.52	.60	288	257	266	50	230	86	83	1.2	3.5
	27.5	105.37	.51	.60	288	257	265	50	228	86	83	1.2	3.5
5	30	106.86	.51	.60	288	256	265	50	228	86	83	1.2	3.5
	32.5	108.36	.50	.59	289	257	266	50	229	86	83	1.2	3.5
	35	109.83	.50	.59	289	256	265	50	205	85	82	1.2	3.5
6	37.5	111.37	.61	.65	287	258	265	59	201	85	83	1.5	4
	40	112.99	.60	.65	287	257	265	53	226	85	82	1.4	4
	42.5	114.64	.59	.64	288	257	266	53	236	85	83	1.4	4
7	45	116.29	.57	.63	288	256	266	53	235	85	83	1.3	4
	47.5	117.92	.65	.67	288	257	266	54	230	85	83	1.6	4
	50	119.57	.68	.69	287	256	266	53	207	85	83	1.7	4

Traverse:	2 /				
Start Time:	15:42	Initial Leak Check:	0.001	cfm@ 15	"Hg
Finish Time:		Final Leak Check:		cfm@ —	"Hg

paused @ 16:17 paw
resumed @ ~~16:23~~ 16:37

Project No.: 21800
Operator :

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: 2 m29 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	121.33	.73	.71	288	256	266	49	189	85	83	1.8	4
	55	123.13	.73	.71	288	256	266	46	197	85	83	1.8	4
	57.5	124.94	.78	74	288	257	266	46	192	85	83	1.9	4
9	60	126.80	.81	.75	288	255	265	46	201	84	83	1.9	4
	62.5	128.72	.82	75	288	257	266	47	202	85	83	1.9	4
	65	130.63	.80	.75	288	257	266	49	207	85	83	1.9	4
10	67.5	132.52	.84	.76	288	257	266	50	203	85	83	2.0	4
	70	134.48	.85	.77	288	257	266	51	190	85	83	2.0	4
	72.5	136.41	.84	.76	288	257	266	51	201	85	83	2.0	4.5
11	75	138.36	.88	.78	288	257	266	53	194	85	83	2.1	5
	77.5	140.37	.87	.78	288	250	266	55	196	85	83	2.1	5
	80	142.37	.88	.78	288	236	265	56	189	85	83	2.1	5
12	82.5	144.37	.74	.72	288	257	266	58	186	85	83	1.8	4.5
	85	146.26	.76	.73	287	255	266	59	183	85	83	1.8	4.5
	87.5	148.14	.74	.72	287	235	265	61	181	85	83	1.8	4.5
	90	149.98											

Traverse:	1				
Start Time:	1	Initial Leak Check:		cfm@	"Hg
Finish Time:	17:30	Final Leak Check:	.002	cfm@ 15	"Hg

Project No.: 21800

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3 M29	Particulate/Metals
Test Date	Oct. 12, 2017
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	6A
Meter Box No.:	~~#3~~ TEAM #4
Impinger Box No.:	#3

Pitot Factor	0.847	
DGMCF	1.006	
Barometric Pressure	30.04	"Hg
Static Pressure	-10.08	"H2O
Nozzle Size	0.2505	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	0.3	mg
Probe	1.7	mg

Moisture Gain

CWTR	449.9	g
WCBDA	20.9	g

Combustion Gas Concentration

Oxygen	8.34	%
Carbon Dioxide	11.14	%
Carbon Monoxide	6.8	ppm

Measuring Device	MII Numbers
Probe / Pitot	S7A
Trendicator	
Control Box	COE 20090
Incline Manometer	COE 20090
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	0.2495
2	0.2505
3	0.2510
4	0.2510
Average:	0.2505

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	52.11	.81	.71	285	248	246	63	73	63	67	1.8	5
	2.5	54.07	.81	.72	286	249	251	52	206	75	63	1.8	5
	5	55.88	.81	.72	286	241	250	51	207	80	65	1.8	5
2	7.5	57.87	.82	.72	285	248	247	51	207	75	64	1.7	5
	10	59.73	.85	.73	285	248	244	51	222	65	65	1.8	5
	12.5	61.57	.83	.73	286	247	244	52	222	64	71	1.8	5
3	15	63.39	.84	.72	286	247	250	53	227	64	64	1.7	5
	17.5	65.21	.82	.72	286	248	250	53	230	64	65	1.7	5
	20	67.0	.82	.72	286	248	248	54	228	65	64	1.7	5
4	22.5	68.82	.76	.69	286	248	244	54	225	64	64	1.6	5
	25	70.58	.80	.71	286	247	245	54	225	64	64	1.7	5
	27.5	72.36	.78	.70	286	248	249	54	229	65	64	1.65	5
5	30	74.14	.74	.68	287	248	249	54	230	65	66	1.6	5
	32.5	75.85	.76	.69	287	248	246	55	227	71	66	1.6	5
	35	77.66	.75	.69	287	248	244	55	225	65	66	1.6	5
6	37.5	79.36	.66	.65	287	249	248	55	226	66	70	1.5	5
	40	81.05	.72	.67	288	251	250	55	230	69	66	1.6	5
	42.5	82.76	.73	.68	288	248	248	55	230	69	66	1.6	5
7	45	84.55	.76	.69	288	248	246	55	226	70	67	1.6	5
	47.5	86.32	.70	.67	289	248	244	55	224	69	66	1.5	5
	50	88.02	.68	.66	288	247	248	55	226	70	65	1.4	5

Traverse:							
Start Time: 9:20	Initial Leak Check:	.002	cfm@	16	"Hg		
Finish Time:	Final Leak Check:		cfm@		"Hg		

Project No.: 21800

Operator :

Field Data Sheet

Date: oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	89.65	.70	.67	288	248	250	55	228	70	68	1.5	5
	55	91.33	.71	.67	288	248	248	55	227	70	67	1.5	5
	57.5	93.03	.70	.66	287	248	245	55	224	71	66	1.5	5
9	60	94.73	.76	.69	287	247	245	55	228	70	66	1.6	5
	62.5	96.48	.73	.68	287	248	250	55	227	71	67	1.6	5
	65	98.22	.71	.67	287	248	249	54	228	71	67	1.6	5
10	67.5	99.98	.71	.67	286	248	247	54	226	71	67	1.6	5
	70	101.71	.69	.66	286	247	245	54	223	71	67	1.55	5
	72.5	103.41	.69	.66	285	247	249	53	225	71	68	1.5	5
11	75	105.11	.60	.62	285	248	251	53	229	71	67	1.2	5
	77.5	106.65	.60	.62	285	247	249	53	226	71	68	1.2	5
	80	108.19	.62	.63	285	247	246	53	223	72	69	1.3	5
12	82.5	109.79	.42	.52	285	246	245	53	221	71	69	.75	5
	85	111.08	.42	.52	286	246	258	53	223	72	69	.75	5
	87.5	112.32	.42	.52	286	247	250	53	222	71	68	.77	4.5
	90	113.58											

Traverse:			
Start Time: ~	Initial Leak Check: ~	cfm@ ~	"Hg
Finish Time: 10:50	Final Leak Check: .002	cfm@ 16.0	"Hg

Project No.: 21800

Operator :

Field Data Sheet

Date: Oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	114.11	.79	.71	285	249	248	65	84	67	69	1.7	5.5
	2.5	116.06	.78	.70	284	249	245	56	210	68	67	1.65	5.5
	5	117.83	.81	.72	284	246	247	53	221	72	68	1.75	5.5
2	7.5	119.54	.80	.72	284	247	248	52	223	75	69	1.8	5.5
	10	121.41	.82	.73	284	248	247	52	226	79	68	1.8	5.5
	12.5	123.29	.82	.73	284	247	244	53	225	83	69	1.75	5.5
3	15	125.15	.81	.73	284	247	247	52	225	85	69	1.75	5.5
	17.5	126.99	.78	.72	284	247	250	52	230	88	70	1.7	5.5
	20	128.80	.78	.72	285	248	249	53	231	90	71	1.7	5.5
4	22.5	130.56	.66	.66	285	248	246	53	227	91	72	1.5	6
	25	132.25	.64	.65	285	248	244	53	223	92	71	1.45	6
	27.5	133.94	.66	.67	284	247	249	52	227	93	71	1.5	6
5	30	135.42	.51	.58	287	247	250	52	226	93	71	1.1	5
	32.5	136.89	.55	.61	285	248	248	53	226	91	72	1.15	5
	35	138.39	.54	.60	286	248	245	52	223	91	73	1.1	5
6	37.5	139.89	.51	.58	286	247	246	52	221	91	72	1.0	5
	40	141.35	.49	.57	286	248	251	52	222	92	73	.90	5
	42.5	142.77	.49	.57	286	248	250	52	227	92	73	.95	5
7	45	144.21	.63	.65	286	248	248	52	224	93	72	1.4	5
	47.5	145.85	.61	.64	285	248	245	52	223	93	74	1.3	5
	50	147.47	.61	.64	285	247	247	52	224	93	73	1.3	5

Traverse:					
Start Time: 11:43	Initial Leak Check: .005	cfm@	17	"Hg	
Finish Time:	Final Leak Check:	cfm@		"Hg	

-10.08

Project No.: 21800

Operator :

Field Data Sheet

Date: Oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	149.10	.65	.66	285	248	251	52	228	93	74	1.45	5.5
	55	150.79	.65	.66	285	248	250	52	230	93	73	1.45	5.5
	57.5	152.50	.67	.67	286	248	248	52	228	93	74	1.5	5.5
9	60	154.22	.70	.69	287	247	245	53	224	93	74	1.6	6
	62.5	155.99	.68	.68	285	247	249	53	227	92	74	1.5	6
	65	157.69	.68	.68	285	248	251	54	225	92	74	1.5	6
10	67.5	159.41	.60	.64	285	248	249	52	225	92	74	1.3	5.5
	70	160.99	.61	.64	285	247	245	51	225	93	74	1.3	5.5
	72.5	162.59	.62	.65	285	246	248	50	215	93	74	1.35	5.5
11	75	164.24	.49	.58	285	247	250	49	222	94	75	.96	5
	77.5	165.72	.49	.58	285	247	247	49	215	94	75	.96	5
	80	167.13	.49	.58	285	246	246	48	211	95	75	.98	5
12	82.5	168.58	.48	.57	285	246	251	48	218	95	75	1.0	5
	85	170.05	.48	.57	285	247	249	48	214	95	76	1.0	5
	87.5	171.49	.49	.58	285	247	245	48	212	96	75	1.0	5
	90	172.94											

Traverse:					
Start Time: —	Initial Leak Check:	—	cfm@	—	"Hg
Finish Time: 17:13	Final Leak Check:	.002	cfm@	16	"Hg

Project No.: 21800

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	1 M29 Particulate/Metals
Test Date	Oct 11/17
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	6A
Meter Box No.:	Team 3
Impinger Box No.:	13

Pitot Factor	.847	
DGMCF	.985	
Barometric Pressure	~~29.80~~ 29.97	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2505	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	= 4.2	mg
Probe	= 2.0	mg

Moisture Gain

CWTR	521.7	g
WCBDA	17.1	g

Combustion Gas Concentration

Oxygen	7.83	%
Carbon Dioxide	11.23	%
Carbon Monoxide	9.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	S7A
Trendicator	
Control Box	COE 20093
Incline Manometer	COE 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env Can
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.2495
2	.2505
3	.2510
4	.2510
Average:	.2505

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: T1 M29 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	58.44	.63	.66	278	252	256	66	130	70	71	1.5	3
	2.5	60.01	.67	.68	278	252	258	53	244	714	73	1.7	3
	5	61.70	.66	.68	278	252	258	48	248	71	73	1.7	3
2	7.5	63.41	.66	.67	277	252	257	46	247	71	73	1.7	3
	10	65.13	.67	.68	277	251	255	48	244	71	74	1.7	3
	12.5	66.83	.67	.68	278	251	256	47	246	72	75	1.7	3
3	15	68.52	.58	.63	285	251	256	48	246	71	76	1.5	3
	17.5	70.15	.57	.63	285	252	256	48	~~245~~ 245	72	77	1.4	3
	20	71.74	.58	.63	285	251	256	47	245	72	78	1.4	3
4	22.5	73.32	.64	.66	287	251	256	50	245	72	79	1.6	3
	25	74.95	.63	.66	288	251	256	47	246	72	80	1.6	3
	27.5	76.58	.63	.66	288	251	256	47	245	73	80	1.6	3
5	30	78.22	.65	.67	288	251	255	46	245	73	81	1.6	3
	32.5	79.87	.65	.67	287	251	257	45	246	74	81	1.6	3
	35	81.52	.66	.68	287	251	256	47	245	74	81	1.7	3
6	37.5	83.20	.61	.65	287	251	256	44	245	74	81	1.6	3
	40	84.85	.61	.65	287	251	255	43	245	74	81	1.6	3
	42.5	86.50	.60	.65	287	252	256	43	245	74	82	1.6	3
7	45	88.14	.53	.61	287	258	256	43	252	74	82	1.3	3
	47.5	89.64	.53	.61	287	254	256	43	243	74	85	1.3	3
	50	91.14	.53	.61	287	250	255	44	246	75	83	1.3	3

Traverse: 2			
Start Time: 8:27	Initial Leak Check: .004	cfm@ 25	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: M29 T1 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	92.66	.62	.66	287	250	257	43	244	75	83	1.6	3
	55	94.30	.65	.67	287	250	255	43	246	75	83	1.7	3
	57.5	96.01	.65	.67	287	250	256	42	246	75	83	1.7	3
9	60	97.74	.71	.70	287	250	255	43	247	78	82	1.8	3
	62.5	99.50	.72	.71	287	250	256	43	249	76	82	1.8	3
	65	101.26	.70	.70	287	250	255	43	247	75	81	1.8	3
10	67.5	103.03	.76	.73	288	251	256	43	248	75	81	2.0	3
	70	104.84	.75	.72	287	251	255	43	248	75	82	2.0	3
	72.5	106.68	.73	.71	287	251	255	43	248	75	84	1.9	3
11	75	108.50	.76	.73	287	250	255	44	248	76	85	2.0	3
	77.5	110.35	.78	.74	287	251	255	45	248	75	86	2.0	3
	80	112.24	.78	.74	287	251	255	43	249	76	86	2.0	3
12	82.5	114.09	.76	.73	287	251	256	43	249	76	87	2.0	3
	85	115.95	.76	.73	287	251	255	43	249	76	87	2.0	3
	87.5	117.82	.75	.73	287	251	256	43	249	76	87	2.0	3
	90	119.70											

Traverse: 2				
Start Time:	Initial Leak Check:	cfm@	"Hg	
Finish Time: 9:57	Final Leak Check: .014	cfm@ 15	"Hg	

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: TL m29 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	120.16	.63	.66	287	248	237	54	138	75	76	1.6	3
	2.5	121.83	.63	.66	287	252	257	44	242	75	78	1.6	3
	5	123.48	.63	.66	287	251	261	42	252	75	80	1.6	3
2	7.5	125.14 ~~+2~~	.63	.66	287	251	258	~~42~~	~~252~~	75	82	1.6	3
	10	126.79	.64	.67	287	250	252	42	252	75	83	1.6	3
	12.5	128.45	.63	.66	287	250	253	42	250	75	84	1.6	3
3	15	130.11	.69 ~~.70~~	.70	285	251	253	42	250	75	85	1.8	3
	17.5	131.85	.70	.76	286	250	247	42	251	75	86	1.8	3
	20	133.62	.70	.70	286	250	248	42	246	75	86	1.8	3
4	22.5	135.38	.71	.71	286	250	245	42	242	75	86	1.8	3
	25	137.13	.74	.72	286	250	248	42	240	76	87	1.9	3
	27.5	138.95	.70	.70	287	251	247	42	240	76	~~87~~	1.8	3
5	30	140.71	.68	.69	286	251	250	42	239	76	87	1.8	3
	32.5	142.46	.68	.69	286	251	249	43	236	76	87	1.8	3
	35	144.22	.68	.69	286	250	249	43	235	76	87	1.8	3
6	37.5	145.96	.66	.68	286	251	248	43	234	77	87	1.7	3
	40	147.71	.68	.69	286	251	249	43	233	77	87	1.8	3
	42.5	149.47	.67	.69	286	251	248	44	233	77	87	1.8	3
7	45	151.22	.62	.66	287	251	248	44	232	77	87	1.6	3
	47.5	152.91	.60	.65	287	251	248	44	228	77	87	1.6	3
	50	154.57	.61	.66	286	251	248	44	228	77	87	1.6	3

Traverse: 1					
Start Time: 10:10	Initial Leak Check:	.002	cfm@	15	"Hg
Finish Time:	Final Leak Check:		cfm@		"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: M29 T1 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	156.23	.67	.69	286	250	248	44	228	77	88	1.8	3
	55	157.98	.72	.71	286	251	248	43	229	77	88	1.9	3.5
	57.5	159.78	.69	.70	287	251	249	44	231	77	88	1.9	3.5
9	60	161.60	.75	.73	287	251	248	44	231	77	88	2.0	3.5
	62.5	163.45	.74	.72	287	251	249	43	232	77	88	2.0	3.5
	65	165.31	.72	.71	287	251	248	44	232	77	88	2.0	3.5
10	67.5	167.15	.78	.74	285	251	248	44	232	78	88	2.1	4
	70	169.05	.83	.77	287	252	249	44	233	77	87	2.2	4
	72.5	171.00	.76	.73	288	251	248	44	234	78	87	2.0	4
11	75	172.87	.84	.77	287	251	248	44	233	78	87	2.2	4
	77.5	174.83	.82	.76	287	251	249	44	234	78	87	2.2	4
	80	176.80	.75	.73	287	252	249	44	234	77	87	2.0	4
12	82.5	178.69	.73	.72	287	251	248	44	233	77	87	1.9	3.5
	85	180.52	.77	.74	286	251	248	45	233	77	87	2.0	3.5
	87.5	182.41	.76	.73	287	252	248	45	233	77	87	2.0	4
	90	184.31											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 11:40	Final Leak Check: .003	cfm@ 14	"Hg

Project No.: 21800

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2 M29	Particulate/Metals
Test Date	Oct 11/17
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	6A
Meter Box No.:	Team 3
Impinger Box No.:	9

Pitot Factor	.847	
DGMCF	.985	
Barometric Pressure	~~29.95 29.53~~	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2505	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	20.1	mg
Probe	1.1	mg

Moisture Gain

CWTR	514.7	g
WCBDA	19.5	g

Combustion Gas Concentration

Oxygen	7.91	%
Carbon Dioxide	11.21	%
Carbon Monoxide	9.6	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	
Control Box	
Incline Manometer	
Comb.Gas.Analyzer	
Micromanometer	
Barometer	
Calipers	

See T1

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average:

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: T2 M29 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	84.78	.85	.76	287	250	250	65	132	71	71	2.2	3.5
	2.5	86.64	.84	.76	287	252	258	60	210	71	72	2.2	3.5
	5	88.59	.90	.78	287	252	256	57	220	71	74	2.3	4
2	7.5	90.58	.86	.77	287	251	253	55	224	71	76	2.2	4
	10	92.55	.86	.77	287	251	253	55	227	71	77	2.2	4
	12.5	94.51	.87	.77	287	251	254	55	229	72	79	2.2	4
3	15	96.47	.88	.78	287	255	254	54	232	71	80	2.2	4
	17.5	98.44	.91	.79	287	250	255	52	232	72	81	2.2	4
	20	100.45	.88	.77	287	~~249~~ 255	255	52	235	72	81	2.2	4
4	22.5	102.43	.70	.70	285	250	255	51	236	72	82	1.8	3
	25	104.20	.70	.70	285	251	255	50	236	73	82	1.8	3
	27.5	105.98	.69	.69	285	251	255	50	237	73	83	1.75	3
5	30	107.68	.65	.67	286	251	255	50	237	73	83	1.7	3
	32.5	109.37	.65	.67	287	251	256	50	238	73	84	1.7	3
	35	111.07	.63	.66	288	251	255	49	239	74	84	1.6	3
6	37.5	112.72	.65	.67	288	251	255	49	239	74	85	1.7	3
	40	114.42	.65	.67	288	251	255	49	239	74	85	1.7	3
	42.5	116.13	.64	.67	288	251	255	49	239	74	85	1.7	3
7	45	117.83	.64	.67	288	251	255	49	239	74	86	1.7	3
	47.5	119.54	.62	.66	289	251	255	48	239	75	86	1.65	3
	50	121.23	.63	.67	288	251	255	48	238	75	87	1.7	3

Traverse: 2			
Start Time: 12:32	Initial Leak Check: .002	cfm@ 15	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: M29 T2 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	122.92	.7	.70	289	251	255	48	239	75	86	1.8	3
	55	124.65	.7	.70	289	251	255	47	222	75	86	1.85	3
	57.5	126.41	.73	.72	289	251	256	44	234	75	86	1.9	3.5
9	60	128.20	.75	.73	289	251	255	43	237	75	86	1.9	3.5
	62.5	130.01	.74	.72	288	251	255	43	239	76	86	1.9	3.5
	65	131.81	.75	.73	288	251	255	43	239	76	86	1.9	3.5
10	67.5	133.63	.81	.75	288	251	256	42	240	76	86	2.1	4
	70	135.53	.81	.75	288	251	255	42	241	76	86	2.1	4
	72.5	137.44	.79	2.75	288	251	256	42	241	76	86	2.1	4
11	75	139.34	.8	.75	287	251	255	42	241	76	86	2.1	4
	77.5	141.25	.83	.76	287	251	255	42	241	76	86	2.2	4
	80	143.19	.81	.76	288	251	255	42	241	76	86	2.1	4
12	82.5	145.13	.77	.74	287	251	256	42	241	76	86	2.10	4
	85	147.04	.77	.74	287	251	255	42	241	76	86	2.1	4
	87.5	148.94	.79	.75	287	251	256	43	241	76	86	2.1	4
	90	150.87											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 14:02	Final Leak Check: 0.002	cfm@ 15	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 11/17	Plant:	Covanta DYEC	Test No.:	T2 M29 Particulate/Metals	Page 4 of 5
		Plant Location:	Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	151.28	.6	.64	287	250	254	47	150	75	76	1.5	3
	2.5	152.96	.62	.65	287	252	258	43	233	75	79	1.5	3
	5	154.59	.63	.66	287	251	257	43	237	75	81	1.6	3
2	7.5	156.23	.62	.66	287	251	257	43	237	75	82	1.6	3
	10	157.86	.64	.67	287	251	256	43	236	75	83	1.6	3
	12.5	159.54	.64	.66	287	251	256	43	236	75	84	1.6	3
3	15	161.23	.80	.75	286	250	254	43	236	75	85	2.1	4
	17.5	163.10	.80	.75	286	251	255	43	238	75	85	2.1	4
	20	165.01 ~~164~~	.81	.75	286	251	255	43	238	75	85	2.1	4
4	22.5	166.90	.68	.69	287	251	255	44	239	75	85	1.8	3.5
	25	168.66	~~.72~~	~~.72~~	286	251	255	43	237	75	85	1.9	4
	27.5	170.46	.69	.70	286	251	255	42	237	75	85	1.8	4
5	30	172.25	.66	.68	286	250	255	42	237	75	85	1.7	4
	32.5	174.00	.65	.68	286	251	255	41	237	75	85	1.7	3.5
	35	175.73	.64	.67	285	250	255	41	237	76	85	1.7	3.5
6	37.5	177.45	.59	.64	285	251	255	41	237	75	85	1.6	3
	40	179.10	.61	.66	285	251	255	41	236	75	85	1.6	3
	42.5	180.76	.59	.64	285	251	255	41	236	75	86	1.6	3
7	45	182.39	.53	.61	285	251	255	41	236	75	85	1.4	3
	47.5	183.95	.53	.61	285	251	255	41	236	75	85	1.4	3
	50	185.48	.52	.60	285	251	255	41	236	75	85	1.4	3

Traverse:	2				
Start Time:	14:10	Initial Leak Check:	0.002	cfm@ 15	"Hg
Finish Time:		Final Leak Check:		cfm@	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: M29 T2 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	187.06	.59	.64	285	251	255	41	236	75	86	1.6	3.5
	55	188.67	.60	.65	285	251	255	41	237	75	86	1.6	3.5
	57.5	190.31	.61	.66	285	251	255	41	237	76	86	1.6	3.5
9	60	191.94	.67	.69	285	251	255	41	237	75	86	1.8	4
	62.5	193.70	.68	.69	285	251	255	41	239	76	86	1.8	4
	65	195.42	.68	.69	285	251	255	41	239	75	86	1.8	4
10	67.5	197.17	.76	.73	285	2516	256	42	240	75	86	2.0	4
	70	198.99	.780	.74	285	251	255	42	241	76	86	2.0	4
	72.5	200.85	.76	2.73	286	252	256	43	241	76	86	2.0	4
11	75	202.70	.80	.75	286	251	255	43	241	76	85	2.1	4
	77.5	204.60	.81	.76	286	252	256	43	242	76	85	2.1	4
	80	206.49	.83	.76	287	252	255	43	242	76	85	2.2	4
12	82.5	208.43	.82	.76	287	252	256	44	243	76	85	2.2	4
	85	210.38	.87	.78	287	252	256	44	242	76	85	2.3	4.5
	87.5	212.38	.80	.75	287	252	257	44	242	77	84	2.1	4
	90	214.32											

Traverse: 1			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 15:40	Final Leak Check: .002	cfm@ 15	"Hg

Project No.: 21800

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particulate/Metals
Test Date	October 12 2017
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	6 series
Meter Box No.:	Team 3
Impinger Box No.:	

Pitot Factor	.847	
DGMCF	.985	
Barometric Pressure	30.09	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	.2505	inches
Stack Diameter	4.5	feet
Length	-	feet
Width	-	feet
Port length:		inches

Particulate Gain

Filter	60.1	mg
Probe	1.6	mg

Moisture Gain

CWTR	472.4	g
WCBDA	28.4	g

Combustion Gas Concentration

Oxygen	7.94	%
Carbon Dioxide	11.24	%
Carbon Monoxide	9.6	ppm

Measuring Device	MII Numbers
Probe / Pitot S7A	
Trendicator	
Control Box	COF 20093
Incline Manometer	COF 20093
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Canada
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	0.2405
2	0.2405
3	0.2510
4	0.2510
Average:	.2505

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: Oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	14.81	.77	.72	285	253	256	72	80	74	74	1.9	3
	2.5	16.59	.76	.72	286	255	256	67	106	74	75	1.9	3
	5	18.40	.76	.72	286	253	256	66	113	74	75	1.9	3
2	7.5	20.19	.76	.72	287	253	257	64	116	74	78	1.9	3
	10	21.99	.76	.72	286	253	256	63	121	74	80	1.9	3
	12.5	23.79	.76	.72	286	253	256	63	137	75	82	1.9	3
3	15	25.60	.73	.71	286	253	256	63	140	75	83	1.85	3
	17.5	27.39	.71	.70	285	253	256	62	124	75	84	1.8	3
	20	29.14	.76	.73	286	254	255	61	125	76	85	1.95	3
4	22.5	30.95	.69	.69	286	253	255	59	123	76	86	1.8	3
	25	32.70	.68	.69	286	254	256	58	121	76	86	1.8	3
	27.5	34.44	.69	.69	286	254	256	57	118	77	87	1.8	3
5	30	36.18	.62	.66	286	253	255	57	117	77	87	1.65	3
	32.5	37.85	.62	.66	286	253	255	57	122	77	88	1.65	3
	35	39.53	.60	.65	286	253	256	56	120	78	88	1.55	3
6	37.5	41.17	.53	.61	286	253	256	55	118	78	88	1.3	3
	40	42.70	.53	.61	286	253	255	55	116	78	88	1.3	3
	42.5	44.21	.54	.62	286	253	255	55	123	78	89	1.4	3
7	45	45.76	.59	.64	286	253	255	55	208	79	89	1.55	3
	47.5	47.38	.59	.64	286	253	255	55	233	79	90	1.55	3
	50	48.99	.60	.65	286	253	255	55	234	79	90	1.55	3

Traverse:					
Start Time: 14:53	Initial Leak Check:	.006	cfm@	15	"Hg
Finish Time: —	Final Leak Check:	—	cfm@	—	"Hg

Project No.: 21800

Operator :

Field Data Sheet

Date: oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	50.64	.61	.66	286	253	255	55	234	79	90	1.6	3
	55	52.30	.61	.66	286	253	255	55	234	79	90	1.6	3
	57.5	53.96	.62	.66	286	253	255	54	234	80	90	1.6	3
9	60	55.63	.67	.69	286	253	254	54	234	80	90	1.75	3
	62.5	57.35	.66	.68	287	253	254	54	235	80	90	1.75	3
	65	59.08	.68	.69	287	253	255	55	235	80	91	1.8	3
10	67.5	60.84	.95	.82	287	253	255	55	235	80	91	2.45	3.4
	70	62.84	1.0	.84	287	252	256	55	237	80	91	2.6	4
	72.5	64.95	.62	.66	285	252	255	54	239	81	91	1.65	3
11	75	66.66	.58	.64	285	252	254	55	236	81	89	1.5	3
	77.5	68.27	.58	.64	286	252	254	56	233	81	89	1.5	3
	80	69.88	.58	.64	285	251	254	56	232	80	90	1.5	3
12	82.5	71.49	.59	.65	285	251	254	57	232	80	90	1.55	3
	85	73.12	.57	.63	286	251	254	57	232	80	90	1.5	3
	87.5	74.74	.56	.63	285	251	254	58	232	80	90	1.5	3
	90	76.38											

Traverse:				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg	
Finish Time: 16:23	Final Leak Check: .004	cfm@ 15	"Hg	

-9.2

Project No.: 21800

Operator :

Field Data Sheet

Date: Oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	76.90	.72	.70	285	253	255	69	128	77	77	1.9	3
	2.5	78.67	.70	.69	283	255	256	60	208	77	78	1.8	3
	5	80.40	.72	.71	283	253	257	56	216	77	80	1.85	3
2	7.5	82.18	.81	.75	283	253	256	54	216	77	83	2.1	3
	10	84.04	.77	.73	283	253	256	54	220	77	86	2.0	3
	12.5	85.89	.78	.74	283	253	256	54	234	77	87	2.0	3
3	15	87.75	.76	.73	284	253	255	55	232	78	88	2.0	3
	17.5	89.61	.72	.71	285	253	255	55	236	78	89	1.9	3
	20	91.40	.73	.72	285	253	256	55	238	78	90	1.95	3
4	22.5	93.22	.70	.70	286	253	255	56	238	79	90	1.9	3
	25	94.99	.72	.71	286	253	255	56	238	79	91	1.9	3
	27.5	96.82	.71	.71	286	253	255	56	238	79	91	1.9	3
5	30	98.60	.65	.68	287	253	255	57	238	80	91	1.7	3
	32.5	100.33	.66	.68	287	253	255	57	237	80	91	1.75	3
	35	102.06	.66	.68	287	253	255	58	237	80	92	1.75	3
6	37.5	103.77	.61	.66	287	253	255	58	237	80	92	1.65	3
	40	105.45	.61	.66	287	253	254	59	236	81	92	1.65	3
	42.5	107.13	.61	.66	288	253	254	59	236	81	92	1.65	3
7	45	108.79	.63	.67	288	253	254	60	236	81	92	1.65	3
	47.5	110.48	.62	.66	288	253	254	61	236	81	93	1.65	3
	50	112.18	.62	.66	287	253	255	62	236	81	93	1.65	3

Traverse:					
Start Time: 17:08	Initial Leak Check: .003	cfm@	15	"Hg	
Finish Time: —	Final Leak Check: —	cfm@	—	"Hg	

Project No.: 21800

Operator :

Field Data Sheet

Date: Oct. 12, 2017	Plant: Covanta DYEC	Test No.: 3 Particulate/Metals	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	113.85	.64	.67	287	253	255	61	235	81	93	1.75	3
	55	115.58	.64	.67	287	253	254	59	234	82	93	1.7	3
	57.5	117.32	.61	.66	287	253	254	58	235	82	93	1.6	3
9	60	118.99	.64	.68	286	253	254	57	235	82	93	1.7	3
	62.5	120.70	.64	.68	285	253	254	57	235	82	93	1.7	3
	65	122.42	.65	.68	284	253	254	56	235	82	93	1.7	3
10	67.5	124.13	.62	.67	283	253	254	55	235	82	93	1.6	3
	70	125.81	.60	.66	281	252	254	55	235	82	95	1.55	3
	72.5	127.44	.62	.67	281	252	254	56	235	82	93	1.6	3
11	75	129.12	.56	.63	282	252	254	56	235	82	93	1.45	3
	77.5	130.70	.56	.63	281	252	254	56	234	82	93	1.45	3
	80	132.29	.58	.64	281	252	254	56	234	82	93	1.5	3
12	82.5	133.91	.56	.63	282	252	254	56	233	82	93	1.45	3
	85	135.50	.56	.63	281	252	254	56	233	82	93	1.45	3
	87.5	137.09	.56	.63	281	252	254	56	233	82	93	1.45	3
	90	138.66											

Traverse:					
Start Time: —	Initial Leak Check:	—	cfm@		"Hg
Finish Time: 18:38	Final Leak Check:	.004	cfm@	14.5	"Hg

Project No.: 21800

Operator :

APPENDIX 7

Particle Size Distribution Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Particle Size
Test Date	OCTOBER 11, 2017
Test Location	APC Outlet No. 1
Operator Signature	[signature]

Project No.:	21800
Page	1 of
Probe No.:	5
Meter Box No.:	T2
Impinger Box No.:	5

Pitot Factor	0.946	
DGMCF	0.996	
Barometric Pressure	29.97	"Hg
Static Pressure	-9.6	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	12	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	162.6	g
WCBDA	8.5	g

Combustion Gas Concentration

Oxygen	8.57	%
Carbon Dioxide	10.85	%
Carbon Monoxide	18.7	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP6
Trendicator	} C0E20094
Control Box	} C0E20094
Incline Manometer	} C0E20094
Comb.Gas.Analyzer	
Micromanometer	—
Barometer	ENVCAN
Calipers	B08922

Reading Interval	—
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	0.1775
2	0.1775
3	0.1770
4	0.1770
Average:	

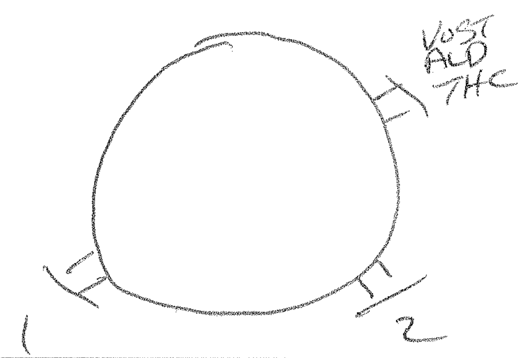
Probe Liner Glass / Metal /Teflon / (Other) PFA

Nozzle Glass / (Metal) / Other

Union None / (Metal) / Teflon / Other

Pitot Leak Checked? Yes No

Site Diagram



Notes:

Rev. November 27, 2014

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: 1 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	50.27	.77	.35	286	261	259	56	52	71	69	.35	4
2	10.9	54.01	.56		286	263	260	58	59	69	67	.35	4
3	21.6	57.68	.54		286	261	261	56	56	69	67	.35	4
4	31.8	61.19	.61		287	261	260	55	52	69	67	.35	4
5	41.6	64.64	.62		286	261	260	55	53	69	67	.35	4
6	51.4	68.10	.65		286	261	260	55	52	69	67	.35	4
	60.7	71.38											
1	0	74.39	.73		286	261	260	56	54	69	67	.35	4
2	10.0	74.86	.61		287	262	260	55	53	70	67	.38	4
3	20.2	78.34	.67		287	261	260	55	53	70	67	.38	4
4	30.2	81.76	.63		287	262	260	55	53	69	67	.38	4
5	40.0	85.15	.67		287	261	260	56	53	70	67	.38	4
6	49.6	88.52	.70		287	260	261	56	52	70	67	.38	4
	58.9	91.85		↓									

Traverse: 1				Traverse: 2			
Start Time: 829	Initial Leak Check: .002	cfm@ 16	"Hg	Start Time: 933	Initial Leak Check: ✓	cfm @	"Hg
Finish Time: 930	Final Leak Check:	cfm@	"Hg	Finish Time: 1032	Final Leak Check: ✓	cfm @	"Hg

-10.0

Project No.: 21800

Operator : DJ MS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Particle Size
Test Date	OCTOBER 11 2017
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of
Probe No.:	5
Meter Box No.:	T2
Impinger Box No.:	14

Pitot Factor	0.846	
DGMCF	0.996	
Barometric Pressure	29.96	"Hg
Static Pressure	-10.0	"H2O
Nozzle Size	.1773	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	12	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	156.7	g
WCBDA	9.4	g

Combustion Gas Concentration

Oxygen	8.60	%
Carbon Dioxide	10.86	%
Carbon Monoxide	16.1	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE
Trendicator	
Control Box	TEST
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	
Barometer	UNIT 1
Calipers	

Reading Interval	—
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.1775
2	.1770
3	.1770
4	.1775
Average:	

Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other_____

Union None / Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 11/17	Plant: Covanta DYEC	Test No.: 2 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	91.91	.82	.35	287	266	263	58	61	68	67	.35	4
2	10.8	95.64	.60		287	266	261	55	58	67	67	.35	4
3	20.2	99.00	.63		287	266	262	53	56	68	68	.38	4
4	29.3	102.19	.65		287	265	264	60	55	68	66	.35	4
5	39.0	105.65	.65		287	265	264	51	55	65	66	.35	4
6	48.7	109.04	.65		287	265	264	51	54	68	67	.35	4
	59.7	112.64											
1	0	112.64	.80		285	264	263	51	57	65	66	.35	4
2	10.6	116.27	.63		286	265	262	50	55	69	66	.38	4
3	20.3	119.57	.56		285	265	262	50	55	68	66	.38	4
4	30.1	122.99	.59		285	264	262	51	55	67	66	.36	4
5	39.9	126.38	.59		285	264	262	51	55	68	65	.38	4
6	50.0	129.66	.64		285	264	261	52	55	68	66	.35	4
	60.3	133.46											

Traverse: 1					Traverse: 2				
Start Time: 1139	Initial Leak Check: .002	cfm@ 15	"Hg		Start Time: 1241	Initial Leak Check:	cfm @	"Hg	
Finish Time: 1230	Final Leak Check:	cfm@	"Hg		Finish Time: 1341	Final Leak Check:	cfm @	"Hg	

Project No.: 21800

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	OCTOBER 11, 2017
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of
Probe No.:	5
Meter Box No.:	72
Impinger Box No.:	14

Pitot Factor	0.846	
DGMCF	0.996	
Barometric Pressure	29.93	"Hg
Static Pressure	-10.0	"H2O
Nozzle Size	0.173	inches
Stack Diameter	4.5	feet
Length	2	feet
Width	2	feet
Port length:	2	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	150.9	g
WCBDA	8.4	g

Combustion Gas Concentration

Oxygen	8.68	%
Carbon Dioxide	10.76	%
Carbon Monoxide	17.2	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE
Trendicator	
Control Box	TEST
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	
Barometer	UNIT 1
Calipers	

Reading Interval	—
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.1770
2	.1775
3	.1770
4	.1775
Average:	

Probe Liner Glass / Metal /Teflon / (Other) PFA

Nozzle Glass / (Metal) / Other_____

Union None / (Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 16/17	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 4	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	33.53	.78	.35	258	258	259	63	62	68	66	.35	4.0
2	11.1	37.35	.63		257	260	261	59	57	67	66	.35	4.0
3	20.7	40.65	.57		257	260	261	55	54	67	66	.35	4.0
4	30.5	44.03	.55		256	260	261	57	53	67	65	.35	4.0
5	40.5	47.40	.61		256	260	260	57	53	67	66	.35	4.0
6	50.3	50.90	.66		256	261	260	57	53	67	66	.35	4.0
	60.2	54.36											
1	0	54.36	.76		256	261	260	57	53	67	66	.35	4.0
2	11.0	56.13	.62		256	260	260	56	54	67	66	.35	4.0
3	20.9	61.45	.63		256	261	260	56	54	67	66	.35	4.0
4	30.0	64.67	.66		258	263	261	55	52	68	66	.35	4.0
5	39.5	67.91	.70		258	260	261	54	52	68	67	.35	4.0
6	49.0	71.18	.74		259	261	259	54	52	68	67	.35	4.0
	58.8	74.64											

Traverse: 1					Traverse: 2				
Start Time: 14.50	Initial Leak Check: .003	cfm@ 16	"Hg		Start Time: 15.52	Initial Leak Check: /	cfm @	"Hg	
Finish Time: 15.50	Final Leak Check:	cfm@	"Hg		Finish Time: 16.52	Final Leak Check: /	cfm @	"Hg	

Project No.: 21800

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particle Size
Test Date	OCTOBER 10, 2017
Test Location	APC Outlet No. 2
Operator Signature	D O'C

Project No.:	21800
Page	1 of
Probe No.:	5
Meter Box No.:	T1
Impinger Box No.:	14

Pitot Factor	0.8446	
DGMCF	0.987	
Barometric Pressure	29.82	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	4.0.1773	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	12	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	160.8	g
WCBDA	11.4	g

Combustion Gas Concentration

Oxygen	7.84	%
Carbon Dioxide	11.17	%
Carbon Monoxide	17.9	ppm

Measuring Device	MII Numbers
Probe / Pitot	SP6
Trendicator	CDE20094
Control Box	11
Incline Manometer	11
Comb.Gas.Analyzer	—
Micromanometer	—
Barometer	ENV. CAN
Calipers	B03922

Reading Interval	—
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.1775
2	.1775
3	.1770
4	.1770
Average:	.1773

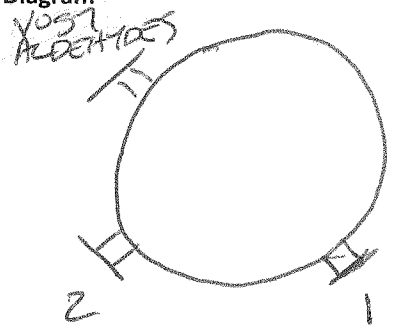
Probe Liner Glass / Metal /Teflon / Other PFA

Nozzle Glass / Metal / Other_____

Union None /Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram



Notes:

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: 1	Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Dwell Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
*	*	*	*		*			*		*	*	*	*
1	0	13.22	~~.32~~ .60	.35	283	268	267	64	61	78	77	.35	4
2	9.6	16.10	.60	↓	284	270	270	62	63	78	77	.35	4
3	18.8	18.79	.58		285	268	268	62	63	78	77	.35	4
4	27.8	22.00	.54		285	268	265	~~262~~	63	78	77	.35	4
5	36.9	25.21	.58		284	268	265	~~262~~	63	78	77	.35	4
6	46.2	28.62	.76		285	265	265	62	63	78	77	.35	4
	56.8	32.50											
1	0	32.50	.67		285	268	257	60	58	80	79	.35	4
[9.5] 2 10.T	~~11.1~~	35.91	.63		285	269	258	58	58	80	79	.35	4
[19.6] 3 10.6	~~22.1~~	39.43	.64		285	268	258	58	58	80	79	.35	4
[30.2] 4 10.9	~~33.0~~	43.10	.58		287	268	258	58	57	80	79	.35	4
[41.1] 5	~~43.6~~	46.98	.65		286	268	257	58	56	80	79	.35	4
[52.1] 6	~~53.70~~	50.70	.80		286	267	257	58	56	80	79	.35	4
[63.2]	63.2	55.01											

Traverse: 1		Traverse: 2	
Start Time: 10:45	Initial Leak Check: .003 cfm@ 15 "Hg	Start Time: 11:51	Initial Leak Check: — cfm @ "Hg
Finish Time: 11:46	Final Leak Check: cfm@ "Hg	Finish Time: 12:54	Final Leak Check: — cfm @ "Hg

Fw .80 .61 .58 .57 .60 .65

.64 .72 .80 .84 .86 .87

P_s -9.2

Project No.: 21800

Operator: [signature]

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particle Size
Test Date	OCTOBER 10, 2017
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of
Probe No.:	5
Meter Box No.:	T1
Impinger Box No.:	5

Pitot Factor	0.846	
DGMCF	0.987	
Barometric Pressure	~~29.81 29.80 29.96~~	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	0.1773	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	12	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	161.2	g
WCBDA	9.2	g

Combustion Gas Concentration

Oxygen	8.26	%
Carbon Dioxide	10.79	%
Carbon Monoxide	17.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	~~SCC~~
Trendicator	
Control Box	TEST
Incline Manometer	1
Comb.Gas.Analyzer	
Micromanometer	UNIT 2
Barometer	
Calipers	

Reading Interval	
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.1775
2	.1775
3	.1770
4	.1770
Average:	

Probe Liner Glass / Metal /Teflon / (Other) RFA

Nozzle Glass / (Metal) / Other_____

Union None / (Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 10/17	Plant: Covanta DYEC	Test No.: 2	Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 2	

Point	Dwell Clock Time *	Dry Gas Meter ft³ *	Pitot ΔP "H_2O *	Desired cfm	Stack Temp °F *	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F *	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F *	Meter Temp Inlet °F *	Meter Pressure ΔH "H_2O *	Pump Vacuum "Hg Gauge *
1	0	55.04	.80	.35	286	270	250	74	77	79	79	.38	4
2	10.8	58.98	.66	↓	287	265	254	65	68	80	79	.38	4
3	20.2	62.46	.67		288	265	255	60	67	80	80	.38	4
4	29.3	65.79	.63		288	265	255	60	64	81	80	.38	4
5	38.7	69.08	.60		285	264	256	61	64	81	80	.38	4
6	48.3	72.44	.65		285	264	255	60	62	81	80	.38	4
	58.5	76.46											
1	0	76.46	.80		284	265	257	75	78	84	82	.38	4
2	11.1	80.51	.67		286	265	257	65	68	85	83	.38	4
3	21.1	84.20	.57		286	265	258	60	62	86	83	.38	4
4	30.5	87.60	.62		286	265	258	61	61	86	83	.38	4
5	40.4	91.29	.62		282	261	257	60	62	86	84	.38	4
6	50.2	94.98	.70		282	261	257	60	62	87	85	.38	4
	60.3	98.76											

FW

FW

Traverse: 1		Traverse: 2	
Start Time: 1430	Initial Leak Check: .001 cfm@ 15 "Hg	Start Time: 1532	Initial Leak Check: — cfm @ — "Hg
Finish Time: 1529	Final Leak Check: cfm@ "Hg	Finish Time: 1632	Final Leak Check: — cfm @ — "Hg

M29 – 510.7
22.2

Project No.: 21800
Operator : [signature]

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Particle Size
Test Date	OCTOBER 10, 2017
Test Location	APC Outlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of
Probe No.:	5
Meter Box No.:	7
Impinger Box No.:	7

Pitot Factor	0.8446	
DGMCF	0.9987	
Barometric Pressure	29.83	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	.1773	inches
Stack Diameter	4.5	feet
Length	0	feet
Width	0	feet
Port length:	12	inches

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	152.3	g
WCBDA	9.6	g

Combustion Gas Concentration

Oxygen	8.30	%
Carbon Dioxide	10.73	%
Carbon Monoxide	15.2	ppm

Measuring Device	MII Numbers
Probe / Pitot	SEE
Trendicator	
Control Box	TEST
Incline Manometer	
Comb.Gas.Analyzer	1
Micromanometer	MW177
Barometer	
Calipers	

Reading Interval	—
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1	0.1775
2	0.1775
3	0.1770
4	0.1770
Average:	

Probe Liner Glass / Metal /Teflon / (Other) PFA

Nozzle Glass / (Metal) / Other_____

Union None / (Metal) / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Aug 10/11	Plant: Covanta DYEC	Test No.: 3 Particle Size	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	98.83	.80	.35	256	267	253	67	66	85	85	.35	6
2	10.9	102.70	.62		255	267	253	64	61	85	85	.35	6
3	20.8	106.44	.50		261	262	255	61	60	85	85	.35	6
4	30.4	110.00	.55		274	262	255	60	61	85	85	.35	6
5	40.1	113.56	.59		280	262	260	59	61	85	85	.35	6
6	49.6	117.10	.60		284	261	260	59	60	85	85	.35	6
	59.5	120.70											
1	0	120.70	.85		283	264	255	61	60	85	84	.35	6
2	10.9	124.56	.71		280	263	263	60	55	85	85	.35	6
3	20.9	128.22	.61		280	262	262	60	55	85	85	.35	6
4	30.1	131.62	.68		287	261	261	60	55	85	85	.35	6
5	39.7	135.12	.72		287	261	261	60	55	85	84	.35	6
6	49.3	138.70	.80		287	260	261	60	54	85	84	.35	6
	59.5	142.40											

Traverse: 1				Traverse: 2			
Start Time: 1735	Initial Leak Check: .003	cfm@ 15	"Hg	Start Time: 1838	Initial Leak Check:	cfm @	"Hg
Finish Time: 1835	Final Leak Check:	cfm@	"Hg	Finish Time: 1938	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator: D. Dills

APPENDIX 8

SVOC Data Sheets
(60 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds
Test Date	October 12, 2012
Test Location	APC Outlet No. 1
Operator Signature	CHRIS BELORE

Project No.:	21800
Page	1 of 5
Probe No.:	
Meter Box No.:	TEAM 2
Impinger Box No.:	12 ✓

Pitot Factor	.844	
DGMCF	.996 ✓	
Barometric Pressure	30.04	"Hg
Static Pressure	-10.08	"H2O
Nozzle Size	.2555 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	12	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	680.0 ✓	g
WCBDA	20.2 ✓	g

Combustion Gas Concentration

Oxygen	8.35 ✓	%
Carbon Dioxide	11.13 ✓	%
Carbon Monoxide	6.8	ppm

Measuring Device	MII Numbers
Probe / Pitot	B097 67
Trendicator	COE
Control Box	- 20092
Incline Manometer	
Comb.Gas.Analyzer	CEM's
Micromanometer	COE 20126
Barometer	ENV CAN
Calipers	B03923

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1	.2555
2	.2555
3	.2555
4	.2555
Average:	.2555

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 01	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	74.91	.56	.64	286	260	260	62	54	66	64	1.35	5
	5	78.44	.57	.64	286	259	259	44	34	65	64	1.35	5
2	10	81.43	.57	.64	286	256	260	44	36	64	63	1.4	5.5
	15	84.62	.58	.64	286	259	260	44	37	65	64	1.4	5.5
3	20	87.83	.67	.69	286	258	260	43	37	65	64	1.6	6
	25	91.10	.67	.69	286	259	260	42	37	65	64	1.6	6
4	30	94.51	.74	.73	286	258	260	42	38	66	64	1.8	7
	35	98.10	.75	.74	286	258	260	41	40	66	64	1.8	7
5	40	101.72	.83	.77	286	258	261	41	40	66	64	2.0	7.5
	45	105.51	.85	.78	287	258	261	41	40	67	65	2.0	7.5
6	50	109.35	.78	.74	289	258	260	41	41	67	65	1.9	7.5
	55	113.14	.78	.74	288	258	261	42	40	67	65	1.9	7.5
7	60	116.95	.56	.63	289	259	261	42	40	68	66	1.4	7.
	65	120.27	.56	.63	288	259	261	43	38	68	66	1.4	7.
8	70	123.57	.59	.66	288	259	261	43	38	68	66	1.1	6
	75	126.62	.59	.66	288	259	262	44	37	69	66	1.1	6
9	80	129.55	.63	.67	287	259	262	44	37	69	67	1.5	6.5
	85	132.73	.63	.67	287	259	262	44	38	69	67	1.5	6.5
10	90	136.05	.78	.75	287	259	262	44	39	69	67	1.9	7.
	95	139.71	.77	.74	286	259	261	43	40	69	67	1.9	7.
11	100	143.41	.84	.78	286	259	262	43	40	69	67	2.1	7.8

Traverse: 1			
Start Time: 09:19	Initial Leak Check: .003	cfm@ 15	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : CHRIS LEGARE

FACTOR : 0.8465

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 11	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	147.26	.84	.78	287	260	262	44	42	69	67	2.1	8.0
12	110	151.15	.88	.79	287	260	262	45	42	69	67	2.3	8.0
	115	155.13	.88	.79	287	266	260	46	42	70	69	2.3	8.0
	120	159.20											

Traverse: 1			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 11:19	Final Leak Check: .000	cfm@ 13	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : CHRIS RECOTE

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. U1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	159.63	.46	.57	284	260	261	51	35	69	67	1.0	6.0
	5	162.68	.49	.59	284	259	261	46	37	69	68	1.0	6.0
2	10	165.61	.50	.60	284	259	262	45	37	69	68	1.0	6.0
	15	168.52	.50	.60	284	259	262	45	37	69	68	1.0	6.0
3	20	171.36	.74	.73	285	258	261	44	38	70	68	1.8	7.5
	25	174.80	.74	.73	285	259	262	43	40	70	68	1.9	7.8
4	30	178.46	.77	.75	285	259	261	44	41	70	69	1.9	7.8
	35	182.18	.84	.78	284	260	261	44	42	71	69	2.1	8.5
5	40	186.10	.81	.77	283	260	262	44	42	71	69	2.1	8.5
	45	189.88	.80	.76	284	260	262	44	42	71	69	2.0	8.5
6	50	193.88	.74	.73	287	260	262	45	43	71	70	1.9	8
	55	197.65	.73	.73	287	260	262	44	43	72	70	1.9	8
7	60	201.41	.55	.63	288	259	262	45	44	72	70	1.3	7
	65	204.76	.56	.64	288	259	264	45	41	72	70	1.25	7
8	70	207.95	.70	.71	286	260	263	45	40	72	70	1.7	7.5
	75	211.40	.72	.72	286	259	264	45	41	73	71	1.7	7.5
9	80	214.93	.80	.76	287	259	264	45	42	73	71	2.0	8.5
	85	218.68	.80	.76	287	260	264	45	43	73	71	2.0	8.5
10	90	222.55	.82	.77	287	260	264	45	43	73	71	2.0	8.5
	95	226.45	.82	.77	287	260	264	46	44	73	71	2.0	8.5
11	100	230.24	.87	.79	287	261	264	46	44	73	71	2.2	9.0

Traverse: 2					
Start Time: 11:42	Initial Leak Check: .004	cfm@ 13	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Project No.: 21800

Operator: CHRIS BELCORE

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. U1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	234.16	.86	.79	287	260	264	46	45	74	72	2.2	9.0
12	110	238.24	.89	.80	287	260	263	46	46	74	71	2.2	9.0
	115	242.29	.88	.80	287	261	264	46	46	74	72	2.2	9.0
	120	246.50											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 13:42	Final Leak Check: .002	cfm@ 13	"Hg

Traverse:			
Start Time: X	Initial Leak Check: X	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : CHRIS BELORE

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	October 12, 2017
Test Location	APC Outlet No. #1
Operator Signature	CHRIS BELORE

Project No.:	21800
Page	1 of 5
Probe No.:	5 SERIES
Meter Box No.:	TEAM 2
Impinger Box No.:	3 ✓

Pitot Factor	0.844	
DGMCF	0.996 ✓	
Barometric Pressure	30.00	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	.2555 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	12	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter	mg
Probe	mg

Moisture Gain

CWTR	643.7 ✓	g
WCBDA	18.8 ✓	g

Combustion Gas Concentration

Oxygen	8.39 ✓	%
Carbon Dioxide	11.01 ✓	%
Carbon Monoxide	10.4	ppm

Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	SEE
Control Box	
Incline Manometer	TEST
Comb.Gas.Analyzer	#1
Micromanometer	
Barometer	
Calipers	

Nozzle Measurements	
1	SEE
2	
3	TEST #1
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	46.95	.84	.78	286	264	241	71	71	73	72	2.1	6.0
	5	50.75	.83	.78	287	263	259	58	66	73	73	2.1	6.0
2	10	54.59	.84	.78	287	263	263	59	63	73	72	2.1	6.0
	15	58.41	.84	.78	287	262	260	51	63	73	72	2.1	6.0
3	20	62.32	.80	.76	287	262	261	49	63	73	72	2	6.0
	25	66.16	.80	.76	288	262	262	48	63	73	72	2	6.0
4	30	70.06	.75	.74	288	261	262	47	64	73	72	1.9	6.0
	35	73.77	.75	.74	288	262	262	47	41	73	72	1.9	6.0
5	40	77.46	.72	.72	288	262	262	47	41	74	72	1.8	5.5
	45	81.24	.70	.71	288	262	262	47	41	74	72	1.7	5.5
6	50	84.88	.60	.66	287	261	262	47	40	74	72	1.5	5.
	55	88.24	.60	.66	288	261	262	48	41	74	72	1.5	5.
7	60	91.56	.71	.72	287	261	262	47	41	74	72	1.7	5.5
	65	95.13	.71	.72	288	261	262	47	41	74	72	1.7	5.5
8	70	98.66	.75	.74	288	261	262	47	41	74	73	1.9	6.
	75	102.42	.75	.74	288	261	262	47	41	74	73	1.9	6
9	80	106.24	.71	.72	288	261	262	47	41	75	73	1.7	6
	85	109.83	.71	.72	288	261	262	47	39	75	73	1.7	6
10	90	113.41	.65	.69	288	261	262	48	40	75	73	1.6	5.5
	95	116.90	.64	.69	287	261	262	48	40	75	73	1.6	5.5
11	100	120.36	.58	.65	287	261	262	48	40	75	73	1.4	5

Traverse:				
Start Time: 14:53	Initial Leak Check:	0.01	cfm@ 15	"Hg
Finish Time: —	Final Leak Check:	—	cfm@ —	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : CHRIS BELORE

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	123.75	.55	.64	286	261	262	48	39	75	73	1.3	5
12	110	126.90	.47	.59	286	261	262	49	39	75	73	1.1	4.5
	115	129.80	.48	.59	286	261	262	50	40	75	73	1.1	4.5
	120	132.87											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 16:53	Final Leak Check: .004	cfm@ 13	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : CHRIS RELOPE

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
	*	*	*		*			*		*	*	*	*
1	0	133.31	.81	.77	286	260	263	62	43	74	73	2	6.5
	5	137.03	.80	.77	287	259	262	51	42	75	73	2.1	7.0
2	10	140.91	.77	.75	287	259	264	50	43	74	73	2.0	6.5
	15	144.76	.80	.77	288	260	263	49	41	75	73	2.1	7.0
3	20	148.64	.76	.75	288	261	263	48	42	75	73	2.0	7.0
	25	152.50	.82	.77	289	261	262	48	42	75	73	2.1	7.0
4	30	156.38	.81	.77	289	261	262	48	42	75	73	2.1	7.0
	35	160.25	.81	.77	290	262	262	49	41	75	73	2.1	7.0
5	40	164.10	.70	.72	290	261	262	49	41	75	74	1.8	6.5
	45	167.80	.70	.72	290	261	262	49	40	75	74	1.75	6.5
6	50	171.45	.67	.67	289	261	262	49	40	78	73	1.45	5.5
	55	174.75	.60	.66	289	262	262	50	39	76	74	1.5	6.0
7	60	178.04	.65	.69	288	261	261	50	40	76	74	1.6	6.0
	65	181.46	.61	.67	287	261	262	50	39	76	74	1.6	6.0
8	70	184.88	.64	.69	287	261	261	51	39	76	74	1.65	6.0
	75	188.35	.68	.71	287	261	262	51	39	76	74	1.75	6.0
9	80	191.90	.64	.69	285	261	261	51	39	76	74	1.65	6.0
	85	195.40	.61	.67	283	261	262	52	39	76	74	1.60	6.0
10	90	198.85	.46	.58	283	261	261	52	39	76	74	1.0	5.0
	95	201.70	.45	.58	280	261	260	52	38	76	74	1.1	5.0
11	100	204.61	.45	.58	280	261	261	52	38	76	74	1.1	6.0

Traverse: 1				
Start Time: 12:04	Initial Leak Check:	.004	cfm@	14 "Hg
Finish Time: —	Final Leak Check:	—	cfm@	— "Hg

Traverse:				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time:	Final Leak Check:		cfm@	"Hg

INLET START @ 1210.

Project No.: 21800

Operator : [signature]

Rev: April 28, 2005

ORTECH Environmental

Field Data Sheet

Date: Oct. 12/17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location:	APC Outlet No. 1

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	207.51	.45	.58	280	260	261	52	38	77	74	1.1	5
12	110	210.40	.45	.58	280	261	261	52	38	76	74	1.2	5
	115	213.34	.45	.58	280	261	262	53	38	76	74	1.2	5
	120	216.27											

Traverse:				
Start Time:	—	Initial Leak Check:	— cfm@	— "Hg
Finish Time:	1904	Final Leak Check:	.002 cfm@	14.5 "Hg

Traverse:				
Start Time:		Initial Leak Check:	cfm @	"Hg
Finish Time:		Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator :

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date	October 13, 2017
Test Location	APC Outlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	6 series
Meter Box No.:	Team 2
Impinger Box No.:	12

Pitot Factor	.844	
DGMCF	.996 ✓	
Barometric Pressure	29.94	"Hg
Static Pressure	-9.9	"H2O
Nozzle Size	.2555	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter	mg
Probe	mg

Moisture Gain

CWTR	650.1 ✓	g
WCBDA	17.6 ✓	g

Combustion Gas Concentration

Oxygen	8.69 ✓	%
Carbon Dioxide	10.75 ✓	%
Carbon Monoxide	15.1	ppm

Measuring Device	MII Numbers
Probe / Pitot	B03767
Trendicator	TEAM 2
Control Box	COE 20092
Incline Manometer	COE 20092
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Canada
Calipers	B03922

Nozzle Measurements	
1	SEE
2	
3	TEST #1
4	
Average:	

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal /(Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes: unit 1 Blank Team 4 1.006 = DGMCF
start DGM 73.15
End DGM 74.50

Field Data Sheet

Date: oct, 13, 2017	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O"	Pump Vacuum "Hg Gauge
		17.70											
1	0	~~17.02~~	.85	.79	281	262	262	70	48	76	75	2.0	6
	5	21.42	.71	.71	288	259	272	48	42	76	74	1.7	6
2	10	24.97	.68	.70	288	260	262	48	41	76	74	1.7	6
	15	28.50	.67	.69	288	260	265	48	41	76	74	1.65	6
3	20	32.01	.63	.67	289	261	265	48	42	77	75	1.55	6
	25	35.41	.64	.68	289	261	264	48	40	77	75	1.6	6
4	30	38.86	.66	.69	289	261	264	47	40	77	75	1.65	6
	35	42.37	.66	.69	289	261	264	47	40	77	74	1.65	6
5	40	45.87	.71	.71	289	261	264	47	40	77	74	1.75	6
	45	49.49	.71	.71	289	262	262	47	40	77	74	1.75	6
6	50	53.13	.66	.69	289	261	263	47	41	77	75	1.65	6
	55	56.63	.66	.69	289	261	263	47	40	78	75	1.65	6
7	60	60.10	.66	.69	288	261	263	47	41	78	75	1.6	6
	65	63.56	.64	.68	288	262	263	47	40	78	75	1.55	6
8	70	66.99	.67	.70	287	261	262	47	40	77	75	1.65	6
	75	70.51	.67	.70	287	263	264	48	42	78	75	1.65	6
9	80	~~73~~ 74.02	.67	.70	286	261	263	47	41	78	75	1.65	6
	85	77.54	.67	.70	286	261	262	47	42	78	75	1.65	6
10	90	81.04	.61	.66	280	261	263	47	42	77	75	1.5	6
	95	84.44	.59	.65	286	261	262	47	42	78	75	1.4	6
11	100	87.71	.60	.66	286	261	262	48	41	78	75	1.45	6

Traverse: 8'3"	.01				
Start Time: ~~8:45~~ 8:47	Initial Leak Check: ~~.009~~	cfm@	15	"Hg	
Finish Time: 10:38	Final Leak Check:	cfm@		"Hg	

Traverse:				
Start Time:	Initial Leak Check:	cfm @		"Hg
Finish Time:	Final Leak Check:	cfm @		"Hg

static = -9.95

Project No.: 21800

Operator :

Field Data Sheet

Date: Oct. 13, 2017	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	90.95	.60	.66	286	261	262	48	40	78	75	1.45	6
12	110	94.26	.40	.54	286	261	263	48	40	78	75	.85	5
	115	96.86	.42	.55	286	261	263	49	38	78	75	.92	5
	120	99.51											

Traverse:					
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 10:38	Final Leak Check: .007	cfm@ 13	"Hg

Traverse:					
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator :

Field Data Sheet

Date: Oct. 13, 2017	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	99.81	.87	.79	286	260	260	64	39	78	75	2.15	8
	5	103.77	.87	.79	287	259	264	48	42	77	75	2.15	8
2	10	107.79	.88	.80	287	260	265	47	43	77	75	2.2	8
	15	111.87	.88	.80	288	260	265	47	44	77	75	2.15	8
3	20	115.88	.82	.77	288	261	265	46	41	77	75	2.0	8
	25	119.74	.82	.77	288	261	264	45	40	77	75	2.0	8
4	30	123.59	.86	.79	288	261	265	45	41	77	75	2.15	8
	35	127.54	.85	.78	288	261	265	45	42	77	75	2.1	8
5	40	131.52	.80	.76	288	262	265	45	43	77	75	1.95	7.5
	45	135.36	.82	.77	289	262	264	46	42	77	75	2	7.5
6	50	139.23	.76	.74	289	261	265	46	42	77	75	1.85	7.5
	55	142.98	.75	.74	289	262	264	46	42	78	75	1.85	7.5
7	60	146.72	.65	.69	289	262	264	46	41	78	75	1.6	7
	65	150.18	.64	.68	289	262	264	47	40	78	75	1.55	7
8	70	153.62	.77	.75	289	262	264	47	40	78	75	1.9	7.5
	75	157.35	.79	.76	289	262	265	47	42	78	75	2.0	8
9	80	161.21	.80	.76	288	262	263	47	42	77	75	1.95	8
	85	165.02	.80	.76	287	262	264	47	41	78	75	1.95	8
10	90	168.85	.75	.74	287	262	264	47	42	78	75	1.8	7.5
	95	172.55	.71	.72	287	261	264	47	41	78	76	1.7	7.5
11	100	176.18	.67	.70	287	262	264	47	42	79	76	1.6	7.0

Traverse:					
Start Time:	10:50	Initial Leak Check:	.008	cfm@	15 "Hg
Finish Time:	—	Final Leak Check:	—	cfm@	— "Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : [signature]

Field Data Sheet

Date: Oct. 13, 2017	Plant: Covanta DYEC	Test No.: 3 SVOC	
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	* Clock Time	* Dry Gas Meter ft^3	* Pitot ΔP "H_2O	Desired cfm	* Stack Temp °F	Probe Temp °F	Oven Temp °F	* Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	* Meter Temp Outlet °F	* Meter Temp Inlet °F	* Meter Pressure ΔH "H_2O	* Pump Vacuum "Hg Gauge
	105	179.65	.65	.69	287	261	264	47	41	78	76	1.6	7
12	110	183.12	.43	.56	287	261	264	47	41	78	76	.97	5.5
	115	185.90	.43	.56	286	261	264	48	38	79	76	1.0	5.5
	120	188.68											

Traverse: 2			
Start Time: –	Initial Leak Check: –	cfm@ –	"Hg
Finish Time: 12:50	Final Leak Check: .01	cfm@ 14	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : [signature]

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date	Oct. 12, 2017
Test Location	APC Outlet No. 2
Operator Signature	D TURTON

Project No.:	21800
Page	1 of 5
Probe No.:	6C
Meter Box No.:	TEAM 1
Impinger Box No.:	4

Pitot Factor	.847	
DGMCF	.987	
Barometric Pressure	30.04	"Hg
Static Pressure	-0.38	"H2O
Nozzle Size	.2535	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	651.2	g
WCBDA	16.9	g

Combustion Gas Concentration

Oxygen	8.05	%
Carbon Dioxide	11.14	%
Carbon Monoxide	9.2	ppm

Measuring Device	MII Numbers
Probe / Pitot ISE	COE 20113
Trendicator	COE
Control Box	20094
Incline Manometer	
Comb.Gas.Analyzer	CEMS
Micromanometer	COE 20126
Barometer	ENV CAN
Calipers	B03922

Nozzle Measurements	
1	.2525
2	.2535
3	.2535
4	.2545
Average:	.2535

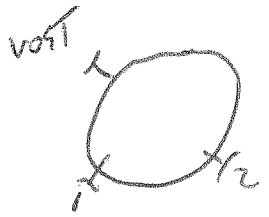
Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) / Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram



Notes:

Field Data Sheet

Date: 04/12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	82.42	.80	.75	282	244	256	62	44	66	65	1.9	4
	5	86.18	.80	.75	285	245	256	46	44	67	66	1.9	4
2	10	89.79	.83	.76	285	246	256	46	58	67	67	1.95	5
	15	93.61	.83	.76	285	248	257	45	46	68	67	1.95	5
3	20	97.43	.83	.77	285	247	257	44	46	69	67	2	5
	25	101.29	.81	.76	286	247	256	43	47	70	67	2	5
4	30	105.14	.78	.74	286	247	256	43	46	71	67	1.9	5
	35	108.94	.75	.73	286	250	257	43	46	72	68	1.8	5
5	40	112.66	.70	.70	286	247	256	43	44	72	68	1.7	4.7
	45	116.27	.70	.70	286	247	256	43	43	72	68	1.7	4.7
6	50	119.81	.63	.67	287	247	256	43	45	73	68	1.5	4.5
	55	123.23	.60	.65	287	247	256	43	43	74	69	1.4	4.2
7	60	126.51	.69	.70	287	247	256	43	42	74	69	1.7	4.7
	65	130.06	.66	.69	287	247	256	43	44	75	70	1.6	4.7
8	70	133.57	.69	.70	286	247	256	44	43	75	70	1.7	4.7
	75	137.13	.71	.71	286	247	255	43	43	75	70	1.7	4.7
9	80	140.66	.71	.71	287	247	256	43	45	76	70	1.7	5
	85	144.26	.71	.71	286	247	256	43	43	76	71	1.7	5
10	90	147.86	.71	.71	286	247	256	43	43	76	71	1.7	5
	95	151.45	.68	.70	286	247	257	44	44	76	71	1.65	5
11	100	155.03	.60	.66	285	247	257	44	45	76	72	1.5	4.5

Traverse: 2				
Start Time: 9:18	Initial Leak Check: .005	cfm@ 16	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg

Traverse: X				
Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time: X	Final Leak Check: X	cfm @ X	"Hg

Project No.: 21800

Operator : DT

Field Data Sheet

Date: OCT 12, 17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	158.38	.60	.66	281	249	258	46	44	78	73	1.5	4.5
12	110	161.72	.55	.67	277	249	256	44	44	78	72	1.3	4
	115	164.92	.58	.65	260	246	256	44	42	76	72	1.4	4.5
	120	~~168.18~~											
		168.18											

Traverse: 2			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 11:18	Final Leak Check: .004	cfm@ 16	"Hg

Traverse: X			
Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time:	Final Leak Check: X	cfm @ X	"Hg

Project No.: 21800

Operator : DT

Field Data Sheet

Date: 06/12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	168.66	.65	.69	285	246	257	61	41	73	72	1.7	5.5
	5	172.22	.72	.74	245	246	256	46	44	73	73	1.9	6
2	10	176.16	.75	.75	245	246	256	45	46	74	73	1.9	6
	15	179.95	.71	.73	245	245	256	45	41	74	72	1.8	6
3	20	183.71	.74	.73	285	246	256	45	41	75	72	1.8	6
	25	187.41	.74	.73	286	246	258	46	43	75	72	1.8	6
4	30	191.10	.71	.72	286	246	257	46	44	76	73	1.7	6
	35	194.78	.71	.72	286	246	256	46	44	77	73	1.7	6
5	40	198.42	.71	.72	285	250	257	46	43	77	73	1.7	6
	45	202.06	.75	.74	286	249	258	46	45	78	73	1.9	6
6	50	205.86	.75	.74	286	249	258	46	45	78	73	1.9	6
	55	209.66	.75	.74	286	249	258	46	44	78	74	1.9	6
7	60	213.41	.66	.69	287	249	257	47	45	78	74	1.6	6
	65	216.99	.66	.69	286	249	257	47	44	79	74	1.6	6
8	70	220.54	.72	.72	286	249	258	48	45	79	75	1.8	6
	75	224.17	.74	.73	286	250	256	47	47	79	74	1.85	6.2
9	80	227.93	.76	.74	286	250	255	48	47	79	75	1.85	6.2
	85	231.69	.79	.75	285	250	254	47	45	80	75	1.9	6.5
10	90	235.53	.84	.78	286	251	255	47	48	80	75	2.1	7
	95	239.50	.84	.78	286	251	255	47	48	80	75	2.1	7
11	100	243.49	.84	.78	286	250	256	47	47	80	76	2.1	7

Traverse:	1				
Start Time:	11:39	Initial Leak Check:	.006	cfm@	16 "Hg
Finish Time:	—	Final Leak Check:	—	cfm@	— "Hg

Traverse:	X				
Start Time:		Initial Leak Check:	X	cfm @	X "Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : DT

Field Data Sheet

Date: OCT 12, 17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P $"H_2O$	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H $"H_2O$	Pump Vacuum "Hg Gauge
	105	247.45	.84	.78	286	251	255	47	47	80	76	2.1	7
12	110	251.44	.90	.81	285	250	255	47	48	80	76	2.2	7.2
	115	255.55	.90	.81	286	251	255	47	49	80	76	2.2	7.2
	120	259.74											

Traverse:	/	Traverse:	X
Start Time:	—	Initial Leak Check: — cfm@ — "Hg	Start Time:	Initial Leak Check: X cfm @ X "Hg
Finish Time:	13:39	Final Leak Check: .004 cfm@ 16 "Hg	Finish Time:	Final Leak Check:

Project No.: 21800

Operator : DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	OCT 12, 17
Test Location	APC Outlet No. 2
Operator Signature	BJURTON

Project No.:	21800
Page	1 of 5
Probe No.:	6C
Meter Box No.:	TEAM 1
Impinger Box No.:	2

Pitot Factor	.847 ✓	
DGMCF	.987 ✓	
Barometric Pressure	30.00	"Hg
Static Pressure	-9.2	"H2O
Nozzle Size	.2335 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:	12	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	683.3 ✓	g
WCBDA	20.6 ✓	g

Combustion Gas Concentration

Oxygen	7.91 ✓	%
Carbon Dioxide	11.20 ✓	%
Carbon Monoxide	10.2	ppm

Measuring Device	MII Numbers
Probe / Pitot	See
Trendicator	
Control Box	
Incline Manometer	Test
Comb.Gas.Analyzer	
Micromanometer	
Barometer	#1
Calipers	

Nozzle Measurements	
1	See
2	
3	Test
4	
Average:	tbf

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) / Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: OCT 12, 17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	60.44	.68	.71	275	252	240	67	42	76	75	1.7	6.5
	5	64.20	.72	.72	286	250	245	58	39	76	75	1.7	6.5
2	10	67.78	.72	.72	286	247	247	57	39	75	75	1.7	6.5
	15	71.32	.72	.72	286	250	248	56	40	76	75	1.7	6.5
3	20	74.85	.72	.72	285	249	249	54	41	75	75	1.7	7
	25	78.42	.72	.72	286	250	251	54	41	77	75	1.7	7
4	30	82.05	.72	.72	285	250	251	54	40	78	75	1.7	7
	35	85.72	.72	.72	286	250	252	53	40	79	75	1.7	7
5	40	89.38	.69	.71	286	250	251	52	40	79	76	1.7	7
	45	93.03	.69	.71	286	250	250	53	40	79	76	1.7	7
6	50	96.66	.67	.70	286	250	250	53	41	80	76	1.6	7
	55	100.23	.67	.70	286	250	252	53	42	80	76	1.6	7
7	60	103.79	.67	.70	286	251	250	53	42	81	76	1.6	7
	65	107.35	.67	.70	286	251	250	51	42	81	77	1.6	7
8	70	110.90	.74	.74	287	250	252	53	41	81	77	1.8	7.5
	75	114.56	.77	.75	287	250	252	51	40	81	77	1.9	8
9	80	118.35	.77	.75	287	250	250	50	41	81	77	1.9	8
	85	122.15	.77	.75	287	250	252	50	42	82	78	1.9	8
10	90	125.94	.77	.75	287	250	252	50	42	82	78	1.9	8
	95	129.74	.77	.75	287	251	252	50	43	81	78	1.9	8
11	100	133.52	.80	.77	286	252	253	50	44	82	78	2	8.5

Traverse: 14:52					
Start Time: 14:52	Initial Leak Check: .008	cfm@ 16	"Hg		
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg		

Traverse: X					
Start Time: X	Initial Leak Check: X	cfm @ X	"Hg		
Finish Time:	Final Leak Check: X	cfm @ X	"Hg		

Project No.: 21800

Operator : D TURTON

Field Data Sheet

Date: OCT 12/17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	137.40	.82	.78	286	251	252	50	46	82	78	2	8.5
12	110	141.30	.82	.78	296	251	252	50	46	82	78	2	8.5
	115	145.19	.82	.78	286	251	253	51	45	82	78	2	8.5
	120	149.17											

Traverse: 1				
Start Time: ~	Initial Leak Check: —	cfm@ →	"Hg
Finish Time: 16:52	Final Leak Check: .006	cfm@ 15	"Hg

Traverse:				
Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time: X	Final Leak Check: X	cfm @ X	"Hg

Project No.: 21800

Operator : DT

Field Data Sheet

Date: Oct 12, 17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	149.59	.68	.71	276	249	250	68	44	80	78	1.7	8.5
	5	153.33	.73	.73	281	250	252	54	41	79	79	1.8	8.5
2	10	157.06	.73	.73	282	250	252	50	40	79	78	1.8	8.5
	15	160.79	.70	.72	283	249	252	50	41	80	78	1.75	8.5
3	20	164.51	.72	.73	289	249	252	51	42	80	78	1.8	8.5
	25	168.17	.72	.73	286	249	252	51	41	80	78	1.8	8.5
4	30	171.85	.73	.73	286	249	252	51	41	80	78	1.8	8.5
	35	175.53	.73	.73	286	249	252	52	42	81	78	1.8	8.5
5	40	179.18	.71	.72	287	250	252	52	42	81	78	1.8	8.5
	45	182.84	.71	.72	287	250	252	53	42	82	78	1.8	8.5
6	50	186.52	.66	.70	287	250	252	53	41	82	78	1.6	8.5
	55	190.10	.66	.70	287	251	253	54	48	83	80	1.8	8.5
7	60	193.71	.56	.64	285	251	252	51	39	82	79	1.4	8
	65	197.30	.56	.64	283	250	252	49	40	82	79	1.4	8
8	70	200.42	.64	.69	284	250	253	48	40	82	79	1.6	8.2
	75	203.88	.66	.70	285	250	253	48	42	82	79	1.7	8.5
9	80	207.41	.73	.73	285	250	253	47	40	83	79	1.8	8.5
	85	211.11	.73	.73	285	250	253	47	40	83	79	1.8	8.5
10	90	214.78	.78	.76	285	250	252	47	42	83	79	1.9	9
	95	218.55	.80	.77	285	250	252	47	42	83	79	2	9.5
11	100	222.42	.80	.77	286	251	252	47	42	83	80	2	9.5

Traverse: 2					Traverse:				
Start Time: 17:10	Initial Leak Check: .004	cfm@ 15	"Hg		Start Time: X	Initial Leak Check: X	cfm @	"Hg	
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg		Finish Time: X	Final Leak Check: X	cfm @	"Hg	

Project No.: 21800

Operator : DT

Field Data Sheet

Date: OCT 2 17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	226.29	.82	.78	286	251	252	48	42	82	80	2.1	10
12	110	230.28	.80	.77	286	251	252	48	42	82	80	2	10
	115	234.19	.80	.77	286	251	252	48	42	83	80	2	10
	120	238.13											

Traverse: 2				Traverse: X			
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg	Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time: 19:10	Final Leak Check: .006	cfm@ 16	"Hg	Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date	OCT 13, 17
Test Location	APC Outlet No. 2
Operator Signature	D TURTON

Project No.:	21800
Page	1 of 5
Probe No.:	6C
Meter Box No.:	TRAIN 1
Impinger Box No.:	4

Pitot Factor	.847	
DGMCF	987	
Barometric Pressure	29.94	"Hg
Static Pressure	-9.15	"H2O
Nozzle Size	.2515	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	692.6	g
WCBDA	20.0	g

Combustion Gas Concentration

Oxygen	7.85	%
Carbon Dioxide	11.27	%
Carbon Monoxide	20.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	Set
Trendicator	
Control Box	
Incline Manometer	Test
Comb.Gas.Analyzer	
Micromanometer	
Barometer	#1
Calipers	

Nozzle Measurements	
1	Set
2	
3	Test
4	
Average:	#1

Site Diagram

Notes: TRAIN 3 DGMCF: 0.985

BLANK 1 TRAIN VOL: 41.8 ft³ 38.88 → 40.75

Field Data Sheet

Date: OCT 13, 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	38.85	.84	.78	285	245	257	68	43	77	76	2	8
	5	42.72	.88	.80	288	249	257	52	43	77	76	2.2	9.5
2	10	46.70	.91	.81	288	250	258	51	44	76	76	2.2	9.5
	15	50.82	.91	.81	288	251	259	50	45	77	76	2.2	9.5
3	20	54.91	.91	.81	288	250	253	50	45	77	76	2.2	9.5
	25	59.03	.91	.81	288	250	253	49	45	78	76	2.2	9.5
4	30	63.10	.82	.77	288	251	255	49	44	78	76	2	9.5
	35	67.12	.82	.77	288	251	254	49	43	79	76	2	9.5
5	40	71.08	.75	.74	287	251	254	49	42	80	77	1.9	9
	45	74.96	.75	.74	287	251	255	49	43	80	77	1.9	9
6	50	78.82	.67	.70	288	251	254	49	43	80	77	1.6	8
	55	82.41	.67	.70	287	251	255	50	42	81	77	1.6	8
7	60	85.97	.67	.70	286	250	255	50	41	80	77	1.6	8
	65	89.53	.67	.70	286	250	255	50	42	81	77	1.6	8
8	70	93.08	.7	.72	286	250	255	50	42	81	77	1.7	8
	75	96.69	.70	.72	285	250	255	50	42	81	78	1.7	8
9	80	100.31	.70	.72	286	250	255	50	42	81	78	1.7	8
	85	103.92	.7	.72	286	250	255	50	42	82	78	1.7	8
10	90	107.54	.68	.71	286	250	255	50	43	81	78	1.7	8
	95	111.13	.68	.71	286	250	255	50	43	81	78	1.7	8
11	100	114.69	.56	.64	286	250	254	50	45	82	78	1.4	8

Traverse: 1				Traverse: X			
Start Time: 08:36	Initial Leak Check: .008	cfm@ 15	"Hg	Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg	Finish Time: X	Final Leak Check: X	cfm @ X	"Hg

TS 08:33

Project No.: 21800

Operator : DT

Field Data Sheet

Date: Oct 13, 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	118.04	.56	.65	273	249	254	51	45	81	79	1.4	8
12	110	121.73	.56	.65	274	250	254	51	43	82	79	1.4	8
	115	124.63	.56	.65	274	250	255	51	41	82	79	1.4	8
	120	127.92											

Traverse:					
Start Time:	—	Initial Leak Check:	—	cfm@	— "Hg
Finish Time:	10:36	Final Leak Check:	0.015	cfm@	16 "Hg

Traverse:					
Start Time:	X	Initial Leak Check:	X	cfm @	X "Hg
Finish Time:	X	Final Leak Check:	X	cfm @	X "Hg

Project No.: 21800

Operator : DT

Field Data Sheet

Date: OCT 13, 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	128.83	.80	.77	285	249	262	65	59	80	79	2	10.5
	5	132.76	.8	.77	285	247	253	50	44	79	79	2	10.5
2	10	136.72	.88	.80	285	248	254	48	44	79	79	2.1	10.5
	15	140.69	.86	.8	296	248	255	47	45	79	79	2.1	~~10.5~~ 11
3	20	144.72	.82	.78	286	249	254	48	45	79	78	2	11
	25	148.71	.82	.79	287	249	254	46	45	79	78	2	11
4	30	152.67	.78	.76	287	250	254	47	45	79	79	2	10.5
	35	156.63	.76	.75	287	250	254	47	45	80	78	1.9	10.5
5	40	160.47	.70	.72	288	250	254	47	45	79	78	1.7	10
	45	164.14	.7	.72	287	250	255	47	43	79	78	1.7	10
6	50	167.77	.63	.68	287	251	255	47	44	80	78	1.5	9
	55	171.25	.63	.68	288	250	255	48	44	80	78	1.5	9
7	60	174.74	.7	.72	287	250	255	48	42	80	78	1.7	9.5
	65	178.31	.7	.72	287	250	255	48	42	80	78	1.7	9.5
8	70	181.90	.74	.74	287	250	255	48	43	80	78	1.9	10
	75	185.59	.72	.73	287	250	255	48	45	80	78	1.6	10
9	80	189.28	.71	.72	287	250	254	48	46	80	78	1.6	10
	85	192.91	.71	.72	287	250	254	48	49	81	79	1.6	10
10	90	196.54	.68	.71	287	250	255	48	54	81	79	1.6	10
	95	200.16	.68	.71	286	250	255	49	44	81	79	1.6	~~10~~ 9.5
11	100	203.72	.62	.68	278	250	255	49	40	82	79	1.5	9

Traverse: 2					Traverse:				
Start Time: 11:02	Initial Leak Check: .009	cfm@ 16	"Hg		Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time: —	Final Leak Check: —	cfm@ —	"Hg		Finish Time:	Final Leak Check: X	cfm @ X	"Hg

Project No.: 21800

Operator : DT

Field Data Sheet

Date: OCT 13, 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
	105	207.17	.60	.67	263	249	254	49	40	82	79	1.5	9
12	110	210.62	.62	.69	262	249	254	49	40	82	79	1.5	9
	115	214.05	62	.69	262	250	259	49	40	82	79	1.5	9
	120	217.47											

Traverse: 2				
Start Time: —	Initial Leak Check: —	cfm@ —	"Hg
Finish Time: 13:02	Final Leak Check: 0.012	cfm@ 15-5	"Hg

Traverse:				
Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	Semi-Volatile Organic Compounds
Test Date	12 oct 17
Test Location	Quench Inlet No. 1
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	68 (6.5 series)
Meter Box No.:	12
Impinger Box No.:	14 ✓

Pitot Factor	0.846 ✓	
DGMCF	1.004 ✓	
Barometric Pressure	30.04	"Hg
Static Pressure	-.049	"H2O
Nozzle Size	0.3378 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	—	mg
Probe	—	mg

Moisture Gain

CWTR	437.4 ✓	g
WCBDA	11.7 ✓	g

Combustion Gas Concentration

Oxygen	7.61 ✓	%
Carbon Dioxide	11.13 ✓	%
Carbon Monoxide	8.5	ppm

Measuring Device	MII Numbers
Probe / Pitot S/L	CCE200098
Trendicator	
Control Box 12	B037100
Incline Manometer #5	B00717
Comb.Gas.Analyzer	DYECHEM
Micromanometer	
Barometer	Env Can
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	0.3370
2	0.3375
3	0.3380
4	0.3385
Average:	0.3378 ✓

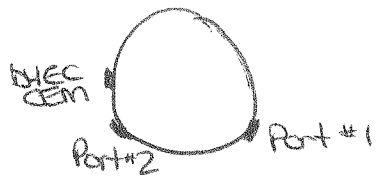
Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram



Notes:

Field Data Sheet

Date: 12 Oct 17	Plant: Covanta DYEC	Test No.: SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm 0.51	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
1	0	91.51	0.48	~~0.47~~	333	259	258	71	72	76	78	0.7	5
	2.5	92.77	0.46	0.50	338	262	257	58	37	79	76	0.7	5
	5	94.00	0.46	0.50	334	259	257	56	38	80	76	0.7	5.5
2	7.5	95.21	0.55	0.55	333	260	258	56	37	83	76	0.9	6
	10	96.63	0.56	0.55	334	264	258	52	38	80	77	0.9	6
	12.5	98.07	0.55	0.55	335	262	256	53	39	85	78	0.9	6.5
3	15	99.49	0.57	0.56	334	261	257	49	43	85	77	0.95	7
	17.5	100.87	0.62	0.58	334	262	256	49	45	83	77	1.0	7
	20	102.31	0.67	0.61	336	265	257	48	41	85	78	1.15	8
4	22.5	103.85	0.67	0.61	336	266	256	47	41	86	79	1.15	8
	25	105.39	0.62	0.58	336	267	256	46	49	86	79	1.1	8
	27.5	106.92	0.60	0.58	334	266	256	45	42	87	80	1.0	8.5
5	30	108.43	0.57	0.56	333	260	256	44	41	89	81	0.9	8.5
	32.5	109.89	0.59	0.57	335	263	256	44	42	90	81	1.0	8.5
	35	111.26	0.57	0.57	333	263	255	44	44	90	82	1.0	8.5
6	37.5	112.64	0.61	0.59	334	264	255	45	46	91	83	1.05	9
	40	114.11	0.63	0.60	334	267	256	44	42	92	84	1.1	9.5
	42.5	115.63	0.63	0.60	333	266	255	46	42	93	85	1.1	9.5
7	45	117.17	0.75	0.65	332	265	255	44	42	93	85	1.25	11.5
	47.5	118.80	0.75	0.65	332	263	255	43	44	95	87	1.25	11.5
	50	120.47	0.73	0.65	331	264	256	43	43	95	86	1.2	11.5

Traverse: 1					
Start Time: 9:38	Initial Leak Check: 0.005	cfm@	15	"Hg
Finish Time: 11:08	Final Leak Check: 0.004	cfm@	23	"Hg

Traverse:					
Start Time:	Initial Leak Check:	cfm @		"Hg
Finish Time:	Final Leak Check:	cfm @		"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 10 Oct 17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	122.10	0.73	0.65	331	261	254	44	44	96	87	1.2	12
	55	123.72	0.74	0.65	331	264	254	44	44	97	88	1.25	12
	57.5	125.35	0.74	0.65	331	266	255	44	43	98	88	1.25	12
9	60	126.96	0.75	0.66	331	265	255	47	45	98	89	1.3	12.5
	62.5	128.60	0.75	0.66	331	265	256	44	43	99	90	1.3	12.5
	65	130.23	0.80	0.68	331	267	254	43	44	100	91	1.4	13.5
10	67.5	131.97	0.80	0.68	330	264	253	45	42	100	91	1.4	13.5
	70	133.65	0.76	0.67	331	264	254	42	43	101	91	1.3	13.5
	72.5	135.26	0.76	0.67	330	265	254	42	42	101	92	1.3	13.5
11	75	136.95	0.65	0.62	329	266	255	41	44	102	92	1.1	13.5
	77.5	138.56	0.66	0.62	328	265	253	41	41	102	93	1.1	13.5
	80	140.15	0.69	0.64	327	265	254	42	42	103	94	1.2	14
12	82.5	141.74	0.70	0.64	328	265	253	41	42	103	94	1.2	14
	85	143.35	0.69	0.64	328	264	253	41	42	104	94	1.2	14
	87.5	144.96	0.69	0.64	328	264	254	43	43	105	96	1.2	14
	90	146.57											

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 12 Oct 17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	147.17	0.60	0.58	334	269	261	69	50	92	90	1.0	5
	2.5	148.62	0.61	0.59	334	272	257	49	40	93	90	1.05	5
	5	150.15	0.62	0.59	334	268	256	46	43	93	89	1.05	5
2	7.5	151.68	0.60	0.59	334	268	257	44	41	93	90	1.0	5.5
	10	153.16	0.59	0.58	333	267	259	42	42	94	90	1.0	5.5
	12.5	154.60	0.59	0.58	333	265	258	41	43	94	89	1.0	5.5
3	15	156.06	0.73	0.65	333	265	257	41	42	95	89	1.25	7.5
	17.5	157.68	0.73	0.65	333	262	257	40	43	95	89	1.25	7.5
	20	159.31	0.72	0.64	333	263	258	41	43	97	90	1.25	7.5
4	22.5	160.93	0.73	0.65	332	265	257	40	43	97	89	1.25	8
	25	162.52	0.73	0.65	333	267	256	40	42	97	90	1.25	8
	27.5	164.13	0.72	0.64	334	261	256	40	43	98	91	1.25	8
5	30	165.73	0.70	0.64	335	260	256	40	43	100	91	1.2	8.5
	32.5	167.32	0.71	0.64	335	263	256	40	44	101	91	1.2	8.5
	35	168.95	0.70	0.64	334	267	256	40	42	100	92	1.2	8.5
6	37.5	170.57	0.66	0.62	333	266	256	40	44	101	92	1.15	9
	40	172.16	0.65	0.62	332	266	256	40	43	101	93	1.1	9
	42.5	173.71	0.65	0.62	332	260	256	40	43	101	93	1.1	9
7	45	175.25	0.73	0.65	332	263	256	41	42	102	94	1.3	10
	47.5	176.86	0.73	0.65	332	259	256	41	43	102	94	1.3	10
	50	178.54	0.74	0.66	333	261	256	41	44	103	94	1.3	10

Traverse: 2			
Start Time: 11:48	Initial Leak Check: 0.005	cfm@ 21	"Hg
Finish Time: 13:18	Final Leak Check: 0.003	cfm@ 22 1/2	"Hg

Traverse: /			
Start Time: /	Initial Leak Check: /	cfm @ /	"Hg
Finish Time: /	Final Leak Check: /	cfm @ /	"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 12 Oct 17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	180.22	0.79	0.68	332	260	256	41	44	104	95	1.4	12
	55	181.95	0.80	0.69	332	263	256	41	45	104	95	1.4	12
	57.5	183.70	0.78	0.68	332	265	256	41	45	105	95	1.35	12
9	60	185.43	0.79	0.68	331	263	255	41	44	105	96	1.35	12
	62.5	187.16	0.79	0.68	331	261	255	42	45	106	96	1.35	12
	65	188.86	0.80	0.69	330	260	255	42	45	106	97	1.4	12.5
10	67.5	190.56	0.79	0.69	330	263	255	42	44	107	96	1.4	12.5
	70	192.30	0.79	0.69	330	261	256	42	44	107	97	1.4	12.5
	72.5	194.05	0.80	0.69	331	266	256	42	46	107	98	1.4	13
11	75	195.79	0.75	0.67	330	267	256	42	46	107	98	1.3	13
	77.5	197.50	0.73	0.66	333	267	255	42	43	107	98	1.3	13
	80	199.20	0.75	0.67	330	261	255	43	44	109	98	1.3	13
12	82.5	200.90	0.74	0.67	330	260	255	43	44	108	99	1.3	13
	85	202.58	0.74	0.67	330	263	254	43	44	108	99	1.3	13
	87.5	204.27	0.74	0.67	330	265	254	43	45	109	99	1.3	13
	90	205.95											

Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : TS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date	12 Oct 17
Test Location	Quench Inlet No. 1
Operator Signature	TS

Project No.:	21800
Page	1 of 5
Probe No.:	6.5 series (6B)
Meter Box No.:	12
Impinger Box No.:	15 ✓

Pitot Factor	0.846	
DGMCF	1.004	
Barometric Pressure	30.00	"Hg
Static Pressure	-2.49	"H2O
Nozzle Size	0.2378	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	—	mg
Probe	—	mg

Moisture Gain

CWTR	418.3 ✓	g
WCBDA	10.6	g

Combustion Gas Concentration

Oxygen	7.65	%
Carbon Dioxide	11.01	%
Carbon Monoxide	13.3	ppm

Measuring Device	MII Numbers
Probe / Pitot SP6	COE20098
Trendicator	
Control Box 12	B03700
Incline Manometer	#5 B00717
Comb.Gas.Analyzer	DYEC CEMS
Micromanometer	
Barometer	Env Can
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 ____
2 See
3 Test #1
4 ____
Average:

Probe Liner (Glass) / Metal /Teflon / Other__________

Nozzle (Glass) / Metal / Other__________

Union None /Metal / (Teflon) / Other__________

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: 12 Oct 17	Plant: Covanta DYEC	Test No.: ② SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	6.71	0.51	0.53	330	258	255	77	49	86	84	0.8	3
	2.5	8.06	0.52	0.54	333	254	263	71	47	86	84	0.8	3
	5	9.42	0.51	0.53	334	254	261	67	47	87	85	0.8	3
2	7.5	10.76	0.52	0.54	335	260	258	65	46	88	84	0.8	3
	10	12.10	0.50	0.53	333	254	257	64	41	90	84	0.8	3.5
	12.5	13.44	0.51	0.54	332	256	258	63	41	88	84	0.8	3.5
3	15	14.78	0.55	0.56	332	259	259	61	39	88	84	0.9	4.5
	17.5	16.22	0.55	0.56	330	255	258	59	40	90	85	0.9	4.5
	20	17.65	0.56	0.56	333	264	260	58	40	91	85	0.9	4.5
4	22.5	19.08	0.56	0.56	333	257	258	56	40	91	85	0.9	5
	25	20.50	0.55	0.56	333	256	257	54	41	92	86	0.9	5
	27.5	21.94	0.55	0.56	333	263	257	53	40	94	87	0.9	5
5	30	23.38	0.56	0.56	333	261	257	51	39	94	87	0.9	5.5
	32.5	24.82	0.56	0.57	334	264	257	51	40	95	88	0.9	5.5
	35	26.25	0.55	0.56	333	262	257	50	41	95	88	0.9	5.5
6	37.5	27.67	0.55	0.56	330	259	257	49	39	96	88	0.9	6
	40	29.08	0.56	0.57	332	258	257	49	39	97	89	0.95	6
	42.5	30.51	0.56	0.57	330	263	257	49	40	98	90	0.95	6
7	45	31.93	0.76	0.66	332	263	256	49	39	98	91	1.3	7.5
	47.5	33.62	0.76	0.66	332	263	256	48	40	99	91	1.3	7.5
	50	35.34	0.77	0.67	330	264	256	48	40	100	92	1.3	7.5

Traverse: 1			
Start Time: 15:01	Initial Leak Check: 0.006	cfm@	19 1/2 "Hg
Finish Time: 16:31	Final Leak Check: 0.004	cfm@	18 1/2 "Hg

Traverse: /			
Start Time: /	Initial Leak Check: /	cfm @ /	"Hg
Finish Time:	Final Leak Check: /	cfm @ /	"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: Dec 17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	37.05	0.80	0.68	332	263	256	47	40	101	90	1.4	8.5
	55	38.81	0.81	0.69	332	262	256	47	40	102	93	1.4	8.5
	57.5	40.56	0.81	0.69	333	264	256	47	40	103	94	1.4	8.5
9	60	42.29	0.82	0.69	333	257	256	47	41	103	94	1.45	9
	62.5	44.05	0.83	0.70	333	265	256	47	41	104	95	1.45	9
	65	45.81	0.83	0.70	333	258	256	47	40	105	95	1.45	9
10	67.5	47.55	0.78	0.68	333	258	256	47	41	105	96	1.4	9.5
	70	49.27	0.78	0.68	333	259	256	47	41	106	96	1.4	9.5
	72.5	51.00	0.77	0.68	333	258	256	48	41	106	97	1.4	9.5
11	75	52.70	0.75	0.67	332	258	256	48	41	106	97	1.35	9.5
	77.5	54.40	0.74	0.66	332	258	256	48	42	107	98	1.3	9.5
	80	56.08	0.74	0.66	333	259	256	48	41	107	98	1.3	9.5
12	82.5	57.76	0.72	0.66	332	258	255	48	42	108	98	1.3	9.5
	85	59.43	0.73	0.66	332	265	255	49	41	108	99	1.3	9.5
	87.5	61.09	0.73	0.66	331	265	256	49	41	108	99	1.3	9.5
	90	62.76											

Traverse:	
Start Time:	Initial Leak Check: cfm@ "Hg
Finish Time:	Final Leak Check: cfm@ "Hg

Traverse:	
Start Time:	Initial Leak Check: cfm @ "Hg
Finish Time:	Final Leak Check: cfm @ "Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 12 Oct 17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	63.41	0.65	0.61	336	262	259	75	51	96	94	1.1	5
	2.5	64.99	0.67	0.62	336	259	260	60	41	97	93	1.15	5
	5	66.55	0.66	0.62	336	263	260	53	41	95	93	1.15	5
2	7.5	68.11	0.66	0.62	336	260	258	51	41	96	92	1.15	5.5
	10	69.65	0.68	0.63	336	260	260	50	41	97	93	1.2	6
	12.5	71.26	0.67	0.62	336	261	258	49	41	97	92	1.15	6
3	15	72.86	0.72	0.64	336	268	259	48	41	98	92	1.2	6.5
	17.5	74.47	0.74	0.65	336	266	259	48	41	98	93	1.3	7
	20	76.14	0.75	0.66	336	267	258	48	42	99	93	1.3	7
4	22.5	77.81	0.72	0.65	336	263	258	47	41	100	93	1.2	7
	25	79.44	0.73	0.65	336	259	258	47	41	100	94	1.25	7.5
	27.5	81.06	0.75	0.66	337	266	258	47	41	101	94	1.3	7.5
5	30	82.73	0.74	0.66	337	263	258	47	42	102	94	1.3	7.5
	32.5	84.39	0.71	0.64	337	266	258	47	42	102	95	1.2	8
	35	86.05	0.72	0.65	337	258	257	47	42	104	95	1.2	8
6	37.5	87.69	0.68	0.63	336	261	257	47	42	103	95	1.2	8
	40	89.30	0.67	0.63	336	258	257	47	42	104	96	1.15	8.5
	42.5	90.87	0.65	0.62	335	266	257	47	42	104	96	1.15	8.5
7	45	92.44	0.73	0.66	334	261	257	48	42	104	97	1.3	9
	47.5	94.10	0.72	0.65	332	266	257	48	42	105	97	1.3	9.5
	50	95.78	0.72	0.65	333	264	256	48	43	106	97	1.3	9.5

Traverse: 2			
Start Time: 17:10	Initial Leak Check: 0.005	cfm@	18 1/2 "Hg
Finish Time: 18:40	Final Leak Check: 0.003	cfm@	24 "Hg

Traverse:			
Start Time: /	Initial Leak Check: /	cfm @ /	"Hg
Finish Time:	Final Leak Check: /	cfm @ /	"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 12 Oct 17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	97.41	0.73	0.66	332	261	256	48	44	106	98	1.3	9.5
	55	99.11	0.78	0.68	332	265	256	48	43	106	98	1.4	10
	57.5	100.83	0.78	0.68	332	259	256	48	44	107	98	1.4	10
9	60	102.60	0.79	0.68	331	264	256	48	44	108	99	1.4	10
	62.5	104.31	0.78	0.68	331	264	256	48	45	108	98	1.4	10
	65	106.05	0.78	0.68	330	264	256	49	45	108	99	1.4	10
10	67.5	107.78	0.79	0.68	331	265	255	49	43	108	99	1.4	10
	70	109.46	0.78	0.68	330	260	255	49	41	109	100	1.4	11
	72.5	111.18	0.78	0.68	331	256	255	49	41	109	100	1.4	11
11	75	112.89	0.78	0.68	330	258	256	50	41	109	101	1.4	11.5
	77.5	114.63	0.77	0.68	330	262	256	50	41	109	101	1.35	11.5
	80	116.37	0.77	0.68	329	265	256	50	39	109	101	1.35	12
12	82.5	118.07	0.77	0.68	330	266	256	51	39	110	101	1.35	12.5
	85	119.79	0.79	0.69	330	259	256	51	39	110	101	1.4	13.5
	87.5	121.52	0.80	0.69	330	264	255	51	40	110	101	1.4	13.5
	90	123.25											

Traverse:				
Start Time:	/	Initial Leak Check:	/ cfm@ /	"Hg
Finish Time:	/	Final Leak Check:	/ cfm@ /	"Hg

Traverse:				
Start Time:	/	Initial Leak Check:	/ cfm @ /	"Hg
Finish Time:	/	Final Leak Check:	/ cfm @ /	"Hg

Project No.: 21800

Operator : TS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date	13 Oct 17
Test Location	Quench Inlet No. 1
Operator Signature	TS

Project No.:	21800	
Page	1 of 5	
Probe No.:	6B	
Meter Box No.:	12	
Impinger Box No.:	14	✓

Pitot Factor	0.846 ✓	
DGMCF	1.004 ✓	
Barometric Pressure	29.94	"Hg
Static Pressure	-2.35	"H2O
Nozzle Size	0.2378 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	—	mg
Probe	—	mg

Moisture Gain

CWTR	433.3 ✓	g
WCBDA	8.5 ✓	g

Combustion Gas Concentration

Oxygen	8.02 ✓	%
Carbon Dioxide	10.75 ✓	%
Carbon Monoxide	16.7	ppm

Measuring Device	MII Numbers
Probe / Pitot SP6	COE 20098
Trendicator	
Control Box 13	B03700
Incline Manometer	#5 B00717
Comb.Gas.Analyzer	DYEC CEM
Micromanometer	
Barometer	EnvCan
Calipers	

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 See
2 Test #1
3 ____
4 ____
Average:

Probe Liner (Glass) / Metal / Teflon / Other________

Nozzle (Glass) / Metal / Other________

Union None / Metal / (Teflon) / Other________

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: 13 Oct 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	23.97	0.49	0.52	332	259	259	77	53	87	86	0.8	2.5
	2.5	25.32	0.51	0.53	333	256	259	63	45	87	85	0.8	2.5
	5	26.62	0.51	0.53	333	253	259	58	45	87	85	0.85	3.5
2	7.5	27.97	0.50	0.53	333	257	259	57	44	89	86	0.85	3.5
	10	29.30	0.50	0.53	333	258	259	57	44	89	85	0.85	4
	12.5	30.62	0.49	0.52	332	259	259	57	44	88	85	0.85	4
3	15	31.92	0.58	0.57	332	259	258	57	44	90	86	1.0	5
	17.5	33.36	0.58	0.57	333	260	258	55	45	91	86	1.0	5
	20	34.81	0.57	0.57	333	260	258	54	45	92	87	1.0	5
4	22.5	36.25	0.60	0.58	333	256	257	53	45	93	87	1.05	5.5
	25	37.74	0.60	0.58	333	259	257	52	44	93	88	1.05	5.5
	27.5	39.22	0.59	0.58	334	258	256	52	44	95	88	1.05	6
5	30	40.69	0.59	0.58	334	258	256	51	45	95	89	1.05	6
	32.5	42.16	0.59	0.58	334	262	258	52	46	96	89	1.05	6
	35	43.62	0.59	0.58	335	266	256	51	46	97	90	1.05	6
6	37.5	45.07	0.62	0.60	334	257	256	51	46	99	91	1.1	7.5
	40	46.61	0.63	0.60	334	259	257	50	46	99	91	1.1	7.5
	42.5	48.16	0.63	0.60	334	260	256	50	46	100	92	1.05	7.5
7	45	49.69	0.81	0.68	334	257	256	51	45	100	92	1.4	9
	47.5	51.35	0.81	0.68	334	262	255	50	46	101	93	1.4	9.5
	50	53.07	0.81	0.69	333	259	256	49	48	103	93	1.4	9.5

Traverse: 1				Traverse: /			
Start Time: 8:33	Initial Leak Check: 0.007	cfm@ 21 1/2	"Hg	Start Time: /	Initial Leak Check: /	cfm @ /	"Hg
Finish Time: 10:03	Final Leak Check: 0.003	cfm@ 16	"Hg	Finish Time: /	Final Leak Check: /	cfm @ /	"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 13 Oct 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot ΔP "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
8	52.5	54.80	0.83	0.69	334	265	255	49	48	103	94	1.45	10.5
	55	56.55	0.82	0.69	333	260	255	49	48	104	95	1.45	10.5
	57.5	58.30	0.82	0.69	333	262	255	49	46	104	95	1.45	11
9	60	60.05	0.82	0.69	332	262	256	49	45	105	97	1.45	11
	62.5	61.77	0.83	0.70	332	265	254	50	46	106	97	1.45	11.5
	65	63.53	0.83	0.70	332	258	255	50	46	107	97	1.45	12
10	67.5	65.30	0.79	0.68	331	261	255	50	47	107	98	1.4	12
	70	67.06	0.78	0.68	331	258	255	51	46	108	98	1.35	12
	72.5	68.76	0.78	0.68	331	262	255	51	47	108	99	1.35	12
11	75	70.46	0.72	0.65	330	261	255	51	45	108	99	1.3	12
	77.5	72.13	0.70	0.65	328	263	254	52	46	109	100	1.2	12
	80	73.77	0.69	0.64	327	265	254	52	46	109	100	1.2	12
12	82.5	75.39	0.65	0.62	328	265	253	52	46	110	100	1.15	12
	85	76.98	0.66	0.63	328	261	255	52	46	110	100	1.15	12
	87.5	78.56	0.67	0.63	326	261	255	53	45	110	101	1.2	12.5
	90	80.19											

Traverse:				
Start Time:	/	Initial Leak Check:	cfm@	"Hg
Finish Time:	/	Final Leak Check:	cfm@	"Hg

Traverse:				
Start Time:	/	Initial Leak Check:	cfm @	"Hg
Finish Time:	/	Final Leak Check:	cfm @	"Hg

static = -2.35

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 13 Oct 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 4 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	80.62	0.72	0.65	335	258	261	77	51	102	94	1.2	4.5
	2.5	82.05	0.71	0.64	336	263	264	54	46	100	93	1.2	4.5
	5	83.85	0.74	0.65	336	262	258	51	45	96	93	1.25	5
2	7.5	85.46	0.75	0.65	336	263	260	48	46	96	93	1.3	5
	10	87.12	0.75	0.66	336	263	259	47	46	98	94	1.3	5.5
	12.5	88.78	0.75	0.66	336	263	259	46	46	100	93	1.3	5.5
3	15	90.46	0.76	0.66	336	259	258	46	45	99	93	1.3	6
	17.5	92.11	0.75	0.66	335	262	258	46	46	100	94	1.3	6
	20	93.73	0.73	0.65	335	262	259	46	45	101	93	1.3	6.5
4	22.5	95.340	0.71	0.64	335	268	259	45	45	100	94	1.25	6.5
	25	97.02	0.69	0.63	335	267	259	45	45	101	94	1.25	6.5
	27.5	98.63	0.72	0.65	334	265	258	45	45	100	94	1.25	7
5	30	100.29	0.68	0.63	334	263	258	45	46	100	95	1.2	7
	32.5	101.90	0.69	0.63	335	259	257	45	47	103	95	1.2	7
	35	103.50	0.69	0.63	335	266	257	45	46	103	95	1.2	7.5
6	37.5	105.12	0.69	0.63	336	261	258	45	46	103	95	1.2	7.5
	40	106.73	0.70	0.64	335	267	257	46	47	105	96	1.2	7.5
	42.5	108.31	0.73	0.65	336	263	257	46	45	106	97	1.3	8
7	45	109.94	0.81	0.69	335	265	256	46	46	105	96	1.4	9
	47.5	111.68	0.81	0.69	335	263	258	46	47	107	97	1.4	9.5
	50	113.43	0.81	0.69	334	264	257	46	47	107	98	1.4	9.5

Traverse: 2				
Start Time: 10:53	Initial Leak Check: 0.006	cfm@ 17	"Hg
Finish Time: 12:23	Final Leak Check: 0.003	cfm@ 16	"Hg

Traverse: /			
Start Time: /	Initial Leak Check: /	cfm @ /	"Hg
Finish Time: /	Final Leak Check: /	cfm @ /	"Hg

Project No.: 21800

Operator : TS

Field Data Sheet

Date: 13 Oct 17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 1	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp ~~Inlet~~/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	115.16	0.84	0.70	334	260	255	46	46	107	98	1.5	10.5
	55	116.97	0.85	0.71	335	265	257	46	48	107	98	1.5	10.5
	57.5	118.79	0.86	0.71	334	267	258	46	47	108	99	1.5	10.5
9	60	120.58	0.86	0.71	333	265	256	45	47	108	99	1.5	11
	62.5	122.37	0.86	0.71	333	261	256	44	47	109	99	1.5	11
	65	124.16	0.86	0.71	332	259	256	44	46	109	100	1.5	11
10	67.5	125.94	0.85	0.71	331	262	256	44	48	110	100	1.5	11
	70	127.71	0.85	0.71	331	265	255	44	48	110	100	1.5	11.5
	72.5	129.50	0.84	0.71	332	261	256	44	49	110	101	1.5	11.5
11	75	131.28	0.79	0.69	333	266	256	44	48	111	101	1.4	11.5
	77.5	133.03	0.78	0.68	332	266	256	44	47	111	101	1.4	11.5
	80	134.77	0.78	0.68	331	265	256	44	48	111	102	1.4	12
12	82.5	136.50	0.77	0.68	330	266	257	45	46	112	101	1.4	12
	85	138.21	0.77	0.68	330	265	254	44	47	111	101	1.4	12
	87.5	139.93	0.78	0.69	324	267	258	44	48	111	102	1.4	12
	90	141.68											

Traverse:				
Start Time:	/	Initial Leak Check:	/ cfm@	/ "Hg
Finish Time:	/	Final Leak Check:	/ cfm@	/ "Hg

Traverse:				
Start Time:	/	Initial Leak Check:	/ cfm @	/ "Hg
Finish Time:	/	Final Leak Check:	/ cfm @	/ "Hg

Project No.: 21800

Operator : TS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	1 Semi-Volatile Organic Compounds
Test Date	Oct 12/17
Test Location	Quench Inlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	
Meter Box No.:	9 / 4
Impinger Box No.:	11 ✓

Pitot Factor	.1847 ✓	
DGMCF	~~1.021~~ / 0.978 ✓	
Barometric Pressure	30.04	"Hg
Static Pressure	-2.55	"H2O
Nozzle Size	.2400 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	mg
Probe	mg

Moisture Gain

CWTR	437.4 ✓	g
WCBDA	11.0 ✓	g

Measuring Device	MII Numbers
Probe / Pitot	15D
Trendicator	
Control Box	A12007 / A0473
Incline Manometer	#3 A02086
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env Can
Calipers	

Reading Interval	2.5	
Number of Ports	2	
Number of Points/Port	12	

Combustion Gas Concentration

Oxygen	7.57 ✓	%
Carbon Dioxide	11.14 ✓	%
Carbon Monoxide	11.0	ppm

Nozzle Measurements	
1	.2390
2	.2395
3	.2405
4	.2410
Average:	.2400 ✓

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date:	Oct 12/17	Plant:	Covanta DYEC	Test No.:	1	SVOC	Page 2 of 5
		Plant Location:	Courtice, Ontario	Test Location:	Quench Inlet No. 2		

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	34.72	.66	.58	333	252	260	60	60	73	74	.9	3.5
	2.5	36.23	.69	.59	333	259	259	~~62~~ ~~54~~ 55	41	74	75	1	4
	5	37.77	.65	.58	332	252	261	53	41	74	76	.9	4
2	7.5	39.23	.67	.59	333	253	262	52	41	72 ~~75~~	77	.9	4
	10	40.69	.68	.59	332	254	265	50	40	73	79	.9	5
	12.5	42.18	.69	.60	332	255	264	49	41	73	81	1.0	5
3	15	43.73	.69	.60	332	254	263	48	41	74	81	.9	5
	17.5	45.24	.72	.61	333	255	264	46	42	74	83	1.0	5.5
	20	46.78	.71	.61	333	255	263	45	41	74	84	1.0	6.0
4	22.5	48.32	.70	.61	333	255	263	44	42	75	85	1.0	6
	25	49.83	.70	.61	333	255	263	44	41	75	86	1.0	6
	27.5	51.34	.73	.62	334	255	263	43	42 ~~5~~	76	87	1.1	7
5	30	52.92	.73	.62	334	255	263	42	43	76	88	1.1	7
	32.5	54.51	.72	.63	334	255	262	42	~~43~~	77	90	1.1	7
	35	56.08	.70	.62	334	255	262	42	43	78	90	1.1	7
6	37.5	57.64	.70	.62	334	255	263	42	43	79	92	1.1	8
	40	59.24	.7	.62	333	255	263	42	43	79	93	1.1	8
	42.5	60.82	.72	.63	333	255	265	43	43	80	94	1.1	8
7	45	62.44	.79	.66	333	255	262	42	43	81	95	1.3	9
	47.5	64.16	.80	.67	334	255	262	44	44	81	96	1.3	9.5
	50	65.87	.83	.68	334	254	262	42	44	86	97	1.3	10

Traverse:	2				
Start Time:	09:19	Initial Leak Check:	.001	cfm@	15 "Hg
Finish Time:		Final Leak Check:		cfm@	"Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 12/17	Plant:	Covanta DYEC	Test No.:	SVOC	Page 3 of 5
		Plant Location:	Courtice, Ontario	Test Location:	Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	67.62	.80	.67	334	255	262	42	44	82	99	1.2	10
	55	69.34	.79	.67	333	254	262	42	43	83	98	1.2	10
	57.5	71.04	.78	.66	333	254	262	42	43	83	99	1.2	10
9	60	72.72	.80	.67	333	254	262	42	43	84	99	1.2	10
	62.5	74.39	.80	.67	332	254	262	43	44	84	100	1.2	10.5
	65	76.07	.82	.68	332	254	261	43	44	85	101	1.2	10.5
10	67.5	77.74	.81	.68	333	254	262	43	44	85	101	1.3	11.5
	70	79.44	.82	.68	332	253	262	43	44	86	102	1.3	12
	72.5	81.16	.81	.68	332	254	261	43	45	86	102	1.2	12
11	75	82.90	.79	.67	331	254	261	44	45	87	102	1.2	12
	77.5	84.57	.80	.68	332	256	262	44	47	87	104	1.2	12
	80	86.25	.79	.67	332	253	262	44	47	88	103	1.2	12
12	82.5	87.93	.80	.68	332	253	262	44	45	88	105	1.2	12
	85	89.59	.78	.67	332	254	261	46	43	88	104	1.2	12
	87.5	91.25	.79	.67	331	253	262	45	42	89	104	1.2	12.5
	90	92.89											

Traverse:	2				
Start Time:		Initial Leak Check:		cfm@	"Hg
Finish Time:	10:49	Final Leak Check:	.0007	cfm@	17 "Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 12/17	Plant:	Covanta DYEC	Test No.:	1 SVOC	Page 4 of 5
		Plant Location:	Courtice, Ontario	Test Location:	Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	43.61	.47	.151	334	265	260	60	47	68	67	.6	3.5
	2.5	44.90	.5	.53	337	268	258	59	46	69	74	.7	4
	5	46.29	.48	.52	337	260	259	55	46	69	78	.6	4.5
2	7.5	47.67	.52	.155	336	261	266	52	44	71	80	.65	5
	10	49.09	.51	.54	335	262	261	49	43	71	82	.6	5
	12.5	50.49	.50	.54	336	246	258	47	43	73	84	.6	5
3	15	51.88	.54	.56	336	238	252	46	43	74	85	.65	5
	17.5	53.33	.52	.55	336	247	251	45	43	74	87	.6	5
	20	54.76	.51	.55	336	261	252	45	43	75	88	.6	5.5
4	22.5	56.19	.51	.55	335	247	253	46	43	76	90	.6	5.5
	25	57.58	.50	.55	335	248	254	45	43	77	90	.6	5.5
	27.5	59.07	.51	.55	335	256	253	46	44	78	92	.6	5.5
5	30	60.35	.50	.55	335	256	254	46	44	78	92	.6	6
	32.5	61.73	.50	.55	335	256	254	46	44	79	93	.6	6
	35	63.09	.51	.55	335	258	255	46	44	80	93	.6	6
6	37.5	64.44	.54	.57	335	258	254	46	45	80	94	.7	6.5
	40	65.87	.57	.59	334	257	255	46	46	81	95	.75	7.5
	42.5	67.43	.60	.60	336	258	255	46	46	81	96	.75	7.5
7	45	68.98	.85	.72	339	259	256	47	48	82	97	1.0	10
	47.5	70.80	.80	.70	335	258	256	46	49	82	98	.95	10
	50	72.68	.82	.71	336	259	256	46	47	82	99	.95	10

Traverse:	1				
Start Time:	1144	Initial Leak Check:	.001	cfm@ 17.5	"Hg
Finish Time:		Final Leak Check:		cfm@	"Hg

Traverse:				
Start Time:		Initial Leak Check:	cfm @	"Hg
Finish Time:		Final Leak Check:	cfm @	"Hg

Box changed @ trav change (Box 4 A04713 dgm<f 0.978)
new file also

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 12/17	Plant: Covanta DYEC	Test No.: 1 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	74.41	.87	.73	335	258	255	2546	46	83	99	1.0	11
	55	76.27	.82	.71	334	259	257	46	46	83	100	.95	10.5
	57.5	78.09	.76	.69	334	259	256	47	47	84	100	.9	10.5
9	60	79.86	.77	.69	333	259	257	47	46	84	100	.9	10.5
	62.5	81.61	.78	.69	334	259	256	48	46	84	100	.9	11
	65	83.34	.78	.69	334	258	256	48	46	84	100	.9	11
10	67.5	85.08	.74	.67	334	259	257	49	46	85	101	.9	11.5
	70	86.83	.71	.66	333	259	257	49	46	85	101	.9	11.5
	72.5	88.56	.70	.66	333	259	257	50	46	85	101	.8	11
11	75	90.25	.61	.61	333	259	256	50	47	85	101	.75	11
	77.5	91.90	.64	.63	331	259	256	51	46	85	101	.75	11
	80	93.52	.64	.63	331	259	257	51	46	85	101	.75	11
12	82.5	95.12	.65	.63	331	257	257	51	47	86	101	.75	11
	85	96.71	.67	.64	331	257	257	52	47	86	101	.8	11.5
	87.5	98.33	.64	.63	331	258	257	52	47	86	101	.75	11.5
	90	99.92											

Traverse: 1				
Start Time:	Initial Leak Check:		cfm@	"Hg
Finish Time: 13:14	Final Leak Check:	0.001	cfm@ 16	"Hg

Traverse:				
Start Time:	Initial Leak Check:		cfm @	"Hg
Finish Time:	Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	Semi-Volatile Organic Compounds
Test Date Oct 12/17	
Test Location	Quench Inlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	
Meter Box No.:	4
Impinger Box No.:	16 ✓

Pitot Factor	.847 ✓	
DGMCF	0.978 ✓	
Barometric Pressure	30.01	"Hg
Static Pressure	-2.55	"H2O
Nozzle Size	.2400 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

Particulate Gain

Filter	mg
Probe	mg

Moisture Gain

CWTR	453.1 ✓	g
WCBDA	9.2 ✓	g

Combustion Gas Concentration

Oxygen	7.50 ✓	%
Carbon Dioxide	11.20 ✓	%
Carbon Monoxide	11.4	ppm

Measuring Device	MII Numbers
Probe / Pitot	15D
Trendicator	
Control Box 4	A04713
Incline Manometer	#3 A02086
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env. Can
Calipers	

see 1

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average:

see 1

Probe Liner Glass / Metal /Teflon / Other_____

Nozzle Glass / Metal / Other_____

Union None /Metal / Teflon / Other_____

Pitot Leak Checked? Yes No

Site Diagram

Notes:

Field Data Sheet

Date:	Oct 12 | 17	Plant:	Covanta DYEC	Test No.:	2	SVOC	Page 2 of 5
		Plant Location:	Courtice, Ontario	Test Location:		Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	.59	.67	.63	334	259	260	60	60	80	83	.18	4.5
	2.5	2.24	.67	.63	336	259	258	60	55	80	88	.8	5
	5	4.07	.61	.61	336	259	258	58	54	80	91	.7	4.5
2	7.5	5.54	.65	.62	336	260	259	56	51	81	92	.7	5
	10	7.10 ~~6.97~~	.65	.63	336	260	259	55	50	81	92	.7	5
	12.5	~~8.62~~ ~~7.10~~	.64 .66	.62	336	259	259	51	51	81	94	.8	5
3	15	10.22 ~~8.62~~	.67	.64	335	260	259	49	50	82	95	.8	5
	17.5	11.83	.66	.63	335	260	259	49	51	82	96	.80	5
	20	13.43	.67	.64	335	261	259	48	52	83	97	.8	5
4	22.5	15.02	.68	.64	336	261	259	48	52	83	98	.8	5.5
	25	16.65	.68	.64	336	261	259	48	52	84	98	.8	5.5
	27.5	18.27	.66	.64	336	261	259	48	52	84	99	.8	6
5	30	19.90	.65	.63	336	261	259	48	53	85	99	.8	6
	32.5	21.51	.66	.64	336	260	259	49	53	85	100	.8	6
	35	23.13	.66	.64	336	259	266	49	54	86	101	.8	6
6	37.5	24.73	.66	.64	336	259	259	49	53	86	101	.8	6.5
	40	26.35	.68	.65	339	259	259	48	44	87	102	.8	7
	42.5	28.01	.66	.64	336	259	260	47	42	87	102	.8	7
7	45	29.67	.75	.68	336	261	259	46	42	87	103	.9	8
	47.5	31.41	.74	.68	335	261	258	45	42	87	103	.9	8
	50	33.15	.75	.68	336	262	259	45	43	87	104	.9	8

Traverse:	2					
Start Time:	14:54	Initial Leak Check:	.004	cfm@	16	"Hg
Finish Time:		Final Leak Check:		cfm@		"Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 12/17	Plant:	Covanta DYEC	Test No.:	2	SVOC	Page 3 of 5
		Plant Location:	Courtice, Ontario	Test Location:		Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	34.88	.77	.69	335	262	259	45	43	87	103	.9	8.5
	55	36.65	.79	.70	336	262	259	45	43	88	104	1.0	9
	57.5	38.50	.80	.71	336	261	260	44	44	88	104	1.0	9
9	60	40.33	.79	.70	336	262	259	44	44	88	104	1.0	9.5
	62.5	42.15	.82	.71	336	261	259	44	44	88	104	1.0	11
	65	44.07	.81	.71	336	261	259	44	46	88	105	.9	10.5
10	67.5	45.95	.77	.69	337	260	260	44	47	88	105	.9	10
	70	47.77	.8	.71	337	261	260	45	46	88	106	.9	10.5
	72.5	49.59	.87	.74	336	261	259	45	45	88	105	1	12
11	75	51.48	.72	.67	337	262	260	45	45	88	106	.9	11.5
	77.5	53.30	.69	.66	336	261	259	45	44	88	105	.8	10
	80	54.95	.70	.66	336	261	259	46	42	89	105	.8	9
12	82.5	56.59	.69	.66	335	261	259	46	43	89	105	.8	10
	85	58.27	.69	.66	335	261	259	46	43	89	106	.8	10
	87.5	59.94	.71	.67	336	261	259	46	43	89	106	.8	10
	90	61.64											

Traverse:	2				
Start Time:		Initial Leak Check:		cfm@	"Hg
Finish Time:	16:24	Final Leak Check:	.002	cfm@ 15	"Hg

Traverse:				
Start Time:		Initial Leak Check:	cfm @	"Hg
Finish Time:		Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 12/17	Plant:	Covanta DYEC	Test No.:	2	SVOC	Page 4 of 5
		Plant Location:	Courtice, Ontario	Test Location:	Quench Inlet No. 2		

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	62.00	.52	.55	339	266	250	60	58	81	82	.6	4
	2.5	63.35	.52	.55	339	261	259	58	40	80	85	.6	5
	5	64.78	.52	.55	338	261	259	54	41	80	88	.6	5
2	7.5	66.19	.54	.57	338	260	257	53	41	80	90	.6	6
	10	67.65	.54	.57	336	256	256	53	41	81	91	.6	6
	12.5	69.09	.55	.57	339	255	256	53	41	81	92	.6	6
3	15	70.57	.56	.58	340	260	257	52	44	82	93	.7	7
	17.5	72.01	.56 ~~.58~~	.58	~~340~~	261	257	52	42	82	94	.7	7
	20	73.65	.55	.58	340	261	257	52	43	83	95	.6	7
4	22.5	75.13	.57	.59	339	261	257	52	43	83	96	.7	7.5
	25	~~76.65~~	.56	.58	339	261	256	52	43	83	97	.7	~~7.8~~
	27.5	78.16	.56	.58	339	260	257	52	44	84	97	.7	8
5	30	79.66	.56	.58	340	259	~~258~~ 260	53	44	84	97	.7	8
	32.5	81.16 ~~81.26~~	.56	.58	340	261	258	53	45	84	98	.7	8
	35	82.65	.56	.58	340	261	258	53	46	85	98	.6	8
6	37.5	84.12	.57	.59	340	261	258	53	47	85	99	.7	8.5
	40	85.64	.57	.59	340	261	258	53	46	85	100	.7	~~8.9~~
	42.5	87.18	.56	.58	339	261	258	53	47	86	100	.7	9
7	45	88.7	.80	.70	338	262	266	52	44	86	101	1.0	12
	47.5	90.41	.76	.69	337	261	258	51	44	86	102	.9	13
	50	92.26	.79	.70	337	261	259	51	45	87	103	.95	13

Traverse:	1				
Start Time:	17:14	Initial Leak Check:	.00	cfm@	17 "Hg
Finish Time:		Final Leak Check:		cfm@	"Hg

Traverse:			
Start Time:		Initial Leak Check:	cfm @ "Hg
Finish Time:		Final Leak Check:	cfm @ "Hg

437.4
11.0

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 12/17	Plant: Covanta DYEC	Test No.: 2 SVOC	Page 5 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	94.11	.79	.70	336	261	258	51	44	87	104	.95	13
	55	95.93	.79	.70	335	261	258	51	44	87	104	.95	13
	57.5	97.74	.78	.70	335	262	258	51	44	87	104	.9	13
9	60	99.53	.77	.69	335	261	258	51	44	88	104	.9	13
	62.5	101.27	.76	.69	335	261	258	52	44	88	105	.9	13
	65	102.99	.80	.71	336	260	258	52	45	88	105	.9	14
10	67.5	104.77	.75	.68	336	261	258	52	47	88	105	.9	14
	70	106.54	.76	.69	335	261	258	52	46	89	105	.9	14
	72.5	108.32	.76	.69	336	260	258	52	47	89	105	.9	14
11	75	110.04	.66	.64	335	261	258	53	48	89	105	.8	14
	77.5	111.73	.65	.64	335	260	258	53	49	89	105	.7	13.5
	80	113.37	.66	.64	335	256	259	54	50	89	105	.7	13
12	82.5	114.96	.65	.64	335	259	258	54	51	89	105	.7	13
	85	116.53	.66	.64	335	257	258	54	52	89	105	.7	13
	87.5	118.11	.67	.65	335	256	259	54	53	89	105	.7	13
	90	119.67											

Traverse: 1				Traverse:			
Start Time:	Initial Leak Check:	cfm@	"Hg	Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time: 18:47	Final Leak Check: .001	cfm@ 16	"Hg	Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : AS

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	Semi-Volatile Organic Compounds
Test Date Oct 13/17	
Test Location	Quench Inlet No. 2
Operator Signature	

Project No.:	21800
Page	1 of 5
Probe No.:	
Meter Box No.:	Box 4
Impinger Box No.:	# 11 ✓

Pitot Factor	1.817 ✓	
DGMCF	0.978 ✓	
Barometric Pressure	29.94.	"Hg
Static Pressure	-2.25	"H2O
Nozzle Size	.240 ✓	inches
Stack Diameter	4.5	feet
Length		feet
Width		feet
Port length:		inches

see 12

Particulate Gain

Filter		mg
Probe		mg

Moisture Gain

CWTR	464.9 ✓	g
WCBDA	13.0 ✓	g

Combustion Gas Concentration

Oxygen	7.50 ✓	%
Carbon Dioxide	11.27 ✓	%
Carbon Monoxide	23.1	ppm

Measuring Device	MII Numbers
Probe / Pitot	15D
Trendicator	
Control Box 4	A04713
Incline Manometer	#3 A02086
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Env Can
Calipers	

see 4.

Reading Interval	2.5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1 _____
2 _____
3 _____
4 _____
Average:

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union None /Metal / (Teflon) / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 13/17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 2 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	20.56	.624	.60	336	255	257	60	60	81	83	.7	4
	2.5	22.12	.67	.62	337	260	261	60	43	82	88	.75	5
	5	23.72	.63	.61	336	260	259	60	43	82	89	.7	5
2	7.5	25.28	.69	.64	336	261	259	60	43	82	92	.8	6
	10	26.88	.69	.64	336	261	259	58	43	83	94	.8	6
	12.5	28.47	.67	.63	336	261	258	56	44	83	94	.8	6.5
3	15	30.06	.71	.65	336	261	258	52	44	84	96	.8	7.5
	17.5	31.73	.72	.66*	336	261	258	50	44	84	97	.8	7.5
	20	33.45	.71	.65	337	262	259	49	44	85	99	.8	7.5
4	22.5	35.12	.72	.66	336	261	258	48	44	85	99	.8	7.5
	25	36.78	.70	.65	336	261	258	48	44	86	100	.8	8
	27.5	38.42	.70	.65	336	262	258	48	44	86	100	.8	8
5	30	40.04	.69	0.65	336	263	258	48	44	87	101	.8	8
	32.5	41.65	.68	0.64	336	261	258	48	44	87	101	.75	8
	35	43.26	.68	.64	336	261	258	47	43	87	102	.8	8.5
6	37.5	44.87	.67	.64	336	261	258	47	44	88	103	.8	8.9
	40	46.48	.67	.64	335	261	258	47	43	88	103	.8	9
	42.5	48.10	.67	.64	335	261	258	48	44	88	103	.8	9
7	45	49.71	.75	.68	335	261	258	48	44	89	103	.9	10.5
	47.5	51.42	.75	.68	336	261	258	48	45	89	104	.9	10.5
	50	~~53~~ 453.13			335	262	258	48	45	89	105	.8	11

Traverse: 2			
Start Time: 08:36	Initial Leak Check: 0.04	cfm@ 17	"Hg
Finish Time:	Final Leak Check:	cfm@	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date: Oct 13/17	Plant: Covanta DYEC	Test No.: 3 SVOC	Page 3 of 5
	Plant Location: Courtice, Ontario	Test Location: Quench Inlet No. 2	

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	54.84	.74	.67	334	261	258	48	45	89	105	.8	11
	55	56.55	.78	.69	335	261	258	48	44	90	106	.9	12
	57.5	58.30	.73	.67	333	261	258	48	45	90	105	.8	11.5
9	60	60.03	.75	.68	333	260	258	48	44	90	106	.8	11.5
	62.5	61.74	.77	.69	333	261	258	49	44	90	106	.9	12
	65	63.48	.76	.68	333	261	258	49	45	90	106	.9	12
10	67.5	65.21	.75	.68	333	261	258	49	45	90	106	.85	12
	70	69.95	.74	.68	333	262	258	49	45	90	106	.85	12.5
	72.5	68.65	.75	.68	333	262	258	50	46	91	106	~~.85~~ .8	12.5
11	75	70.34	.66	.69	333	262	258	50	46	91	106	~~.85~~ .8	12
	77.5	72.01	.66	.64	333	262	257	50	46	91	106	.7	12
	80	73.63	.68	.65	333	262	258	50	47	91	106	.75	12.5
12	82.5	75.27	.67	.69	333	262	258	50	47	91	106	.75	12.5
	85	76.90	.7	.66	333	262	258	51	48	91	106	.8	13
	87.5	78.54	.72	.67	335	262	258	51	49	91	106	.8	13.5
	90	80.28											

Traverse: 2			
Start Time:	Initial Leak Check:	cfm@	"Hg
Finish Time: 10:06	Final Leak Check: 0.001	cfm@ 17.5	"Hg

Traverse:			
Start Time:	Initial Leak Check:	cfm @	"Hg
Finish Time:	Final Leak Check:	cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 13/17	Plant:	Covanta DYEC	Test No.:	3	SVOC	Page 4 of 5
		Plant Location:	Courtice, Ontario	Test Location:	Quench Inlet No. 2		

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	80.84	.47	.52	333	264	259	60	60	84	87	.5	3.5
	2.5	82.11	.46	.52	335	262	262	58	44	83	87	.5	4
	5	83.40	.46	.52	336	261	260	52	43	83	91	.55	4
2	7.5	84.71	.5	.54	336	261	258	50	43	84	93	.6	4.5
	10	86.07	.49	.54	336	261	258	50	44	84	95	.6	4.5
	12.5	87.46	.495	.54	336	261	259	50	44	84	96	.6	4.5
3	15	88.80	.49	.54	336	261	259	50	44	85	96	.6	4.5
	17.5	90.55	.50	.55	336	261	258	50	44	85	97	.6	4.5
	20	91.51	.51	.55	336	261	257	50	44	86	98	.65	5
4	22.5	92.89	.50	.55	336	261	258	50	44	86	99	.65	5
	25	92.23	.51	.55	336	261	257	50	44	86	100	.65	5
	27.5	95.65	.50	.55	336	261	258	50	44	87	100	.6	5.5
5	30	97.06	.50	.55	336	261	258	51	45	87	102	.6	6
	32.5	98.46	.50	.55	336	261	257	51	46	88	102	.6	6
	35	99.85	.52	.56	337	262	257	51	44	84	102	.65	6
6	37.5	101.26	.54	.57	336	261	258	51	45	88	102	.65	6
	40	102.69	.54	.57	336	261	258	51	45	89	103	.65	6
	42.5	104.13	.52	.56	336	262	257	51	46	89	103	.6	6.5
7	45	105.55	.91	.70	336	261	257	52	46	84	104	.95	9
	47.5	107.26	.87	.73	336	261	257	52	48	90	105	1.05	10
	50	109.08	.86	.68	337	262	257	51	49	90	106	1	10

Traverse:	1					
Start Time:	11:04	Initial Leak Check:	.006	cfm@	16	"Hg
Finish Time:	8	Final Leak Check:		cfm@		"Hg

Traverse:					
Start Time:		Initial Leak Check:		cfm @	"Hg
Finish Time:		Final Leak Check:		cfm @	"Hg

Project No.: 21800

Operator : AS

Field Data Sheet

Date:	Oct 13/17	Plant:	Covanta DYEC	Test No.:	3	SVOC	Page 5 of 5
		Plant Location:	Courtice, Ontario	Test Location:	Quench Inlet No. 2		

Point	Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
8	52.5	110.91	.87	.73	336	261	259	51	48	90	107	1	10
	55	112.76	.88	.74	335	261	257	51	48	90	107	1	11
	57.5	114.61	.87	.73	335	262	258	52	49	91	108	1	11
9	60	116.45	.82	.71	335	262	258	52	49	91	108	.9	11
	62.5	118.26	.80	.70	334	261	257	52	49	91	108	.9	11
	65	120.05	.82	.71	335	262	257	52	50	91	108	.9	11.5
10	67.5	121.86	.77	.69	334	262	257	53	52	92	108	.85	11
	70	123.64	.76	.69	334	262	258	54	52	92	108	.85	11
	72.5	125.39	.77	.69	334	262	256	53	50	92	108	.85	11.5
11	75	127.14	.66	.64	333	262	257	52	48	92	108	.8	11
	77.5	128.83	.67	.64	333	262	256	52	47	92	108	.8	11
	80	130.48	.65	.63	333	262	257	53	47	92	108	.75	11
12	82.5	132.12	.64	.63	333	262	256	52	46	92	108	.75	11
	85	133.74	.64	.63	333	262	257	52	46	92	108	.75	11
	87.5	135.35	.65	.63	333	263	257	51	46	92	108	.75	11
	90	136.95											

Traverse:	1			
Start Time:		Initial Leak Check:	cfm@	"Hg
Finish Time:	12:39	Final Leak Check:	.0053 cfm@	15 "Hg

Traverse:			
Start Time:		Initial Leak Check:	cfm @ "Hg
Finish Time:		Final Leak Check:	cfm @ "Hg

Project No.: 21800

Operator : AS

APPENDIX 9

Acid Gas Field Data Sheets
(12 pages)

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	1 M26A
Test Date	OCT 10 17
Test Location	APC Outlet No. 1
Operator Signature	TURTON

Project No.:	21800
Page	1 of 2
Probe No.:	6C
Meter Box No.:	TEAM 4
Impinger Box No.:	

Pitot Factor	.847	
DGMCF	1.006	
Barometric Pressure	~~29.83~~	"Hg
Static Pressure	~~-.545~~ -10.0	"H2O
Nozzle Size	.2535	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	157.6	g
WCBDA	12.0	g

Combustion Gas Concentration

Oxygen	8.93	%
Carbon Dioxide	10.53	%
Carbon Monoxide	9.5	ppm

Measuring Device	MII Numbers
Probe / Pitot ISE	Cal 20113
Trendicator	ROE
Control Box	20090
Incline Manometer	
Comb.Gas.Analyzer	CEM's
Micromanometer	COE 20126
Barometer	ENV CAN
Calipers	B03922

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.2525
2	.2535
3	.2545
4	.2925
Average:	.2535

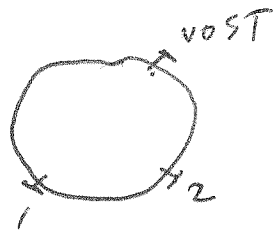
Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / ~~Teflon~~ / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram



Notes:

Rev. November 27, 2014

Field Data Sheet

Date: Oct 10, 17	Plant: Covanta DYEC	Test No.: 1 M26A ~~Particulate/Metals~~	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	17.05	.82	.76	285	256	250	67	217	74	74	2	5
2	5	20.90	.75	.72	285	255	247	50	254	72	74	1.8	5
3	10	24.72	.93	.80	287	255	247	47	225	73	74	2-3	5
4	15	28.94	.85	.77	287	256	252	47	231	74	74	2	5
5	20	32.91	.80	.75	286	256	250	51	225	76	75	1-8	5
6	25	36.67	.70	.70	286	257	251	54	229	77	76	1.6	4.5
7	30	40.18	.75	.73	286	257	248	56	223	77	76	1.7	4.7
8	35	43.85	.75	.73	285	252	248	59	225	78	76	1.7	4.7
9	40	47.52	.75	.73	285	252	252	56	221	79	79	1.7	4.7
10	45	51.18	.78	.75	285	252	247	47	222	79	76	1-8	5
11	50	54.93	.68	.69	285	252	252	52	230	79	76	1.6	4.7
12	55	58.59	.60	.65	285	252	252	52	240	80	77	1.4	4.5
	60	61.98											

Traverse: 2						Traverse: X					
Start Time: 9:42	Initial Leak Check:	0.006	cfm@	17	"Hg	Start Time:	Initial Leak Check:		cfm @		"Hg
Finish Time: 11:00	Final Leak Check:	.007	cfm@	17	"Hg	Finish Time:	Final Leak Check:		cfm @		"Hg

* 9:48 off production issue (6 min) Restart 10:06

Project No.: 21800

Operator: DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 1	M26A
Test Date	OCT 10, 17
Test Location	APC Outlet No. 1
Operator Signature	D Turton

Project No.:	21800
Page	1 of 2
Probe No.:	6C
Meter Box No.:	TEAM 4
Impinger Box No.:	

Pitot Factor	.847	
DGMCF	1.006	
Barometric Pressure	29.38	"Hg
Static Pressure	-10.0	"H2O
Nozzle Size	.2575	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	n	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	163.9	g
WCBDA	11.7	g

Combustion Gas Concentration

Oxygen	8.59	%
Carbon Dioxide	10.70	%
Carbon Monoxide	~~76~~ 7.7	ppm

Measuring Device	MII Numbers
Probe / Pitot	See
Trendicator	
Control Box	
Incline Manometer	Test
Comb.Gas.Analyzer	
Micromanometer	
Barometer	# 1
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1	See
2	
3	Test
4	
Average:	# 1

Probe Liner (Glass) / Metal / Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) / Metal / ~~Teflon~~ / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: OCT 10, 17	Plant: Covanta DYEC	Test No.: 2 M26A ~~Particulate/Metals~~	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	62.36	.78	.74	285	252	256	67	160	77	76	1.8	5
2	5	66.22	.95	.82	284	251	251	63	100	79	76	2.2	5.5
3	10	70.43	.90	.80	286	251	250	59	126	76	76	2.1	5.2
4	15	74.50	.90	.80	285	253	251	57	126	80	77	2.1	5.2
5	20	78.58	.81	.76	286	253	250	54	126	79	77	1.8	5
6	25	82.57	.75	.73	286	253	251	52	92	79	77	1.7	5
7	30	86.14	.65	.68	287	252	251	51	92	80	77	1.5	5
8	35	89.62	.71	.71	286	253	248	52	94	80	77	1.6	5
9	40	93.24	.70	.71	285	253	248	52	94	80	77	1.6	5
10	45	96.88	.66	.69	280	253	248	55	94	79	77	1.5	5
11	50	100.37	.60	.66	280	253	250	57	84	79	77	1.4	5
12	55	103.77	.60	.66	280	253	248	56	94	79	77	1.4	5
	60	107.06											

Traverse:						Traverse:					
Start Time:	11:41	Initial Leak Check:	.004	cfm@	17 "Hg	Start Time:	X	Initial Leak Check:	X	cfm @	X "Hg
Finish Time:	12:41	Final Leak Check:	.005	cfm@	15 "Hg	Finish Time:		Final Leak Check:	X	cfm @	X "Hg

Project No.: 21800

Operator : DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 3	M26A
Test Date	OCT 10, 17
Test Location	APC Outlet No. 1
Operator Signature	[signature]

Project No.:	21800
Page	1 of 2
Probe No.:	6C
Meter Box No.:	TEAM 4
Impinger Box No.:	

Pitot Factor	.947	
DGMCF	1.006	
Barometric Pressure	29.81	"Hg
Static Pressure	-10.0	"H2O
Nozzle Size	.2535	inches
Stack Diameter	4.5	feet
Length	-	feet
Width	-	feet
Port length:	12	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	160.0	g
WCBDA	9.1	g

Combustion Gas Concentration

Oxygen	8.49	%
Carbon Dioxide	10.74	%
Carbon Monoxide	8.9	ppm

Measuring Device	MII Numbers
Probe / Pitot	See
Trendicator	
Control Box	
Incline Manometer	Test
Comb.Gas.Analyzer	
Micromanometer	
Barometer	#1
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	See
2	
3	Test
4	
Average:	#1

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: OCT 10, 17	Plant: Covanta DYEC	Test No.: 3 M26A ~~Particulate/Metals~~	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 1	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	7.59	.75	.73	285	250	253	67	77	77	77	1.7	4.5
2	5	11.16	.92	.80	283	251	253	55	220	76	77	2.1	5
3	10	15.22	.89	.79	284	252	251	51	229	79	77	2.0	5
4	15	19.24	.80	.75	285	253	247	50	230	79	78	1.8	5
5	20	23.08	.75	.73	285	253	247	50	230	83	78	1.7	4.5
6	25	26.81	.75	.73	285	252	249	50	230	81	79	1.7	4.5
7	30	30.52	.65	.68	285	252	249	50	230	82	79	1.5	4.5
8	35	34.01	.67	.69	285	252	250	51	235	81	79	1.5	4.5
9	40	37.48	.73	.72	286	252	254	52	228	82	79	1.7	4.5
10	45	41.05	.73	.72	286	252	250	51	230	82	~~80~~ 79	1.7	4.5
11	50	44.66	.6	.65	285	252	251	50	228	82	80	1.4	4.5
12	55	48.00	.6	.66	279	252	251	50	230	83	80	1.4	4.5
	60	51.32											

Traverse: 1					Traverse: X				
Start Time: 14:06	Initial Leak Check: .004	cfm@ 15	"Hg		Start Time: X	Initial Leak Check: X	cfm @ X	"Hg	
Finish Time: 15:06	Final Leak Check: .005	cfm@ 16	"Hg		Finish Time: X	Final Leak Check: X	cfm @ X	"Hg	

Project No.: 21800

Operator : DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	1 M26A
Test Date	Oct 11, 17
Test Location	APC Outlet No. 2
Operator Signature	D TURTON

Project No.:	21800
Page	1 of 2
Probe No.:	6C
Meter Box No.:	TEAM 1
Impinger Box No.:	

Pitot Factor	.847	
DGMCF	.987	
Barometric Pressure	~~29.80~~ 29.98	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2535	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	178.4	g
WCBDA	8.2	g

Combustion Gas Concentration

Oxygen	7.90	%
Carbon Dioxide	11.22	%
Carbon Monoxide	8.5	ppm

Measuring Device	MII Numbers
Probe / Pitot	ISC COE 20113
Trendicator	
Control Box	COE 20094
Incline Manometer	
Comb.Gas.Analyzer	CEM's
Micromanometer	COE 20126
Barometer	ENV CAN
Calipers	803922

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	.2525
2	.2535
3	.2535
4	.2545
Average:	.2535

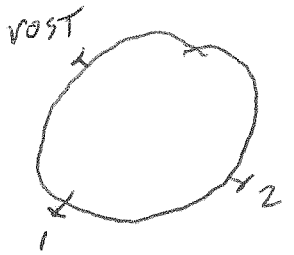
Probe Liner (Glass) / Metal / Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) / Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram



Notes:

Field Data Sheet

Date: Oct 11, 17	Plant: Covanta DYEC	Test No.: 1 M26A ~~Particulate/Metals~~	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 3	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	42.75	.8	.76	285	257	258	66	102	73	72	1.9	2.5
2	5	46.58	.88	.79	287	257	260	45	190	72	72	2.1	3
3	10	50.55	.85	.78	287	258	252	45	236	72	72	2.1	3
4	15	54.53	.80	.76	287	259	260	45	240	73	73	1.9	3
5	20	98.38	.75	.73	287	259	260	45	240	74	73	1.89	3
6	25	62.16	.70	.71	288	257	260	46	247	75	73	1.8	3
7	30	65.86	.70	.71	287	258	260	46	247	75	73	1.7	2.5
8	35	69.44	.74	.73	287	259	259	45	247	76	73	1.8	3
9	40	73.16	.74	.73	287	258	259	45	246	76	73	1.8	3
10	45	76.90	.70	.71	282	258	259	45	246	77	74	1.7	2.5
11	50	80.51	.64	.68	282	259	259	44	246	78	74	1.6	2.5
12	55	84.00	.64	.68	282	258	259	45	246	78	74	1.6	2.5
	60	87.48											

Traverse:					
Start Time: 9:30	Initial Leak Check: .007	cfm@ 15	"Hg	Traverse:	
Finish Time: 9:30	Final Leak Check: .005	cfm@ 15	"Hg	Start Time: X	Initial Leak Check: cfm @ "Hg
				Finish Time:	Final Leak Check: X cfm @ X "Hg

Project No.: 21800

Operator : DT

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.: 2	M26A
Test Date	Oct 11, 17
Test Location	APC Outlet No. 2
Operator Signature	D TURTON

Project No.:	21800
Page	1 of 2
Probe No.:	6C
Meter Box No.:	TEAM 1
Impinger Box No.:	

Pitot Factor	.847	
DGMCF	.987	
Barometric Pressure	~~29.80~~ 29.96	"Hg
Static Pressure	-9.1	"H2O
Nozzle Size	.2535	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	171.4	g
WCBDA	9.8	g

Combustion Gas Concentration

Oxygen	7.38	%
Carbon Dioxide	11.28	%
Carbon Monoxide	10.0	ppm

Measuring Device	MII Numbers
Probe / Pitot	See
Trendicator	
Control Box	
Incline Manometer	Test
Comb.Gas.Analyzer	
Micromanometer	
Barometer	# 1
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements	
1	See
2	
3	Test
4	
Average:	# 1

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) / Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: OCT 11, 17	Plant: Covanta DYEC	Test No.: 2 M26A ~~Particulate/Metals~~	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	89.83	.72	.72	285	254	250	64	87	73	72	1.8	3
2	5	93.60	.80	.76	284	250	248	49	120	73	73	1.9	3
3	10	97.41	.84	.78	285	249	252	46	230	72	72	2	3
4	15	101.32	.78	.75	285	249	252	46	234	73	72	1.9	3
5	20	105.14	.66	.69	285	249	253	46	236	74	72	1.6	2.5
6	25	108.66	.64	.68	285	249	254	45	235	75	73	1.6	2.5
7	30	112.14	.72	.72	286	248	254	49	236	76	73	1.8	3
8	35	115.79	.70	.71	286	249	254	45	234	77	73	1.8	3
9	40	119.47	.7	.71	286	248	254	45	233	77	73	1.75	3
10	45	123.08	.82	.77	286	248	254	45	233	77	73	2	3
11	50	127.02	.83	.78	284	248	254	45	234	78	73	2	3
12	55	130.94	.85	.79	284	247	255	47	234	78	73	2	3
	60	134.03											

Traverse: 2				
Start Time: 10:26	Initial Leak Check: .008	cfm@ 16	"Hg
Finish Time: 11:26	Final Leak Check: .008	cfm@ 15	"Hg

Traverse:				
Start Time: X	Initial Leak Check: X	cfm @ X	"Hg
Finish Time:	Final Leak Check: X	cfm @ X	"Hg

Project No.: 21800

Operator : D TURTON

ORTECH Environmental

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	7 M26A
Test Date	OCT 11, 17
Test Location	APC Outlet No. 2
Operator Signature	D TURTON

Project No.:	21800
Page	1 of 2
Probe No.:	6C
Meter Box No.:	TEAM 1
Impinger Box No.:	

Pitot Factor	.847	
DGMCF	.987	
Barometric Pressure	~~29.81~~ 29.96	"Hg
Static Pressure	-9.10	"H2O
Nozzle Size	.2535	inches
Stack Diameter	4.5	feet
Length	—	feet
Width	—	feet
Port length:	12	inches

Particulate Gain

Filter	0	mg
Probe	0	mg

Moisture Gain

CWTR	162.4	g
WCBDA	10.2	g

Combustion Gas Concentration

Oxygen	7.91	%
Carbon Dioxide	11.23	%
Carbon Monoxide	9.8	ppm

Measuring Device	MII Numbers
Probe / Pitot	SQR
Trendicator	
Control Box	
Incline Manometer	Test
Comb.Gas.Analyzer	
Micromanometer	
Barometer	# 1
Calipers	

Reading Interval	5
Number of Ports	2
Number of Points/Port	12

Nozzle Measurements

1	SQR
2	
3	Test
4	
Average:	# 1

Probe Liner (Glass) / Metal /Teflon / Other_____

Nozzle (Glass) / Metal / Other_____

Union (None) /Metal / Teflon / Other_____

Pitot Leak Checked? (Yes) No

Site Diagram

Notes:

Field Data Sheet

Date: Oct 11, 17	Plant: Covanta DYEC	Test No.: 3 m26A ~~Particulate/Metals~~	Page 2 of 2
	Plant Location: Courtice, Ontario	Test Location: APC Outlet No. 2	

Point	M26A Clock Time	Dry Gas Meter ft^3	Pitot Δ P "H_2O	Desired cfm	Stack Temp °F	Probe Temp °F	Oven Temp °F	Impinger Temp Outlet °F	Impinger Temp Inlet/Trap °F	Meter Temp Outlet °F	Meter Temp Inlet °F	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
1	0	36.67	.72	.72	285	247	253	67	80	73	72	1.8	2
2	5	40.50	.85	.78	283	246	255	67	228	72	71	2-1	2
3	10	44.49	.81	.76	283	246	255	49	231	72	71	2	2
4	15	48.39	.76	.74	285	247	256	49	231	72	72	1.9	2
5	20	52.16	.66	.69	286	242	256	49	231	72	72	1.6	2
6	25	55.66	.60	.66	286	248	256	50	224	74	71	1.45	2
7	30	59.00	.72	.72	286	248	256	52	232	75	71	1.8	2
8	35	62.69	.76	.74	287	248	256	54	228	75	71	1.9	2
9	40	66.50	.70	.71	287	247	255	56	228	76	71	1.7	2
10	45	70.13	.72	.72	280	247	255	58	228	76	71	1.8	2
11	50	73.79	.78	.75	284	247	255	59	227	77	72	2	2
12	55	77.66	.61	.67	268	247	255	58	230	77	72	1.5	2
	60	81.09											

Traverse: 2					Traverse:				
Start Time: 12:34	Initial Leak Check: .005	cfm@ 15	"Hg		Start Time: X	Initial Leak Check: X	cfm @ X	"Hg	
Finish Time: 13:34	Final Leak Check: .005	cfm@ 15	"Hg		Finish Time:	Final Leak Check: X	cfm @ X	"Hg	

Project No.: 21800

Operator : DT

APPENDIX 10

VOST Field Data Sheets
(8 pages)

Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Volatile Organics Sampling Train
Sample Volume Corrections

Test No./ Pair No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm3)*
1-1	0.975	8.02	28.55	20.53	30.06	2.00	20.8	20.50	0.0205
1-2	0.975	31.50	52.00	20.50	30.06	2.00	23.2	20.30	0.0203
1-3	0.975	52.50	73.90	21.40	30.06	2.00	25.4	21.04	0.0210
1-4	0.975	74.00	96.00	22.00	30.06	2.00	27.2	21.50	0.0215
2-1	0.975	96.60	118.00	21.40	30.04	2.00	27.8	20.86	0.0209
2-2	0.975	21.80	42.60	20.80	30.04	2.00	28.4	20.23	0.0202
2-3	0.975	48.00	68.60	20.60	30.04	2.00	28.8	20.01	0.0200
2-4	0.975	68.90	89.20	20.30	30.04	2.00	28.8	19.72	0.0197
3-1	0.975	85.00	104.70	19.70	29.94	2.00	28.0	19.12	0.0191
3-2	0.975	5.10	25.20	20.10	29.94	2.00	29.6	19.41	0.0194
3-3	0.975	26.30	48.10	21.80	29.94	2.00	29.0	21.09	0.0211
3-4	0.975	48.40	69.50	21.10	29.94	2.00	29.2	20.40	0.0204

* Dry at 25°C and 1 atmosphere

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Volatile Organics Sampling Train
Sample Volume Corrections

Test No./ Pair No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm3)*
1-1	0.997	82.90	103.50	20.60	30.06	2.30	22.0	20.96	0.0210
1-2	0.997	4.00	25.10	21.10	30.06	2.30	24.2	21.31	0.0213
1-3	0.997	25.65	46.10	20.45	30.06	2.30	26.6	20.49	0.0205
1-4	0.997	46.70	67.70	21.00	30.06	2.30	28.2	20.93	0.0209
2-1	0.997	68.15	89.30	21.15	30.04	2.30	26.2	21.20	0.0212
2-2	0.997	89.70	109.30	19.60	30.04	2.30	27.8	19.55	0.0195
2-3	0.997	10.99	32.30	21.31	30.04	2.30	27.8	21.25	0.0213
2-4	0.997	32.95	54.80	21.85	30.04	2.30	28.0	21.78	0.0218
3-1	0.997	80.50	101.10	20.60	29.94	2.30	29.6	20.35	0.0204
3-2	0.997	1.90	21.70	19.80	29.94	2.30	31.6	19.44	0.0194
3-3	0.997	22.30	42.90	20.60	29.94	2.30	32.4	20.17	0.0202
3-4	0.997	43.50	64.30	20.80	29.94	2.30	33.0	20.32	0.0203

* Dry at 25°C and 1 atmosphere

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 1	Control Box ID: MO5198	
Test location: APC Outlet No. 1	DGMCF: 0.975	Operator: RM	
Date: Oct 12/17	Barometric Pressure: 30.06 "Hg	Project No: 21800	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 1SA, 1SB L1988306-46	

Tube Pair 1 Start Time: 922		Initial Leak Check NDL @ 17 "Hg				Sample ID: 1A, 1B		
Tube Pair 1 End Time: 942		Final Leak Check NDL @ 14 "Hg				Lab ID: L1988306-46		
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg	
		Probe °C	Stack °C	Condensor °C	Meter Avg °C			
0	8.02	147	142	6	20	2.0	3.5	
5	13.2	147	142	6	20	2.0	4.0	
10	18.2	144	143	6	22	2.0	4.0	
15	23.0	148	143	6	21	2.0	4.0	
20	28.55	148	143	6	21	2.0	4.0	

Tube Pair 2 Start Time: 954		Initial Leak Check NDL @ 14 "Hg				Sample ID: 2A 2B		
Tube Pair 2 End Time: 1014		Final Leak Check NDL @ 16 "Hg				Lab ID: -47		
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg	
		Probe °C	Stack °C	Condensor °C	Meter Avg °C			
0	31.5	148	143	6	22	2.0	4	
5	36.7	148	143	6	22	2.0	4	
10	41.9	148	144	6	23	2.0	4	
15	46.8	146	143	7	24	2.0	4	
20	52.0	146	143	7	25	2.0	4	

Tube Pair 3 Start Time: 1021		Initial Leak Check NDL @ 12 "Hg				Sample ID: 3A, 3B		
Tube Pair 3 End Time: 1041		Final Leak Check NDL @ 13.5 "Hg				Lab ID: -48		
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg	
		Probe °C	Stack °C	Condensor °C	Meter Avg °C			
0	52.5	147	142	8	24	~~3.5~~ 2.0	3.5	
5	57.7	147	142	7	25	2.0	3.5	
10	62.8	147	142	7	26	~~2.0~~	4	
15	68.1	146	142	7	26	2.0	4	
20	73.9	146	142	7	26	2.0	4	

Tube Pair 4 Start Time: 1045		Initial Leak Check NDL @ 11 "Hg				Sample ID: 4A, 4B		
Tube Pair 4 End Time: 1109		Final Leak Check NDL @ 14 "Hg				Lab ID: -49		
Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg	
		Probe °C	Stack °C	Condensor °C	Meter Avg °C			
0	74.0	146	141	9	26	2.0	4	
5	79.0	145	141	7	27	2.0	4.5	
10	84.0	146	141	7	27	2.0	4.5	
15	91.0	146	141	7	28	2.0	5	
20	96.0	146	141	7	28	2.0	5	

Vost Data Sheet

Plant: Covanta DYEC	Test Condition:		
Plant Location Courtice, ON	Test No: 2	Control Box ID: M05490	
Test location: APC Outlet No. 1	DGMCF: 0.975	Operator: RW	
Date: OCT 12/17	Barometric Pressure: 30.04 "Hg	Project No: 21800	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: ~~15A 15B~~ L1988306-75 30A 30B	

Tube Pair 1 Start Time: 11 19	Initial Leak Check NDL @ 16 "Hg	Sample ID: 5A 5B			
Tube Pair 1 End Time: 11 39	Final Leak Check NDL @ 11 "Hg	Lab ID: L1988306-50			

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	96.6	145	141	7	27	2.0	4
5	102.0	146	141	7	28	2.0	4
10	106.50	146	141	8	28	2.0	5
15	113.0	146	141	8	28	2.0	4.5
20	118.0	146	141	8	28	2.0	4.5

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Tube Pair 2 Start Time: 11 54	Initial Leak Check NDL @ 11 "Hg	Sample ID: 6A 6B			
Tube Pair 2 End Time: 12 14	Final Leak Check @ "Hg	Lab ID: -51			

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	21.8	146	141	9	26	2.0	4
5	27.9	147	141	10	28	2.0	4
10	32.6	147	141	8	29	2.0	4
15	37.6	147	141	8	29	2.0	4
20	42.6	147	142	8	29	2.0	4

Tube Pair 3 Start Time: 1227	Initial Leak Check NDL @ 14 "Hg	Sample ID: 7A 7B			
Tube Pair 3 End Time: 1247	Final Leak Check NDL @ 13 "Hg	Lab ID: -52			

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	49.0	137	141	9	29	2.0	4
5	53.2	146	142	8	29	2.0	4
10	58.3	146	141	5	29 28	2.0	4
15	62.8	146	142	5	28	2.0	4
20	68.6	146	142	5	29	2.0	4

Tube Pair 4 Start Time: 1256	Initial Leak Check NDL @ 13 "Hg	Sample ID: 8A 8B			
Tube Pair 4 End Time: 1316	Final Leak Check NDL @ 14 "Hg	Lab ID: -53			

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	68.9	147	142	7	28	2.0	4
5	74.4	147	142	7	29	2.0	4
10	79.9	147	142	6	29	2.0	4
15	84.4	147	142	6	29	2.0	4
20	89.2	145	142	6	29	2.0	4

Vost Data Sheet

Plant: Covanta DYEC		Test Condition:	
Plant Location Courtice, ON		Test No: 3	Control Box ID: M05498
Test location: APC Outlet No. 1		DGMCF: 0.975	Operator: DeL
Date: OCTOBER 13 2017		Barometric Pressure: 29.94 "Hg	Project No: 21800
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak		Field Blank Pair ID: 13A, 13B L1988306-58

Tube Pair 1 Start Time: 1049	Initial Leak Check NDL @ 16 "Hg	Sample ID: 9A, 9B
Tube Pair 1 End Time: 1109	Final Leak Check NDL @ 19 "Hg	Lab ID: L1988306-54

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	85.0	130	142	20	28	2.0	3.5
5	91.0	130	142	12	27	2.0	4.0
10	95.6	131	142	12	28	2.0	4.0
15	100.3	131	142	12	28	2.0	4.0
20	104.7	131	143	12	29	2.0	4.0

Tube Pair 2 Start Time: 1115	Initial Leak Check NDL @ 16.5 "Hg	Sample ID: 10A, 10B
Tube Pair 2 End Time: 1135	Final Leak Check NDL @ 11 "Hg	Lab ID: -55

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	5.1	131	142	13	29	2.35	3.5
5	10.7	130	142	12	29	2	3.4
10	16.0	131	142	12	30	2	4
15	21.0	131	142	12	30	2	4
20	25.2	131	142	12	30	2	4

Tube Pair 3 Start Time: 1141	Initial Leak Check NDL @ 11 "Hg	Sample ID: 11A, 11B
Tube Pair 3 End Time: 1201	Final Leak Check NDL @ 11 "Hg	Lab ID: -56

Clock Time	Dry Gas Meter 263 L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	~~26.3~~	131	143	12	29	2.0	5
5	31.3	131	143	12	29	2.0	5
10	37.4	131	143	12	29	2.0	5
15	42.8	131	143	12	29	2.0	5
20	48.1	130	142	11	29	2.0	5

Tube Pair 4 Start Time: 1209	Initial Leak Check NDL @ 11 "Hg	Sample ID: 12A, 12B
Tube Pair 4 End Time: 1229	Final Leak Check NDL @ 22 "Hg	Lab ID: -57

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	48.4	130	143	12	29	2.0	3.5
5	53.4	130	143	12	29	2.0	4
10	58.9	130	143	12	29	2.0	4
15	64.5	131	143	12	29	2.0	4
20	69.5	135	143	10	30	2.0	4

ORTECH Environmental

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE		
Plant Location Courtice, ON	Test No: 1	Control Box ID: VOST #2	
Test location: APC Outlet No. 2	DGMCF: 0.997	Operator: JG	
Date: Oct 12 2017	Barometric Pressure: 30.00 "Hg	Project No: 21800	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak @ 21"	Field Blank Pair ID: 15A, 15B	

L1988306-6

Tube Pair 1 Start Time: ~~0718~~ 09:18	Initial Leak Check NDL @ 21" "Hg	Sample ID: 16A, 16B	
Tube Pair 1 End Time: 0938	Final Leak Check NDL @ 17.5" "Hg	Lab ID: L1988306-61	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6482.90	139	141	11	18	2.3	0.5
5	6488.40	140	141	~~12~~ 09	20	2.3	0.5
10	6493.60	139	141	8	23	2.3	0.5
15	6498.60	140	141	9	24	2.3	0.5
20	6503.50	140	141	9	25	2.3	0.5

Tube Pair 2 Start Time: 0945	Initial Leak Check NDL @ 17.5" "Hg	Sample ID: 17A, 17B	
Tube Pair 2 End Time: 1005	Final Leak Check NDL @ 21.5 "Hg	Lab ID: L1988306-62	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6504.0	138	142	12	~~22~~ 23	~~2.5~~ 2.3	0.5
5	6509.4	140	142	9	24	2.3	0.5
10	6514.65	140	142	9	24	2.3	0.5
15	6519.90	141	141	10	25	2.3	0.5
20	6525.10	142	141	9	25	2.3	0.5

Tube Pair 3 Start Time: 1012	Initial Leak Check NDL @ 21.5 "Hg	Sample ID: 18A, 18B	
Tube Pair 3 End Time: ~~1022~~ 1037	Final Leak Check @ 21.5 "Hg	Lab ID: L1988306-63	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6525.65	138	142	13	24	2.3	0.5
5	6530.55	138	142	11	26	2.3	0.5
10	6535.15	138	142	11	27	2.3	2.0
15	6540.40	139	142	10	28	2.3	2.5
20	6546.10	141	142	10	28	2.3	2.5

Tube Pair 4 Start Time: 1038	Initial Leak Check NDL @ 21.5 "Hg	Sample ID: 19A, 19B	
Tube Pair 4 End Time: 1058	Final Leak Check NDL @ "Hg	Lab ID: L1988306-64	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6546.70	140	142	11	26	2.3	0.5
5	6552.0	138	142	10	28	2.3	0.5
10	6557.40	140	141	10	28	2.3	0.5
15	6562.55	138	141	9	29	2.3	0.5
20	6567.20	138	142	9	30	2.3	0.5

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE		
Plant Location Courtice, ON	Test No: 2	Control Box ID: VOST #2	
Test location: APC Outlet No. 2	DGMCF: 0.997	Operator: JG	
Date: OCTOBER 12, 2017	Barometric Pressure: 30.04 "Hg	Project No: 21800	
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 30A 30B L1988306-75	

Tube Pair 1 Start Time: 1106	Initial Leak Check NDL @ 21.5 "Hg	Sample ID: 20A, 20B	
Tube Pair 1 End Time: 1126	Final Leak Check NDL @ 22 "Hg	Lab ID: L1988306-65	

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	6568.15	139	141	13	27	2.3	0.5
5	6573.45	140	141	11	26	2.3	0.5
10	6578.75	140	141	10	26	2.3	0.5
15	6584.05	141	142	10	26	2.3	0.5
20	6589.30	140	141	10	26	2.3	0.5

Tube Pair 2 Start Time: 1131	Initial Leak Check NDL @ 21.5 "Hg	Sample ID: 21A, 21B	
Tube Pair 2 End Time: 1151	Final Leak Check NDL @ 21.5 "Hg	Lab ID: L1988306-66	

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	6589.75	139	142	13	26	2.3	2.5
5	6593.10	140	142	12	27	2.3	2.5
10	6598.60	139	142	11	28	2.3	2.5
15	6603.90	140	144	10	29	2.3	2.5
20	6609.30	140	142	10	29	2.3	2.5

Tube Pair 3 Start Time: 1157	Initial Leak Check NDL @ 21.5 "Hg	Sample ID: 22A, 22B	
Tube Pair 3 End Time: 1218	Final Leak Check NDL @ 22 "Hg	Lab ID: L1988306-67	

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	6610.99	140	141	12	28	2.3	2.0
5	6615.35	141	142	10	27	2.3	2.0
10	6620.60	141	141	9	27	2.3	2.0
15	6625.70	141	141	9	28	2.3	2.0
2021	6632.30	141	141	9	29	2.3	2.0

Tube Pair 4 Start Time: 1224	Initial Leak Check NDL @ 21.5 "Hg	Sample ID: 23A, 23B	
Tube Pair 4 End Time: 1244	Final Leak Check NDL @ 21.5 "Hg	Lab ID: L1988306-67	

Clock Time	Dry Gas Meter L	Temperatures: Probe °C	Stack °C	Condensor °C	Meter Avg °C	Meter Pressure "H_2O	Pump Vacuum "Hg
0	6632.95	141	141	11	27	2.3	1.0
5	6638.45	140	141	11	27	2.3	1.0
10	6643.95	139	141	11	28	2.3	1.0
15	6649.40	141	142	11	29	2.3	1.0
20	6654.80	140	141	11	29	2.3	1.0

Vost Data Sheet

Plant: Covanta DYEC	Test Condition: COMPLIANCE		A10117
Plant Location Courtice, ON	Test No: 3		Control Box ID: Vost #2
Test location: APC Outlet No. 2	DGMCF: 0.997		Operator: JG
Date: OCTOBER 13, 2017	Barometric Pressure: 29.94 "Hg		Project No: 21800
~ 1 LPM for 20 minutes	NDL - No Dectectable Leak	Field Blank Pair ID: 13A, 13B	

L1988306-58

Tube Pair 1 Start Time: 1024	Initial Leak Check NDL @ 21 "Hg	Sample ID: 24A, 24B	
Tube Pair 1 End Time: 1044	Final Leak Check @ "Hg	Lab ID: L1988306-69	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6780.5	138	141	19	27	2.3	0.5
5	6785.0	139	141	14	29	2.3	0.5
10	6790.45	139	142	14	30	2.3	0.5
15	6795.80	138	141	14	31	2.3	0.5
20	6801.10	138	141	14	31	2.3	0.5

Tube Pair 2 Start Time: 1054	Initial Leak Check NDL @ 21 "Hg	Sample ID: 25A, 25B	
Tube Pair 2 End Time: 1114	Final Leak Check NDL @ 21 "Hg	Lab ID: L1988306-70	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6801.90	136	141	15	30	2.3	0.5
5	6807.1	138	142	17	31	2.3	0.5
10	6812.2	138	142	15	31	2.3	0.5
15	6816.9	136	142	14	33	2.3	0.5
20	6821.7	136	142	13	33	2.3	0.5

Tube Pair 3 Start Time: 1121	Initial Leak Check NDL @ 21 "Hg	Sample ID: 27A, 27B	
Tube Pair 3 End Time: 1141	Final Leak Check NDL @ 21 "Hg	Lab ID: L1988306-72	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6822.30	136	142	16	31	2.3	1.0
5	6827.55	137	142	14	32	2.3	1.0
10	6832.30	138	142	13	32	2.3	3
15	6837.55	142	145	13	34	2.3	3
20	6842.90	137	142	13	33	2.3	3

Tube Pair 4 Start Time: 1149	Initial Leak Check NDL @ 21 "Hg	Sample ID: 26A, 26B	
Tube Pair 4 End Time: 1209	Final Leak Check @ "Hg	Lab ID: L1988306-71	

Clock Time	Dry Gas Meter L	Temperatures				Meter Pressure "H_2O	Pump Vacuum "Hg
		Probe °C	Stack °C	Condensor °C	Meter Avg °C		
0	6843.50	137	142	16	31	2.3	0.5
5	6848.80	139	143	13	32	2.3	0.5
10	6854.10	138	142	13	34	2.3	0.5
15	6859.20	138	143	14	34	2.3	0.5
20	6864.30	139	142	13	34	2.3	0.5

APPENDIX 11

Aldehydes Field Data Sheets
(8 pages)

Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Aldehydes
Sample Volume Corrections

Test No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H_2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm^3)*
1	0.983	91.60	122.40	30.80	30.01	1.00	28.1	30.13	0.0301
2	0.983	22.65	54.00	31.35	30.00	1.00	30.5	30.42	0.0304
3	0.983	54.50	84.80	30.30	29.96	1.00	28.3	29.57	0.0296

* Dry at 25°C and 1 atmosphere.

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Aldehydes
Sample Volume Corrections

Test No.	DGMCF	Initial DGM Reading (L)	Final DGM Reading (L)	Actual Vol. Sampled (L)	Barometric Pressure (in Hg)	Average DGM Pressure del H (in H_2O)	Average DGM Temperature (°C)	Corrected Volume (L)*	Corrected Volume (Rm^3)*
1	1.002	72.00	109.93	37.93	30.02	1.31	31.6	37.43	0.0374
2	1.002	10.00	44.80	34.80	30.00	1.20	31.5	34.32	0.0343
3	1.002	46.00	78.25	32.25	29.96	1.20	30.9	31.82	0.0318

* Dry at 25°C and 1 atmosphere.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	1
Test location:	APC Outlet No. 1
Date:	OCTOBER 2, 2017
Project No.:	21800

Measuring Device	MII Number
Control Module	M05497
Barometer	ENV. CAN

Barometric Pressure: 30.01 "Hg

Clock Time	Dry Gas Meter 916 L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	~~900~~	147	142	131	21	26	~~1.020~~	3
5	93.9	136	142	135	15	26	1.0	3
10	96.1	135	143	135	15	27	1.0	3
15	99.3	147	144	135	15	27	1.0	3
20	102.0	132	143	135	15	28	1.0	3
25	104.5	132	143	134	15	28	1.0	3
30	107.0	131	144	133	15	29	1.0	3
35	109.6	137	144	133	15	29	1.0	3
40	112.0	138	144	133	15	29	1.0	3
45	114.5	138	144	133	15	29	1.0	3
50	117.0	138	144	133	14	29	1.0	3
55	119.5	138	144	132	14	29	1.0	3
60	122.14	138	144	132	14	29	1.0	3

Start Time:	~~922~~ 1455		
Finish Time:	1536		
Initial Leak Check:	<.01	Lpm @ 15	" Hg
Final Leak Check:	<.01	Lpm @ 10	" Hg

DGMCF:	~~0.975~~ 0.983
Sample Volume:	30.8
Average DGM Temp:	28.1
Average DGM Δ H:	1.0

Comments:

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No. 1
Date:	Oct 12/17
Project No.:	21800

Measuring Device	MII Number
Control Module	MU3498
Barometer	ENV-CAN

Barometric Pressure: 30.00 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	22.65	133	143	133	15	29	1.0	3
5	25.5	139	143	133	15	29	1.0	3
10	28.4	139	142	135	15	29	1.0	3
15	31.1	139	143	134	15	29	1.0	3
20	33.9	135	143	135	15	30	1.0	3
25	36.8	139	143	135	14	30	1.0	3
30	39.2	138	142	134	14	30	1.0	3
35	41.8	136	142	134	14	30	1.0	3
40	44.2	134	142	135	13	32	1.0	3
45	46.7	139	142	134	13	32	1.0	3
50	49.1	135	141	135	13	32	1.0	3
55	51.6	139	142	135	12	32	1.0	3
60	54.0	139	142	135	13	32	1.0	3

Start Time:	1629
Finish Time:	1729
Initial Leak Check:	<0.01 Lpm @ 12 " Hg
Final Leak Check:	<0.01 Lpm @ 10 " Hg

DGMCF:	~~0.995~~ 0.983
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	1.0

Comments:

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No.
Date:	OCT 13/17
Project No.:	21800

Measuring Device	MII Number
Control Module	M05499
Barometer	ENV. CAL

Barometric Pressure: 29.96 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	54.5	138	142	133	15	25	1.0	3
5	57.3	138	143	133	15	25	1.0	3
10	59.7	138	143	133	15	26	1.0	3
15	62.1	138	143	132	15	26	1.0	3
20	64.4	139	144	135	15	28	1.0	5
25	66.6	139	143	134	15	29	1.0	3
30	69.0	139	143	135	14	29	1.0	3
35	71.1	138	144	137	14	30	1.0	3
40	73.9	138	143	133	14	30	1.0	3
45	76.6	138	143	134	15	30	1.0	3
50	79.1	138	143	134	15	30	1.0	3
55	81.9	139	144	133	15	30	1.0	3
60	84.8	139	144	133	15	30	1.0	3

Start Time:	842		
Finish Time:	942		
Initial Leak Check:	0.01	Lpm @ 10	" Hg
Final Leak Check:	0.01	Lpm @ 11	" Hg

DGMCF:	0.983 ✓
Sample Volume:	
Average DGM Temp:	
Average DGM Δ H:	

Comments:

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	1
Test location:	APC Outlet No. 2
Date:	October 12, 2017
Project No.:	21800

Measuring Device	MII Number
Control Module	Vost42 A1017
Barometer	ENVCAN

Barometric Pressure: 30.02 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure Δ H "H_2O	Pump Vacuum "Hg Gauge
0	6566720	137	141	144	22	29	1.4	0.5
5	6675.70	137	141	144	22	29	1.4	0.5
10	6679.10	138	141	142	21	30	1.4	0.5
15	66823	138	141	140	21	31	1.4	0.5
20	6685.0	138	144	141	21	31	1.4	0.5
25	6688.6	140	141	139	21	32	1.4	0.5
30	6691.1	138	141	140	20	32	1.4	0.5
35	6695.0	140	141	139	21	32	1.2	0.6
40	6697.7	140	142	139	21	33	1.2	0.5
45	6700.35	140	142	137	21	33	1.2	0.5
50	6703.55	140	142	137	21	33	1.2	0.5
55	6706.35	139	141	136	20	33	1.2	0.5
60	6709.93	140	142	136	21	33	1.2	0.5

Start Time:	1325	
Finish Time:	1425	
Initial Leak Check:	< .01	Lpm @ 21.5 " Hg
Final Leak Check:	< .01	Lpm @ 17.5 " Hg

DGMCF:	1.007
Sample Volume:	37.93
Average DGM Temp:	31.6
Average DGM Δ H:	1.3

Comments: PURGE ON @ 1307 @ .5 lpm 6656.40
OFF @ 1317 @ .5 lpm 6670.70

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	2
Test location:	APC Outlet No. 2
Date:	October 12, 2017
Project No.:	21800

Measuring Device	MII Number
Control Module	A1047
Barometer	ENV CAN

Barometric Pressure: 30.00 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
0	6710.0	139	142	137	20	36	1.2	0.5
5	6712.6	138	141	135	20	28	1.2	0.5
10	6715.7	138	141	135	20	29	1.2	0.5
15	6718.65	139	141	136	21	30	1.2	0.5
20	6721.65	140	141	138	21	30	1.2	0.5
25	6724.48	138	141	137	21	31	1.2	0.5
30	6727.4	139	141	137	21	31	1.2	0.5
35	6730.30	139	141	136	21	32	1.2	0.5
40	6733.15	139	143	139	21	32	1.2	0.5
45	6736.0	139	143	139	21	32	1.2	0.5
50	6738.95	140	142	138	21	33	1.2	0.5
55	6741.85	139	142	136	21	33	1.2	0.5
60	6744.80	138	142	137	21	33	1.2	0.5

Start Time:	1513		
Finish Time:	1613		
Initial Leak Check:	<.01	Lpm @	18 " Hg
Final Leak Check:	<.01	Lpm @	16 " Hg

DGMCF:	1.002
Sample Volume:	34.8
Average DGM Temp:	31.53
Average DGM ΔH:	1.2

Comments:

: sample @ ~0.5 lpm for 60 minutes.

ORTECH Environmental
CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	3
Test location:	APC Outlet No. 2
Date:	October 13, 2012
Project No.:	21800

Measuring Device	MII Number
Control Module	Vost #2 A1OU7
Barometer	ENV CAN

Barometric Pressure: 29.96 "Hg

Clock Time	Dry Gas Meter L	Probe Temp °C	Stack Temp °C	Oven Temp °C	Impinger Outlet °C	Meter Temp Average °C	Meter Pressure ΔH "H_2O	Pump Vacuum "Hg Gauge
0	6746.0	139	141	141	22	23	1.2	0.5
5	6750.1	136	142	138	22	26	1.2	0.5
10	6752.6	136	142	137	22	28	1.2	0.5
15	6755.20	135	143	139	22	30	1.2	0.5
20	6757.70	136	145	143	~~22~~ 21	~~39~~ 31	1.2	0.5
25	6760.30	134	143	140	21	31	1.2	0.5
30	6762.80	134	143	137	22	32	1.2	0.5
35	6765.35	136	143	137	22	32	1.2	0.5
40	6767.95	134	142	139	21	33	1.2	0.5
45	6770.35	135	142	138	22	34	1.2	0.5
50	6773.15	136	142	139	23	34	1.2	0.5
55	6775.35	136	142	138	23	34	1.2	0.5
60	6778.25	138	144	142	23	34	1.2	0.5

Start Time:	0822	
Finish Time:	0927	
Initial Leak Check:	<.01	Lpm @ 20 " Hg
Final Leak Check:	<.01	Lpm @ 20 " Hg

DGMCF:	1.002
Sample Volume:	32.25
Average DGM Temp:	30.92
Average DGM ΔH:	1.2

Comments:

: sample @ ~0.5 lpm for 60 minutes.

APPENDIX 12

ORTECH Sample Log/Chain of Custody Forms
(15 pages)

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

L 2006117

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17-21800-M201A-	Date	Location	Sample Description	Sample Media	Sample Analysis
	✓1	11-OCT-17	# 1 APC Outlet	Test 1 Nozzle & PM10 cyclone rinse	Acetone	Particulate
	✓2			Test 1 PM 2.5 cyclone Rinse	Acetone	Particulate
	✓3			Test 1 PM 2.5 exit & connectors	Acetone	Particulate
	✓4			Test 1 Back up filter	Filter	Particulate
5	✓5			Test 1 Impinger Soln & rinse	Water	Particulate
5	✓6			Test 1 Secondary Filter	Filter	Particulate*
5	✓7			Test 1 Impinger Rinse	Acetone & Hexane	Particulate
6	✓8	11-OCT-17	# 1 APC Outlet	Test 2 Nozzle & PM10 cyclone rinse	Acetone	Particulate
7	✓9			Test 2 PM 2.5 cyclone Rinse	Acetone	Particulate
8	✓10			Test 2 PM 2.5 exit & connectors	Acetone	Particulate
9	✓11			Test 2 Back up filter	Filter	Particulate
10	✓12			Test 2 Impinger Soln & rinse	Water	Particulate
10	✓13			Test 2 Secondary Filter	Filter	Particulate*
10	✓14			Test 2 Impinger Rinse	Acetone & Hexane	Particulate
11	✓15	11-OCT-17	# 1 APC Outlet	Test 3 Nozzle & PM10 cyclone rinse	Acetone	Particulate
12	✓16			Test 3 PM 2.5 cyclone Rinse	Acetone	Particulate
13	✓17			Test 3 PM 2.5 exit & connectors	Acetone	Particulate
14	✓18			Test 3 Back up filter	Filter	Particulate
15	✓19			Test 3 Impinger Soln & rinse	Water	Particulate
15	✓20			Test 3 Secondary Filter	Filter	Particulate*
15	✓21			Test 3 Impinger Rinse	Acetone & Hexane	Particulate

Note: * To be included in condensible particulate analysis as per US EPA Method 202.

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17-21800-M201A-	Date	Location	Sample Description	Sample Media	Sample Analysis
16	✓ 22	10-OCT-17	# 2 APC Outlet	Test 1 Nozzle & PM10 cyclone rinse	Acetone	Particulate
17	✓ 23			Test 1 PM 2.5 cyclone Rinse	Acetone	Particulate
18	✓ 24			Test 1 PM 2.5 exit & connectors	Acetone	Particulate
19	✓ 25			Test 1 Back up filter	Filter	Particulate
20	✓ 26			Test 1 Impinger Soln & rinse	Water	Particulate
	✓ 27			Test 1 Secondary Filter	Filter	Particulate*
	✓ 28			Test 1 Impinger Rinse	Acetone & Hexane	Particulate
21	✓ 29	10-OCT-17	# 2 APC Outlet	Test 2 Nozzle & PM10 cyclone rinse	Acetone	Particulate
22	✓ 30			Test 2 PM 2.5 cyclone Rinse	Acetone	Particulate
23	✓ 31			Test 2 PM 2.5 exit & connectors	Acetone	Particulate
24	✓ 32			Test 2 Back up filter	Filter	Particulate
25	✓ 33			Test 2 Impinger Soln & rinse	Water	Particulate
	✓ 34			Test 2 Secondary Filter	Filter	Particulate*
	✓ 35			Test 2 Impinger Rinse	Acetone & Hexane	Particulate
26	✓ 36	10-OCT-17	# 2 APC Outlet	Test 3 Nozzle & PM10 cyclone rinse	Acetone	Particulate
27	✓ 37			Test 3 PM 2.5 cyclone Rinse	Acetone	Particulate
28	✓ 38			Test 3 PM 2.5 exit & connectors	Acetone	Particulate
29	✓ 39			Test 3 Back up filter	Filter	Particulate
30	✓ 40			Test 3 Impinger Soln & rinse	Water	Particulate
	✓ 41			Test 3 Secondary Filter	Filter	Particulate*
	✓ 42			Test 3 Impinger Rinse	Acetone & Hexane	Particulate

Note: *To be included in condensible particulate analysis as per US EPA Method 202.

ORTECH Environmental Sample Log
Method 201A & Method 202
Covanta

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote/ PO: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17-21800-M201A-	Date	Location	Sample Description	Sample Media	Sample Analysis
31	✓43	11-OCT-17	# 1 APC Outlet	Blank 1 Nozzle & PM10 cyclone rinse	Acetone	Particulate
32	✓44			Blank 1 PM 2.5 cyclone Rinse	Acetone	Particulate
33	✓45			Blank 1 PM 2.5 exit & connectors	Acetone	Particulate
34	✓46			Blank 1 Back up filter	Filter	Particulate
35	✓47			Blank 1 Impinger Soln & rinse	Water	Particulate
	✓48			Blank 1 Secondary Filter	Filter	Particulate*
	✓49			Blank 1 Impinger Rinse	Acetone & Hexane	Particulate
36	✓50	10-OCT-17	# 2 APC Outlet	Blank 2 Nozzle & PM10 cyclone rinse	Acetone	Particulate
37	✓51			Blank 2 PM 2.5 cyclone Rinse	Acetone	Particulate
38	✓52			Blank 2 PM 2.5 exit & connectors	Acetone	Particulate
39	✓53			Blank 2 Back up filter	Filter	Particulate
40	✓54			Blank 2 Impinger Soln & rinse	Water	Particulate
	✓55			Blank 2 Secondary Filter	Filter	Particulate*
	✓56			Blank 2 Impinger Rinse	Acetone & Hexane	Particulate

Note: *To be included in condensible particulate analysis as per US EPA Method 202.

Relinquished To: AARON BARTON Date: 12-oct-2017 11:45

10.4°C

Relinquished By: Angela Nolan Date: 12-OCT-17

ORTECH Environmental Sample Log

Acid Gases
Covanta

L2006132

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO #: Ortech PO# : 21800 - J2393

ORTECH Sample ID 17-21800-M26A-	Sample Date	Location	Sample Description	Media	Initial Volume(ml)	Final Volume(ml)	Sample Analysis
1	10-OCT-17	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	462	HCl, HF & Ammonia
2	↓	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	476	HCl, HF & Ammonia
3	↓	APC Outlet # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	303	HCl, HF & Ammonia
4	11-OCT-17	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	480	HCl, HF & Ammonia
5	↓	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	492	HCl, HF & Ammonia
6	↓	APC Outlet # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	477	HCl, HF & Ammonia
Blank 1	10-OCT-17	APC # 1	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	314	HCl, HF & Ammonia
Blank 2	11-OCT-17	APC # 2	Impinger Soln & rinse	0.1N H_2SO_4 + DH_2O	200	302	HCl, HF & Ammonia

Analyze for HCl, HF and Ammonia

Relinquished By: Angela Melan Date: 12-OCT-17

Relinquished To: AARON BURTON Date: 12-oct-2017 11.45

10.4°C

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

L2006140

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE #: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17-21800-PM-	Sample Date	Sample Description	Location	Sample Media	Sample Analysis
1	✓1	10-OCT-17	Test 1 Probe Rinse Acetone	#1 APC Outlet	Acetone	Particulate & Metals
	✓2		Test 1 Probe Rinse Nitric		0.1N Nitric	Metals
	✓3		Test 1 Filter		Particulate	Particulate & Metals
	✓4		Test 1 Impinger 1-5 Solution		Nitric/Peroxide	Metals
	✓5		Test 1 Impinger 6-7 Solution		Acid. KMnO4	Mercury
	✓6		Test 1 Impinger 6-7 Rinse		8N HCl	Mercury
2	✓7	10-OCT-17	Test 2 Probe Rinse Acetone	#1 APC Outlet	Acetone	Particulate & Metals
	✓8		Test 2 Probe Rinse Nitric		0.1N Nitric	Metals
	✓9		Test 2 Filter		Particulate	Particulate & Metals
	✓10		Test 2 Impinger 1-5 Solution		Nitric/Peroxide	Metals
	✓11		Test 2 Impinger 6-7 Solution		Acid. KMnO4	Mercury
	✓12		Test 2 Impinger 6-7 Rinse		8N HCl	Mercury
3	✓19	11-OCT-17	Blank 1 Probe Rinse Acetone	Blank	Acetone	Particulate & Metals
	✓20		Blank 1 Probe Rinse Nitric		0.1N Nitric	Metals
	✓ 21		Blank 1 Filter		Particulate	Particulate & Metals
	✓22		Blank 1 Impinger 1-5 Solution		Nitric/Peroxide	Metals
	✓23		Blank 1 Impinger 6-7 Solution		Acid. KMnO4	Mercury
	✓24		Blank 1 Impinger 6-7 Rinse		8N HCl	Mercury

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE #: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17-21800-PM-	Sample Date	Sample Description	Location	Sample Media	Sample Analysis
4	✓25	11-OCT-17	Test 1 Probe Rinse Acetone	#2 APC Outlet	Acetone	Particulate & Metals
	✓26		Test 1 Probe Rinse Nitric		0.1N Nitric	Metals
	✓27		Test 1 Filter		Particulate	Particulate & Metals
	✓28		Test 1 Impinger 1-5 Solution		Nitric/Peroxide	Metals
	✓29		Test 1 Impinger 6-7 Solution		Acid. KMnO4	Mercury
	✓30		Test 1 Impinger 6-7 Rinse		8N HCl	Mercury
5	✓31	11-OCT-17	Test 2 Probe Rinse Acetone	#2 APC Outlet	Acetone	Particulate & Metals
	✓32		Test 2 Probe Rinse Nitric		0.1N Nitric	Metals
	✓33		Test 2 Filter		Particulate	Particulate & Metals
	✓34		Test 2 Impinger 1-5 Solution		Nitric/Peroxide	Metals
	✓35		Test 2 Impinger 6-7 Solution		Acid. KMnO4	Mercury
	✓36		Test 2 Impinger 6-7 Rinse		8N HCl	Mercury
6	✓43	11-OCT-17	Blank 2 Probe Rinse Acetone	Blank	Acetone	Particulate & Metals
	✓44		Blank 2 Probe Rinse Nitric		0.1N Nitric	Metals
	✓45		Blank 2 Filter		Particulate	Particulate & Metals
	✓46		Blank 2 Impinger 1-5 Solution		Nitric/Peroxide	Metals
	✓47		Blank 2 Impinger 6-7 Solution		Acid. KMnO4	Mercury
	✓48		Blank 2 Impinger 6-7 Rinse		8N HCl	Mercury

Relinquished By: Angela Nolan Date: 12-Oct-17

Relinquished To: Aaron Burton Date: 12-Oct-2017 11:45

10.4°C

ORTECH

ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

L12006140

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE #: Ortech PO# : 21800 - J2393

ORTECH Sample ID 17-21800-PM-	Sample Date	Sample Description	Location	Sample Media	Sample Analysis
37 ✓		Test 3 Probe Rinse Acetone	#2 APC Outlet	Acetone	Particulate & Metals
38 ✓		Test 3 Probe Rinse Nitric		0.1N Nitric	Metals
39 ✓		Test 3 Filter		Particulate	Particulate & Metals
40 ✓		Test 3 Impinger 1-5 Solution		Nitric/Peroxide	Metals
41 ✓		Test 3 Impinger 6-7 Solution		Acid. KMnO4	Mercury
42 ✓		Test 3 Impinger 6-7 Rinse		8N HCl	Mercury

-8

Relinquished By: [signature] Date: Oct 13/17

Relinquished To: [signature] Date: 13 Oct 17

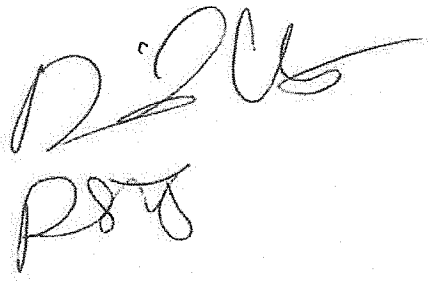
ORTECH Environmental Sample Log
Particulate and Metals Samples
Covanta

LI2006140

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE #: Ortech PO# : 21800 - J2393

ORTECH Sample ID 17-21800-PM-	Sample Date	Sample Description	Location	Sample Media	Sample Analysis
13 ✓		Test 3	#1 APC Outlet	Acetone	Particulate & Metals
14 ✓		Probe Rinse Acetone Test 3		0.1N Nitric	Metals
15 ✓		Probe Rinse Nitric Test 3		Particulate	Particulate & Metals
16 ✓		Filter Test 3		Nitric/Peroxide	Metals
17 ✓		Impinger 1-5 Solution Test 3		Acid. KMnO4	Mercury
18 ✓		Impinger 6-7 Solution Test 3 Impinger 6-7 Rinse		8N HCl	Mercury

-7



ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

L2006987

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17 - 21800 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
1	101 ✓		Test 1 Probe Rinse	# 1 Quench Inlet	Hexane/Acetone	SVOC
	102 ✓		Test 1 Filter		Particulate	SVOC
	103 ✓		Test 1 XAD-II Trap		N.A.	SVOC
	104 ✓		Test 1 Impinger Solution		Ethylene Glycol	SVOC
	105 ✓		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
2	106 ✓		Test 2 Probe Rinse	# 1 Quench Inlet	Hexane/Acetone	SVOC
	107 ✓		Test 2 Filter		Particulate	SVOC
	108 ✓		Test 2 XAD-II Trap		N.A.	SVOC
	109 ✓		Test 2 Impinger Solution		Ethylene Glycol	SVOC
	110 ✓		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
3	111 ✓		Test 3 Probe Rinse	# 1 Quench Inlet	Hexane/Acetone	SVOC
	112 ✓		Test 3 Filter		Particulate	SVOC
	113 ✓		Test 3 XAD-II Trap		N.A.	SVOC
	114 ✓		Test 3 Impinger Solution		Ethylene Glycol	SVOC
	115 ✓		Test 3 Impinger Rinse		Hexane/Acetone	SVOC

16:25 14.8°C

Refer to letter dated September 8, 2017 for lists of analytes.

Relinquished To: RBS Date: 13.Oct.17

Relinquished By: Date: Oct 13/17

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21800 - J2393

ORTECH Sample ID 17 - 21800 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis	
131		Test 1 Probe Rinse	# 2 Quench Inlet	Hexane/Acetone	SVOC	4
132		Test 1 Filter		Particulate	SVOC	
133		Test 1 XAD-II Trap		N.A.	SVOC	
134		Test 1 Impinger Solution		Ethylene Glycol	SVOC	
135		Test 1 Impinger Rinse		Hexane/Acetone	SVOC	
136		Test 2 Probe Rinse	# 2 Quench Inlet	Hexane/Acetone	SVOC	5
137		Test 2 Filter		Particulate	SVOC	
138		Test 2 XAD-II Trap		N.A.	SVOC	
139		Test 2 Impinger Solution		Ethylene Glycol	SVOC	
140		Test 2 Impinger Rinse		Hexane/Acetone	SVOC	
141		Test 3 Probe Rinse	# 2 Quench Inlet	Hexane/Acetone	SVOC	6
142		Test 3 Filter		Particulate	SVOC	
143		Test 3 XAD-II Trap		N.A.	SVOC	
144		Test 3 Impinger Solution		Ethylene Glycol	SVOC	
145		Test 3 Impinger Rinse		Hexane/Acetone	SVOC	

Refer to letter dated September 8, 2017 for lists of analytes.

16:25 14.8°C

Relinquished To: RSES Date: 13-OCT-17

Relinquished By: OCT 13/17 Date: DSL

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

L2007004

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21800 - J2393

ORTECH Sample ID 17 - 21800 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
1 ✓		Test 1 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
2 ✓		Test 1 Filter		Particulate	SVOC
3 ✓		Test 1 XAD-II Trap		N.A.	SVOC
4 ✓		Test 1 Impinger Solution		Ethylene Glycol	SVOC
5 ✓		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
6 ✓		Test 2 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
7 ✓		Test 2 Filter		Particulate	SVOC
8 ✓		Test 2 XAD-II Trap		N.A.	SVOC
9 ✓		Test 2 Impinger Solution		Ethylene Glycol	SVOC
10 ✓		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
11 ✓		Test 3 Probe Rinse	# 1 APC Outlet	Hexane/Acetone	SVOC
12 ✓		Test 3 Filter		Particulate	SVOC
13 ✓		Test 3 XAD-II Trap		N.A.	SVOC
14 ✓		Test 3 Impinger Solution		Ethylene Glycol	SVOC
15 ✓		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
16 ✓		Blank 1 Probe Rinse	Blank	Hexane/Acetone	SVOC
17 ✓		Blank 1 Filter		Particulate	SVOC
18 ✓		Blank 1 XAD-II Trap		N.A.	SVOC
19 ✓		Blank 1 Impinger Solution		Ethylene Glycol	SVOC
20 ✓		Blank 1 Impinger Rinse		Hexane/Acetone	SVOC

1
2
3
4

Refer to letter dated September 8, 2017 for lists of analytes.

16:25

Relinquished To: [signature] Date: 13 OCT 17

Relinquished By: [signature] Date: Oct 13/17

14.8°C

ORTECH Environmental Sample Log
Semi-Volatile Organics Samples
Covanta

Client: Covanta
Job/Report Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
Quote / PO: Ortech PO# : 21800 - J2393

	ORTECH Sample ID 17 - 21800 -SVOC-	Date	Sample Description	Location	Sample Media	Sample Analysis
5	21		Test 1 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
	22		Test 1 Filter		Particulate	SVOC
	23		Test 1 XAD-II Trap		N.A.	SVOC
	24		Test 1 Impinger Solution		Ethylene Glycol	SVOC
	25		Test 1 Impinger Rinse		Hexane/Acetone	SVOC
6	26		Test 2 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
	27		Test 2 Filter		Particulate	SVOC
	28		Test 2 XAD-II Trap		N.A.	SVOC
	29		Test 2 Impinger Solution		Ethylene Glycol	SVOC
	30		Test 2 Impinger Rinse		Hexane/Acetone	SVOC
7	31		Test 3 Probe Rinse	# 2 APC Outlet	Hexane/Acetone	SVOC
	32		Test 3 Filter		Particulate	SVOC
	33		Test 3 XAD-II Trap		N.A.	SVOC
	34		Test 3 Impinger Solution		Ethylene Glycol	SVOC
	35		Test 3 Impinger Rinse		Hexane/Acetone	SVOC
8	36		Blank 2 Probe Rinse	Blank	Hexane/Acetone	SVOC
	37		Blank 2 Filter		Particulate	SVOC
	38		Blank 2 XAD-II Trap		N.A.	SVOC
	39		Blank 2 Impinger Solution		Ethylene Glycol	SVOC
	40		Blank 2 Impinger Rinse		Hexane/Acetone	SVOC

Refer to letter dated September 8, 2017 for lists of analytes.

16:25

Relinquished To: [signature] Date: 13 OCT 17

Relinquished By: [signature] Date: OCT 13/17

L2007378

ORTECH Sample Log
Method 430 Samples
Covanta

Client: Covanta
Project Number: 21800
Received By:
How Received: Train Recovery
Job Assigned To: ALS
QUOTE/P.O.: Ortech P.O. : 21800 - J2393

Test Location	Test Number	ORTECH Sample ID 17-21800-M430-	Sample Date	Sample Media
#1 APC Outlet	✓1	1		DNPH & Toluene
	✓2	2		DNPH & Toluene
	✓3	3		DNPH & Toluene
	✓Blank 1	Blank 1		DNPH & Toluene
#2 APC Outlet	✓1	4		DNPH & Toluene
	✓2	5		DNPH & Toluene
	✓3	6		DNPH & Toluene
	✓Blank 2	Blank 2		DNPH & Toluene
	Trip Spike			

Analyse for: **Formaldehyde**
Acetaldehyde
Acrolein

Relinquished To: [signature] Date: 13 OCT 17

Relinquished By: [signature] Date: OCT 13/17

ALS Environmental

Chain of Custody / Analytical Request Form

1435 Norjohn Court Unit 1, Burlington Ontario, Canada L7L 0E6
Tel +1-905-331-3111 Fax +1-905-331-4567 www.alsglobal.com alsbu.clientservices@alsglobal.com

COC # _____

Page ____ of ____

Report To		Report Format / Distribution		Service Requested
Company:	ALS Environmental	☑ Standard ☐ Other:		☐ Regular Service
Contact:	Rachael Stolys	☑ PDF ☑ Excel ☐ Digital ☐ Fax		☑ Rush Service - surcharge applies
Address:	1435 Norjohn Court Unit 1 Burlington ON	Email 1:	rachael.stolys@alsgloblal.com	☐ Other - Please contact ALS
Phone:		Email 2:	alsbu.clientservices@alsglobal.com	
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**		
Company:		Job #:	21800 - Covanta	
Contact:		Location:		
Address:		PO:		
Phone:	Fax:	Sampled by:		
Lab Work Order #		**ALS Contact:**	**Chris Gibson**	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Analysis Request: Method CARB430 Alde	Hazardous? Provide Details	Highly Contaminated?	Number of Containers
	17-21800-M430-TEST 1 (#1 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-TEST 2 (#1 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-TEST 3 (#1 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-BLANK 1 (#1 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-TEST 4 (#2APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-TEST 5 (#2 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-TEST 6 (#2 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-BLANK 2 (#2 APC OUTLET)			DNPH & Toluene	X			
	17-21800-M430-TRIP SPIKE			DNPH & Toluene	X			

Special Instructions / Regulations / Hazardous Details

Targets required: Formaldehyde, Acetaldehyde, Acrolein Results needed by: 27-OCT-17

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided by ALS

Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
						°C				

ORTECH Sample Log
VOCs

L2007472

Client: Covanta
Project Number: 21800
Received By:
Job Assigned To: ALS
Quote / PO : ORTECH PO: 21800 - J2393

Test Location	Test Number	Pair Number	ORTECH Sample ID 17-21800-VOST-	Sample Date	Sample Description	Sample Analysis
# 1 APC Outlet	1 -1 ✓	1	1A, 1B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-2 ✓	2	2A, 2B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-3 ✓	3	3A, 3B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-4	4	4A, 4B	October 12, 2017	Archived @ ORTECH	
	✓	Field Blank	15A, 15B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	2 -5 ✓	1	5A, 5B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
		2	6A, 6B	October 12, 2017	Archived @ ORTECH	
	-6 ✓	3	7A, 7B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-7 ✓	4	8A, 8B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	3 -8 ✓	1	9A, 9B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
	-9 ✓	2	10A, 10B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
		3	11A, 11B	October 13, 2017	Archived @ ORTECH	
	-10 ✓	4	12A, 12B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
	-11 ✓	Field Blank	13A, 13B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
	-12 ✓	Trip Blank	14A, 14B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
	Combined Condesate			October 13, 2017	Archived @ ORTECH	
# 2 APC Outlet	1 -13 ✓	1	16A, 16B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-14 ✓	2	17A, 17B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
		3	18A, 18B	October 12, 2017	Archived @ ORTECH	
	-15 ✓	4	19A, 19B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	2 -16 ✓	1	20A, 20B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
		2	21A, 21B	October 12, 2017	Archived @ ORTECH	
	-17 ✓	3	22A, 22B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-18 ✓	4	23A, 23B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	-19 ✓	Field Blank	30A, 30B	October 12, 2017	Tenax and Tenax/Charcoal	VOCs
	3 -20 ✓	1	24A, 24B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
	-21 ✓	2	25A, 25B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
		3	27A, 27B	October 13, 2017	Archived @ ORTECH	
	-22 ✓	4	26A, 26B	October 13, 2017	Tenax and Tenax/Charcoal	VOCs
	Combined Condesate			October 13, 2017	Archived @ ORTECH	

Refer to letter dated September 8, 2017 for lists of analytes.

Custody Relinquished by: Andrew Saikaley Date:

Custody Received by: W. DAVIS Date: 16-Oct-17
11:45
18.0°C

APPENDIX 13

Particulate and Metals Train Recovery Data Sheets
(8 pages)

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Date:	OCT. 10/17
Test No.:	1
Test Location:	UNIT 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	423.9
After Act. Rinse:	503.3
Total TS1:	79.4

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	425.8
After 0.1N HNO_3 Rinse:	601.2
Total TS2:	175.4

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 39

CONTAINER TS3

Initial Wt:	0.5956
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	1
TS2 (Probe Rinse-0.1N HNO_3)	2
TS3 (Filter)	3
TS4 (Impinger 1-5 Sol'n-HNO_3)	4
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	5
TS5-B (Impinger 6, 7 Rinse-HCl)	6

Train Loaded By: DU

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 10/17

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

Impinger #1 Empty		
Empty Wt:	678.9	
Final Wt:	913.0	
1 Gain:	234.1	
Colour:	CL	

Impinger #2 Empty (Knock-out)	
Empty Wt:	601.8
Final Wt:	796.9
2 Gain:	195.1
Colour:	CL

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	677.1
Initial Wt:	790.1
Final Wt:	843.5
3 Gain:	53.4
Colour:	CL

Impinger #4 HNO_3/H_2O_2	
Empty Wt:	688.8
Initial Wt:	783.8
Final Wt:	796.7
4 Gain:	12.9
Colour:	CL

Impinger #5 Empty	
Empty Wt:	520.2
Final Wt:	524.3
5 Gain:	4.1
Colour:	CL

CONTAINER TS4 WEIGHTS	
Empty Wt:	423.7
w/ Imp. 1-5 Soln:	1127.3
Imp. 1 to 5 Volume:	703.6
After HNO_3 Rinse:	1315.5
Total TS4:	891.8

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

Impinger #6 $KMnO_4/H_2SO_4$	
Empty Wt:	668.5
Initial Wt:	780.5
Final Wt:	790.4
6 Gain:	5.9
Colour:	PURPLE

Impinger # 7 $KMnO_4/H_2SO_4$	
Empty Wt:	667.6
Initial Wt:	782.5
Final Wt:	787.1
7 Gain:	5.2
Colour:	PURPLE

CWTR = 1 to 7: 510.7

WCBDA= 8: 22.2

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.7
With Imp. 6&7 Soln:	901.5
Imp. 6&7 Volume:	234.8
After $KMnO_4$ Rinse:	777.4
After100g H_2O Rinse:	865.7
Total TS5-A:	439.0

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.2
With 150 mL DI H_2O:	454.2
After HCl Rinse:	495.9
After DI H_2O Rinse:	602.0
Total TS5-B:	320.8

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 8

Impinger #8 Silica Gel	
Initial Wt:	916.2
Final Wt:	938.4
8 Gain:	22.2

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

13

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Date:	OCT. 10/17
Test No.:	2
Test Location:	UNIT 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	278.2
After Act. Rinse:	397.5
Total TS1:	119.3

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	279.5
After 0.1N HNO_3 Rinse:	447.0
Total TS2:	167.5

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: #37

CONTAINER TS3

Initial Wt:	6055
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	7
TS2 (Probe Rinse-0.1N HNO_3)	8
TS3 (Filter)	9
TS4 (Impinger 1-5 Sol'n-HNO_3)	10
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	11
TS5-B (Impinger 6, 7 Rinse-HCl)	12

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	517.1
	Final Wt:	907.7
1	Gain:	390.6
	Colour:	CC

	Impinger #2 Empty (Knock-out)	
	Empty Wt:	603.1
	Final Wt:	650.5
2	Gain:	47.4
	Colour:	CC

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	677.6
	Initial Wt:	788.2
	Final Wt:	837.0
3	Gain:	48.8
	Colour:	CC

	Impinger #4 HNO_3/H_2O_2	
	Empty Wt:	669.8
	Initial Wt:	776.2
	Final Wt:	797.9
4	Gain:	21.7
	Colour:	CC

	Impinger #5 Empty	
	Empty Wt:	615.0
	Final Wt:	617.1
5	Gain:	2.1
	Colour:	CC

CONTAINER TS4 WEIGHTS	
Empty Wt:	426.0
w/ Imp. 1-5 Soln:	1100.2
Imp. 1 to 5 Volume:	674.2
After HNO_3 Rinse:	1297.9
Total TS4:	871.9

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

	Impinger #6 $KMnO_4/H_2SO_4$	
	Empty Wt:	666.3
	Initial Wt:	779.6
	Final Wt:	773.6
6	Gain:	-6.0
	Colour:	PURPLE

	Impinger # 7 $KMnO_4/H_2SO_4$	
	Empty Wt:	658.6
	Initial Wt:	772.6
	Final Wt:	775.6
7	Gain:	3.0
	Colour:	PURPLE

507.6 ✓

CWTR = 1 to 7: ~~507.6~~ ~~520.5~~

WCBDA= 8: 26.5

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.3
With Imp. 6&7 Soln:	646.3
Imp. 6&7 Volume:	220.0
After $KMnO_4$ Rinse:	757.2
After100g H_2O Rinse:	851.6
Total TS5-A:	425.3

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.6
With 150 mL DI H_2O:	456.9
After HCl Rinse:	502.3
After DI H_2O Rinse:	609.6
Total TS5-B:	328.0

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 8

	Impinger #8 Silica Gel	
	Initial Wt:	874.8
	Final Wt:	901.3
8	Gain:	26.5

9

Train Loaded By: RM
Train Recovered By: AN / DT
Recovery Witnessed By:
Date: OCT. 10/17

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Date:	OCT. 12/17
Test No.:	3
Test Location:	UNIT 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	282.0
After Act. Rinse:	417.2
Total TS1:	135.2

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.4
After 0.1N HNO_3 Rinse:	528.0
Total TS2:	246.6

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 16-2-80

CONTAINER TS3

Initial Wt:	0.6359 ~~0.5532~~
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	13
TS2 (Probe Rinse-0.1N HNO_3)	14
TS3 (Filter)	15
TS4 (Impinger 1-5 Sol'n-HNO_3)	16
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	17
TS5-B (Impinger 6, 7 Rinse-HCl)	18

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 12/17

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	677.0
	Final Wt:	998.7
1	Gain:	321.7
	Colour:	CC

	Impinger #2 Empty (Knock-out)	
	Empty Wt:	602.1
	Final Wt:	661.0
2	Gain:	58.9
	Colour:	CC

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	690.1
	Initial Wt:	800.5
	Final Wt:	852.6
3	Gain:	52.1
	Colour:	CC

	Impinger #4 HNO_3/H_2O_2	
	Empty Wt:	676.9
	Initial Wt:	779.4
	Final Wt:	803.3
4	Gain:	23.9
	Colour:	CC

	Impinger #5 Empty	
	Empty Wt:	518.8
	Final Wt:	523.7
5	Gain:	4.9
	Colour:	CC

CONTAINER TS4 WEIGHTS	
Empty Wt:	424.8
w/ Imp. 1-5 Soln:	1060.3
Imp. 1 to 5 Volume:	635.5
After HNO_3 Rinse:	1255.1
Total TS4:	830.3

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

	Impinger #6 $KMnO_4/H_2SO_4$	
	Empty Wt:	669.2
	Initial Wt:	777.1
	Final Wt:	790.9
6	Gain:	13.8
	Colour:	PURPLE

	Impinger # 7 $KMnO_4/H_2SO_4$	
	Empty Wt:	607.1
	Initial Wt:	786.6
	Final Wt:	791.2
7	Gain:	4.6
	Colour:	PURPLE

CWTR = 1 to 7: 449.9

WCBDA= 8: 20.9

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	425.5
With Imp. 6&7 Soln:	665.8
Imp. 6&7 Volume:	240.3
After $KMnO_4$ Rinse:	773.4
After100g H_2O Rinse:	876.4
Total TS5-A:	450.9

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.2
With 150 mL DI H_2O:	430.3
After HCl Rinse:	463.9
After DI H_2O Rinse:	579
Total TS5-B:	294.7

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 8

Impinger #8 Silica Gel	
Initial Wt:	884.0
Final Wt:	904.9
8 Gain:	20.9

13

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 11/17
Test No.: 1
Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	299.2
After Act. Rinse:	409.4
Total TS1:	130.2

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.0
After 0.1N HNO_3 Rinse:	407.9
Total TS2:	126.9

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 38

CONTAINER TS3

Initial Wt:	0.6056
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	677.6
Final Wt:	946.9
1 Gain:	269.3
Colour:	CC

Impinger #2 Empty (Knock-out)	
Empty Wt:	602.4
Final Wt:	764.2
2 Gain:	161.8
Colour:	CC

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	690.0
Initial Wt:	801.8
Final Wt:	858.8
3 Gain:	57.0
Colour:	CC

Impinger #4 HNO_3/H_2O_2	
Empty Wt:	676.6
Initial Wt:	774.8
Final Wt:	792.7
4 Gain:	17.9
Colour:	CC

Impinger #5 Empty	
Empty Wt:	519.1
Final Wt:	523.9
5 Gain:	4.8
Colour:	CC

CONTAINER TS4 WEIGHTS	
Empty Wt:	427.2
w/ Imp. 1-5 Soln:	1141.9
Imp. 1 to 5 Volume:	714.7
After HNO_3 Rinse:	1339.0
Total TS4:	911.8

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

Impinger #6 $KMnO_4/H_2SO_4$	
Empty Wt:	609.1
Initial Wt:	781.5
Final Wt:	790.0
6 Gain:	8.5
Colour:	PURPLE

Impinger # 7 $KMnO_4/H_2SO_4$	
Empty Wt:	668.9
Initial Wt:	783.7
Final Wt:	786.1
7 Gain:	2.4
Colour:	PURPLE

CWTR = 1 to 7: 521.7

WCBDA= 8: 17.1

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.6
With Imp. 6&7 Soln:	655.0
Imp. 6&7 Volume:	228.4
After $KMnO_4$ Rinse:	773.2
After100g H_2O Rinse:	879.4
Total TS5-A:	452.8

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.6
With 150 mL DI H_2O:	434.1
After HCl Rinse:	489.7
After DI H_2O Rinse:	615.3
Total TS5-B:	332.7

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 8

Impinger #8 Silica Gel	
Initial Wt:	938.4
Final Wt:	955.5
8 Gain:	17.1

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	25
TS2 (Probe Rinse-0.1N HNO_3)	26
TS3 (Filter)	27
TS4 (Impinger 1-5 Sol'n-HNO_3)	28
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	29
TS5-B (Impinger 6, 7 Rinse-HCl)	30

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

13

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 11/17

Particulate and Metals Train Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 11/17
Test No.: 2
Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.1
After Act. Rinse:	381.1
Total TS1:	100.0

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	278.0
After 0.1N HNO_3 Rinse:	440.2
Total TS2:	162.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 15

CONTAINER TS3

Initial Wt:	0.1431
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	31
TS2 (Probe Rinse-0.1N HNO_3)	32
TS3 (Filter)	33
TS4 (Impinger 1-5 Sol'n-HNO_3)	34
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	35
TS5-B (Impinger 6, 7 Rinse-HCl)	36

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 11/17

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	564.0
	Final Wt:	854.5
1	Gain:	290.5
	Colour:	CC

	Impinger #2 Empty (Knock-out)	
	Empty Wt:	603.8
	Final Wt:	755.7
2	Gain:	151.9
	Colour:	CC

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	~~646.7~~ 646.4
	Initial Wt:	787.2
	Final Wt:	848.2
3	Gain:	61.0
	Colour:	CC

	Impinger #4 HNO_3/H_2O_2	
	Empty Wt:	~~676.4~~ 669.7
	Initial Wt:	769.0
	Final Wt:	779.9
4	Gain:	10.9
	Colour:	CC

	Impinger #5 Empty	
	Empty Wt:	615.3
	Final Wt:	617.0
5	Gain:	1.7
	Colour:	CC

CONTAINER TS4 WEIGHTS	
Empty Wt:	423.3
w/ Imp. 1-5 Soln:	1142.9
Imp. 1 to 5 Volume:	719.6
After HNO_3 Rinse:	1338.1
Total TS4:	914.8

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

	Impinger #6 $KMnO_4/H_2SO_4$	
	Empty Wt:	666.9
	Initial Wt:	783.3
	Final Wt:	781.1
6	Gain:	-2.2
	Colour:	FWERE

	Impinger # 7 $KMnO_4/H_2SO_4$	
	Empty Wt:	600.8
	Initial Wt:	777.8
	Final Wt:	778.7
7	Gain:	0.9
	Colour:	FWERE

CWTR = 1 to 7: 514.7

WCBDA= 8: 19.5

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A

Empty Wt:	424.0
With Imp. 6&7 Soln:	651.0
Imp. 6&7 Volume:	227.0
After $KMnO_4$ Rinse:	757.0
After100g H_2O Rinse:	867.1
Total TS5-A:	443.1

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B

Empty Wt:	281.8
With 150 mL DI H_2O:	432.6
After HCl Rinse:	472.7
After DI H_2O Rinse:	592.7
Total TS5-B:	310.9

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 8

Impinger #8 Silica Gel	
Initial Wt:	901.3
Final Wt:	920.8
8 Gain:	19.5

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

9

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Date:	OCT. 12/17
Test No.:	3
Test Location:	UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.1
After Act. Rinse:	432.4
Total TS1:	151.3

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	281.8
After 0.1N HNO_3 Rinse:	451.3
Total TS2:	169.5

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: ~~#20~~ #23

CONTAINER TS3

Initial Wt:	~~0.7074~~ 0.6367
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	37
TS2 (Probe Rinse-0.1N HNO_3)	38
TS3 (Filter)	39
TS4 (Impinger 1-5 Sol'n-HNO_3)	40
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	41
TS5-B (Impinger 6, 7 Rinse-HCl)	42

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 12/17

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	564.2
	Final Wt:	901.8
1	Gain:	337.6
	Colour:	CC

	Impinger #2 Empty (Knock-out)	
	Empty Wt:	603.8
	Final Wt:	667.4
2	Gain:	63.6
	Colour:	CC

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	676.5
	Initial Wt:	786.4
	Final Wt:	847.2
3	Gain:	60.8
	Colour:	CC

	Impinger #4 HNO_3/H_2O_2	
	Empty Wt:	669.7
	Initial Wt:	771.3
	Final Wt:	783.1
4	Gain:	11.8
	Colour:	CC

	Impinger #5 Empty	
	Empty Wt:	615.4
	Final Wt:	618.2
5	Gain:	2.8
	Colour:	CC

CONTAINER TS4 WEIGHTS	
Empty Wt:	429.9
w/ Imp. 1-5 Soln:	1103.5
Imp. 1 to 5 Volume:	680.6
After HNO_3 Rinse:	1269.2
Total TS4:	840.3

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

	Impinger #6 $KMnO_4/H_2SO_4$	
	Empty Wt:	667.5
	Initial Wt:	788.0
	Final Wt:	784.3
6	Gain:	−3.7
	Colour:	PURPLE

	Impinger # 7 $KMnO_4/H_2SO_4$	
	Empty Wt:	701.5
	Initial Wt:	772.0
	Final Wt:	771.5
7	Gain:	−0.5
	Colour:	PURPLE

CWTR = 1 to 7: 472.4

WCBDA= 8: 28.4

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A

Empty Wt:	473.0
With Imp. 6&7 Soln:	~~1103.5~~
Imp. 6&7 Volume:	~~630.5~~
After $KMnO_4$ Rinse:	765.5
After100g H_2O Rinse:	~~896.1~~
Total TS5-A:	473.7

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B

Empty Wt:	425.5
With 150 mL DI H_2O:	~~575.5~~
After HCl Rinse:	~~586.5~~
After DI H_2O Rinse:	704.4
Total TS5-B:	280.9

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 8

649.0
~~765.5~~
226.0

Impinger #8 Silica Gel	
Initial Wt:	846.6
Final Wt:	875.0
8 Gain:	28.4

9

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Date:	OCT. 11/17
Test No.:	BLANK 1
Test Location:	UNIT 1

Nozzle, Probe Liner, Cyclone Bypass & F.H. Filter Housing

Filter

Filter ID: 10-2-86

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.6
After Act. Rinse:	422.5
Total TS1:	140.9

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	283.6
After 0.1N HNO_3 Rinse:	434.3
Total TS2:	150.7

MARK FLUID LEVEL

SEAL AND LABEL TS2

CONTAINER TS3

Initial Wt:	0.6446
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

Impinger #1 Empty	
Empty Wt:	679.0
Final Wt:	679.0
1 Gain:	0
Colour:	—

Impinger #2 Empty (Knock-out)	
Empty Wt:	600.8
Final Wt:	600.8
2 Gain:	0
Colour:	—

Impinger #3 HNO_3/H_2O_2	
Empty Wt:	677.5
Initial Wt:	779.4
Final Wt:	779.4
3 Gain:	0
Colour:	CC

Impinger #4 HNO_3/H_2O_2	
Empty Wt:	690.3
Initial Wt:	792.2
Final Wt:	792.2
4 Gain:	0
Colour:	CC

Impinger #5 Empty	
Empty Wt:	521.0
Final Wt:	521.0
5 Gain:	0
Colour:	—

CONTAINER TS4 WEIGHTS	
Empty Wt:	424.4
w/ Imp. 1-5 Soln:	632.0
Imp. 1 to 5 Volume:	207.6
After HNO_3 Rinse:	757.7
Total TS4:	333.3

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

Impinger #6 $KMnO_4/H_2SO_4$	
Empty Wt:	668.8
Initial Wt:	772.3
Final Wt:	772.3
6 Gain:	0
Colour:	PURPLE

Impinger # 7 $KMnO_4/H_2SO_4$	
Empty Wt:	666.4
Initial Wt:	769.2
Final Wt:	769.2
7 Gain:	0
Colour:	PURPLE

CWTR = 1 to 7: 0

WCBDA= 8: 0

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	426.4
With Imp. 6&7 Soln:	656.0
Imp. 6&7 Volume:	229.6
After $KMnO_4$ Rinse:	781.5
After100g H_2O Rinse:	898.8
Total TS5-A:	452.4

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	283.6
With 150 mL DI H_2O:	490.2
After HCl Rinse:	529.5
After DI H_2O Rinse:	612.9
Total TS5-B:	329.3

MARK FLUID LEVEL

SEAL & LABEL TS5-B

Impinger 8

Impinger #8 Silica Gel	
Initial Wt:	913.4
Final Wt:	913.4
8 Gain:	0

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	19
TS2 (Probe Rinse-0.1N HNO_3)	20
TS3 (Filter)	21
TS4 (Impinger 1-5 Sol'n-HNO_3)	22
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	23
TS5-B (Impinger 6, 7 Rinse-HCl)	24

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 11/17

ORTECH Enivronmental

Particulate and Metals Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Date:	OCT. 11/17
Test No.:	BLANK 2
Test Location:	UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	281.4
After Act. Rinse:	432.2
Total TS1:	150.8

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS2

Container TS2 Weights	
Empty Wt:	283.3
After 0.1N HNO_3 Rinse:	433.5
Total TS2:	150.2

MARK FLUID LEVEL

SEAL AND LABEL TS2

Filter

Filter ID: 16-Q-72

CONTAINER TS3

Initial Wt:	0.6560
Final Wt:	
Gain:	
Colour:	WHITE

Seal and label container TS3

SAMPLE IDENTIFICATION	17-21800-PM-
TS1 (Probe Rinse-Acetone)	43
TS2 (Probe Rinse-0.1N HNO_3)	44
TS3 (Filter)	45
TS4 (Impinger 1-5 Sol'n-HNO_3)	46
TS5-A (Impinger 6, 7 Sol'n-$KMnO_4$)	47
TS5-B (Impinger 6, 7 Rinse-HCl)	48

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 11/17

Impingers 1, 2, 3, 4 and 5

CONTAINER TS4

	Impinger #1 Empty	
	Empty Wt:	701.2
	Final Wt:	701.2
1	Gain:	0
	Colour:	—

	Impinger #2 Empty (Knock-out)	
	Empty Wt:	669.3
	Final Wt:	669.3
2	Gain:	0
	Colour:	—

	Impinger #3 HNO_3/H_2O_2	
	Empty Wt:	673.4
	Initial Wt:	775.5
	Final Wt:	775.5
3	Gain:	0
	Colour:	CC

	Impinger #4 HNO_3/H_2O_2	
	Empty Wt:	691.1
	Initial Wt:	793.1
	Final Wt:	793.1
4	Gain:	0
	Colour:	CC

	Impinger #5 Empty	
	Empty Wt:	573.4
	Final Wt:	573.4
5	Gain:	0
	Colour:	—

CONTAINER TS4 WEIGHTS	
Empty Wt:	424.2
w/ Imp. 1-5 Soln:	636.1
Imp. 1 to 5 Volume:	211.9
After HNO_3 Rinse:	760.8
Total TS4:	336.6

MARK FLUID LEVEL

SEAL AND LABEL TS4

Impinger 6 & 7

	Impinger #6 $KMnO_4/H_2SO_4$	
	Empty Wt:	671.5
	Initial Wt:	780.1
	Final Wt:	780.1
6	Gain:	0
	Colour:	PURPLE

	Impinger # 7 $KMnO_4/H_2SO_4$	
	Empty Wt:	673.8
	Initial Wt:	780.7
	Final Wt:	780.7
7	Gain:	0
	Colour:	PURPLE

CWTR = 1 to 7: 0

WCBDA= 8: 0

Impinger 6 & 7

CONTAINER TS5-A & TS5-B

CONTAINER TS5-A	
Empty Wt:	424.0
With Imp. 6&7 Soln:	650.0
Imp. 6&7 Volume:	226.0
After $KMnO_4$ Rinse:	761.6
After100g H_2O Rinse:	860.4
Total TS5-A:	436.4

MARK FLUID LEVEL

SEAL & LABEL TS5-A

CONTAINER TS5-B	
Empty Wt:	281.7
With 150 mL DI H_2O:	436.9
After HCl Rinse:	480.4
After DI H_2O Rinse:	571.0
Total TS5-B:	289.3

MARK FLUID LEVEL

SEAL & LABEL TS5-B

TS1,TS2- 500 ml Glass Bottle
TS3- Petri Dish
TS4- 4 L Amber Glass Bottle
TS5-A - 1000 ml Amber Glass Bottle
TS5-B - 500 ml Amber Glass Bottle

Impinger 8

Impinger #8 Silica Gel	
Initial Wt:	866.0
Final Wt:	866.0
8 Gain:	0

APPENDIX 14

Inorganics Analytical Reports
(29 pages)

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006140		Mississauga, ON L5J 2Y4
Date of Report	24-Oct-17		Canada
Date of Sample Receipt	12-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (SR 23-Oct-2017)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: R. Stolys

Rachael Stolys
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(7 THRU 12) (#1 APC OUTLET) TEST#2	17-21800-PM-(19 THRU 24) BLANK 1	17-21800-PM-(25 THRU 30) (#2 APC OUTLET) TEST#1	17-21800-PM-(31 THRU 36) (#2 APC OUTLET) TEST#2
ALS Sample ID		L2006140-1	L2006140-2	L2006140-3	L2006140-4	L2006140-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Oct-17	10-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
PM via Gravimetric Analysis Method 5	LOR					
	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	5.2	8.3	0.9	4.2	<0.1
Acetone Particulate Matter	0.4	1.2	1.9	0.4	2.0	1.1
	g	g	g	g	g	g
Acetone Mass	0.02	80.3	120	142	131	101

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-PM-(43 THRU 48) BLANK		17-21800-PM-(13 THRU 18) (#1 APC 2 OUTLET) TEST #3		17-21800-PM-(37 THRU 42) (#2 APC OUTLET) TEST #3		MB	
ALS Sample ID		L2006140-6		L2006140-7		L2006140-8		L2006140-MB	
Matrix		Stack		Stack		Stack		n/a	
Analysis type		Sample		Sample		Sample		Sample	
Sampling Date/Time		11-Oct-17		12-Oct-17		12-Oct-17		n/a	
Date of Receipt		12-Oct-17		13-Oct-17		13-Oct-17		n/a	
PM via Gravimetric Analysis Method 5	**LOR**								
	mg	**mg**		**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	0.8		0.3	J	<0.1		<0.1	
Acetone Particulate Matter	0.4	0.1	J	1.7		1.6		0.3	J
	g	**g**		**g**		**g**		**g**	
Acetone Mass	0.02	152		136		153		32.0	

ALS Environmental
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006140		Mississauga, ON L5J 2Y4
Date of Report	31-Oct-17		(905)822-4120
Date of Sample Receipt	12-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (SA 27-Oct-17)
Sample Preparation via USEPA Method 29 (SR 26-Oct-17)

2A:

LCS and LCSD recoveries for Sb, Be, Cd, Cr, V, Mn are outside ALS DQOs, with low recoveries for each. These targets may be biased slightly low.
MS shows some low recoveries for Sb, Ba, Cd, Mn. MSD is in control. This is not expected to have an impact on data quality.
Be recovery in MS/MSD are outside ALS DQOs. This may point to a matrix interference, which may result in an overall low bias.

LCB = Laboratory Control Blank
LCS = Laboratory Control Sample
LCSD = Laboratory Control Sample Duplicate
LOR = Limit of Reporting

Certified by: R. Stolys

Rachael Stolys
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-PM (1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM (7 THRU 12) (#1 APC OUTLET) TEST#2	17-21800-PM (19 THRU 24) BLANK 1	17-21800-PM (25 THRU 30) (#2 APC OUTLET) TEST#1	17-21800-PM (31 THRU 36) (#2 APC OUTLET) TEST#2	17-21800-PM (43 THRU 48) BLANK 2
ALS Sample ID		L2006140-1	L2006140-2	L2006140-3	L2006140-4	L2006140-5	L2006140-6
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Sample	Sample	Sample	Sample	Sample
Sampling Date		10-Oct-17	10-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A							
Antimony	0.2	0.442	0.297	<	0.458	0.313	<
Arsenic	1	<	<	<	<	<	<
Barium	5	7.03	6.38	<	11.2	<	<
Beryllium	0.2	<	<	<	<	<	<
Cadmium	0.1	0.152	0.216	<	0.227	<	<
Chromium	1	3.91	3.02	<	4.49	4.20	<
Cobalt	0.2	0.482	0.477	<	0.536	<	<
Copper	1	1.44	2.86	<	9.22	7.65	<
Lead	0.5	0.932	0.859	<	2.12	2.20	<
Manganese	0.5	1.47	1.70	0.541	4.58	1.80	0.560
Molybdenum	0.2	18.6	19.9	23.0	20.9	22.8	23.5
Nickel	0.2	4.28	4.39	1.59	5.57	3.09	0.922
Selenium	2	<	<	<	<	<	<
Silver	0.2	<	<	<	<	<	<
Thallium	0.2	<	<	<	<	<	<
Vanadium	1	<	<	<	<	<	<
Zinc	6	12.4	10.6	<	15.1	7.43	<
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	<	<	<	<
Arsenic	0.2	<	<	<	<	<	<
Barium	0.5	1.83	1.98	1.46	1.40	1.51	0.873
Beryllium	0.1	<	<	<	<	<	<
Cadmium	0.05	0.115	0.0943	<	<	<	<
Chromium	0.15	1.44	0.704	0.243	0.669	0.646	<
Cobalt	0.1	<	0.136	<	<	0.347	<
Copper	0.3	4.85	3.08	1.88	3.57	1.27	2.16
Lead	0.05	0.691	0.880	0.327	0.715	0.586	0.275
Manganese	0.15	15.6	2.06	0.345	1.39	0.738	0.221
Molybdenum	0.1	<	<	<	<	<	<
Nickel	0.1	2.20	1.49	0.771	1.13	0.675	0.683
Selenium	1	<	<	<	<	<	<
Silver	0.1	<	<	<	<	<	<
Thallium	0.05	<	<	<	<	<	<
Vanadium	0.1	<	<	<	<	<	<
Zinc	3	9.71	8.01	<	25.5	5.90	<

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-PM (13 THRU 18) (#1 APC OUTLET) TEST #3	17-21800-PM (37 THRU 42) (#2 APC OUTLET) TEST #3	MB
ALS Sample ID		L2006140-7	L2006140-8	L2006140-MB
Matrix		Stack	Stack	n/a
Analysis Type		Sample	Sample	Sample
Sampling Date		12-Oct-17	12-Oct-17	n/a
Date of Receipt		13-Oct-17	13-Oct-17	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**ug**
Front Half HF Fraction 1A				
Antimony	0.2	0.273	<	1.09
Arsenic	1	<	<	<
Barium	5	5.15	<	<
Beryllium	0.2	<	<	<
Cadmium	0.1	0.131	0.108	<
Chromium	1	1.79	2.05	<
Cobalt	0.2	<	<	<
Copper	1	2.46	1.85	1.22
Lead	0.5	0.660	0.614	<
Manganese	0.5	0.810	0.665	<
Molybdenum	0.2	22.6	22.8	10.3
Nickel	0.2	1.79	1.73	2.19
Selenium	2	<	<	<
Silver	0.2	<	<	<
Thallium	0.2	<	<	<
Vanadium	1	<	<	<
Zinc	6	7.81	<	<
Back Half (HNO3 / H2O2) Fraction 2A				
Antimony	0.1	<	<	n/a
Arsenic	0.2	<	<	n/a
Barium	0.5	1.33	1.07	n/a
Beryllium	0.1	<	<	n/a
Cadmium	0.05	<	<	n/a
Chromium	0.15	0.317	0.243	n/a
Cobalt	0.1	<	<	n/a
Copper	0.3	1.75	0.953	n/a
Lead	0.05	0.535	0.389	n/a
Manganese	0.15	0.942	0.995	n/a
Molybdenum	0.1	<	<	n/a
Nickel	0.1	1.01	0.430	n/a
Selenium	1	<	<	n/a
Silver	0.1	<	<	n/a
Thallium	0.05	<	<	n/a
Vanadium	0.1	<	<	n/a
Zinc	3	6.09	4.94	n/a

ALS Environmental

Sample QC Summary Report

Sample Name		RB	LCS	LCS	LCSD	LCSD
ALS Sample ID		RB	LCS	LCS	LCSD	LCSD
Matrix		STACK	STACK	STACK	STACK	STACK
Analysis Type		Blank	LCS	LCS	LCS	LCS
Sampling Date		n/a	n/a	n/a	n/a	n/a
Date of Receipt		n/a	n/a	n/a	n/a	n/a
Multi-Metals via ICP-MS	**LOR ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A						
Antimony	0.2	0.381	10.5	85	11.6	94
Arsenic	1	<	53.8	90	58.1	97
Barium	5	<	54.0	90	59.0	98
Beryllium	0.2	<	50.7	85	53.7	90
Cadmium	0.1	<	26.2	87	28.6	95
Chromium	1	<	53.2	89	57.0	95
Cobalt	0.2	<	54.4	91	59.4	99
Copper	1	<	53.8	90	59.2	99
Lead	0.5	<	53.2	89	58.3	97
Manganese	0.5	<	53.0	88	57.6	96
Molybdenum	0.2	<	26.4	89	28.4	95
Nickel	0.2	<	53.1	88	58.0	97
Selenium	2	<	52.5	88	58.2	97
Silver	0.2	<	26.1	87	28.4	94
Thallium	0.2	<	55.1	92	59.9	100
Vanadium	1	<	53.0	88	56.9	95
Zinc	6	<	105	88	113	94
Back Half (HNO3 / H2O2) Fraction 2A						
Antimony	0.1	<	4.86	81	4.95	83
Arsenic	0.2	<	28.3	94	28.6	95
Barium	0.5	<	28.2	94	28.7	95
Beryllium	0.1	<	22.8	76	22.8	76
Cadmium	0.05	<	11.9	80	12.4	82
Chromium	0.15	<	25.2	84	25.2	84
Cobalt	0.1	<	28.0	93	27.9	93
Copper	0.3	<	29.5	98	29.6	99
Lead	0.05	0.0812	26.4	88	26.9	89
Manganese	0.15	<	24.8	82	24.7	82
Molybdenum	0.1	<	16.7	111	16.5	109
Nickel	0.1	<	28.2	94	28.2	94
Selenium	1	<	27.0	90	26.9	89
Silver	0.1	<	15.8	106	15.9	106
Thallium	0.05	<	28.0	93	28.8	96
Vanadium	0.1	<	25.2	84	25.1	84
Zinc	3	<	55.8	93	55.5	92

ALS Environmental

Sample QC Summary Report

Sample Name		17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1
ALS Sample ID		L2006140-1	L2006140-1	MS	MS	MSD	MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date		10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
Multi-Metals via ICP-MS	**LOR**						
	ug	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Front Half HF Fraction 1A							
Antimony	0.2	0.442	0.379	22.8	93	22.4	92
Arsenic	1	<	<	115	96	118	98
Barium	5	7.03	6.04	103	80	104	81
Beryllium	0.2	<	<	102	85	109	90
Cadmium	0.1	0.152	0.123	55.4	92	54.9	91
Chromium	1	3.91	3.20	120	97	123	99
Cobalt	0.2	0.482	0.431	118	98	122	101
Copper	1	1.44	1.28	120	99	124	102
Lead	0.5	0.932	0.841	113	93	112	92
Manganese	0.5	1.47	1.27	120	98	121	100
Molybdenum	0.2	18.6	16.4	78.4	100	82.5	107
Nickel	0.2	4.28	3.69	119	95	123	99
Selenium	2	<	<	114	95	116	96
Silver	0.2	<	<	58.2	97	60.9	101
Thallium	0.2	<	<	122	102	123	102
Vanadium	1	<	<	115	96	117	98
Zinc	6	12.4	10.8	249	98	260	103
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	9.46	78	9.97	82
Arsenic	0.2	<	<	56.0	93	58.2	97
Barium	0.5	1.83	1.68	48.2	77	50.1	80
Beryllium	0.1	<	<	43.9	73	44.8	75
Cadmium	0.05	0.115	0.123	23.8	79	24.8	82
Chromium	0.15	1.44	1.20	51.5	83	54.1	88
Cobalt	0.1	<	<	56.9	95	59.6	99
Copper	0.3	4.85	4.46	63.3	97	65.7	101
Lead	0.05	0.691	0.621	49.5	81	51.9	85
Manganese	0.15	15.6	14.2	62.9	79	65.8	84
Molybdenum	0.1	<	<	33.5	112	34.5	115
Nickel	0.1	2.20	2.09	58.6	94	61.3	99
Selenium	1	<	<	52.8	87	54.2	89
Silver	0.1	<	<	31.9	106	33.4	111
Thallium	0.05	<	<	55.3	92	58.0	97
Vanadium	0.1	<	<	50.4	84	52.6	88
Zinc	3	9.71	8.81	119	91	123	94

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Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006140		Mississauga, ON L5J 2Y4
Date of Report	27-Oct-17		CANADA
Date of Sample Receipt	12-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS:

Mercury Analysis via CVAA using Method USEPA 7470A (NOB 2017-10-26)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: hivol, solids: 85-115%, stack: 90-110%)
MS = Matrix Spike Sample (limits: 75-125%)
RPD = Relative Percent Difference (limits: <20%)
CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by: R. Stolys

Rachael Stolys
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(7 THRU 12) (#1 APC OUTLET) TEST#2	17-21800-PM-(19 THRU 24) BLANK 1	17-21800-PM-(25 THRU 30) (#2 APC OUTLET) TEST#1	17-21800-PM-(31 THRU 36) (#2 APC OUTLET) TEST#2
ALS Sample ID		L2006140-1	L2006140-2	L2006140-3	L2006140-4	L2006140-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Oct-17	10-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
Mercury via CVAA	LOR					
Method 29	**ug**	**ug**	**ug**	**ug**	**ug**	**ug**
Analytical Fraction 1B	0.015	<	<	<	<	<
Analytical Fraction 2B	0.050	0.997	0.910	0.252	0.846	0.837
Analytical Fraction 3B	0.025	<	<	<	<	<
Analytical Fraction 3C	0.025	0.113	0.0925	0.0350	0.0575	0.0600

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Sample Analysis Summary Report

Sample Name		17-21800-PM-(43 THRU 48) BLANK 2	17-21800-PM-(13 THRU 18) (#1 APC OUTLET) TEST #3	17-21800-PM-(37 THRU 42) (#2 APC OUTLET) TEST #3
ALS Sample ID		L2006140-6	L2006140-7	L2006140-8
Matrix		Stack	Stack	Stack
Analysis type		Sample	Sample	Sample
Sampling Date/Time		11-Oct-17	12-Oct-17	12-Oct-17
Date of Receipt		12-Oct-17	13-Oct-17	13-Oct-17
Mercury via CVAA	LOR			
Method 29	**ug**	**ug**	**ug**	**ug**
Analytical Fraction 1B	0.015	<	<	<
Analytical Fraction 2B	0.050	0.251	0.744	0.632
Analytical Fraction 3B	0.025	<	<	<
Analytical Fraction 3C	0.025	<	0.0825	0.0600

ALS Environmental

Sample QC Summary Report

Sample Name		LCB	LCS	LCS	LCSD	LCSD
ALS Sample ID		LCB	LCS	LCS	LCSD	LCSD
Analysis type		Method Blank	Blank Spike	Blank Spike	Blank Spike Dup	Blank Spike Dup
Sampling Date/Time		N/A	N/A	N/A	N/A	N/A
Date of Receipt		N/A	N/A	N/A	N/A	N/A
Mercury via CVAA	LOR					
Method 29	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	<	0.315	105%	0.294	98%
Analytical Fraction 2B	0.050	<	0.973	99%	0.985	101%
Analytical Fraction 3B	0.025	<	0.494	100%	0.481	97%
Analytical Fraction 3C	0.025	<	0.494	101%	0.515	106%

ALS Environmental

Sample QC Summary Report

Sample Name		17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1	17-21800-PM-(1 THRU 6) (#1 APC OUTLET) TEST#1
ALS Sample ID		L2006140-1	L2006140-1DUP	L2006140-1MS	L2006140-1MS	L2006140-1MSD	L2006140-1MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time		10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
Mercury via CVAA	LOR						
Method 29	**ug**	**ug**	**ug**	**ug**	**% Rec**	**ug**	**% Rec**
Analytical Fraction 1B	0.015	0.014	0.052	0.321	102%	0.298	95%
Analytical Fraction 2B	0.050	0.997	1.17	10.0	101%	10.3	105%
Analytical Fraction 3B	0.025	<	<	0.485	97%	0.488	98%
Analytical Fraction 3C	0.025	0.113	0.163	2.68	103%	2.73	105%

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Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006117		Mississauga, ON L5J 2Y4
Date of Report	20-Oct-17		Canada
Date of Sample Receipt	12-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 201A (SR 19-Oct-2017)

ANALYST COMMENTS:

Samples L2006117-4, 9, 14, 19, 24 show visible signs of damage, as evidenced by visible tears in the filter and loose filter pieces in the petri dishes. Although all pieces were weighed for each sample, these filters show an overall loss of mass during sampling. The filter results in this report are the actual values, presented without LOR truncation. **PE 20-Oct-17**

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: R. Stolys

Rachael Stolys
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-1 (#1 APC OUTLET) TEST#1	17-21800-M201A-2 (#1 APC OUTLET) TEST#1	17-21800-M201A-3 (#1 APC OUTLET) TEST#1	17-21800-M201A-4 (#1 APC OUTLET) TEST#1	17-21800-M201A-8 (#1 APC OUTLET) TEST#2
ALS Sample ID		L2006117-1	L2006117-2	L2006117-3	L2006117-4	L2006117-6
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-	0.0 J	-
Acetone Particulate Matter	0.4	0.8	0.1 J	<0.1	-	0.3 J
	g	g	g	g	g	g
Acetone Mass	0.02	50.9	37.4	22.4	-	43.1

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-9 (#1 APC OUTLET) TEST#2	17-21800-M201A-10 (#1 APC OUTLET) TEST#2	17-21800-M201A-11 (#1 APC OUTLET) TEST#2	17-21800-M201A-15 (#1 APC OUTLET) TEST#3	17-21800-M201A-16 (#1 APC OUTLET) TEST#3
ALS Sample ID		L2006117-7	L2006117-8	L2006117-9	L2006117-11	L2006117-12
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17	11-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-0.7 J	-	-
Acetone Particulate Matter	0.4	<0.1	0.1 J	-	0.1 J	0.3 J
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	38.1	18.0	-	39.3	40.9

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-17 (#1 APC OUTLET) TEST#3		17-21800-M201A-18 (#1 APC OUTLET) TEST#3		17-21800-M201A-22 (#2 APC OUTLET) TEST#1	17-21800-M201A-23 (#2 APC OUTLET) TEST#1		17-21800-M201A-24 (#2 APC OUTLET) TEST#1
ALS Sample ID		L2006117-13		L2006117-14		L2006117-16	L2006117-17		L2006117-18
Matrix		Stack		Stack		Stack	Stack		Stack
Analysis type		Sample		Sample		Sample	Sample		Sample
Sampling Date/Time		11-Oct-17		11-Oct-17		10-Oct-17	10-Oct-17		10-Oct-17
Date of Receipt		12-Oct-17		12-Oct-17		12-Oct-17	12-Oct-17		12-Oct-17
PM via Gravimetric Analysis	**LOR**								
Method 201A	**mg**	**mg**		**mg**		**mg**	**mg**		**mg**
Filter Particulate Matter	0.8	-		-0.2	J	-	-		-
Acetone Particulate Matter	0.4	<0.1		-		0.9	0.2	J	<0.1
	g	**g**		**g**		**g**	**g**		**g**
Acetone Mass	0.02	12.5		-		57.0	38.7		10.8

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-25 (#2 APC OUTLET) TEST#1		17-21800-M201A-29 (#2 APC OUTLET) TEST#2		17-21800-M201A-30 (#2 APC OUTLET) TEST#2		17-21800-M201A-31 (#2 APC OUTLET) TEST#2		17-21800-M201A-32 (#2 APC OUTLET) TEST#2	
ALS Sample ID		L2006117-19		L2006117-21		L2006117-22		L2006117-23		L2006117-24	
Matrix		Stack		Stack		Stack		Stack		Stack	
Analysis type		Sample		Sample		Sample		Sample		Sample	
Sampling Date/Time		10-Oct-17		10-Oct-17		10-Oct-17		10-Oct-17		10-Oct-17	
Date of Receipt		12-Oct-17		12-Oct-17		12-Oct-17		12-Oct-17		12-Oct-17	
PM via Gravimetric Analysis	**LOR**										
Method 201A	**mg**	**mg**		**mg**		**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	-1.5	J	-		-		-		-0.9	J
Acetone Particulate Matter	0.4	-		0.3	J	0.3	J	0.5		-	
	g	**g**		**g**		**g**		**g**		**g**	
Acetone Mass	0.02	-		34.5		46.7		18.1		-	

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-36 (#2 APC OUTLET) TEST#3	17-21800-M201A-37 (#2 APC OUTLET) TEST#3	17-21800-M201A-38 (#2 APC OUTLET) TEST#3	17-21800-M201A-39 (#2 APC OUTLET) TEST#3	17-21800-M201A-43 (#1 APC OUTLET) BLANK #1
ALS Sample ID		L2006117-26	L2006117-27	L2006117-28	L2006117-29	L2006117-31
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17	11-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
PM via Gravimetric Analysis	**LOR**					
Method 201A	**mg**	**mg**	**mg**	**mg**	**mg**	**mg**
Filter Particulate Matter	0.8	-	-	-	-0.9 J	-
Acetone Particulate Matter	0.4	0.5	0.3 J	<0.1	-	<0.1
	g	**g**	**g**	**g**	**g**	**g**
Acetone Mass	0.02	61.9	43.5	19.4	-	53.4

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-44 (#1 APC OUTLET) BLANK #1	17-21800-M201A-45 (#1 APC OUTLET) BLANK #1	17-21800-M201A-46 (#1 APC OUTLET) BLANK #1	17-21800-M201A-50 (#2 APC OUTLET) BLANK #2	17-21800-M201A-51 (#2 APC OUTLET) BLANK #2
ALS Sample ID		L2006117-32	L2006117-33	L2006117-34	L2006117-36	L2006117-37
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Oct-17	11-Oct-17	11-Oct-17	10-Oct-17	10-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
PM via Gravimetric Analysis Method 201A	**LOR**					
	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	-	-	-0.1 J	-	-
Acetone Particulate Matter	0.4	<0.1	<0.1	-	<0.1	0.1 J
	g	g	g	g	g	g
Acetone Mass	0.02	51.2	51.5	-	49.5	49.0

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-52 (#2 APC OUTLET) BLANK #2		17-21800-M201A-53 (#2 APC OUTLET) BLANK #2		MB	
ALS Sample ID		L2006117-38		L2006117-39		L2006117-MB	
Matrix		Stack		Stack		n/a	
Analysis type		Sample		Sample		Sample	
Sampling Date/Time		10-Oct-17		10-Oct-17		n/a	
Date of Receipt		12-Oct-17		12-Oct-17		n/a	
PM via Gravimetric Analysis Method 201A	**LOR**						
	mg	**mg**		**mg**		**mg**	
Filter Particulate Matter	0.8	-		-0.2	J	0.3	J
Acetone Particulate Matter	0.4	<0.1		-		0.1	J
	g	**g**		**g**		**g**	
Acetone Mass	0.02	49.8		-		31.5	

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Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006117 Revision 1		Mississauga, ON L5J 2Y4
Date of Report	20-Oct-17		Canada
Date of Sample Receipt	12-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 Covanta

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (SR 19-Oct-2017)

*** Revised Report ***

This report supersedes all prior reports for the above-noted workorder and test. The report has been revised as follows:
Spelling error has been corrected.

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank
CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)
LOR = Limit of Reporting

Certified by: _____
Rachael Stolys
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name		17-21800-M201A-(5-7) (#1 APC OUTLET) TEST#1	17-21800-M201A-(12-14) (#1 APC OUTLET) TEST#2	17-21800-M201A-(19-21) (#1 APC OUTLET) TEST#3	17-21800-M201A-(26-28) (#2 APC OUTLET) TEST#1	17-21800-M201A-(33-35) (#2 APC OUTLET) TEST#2
ALS Sample ID		L2006117-5	L2006117-10	L2006117-15	L2006117-20	L2006117-25
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		11-Oct-17	11-Oct-17	11-Oct-17	10-Oct-17	10-Oct-17
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
PM via Gravimetric Analysis Method 202	**LOR**					
	mg	**mg**	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	2.8	2.6	2.4	2.2	2.3
Non-Extractable Condensable Particulates	0.4	4.5	3.5	8.0	4.1	3.8
	g	**g**	**g**	**g**	**g**	**g**
Water Mass	0.02	328	340	339	305	355

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Sample Analysis Summary Report

Sample Name		17-21800-M201A-(40-42) (#2 APC OUTLET) TEST#3	17-21800-M201A-(47-49) (#1 APC OUTLET) BLANK #1	17-21800-M201A-(54-56) (#2 APC OUTLET) BLANK #2	MB
ALS Sample ID		L2006117-30	L2006117-35	L2006117-40	L2006117-MB
Matrix		Stack	Stack	Stack	n/a
Analysis type		Sample	Sample	Sample	Sample
Sampling Date/Time		10-Oct-17	11-Oct-17	10-Oct-17	n/a
Date of Receipt		12-Oct-17	12-Oct-17	12-Oct-17	n/a
PM via Gravimetric Analysis Method 202	**LOR**				
	mg	**mg**	**mg**	**mg**	**mg**
Extractable Condensable Particulates	0.4	2.8	1.3	1.4	0.6
Non-Extractable Condensable Particulates	0.4	2.5	1.2	0.6	0.9
	g	**g**	**g**	**g**	**g**
Water Mass	0.02	221	202	179	279

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006132		Mississauga, ON L5J 2Y4
Date of Report	19-Oct-17		(905)822-4120
Date of Sample Receipt	12-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS:

Cl as HCl Anion Analysed via Ion Chromatography USEPA Method 26A (FE 13-Oct-2017)
F as HF Anion Analysed via Ion Chromatography USEPA Method 26A (FE 13-Oct-2017)
Ammonia, Total (as NH_3) via Ion Chromatography USEPA Method CTM-027 (FE 16-Oct-2017)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: 90-110%)
MS = Matrix Spike Sample (limits: 90-110%, NH_3: 85-115%)
RPD = Relative Percent Difference (limits: <20% for sample duplicate, <10% for duplicate injection)
CVS = Calibration Verification Standard (limits: 90-110%)

Certified by: R. Stolys

Rachael Stolys
Account Manager

ALS Environmental

Sample Analysis Summary Report

Sample Name	17-21800-M26A-1 (APC OUTLET #1)	17-21800-M26A-2 (APC OUTLET #1)	17-21800-M26A-3 (APC OUTLET #1)	17-21800-M26A-4 (APC OUTLET #2)	17-21800-M26A-5 (APC OUTLET #2)
ALS Sample ID	L2006132-1	L2006132-2	L2006132-3	L2006132-4	L2006132-5
Matrix	Stack	Stack	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample	Sample	Sample
Sampling Date/Time	10-Oct-17	10-Oct-17	10-Oct-17	11-Oct-17	11-Oct-17
Date of Receipt	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
Ion Chromatography Analysis USEPA Method 26	**mg**	**mg**	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.168	<0.174	<0.168	<0.175	<0.179
Analysis 1	<0.168	<0.174	<0.168	<0.175	<0.179
Analysis 2	<0.168	<0.174	<0.168	<0.175	<0.179
Total Cl^- as HCl (ave)	6.61	6.88	6.83	6.16	5.87
Analysis 1	6.52	6.96	6.93	6.07	5.77
Analysis 2	6.70	6.80	6.73	6.24	5.96
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**mg**	**mg**
Total Ammonia as NH_3	<0.434	0.471	0.502	0.469	0.572

ALS Environmental

Sample Analysis Summary Report

Sample Name	17-21800-M26A-6 (APC OUTLET #2)	17-21800-M26A-BLANK 1 (APC OUTLET #1)	17-21800-M26A-BLANK 2 (APC OUTLET #2)
ALS Sample ID	L2006132-6	L2006132-7	L2006132-8
Matrix	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample
Sampling Date/Time	11-Oct-17	10-Oct-17	11-Oct-17
Date of Receipt	12-Oct-17	12-Oct-17	12-Oct-17
Ion Chromatography Analysis USEPA Method 26	**mg**	**mg**	**mg**
Total F^- as HF (ave)	<0.174	<0.114	<0.112
Analysis 1	<0.174	<0.114	<0.112
Analysis 2	<0.174	<0.114	<0.112
Total Cl^- as HCl (ave)	5.82	<0.201	<0.197
Analysis 1	5.84	<0.201	<0.197
Analysis 2	5.80	<0.201	<0.197
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**
Total Ammonia as NH_3	0.500	<0.288	<0.283

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Sample QC Summary Report

Sample Name	LCB	LCS	LCS
ALS Sample ID	LCB	LCS	LCS
Matrix	Stack	Stack	Stack
Analysis type	Method Blank	Blank Spike	Blank Spike
Sampling Date/Time	N/A	N/A	N/A
Date of Receipt	N/A	N/A	N/A
Ion Chromatography Analysis			
USEPA Method 26	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	0.0223	0.544	99%
Analysis 1	0.0224	0.551	
Analysis 2	0.0222	0.538	
Total Cl^- as HCl (ave)	<0.0309	0.775	98%
Analysis 1	<0.0309	0.776	
Analysis 2	<0.0309	0.773	
Ion Chromatography Analysis			
USEPA Method CTM-027 Ammonia	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	<0.0472	0.496	105%

ALS Environmental

Sample QC Summary Report

Sample Name	17-21800-M26A-1 (APC OUTLET #1)	17-21800-M26A-1 (APC OUTLET #1)	17-21800-M26A-1 (APC OUTLET #1)	17-21800-M26A-1 (APC OUTLET #1)
ALS Sample ID	L2006132-1	L2006132-1DUP	L2006132-1MS	L2006132-1MS
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Duplicate	Matrix Spike	Matrix Spike
Sampling Date/Time	10-Oct-17	10-Oct-17	10-Oct-17	10-Oct-17
Date of Receipt	12-Oct-17	12-Oct-17	12-Oct-17	12-Oct-17
Ion Chromatography Analysis USEPA Method 26	**mg**	**mg**	**mg**	**% Rec**
Total F^- as HF (ave)	<0.168	<0.168	5.14	102%
Analysis 1	<0.168	<0.168	5.28	
Analysis 2	<0.168	<0.168	5.01	
Total Cl^- as HCl (ave)	6.61	6.42	13.8	97%
Analysis 1	6.52	6.43	13.8	
Analysis 2	6.70	6.42	13.7	
Ion Chromatography Analysis USEPA Method CTM-027 Ammonia	**mg**	**mg**	**mg**	**% Rec**
Ammonia, Total (as NH_3)	<0.434	<0.434	4.69	99%

APPENDIX 15

Particle Size Distribution Train Recovery Data Sheets
(8 pages)

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 11/17

Test No.: 1
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 224438	Impinger #1 Knock Out	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
				Empty Wt: 476.7		
				Final Wt: 640.7		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	1 Gain: 164.0	* if there is no gain purge is not required.	
				Colour: CC		
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:			Acetone/Hexane Rinse
Empty Wt: 170.5	Empty Wt: 168.9	Empty Wt: 170.8	Final Wt:	Impinger #2 Empty	Purge On: 10:44	Empty Wt: 427.5
After Act. Rinse: 223.1	After Act. Rinse: 207.8	After Act. Rinse: 194.9	Gain:	Empty Wt: 636.0	Purge Off: 11:44	After Acetone Rinse: 581.3
Total TS1: 52.6	Total TS2: 38.9	Total TS3: 24.1	Colour: WHITE	Final Wt: 636.2		After Hexane Rinse: 653.3
				2 Gain: 0.2	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Colour: CC		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt:	Beaker Initial Wt:	Beaker Initial Wt:		Impinger #3 H_2O	CONTAINER TS5	
Final Wt:	Final Wt:	Final Wt:		Empty Wt: 655.9	Empty Wt: 427.0	
Gain:	Gain:	Gain:		Initial Wt: 756.1	With Imp 2: 591.0	
				Final Wt: 754.5	After H_2O Rinse: 754.5	
				3 Gain: -1.6	Total Volume TS5: 327.5	
				Colour: EC		
				Impinger #4 Silica Gel	CONTAINER TS6	
				Initial Wt: 840.6	Secondary Filter	
				Final Wt: 849.1		
				4 Gain: 8.5	Filter ID: 17-21800-M201A-6	
				% Spent: 10		

17-21800

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	1
TS2 (Part. > 2.5)	2
TS3 (Part. < 2.5)	3
TS4 (Back Up Filter, <2.5)	4
TS5 (Imp 2 H_2O and rinse)	5
TS6 (Secondary Filter)	6
TS7 (Acetone / Hexane rinse)	7

5

CWTR=1+2+3:	162.6
WCBDA=4:	8.5

Train Loaded By: AN
Train Recovered By: AN / DM
Recovery Witnessed By:
Date: OCT. 11/17

PM_{10} , $PM_{2.5}$ & Condensible Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 11/17

Test No.: 2
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 074440	Impinger #1 Knock Out Empty Wt: 488.6 Final Wt: 648.8 1 Gain: 160.2 Colour: CC	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * if there is no gain purge is not required.	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 169.9 After Act. Rinse: 213.2 Total TS1: 43.3	Container TS2 Weights Empty Wt: 170.0 After Act. Rinse: 208.7 Total TS2: 38.7	Container TS3 Weights Empty Wt: 170.0 After Act. Rinse: 189.1 Total TS3: 19.1	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 604.4 Final Wt: 602.4 2 Gain: -2.0 Colour: ——	Purge On: 14:00 Purge Off: 15:00	Acetone/Hexane Rinse Empty Wt: 423.8 After Acetone Rinse: 582.7 After Hexane Rinse: 651.6
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4		Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:		Impinger #3 H_2O Empty Wt: 600.3 Initial Wt: 671.7 Final Wt: 670.2 3 Gain: -1.5 Colour: CC	CONTAINER TS5 Empty Wt: 424.1 With Imp 2: 580.6 After H_2O Rinse: 766.2 Total Volume TS5: 342.1	
				Impinger #4 Silica Gel Initial Wt: 815.6 Final Wt: 825.0 4 Gain: 9.4 % Spent: 10	CONTAINER TS6 Secondary Filter Filter ID: 17-21800-M201A-13	

SAMPLE IDENTIFICATION	~~16-21672~~-M201A- (17-21800-)
TS1 (Part. > 10)	8
TS2 (Part. > 2.5)	9
TS3 (Part. < 2.5)	10
TS4 (Back Up Filter, <2.5)	11
TS5 (Imp 2 H_2O and rinse)	12
TS6 (Secondary Filter)	13
TS7 (Acetone / Hexane rinse)	14

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 11/17

CWTR=1+2+3:	156.7 ✓
WCBDA=4:	9.4

7

PM_{10} , $PM_{2.5}$ & Condensable Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 11/17

Test No.: 3
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 224441	Impinger #1 Knock Out Empty Wt: 527.6 Final Wt: 683.2 1 Gain: 155.6 Colour: CC	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 170.5 After Act. Rinse: 210.3 Total TS1: 39.8	Container TS2 Weights Empty Wt: 169.1 After Act. Rinse: 210.5 Total TS2: 41.4	Container TS3 Weights Empty Wt: 177.0 After Act. Rinse: 189.8 Total TS3: 12.8	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 671.6 Final Wt: 668.9 2 Gain: -2.7 Colour: ~~CC~~	Purge On: 17:00 Purge Off: 18:00 Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Acetone/Hexane Rinse Empty Wt: 282.5 After Acetone Rinse: 444.1 After Hexane Rinse: 502.2 Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4			
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:		Impinger #3 H_2O Empty Wt: 654.4 Initial Wt: 755.8 Final Wt: 753.8 3 Gain: -2.0 Colour: CC	CONTAINER TS5 Empty Wt: 281.9 With Imp 2: 437.1 After H_2O Rinse: 622.6 Total Volume TS5: 340.7	
				Impinger #4 Silica Gel Initial Wt: 851.6 Final Wt: 860.0 4 Gain: 8.4 % Spent: 20	CONTAINER TS6 Secondary Filter Filter ID: 17-21800-M201A-20	

17-21800

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	15
TS2 (Part. > 2.5)	16
TS3 (Part. < 2.5)	17
TS4 (Back Up Filter, <2.5)	18
TS5 (Imp 2 H_2O and rinse)	19
TS6 (Secondary Filter)	20
TS7 (Acetone / Hexane rinse)	21

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 11/17

CWTR=1+2+3:	150.9 ✓
WCBDA=4:	8.4

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PM_{10} , $PM_{2.5}$ & Conde...e Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 10/17

Test No.: 1
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: Q24433	Impinger #1 Knock Out	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
				Empty Wt: 526.1		
				Final Wt: 688.2		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	1 Gain: 162.1	* if there is no gain purge is not required.	
				Colour: CLEAR		
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:			Acetone/Hexane Rinse
Empty Wt: 173.8	Empty Wt: 174.0	Empty Wt: 174.1	Final Wt:	Impinger #2 Empty	Purge On: 13:16	Empty Wt: 424.4
After Act. Rinse: 231.3	After Act. Rinse: 213.0	After Act. Rinse: 185.1	Gain:	Empty Wt: 668.5	Purge Off: 14:16	After Acetone Rinse: 508.7
Total TS1: 57.5	Total TS2: 39.0	Total TS3: 11.0	Colour: WHITE	Final Wt: 669.0		After Hexane Rinse: 648.3
				2 Gain: 0.5	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4	Colour: CLEAR		
				Secondary Filter		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Beaker Initial Wt:	Beaker Initial Wt:	Beaker Initial Wt:		Impinger #3 H_2O	CONTAINER TS5	
Final Wt:	Final Wt:	Final Wt:		Empty Wt: 654.4	Empty Wt: 424.7	
Gain:	Gain:	Gain:		Initial Wt: 757.6	With Imp 2: 584.7	
				Final Wt: 755.8	After H_2O Rinse: 732.1	
				3 Gain: -1.8	Total Volume TS5: 309.4	
				Colour: CLEAR		
				Impinger #4 Silica Gel	CONTAINER TS6	
				Initial Wt: 840.5	Secondary Filter	
				Final Wt: 851.9		
				4 Gain: 11.4	Filter ID: 17-21800-M201A-27	
				% Spent: 5		

17-21800-

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	22
TS2 (Part. > 2.5)	23
TS3 (Part. < 2.5)	24
TS4 (Back Up Filter, <2.5)	25
TS5 (Imp 2 H_2O and rinse)	26
TS6 (Secondary Filter)	27
TS7 (Acetone / Hexane rinse)	28

Train Loaded By: DU
Train Recovered By: AM
Recovery Witnessed By:
Date: OCT. 10/17

CWTR=1+2+3:	160.8 ✓
WCBDA=4:	11.4

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PM_{10}, $PM_{2.5}$ & Condensible Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 10/17

Test No.: 2
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 024435	Impinger #1 Knock Out Empty Wt: 475.1 Final Wt: 637.2 1 Gain: 162.1 Colour: CL	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 173.9 After Act. Rinse: 208.5 Total TS1: 34.6	Container TS2 Weights Empty Wt: 174.1 After Act. Rinse: 221.5 Total TS2: 47.4	Container TS3 Weights Empty Wt: 174.1 After Act. Rinse: 192.3 Total TS3: 18.2	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 635.9 Final Wt: 636.3 2 Gain: 0.4 Colour: CL	Purge On: 16:45 Purge Off: 17:45	Acetone/Hexane Rinse Empty Wt: 428.3 After Acetone Rinse: 564.6 After Hexane Rinse: 629.5
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4		Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:		Impinger #3 H_2O Empty Wt: 657.6 Initial Wt: 757.3 Final Wt: 756.0 3 Gain: -1.3 Colour: —	CONTAINER TS5 Empty Wt: 484.6 With Imp 2: 586.7 After H_2O Rinse: 781.4 Total Volume TS5: 356.8	

17-21800

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	29
TS2 (Part. > 2.5)	30
TS3 (Part. < 2.5)	31
TS4 (Back Up Filter, <2.5)	32
TS5 (Imp 2 H_2O and rinse)	33
TS6 (Secondary Filter)	34
TS7 (Acetone / Hexane rinse)	35

Impinger #4 Silica Gel	CONTAINER TS6
Initial Wt: 831.6	Secondary Filter
Final Wt: 840.8	
4 Gain: 9.2	Filter ID: 17-21800-M201A-34
% Spent: 5	

5

CWTR=1+2+3:	161.2 ✓
WCBDA=4:	9.2

Train Loaded By: DM
Train Recovered By: AN/DM
Recovery Witnessed By:
Date: OCT. 10/17

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: Oct 10, 2017

Test No.: 3
Test Location: UNIT #2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: Q24436	Impinger #1 Knock Out	Perform nitrogen purge of imp 1 transfered to impaction stem impinger (14 lpm for 1 hr)	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
				Empty Wt: 488.5		
				Final Wt: 641.9		
				1 Gain: 153.4	* if there is no gain purge is not required.	
				Colour: CLEAR		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4		1945	
Container TS1 Weights	Container TS2 Weights	Container TS3 Weights	Initial Wt:	Impinger #2 Empty	Purge On: ~~1945~~	Acetone/Hexane Rinse
Empty Wt: 170.1	Empty Wt: 170.2	Empty Wt: 170.3	Final Wt:	Empty Wt: 602.2	Purge Off: 2045	Empty Wt: 282.6
After Act. Rinse: 238.4	After Act. Rinse: 219.9	After Act. Rinse: 196.1	Gain:	Final Wt: 602.5	750.2	After Acetone Rinse: 349.6
Total TS1: 68.3	Total TS2: 49.7	Total TS3: 25.8	Colour: WHITE	2 Gain: 0.3		After Hexane Rinse: 427.4
				Colour: CLEAR	Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4			
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt:	Beaker Initial Wt:	Beaker Initial Wt:		Impinger #3 H_2O	CONTAINER TS5	
Final Wt:	Final Wt:	Final Wt:		Empty Wt: 570.2	Empty Wt: 281.9	
Gain:	Gain:	Gain:		Initial Wt: 673.1	With Imp 2: 424.3	
				Final Wt: 671.7	After H_2O Rinse: 503.3	
				3 Gain: -1.4	Total Volume TS5: ~~2910~~ 2914	
				Colour: CLEAR		
				Impinger #4 Silica Gel	CONTAINER TS6	
				Initial Wt: 80[illegible]	Secondary Filter	
				Final Wt: 8[illegible]		
				4 Gain: 9.6	Filter ID:	
				% Spent: 2[illegible]		

17-21800

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	36
TS2 (Part. > 2.5)	37
TS3 (Part. < 2.5)	38
TS4 (Back Up Filter, <2.5)	39
TS5 (Imp 2 H_2O and rinse)	40
TS6 (Secondary Filter)	41
TS7 (Acetone / Hexane rinse)	42

7

Train Loaded By: DM
Train Recovered By: JGT/DV
Recovery Witnessed By:
Date: Oct 10, 2017.

150.3

CWTR=1+2+3:	~~234.3~~ ✓
WCBDA=4:	9.6

PM_{10} , $PM_{2.5}$ & Condensate Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT. 11/17

Test No.: BLANK 1
Test Location: UNIT 1

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 024439	Impinger #1 Knock Out Empty Wt: 526.4 Final Wt: 526.4 1 Gain: 0 Colour: —	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * *if there is no gain purge is not required.*	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 170.4 After Act. Rinse: 224.1 Total TS1: 53.7	Container TS2 Weights Empty Wt: 170.5 After Act. Rinse: 221.9 Total TS2: 51.4	Container TS3 Weights Empty Wt: 169.2 After Act. Rinse: 220.9 Total TS3: 51.7	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 670.0 Final Wt: 670.0 2 Gain: 0 Colour: —	Purge On: Purge Off:	Acetone/Hexane Rinse Empty Wt: 427.0 After Acetone Rinse: 540.7 After Hexane Rinse: 630.5
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4		Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:		Impinger #3 H_2O Empty Wt: 650.3 Initial Wt: 751.1 Final Wt: 751.1 3 Gain: 0 Colour: CC	CONTAINER TS5 Empty Wt: 427.3 With Imp 2: 528.5 After H_2O Rinse: 629.8 Total Volume TS5: 202.5	
				Impinger #4 Silica Gel Initial Wt: 913.7 Final Wt: 913.7 4 Gain: 0 % Spent: 0	CONTAINER TS6 Secondary Filter Filter ID: 17-21800-M201A-48	

17-21800-

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	43
TS2 (Part. > 2.5)	44
TS3 (Part. < 2.5)	45
TS4 (Back Up Filter, <2.5)	46
TS5 (Imp 2 H_2O and rinse)	47
TS6 (Secondary Filter)	48
TS7 (Acetone / Hexane rinse)	49

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 11/17

CWTR=1+2+3:	0
WCBDA=4:	0

PM_{10} , $PM_{2.5}$ & Conde...e Recovery Data Sheet

Client: Covanta DYEC
Project No.: 21800
Date: OCT.10/17

Test No.: BLANK 2
Test Location: UNIT 2

Nozzle, PM 10 Cyclone walls, collection cup, outside of exit stem	PM 10 Turnaround cup, exit stem, connecting tubing from, PM 10 head to PM 2.5 cyclone. PM 2.5 Cyclone walls, collection cup, and outside of exit stem	Exit Stem, and Connecting Tubing to Filter, and Filter Top	Back-Up Filter	Impingers 1, 2, 3, 4	CONTAINER TS5 & TS6	CONTAINER TS7
			Filter ID: 22437	Impinger #1 Knock Out Empty Wt: 526.2 Final Wt: 526.2 1 Gain: 0 Colour: —	Perform nitrogen purge of imp 1 transfered to Impaction stem impinger (14 lpm for 1 hr) * if there is no gain purge is not required.	Rinse all glassware from filter to front half 2nd filter with Acetone & Hexane into TS7
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4			
Container TS1 Weights Empty Wt: 174.1 After Act. Rinse: 224.0 Total TS1: 49.9	Container TS2 Weights Empty Wt: 174.1 After Act. Rinse: 223.4 Total TS2: 49.3	Container TS3 Weights Empty Wt: 174.0 After Act. Rinse: 224.1 Total TS3: 50.1	Initial Wt: Final Wt: Gain: Colour: WHITE	Impinger #2 Empty Empty Wt: 668.3 Final Wt: 668.3 2 Gain: 0 Colour: —	Purge On: Purge Off:	Acetone/Hexane Rinse Empty Wt: 424.6 After Acetone Rinse: 533.1 After Hexane Rinse: 629.0
Seal and label container TS1	Seal and label container TS2	Seal and label container TS3	Seal and label container TS4		Rinse all glassware from filter to 2nd u-tube with di H2O into TS3	Mark Fluid Level and Seal and Label Container
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	Secondary Filter		
Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:	Beaker Initial Wt: Final Wt: Gain:		Impinger #3 H_2O Empty Wt: 654.6 Initial Wt: 754.6 Final Wt: 754.6 3 Gain: 0 Colour: CC	CONTAINER TS5 Empty Wt: 424.5 With Imp 2: 524.5 After H_2O Rinse: 604.5 Total Volume TS5: 180.0	
				Impinger #4 Silica Gel Initial Wt: 893.3 Final Wt: 893.3 4 Gain: 0 % Spent: 0	CONTAINER TS6 Secondary Filter Filter ID: 17-21800-M201A-S5	

17-21800-

SAMPLE IDENTIFICATION	~~16-21672~~-M201A-
TS1 (Part. > 10)	S0
TS2 (Part. > 2.5)	S1
TS3 (Part. < 2.5)	S2
TS4 (Back Up Filter, <2.5)	S3
TS5 (Imp 2 H_2O and rinse)	S4
TS6 (Secondary Filter)	S5
TS7 (Acetone / Hexane rinse)	S6

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT.10/17

CWTR=1+2+3:	0
WCBDA=4:	0

APPENDIX 16

SVOC Train Recovery Data Sheets
(14 pages)

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 1
Test Date:
Test Location: UNIT 1 OUTLET

Sample ID 1	Sample ID 2	Sample ID 3	Sample ID 4	Sample ID 5	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 411.4	Colour: WHITE	Initial Wt: ~~325.8~~ 366.9	Impinger #1 Empty	Empty Wt: 424.9	Initial Wt: 894.0
After Acetone/ Hexane Rinse: 683.5	FOLD IN FOIL	Final Wt: 371.1	Empty Wt: 657.6	After Acetone Rinse: 515.3	Final Wt: 914.2
Total TS1: 272.1	SEAL AND LABEL CONTAINER TS2	1 Gain: 4.2	Final Wt: 974.2	After Hexane Rinse: 608.8	S Gain: 20.2
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 316.6	Total TS5: 183.9	% Spent: 40
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: CC	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 528.7		
			Initial Wt: 628.8		
			Final Wt: 812.2		
			3 Gain: 183.4		
			Colour: CC		
			Impinger #3 Empty		
			Empty Wt: 531.6	Impinger Box ID: 12	
			Final Wt: 709.4		
			4 Gain: 177.8		
			Colour: CC		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	BB
Trap ID:	~~8~~ 3
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Container TS4 Weights	
Empty Wt:	425.2
With Imp Soln:	1186.4
Imp Volume:	755.2
After ~100g H_2O Rinse:	1317.5
Total TS4:	892.3

680.0 ✓

CWTR = 1 + 2 + 3 + 4: ~~577.0~~

WCBDA=5: 20.2

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: T. Timar
Train Recovered By: AW
Recovery Witnessed By:
Date: OCT. 12/17

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 2
Test Date: 12 Oct 17
Test Location: Unit 1 - outlet

Sample ID 6	Sample ID 7	Sample ID 8	Sample ID 9	Sample ID 10	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 410.5	Colour: WHITE	Initial Wt: 393.1	Impinger #1 Empty	Empty Wt: 423.8	Initial Wt: 922.4
After Acetone/ Hexane Rinse: 636.9	FOLD IN FOIL	1 Final Wt: 401.7	Empty Wt: 660.6	After Acetone Rinse: 529.3	Final Wt: 941.2
Total TS1: 226.4	SEAL AND LABEL CONTAINER TS2	Gain: 8.6	Final Wt: 986.8	After Hexane Rinse: 614.3	5 Gain: 18.8
MARK FLUID LEVEL	SEAL TRAP	Colour: White	2 Gain: 326.2	Total TS5: 190.5	% Spent:
SEAL AND LABEL CONTAINER TS1	WRAP IN FOIL		Colour: clear	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
	LABEL AS CONTAINER TS3		Impinger #2 Ethylene Glycol		
			Empty Wt: 546.3		
			Initial Wt: 659.9		
			Final Wt: 916.8		
			3 Gain: 256.9		
			Colour: Clear		
			Impinger #3 Empty	Impinger Box ID: 3	
			Empty Wt: 656.1		
			Final Wt: 708.1		
			4 Gain: 52.0		
			Colour: Clear		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	X
Trap ID:	2
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Container TS4 Weights	
Empty Wt:	422.2
With Imp Soln:	1141.6
Imp Volume:	719.4
After ~100g H_2O Rinse:	1261.8
Total TS4:	839.6

CWTR = 1 + 2 + 3 + 4: 643.7

WCBDA=5: 18.8

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 13/17

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 3
Test Date: 13 Oct 17
Test Location: Unit 1 Outlet

Sample ID 11	Sample ID 12	Sample ID 13	Sample ID 14	Sample ID 15	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 411.1	Colour: white	Initial Wt: 382.3	Impinger #1 Empty	Empty Wt: 424.2	Initial Wt: 857.3
After Acetone/ Hexane Rinse: 664.0	FOLD IN FOIL	Final Wt: 388.4	Empty Wt: 611.9	After Acetone Rinse: 535.6	Final Wt: 874.9
Total TS1: 252.9	SEAL AND LABEL CONTAINER TS2	1 Gain: 6.1	Final Wt: 977.6	After Hexane Rinse: 638.7	5 Gain: 17.6
MARK FLUID LEVEL		Colour: white	2 Gain: 365.7	Total TS5: 214.5	% Spent:
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: clear		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
		LABEL AS CONTAINER TS3	Empty Wt: 603.5		
			Initial Wt: 764.8		
			Final Wt: 966.1		
			3 Gain: 201.3		
			Colour: clear		
			Impinger #3 Empty	Impinger Box ID: 12	
			Empty Wt: 610.7		
			Final Wt: 687.7		
			4 Gain: 77.0		
			Colour: clear		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	CC
Trap ID:	17
HPLC Batch No.:	
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	
Acetone Batch No.:	

Container TS4 Weights	
Empty Wt:	424.8
With Imp Soln:	1154.2
Imp Volume:	729.4
After ~100g H_2O Rinse:	1252.9
Total TS4:	828.1

CWTR = 1 + 2 + 3 + 4: 650.1

WCBDA=5: 17.6

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: AN
Train Recovered By: TS
Recovery Witnessed By: —
Date: 13 Oct 17

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 1
Test Date: OCT. 12/17
Test Location: UNIT 2 OUTLET

Sample ID 21	Sample ID 22	Sample ID 23	Sample ID 24	Sample ID 25	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 411.2 After Acetone/ Hexane Rinse: 676.1 Total TS1: 264.9	Colour: WHITE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 353.8 Final Wt: 358.8 1 Gain: 5.0 Colour: WHITE SEAL TRAP WRAP IN FOIL LABEL AS CONTAINER TS3	Impinger #1 Empty Empty Wt: 660.9 Final Wt: 984.2 2 Gain: 323.3 Colour: CC Impinger #2 Ethylene Glycol Empty Wt: 639.7 Initial Wt: 741.6 Final Wt: 882.0 3 Gain: 140.4 Colour: CC Impinger #3 Empty Empty Wt: 667.2 Final Wt: 849.7 4 Gain: 182.5 Colour: CC	Empty Wt: 422.0 After Acetone Rinse: 520.0 After Hexane Rinse: 612.5 Total TS5: 190.5 *Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	Initial Wt: 906.6 Final Wt: 923.5 5 Gain: 16.9 % Spent: 40
MARK FLUID LEVEL SEAL AND LABEL CONTAINER TS1					

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	JJ
Trap ID:	4
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Container TS4 Weights	
Empty Wt:	423.4
With Imp Soln:	1146.2
Imp Volume:	722.8
After ~100g H_2O Rinse:	1277.8
Total TS4:	854.4

Impinger Box ID: 4

Train Loaded By: T. Timar
Train Recovered By: AM
Recovery Witnessed By:
Date: OCT. 12/17

CWTR = 1 + 2 + 3 + 4: 651.2

WCBDA=5: 16.9

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 2
Test Date: OCT. 12/17
Test Location: UNIT 2 OUTLET

Sample ID 26	Sample ID 27	Sample ID 28	Sample ID 29	Sample ID 30	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 411.0 After Acetone/ Hexane Rinse: 654.4 Total TS1: 243.4	Colour: WHITE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 414.3 Final Wt: 417.6 1 Gain: 3.3 Colour: WHITE SEAL TRAP WRAP IN FOIL LABEL AS CONTAINER TS3	Impinger #1 Empty Empty Wt: 674.8 Final Wt: 1007.1 2 Gain: 332.3 Colour: CC Impinger #2 Ethylene Glycol Empty Wt: 657.2 Initial Wt: 758.2 Final Wt: 939.1 3 Gain: 180.9 Colour: CC Impinger #3 Empty Empty Wt: 669.9 Final Wt: 836.7 4 Gain: 166.8 Colour: CC Container TS4 Weights Empty Wt: 424.6 With Imp Soln: 1185.2 Imp Volume: 760.6 After ~100g H_2O Rinse: 1336.8 Total TS4: 912.2 CWTR = 1 + 2 + 3 + 4: 683.3 WCBDA=5: 20.6	Empty Wt: 423.7 After Acetone Rinse: 529.6 After Hexane Rinse: 619.5 Total TS5: 195.8 Use 100 - 150g acetone total & 100- 150g of hexane total for rinses Impinger Box ID: 2	Initial Wt: 962.9 Final Wt: 983.5 5 Gain: 20.6 % Spent: 50
MARK FLUID LEVEL SEAL AND LABEL CONTAINER TS1					

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	K
Trap ID:	20
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Train Loaded By: T. Timer
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 13/17

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 3
Test Date: OCT. 13/17
Test Location: UNIT 2 OUTLET

Sample ID 31	Sample ID 32	Sample ID 33	Sample ID 34	Sample ID 35	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 410.5	Colour: WHITE	Initial Wt: 353.4	Impinger #1 Empty	Empty Wt: 424.8	Initial Wt: 865.4
After Acetone/ Hexane Rinse: 625.3	FOLD IN FOIL	Final Wt: 358.2	Empty Wt: 656.1	After Acetone Rinse: 526.8	Final Wt: 885.4
Total TS1: 214.8	SEAL AND LABEL CONTAINER TS2	1 Gain: 4.8	Final Wt: 992.5	After Hexane Rinse: 616.6	5 Gain: 20.0
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 336.4	Total TS5: 191.8	% Spent: 30
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: CC		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
		LABEL AS CONTAINER TS3	Empty Wt: 554.7		
			Initial Wt: 677.7		
			Final Wt: 853.5		
			3 Gain: 175.8		
			Colour: CC		
			Impinger #3 Empty	Impinger Box ID: 4	
			Empty Wt: 662.2		
			Final Wt: 837.8		
			4 Gain: 175.6		
			Colour: CC		
			Container TS4 Weights		
			Empty Wt: 425.3		
			With Imp Soln: 1210.5		
			Imp Volume: 785.2		
			After ~100g H_2O Rinse: 1371.3		
			Total TS4: 946.0		
			CWTR = 1 + 2 + 3 + 4: 1692.6		
			WCBDA=5: 20.0		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	DD
Trap ID:	13
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102705
Acetone Batch No.:	102421

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: AN
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 13/17

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 1 UNIT 1 INLET
Test Date: Oct. 12, 2017
Test Location: UNIT 1 INLET

Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
	2 filters				
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 423.0	Colour: GREY	Initial Wt: 327.2	Impinger #1 Empty	Empty Wt: 423.6	Initial Wt: 949.4
After Acetone/ Hexane Rinse: 865.0	FOLD IN FOIL	1 Final Wt: 332.5	Empty Wt: 656.1	After Acetone Rinse: 596.1	Final Wt: 961.1
Total TS1: 442.0	SEAL AND LABEL CONTAINER TS2	Gain: 5.3	Final Wt: 977.6	After Hexane Rinse: 729.0	5 Gain: 11.7
		Colour: WHITE	2 Gain: 321.5	Total TS5: 303.4	% Spent: 20 %
		SEAL TRAP	Colour: clear		
MARK FLUID LEVEL		WRAP IN FOIL	Impinger #2 Ethylene Glycol	Use 100 - 150g acetone total & 100- 150g of hexane total for rinses	
SEAL AND LABEL CONTAINER TS1		LABEL AS CONTAINER TS3	Empty Wt: 552.2		
			Initial Wt: 653.8		
			Final Wt: 763.6		
			3 Gain: 109.8		
			Colour: clear		
			Impinger #3 Empty	Impinger Box ID: X 14	
			Empty Wt: 539.2		
			Final Wt: 535.0		
			4 Gain: 0.8		
			Colour: clear		
			Container TS4 Weights		
			Empty Wt: 423.6		
			With Imp Soln: 949.5		
			Imp Volume: 525.9		
			After ~100g H_2O Rinse: 1059.2		
			Total TS4: 635.6		
			437.4		
			CWTR = 1 + 2 + 3 + 4: ~~435.4~~		
			WCBDA=5: ~~11.6~~ 11.7		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	EE
Trap ID:	19
HPLC Batch No.:	
Ethylene Gylcol Batch No.:	
Hexane Batch No.:	
Acetone Batch No.:	

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Train Loaded By: T. Timar
Train Recovered By: CHRIS BELLDOE
Recovery Witnessed By:
Date: Oct. 12, 2017

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 2
Test Date: Oct. 12, 2017
Test Location: Unit 1 Inlet

Sample ID 106	Sample ID 107	Sample ID 108	Sample ID 109	Sample ID 110	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap 18	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
	2 filters				
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 411.6	Colour: GREY	Initial Wt: 194.0	Impinger #1 Empty	Empty Wt: 421.9	Initial Wt: 932.9
After Acetone/ Hexane Rinse: 910.9	FOLD IN FOIL	Final Wt: 397.8	Empty Wt: 656.7	After Acetone Rinse: 514.6	Final Wt: 943.5
Total TS1: 499.3	SEAL AND LABEL CONTAINER TS2	1 Gain: 3.8	Final Wt: 951.8	After Hexane Rinse: 629.0	5 Gain: 10.6
		Colour: white	2 Gain: 295.1	Total TS5: 206.1	% Spent: 20 %
MARK FLUID LEVEL		SEAL TRAP	Colour: clear		
SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL	Impinger #2 Ethylene Glycol	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
		LABEL AS CONTAINER TS3	Empty Wt: 563.1		
			Initial Wt: 665.3		
			Final Wt: 784.5		
			3 Gain: 119.2		
			Colour: clear		
			Impinger #3 Empty	Impinger Box ID: 15	
			Empty Wt: 676.7		
			Final Wt: 676.9		
			4 Gain: 0.2		
			Colour: empty		
			Container TS4 Weights		
			Empty Wt: 421.7		
			With Imp Soln: 929.7		
			Imp Volume: 508.0		
			After ~100g H_2O Rinse: 1102.5		
			Total TS4: 680.8		
			CWTR = 1 + 2 + 3 + 4: 418.3		
			WCBDA=5: 10.6		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	AA
Trap ID:	18
HPLC Batch No.:	ALS H_2O
Ethylene Gylcol Batch No.:	lot # 170540
Hexane Batch No.:	lot # 102985
Acetone Batch No.:	lot # 102401

Train Loaded By: T. Timer
Train Recovered By: CHRIS RELYEA
Recovery Witnessed By: _____
Date: Oct. 13, 2017

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 3
Test Date: OCT. 13/17
Test Location: UNIT 1 INLET

Sample ID 111	Sample ID 112	Sample ID 113	Sample ID 114	Sample ID 115	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER ~~TS3~~ 365.3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 423.2	Colour: GREY	Initial Wt: ~~365.3~~	Impinger #1 Empty	Empty Wt: 424.6	Initial Wt: 960.8
After Acetone/ Hexane Rinse: 841.5	FOLD IN FOIL	Final Wt: 369.9	Empty Wt: 564.6	After Acetone Rinse: 537.7	Final Wt: 969.3
Total TS1: 418.3	SEAL AND LABEL CONTAINER TS2	1 Gain: 4.6	Final Wt: 929.3	After Hexane Rinse: 646.3	5 Gain: 8.5
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 364.7	Total TS5: 221.7	% Spent: 40
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: CC	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 655.8		
			Initial Wt: 753.2		
			Final Wt: 816.6		
			3 Gain: 63.4		
			Colour: CC		
			Impinger #3 Empty		
			Empty Wt: 602.1		
			Final Wt: 602.7		
			4 Gain: 0.6		
			Colour: CC		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	W
Trap ID:	# 14
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Container TS4 Weights	
Empty Wt:	423.6
With Imp Soln:	930.6
Imp Volume:	507.0
After ~100g H_2O Rinse:	1085.1
Total TS4:	1061.5

Impinger Box ID:

Train Loaded By: C. BELOTTE
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 13/17

CWTR = 1 + 2 + 3 + 4: 433.3

WCBDA=5: 8.5

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 1
Test Date: OCT. 12/17
Test Location: UNIT 2 INLET

Sample ID 131	Sample ID 132	Sample ID 133	Sample ID 134	Sample ID 135	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 424.0	Colour: GREY	Initial Wt: 410.5	Impinger #1 Empty	Empty Wt: 423.9	Initial Wt: 855.2
After Acetone/ Hexane Rinse: 734.0	FOLD IN FOIL	1 Final Wt: 415.0	Empty Wt: 671.5	After Acetone Rinse: 513.6	Final Wt: 866.2
Total TS1: 310.0	SEAL AND LABEL CONTAINER TS2	Gain: 4.5	Final Wt: 1008.1	After Hexane Rinse: 580.2	5 Gain: 11.0
MARK FLUID LEVEL		Colour: WHITE	2 Gain: 336.6	Total TS5: 156.3	% Spent: 40
SEAL AND LABEL CONTAINER TS1		SEAL TRAP	Colour: CC		
		WRAP IN FOIL	Impinger #2 Ethylene Glycol	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
		LABEL AS CONTAINER TS3	Empty Wt: 673.5		
			Initial Wt: 773.8		
			Final Wt: 869.6		
			3 Gain: 95.8		
			Colour: CC		
			Impinger #3 Empty	Impinger Box ID: 11	
			Empty Wt: 665.4		
			Final Wt: 665.9		
			4 Gain: 0.5		
			Colour: CC		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	FF
Trap ID:	7
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170546
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Container TS4 Weights	
Empty Wt:	421.9
With Imp Soln:	934.0
Imp Volume:	512.1
After ~100g H_2O Rinse:	1049.5
Total TS4:	627.6

CWTR = 1 + 2 + 3 + 4: 437.4

WCBDA=5: 11.0

Train Loaded By: TT
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 12/17

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 2
Test Date: OCT.12/17
Test Location: UNIT 2 INLET

Sample ID 136	Sample ID 137	Sample ID 138	Sample ID 139	Sample ID 140	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 410.9	Colour: GREY	Initial Wt: 414.6	Impinger #1 Empty	Empty Wt: 424.4	Initial Wt: 989.8
After Acetone/ Hexane Rinse: 873.3	FOLD IN FOIL	1 Final Wt: 417.9	Empty Wt: 548.9	After Acetone Rinse: 526.0	Final Wt: 999.0
Total TS1: 462.4	SEAL AND LABEL CONTAINER TS2	Gain: 3.3	Final Wt: 965.9	After Hexane Rinse: 632.5	5 Gain: 9.2
MARK FLUID LEVEL	SEAL TRAP	Colour: WHITE	2 Gain: 417.0	Total TS5: 208.1	% Spent: 3C
SEAL AND LABEL CONTAINER TS1	WRAP IN FOIL		Colour: CC	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
	LABEL AS CONTAINER TS3		Impinger #2 Ethylene Glycol		
			Empty Wt: 523.5		
			Initial Wt: 633.7		
			Final Wt: 465.9		
			3 Gain: 32.5		
			Colour: CC		
			Impinger #3 Empty	Impinger Box ID: 16	
			Empty Wt: 655.0		
			Final Wt: 655.3		
			4 Gain: 0.3		
			Colour: CC		
			Container TS4 Weights		
			Empty Wt: 424.3		
			With Imp Soln: 955.3		
			Imp Volume: 531.0		
			After ~100g H_2O Rinse: 1114.7		
			Total TS4: 690.4		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	II
Trap ID:	6
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Train Loaded By: T. Timar
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT.13/17

CWTR = 1 + 2 + 3 + 4: 453.1

WCBDA=5: 9.2

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: 3
Test Date: 13 Oct 17
Test Location: #2 Quench Inlet

Sample ID 141	Sample ID 142	Sample ID 143	Sample ID 144	Sample ID 145	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 424.9	Colour: Grey	Initial Wt: 390.9	Impinger #1 Empty	Empty Wt: 426.3	Initial Wt: 865.5
After Acetone/ Hexane Rinse: 749.4	FOLD IN FOIL	1 Final Wt: 396.3	Empty Wt: 640.2	After Acetone Rinse: 541.3	Final Wt: 878.5
Total TS1: 324.5		Gain: 5.4	Final Wt: 1026.5	After Hexane Rinse: 655.0	5 Gain: 13.0
	SEAL AND LABEL CONTAINER TS2	Colour: white	2 Gain: 386.3	Total TS5: 228.7	% Spent:
MARK FLUID LEVEL		SEAL TRAP	Colour: clear		
			Impinger #2 Ethylene Glycol		
SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL	Empty Wt: 657.4	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
			Initial Wt: 753.3		
		LABEL AS CONTAINER TS3	Final Wt: 858.7		
			3 Gain: 105.4		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 671.6	Impinger Box ID: 11	
			Final Wt: 689.4		
			4 Gain: 17.8		
			Colour: Clear		
			Container TS4 Weights		
			Empty Wt: 426.1		
			With Imp Soln: 966.8		
			Imp Volume: 540.7		
			After ~100g H_2O Rinse: 1088.1		
			Total TS4: 662		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	W
Trap ID:	12
HPLC Batch No.:	
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	
Acetone Batch No.:	

Train Loaded By: AN
Train Recovered By: TS
Recovery Witnessed By:
Date: 13 Oct 17

CWTR = 1 + 2 + 3 + 4: 464.9

WCBDA=5: 13.0

✓ TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: BLANK 1
Test Date: Oct. 13, 2017
Test Location: Unit 1

Sample ID 16	Sample ID 17	Sample ID 18	Sample ID 19	Sample ID 20	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 425.1	Colour: WHITE	Initial Wt: 402.2	Impinger #1 Empty	Empty Wt: 425.3	Initial Wt: 941.2
After Acetone/ Hexane Rinse: 798.2	FOLD IN FOIL	1 Final Wt: 402.2	Empty Wt: 458.0	After Acetone Rinse: 545.1	Final Wt: 941.2
Total TS1: 373.1		Gain: 0	Final Wt: 458.0	After Hexane Rinse: 676.9	5 Gain: 0
	SEAL AND LABEL CONTAINER TS2	Colour: white	2 Gain: 0	Total TS5: 251.6	% Spent: —
MARK FLUID LEVEL		SEAL TRAP	Colour: —	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL	Impinger #2 Ethylene Glycol		
		LABEL AS CONTAINER TS3	Empty Wt: 513.3		
			Initial Wt: ~~430~~ 628.7		
			Final Wt: 628.9		
			3 Gain: 0.3		
			Colour: clear		
			Impinger #3 Empty		
			Empty Wt: 530.9		
			Final Wt: 530.9		
			4 Gain: 0		
			Colour: —		

Impinger Box ID: 3

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	HH
Trap ID:	1
HPLC Batch No.:	ALS H2O
Ethylene Gylcol Batch No.:	170540
Hexane Batch No.:	102205
Acetone Batch No.:	102421

Container TS4 Weights	
Empty Wt:	425.0
With Imp Soln:	534.6
Imp Volume:	109.6
After ~100g H_2O Rinse:	704.7
Total TS4:	290.1.7

CWTR = 1 + 2 + 3 + 4: 0.3

WCBDA=5: 0

Train Loaded By: AN
Train Recovered By: CHECK BELOW
Recovery Witnessed By: —
Date: Oct. 13, 2017

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC
Project No.: 21800
Sample Batch No.: 17-21800-SVOC-

Test No.: Blank 2 Unit 2
Test Date: Oct. 13, 2017
Test Location: Blank 2 Unit 2

Sample ID 36	Sample ID 37	Sample ID 38	Sample ID 39	Sample ID 40	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-II Trap	Impingers 1, 2 & 3	Back-Half Rinses Trap Bottom U-Tube, Imp. Inlet Stem, U-Tubes and Impingers	Impinger 4 Silica Gel
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 429.5	Colour: WHITE	Initial Wt: 323.1	Impinger #1 Empty	Empty Wt: 425.0	Initial Wt: 943.5
After Acetone/ Hexane Rinse: 611.9	FOLD IN FOIL	1 Final Wt: 323.1	Empty Wt: 656.8	After Acetone Rinse: 544.8	Final Wt: 943.5
Total TS1: 187.3		Gain: 0	Final Wt: 656.8	After Hexane Rinse: 462.0	5 Gain: 0
	SEAL AND LABEL CONTAINER TS2	Colour: WHITE	2 Gain: 0	Total TS5: 237.0	% Spent: 0
MARK FLUID LEVEL		SEAL TRAP	Colour: —		
			Impinger #2 Ethylene Glycol	*Use 100 - 150g acetone total & 100- 150g of hexane total for rinses*	
SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL	Empty Wt: 656.3		
			Initial Wt: 771.3		
		LABEL AS CONTAINER TS3	Final Wt: 771.3		
			3 Gain: 0		
			Colour: CC		
			Impinger #3 Empty	Impinger Box ID: 15	
			Empty Wt: 534.9		
			Final Wt: 534.9		
			4 Gain: 0		
			Colour: —		

Train & Proofing Identification	
Glassware Train Proofing Provided By:	ALS
Glassware Train ID:	GG
Trap ID:	B
HPLC Batch No.:	ALS
Ethylene Gylcol Batch No.:	lot # 170546
Hexane Batch No.:	lot # 172205
Acetone Batch No.:	lot # 172421

Container TS4 Weights	
Empty Wt:	~~423.8~~ 423.8
With Imp Soln:	523.4
Imp Volume:	99.6
After ~100g H_2O Rinse:	670.6
Total TS4:	246.8

Train Loaded By: CHRIS BELOTE
Train Recovered By: CHRIS BELOTE/IAN
Recovery Witnessed By: —
Date: Oct. 13, 2017

CWTR = 1 + 2 + 3 + 4: 0

WCBDA=5: 0

TS1, TS4, TS5 - 1L Amber Glass Bottle
TS2 - Glass Petri Dish
TS3 - Glass Trap

APPENDIX 17

SVOC Analytical Report
(97 pages)

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Rd.
ALS WO#:	L2006987 Revision 1		Mississauga, ON
Date of Report	23-Oct-17		L5J 2Y4
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS: **PCDD/F by EPA M23**

***** Revised Report ***** Cover page comment added.

These sample extracts received column solid phase extraction cleanup with Florisil as well as activated carbon prior to analysis by GC/HRMS.

There were peaks observed in the parent octachlorodiphenylether mass that coeluted with HxCDF targets. However, the extract has received cleanup steps designed to exclude diphenylethers. In addition, in cases where peaks did not coelute with a HxCDF peak, no peak was observed in the HxCDF mass, as would be expected for an octachlorodiphenylether. No bias to HxCDF data is expected.

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life sciences

Sample Analysis summary Report

Sample Name	17-21800-SVOC-(101-105) TEST#1 #1 QUENCH INLET	17-21800-SVOC-(106-110) TEST#2 #1 QUENCH INLET	17-21800-SVOC-(111-115) TEST#3 #1 QUENCH INLET	17-21800-SVOC-(131-135) TEST#1 #2 QUENCH INLET	17-21800-SVOC-(136-140) TEST#2 #2 QUENCH INLET	17-21800-SVOC-(141-145) TEST#3 #2 QUENCH INLET
ALS Sample ID	L2006987-1	L2006987-2	L2006987-3	L2006987-4	L2006987-5	L2006987-6
Sample Size	1	1	1	1	1	1
Sample size units	Train	Train	Train	Train	Train	Train
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	n/a	n/a	n/a	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17
Target Analytes	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
2,3,7,8-TCDD	568	589	761	715	593	938
1,2,3,7,8-PeCDD	720	812	1040	894	846	919
1,2,3,4,7,8-HxCDD	431	351	422	369	318	317
1,2,3,6,7,8-HxCDD	587	477	606	507	426	454
1,2,3,7,8,9-HxCDD	534	562	599	535	479	519
1,2,3,4,6,7,8-HpCDD	3610	3150	3360	2860	2520	2650
OCDD	10000	7690	8870	6480	5200	5870
2,3,7,8-TCDF	3500	3610	5370	4450	3840	6580
1,2,3,7,8-PeCDF	3640	4210	5420	4620	3630	5960
2,3,4,7,8-PeCDF	3390	4020	3510	3090	2470	5120
1,2,3,4,7,8-HxCDF	2830	3530	3480	3260	2720	3340
1,2,3,6,7,8-HxCDF	3040	3740	3740	3210	2760	3430
2,3,4,6,7,8-HxCDF	2240	2530	2550	1990	1620	2190
1,2,3,7,8,9-HxCDF	536	555	605	479	385	540
1,2,3,4,6,7,8-HpCDF	9960	11300	10800	7550	7230	7990
1,2,3,4,7,8,9-HpCDF	664	879	801	570	511	632
OCDF	1900	2020	2130	1220	1060	1330
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	93	94	97	94	96	97
13C12-1,2,3,4,7,8-HxCDD	97	81	102	86	84	85
13C12-2,3,4,7,8-PeCDF	104	104	101	108	108	111
13C12-1,2,3,4,7,8-HxCDF	88	91	95	94	96	92
13C12-1,2,3,4,7,8,9-HpCDF	110	105	112	115	121	109
Extraction Standards						
13C12-2,3,7,8-TCDD	50	56	47	54	51	36
13C12-1,2,3,7,8-PeCDD	55	72	40	67	63	52
13C12-1,2,3,6,7,8-HxCDD	66	73	57	71	74	46
13C12-1,2,3,4,6,7,8-HpCDD	66	70	59	78	78	47
13C12-OCDD	62	59	52	80	79	39
13C12-2,3,7,8-TCDF	55	60	53	59	56	39
13C12-1,2,3,7,8-PeCDF	55	69	41	62	59	46
13C12-1,2,3,6,7,8-HxCDF	67	66	59	64	65	41
13C12-1,2,3,4,6,7,8-HpCDF	61	64	51	66	65	42
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	67	66	62	69	66	40
Homologue Group Totals	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
Total-TCDD	7280	6800	10400	10500	9100	10700
Total-PeCDD	7100	5920	8800	7970	7690	7900
Total-HxCDD	7040	5830	6690	6660	5700	5820
Total-HpCDD	7530	6550	6930	5850	5180	5560
Total-TCDF	107000	113000	181000	133000	106000	189000
Total-PeCDF	54100	60800	78300	63500	48900	81700
Total-HxCDF	24900	31400	31000	21200	20000	27500
Total-HpCDF	13400	15600	14900	10300	9820	11100
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	3930	4430	4910	4270	3650	5420
Mid Point PCDD/F TEQ (WHO 2005)	3930	4430	4910	4270	3650	5420
Upper Bound PCDD/F TEQ (WHO 2005)	3930	4430	4910	4270	3650	5420

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Quality Control Summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2640112-1	WG2640112-2
Sample Size	1	1
Sample size units	Train	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17
Target Analytes	**pg**	**% Rec**
2,3,7,8-TCDD	<10	102
1,2,3,7,8-PeCDD	<4.2	105
1,2,3,4,7,8-HxCDD	<4.7	90
1,2,3,6,7,8-HxCDD	<4.5	110
1,2,3,7,8,9-HxCDD	<4.5	107
1,2,3,4,6,7,8-HpCDD	<3.5	91
OCDD	<7.0	91
2,3,7,8-TCDF	<7.1	87
1,2,3,7,8-PeCDF	<4.9	93
2,3,4,7,8-PeCDF	<4.8	95
1,2,3,4,7,8-HxCDF	<2.9	99
1,2,3,6,7,8-HxCDF	<2.5	118
2,3,4,6,7,8-HxCDF	<2.7	108
1,2,3,7,8,9-HxCDF	<3.3	107
1,2,3,4,6,7,8-HpCDF	<3.0	99
1,2,3,4,7,8,9-HpCDF	<4.2	105
OCDF	<5.8	91
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS
Extraction Standards		
13C12-2,3,7,8-TCDD	35	50
13C12-1,2,3,7,8-PeCDD	33	50
13C12-1,2,3,6,7,8-HxCDD	39	65
13C12-1,2,3,4,6,7,8-HpCDD	46	70
13C12-OCDD	44	64
13C12-2,3,7,8-TCDF	40	56
13C12-1,2,3,7,8-PeCDF	34	48
13C12-1,2,3,6,7,8-HxCDF	38	59
13C12-1,2,3,4,6,7,8-HpCDF	42	62
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	55	65
Homologue Group Totals	**pg**	
Total-TCDD	<10	
Total-PeCDD	<4.2	
Total-HxCDD	<4.7	
Total-HpCDD	<3.5	
Total-TCDF	<7.1	
Total-PeCDF	<4.9	
Total-HxCDF	<3.3	
Total-HpCDF	<4.2	
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.00	
Mid Point PCDD/F TEQ (WHO 2005)	9.56	
Upper Bound PCDD/F TEQ (WHO 2005)	19.1	

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(101-105) TEST#1 #1 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-1	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A06
Run Date	21-Oct-17 16:28
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.60	568	22	M		30
1,2,3,7,8-PeCDD	1	31.90	720	11			150
1,2,3,4,7,8-HxCDD	0.1	33.97	431	8.1			150
1,2,3,6,7,8-HxCDD	0.1	34.03	587	7.7			150
1,2,3,7,8,9-HxCDD	0.1	34.15	534	7.6			150
1,2,3,4,6,7,8-HpCDD	0.01	35.63	3610	17			150
OCDD	0.0003	37.11	10000	22			300
2,3,7,8-TCDF	0.1	26.68	3500	18			30
1,2,3,7,8-PeCDF	0.03	30.92	3640	21			150
2,3,4,7,8-PeCDF	0.3	31.67	3390	21	M		150
1,2,3,4,7,8-HxCDF	0.1	33.48	2830	32			150
1,2,3,6,7,8-HxCDF	0.1	33.55	3040	28			150
2,3,4,6,7,8-HxCDF	0.1	33.88	2240	30			150
1,2,3,7,8,9-HxCDF	0.1	34.32	536	36			150
1,2,3,4,6,7,8-HpCDF	0.01	35.07	9960	15			150
1,2,3,4,7,8,9-HpCDF	0.01	35.87	664	21			150
OCDF	0.0003	37.20	1900	11			300
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.60	93	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	97	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.66	104	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	88	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87	110	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	6000	27.58	50	40-130			
13C12-1,2,3,7,8-PeCDD	6000	31.89	55	40-130			
13C12-1,2,3,6,7,8-HxCDD	6000	34.02	66	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.62	66	25-130			
13C12-OCDD	12000	37.11	62	25-130			
13C12-2,3,7,8-TCDF	6000	26.67	55	40-130			
13C12-1,2,3,7,8-PeCDF	6000	30.92	55	40-130			
13C12-1,2,3,6,7,8-HxCDF	6000	33.54	67	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.06	61	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	6000	34.29	67	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	12	7280	22	30
Total-PeCDD	9	7100	11	150
Total-HxCDD	7	7040	8.1	150
Total-HpCDD	2	7530	17	150
Total-TCDF	19	107000	18	30
Total-PeCDF	14	54100	21	150
Total-HxCDF	12	24900	36	150
Total-HpCDF	4	13400	21	150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	3930
Mid Point PCDD/F TEQ (WHO 2005)	3930
Upper Bound PCDD/F TEQ (WHO 2005)	3930

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-5VOC-(106-110) TEST#2 #1 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-2	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A07
Run Date	21-Oct-17 17:11
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.60	589	12			30
1,2,3,7,8-PeCDD	1	31.89	812	6.9			150
1,2,3,4,7,8-HxCDD	0.1	33.97	351	7.6			150
1,2,3,6,7,8-HxCDD	0.1	34.03	477	7.2			150
1,2,3,7,8,9-HxCDD	0.1	34.14	562	7.2			150
1,2,3,4,6,7,8-HpCDD	0.01	35.63	3150	11			150
OCDD	0.0003	37.11	7690	21			300
2,3,7,8-TCDF	0.1	26.68	3610	18			30
1,2,3,7,8-PeCDF	0.03	30.92	4210	16			150
2,3,4,7,8-PeCDF	0.3	31.67	4020	16			150
1,2,3,4,7,8-HxCDF	0.1	33.48	3530	8.3			150
1,2,3,6,7,8-HxCDF	0.1	33.54	3740	7.2			150
2,3,4,6,7,8-HxCDF	0.1	33.88	2530	7.9			150
1,2,3,7,8,9-HxCDF	0.1	34.31	555	9.5			150
1,2,3,4,6,7,8-HpCDF	0.01	35.06	11300	14			150
1,2,3,4,7,8,9-HpCDF	0.01	35.87	879	20			150
OCDF	0.0003	37.20	2020	10			300
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.60	94	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	81	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.66	104	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	91	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	105	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	6000	27.57	56	40-130			
13C12-1,2,3,7,8-PeCDD	6000	31.88	72	40-130			
13C12-1,2,3,6,7,8-HxCDD	6000	34.02	73	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.62	70	25-130			
13C12-OCDD	12000	37.10	59	25-130			
13C12-2,3,7,8-TCDF	6000	26.65	60	40-130			
13C12-1,2,3,7,8-PeCDF	6000	30.91	69	40-130			
13C12-1,2,3,6,7,8-HxCDF	6000	33.53	66	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.06	64	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	6000	34.29	66	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	13	6800	12		30
Total-PeCDD	8	5920	6.9		150
Total-HxCDD	7	5830	7.6		150
Total-HpCDD	2	6550	11		150
Total-TCDF	21	113000	18		30
Total-PeCDF	15	60800	16		150
Total-HxCDF	13	31400	9.5		150
Total-HpCDF	4	15600	20		150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	4430
Mid Point PCDD/F TEQ (WHO 2005)	4430
Upper Bound PCDD/F TEQ (WHO 2005)	4430

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF Indicates the Toxic Equivalency Factor
TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(111-115) TEST#3 #1 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-3	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A08
Run Date	21-Oct-17 17:54
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.57	761	11			30
1,2,3,7,8-PeCDD	1	31.89	1040	7.4			150
1,2,3,4,7,8-HxCDD	0.1	33.97	422	88			150
1,2,3,6,7,8-HxCDD	0.1	34.03	606	83			150
1,2,3,7,8,9-HxCDD	0.1	34.15	599	83			150
1,2,3,4,6,7,8-HpCDD	0.01	35.63	3360	16			150
OCDD	0.0003	37.12	8870	20			300
2,3,7,8-TCDF	0.1	26.65	5370	19	M		30
1,2,3,7,8-PeCDF	0.03	30.92	5420	15			150
2,3,4,7,8-PeCDF	0.3	31.58	3510	15			150
1,2,3,4,7,8-HxCDF	0.1	33.48	3480	10			150
1,2,3,6,7,8-HxCDF	0.1	33.54	3740	8.9			150
2,3,4,6,7,8-HxCDF	0.1	33.88	2550	9.8			150
1,2,3,7,8,9-HxCDF	0.1	34.31	605	12			150
1,2,3,4,6,7,8-HpCDF	0.01	35.07	10800	15			150
1,2,3,4,7,8,9-HpCDF	0.01	35.88	801	20			150
OCDF	0.0003	37.21	2130	11			300
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.57	97	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	102	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.66	101	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	95	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87	112	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	6000	27.55	47	40-130			
13C12-1,2,3,7,8-PeCDD	6000	31.88	40	40-130			
13C12-1,2,3,6,7,8-HxCDD	6000	34.02	57	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.62	59	25-130			
13C12-OCDD	12000	37.11	52	25-130			
13C12-2,3,7,8-TCDF	6000	26.62	53	40-130			
13C12-1,2,3,7,8-PeCDF	6000	30.91	41	40-130			
13C12-1,2,3,6,7,8-HxCDF	6000	33.54	59	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.06	51	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	6000	34.29	62	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	13	10400	11	30
Total-PeCDD	9	8800	7.4	150
Total-HxCDD	6	6690	88	150
Total-HpCDD	2	6930	16	150
Total-TCDF	20	181000	19	30
Total-PeCDF	16	78300	15	150
Total-HxCDF	12	31000	12	150
Total-HpCDF	4	14900	20	150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	4910
Mid Point PCDD/F TEQ (WHO 2005)	4910
Upper Bound PCDD/F TEQ (WHO 2005)	4910

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(131-135) TEST#1 #2 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-4	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A09
Run Date	21-Oct-17 18:36
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.57	715	9.7			30
1,2,3,7,8-PeCDD	1	31.89	894	14			150
1,2,3,4,7,8-HxCDD	0.1	33.96	369	5.2			150
1,2,3,6,7,8-HxCDD	0.1	34.02	507	4.9			150
1,2,3,7,8,9-HxCDD	0.1	34.14	535	4.9			150
1,2,3,4,6,7,8-HpCDD	0.01	35.63	2860	8.5			150
OCDD	0.0003	37.11	6480	6.5			300
2,3,7,8-TCDF	0.1	26.64	4450	12			30
1,2,3,7,8-PeCDF	0.03	30.91	4620	7.4			150
2,3,4,7,8-PeCDF	0.3	31.58	3090	7.2			150
1,2,3,4,7,8-HxCDF	0.1	33.47	3260	9.7			150
1,2,3,6,7,8-HxCDF	0.1	33.54	3210	8.5			150
2,3,4,6,7,8-HxCDF	0.1	33.88	1990	9.3			150
1,2,3,7,8,9-HxCDF	0.1	34.31	479	11			150
1,2,3,4,6,7,8-HpCDF	0.01	35.06	7550	6.4			150
1,2,3,4,7,8,9-HpCDF	0.01	35.87	570	8.8			150
OCDF	0.0003	37.20	1220	3.8			300
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.57	94	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	86	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.65	108	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	94	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	115	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	6000	27.54	54	40-130			
13C12-1,2,3,7,8-PeCDD	6000	31.88	67	40-130			
13C12-1,2,3,6,7,8-HxCDD	6000	34.02	71	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.62	78	25-130			
13C12-OCDD	12000	37.10	80	25-130			
13C12-2,3,7,8-TCDF	6000	26.62	59	40-130			
13C12-1,2,3,7,8-PeCDF	6000	30.90	62	40-130			
13C12-1,2,3,6,7,8-HxCDF	6000	33.53	64	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.06	66	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	6000	34.28	69	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	16	10500	9.7	30
Total-PeCDD	9	7970	14	150
Total-HxCDD	7	6660	5.2	150
Total-HpCDD	2	5850	8.5	150
Total-TCDF	20	133000	12	30
Total-PeCDF	16	63500	7.4	150
Total-HxCDF	9	21200	11	150
Total-HpCDF	4	10300	8.8	150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	4270
Mid Point PCDD/F TEQ (WHO 2005)	4270
Upper Bound PCDD/F TEQ (WHO 2005)	4270

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF Indicates the Toxic Equivalency Factor
TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(136-140) TEST#2 #2 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-5	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A10
Run Date	21-Oct-17 19:19
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.55	593	8.0			30
1,2,3,7,8-PeCDD	1	31.88	846	4.9			150
1,2,3,4,7,8-HxCDD	0.1	33.95	318	6.5			150
1,2,3,6,7,8-HxCDD	0.1	34.02	426	6.2			150
1,2,3,7,8,9-HxCDD	0.1	34.13	479	6.2			150
1,2,3,4,6,7,8-HpCDD	0.01	35.62	2520	6.6			150
OCDD	0.0003	37.10	5200	8.2			300
2,3,7,8-TCDF	0.1	26.64	3840	9.6	M		30
1,2,3,7,8-PeCDF	0.03	30.91	3630	7.8			150
2,3,4,7,8-PeCDF	0.3	31.57	2470	7.6			150
1,2,3,4,7,8-HxCDF	0.1	33.47	2720	8.6			150
1,2,3,6,7,8-HxCDF	0.1	33.53	2760	7.4			150
2,3,4,6,7,8-HxCDF	0.1	33.87	1620	8.2			150
1,2,3,7,8,9-HxCDF	0.1	34.30	385	9.8			150
1,2,3,4,6,7,8-HpCDF	0.01	35.06	7230	6.1			150
1,2,3,4,7,8,9-HpCDF	0.01	35.86	511	8.3			150
OCDF	0.0003	37.19	1060	7.3			300
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.55	96	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.95	84	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.64	108	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.46	96	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	121	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	6000	27.54	51	40-130			
13C12-1,2,3,7,8-PeCDD	6000	31.87	63	40-130			
13C12-1,2,3,6,7,8-HxCDD	6000	34.01	74	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.61	78	25-130			
13C12-OCDD	12000	37.09	79	25-130			
13C12-2,3,7,8-TCDF	6000	26.62	56	40-130			
13C12-1,2,3,7,8-PeCDF	6000	30.89	59	40-130			
13C12-1,2,3,6,7,8-HxCDF	6000	33.52	65	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.05	65	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	6000	34.27	66	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	**LQL**
Total-TCDD	16	9100	8.0	30
Total-PeCDD	9	7690	4.9	150
Total-HxCDD	7	5700	6.5	150
Total-HpCDD	2	5180	6.6	150
Total-TCDF	20	106000	9.6	30
Total-PeCDF	12	48900	7.8	150
Total-HxCDF	12	20000	9.8	150
Total-HpCDF	4	9820	8.3	150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	3650
Mid Point PCDD/F TEQ (WHO 2005)	3650
Upper Bound PCDD/F TEQ (WHO 2005)	3650

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(141-145) TEST#3 #2 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-6	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A11
Run Date	21-Oct-17 20:02
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.61	938	23			30
1,2,3,7,8-PeCDD	1	31.91	919	12			150
1,2,3,4,7,8-HxCDD	0.1	33.97	317	7.9			150
1,2,3,6,7,8-HxCDD	0.1	34.03	454	7.5			150
1,2,3,7,8,9-HxCDD	0.1	34.15	519	7.5			150
1,2,3,4,6,7,8-HpCDD	0.01	35.64	2650	14			150
OCDD	0.0003	37.12	5870	17			300
2,3,7,8-TCDF	0.1	26.68	6580	31			30
1,2,3,7,8-PeCDF	0.03	30.94	5960	22			150
2,3,4,7,8-PeCDF	0.3	31.68	5120	21			150
1,2,3,4,7,8-HxCDF	0.1	33.49	3340	9.0			150
1,2,3,6,7,8-HxCDF	0.1	33.55	3430	7.8			150
2,3,4,6,7,8-HxCDF	0.1	33.89	2190	8.6			150
1,2,3,7,8,9-HxCDF	0.1	34.32	540	10			150
1,2,3,4,6,7,8-HpCDF	0.01	35.07	7990	13			150
1,2,3,4,7,8,9-HpCDF	0.01	35.88	632	17			150
OCDF	0.0003	37.21	1330	9.2			300
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.61	97	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.97	85	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.67	111	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.48	92	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87	109	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	6000	27.58	36	40-130			
13C12-1,2,3,7,8-PeCDD	6000	31.89	52	40-130			
13C12-1,2,3,6,7,8-HxCDD	6000	34.03	46	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.63	47	25-130			
13C12-OCDD	12000	37.12	39	25-130			
13C12-2,3,7,8-TCDF	6000	26.67	39	40-130			
13C12-1,2,3,7,8-PeCDF	6000	30.92	46	40-130			
13C12-1,2,3,6,7,8-HxCDF	6000	33.54	41	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.07	42	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	6000	34.30	40	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	13	10700	23		30
Total-PeCDD	9	7900	12		150
Total-HxCDD	7	5820	7.9		150
Total-HpCDD	2	5560	14		150
Total-TCDF	21	189000	31		30
Total-PeCDF	15	81700	22		150
Total-HxCDF	13	27500	10		150
Total-HpCDF	4	11100	17		150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	5420
Mid Point PCDD/F TEQ (WHO 2005)	5420
Upper Bound PCDD/F TEQ (WHO 2005)	5420

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF Indicates the Toxic Equivalency Factor
TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		Approved:
ALS Sample ID	WG2640112-1	Extraction Date	16-Oct-17		*T.Patterson*
Analysis Method	EPA M23	Sample Size	1	Train	--e-signature--
Analysis Type	Blank	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	QC	Split Ratio	3		

Run Information	**Run 1**
Filename	6-171021A05
Run Date	21-Oct-17 15:45
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 D85MSUSN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<10	10	U		30
1,2,3,7,8-PeCDD	1	NotFnd	<4.2	4.2	U		150
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<4.7	4.7	U		150
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<4.5	4.5	U		150
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<4.5	4.5	U		150
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<3.5	3.5	U		150
OCDD	0.0003	37.11	<7.0	5.2	M,J,R	7.0	300
2,3,7,8-TCDF	0.1	NotFnd	<7.1	7.1	U		30
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.9	4.9	U		150
2,3,4,7,8-PeCDF	0.3	NotFnd	<4.8	4.8	U		150
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<2.9	2.9	U		150
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<2.5	2.5	U		150
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<2.7	2.7	U		150
1,2,3,7,8,9-HxCDF	0.1	34.29	<3.3	3.3	M,U	2.7	150
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<3.0	3.0	U		150
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<4.2	4.2	U		150
OCDF	0.0003	NotFnd	<5.8	5.8	U		300

Field Spike Standards	**% Rec**
37Cl4-2,3,7,8-TCDD	NS
13C12-1,2,3,4,7,8-HxCDD	NS
13C12-2,3,4,7,8-PeCDF	NS
13C12-1,2,3,4,7,8-HxCDF	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS

Extraction Standards				
13C12-2,3,7,8-TCDD	6000	27.55	35	40-130
13C12-1,2,3,7,8-PeCDD	6000	31.88	33	40-130
13C12-1,2,3,6,7,8-HxCDD	6000	34.02	39	40-130
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.62	46	25-130
13C12-OCDD	12000	37.10	44	25-130
13C12-2,3,7,8-TCDF	6000	26.64	40	40-130
13C12-1,2,3,7,8-PeCDF	6000	30.91	34	40-130
13C12-1,2,3,6,7,8-HxCDF	6000	33.53	38	40-130
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.06	42	25-130

Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	6000	34.28	55	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<10	10	U	30
Total-PeCDD	0	<4.2	4.2	U	150
Total-HxCDD	0	<4.7	4.7	U	150
Total-HpCDD	0	<3.5	3.5	U	150
Total-TCDF	0	<7.1	7.1	U	30
Total-PeCDF	0	<4.9	4.9	U	150
Total-HxCDF	0	<3.3	3.3	U	150
Total-HpCDF	0	<4.2	4.2	U	150

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.00
Mid Point PCDD/F TEQ (WHO 2005)	9.56
Upper Bound PCDD/F TEQ (WHO 2005)	19.1

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
NS	Indicates that this standard was not spiked to sample

ALS Life sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		
ALS Sample ID	WG2640112-2	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA M23	Sample Size	1	n/a	*T.Patterson*
Analysis Type	LCS	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	3		23-Oct-2017

Run Information	**Run 1**
Filename	6-171021A02
Run Date	21-Oct-17 13:36
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB5MSUSN189314H

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
2,3,7,8-TCDD	600	27.57	102	70-130	
1,2,3,7,8-PeCDD	3000	31.88	105	70-130	
1,2,3,4,7,8-HxCDD	3000	33.96	90	70-130	
1,2,3,6,7,8-HxCDD	3000	34.01	110	70-130	
1,2,3,7,8,9-HxCDD	3000	34.13	107	70-130	
1,2,3,4,6,7,8-HpCDD	3000	35.62	91	70-130	
OCDD	6000	37.10	91	70-130	
2,3,7,8-TCDF	600	26.65	87	70-130	
1,2,3,7,8-PeCDF	3000	30.91	93	70-130	
2,3,4,7,8-PeCDF	3000	31.66	95	70-130	
1,2,3,4,7,8-HxCDF	3000	33.47	99	70-130	
1,2,3,6,7,8-HxCDF	3000	33.53	118	70-130	
2,3,4,6,7,8-HxCDF	3000	33.87	108	70-130	
1,2,3,7,8,9-HxCDF	3000	34.28	107	70-130	
1,2,3,4,6,7,8-HpCDF	3000	35.06	99	70-130	
1,2,3,4,7,8,9-HpCDF	3000	35.87	105	70-130	
OCDF	6000	37.19	91	70-130	
Field Spike Standards			**% Rec**		
37Cl4-2,3,7,8-TCDD			NS		
13C12-1,2,3,4,7,8-HxCDD			NS		
13C12-2,3,4,7,8-PeCDF			NS		
13C12-1,2,3,4,7,8-HxCDF			NS		
13C12-1,2,3,4,7,8,9-HpCDF			NS		
Extraction Standards					
13C12-2,3,7,8-TCDD	6000	27.54	50	40-130	
13C12-1,2,3,7,8-PeCDD	6000	31.87	50	40-130	
13C12-1,2,3,6,7,8-HxCDD	6000	34.01	65	40-130	M
13C12-1,2,3,4,6,7,8-HpCDD	6000	35.61	70	25-130	
13C12-OCDD	12000	37.09	64	25-130	
13C12-2,3,7,8-TCDF	6000	26.62	56	40-130	
13C12-1,2,3,7,8-PeCDF	6000	30.90	48	40-130	
13C12-1,2,3,6,7,8-HxCDF	6000	33.52	59	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	6000	35.05	62	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	6000	34.27	65	40-130	

M	Indicates that a peak has been manually integrated.
NS	Indicates that this standard was not spiked to sample

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2007004		Mississauga, ON
Date of Report	24-Oct-17		L5J 2Y4
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800

COMMENTS: **PCDD/F by EPA M23**
Composite Data from DB5MS and from DB225 GC Columns

Certified by: _____
Ron McLeod, PhD
Director, Air Toxics & Special Chemistries, Life Sciences

ALS Life sciences

Sample Analysis summary Report

Sample Name	17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET	17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET	17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET	17-21800-SVOC-(16-20) BLANK #1	17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET	17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET
ALS Sample ID	L2007004-1	L2007004-2	L2007004-3	L2007004-4	L2007004-5	L2007004-6
Sample Size	1	1	1	1	1	1
Sample size units	sample	sample	sample	sample	sample	sample
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	n/a	n/a	n/a	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17
Target Analytes	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
2,3,7,8-TCDD	<8.8	<13	<9.5	<9.0	<9.0	<9.9
1,2,3,7,8-PeCDD	8.61	<13	<7.0	<6.2	<7.8	<6.3
1,2,3,4,7,8-HxCDD	<14	<12	<7.7	<3.9	<26	37.3
1,2,3,6,7,8-HxCDD	<37	27.3	34.9	<3.7	84.0	66.7
1,2,3,7,8,9-HxCDD	<20	<19	<19	<3.7	40.4	<13
1,2,3,4,6,7,8-HpCDD	395	329	341	<20	1530	1450
OCDD	540	437	586	<51	3880	3790
2,3,7,8-TCDF	<3.0	<2.2	<2.0	23.1	<6.6	<5.0
1,2,3,7,8-PeCDF	<9.1	8.77	<S.3	23.1	<7.3	<4.6
2,3,4,7,8-PeCDF	10.9	13.1	<11	<10	17.6	<9.3
1,2,3,4,7,8-HxCDF	<8.9	<13	<9.5	<12	21.4	31.3
1,2,3,6,7,8-HxCDF	<11	<9.1	<8.5	13.7	28.8	29.3
2,3,4,6,7,8-HxCDF	11.5	8.44	11.9	<9.0	43.1	<36
1,2,3,7,8,9-HxCDF	<3.2	<2.6	<2.5	<11	3.77	<2.3
1,2,3,4,6,7,8-HpCDF	<71	70.8	<70	<32	218	249
1,2,3,4,7,8,9-HpCDF	<17	8.86	<11	<8.3	44.8	51.7
OCDF	78.0	63.9	<76	<8.7	269	273
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	95	100	93	97	92	95
13C12-1,2,3,4,7,8-HxCDD	109	86	91	87	107	86
13C12-2,3,4,7,8-PeCDF	105	102	101	101	103	105
13C12-1,2,3,4,7,8-HxCDF	121	100	101	98	99	101
13C12-1,2,3,4,7,8,9-HpCDF	113	107	111	113	110	117
Extraction Standards						
13C12-2,3,7,8-TCDD	63	52	60	58	64	58
13C12-1,2,3,7,8-PeCDD	S6	49	52	53	60	61
13C12-1,2,3,6,7,8-HxCDD	73	69	68	73	77	78
13C12-1,2,3,4,6,7,8-HpCDD	83	65	70	71	88	80
13C12-OCDD	77	60	66	67	87	82
13C12-2,3,7,8-TCDF	71	60	64	68	75	66
13C12-1,2,3,7,8-PeCDF	56	50	52	53	74	58
13C12-1,2,3,6,7,8-HxCDF	81	69	71	67	78	69
13C12-1,2,3,4,6,7,8-HpCDF	73	60	62	63	78	70
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	72	59	73	71	80	83
Homologue Group Totals	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
Total-TCDD	270	315	152	<9.0	146	205
Total-PeCDD	336	35.6	284	<6.2	435	254
Total-HxCDD	717	747	657	<3.9	1920	1630
Total-HpCDD	814	329	773	<3.6	3250	3160
Total-TCDF	74.1	<7.5	<8.2	259	189	19.7
Total-PeCDF	92.6	63.9	58.8	152	140	17.0
Total-HxCDF	123	15.2	45.2	71.8	317	236
Total-HpCDF	<9.8	106	32.0	<8.3	329	301
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	17.2	12.0	8.27	4.37	46.6	35.2
Mid Point PCDD/F TEQ (WHO 2005)	32.0	30.6	25.0	18.3	62.3	51.7
Upper Bound PCDD/F TEQ (WHO 2005)	36.8	43.8	34.0	27.5	66.9	59.9

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Sample Analysis summary Report

Sample Name	17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET	17-21800-SVOC-(36-40) BLANK #2
ALS Sample ID	L2007004-7	L2007004-8
Sample Size	1	1
Sample size units	sample	sample
Percent Moisture	n/a	n/a
Sample Matrix	Stack	Stack
Sampling Date	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17
Target Analytes	**pg**	**pg**
2,3,7,8-TCDD	<8.5	<8.8
1,2,3,7,8-PeCDD	7.04	<4.1
1,2,3,4,7,8-HxCDD	41.6	<3.9
1,2,3,6,7,8-HxCDD	<90	<3.7
1,2,3,7,8,9-HxCDD	51.7	<3.7
1,2,3,4,6,7,8-HpCDD	1590	<4.3
OCDD	4230	37.5
2,3,7,8-TCDF	<2.4	<5.5
1,2,3,7,8-PeCDF	<7.1	<4.2
2,3,4,7,8-PeCDF	10.7	<4.1
1,2,3,4,7,8-HxCDF	17.6	<3.1
1,2,3,6,7,8-HxCDF	23.6	<2.7
2,3,4,6,7,8-HxCDF	33.1	<3.0
1,2,3,7,8,9-HxCDF	<2.8	<3.6
1,2,3,4,6,7,8-HpCDF	234	4.47
1,2,3,4,7,8,9-HpCDF	51.7	<2.8
OCDF	286	<5.7
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	97	95
13C12-1,2,3,4,7,8-HxCDD	114	95
13C12-2,3,4,7,8-PeCDF	103	102
13C12-1,2,3,4,7,8-HxCDF	100	100
13C12-1,2,3,4,7,8,9-HpCDF	113	116
Extraction Standards		
13C12-2,3,7,8-TCDD	57	56
13C12-1,2,3,7,8-PeCDD	62	47
13C12-1,2,3,6,7,8-HxCDD	62	69
13C12-1,2,3,4,6,7,8-HpCDD	78	71
13C12-OCDD	81	66
13C12-2,3,7,8-TCDF	63	64
13C12-1,2,3,7,8-PeCDF	62	48
13C12-1,2,3,6,7,8-HxCDF	64	68
13C12-1,2,3,4,6,7,8-HpCDF	67	63
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	73	72
Homologue Group Totals	**pg**	**pg**
Total-TCDD	137	<8.8
Total-PeCDD	410	<4.1
Total-HxCDD	1860	<3.9
Total-HpCDD	3400	<4.3
Total-TCDF	43.6	<5.5
Total-PeCDF	45.1	<4.2
Total-HxCDF	250	<3.6
Total-HpCDF	372	4.47
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	47.1	0.0560
Mid Point PCDD/F TEQ (WHO 2005)	60.7	8.68
Upper Bound PCDD/F TEQ (WHO 2005)	65.4	17.3

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Quality Control Summary Report

Sample Name	Method Blank	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2640104-1	WG2640104-4	WG2640104-2
Sample Size	1.00	1.00	1.00
Sample size units	sample	sample	n/a
Percent Moisture	n/a	n/a	n/a
Sample Matrix	QC	QC	QC
Sampling Date	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17
Target Analytes	**pg**	**pg**	**% Rec**
2,3,7,8-TCDD	<7.5	<5.9	101
1,2,3,7,8-PeCDD	<3.4	<3.0	106
1,2,3,4,7,8-HxCDD	<2.9	<3.0	88
1,2,3,6,7,8-HxCDD	<2.8	<2.9	110
1,2,3,7,8,9-HxCDD	<2.8	<2.8	110
1,2,3,4,6,7,8-HpCDD	<2.5	<3.3	94
OCDD	<4.8	<3.3	96
2,3,7,8-TCDF	<4.8	<3.7	85
1,2,3,7,8-PeCDF	<4.2	<2.7	90
2,3,4,7,8-PeCDF	<4.0	<2.6	87
1,2,3,4,7,8-HxCDF	<2.2	<2.5	99
1,2,3,6,7,8-HxCDF	<1.9	<2.2	113
2,3,4,6,7,8-HxCDF	<2.0	<2.4	101
1,2,3,7,8,9-HxCDF	<2.5	<2.9	109
1,2,3,4,6,7,8-HpCDF	<1.7	<1.5	94
1,2,3,4,7,8,9-HpCDF	<2.3	<2.1	106
OCDF	<4.4	<5.2	94
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS	NS
Extraction Standards			
13C12-2,3,7,8-TCDD	56	58	55
13C12-1,2,3,7,8-PeCDD	50	50	48
13C12-1,2,3,6,7,8-HxCDD	63	65	60
13C12-1,2,3,4,6,7,8-HpCDD	73	64	65
13C12-OCDD	69	58	61
13C12-2,3,7,8-TCDF	66	69	62
13C12-1,2,3,7,8-PeCDF	52	50	50
13C12-1,2,3,6,7,8-HxCDF	60	62	56
13C12-1,2,3,4,6,7,8-HpCDF	65	59	59
Cleanup Standard			
13C12-1,2,3,7,8,9-HxCDF	76	59	74
Homologue Group Totals	**pg**	**pg**	
Total-TCDD	<7.5	<5.9	
Total-PeCDD	<3.4	<3.0	
Total-HxCDD	<2.9	<3.0	
Total-HpCDD	<2.5	<3.3	
Total-TCDF	<4.8	<3.7	
Total-PeCDF	<4.2	<2.7	
Total-HxCDF	<2.5	<2.9	
Total-HpCDF	<2.3	<2.1	
Toxic Equivalency - (WHO 2005)			
Lower Bound PCDD/F TEQ (WHO 2005)	0.00	0.00	
Mid Point PCDD/F TEQ (WHO 2005)	7.24	6.04	
Upper Bound PCDD/F TEQ (WHO 2005)	14.5	12.1	

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Continuing Calibration Summary Report

Sample Name	CCV	CCV
ALS Sample ID	H6-17-CCV-0719	H6-17-CCV-0720
Sample Size	1	1
Sample size units	n/a	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	n/a	n/a
Target Analytes	**% Rec**	**% Rec**
2,3,7,8-TCDD	101	109
1,2,3,7,8-PeCDD	98	97
1,2,3,4,7,8-HxCDD	101	84
1,2,3,6,7,8-HxCDD	95	93
1,2,3,7,8,9-HxCDD	99	90
1,2,3,4,6,7,8-HpCDD	91	92
OCDD	93	95
2,3,7,8-TCDF	96	102
1,2,3,7,8-PeCDF	91	95
2,3,4,7,8-PeCDF	90	93
1,2,3,4,7,8-HxCDF	92	94
1,2,3,6,7,8-HxCDF	98	98
2,3,4,6,7,8-HxCDF	94	94
1,2,3,7,8,9-HxCDF	100	93
1,2,3,4,6,7,8-HpCDF	97	100
1,2,3,4,7,8,9-HpCDF	110	111
OCDF	92	96
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	89	93
13C12-1,2,3,4,7,8-HxCDD	107	91
13C12-2,3,4,7,8-PeCDF	97	102
13C12-1,2,3,4,7,8-HxCDF	100	100
13C12-1,2,3,4,7,8,9-HpCDF	110	108
Extraction Standards		
13C12-2,3,7,8-TCDD	94	92
13C12-1,2,3,7,8-PeCDD	78	78
13C12-1,2,3,6,7,8-HxCDD	102	106
13C12-1,2,3,4,6,7,8-HpCDD	108	105
13C12-OCDD	115	113
13C12-2,3,7,8-TCDF	105	109
13C12-1,2,3,7,8-PeCDF	79	80
13C12-1,2,3,6,7,8-HxCDF	102	101
13C12-1,2,3,4,6,7,8-HpCDF	98	95
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	106	99

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Sample Analysis Report

Sample Name	**17-21800-5VOC-(1-5) TEST#1 #1 APC OUTLET**	Sampling Date	n/a	
ALS Sample ID	L2007004-1	Extraction Date	16-Oct-17	
Analysis Method	EPA M23	Sample Size	1	sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	5	

Approved:
A.Byrne
--e-signature--
24-Oct-2017

Run Information	**Run 1**	**Run 2**
Filename	6-171020A25	1-171024AS004
Run Date	21-Oct-17 06:20	24-Oct-17 12:15
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-6 DB5ms USN189314H	HRMS-1 DB225USB652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<8.8	8.8	U		50						
1,2,3,7,8-PeCDD	1	31.89	8.61	4.3	M,J		250						
1,2,3,4,7,8-HxCDD	0.1	33.97	<14	8.0	M,J,R	14	250						
1,2,3,6,7,8-HxCDD	0.1	34.03	<37	7.6	M,J,R	37	250						
1,2,3,7,8,9-HxCDD	0.1	34.14	<20	7.5	M,J,R	20	250						
1,2,3,4,6,7,8-HpCDD	0.01	35.63	395	7.4			250						
OCDD	0.0003	37.12	540	7.4			500						
2,3,7,8-TCDF	0.1							15.29	<3.0	3.0	M,U	2.7	50
1,2,3,7,8-PeCDF	0.03	NotFnd	<9.1	9.1	U		250						
2,3,4,7,8-PeCDF	0.3	31.60	10.9	8.9	J		250						
1,2,3,4,7,8-HxCDF	0.1	33.48	<8.9	6.0	M,J,R	8.9	250						
1,2,3,6,7,8-HxCDF	0.1	33.55	<11	5.2	M,J,R	11	250						
2,3,4,6,7,8-HxCDF	0.1							23.86	11.5	2.6	M,J		250
1,2,3,7,8,9-HxCDF	0.1							NotFnd	<3.2	3.2	U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.07	<71	7.1	J,R	71	250						
1,2,3,4,7,8,9-HpCDF	0.01	35.88	<17	9.8	J,R	17	250						
OCDF	0.0003	37.21	78.0	4.4	J		500						
Field Spike Standards	**pg**		**% Rec**	**Limits**					**% Rec**				
37Cl4-2,3,7,8-TCDD	2000	27.57	95	70-130									
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	109	70-130	M								
13C12-2,3,4,7,8-PeCDF	8000	31.66	105	70-130									
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	121	70-130									
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87	113	70-130									
Extraction Standards													
13C12-2,3,7,8-TCDD	8000	27.55	63	40-130									
13C12-1,2,3,7,8-PeCDD	8000	31.88	56	40-130									
13C12-1,2,3,6,7,8-HxCDD	8000	34.02	73	40-130	M								
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	83	25-130									
13C12-OCDD	16000	37.11	77	25-130									
13C12-2,3,7,8-TCDF	8000			40-130				15.27	71				
13C12-1,2,3,7,8-PeCDF	8000	30.91	56	40-130									
13C12-1,2,3,6,7,8-HxCDF	8000			40-130				20.39	81				
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	73	25-130									
Cleanup Standard	**pg**												
13C12-1,2,3,7,8,9-HxCDF	10000	34.29	72	40-130									

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**	**# peaks**	**Conc. pg**	**EDL pg**
Total-TCDD	3	270	8.8		50			
Total-PeCDD	5	336	4.3		250			
Total-HxCDD	2	717	8.0		250			
Total-HpCDD	2	814	7.4		250			
Total-TCDF	3	74.1	6.1		50			
Total-PeCDF	5	92.6	9.1		250			
Total-HxCDF	4	123	6.8		250			
Total-HpCDF	0	<9.8	9.8	U	250			

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	17.2
Mid Point PCDD/F TEQ (WHO 2005)	32.0
Upper Bound PCDD/F TEQ (WHO 2005)	36.8

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET**	Sampling Date	n/a	
ALS Sample ID	L2007004-2	Extraction Date	16-Oct-17	
Analysis Method	EPA M23	Sample Size	1	sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	5	

Approved:
A.Byrne
--e-signature--
24-Oct-2017

Run Information	**Run 1**	**Run 2**
Filename	6-171020A26	1-171024AS005
Run Date	21-Oct-17 07:03	24-Oct-17 12:53
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-6 DB5ms USN189314H	HRMS-1 DB225USB652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<13	13	U		50						
1,2,3,7,8-PeCDD	1	NotFnd	<13	13	U		250						
1,2,3,4,7,8-HxCDD	0.1	33.97	<12	4.4	M,J,R	12	250						
1,2,3,6,7,8-HxCDD	0.1	34.02	27.3	4.1	M,J		250						
1,2,3,7,8,9-HxCDD	0.1	34.15	<19	4.1	M,J,R	19	250						
1,2,3,4,6,7,8-HpCDD	0.01	35.63	329	9.4			250						
OCDD	0.0003	37.11	437	5.0	J		500						
2,3,7,8-TCDF	0.1							15.27	<2.2	2.2	M,U	1.7	50
1,2,3,7,8-PeCDF	0.03	30.95	8.77	5.7	M,J		250						
2,3,4,7,8-PeCDF	0.3	31.59	13.1	5.6	J		250						
1,2,3,4,7,8-HxCDF	0.1	33.47	<13	6.1	J,R	13	250						
1,2,3,6,7,8-HxCDF	0.1	33.54	<9.1	5.3	J,R	9.1	250						
2,3,4,6,7,8-HxCDF	0.1							23.85	8.44	2.1	M,J		250
1,2,3,7,8,9-HxCDF	0.1							NotFnd	<2.6	2.6	U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.07	70.8	3.0	M,J		250						
1,2,3,4,7,8,9-HpCDF	0.01	35.88	8.86	4.1	M,J		250						
OCDF	0.0003	37.21	63.9	4.2	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**		**% Rec**
37Cl4-2,3,7,8-TCDD	2000	27.58	100	70-130		
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	86	70-130		
13C12-2,3,4,7,8-PeCDF	8000	31.66	102	70-130		
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	100	70-130		
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87	107	70-130		
Extraction Standards						
13C12-2,3,7,8-TCDD	8000	27.55	52	40-130		
13C12-1,2,3,7,8-PeCDD	8000	31.88	49	40-130		
13C12-1,2,3,6,7,8-HxCDD	8000	34.02	69	40-130		
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	65	25-130		
13C12-OCDD	16000	37.11	60	25-130		
13C12-2,3,7,8-TCDF	8000			40-130	15.27	60
13C12-1,2,3,7,8-PeCDF	8000	30.91	50	40-130		
13C12-1,2,3,6,7,8-HxCDF	8000			40-130	20.39	69
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	60	25-130		
Cleanup Standard	**pg**					
13C12-1,2,3,7,8,9-HxCDF	10000	34.29	59	40-130		

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**# peaks**	**Conc. pg**	**EDL pg**
Total-TCDD	2	315	13	50			
Total-PeCDD	1	35.6	13	250			
Total-HxCDD	4	747	4.4	250			
Total-HpCDD	1	329	9.4	250			
Total-TCDF	0	<7.5	7.5	U 50			
Total-PeCDF	4	63.9	5.7	250			
Total-HxCDF	1	15.2	7.0	250			
Total-HpCDF	3	106	4.1	250			

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	12.0
Mid Point PCDD/F TEQ (WHO 2005)	30.6
Upper Bound PCDD/F TEQ (WHO 2005)	43.8

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET**	Sampling Date	n/a	
ALS Sample ID	L2007004-3	Extraction Date	16-Oct-17	
Analysis Method	EPA M23	Sample Size	1	sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	5	

Approved:
A.Byrne
--e-signature--
24-Oct-2017

Run Information	**Run 1**	**Run 2**
Filename	6-171020A27	1-171024AS006
Run Date	21-Oct-17 07:46	24-Oct-17 12:15
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-6 DB5ms USN189314H	HRMS-1 DB225USB652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<9.5	9.5	U		50						
1,2,3,7,8-PeCDD	1	NotFnd	<7.0	7.0	U		250						
1,2,3,4,7,8-HxCDD	0.1	33.96	<7.7	7.7	M,U	7.6	250						
1,2,3,6,7,8-HxCDD	0.1	34.02	34.9	7.3	M,J		250						
1,2,3,7,8,9-HxCDD	0.1	34.13	<19	7.3	M,J,R	19	250						
1,2,3,4,6,7,8-HpCDD	0.01	35.62	341	6.1			250						
OCDD	0.0003	37.10	586	4.3			500						
2,3,7,8-TCDF	0.1							15.25	<2.0	2.0	M,U	1.9	50
1,2,3,7,8-PeCDF	0.03	NotFnd	<5.3	5.3	U		250						
2,3,4,7,8-PeCDF	0.3	31.58	<11	5.2	J,R	11	250						
1,2,3,4,7,8-HxCDF	0.1	33.46	<9.5	5.0	J,R	9.5	250						
1,2,3,6,7,8-HxCDF	0.1	33.54	<8.5	4.3	J,R	8.5	250						
2,3,4,6,7,8-HxCDF	0.1							23.85	11.9	2.0	M,J		250
1,2,3,7,8,9-HxCDF	0.1							23.24	<2.5	2.5	M,U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.06	<70	2.4	J,R	70	250						
1,2,3,4,7,8,9-HpCDF	0.01	35.86	<11	3.3	M,J,R	11	250						
OCDF	0.0003	37.19	<76	3.3	J,R	76	500						

Field Spike Standards	**pg**		**% Rec**	**Limits**			**% Rec**
37Cl4-2,3,7,8-TCDD	2000	27.57	93	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.95	91	70-130	M		
13C12-2,3,4,7,8-PeCDF	8000	31.65	101	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.46	101	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	111	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.54	60	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.87	52	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.01	68	40-130	M		
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.61	70	25-130			
13C12-OCDD	16000	37.09	66	25-130			
13C12-2,3,7,8-TCDF	8000			40-130		15.25	64
13C12-1,2,3,7,8-PeCDF	8000	30.90	52	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000			40-130		20.38	71
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.05	62	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.27	73	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**			**# peaks**	**Conc. pg**	**EDL pg**
Total-TCDD	1	152	9.5		50			
Total-PeCDD	3	284	7.0		250			
Total-HxCDD	3	657	7.7		250			
Total-HpCDD	2	773	6.1		250			
Total-TCDF	0	<8.2	8.2	U	50			
Total-PeCDF	2	58.8	5.3		250			
Total-HxCDF	1	45.2	5.7		250			
Total-HpCDF	1	32.0	3.3		250			

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	8.27
Mid Point PCDD/F TEQ (WHO 2005)	25.0
Upper Bound PCDD/F TEQ (WHO 2005)	34.0

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(16-20) BLANK #1**	Sampling Date	n/a		
ALS Sample ID	L2007004-4	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA M23	Sample Size	1	sample	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		24-Oct-2017

Run Information	**Run 1**
Filename	6-171020A28
Run Date	21-Oct-17 08:29
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5ms USN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<9.0	9.0	U		50
1,2,3,7,8-PeCDD	1	NotFnd	<6.2	6.2	U		250
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<3.9	3.9	U		250
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<3.7	3.7	U		250
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<3.7	3.7	U		250
1,2,3,4,6,7,8-HpCDD	0.01	35.63	<20	3.6	J,R	20	250
OCDD	0.0003	37.12	<51	3.3	J,R	51	500
2,3,7,8-TCDF	0.1	26.65	23.1	7.4	M,J		50
1,2,3,7,8-PeCDF	0.03	30.92	23.1	5.9	M,J		250
2,3,4,7,8-PeCDF	0.3	31.60	<10	5.8	J,R	10	250
1,2,3,4,7,8-HxCDF	0.1	33.48	<12	9.4	J,R	12	250
1,2,3,6,7,8-HxCDF	0.1	33.55	13.7	8.2	J		250
2,3,4,6,7,8-HxCDF	0.1	33.89	<9.0	9.0	U		250
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<11	11	U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.07	<32	6.1	J,R	32	250
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<8.3	8.3	U		250
OCDF	0.0003	37.20	<8.7	3.7	M,J,R	8.7	500
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	2000	27.57	97	70-130			
13C12-1,2,3,4,7,8-HxCDD	8000	33.96	87	70-130			
13C12-2,3,4,7,8-PeCDF	8000	31.66	101	70-130			
13C12-1,2,3,4,7,8-HxCDF	8000	33.47	98	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87	113	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	8000	27.55	58	40-130			
13C12-1,2,3,7,8-PeCDD	8000	31.88	53	40-130			
13C12-1,2,3,6,7,8-HxCDD	8000	34.02	73	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	71	25-130			
13C12-OCDD	16000	37.11	67	25-130			
13C12-2,3,7,8-TCDF	8000	26.64	68	40-130			
13C12-1,2,3,7,8-PeCDF	8000	30.91	53	40-130			
13C12-1,2,3,6,7,8-HxCDF	8000	33.54	67	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	63	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	10000	34.29	71	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<9.0	9.0	U	50
Total-PeCDD	0	<6.2	6.2	U	250
Total-HxCDD	0	<3.9	3.9	U	250
Total-HpCDD	0	<3.6	3.6	U	250
Total-TCDF	5	259	7.4		50
Total-PeCDF	3	152	5.9		250
Total-HxCDF	4	71.8	11		250
Total-HpCDF	0	<8.3	8.3	U	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	4.37
Mid Point PCDD/F TEQ (WHO 2005)	18.3
Upper Bound PCDD/F TEQ (WHO 2005)	27.5

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET**	Sampling Date	n/a	
ALS Sample ID	L2007004-5	Extraction Date	16-Oct-17	
Analysis Method	EPA M23	Sample Size	1	sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	5	

Approved:
A.Byrne
--e-signature--
24-Oct-2017

Run Information	**Run 1**	**Run 2**
Filename	6-171020A29	1-171024AS007
Run Date	21-Oct-17 09:12	00-Jan-00 14:08
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-6 DB5ms USN189314H	HRMS-1 D8225US8652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<9.0	9.0	U		50						
1,2,3,7,8-PeCDD	1	31.89	<7.8	6.5	M,J,R	7.8	250						
1,2,3,4,7,8-HxCDD	0.1	33.96	<26	5.1	J,R	26	250						
1,2,3,6,7,8-HxCDD	0.1	34.02	84.0	4.8	J		250						
1,2,3,7,8,9-HxCDD	0.1	34.13	40.4	4.8	J		250						
1,2,3,4,6,7,8-HpCDD	0.01	35.62	1530	8.7			250						
OCDD	0.0003	37.10	3880	8.4			500						
2,3,7,8-TCDF	0.1							15.27	<6.6	1.5	M,J,R	6.6	50
1,2,3,7,8-PeCDF	0.03	30.79	<7.3	7.3	M,U	5.7	250						
2,3,4,7,8-PeCDF	0.3							19.08	17.6	0.98	M,J		250
1,2,3,4,7,8-HxCDF	0.1	33.47	21.4	4.4	M,J		250						
1,2,3,6,7,8-HxCDF	0.1	33.54	28.8	3.8	M,J		250						
2,3,4,6,7,8-HxCDF	0.1							23.84	43.1	1.6	M,J		250
1,2,3,7,8,9-HxCDF	0.1							23.29	3.77	2.0	M,J		250
1,2,3,4,6,7,8-HpCDF	0.01	35.06	218	3.2	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	35.87	44.8	4.3	J		250						
OCDF	0.0003	37.20	269	3.6	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**			**% Rec**	
37Cl4-2,3,7,8-TCDD	2000	27.57	92	70-130				
13C12-1,2,3,4,7,8-HxCDD	8000	33.95	107	70-130				
13C12-2,3,4,7,8-PeCDF	8000	31.65	103	70-130				
13C12-1,2,3,4,7,8-HxCDF	8000	33.46	99	70-130				
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	110	70-130				
Extraction Standards								
13C12-2,3,7,8-TCDD	8000	27.54	64	40-130				
13C12-1,2,3,7,8-PeCDD	8000	31.87	60	40-130				
13C12-1,2,3,6,7,8-HxCDD	8000	34.01	77	40-130				
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	88	25-130				
13C12-OCDD	16000	37.10	87	25-130				
13C12-2,3,7,8-TCDF	8000			40-130			15.25	75
13C12-1,2,3,7,8-PeCDF	8000			40-130			17.02	74
13C12-1,2,3,6,7,8-HxCDF	8000			40-130			20.38	78
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	78	25-130				
Cleanup Standard	**pg**							
13C12-1,2,3,7,8,9-HxCDF	10000	34.28	80	40-130				

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**# peaks**	**Conc. pg**	**EDL pg**
Total-TCDD	1	146	9.0	50			
Total-PeCDD	4	435	6.5	250			
Total-HxCDD	6	1920	5.1	250			
Total-HpCDD	2	3250	8.7	250			
Total-TCDF	6	189	7.0	50			
Total-PeCDF	4	140	7.3	250			
Total-HxCDF	8	317	5.0	250			
Total-HpCDF	3	329	4.3	250			

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	46.6
Mid Point PCDD/F TEQ (WHO 2005)	62.3
Upper Bound PCDD/F TEQ (WHO 2005)	66.9

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET**	Sampling Date	n/a	
ALS Sample ID	L2007004-6	Extraction Date	16-Oct-17	Approved:
Analysis Method	EPA M23	Sample Size	1 sample	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a	--e-signature--
Sample Matrix	Stack	Split Ratio	5	24-Oct-2017

Run Information	**Run 1**	**Run 2**
Filename	6-171020A30	1-171024AS008
Run Date	21-Oct-17 09:55	24-Oct-17 14:46
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-6 D85ms USN189314H	HRMS-1 DB225USB652116H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	NotFnd	<9.9	9.9	U		50						
1,2,3,7,8-PeCDD	1	NotFnd	<6.3	6.3	U		250						
1,2,3,4,7,8-HxCDD	0.1	33.96	37.3	6.5	J		250						
1,2,3,6,7,8-HxCDD	0.1	34.02	66.7	6.2	J		250						
1,2,3,7,8,9-HxCDD	0.1	34.13	<13	6.2	M,J,R	13	250						
1,2,3,4,6,7,8-HpCDD	0.01	35.62	1450	11			250						
OCDD	0.0003	37.10	3790	6.7			500						
2,3,7,8-TCDF	0.1							15.30	<5.0	1.8	M,J,1.		50
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.6	4.6	U		250						
2,3,4,7,8-PeCDF	0.3	31.57	<9.3	4.5	J,R	9.3	250						
1,2,3,4,7,8-HxCDF	0.1	33.47	31.3	7.3	M,J		250						
1,2,3,6,7,8-HxCDF	0.1	33.54	29.3	6.4	M,J		250						
2,3,4,6,7,8-HxCDF	0.1							23.84	<36	1.9	M,J,R	36	250
1,2,3,7,8,9-HxCDF	0.1							23.23	<2.3	2.3	M,U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.06	249	2.9	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	35.86	51.7	4.0	J		250						
OCDF	0.0003	37.19	273	5.6	J		500						

Field Spike Standards	**pg**		**% Rec**	**Limits**		**% Rec**
37Cl4-2,3,7,8-TCDD	2000	27.57	95	70-130		
13C12-1,2,3,4,7,8-HxCDD	8000	33.95	86	70-130		
13C12-2,3,4,7,8-PeCDF	8000	31.65	105	70-130		
13C12-1,2,3,4,7,8-HxCDF	8000	33.46	101	70-130		
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	117	70-130		
Extraction Standards						
13C12-2,3,7,8-TCDD	8000	27.54	58	40-130		
13C12-1,2,3,7,8-PeCDD	8000	31.87	61	40-130		
13C12-1,2,3,6,7,8-HxCDD	8000	34.01	78	40-130		
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.61	80	25-130		
13C12-OCDD	16000	37.09	82	25-130		
13C12-2,3,7,8-TCDF	8000			40-130	15.28	66
13C12-1,2,3,7,8-PeCDF	8000	30.90	58	40-130		
13C12-1,2,3,6,7,8-HxCDF	8000			40-130	20.40	69
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.05	70	25-130		
Cleanup Standard	**pg**					
13C12-1,2,3,7,8,9-HxCDF	10000	34.28	83	40-130		

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**# peaks**	**Conc. pg**	**EDL pg**
Total-TCDD	2	205	9.9	50			
Total-PeCDD	3	254	6.3	250			
Total-HxCDD	5	1630	6.5	250			
Total-HpCDD	2	3160	11	250			
Total-TCDF	1	19.7	9.1	50			
Total-PeCDF	1	17.0	4.6	250			
Total-HxCDF	7	236	8.4	250			
Total-HpCDF	2	301	4.0	250			

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	35.2
Mid Point PCDD/F TEQ (WHO 2005)	51.7
Upper Bound PCDD/F TEQ (WHO 2005)	59.9

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
1.	This result is an EMPC

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET**	Sampling Date	n/a	
ALS Sample ID	L2007004-7	Extraction Date	16-Oct-17	
Analysis Method	EPA M23	Sample Size	1	sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Stack	Split Ratio	5	

Approved:
A.Byrne
--e-signature--
24-Oct-2017

Run Information	**Run 1**	**Run 2**
Filename	6-171020A31	1-171024A5009
Run Date	21-Oct-17 10:38	24-Oct-17 14:46
Final Volume	20 uL	20 uL
Dilution Factor	1	1
Analysis Units	pg	pg
Instrument - Column	HRMS-6 DB5ms USN189314H	HRMS-1 DB225USB652116H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<8.5	8.5	U		50						
1,2,3,7,8-PeCDD	1	31.89	7.04	5.5	M,J		250						
1,2,3,4,7,8-HxCDD	0.1	33.97	41.6	10	J		250						
1,2,3,6,7,8-HxCDD	0.1	34.03	<90	9.6	J,R	90	250						
1,2,3,7,8,9-HxCDD	0.1	34.14	51.7	9.6	J		250						
1,2,3,4,6,7,8-HpCDD	0.01	35.63	1590	7.7			250						
OCDD	0.0003	37.11	4230	6.5			500						
2,3,7,8-TCDF	0.1							15.29	<2.4	2.4	M,U	2.0	50
1,2,3,7,8-PeCDF	0.03	NotFnd	<7.1	7.1	U		250						
2,3,4,7,8-PeCDF	0.3							19.09	10.7	1.2	M,J		250
1,2,3,4,7,8-HxCDF	0.1	33.48	17.6	6.1	J		250						
1,2,3,6,7,8-HxCDF	0.1	33.55	23.6	5.3	J		250						
2,3,4,6,7,8-HxCDF	0.1							23.84	33.1	2.3	M,J		250
1,2,3,7,8,9-HxCDF	0.1							NotFnd	<2.8	2.8	U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.07	234	3.0	J		250						
1,2,3,4,7,8,9-HpCDF	0.01	35.88	51.7	4.1	J		250						
OCDF	0.0003	37.21	286	4.0	J		500						
Field Spike Standards	**pg**			**% Rec**	**Limits**					**% Rec**			
37Cl-2,3,7,8-TCDD	2000	27.58		97	70-130								
13C12-1,2,3,4,7,8-HxCDD	8000	33.96		114	70-130	M							
13C12-2,3,4,7,8-PeCDF	8000	31.66		103	70-130								
13C12-1,2,3,4,7,8-HxCDF	8000	33.47		100	70-130								
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.87		113	70-130								
Extraction Standards													
13C12-2,3,7,8-TCDD	8000	27.55		57	40-130								
13C12-1,2,3,7,8-PeCDD	8000	31.88		62	40-130								
13C12-1,2,3,6,7,8-HxCDD	8000	34.02		62	40-130	M							
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62		78	25-130								
13C12-OCDD	16000	37.11		81	25-130								
13C12-2,3,7,8-TCDF	8000				40-130			15.28	63				
13C12-1,2,3,7,8-PeCDF	8000				40-130			17.03	62				
13C12-1,2,3,6,7,8-HxCDF	8000				40-130			20.40	64				
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06		67	25-130								
Cleanup Standard	**pg**												
13C12-1,2,3,7,8,9-HxCDF	10000	34.29		73	40-130								

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**# peaks**	**Conc. pg**	**EDL pg**
Total-TCDD	1	137	8.5	50			
Total-PeCDD	4	410	5.5	250			
Total-HxCDD	5	1860	10	250			
Total-HpCDD	2	3400	7.7	250			
Total-TCDF	2	43.6	6.6	50			
Total-PeCDF	2	45.1	7.1	250			
Total-HxCDF	9	250	7.0	250			
Total-HpCDF	3	372	4.1	250			

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	47.1
Mid Point PCDD/F TEQ (WHO 2005)	60.7
Upper Bound PCDD/F TEQ (WHO 2005)	65.4

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(36-40) BLANK #2**	Sampling Date	n/a		Approved:
ALS Sample ID	L2007004-8	Extraction Date	16-Oct-17		*A.Byrne*
Analysis Method	EPA M23	Sample Size	1	sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		24-Oct-2017
Sample Matrix	Stack	Split Ratio	5		

Run Information	**Run 1**
Filename	6-171020A32
Run Date	21-Oct-17 11:21
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 D85ms USN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<8.8	8.8	U		50
1,2,3,7,8-PeCDD	1	NotFnd	<4.1	4.1	U		250
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<3.9	3.9	U		250
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<3.7	3.7	U		250
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<3.7	3.7	U		250
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<4.3	4.3	U		250
OCDD	0.0003	37.11	37.5	6.7	J		500
2,3,7,8-TCDF	0.1	NotFnd	<5.5	5.5	U		50
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.2	4.2	U		250
2,3,4,7,8-PeCDF	0.3	NotFnd	<4.1	4.1	U		250
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<3.1	3.1	U		250
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<2.7	2.7	U		250
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<3.0	3.0	U		250
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<3.6	3.6	U		250
1,2,3,4,6,7,8-HpCDF	0.01	35.06	4.47	2.1	M,J		250
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.8	2.8	U		250
OCDF	0.0003	NotFnd	<5.7	5.7	U		500

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	2000	27.57	95	70-130
13C12-1,2,3,4,7,8-HxCDD	8000	33.95	95	70-130
13C12-2,3,4,7,8-PeCDF	8000	31.65	102	70-130
13C12-1,2,3,4,7,8-HxCDF	8000	33.46	100	70-130
13C12-1,2,3,4,7,8,9-HpCDF	8000	35.86	116	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	8000	27.54	56	40-130
13C12-1,2,3,7,8-PeCDD	8000	31.87	47	40-130
13C12-1,2,3,6,7,8-HxCDD	8000	34.01	69	40-130
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.61	71	25-130
13C12-OCDD	16000	37.09	66	25-130
13C12-2,3,7,8-TCDF	8000	26.62	64	40-130
13C12-1,2,3,7,8-PeCDF	8000	30.90	48	40-130
13C12-1,2,3,6,7,8-HxCDF	8000	33.52	68	40-130
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.05	63	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.27	72	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<8.8	8.8	U	50
Total-PeCDD	0	<4.1	4.1	U	250
Total-HxCDD	0	<3.9	3.9	U	250
Total-HpCDD	0	<4.3	4.3	U	250
Total-TCDF	0	<5.5	5.5	U	50
Total-PeCDF	0	<4.2	4.2	U	250
Total-HxCDF	0	<3.6	3.6	U	250
Total-HpCDF	1	4.47	2.8		250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.0560
Mid Point PCDD/F TEQ (WHO 2005)	8.68
Upper Bound PCDD/F TEQ (WHO 2005)	17.3

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H6-17-CCV-0719	Extraction Date	n/a		Approved:
Analysis Method	EPA M23	Sample Size	1	n/a	*A.Byrne*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		24-Oct-2017

Run Information	**Run 1**
Filename	6-171020A17
Run Date	21-Oct-17 00:31
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB5ms USN189314H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.57	101	75-125	
1,2,3,7,8-PeCDD	50	31.89	98	75-125	
1,2,3,4,7,8-HxCDD	50	33.96	101	75-125	M
1,2,3,6,7,8-HxCDD	50	34.02	95	75-125	M
1,2,3,7,8,9-HxCDD	50	34.14	99	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.62	91	75-125	
OCDD	100	37.10	93	75-125	
2,3,7,8-TCDF	10	26.65	96	75-125	
1,2,3,7,8-PeCDF	50	30.91	91	75-125	
2,3,4,7,8-PeCDF	50	31.66	90	75-125	
1,2,3,4,7,8-HxCDF	50	33.47	92	75-125	
1,2,3,6,7,8-HxCDF	50	33.54	98	75-125	
2,3,4,6,7,8-HxCDF	50	33.87	94	75-125	
1,2,3,7,8,9-HxCDF	50	34.29	100	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.06	97	75-125	
1,2,3,4,7,8,9-HpCDF	50	35.87	110	75-125	
OCDF	100	37.19	92	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.57	89	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	33.95	107	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.65	97	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.46	100	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	35.86	110	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.55	94	75-125	
13C12-1,2,3,7,8-PeCDD	100	31.87	78	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.01	102	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.62	108	70-130	
13C12-OCDD	200	37.10	115	70-130	
13C12-2,3,7,8-TCDF	100	26.64	105	70-130	
13C12-1,2,3,7,8-PeCDF	100	30.90	79	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.53	102	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.06	98	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.28	106	40-130	

M	Indicates that a peak has been manually integrated.

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Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H6-17-CCV-0720	Extraction Date	n/a		Approved:
Analysis Method	EPA M23	Sample Size	1	n/a	*A.Byrne*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		24-Oct-2017

Run Information	**Run 1**
Filename	6-171020A33
Run Date	21-Oct-17 12:04
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB5ms USN189314H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.57	109	75-125	
1,2,3,7,8-PeCDD	50	31.89	97	75-125	
1,2,3,4,7,8-HxCDD	50	33.97	84	75-125	
1,2,3,6,7,8-HxCDD	50	34.03	93	75-125	
1,2,3,7,8,9-HxCDD	50	34.15	90	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.63	92	75-125	
OCDD	100	37.11	95	75-125	
2,3,7,8-TCDF	10	26.65	102	75-125	
1,2,3,7,8-PeCDF	50	30.92	95	75-125	
2,3,4,7,8-PeCDF	50	31.67	93	75-125	
1,2,3,4,7,8-HxCDF	50	33.48	94	75-125	
1,2,3,6,7,8-HxCDF	50	33.54	98	75-125	
2,3,4,6,7,8-HxCDF	50	33.88	94	75-125	
1,2,3,7,8,9-HxCDF	50	34.29	93	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.07	100	75-125	
1,2,3,4,7,8,9-HpCDF	50	35.87	111	75-125	
OCDF	100	37.20	96	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.57	93	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	33.96	91	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.66	102	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.47	100	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	35.87	108	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.55	92	75-125	
13C12-1,2,3,7,8-PeCDD	100	31.88	78	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.02	106	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.62	105	70-130	
13C12-OCDD	200	37.10	113	70-130	
13C12-2,3,7,8-TCDF	100	26.64	109	70-130	
13C12-1,2,3,7,8-PeCDF	100	30.91	80	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.53	101	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.06	95	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.28	99	40-130	

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Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG2640104-1	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA M23	Sample Size	1	sample	*A.Byrne*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	5		24-Oct-2017

Run Information	**Run 1**
Filename	6-171020A21
Run Date	21-Oct-17 03:29
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5ms USN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<7.5	7.5	U		50
1,2,3,7,8-PeCDD	1	NotFnd	<3.4	3.4	U		250
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<2.9	2.9	U		250
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<2.8	2.8	U		250
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<2.8	2.8	U		250
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<2.5	2.5	U		250
OCDD	0.0003	37.11	<4.8	2.7	M,J,R	4.8	500
2,3,7,8-TCDF	0.1	NotFnd	<4.8	4.8	U		50
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.2	4.2	U		250
2,3,4,7,8-PeCDF	0.3	NotFnd	<4.0	4.0	U		250
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<2.2	2.2	U		250
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.9	1.9	U		250
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<2.0	2.0	U		250
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<2.5	2.5	U		250
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<1.7	1.7	U		250
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.3	2.3	U		250
OCDF	0.0003	NotFnd	<4.4	4.4	U		500

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	2000	NS	NS	70-130
13C12-1,2,3,4,7,8-HxCDD	8000	NS	NS	70-130
13C12-2,3,4,7,8-PeCDF	8000	NS	NS	70-130
13C12-1,2,3,4,7,8-HxCDF	8000	NS	NS	70-130
13C12-1,2,3,4,7,8,9-HpCDF	8000	NS	NS	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	8000	27.55	56	40-130
13C12-1,2,3,7,8-PeCDD	8000	31.88	50	40-130
13C12-1,2,3,6,7,8-HxCDD	8000	34.02	63	40-130
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	73	25-130
13C12-OCDD	16000	37.10	69	25-130
13C12-2,3,7,8-TCDF	8000	26.64	66	40-130
13C12-1,2,3,7,8-PeCDF	8000	30.91	52	40-130
13C12-1,2,3,6,7,8-HxCDF	8000	33.53	60	40-130
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	65	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.28	76	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<7.5	7.5	U	50
Total-PeCDD	0	<3.4	3.4	U	250
Total-HxCDD	0	<2.9	2.9	U	250
Total-HpCDD	0	<2.5	2.5	U	250
Total-TCDF	0	<4.8	4.8	U	50
Total-PeCDF	0	<4.2	4.2	U	250
Total-HxCDF	0	<2.5	2.5	U	250
Total-HpCDF	0	<2.3	2.3	U	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.00
Mid Point PCDD/F TEQ (WHO 2005)	7.24
Upper Bound PCDD/F TEQ (WHO 2005)	14.5

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG2640104-4	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA M23	Sample Size	1	sample	*A.Byrne*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	5		24-Oct-2017

Run Information	**Run 1**
Filename	6-171020A22
Run Date	21-Oct-17 04:12
Final Volume	20 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-6 DB5ms USN189314H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<5.9	5.9	U		50
1,2,3,7,8-PeCDD	1	NotFnd	<3.0	3.0	U		250
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<3.0	3.0	U		250
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<2.9	2.9	U		250
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<2.8	2.8	U		250
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<3.3	3.3	U		250
OCDD	0.0003	NotFnd	<3.3	3.3	U		500
2,3,7,8-TCDF	0.1	NotFnd	<3.7	3.7	U		50
1,2,3,7,8-PeCDF	0.03	NotFnd	<2.7	2.7	U		250
2,3,4,7,8-PeCDF	0.3	NotFnd	<2.6	2.6	U		250
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<2.5	2.5	U		250
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<2.2	2.2	U		250
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<2.4	2.4	U		250
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<2.9	2.9	U		250
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<1.5	1.5	U		250
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.1	2.1	U		250
OCDF	0.0003	NotFnd	<5.2	5.2	U		500

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	2000	NS	NS	70-130
13C12-1,2,3,4,7,8-HxCDD	8000	NS	NS	70-130
13C12-2,3,4,7,8-PeCDF	8000	NS	NS	70-130
13C12-1,2,3,4,7,8-HxCDF	8000	NS	NS	70-130
13C12-1,2,3,4,7,8,9-HpCDF	8000	NS	NS	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	8000	27.55	58	40-130
13C12-1,2,3,7,8-PeCDD	8000	31.88	50	40-130
13C12-1,2,3,6,7,8-HxCDD	8000	34.02	65	40-130
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	64	25-130
13C12-OCDD	16000	37.11	58	25-130
13C12-2,3,7,8-TCDF	8000	26.64	69	40-130
13C12-1,2,3,7,8-PeCDF	8000	30.91	50	40-130
13C12-1,2,3,6,7,8-HxCDF	8000	33.54	62	40-130
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	59	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	10000	34.29	59	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<5.9	5.9	U	50
Total-PeCDD	0	<3.0	3.0	U	250
Total-HxCDD	0	<3.0	3.0	U	250
Total-HpCDD	0	<3.3	3.3	U	250
Total-TCDF	0	<3.7	3.7	U	50
Total-PeCDF	0	<2.7	2.7	U	250
Total-HxCDF	0	<2.9	2.9	U	250
Total-HpCDF	0	<2.1	2.1	U	250

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.00
Mid Point PCDD/F TEQ (WHO 2005)	6.04
Upper Bound PCDD/F TEQ (WHO 2005)	12.1

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
U	Indicates that this compound was not detected above the EDL.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		
ALS Sample ID	WG2640104-2	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA M23	Sample Size	1	n/a	*A.Byrne*
Analysis Type	LCS	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	5		24-Oct-2017

Run Information	**Run 1**
Filename	6-171020A18
Run Date	21-Oct-17 01:22
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-6 DB5ms USN189314H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	800	27.60	101	70-130	
1,2,3,7,8-PeCDD	4000	31.89	106	70-130	
1,2,3,4,7,8-HxCDD	4000	33.97	88	70-130	
1,2,3,6,7,8-HxCDD	4000	34.03	110	70-130	
1,2,3,7,8,9-HxCDD	4000	34.15	110	70-130	
1,2,3,4,6,7,8-HpCDD	4000	35.63	94	70-130	
OCDD	8000	37.11	96	70-130	
2,3,7,8-TCDF	800	26.67	85	70-130	
1,2,3,7,8-PeCDF	4000	30.92	90	70-130	
2,3,4,7,8-PeCDF	4000	31.68	87	70-130	
1,2,3,4,7,8-HxCDF	4000	33.48	99	70-130	
1,2,3,6,7,8-HxCDF	4000	33.55	113	70-130	
2,3,4,6,7,8-HxCDF	4000	33.88	101	70-130	
1,2,3,7,8,9-HxCDF	4000	34.29	109	70-130	
1,2,3,4,6,7,8-HpCDF	4000	35.07	94	70-130	
1,2,3,4,7,8,9-HpCDF	4000	35.88	106	70-130	
OCDF	8000	37.20	94	70-130	
Field Spike Standards	**pg**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	2000	NS	NS	70-130	
13C12-1,2,3,4,7,8-HxCDD	8000	NS	NS	70-130	
13C12-2,3,4,7,8-PeCDF	8000	NS	NS	70-130	
13C12-1,2,3,4,7,8-HxCDF	8000	NS	NS	70-130	
13C12-1,2,3,4,7,8,9-HpCDF	8000	NS	NS	70-130	
Extraction Standards					
13C12-2,3,7,8-TCDD	8000	27.57	55	40-130	
13C12-1,2,3,7,8-PeCDD	8000	31.88	48	40-130	
13C12-1,2,3,6,7,8-HxCDD	8000	34.02	60	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	8000	35.62	65	25-130	
13C12-OCDD	16000	37.11	61	25-130	
13C12-2,3,7,8-TCDF	8000	26.65	62	40-130	
13C12-1,2,3,7,8-PeCDF	8000	30.91	50	40-130	
13C12-1,2,3,6,7,8-HxCDF	8000	33.54	56	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	8000	35.06	59	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	10000	34.29	74	40-130	

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2006987		Mississauga, ON L5J 2Y4
Date of Report	23-Oct-17		CANADA
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS: Toxic PCB Congeners by GC/HRMS (EPA 1668C)

Certified by:

Steve Kennedy
Technical Supervisor

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Sample Analysis summary Report

Sample Name	17-21800-SVOC-(101-105) TEST#1 #1 QUENCH INLET	17-21800-SVOC-(106-110) TEST#2 #1 QUENCH INLET	17-21800-SVOC-(111-115) TEST#3 #1 QUENCH INLET	17-21800-SVOC-(131-135) TEST#1 #2 QUENCH INLET	17-21800-SVOC-(136-140) TEST#2 #2 QUENCH INLET	17-21800-SVOC-(141-145) TEST#3 #2 QUENCH INLET
ALS Sample ID	L2006987-1	L2006987-2	L2006987-3	L2006987-4	L2006987-5	L2006987-6
Sample Size	1	1	1	1	1	1
Sample size units	Stack	Stack	Stack	Stack	Stack	Stack
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	n/a	n/a	n/a	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17
Dioxin-Like Toxic PCBs	**pg**	**pg**	**pg**	**pg**	**pg**	**pg**
PCB-81	180	<110	163	180	<350	<240
PCB-77	993	872	881	828	1150	1030
PCB-123	<740	<660	<870	<860	<1100	<880
PCB-118	3600	3160	2270	4230	4880	2690
PCB-114	311	274	289	307	295	241
PCB-105	1400	1350	1120	1850	1840	1200
PCB-126	463	434	508	486	430	634
PCB-167	<150	96.7	117	<72	<96	<65
PCB-156	308	276	276	280	232	252
PCB-157	174	163	199	153	112	140
PCB-169	<150	<150	<180	<140	150	<180
PCB-189	239	206	256	149	124	170
Field Spikes	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-95	65	97	94	152	68	69
13C12-PCB-153	100	104	81	110	107	80
Extraction Standards						
13C12-PCB-81	50	47	52	84	21	35
13C12-PCB-77	61	46	54	86	49	62
13C12-PCB-123	82	73	67	73	66	78
13C12-PCB-118	84	81	70	89	81	89
13C12-PCB-114	82	77	68	80	77	87
13C12-PCB-105	82	75	67	78	73	86
13C12-PCB-126	77	72	70	78	76	87
13C12-PCB-167	78	81	61	78	75	61
13C12-PCB-156	83	77	72	77	75	84
13C12-PCB-157	77	76	62	77	74	86
13C12-PCB-169	79	74	69	78	76	87
13C12-PCB-189	88	86	69	82	83	72
Cleanup Standard						
13C12-PCB-111	61	80	56	87	55	31
Toxic Equivalency (WHO 2005)						
Lower Bound PCB TEQ	46.6	43.7	51.1	48.9	47.8	63.6
Mid Point PCB TEQ	51.2	48.2	56.5	53.2	48.0	69.1
Upper Bound PCB TEQ	51.2	48.2	56.5	53.2	48.0	69.1

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Sample Analysis summary Report

Sample Name	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2640112-1	WG2640112-2
Sample Size	1	1
Sample size units	n/a	n/a
Percent Moisture	n/a	n/a
Sample Matrix	QC	QC
Sampling Date	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17
Dioxin-Like Toxic PCBs	**pg**	**% Rec**
PCB-81	<2.5	93
PCB-77	<2.9	106
PCB-123	<3.6	99
PCB-118	<2.7	108
PCB-114	<3.5	106
PCB-105	<3.4	107
PCB-126	<3.8	111
PCB-167	<2.6	97
PCB-156	<2.8	93
PCB-157	<3.0	111
PCB-169	<3.5	99
PCB-189	<1.4	100
Field Spikes	**% Rec**	**% Rec**
13C12-PCB-95	NS	NS
13C12-PCB-153	NS	NS
Extraction Standards		
13C12-PCB-81	77	70
13C12-PCB-77	83	72
13C12-PCB-123	73	75
13C12-PCB-118	76	67
13C12-PCB-114	71	69
13C12-PCB-105	74	70
13C12-PCB-126	76	67
13C12-PCB-167	77	67
13C12-PCB-156	72	69
13C12-PCB-157	71	66
13C12-PCB-169	69	67
13C12-PCB-189	80	75
Cleanup Standard		
13C12-PCB-111	89	83
Toxic Equivalency (WHO 2005)		
Lower Bound PCB TEQ	0.00	
Mid Point PCB TEQ	0.243	
Upper Bound PCB TEQ	0.487	

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(101-105) TEST#1 #1 QUENCH INLET**	Sampling Date	n/a		
ALS Sample ID	L2006987-1	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	3		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS024
Run Date	20-Oct-17 01:07
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.98	180	130	M,J
PCB-77	0.0001	7.12	993	130	M
PCB-123	0.00003	7.40	<740	740	M,U,1.
PCB-118	0.00003	7.47	3600	25	M
PCB-114	0.00003	7.64	311	31	M,J
PCB-105	0.00003	7.86	1400	30	M
PCB-126	0.1	8.38	463	35	M
PCB-167	0.00003	8.63	<150	55	M,J,R
PCB-156	0.00003	9.02	308	52	M,J
PCB-157	0.00003	9.08	174	59	M,J
PCB-169	0.03	9.62	<150	63	M,J,R
PCB-189	0.00003	10.20	239	6.7	J
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-95	8000	6.23	65	70-130	R
13C12-PCB-153	8000	7.78	100	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	6000	6.97	50	10-145	
13C12-PCB-77	6000	7.11	61	10-145	
13C12-PCB-123	6000	7.41	82	10-145	
13C12-PCB-118	6000	7.46	84	10-145	
13C12-PCB-114	6000	7.62	82	10-145	
13C12-PCB-105	6000	7.85	82	10-145	
13C12-PCB-126	6000	8.37	77	10-145	
13C12-PCB-167	6000	8.65	78	10-145	
13C12-PCB-156	6000	9.00	83	10-145	
13C12-PCB-157	6000	9.08	77	10-145	
13C12-PCB-169	6000	9.62	79	10-145	
13C12-PCB-189	6000	10.19	88	10-145	
Cleanup Standard	**pg**		**% Rec**	**Limits**	
13C12-PCB-111	6000	6.90	61	10-145	

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	46.6
Mid Point PCB TEQ	51.2
Upper Bound PCB TEQ	51.2

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(106-110) TEST#2 #1 QUENCH INLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2006987-2	Extraction Date	16-Oct-17		*A.Byrne*
Analysis Method	EPA 1668C	Sample Size	1	Stack	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	3		

Run Information	**Run 1**
Filename	1-171020BS025
Run Date	20-Oct-17 01:25
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.97	<110	99	M,J,R
PCB-77	0.0001	7.11	872	120	M
PCB-123	0.00003	7.38	<660	650	M,1.
PCB-118	0.00003	7.46	3160	17	M
PCB-114	0.00003	7.63	274	19	M,J
PCB-105	0.00003	7.85	1350	20	M
PCB-126	0.1	8.37	434	24	M
PCB-167	0.00003	8.65	96.7	16	M,J
PCB-156	0.00003	9.00	276	17	M,J
PCB-157	0.00003	9.08	163	18	M,J
PCB-169	0.03	9.62	<150	20	M,J,R
PCB-189	0.00003	10.19	206	8.3	J

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.22	97	70-130
13C12-PCB-153	8000	7.76	104	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	6000	6.96	47	10-145
13C12-PCB-77	6000	7.11	46	10-145
13C12-PCB-123	6000	7.40	73	10-145
13C12-PCB-118	6000	7.46	81	10-145
13C12-PCB-114	6000	7.61	77	10-145
13C12-PCB-105	6000	7.84	75	10-145
13C12-PCB-126	6000	8.36	72	10-145
13C12-PCB-167	6000	8.65	81	10-145
13C12-PCB-156	6000	9.00	77	10-145
13C12-PCB-157	6000	9.07	76	10-145
13C12-PCB-169	6000	9.61	74	10-145
13C12-PCB-189	6000	10.18	86	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	6000	6.89	80	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	43.7
Mid Point PCB TEQ	48.2
Upper Bound PCB TEQ	48.2

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(111-115) TEST#3 #1 QUENCH INLET**	Sampling Date	n/a		
ALS Sample ID	L2006987-3	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	3		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS026
Run Date	20-Oct-17 01:43
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.98	163	54	M,J
PCB-77	0.0001	7.13	881	59	M
PCB-123	0.00003	7.39	<870	870	M,U,1.
PCB-118	0.00003	7.47	2270	20	M
PCB-114	0.00003	7.65	289	25	M,J
PCB-105	0.00003	7.86	1120	26	M
PCB-126	0.1	8.38	508	29	M
PCB-167	0.00003	8.66	117	13	M,J
PCB-156	0.00003	9.01	276	12	M,J
PCB-157	0.00003	9.09	199	14	M,J
PCB-169	0.03	9.63	<180	14	M,J,R
PCB-189	0.00003	10.20	256	14	M,J
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-95	8000	6.24	94	70-130	
13C12-PCB-153	8000	7.77	81	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	6000	6.97	52	10-145	
13C12-PCB-77	6000	7.12	54	10-145	
13C12-PCB-123	6000	7.41	67	10-145	R
13C12-PCB-118	6000	7.47	70	10-145	
13C12-PCB-114	6000	7.62	68	10-145	
13C12-PCB-105	6000	7.85	67	10-145	
13C12-PCB-126	6000	8.38	70	10-145	
13C12-PCB-167	6000	8.66	61	10-145	
13C12-PCB-156	6000	9.01	72	10-145	
13C12-PCB-157	6000	9.08	62	10-145	
13C12-PCB-169	6000	9.62	69	10-145	
13C12-PCB-189	6000	10.20	69	10-145	
Cleanup Standard	**pg**		**% Rec**	**Limits**	
13C12-PCB-111	6000	6.90	56	10-145	
Toxic Equivalency (WHO 2005)			**pg**		
Lower Bound PCB TEQ			51.1		
Mid Point PCB TEQ			56.5		
Upper Bound PCB TEQ			56.5		

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(131-135) TEST#1 #2 QUENCH INLET**	Sampling Date	n/a		
ALS Sample ID	L2006987-4	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	3		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS027
Run Date	20-Oct-17 02:01
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.98	180	110	M,J
PCB-77	0.0001	7.13	828	130	M
PCB-123	0.00003	7.40	<860	720	M,1.
PCB-118	0.00003	7.47	4230	26	M
PCB-114	0.00003	7.64	307	29	M,J
PCB-105	0.00003	7.86	1850	31	M
PCB-126	0.1	8.38	486	37	M
PCB-167	0.00003	8.66	<72	18	M,J,R
PCB-156	0.00003	9.01	280	18	M,J
PCB-157	0.00003	9.09	153	19	M,J
PCB-169	0.03	9.64	<140	20	M,J,R
PCB-189	0.00003	10.20	149	10	J

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.24	152	70-130
13C12-PCB-153	8000	7.78	110	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	6000	6.97	84	10-145
13C12-PCB-77	6000	7.12	86	10-145
13C12-PCB-123	6000	7.41	73	10-145
13C12-PCB-118	6000	7.47	89	10-145
13C12-PCB-114	6000	7.62	80	10-145
13C12-PCB-105	6000	7.85	78	10-145
13C12-PCB-126	6000	8.38	78	10-145
13C12-PCB-167	6000	8.66	78	10-145
13C12-PCB-156	6000	9.01	77	10-145
13C12-PCB-157	6000	9.08	77	10-145
13C12-PCB-169	6000	9.62	78	10-145
13C12-PCB-189	6000	10.19	82	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	6000	6.90	87	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	48.9
Mid Point PCB TEQ	53.2
Upper Bound PCB TEQ	53.2

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(136-140) TEST#2 #2 QUENCH INLET**	Sampling Date	n/a		
ALS Sample ID	L2006987-5	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	3		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS028
Run Date	20-Oct-17 02:19
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.97	<350	48	M,R
PCB-77	0.0001	7.13	1150	23	M
PCB-123	0.00003	7.41	<1100	1100	M,U,1.
PCB-118	0.00003	7.47	4880	35	M
PCB-114	0.00003	7.63	295	39	M,J
PCB-105	0.00003	7.86	1840	42	M
PCB-126	0.1	8.38	430	47	
PCB-167	0.00003	8.66	<96	18	M,J,R
PCB-156	0.00003	9.01	232	19	J
PCB-157	0.00003	9.09	112	19	M,J
PCB-169	0.03	9.63	150	20	M,J
PCB-189	0.00003	10.20	124	11	J

Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-95	8000	6.24	68	70-130	
13C12-PCB-153	8000	7.77	107	70-130	

Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	6000	6.97	21	10-145	R
13C12-PCB-77	6000	7.12	49	10-145	
13C12-PCB-123	6000	7.41	66	10-145	
13C12-PCB-118	6000	7.47	81	10-145	
13C12-PCB-114	6000	7.62	77	10-145	
13C12-PCB-105	6000	7.85	73	10-145	
13C12-PCB-126	6000	8.38	76	10-145	
13C12-PCB-167	6000	8.66	75	10-145	
13C12-PCB-156	6000	9.01	75	10-145	
13C12-PCB-157	6000	9.08	74	10-145	
13C12-PCB-169	6000	9.62	76	10-145	
13C12-PCB-189	6000	10.19	83	10-145	

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	6000	6.91	55	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	47.8
Mid Point PCB TEQ	48.0
Upper Bound PCB TEQ	48.0

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(141-145) TEST#3 #2 QUENCH INLET**	Sampling Date	n/a		
ALS Sample ID	L2006987-6	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	3		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS029
Run Date	20-Oct-17 02:37
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.98	<240	240	M,U
PCB-77	0.0001	7.13	1030	140	M
PCB-123	0.00003	7.39	<880	550	M,1.
PCB-118	0.00003	7.47	2690	33	M
PCB-114	0.00003	7.64	241	35	M,J
PCB-105	0.00003	7.86	1200	36	M
PCB-126	0.1	8.38	634	42	M
PCB-167	0.00003	8.66	<65	26	M,J,R
PCB-156	0.00003	9.01	252	18	M,J
PCB-157	0.00003	9.09	140	19	M,J
PCB-169	0.03	9.63	<180	20	M,J,R
PCB-189	0.00003	10.20	170	11	M,J

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.24	69	70-130
13C12-PCB-153	8000	7.77	80	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	6000	6.97	35	10-145
13C12-PCB-77	6000	7.12	62	10-145
13C12-PCB-123	6000	7.41	78	10-145
13C12-PCB-118	6000	7.47	89	10-145
13C12-PCB-114	6000	7.62	87	10-145
13C12-PCB-105	6000	7.85	86	10-145
13C12-PCB-126	6000	8.38	87	10-145
13C12-PCB-167	6000	8.66	61	10-145
13C12-PCB-156	6000	9.01	84	10-145
13C12-PCB-157	6000	9.08	86	10-145
13C12-PCB-169	6000	9.62	87	10-145
13C12-PCB-189	6000	10.19	72	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	6000	6.90	31	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	63.6
Mid Point PCB TEQ	69.1
Upper Bound PCB TEQ	69.1

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG2640112-1	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	n/a	*A.Byrne*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS008
Run Date	20-Oct-17 20:17
Final Volume	45 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<2.5	2.5	U
PCB-77	0.0001	NotFnd	<2.9	2.9	U
PCB-123	0.00003	NotFnd	<3.6	3.6	U
PCB-118	0.00003	NotFnd	<2.7	2.7	U
PCB-114	0.00003	NotFnd	<3.5	3.5	U
PCB-105	0.00003	NotFnd	<3.4	3.4	U
PCB-126	0.1	NotFnd	<3.8	3.8	U
PCB-167	0.00003	NotFnd	<2.6	2.6	U
PCB-156	0.00003	NotFnd	<2.8	2.8	U
PCB-157	0.00003	NotFnd	<3.0	3.0	U
PCB-169	0.03	NotFnd	<3.5	3.5	U
PCB-189	0.00003	NotFnd	<1.4	1.4	U

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-95	0	NS	
13C12-PCB-153	0	NS	

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	6000	6.96	77	10-145
13C12-PCB-77	6000	7.10	83	10-145
13C12-PCB-123	6000	7.40	73	10-145
13C12-PCB-118	6000	7.45	76	10-145
13C12-PCB-114	6000	7.61	71	10-145
13C12-PCB-105	6000	7.84	74	10-145
13C12-PCB-126	6000	8.36	76	10-145
13C12-PCB-167	6000	8.63	77	10-145
13C12-PCB-156	6000	8.99	72	10-145
13C12-PCB-157	6000	9.07	71	10-145
13C12-PCB-169	6000	9.61	69	10-145
13C12-PCB-189	6000	10.17	80	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	6000	6.89	89	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.243
Upper Bound PCB TEQ	0.487

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
U	Indicates that this compound was not detected above the DL.
NS	Indicates that this standard has not been added.

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Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a	
ALS Sample ID	WG2640112-2	Extraction Date	16-Oct-17	Approved:
Analysis Method	EPA 1668C	Sample Size	1	*A.Byrne*
Analysis Type	LCS	Percent Moisture	n/a	--e-signature--
Sample Matrix	QC	Split Ratio	1	23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS002
Run Date	20-Oct-17 18:28
Final Volume	45 uL
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMS-1 DB5MSUS360147H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
PCB-81	3000	6.97	93	60-135	
PCB-77	3000	7.12	106	60-135	
PCB-123	3000	7.41	99	60-135	
PCB-118	3000	7.48	108	60-135	
PCB-114	3000	7.63	106	60-135	
PCB-105	3000	7.85	107	60-135	
PCB-126	3000	8.37	111	60-135	
PCB-167	3000	8.66	97	60-135	
PCB-156	3000	9.00	93	60-135	
PCB-157	3000	9.08	111	60-135	
PCB-169	3000	9.63	99	60-135	
PCB-189	3000	10.19	100	60-135	

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-95	0	NS	
13C12-PCB-153	0	NS	

Extraction Standards	**pg**	**% Rec**	**Limits**
13C12-PCB-81	6000	70	40-145
13C12-PCB-77	6000	72	40-145
13C12-PCB-123	6000	75	40-145
13C12-PCB-118	6000	67	40-145
13C12-PCB-114	6000	69	40-145
13C12-PCB-105	6000	70	40-145
13C12-PCB-126	6000	67	40-145
13C12-PCB-167	6000	67	40-145
13C12-PCB-156	6000	69	40-145
13C12-PCB-157	6000	66	40-145
13C12-PCB-169	6000	67	40-145
13C12-PCB-189	6000	75	40-145

Cleanup Standard	**pg**	**% Rec**	**Limits**
13C12-PCB-111	6000	83	40-145

Lower Bound PCB TEQ
Mid Point PCB TEQ
Upper Bound PCB TEQ

NS Indicates that this standard has not been added.

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road Mississauga, ON L5J 2Y4 CANADA
ALS WO#:	L2007004		
Date of Report	23-Oct-17		
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS: **Toxic PCB Congeners by GC/HRMS (EPA 1668C)**

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life sciences

Sample Analysis summary Report

Sample Name	17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET	17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET	17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET	17-21800-SVOC-(16-20) BLANK #1
ALS Sample ID	L2007004-1	L2007004-2	L2007004-3	L2007004-4
Sample Size	1	1	1	1
Sample size units	Stack	Stack	Stack	Stack
Percent Moisture	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack
Sampling Date	n/a	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17
Dioxin-like Toxic PCBs	**pg**	**pg**	**pg**	**pg**
PCB-81	<30	<21	<30	<15
PCB-77	60.9	67.6	91.3	21.6
PCB-123	<110	<150	<270	<41
PCB-118	973	1340	2160	180
PCB-114	32.8	49.8	<78	<4.3
PCB-105	315	389	804	<69
PCB-126	<14	<27	<29	<5.1
PCB-167	<11	<11	<10	<2.7
PCB-156	<18	<27	<49	<8.6
PCB-157	<12	<7.8	<8.5	<2.9
PCB-169	<14	<8.7	<6.6	<3.3
PCB-189	<4.9	<3.3	<4.0	<1.1
Field Spikes	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-95	132	79	88	124
13C12-PCB-153	103	101	111	102
Extraction Standards				
13C12-PCB-81	90	69	75	77
13C12-PCB-77	96	95	94	79
13C12-PCB-123	87	88	82	79
13C12-PCB-118	87	89	89	81
13C12-PCB-114	84	89	84	77
13C12-PCB-105	86	86	85	80
13C12-PCB-126	82	81	81	77
13C12-PCB-167	93	92	83	84
13C12-PCB-156	88	84	83	82
13C12-PCB-157	86	82	85	77
13C12-PCB-169	84	83	82	77
13C12-PCB-189	89	87	90	84
Cleanup Standard				
13C12-PCB-111	82	85	89	83
Toxic Equivalency (WHO 2005)				
Lower Bound PCB TEQ	0.0457	0.0601	0.0981	0.00756
Mid Point PCB TEQ	0.964	1.55	1.67	0.318
Upper Bound PCB TEQ	1.88	3.03	3.22	0.625

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Sample Analysis summary Report

Sample Name	17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET	17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET	17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET	17-21800-SVOC-(36-40) BLANK #2
ALS Sample ID	L2007004-5	L2007004-6	L2007004-7	L2007004-8
Sample Size	1	1	1	1
Sample size units	Stack	Stack	Stack	Stack
Percent Moisture	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack
Sampling Date	n/a	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17
Dioxin-like Toxic PCBs	**pg**	**pg**	**pg**	**pg**
PCB-81	10.3	<11	<21	<5.1
PCB-77	57.9	<72	55.0	<9.4
PCB-123	<78	<210	<150	<6.9
PCB-118	700	1580	1070	95.8
PCB-114	33.9	56.6	<46	<5.2
PCB-105	244	481	409	<26
PCB-126	<20	<27	<13	<6.0
PCB-167	<6.9	<9.0	<9.3	<3.0
PCB-156	25.9	<46	42.0	<3.2
PCB-157	<7.4	<13	<12	<3.3
PCB-169	<8.0	<6.1	<6.1	<3.7
PCB-189	11.4	8.46	<5.2	<3.1
Field Spikes	**% Rec**	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-95	105	86	124	134
13C12-PCB-153	109	101	107	107
Extraction Standards				
13C12-PCB-81	76	37	64	70
13C12-PCB-77	100	56	77	73
13C12-PCB-123	96	54	67	69
13C12-PCB-118	89	61	79	76
13C12-PCB-114	92	57	73	72
13C12-PCB-105	93	57	72	73
13C12-PCB-126	92	56	70	70
13C12-PCB-167	92	62	75	77
13C12-PCB-156	95	56	71	72
13C12-PCB-157	91	58	76	72
13C12-PCB-169	94	59	75	72
13C12-PCB-189	101	64	80	83
Cleanup Standard				
13C12-PCB-111	85	60	76	78
Toxic Equivalency (WHO 2005)				
Lower Bound PCB TEQ	0.0393	0.0638	0.0511	0.00287
Mid Point PCB TEQ	2.16	1.52	0.802	0.361
Upper Bound PCB TEQ	2.28	2.97	1.55	0.718

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Sample Analysis summary Report

Sample Name	Method Blank	Method Blank	Laboratory Control Sample
ALS Sample ID	WG2640104-1	WG2640104-4	WG2640104-2
Sample Size	1	1	1
Sample size units	Stack	Stack	n/a
Percent Moisture	n/a	n/a	n/a
Sample Matrix	XAD	Reagent	QC
Sampling Date	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17
Dioxin-like Toxic PCBs	**pg**	**pg**	**% Rec**
PCB-81	<2.1	<1.9	101
PCB-77	<2.4	<2.1	101
PCB-123	<2.7	<2.1	94
PCB-118	2.73	<3.3	94
PCB-114	<2.4	<1.9	108
PCB-105	<2.6	<2.0	102
PCB-126	<2.9	<2.4	110
PCB-167	<2.9	<1.2	98
PCB-156	<3.5	<1.3	93
PCB-157	<3.3	<1.4	105
PCB-169	<3.7	<1.5	93
PCB-189	<0.63	<1.3	89
Field Spikes	**% Rec**	**% Rec**	**% Rec**
13C12-PCB-95	NS	NS	NS
13C12-PCB-153	NS	NS	NS
Extraction Standards			
13C12-PCB-81	90	81	71
13C12-PCB-77	96	86	76
13C12-PCB-123	77	80	78
13C12-PCB-118	97	90	78
13C12-PCB-114	86	85	74
13C12-PCB-105	85	82	79
13C12-PCB-126	86	82	78
13C12-PCB-167	91	89	82
13C12-PCB-156	83	85	77
13C12-PCB-157	84	85	78
13C12-PCB-169	84	84	79
13C12-PCB-189	95	93	86
Cleanup Standard			
13C12-PCB-111	92	82	82
Toxic Equivalency (WHO 2005)			
Lower Bound PCB TEQ	0.0000819	0.00	
Mid Point PCB TEQ	0.201	0.143	
Upper Bound PCB TEQ	0.402	0.286	

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET**	Sampling Date	n/a		
ALS Sample ID	L2007004-1	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS017
Run Date	20-Oct-17 23:00
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.99	<30	30	M,U
PCB-77	0.0001	7.12	60.9	33	M,J
PCB-123	0.00003	7.40	<110	110	M,U,1.
PCB-118	0.00003	7.47	973	10	
PCB-114	0.00003	7.62	32.8	13	M,J
PCB-105	0.00003	7.85	315	13	M
PCB-126	0.1	NotFnd	<14	14	U
PCB-167	0.00003	8.64	<11	11	M,U
PCB-156	0.00003	9.00	<18	12	M,J,R
PCB-157	0.00003	NotFnd	<12	12	U
PCB-169	0.03	NotFnd	<14	14	U
PCB-189	0.00003	NotFnd	<4.9	4.9	U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.23	132	70-130
13C12-PCB-153	8000	7.76	103	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.97	90	10-145
13C12-PCB-77	8000	7.11	96	10-145
13C12-PCB-123	8000	7.41	87	10-145
13C12-PCB-118	8000	7.46	87	10-145
13C12-PCB-114	8000	7.61	84	10-145
13C12-PCB-105	8000	7.85	86	10-145
13C12-PCB-126	8000	8.37	82	10-145
13C12-PCB-167	8000	8.64	93	10-145
13C12-PCB-156	8000	9.00	88	10-145
13C12-PCB-157	8000	9.08	86	10-145
13C12-PCB-169	8000	9.62	84	10-145
13C12-PCB-189	8000	10.18	89	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.90	82	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0457
Mid Point PCB TEQ	0.964
Upper Bound PCB TEQ	1.88

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET**	Sampling Date	n/a		
ALS Sample ID	L2007004-2	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS018
Run Date	20-Oct-17 23:18
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.99	<21	21	J,R
PCB-77	0.0001	7.12	67.6	19	M,J
PCB-123	0.00003	7.40	<150	24	M,J,1.
PCB-118	0.00003	7.47	1340	100	M
PCB-114	0.00003	7.64	49.8	22	M,J
PCB-105	0.00003	7.85	389	23	M
PCB-126	0.1	NotFnd	<27	27	U
PCB-167	0.00003	8.64	<11	6.8	M,J,R
PCB-156	0.00003	9.01	<27	7.5	M,J,R
PCB-157	0.00003	NotFnd	<7.8	7.8	U
PCB-169	0.03	NotFnd	<8.7	8.7	U
PCB-189	0.00003	NotFnd	<3.3	3.3	U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.23	79	70-130
13C12-PCB-153	8000	7.77	101	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.97	69	10-145
13C12-PCB-77	8000	7.12	95	10-145
13C12-PCB-123	8000	7.41	88	10-145
13C12-PCB-118	8000	7.46	89	10-145
13C12-PCB-114	8000	7.62	89	10-145
13C12-PCB-105	8000	7.85	86	10-145
13C12-PCB-126	8000	8.37	81	10-145
13C12-PCB-167	8000	8.64	92	10-145
13C12-PCB-156	8000	9.00	84	10-145
13C12-PCB-157	8000	9.08	82	10-145
13C12-PCB-169	8000	9.62	83	10-145
13C12-PCB-189	8000	10.18	87	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.90	85	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0601
Mid Point PCB TEQ	1.55
Upper Bound PCB TEQ	3.03

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2007004-3	Extraction Date	16-Oct-17		*A.Byrne*
Analysis Method	EPA 1668C	Sample Size	1	Stack	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	5		

Run Information	**Run 1**
Filename	1-171020BS019
Run Date	20-Oct-17 23:36
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.99	<30	23	M,J,R
PCB-77	0.0001	7.13	91.3	21	J
PCB-123	0.00003	7.39	<270	210	M,J,1.
PCB-118	0.00003	7.47	2160	21	M
PCB-114	0.00003	7.63	<78	24	M,J,R
PCB-105	0.00003	7.86	804	24	M
PCB-126	0.1	NotFnd	<29	29	U
PCB-167	0.00003	8.65	<10	5.9	M,J,R
PCB-156	0.00003	9.01	<49	6.0	M,J,R
PCB-157	0.00003	9.09	<8.5	5.9	M,J,R
PCB-169	0.03	NotFnd	<6.6	6.6	U
PCB-189	0.00003	NotFnd	<4.0	4.0	U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.22	88	70-130
13C12-PCB-153	8000	7.77	111	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.96	75	10-145
13C12-PCB-77	8000	7.11	94	10-145
13C12-PCB-123	8000	7.40	82	10-145
13C12-PCB-118	8000	7.45	89	10-145
13C12-PCB-114	8000	7.62	84	10-145
13C12-PCB-105	8000	7.85	85	10-145
13C12-PCB-126	8000	8.36	81	10-145
13C12-PCB-167	8000	8.65	83	10-145
13C12-PCB-156	8000	9.00	83	10-145
13C12-PCB-157	8000	9.07	85	10-145
13C12-PCB-169	8000	9.62	82	10-145
13C12-PCB-189	8000	10.19	90	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.89	89	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0981
Mid Point PCB TEQ	1.67
Upper Bound PCB TEQ	3.22

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(16-20) BLANK #1**	Sampling Date	n/a		
ALS Sample ID	L2007004-4	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS020
Run Date	20-Oct-17 23:54
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<15	15	U
PCB-77	0.0001	7.13	21.6	17	M,J
PCB-123	0.00003	7.39	<41	41	M,U,1.
PCB-118	0.00003	7.48	180	3.4	M,J
PCB-114	0.00003	NotFnd	<4.3	4.3	U
PCB-105	0.00003	7.86	<69	4.3	M,J,R
PCB-126	0.1	NotFnd	<5.1	5.1	U
PCB-167	0.00003	8.65	<2.7	2.6	M,J,R
PCB-156	0.00003	9.02	<8.6	2.8	M,J,R
PCB-157	0.00003	NotFnd	<2.9	2.9	U
PCB-169	0.03	NotFnd	<3.3	3.3	U
PCB-189	0.00003	NotFnd	<1.1	1.1	U
Field Spikes	**pg**		**% Rec**	**Limits**	
13C12-PCB-95	8000	6.23	124	70-130	
13C12-PCB-153	8000	7.77	102	70-130	
Extraction Standards	**pg**		**% Rec**	**Limits**	
13C12-PCB-81	8000	6.96	77	10-145	
13C12-PCB-77	8000	7.11	79	10-145	
13C12-PCB-123	8000	7.40	79	10-145	R
13C12-PCB-118	8000	7.47	81	10-145	
13C12-PCB-114	8000	7.62	77	10-145	
13C12-PCB-105	8000	7.84	80	10-145	
13C12-PCB-126	8000	8.38	77	10-145	
13C12-PCB-167	8000	8.65	84	10-145	
13C12-PCB-156	8000	9.01	82	10-145	
13C12-PCB-157	8000	9.07	77	10-145	
13C12-PCB-169	8000	9.62	77	10-145	
13C12-PCB-189	8000	10.19	84	10-145	
Cleanup Standard	**pg**		**% Rec**	**Limits**	
13C12-PCB-111	10000	6.89	83	10-145	
Toxic Equivalency (WHO 2005)			**pg**		
Lower Bound PCB TEQ			0.00756		
Mid Point PCB TEQ			0.318		
Upper Bound PCB TEQ			0.625		

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET**	Sampling Date	n/a		
ALS Sample ID	L2007004-5	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS021
Run Date	20-Oct-17 00:12
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.98	10.3	6.6	M,J
PCB-77	0.0001	7.12	57.9	5.3	M,J
PCB-123	0.00003	7.40	<78	75	M,J,1.
PCB-118	0.00003	7.47	700	4.6	M
PCB-114	0.00003	7.63	33.9	5.3	J
PCB-105	0.00003	7.85	244	5.5	M,J
PCB-126	0.1	8.38	<20	6.1	M,J,R
PCB-167	0.00003	8.66	<6.9	6.9	M,U
PCB-156	0.00003	9.02	25.9	6.9	M,J
PCB-157	0.00003	NotFnd	<7.4	7.4	U
PCB-169	0.03	NotFnd	<8.0	8.0	U
PCB-189	0.00003	10.19	11.4	4.3	M,J

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.23	105	70-130
13C12-PCB-153	8000	7.76	109	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.96	76	10-145
13C12-PCB-77	8000	7.11	100	10-145
13C12-PCB-123	8000	7.41	96	10-145
13C12-PCB-118	8000	7.46	89	10-145
13C12-PCB-114	8000	7.61	92	10-145
13C12-PCB-105	8000	7.85	93	10-145
13C12-PCB-126	8000	8.37	92	10-145
13C12-PCB-167	8000	8.65	92	10-145
13C12-PCB-156	8000	9.00	95	10-145
13C12-PCB-157	8000	9.08	91	10-145
13C12-PCB-169	8000	9.61	94	10-145
13C12-PCB-189	8000	10.19	101	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.90	85	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0393
Mid Point PCB TEQ	2.16
Upper Bound PCB TEQ	2.28

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET**	Sampling Date	n/a		Approved:
ALS Sample ID	L2007004-6	Extraction Date	16-Oct-17		*A.Byrne*
Analysis Method	EPA 1668C	Sample Size	1	Stack	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		23-Oct-2017
Sample Matrix	Stack	Split Ratio	5		

Run Information	**Run 1**
Filename	1-171020BS022
Run Date	20-Oct-17 00:31
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags
PCB-81	0.0003	7.00	<11	3.3	M,J,R
PCB-77	0.0001	7.13	<72	2.6	M,J,R
PCB-123	0.00003	7.40	<210	210	M,U,1.
PCB-118	0.00003	7.47	1580	20	M
PCB-114	0.00003	7.64	56.6	22	M,J
PCB-105	0.00003	7.87	481	22	M
PCB-126	0.1	NotFnd	<27	27	U
PCB-167	0.00003	8.66	<9.0	5.1	M,J,R
PCB-156	0.00003	9.02	<46	5.9	M,J,R
PCB-157	0.00003	9.10	<13	5.9	M,J,R
PCB-169	0.03	NotFnd	<6.1	6.1	U
PCB-189	0.00003	10.21	8.46	8.3	M,J

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.23	86	70-130
13C12-PCB-153	8000	7.78	101	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.97	37	10-145
13C12-PCB-77	8000	7.12	56	10-145
13C12-PCB-123	8000	7.41	54	10-145
13C12-PCB-118	8000	7.46	61	10-145
13C12-PCB-114	8000	7.63	57	10-145
13C12-PCB-105	8000	7.85	57	10-145
13C12-PCB-126	8000	8.37	56	10-145
13C12-PCB-167	8000	8.66	62	10-145
13C12-PCB-156	8000	9.00	56	10-145
13C12-PCB-157	8000	9.08	58	10-145
13C12-PCB-169	8000	9.63	59	10-145
13C12-PCB-189	8000	10.19	64	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.90	60	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0638
Mid Point PCB TEQ	1.52
Upper Bound PCB TEQ	2.97

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET**	Sampling Date	n/a		
ALS Sample ID	L2007004-7	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS023
Run Date	20-Oct-17 00:49
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	6.98	<21	21	M,U
PCB-77	0.0001	7.12	55.0	20	J
PCB-123	0.00003	7.38	<150	11	M,J,1.
PCB-118	0.00003	7.46	1070	9.2	M
PCB-114	0.00003	7.62	<46	10	M,J,R
PCB-105	0.00003	7.85	409	11	M
PCB-126	0.1	NotFnd	<13	13	U
PCB-167	0.00003	8.66	<9.3	5.3	M,J,R
PCB-156	0.00003	9.00	42.0	5.6	M,J
PCB-157	0.00003	9.08	<12	5.7	M,J,R
PCB-169	0.03	NotFnd	<6.1	6.1	U
PCB-189	0.00003	10.19	<5.2	5.2	M,U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.23	124	70-130
13C12-PCB-153	8000	7.76	107	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.96	64	10-145
13C12-PCB-77	8000	7.11	77	10-145
13C12-PCB-123	8000	7.40	67	10-145
13C12-PCB-118	8000	7.46	79	10-145
13C12-PCB-114	8000	7.61	73	10-145
13C12-PCB-105	8000	7.84	72	10-145
13C12-PCB-126	8000	8.37	70	10-145
13C12-PCB-167	8000	8.65	75	10-145
13C12-PCB-156	8000	9.00	71	10-145
13C12-PCB-157	8000	9.07	76	10-145
13C12-PCB-169	8000	9.61	75	10-145
13C12-PCB-189	8000	10.18	80	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.89	76	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.0511
Mid Point PCB TEQ	0.802
Upper Bound PCB TEQ	1.55

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**17-21800-SVOC-(36-40) BLANK #2**	Sampling Date	n/a		
ALS Sample ID	L2007004-8	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Stack	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS012
Run Date	20-Oct-17 21:29
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<5.1	5.1	U
PCB-77	0.0001	7.12	<9.4	5.9	M,J,R
PCB-123	0.00003	7.40	<6.9	5.5	M,J,R,1.
PCB-118	0.00003	7.47	95.8	4.4	M,J
PCB-114	0.00003	NotFnd	<5.2	5.2	U
PCB-105	0.00003	7.85	<26	5.0	M,J,R
PCB-126	0.1	NotFnd	<6.0	6.0	U
PCB-167	0.00003	NotFnd	<3.0	3.0	U
PCB-156	0.00003	NotFnd	<3.2	3.2	U
PCB-157	0.00003	NotFnd	<3.3	3.3	U
PCB-169	0.03	NotFnd	<3.7	3.7	U
PCB-189	0.00003	NotFnd	<3.1	3.1	U

Field Spikes	**pg**		**% Rec**	**Limits**
13C12-PCB-95	8000	6.23	134	70-130
13C12-PCB-153	8000	7.77	107	70-130

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.97	70	10-145
13C12-PCB-77	8000	7.12	73	10-145
13C12-PCB-123	8000	7.41	69	10-145
13C12-PCB-118	8000	7.46	76	10-145
13C12-PCB-114	8000	7.62	72	10-145
13C12-PCB-105	8000	7.85	73	10-145
13C12-PCB-126	8000	8.37	70	10-145
13C12-PCB-167	8000	8.64	77	10-145
13C12-PCB-156	8000	9.00	72	10-145
13C12-PCB-157	8000	9.08	72	10-145
13C12-PCB-169	8000	9.62	72	10-145
13C12-PCB-189	8000	10.18	83	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.90	78	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.00287
Mid Point PCB TEQ	0.361
Upper Bound PCB TEQ	0.718

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
1.	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life sciences

Sample Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG2640104-1	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	XAD	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS009
Run Date	20-Oct-17 20:35
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<2.1	2.1	U
PCB-77	0.0001	NotFnd	<2.4	2.4	U
PCB-123	0.00003	NotFnd	<2.7	2.7	U
PCB-118	0.00003	7.47	2.73	2.0	M,J
PCB-114	0.00003	NotFnd	<2.4	2.4	U
PCB-105	0.00003	7.87	<2.6	2.6	M,J,R
PCB-126	0.1	NotFnd	<2.9	2.9	U
PCB-167	0.00003	NotFnd	<2.9	2.9	U
PCB-156	0.00003	NotFnd	<3.5	3.5	U
PCB-157	0.00003	NotFnd	<3.3	3.3	U
PCB-169	0.03	NotFnd	<3.7	3.7	U
PCB-189	0.00003	NotFnd	<0.63	0.63	U

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-95	0	NS	
13C12-PCB-153	0	NS	

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.96	90	10-145
13C12-PCB-77	8000	7.11	96	10-145
13C12-PCB-123	8000	7.40	77	10-145
13C12-PCB-118	8000	7.47	97	10-145
13C12-PCB-114	8000	7.62	86	10-145
13C12-PCB-105	8000	7.84	85	10-145
13C12-PCB-126	8000	8.38	86	10-145
13C12-PCB-167	8000	8.65	91	10-145
13C12-PCB-156	8000	9.01	83	10-145
13C12-PCB-157	8000	9.07	84	10-145
13C12-PCB-169	8000	9.62	84	10-145
13C12-PCB-189	8000	10.18	95	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.89	92	10-145

Toxic Equivalency (WHO 2005)	**pg**
	0.0000819
	0.201
	0.402

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this standard has not been added.

ALS Life sciences

Sample Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG2640104-4	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	Stack	*A.Byrne*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	Reagent	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS010
Run Date	20-Oct-17 20:53
Final Volume	25 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-1 D85MSUSP360147H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**
PCB-81	0.0003	NotFnd	<1.9	1.9	U
PCB-77	0.0001	NotFnd	<2.1	2.1	U
PCB-123	0.00003	NotFnd	<2.1	2.1	U
PCB-118	0.00003	7.47	<3.3	1.8	M,J,R
PCB-114	0.00003	NotFnd	<1.9	1.9	U
PCB-105	0.00003	NotFnd	<2.0	2.0	U
PCB-126	0.1	NotFnd	<2.4	2.4	U
PCB-167	0.00003	NotFnd	<1.2	1.2	U
PCB-156	0.00003	NotFnd	<1.3	1.3	U
PCB-157	0.00003	NotFnd	<1.4	1.4	U
PCB-169	0.03	NotFnd	<1.5	1.5	U
PCB-189	0.00003	NotFnd	<1.3	1.3	U

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-9S	0	NS	
13C12-PCB-153	0	NS	

Extraction Standards	**pg**		**% Rec**	**Limits**
13C12-PCB-81	8000	6.96	81	10-145
13C12-PCB-77	8000	7.11	86	10-145
13C12-PCB-123	8000	7.40	80	10-145
13C12-PCB-118	8000	7.46	90	10-145
13C12-PCB-114	8000	7.61	85	10-145
13C12-PCB-105	8000	7.84	82	10-145
13C12-PCB-126	8000	8.36	82	10-145
13C12-PCB-167	8000	8.65	89	10-145
13C12-PCB-156	8000	9.00	85	10-145
13C12-PCB-157	8000	9.07	85	10-145
13C12-PCB-169	8000	9.61	84	10-145
13C12-PCB-189	8000	10.18	93	10-145

Cleanup Standard	**pg**		**% Rec**	**Limits**
13C12-PCB-111	10000	6.89	82	10-145

Toxic Equivalency (WHO 2005)	**pg**
Lower Bound PCB TEQ	0.00
Mid Point PCB TEQ	0.143
Upper Bound PCB TEQ	0.286

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the DL.
J	indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this standard has not been added.

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Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		
ALS Sample ID	WG2640104-2	Extraction Date	16-Oct-17		Approved:
Analysis Method	EPA 1668C	Sample Size	1	n/a	*A.Byrne*
Analysis Type	LCS	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	5		23-Oct-2017

Run Information	**Run 1**
Filename	1-171020BS003
Run Date	20-Oct-17 18:46
Final Volume	25 uL
Dilution Factor	1
Analysis Units	% Rec
Instrument - Column	HRMS-1 DB5MSUSP360147H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
PCB-81	4000	6.97	101	60-135	
PCB-77	4000	7.12	101	60-135	
PCB-123	4000	7.41	94	60-135	R
PCB-118	4000	7.47	94	60-135	
PCB-114	4000	7.63	108	60-135	
PCB-105	4000	7.85	102	60-135	
PCB-126	4000	8.38	110	60-135	
PCB-167	4000	8.66	98	60-135	
PCB-156	4000	9.02	93	60-135	
PCB-157	4000	9.08	105	60-135	
PCB-169	4000	9.62	93	60-135	
PCB-189	4000	10.19	89	60-135	

Field Spikes	**pg**	**% Rec**	**Limits**
13C12-PCB-95	0	NS	
13C12-PCB-153	0	NS	

Extraction Standards	**pg**	**% Rec**	**Limits**
13C12-PCB-81	8000	6.97	71	40-145
13C12-PCB-77	8000	7.12	76	40-145
13C12-PCB-123	8000	7.41	78	40-145
13C12-PCB-118	8000	7.46	78	40-145
13C12-PCB-114	8000	7.63	74	40-145
13C12-PCB-105	8000	7.85	79	40-145
13C12-PCB-126	8000	8.37	78	40-145
13C12-PCB-167	8000	8.65	82	40-145
13C12-PCB-156	8000	9.00	77	40-145
13C12-PCB-157	8000	9.08	78	40-145
13C12-PCB-169	8000	9.61	79	40-145
13C12-PCB-189	8000	10.19	86	40-145

Cleanup Standard	**pg**	**% Rec**	**Limits**
13C12-PCB-111	10000	6.90	82	40-145

R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Indicates that this standard has not been added.

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2007004		Mississauga, ON L5J 2Y4
Date of Report	20-Oct-17		CANADA
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS: **CB by LRGC/MS - Isotope dilution**

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank (Reagent)		17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET		17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET		17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET		17-21800-SVOC-(16-20) BLANK #1	
ALS Sample ID	WG2640104-1		WG2640104-4		L2007004-1		L2007004-2		L2007004-3		L2007004-4	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	QC		QC		Stack		Stack		Stack		Stack	
Sampling Date	n/a		n/a		n/a		n/a		n/a		n/a	
Extraction Date	16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Chlorobenzene	<10	U	<10	U	993		832		1300		<10	U
1,3-Dichlorobenzene	<10	U	<10	U	187		158		219		<10	U
1,4-Dichlorobenzene	11.2		<10	U	97.4	B	81.6	B	95.3	B	22.3	B
1,2-Dichlorobenzene	<10	U	<10	U	105		88.2		126		<10	U
1,3,5-Trichlorobenzene	<10	U	<10	U	13.7	M	12.1	M	16.7	M	<10	U
1,2,4-Trichlorobenzene	<10	U	<10	U	43.7		40		42.4		<10	U
1,2,3-Trichlorobenzene	<10	U	<10	U	23.4		12.3		13.6		<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	10.3		<10	U
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Pentachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	NS		NS		111		114		121		122	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	69		61		55		57		58		51	
13C6-1,4-Dichlorobenzene	81		73		74		75		81		60	
13C6-1,2,3-Trichlorobenzene	73		63		66		69		71		59	
13C6-1,2,3,4-Tetrachlorobenzene	69		59		63		67		67		58	
13C6-Pentachlorobenzene	84		71		74		84		81		73	
13C6-Hexachlorobenzene	87		72		76		89		84		79	

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
NS	Indicates that this compound was not spiked.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET		17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET		17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET		17-21800-SVOC-(36-40) BLANK #2		Laboratory Control Sample	
ALS Sample ID	L2007004-5		L2007004-6		L2007004-7		L2007004-8		WG2640104-2	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		%	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	Stack		Stack		Stack		Stack		QC	
Sampling Date	n/a		n/a		n/a		n/a		n/a	
Extraction Date	16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
Chlorobenzene	1310		731		2190		<10	U	NS	
1,3-Dichlorobenzene	213		171		301		<10	U	128	M
1,4-Dichlorobenzene	106	B	89.6	B	122		19.9	B	90	
1,2-Dichlorobenzene	123		97.6		176		<10	U	107	
1,3,5-Trichlorobenzene	15.2	M	12.9	M	21.8		<10	U	97	
1,2,4-Trichlorobenzene	45.8		42.8		59.2		<10	U	97	
1,2,3-Trichlorobenzene	19.3		11.7	M	33.4	M	<10	U	95	
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<10	U	<10	U	10.2		<10	U	111	
1,2,3,4-Tetrachlorobenzene	<10	U	<10	U	<10	U	<10	U	114	
Pentachlorobenzene	<10	U	<10	U	<10	U	<10	U	115	
Hexachlorobenzene	<10	U	<10	U	<10	U	<10	U	113	
Field Sampling Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene	114		121		115		114		NS	
Extraction Standards	**%Rec**		**%Rec**		**%Rec**		**%Rec**		**%Rec**	
13C6-Chlorobenzene	55		93		57		51		71	
13C6-1,4-Dichlorobenzene	73		75		83		72		89	
13C6-1,2,3-Trichlorobenzene	64		66		73		67		96	
13C6-1,2,3,4-Tetrachlorobenzene	60		62		68		64		75	
13C6-Pentachlorobenzene	73		78		83		79		91	
13C6-Hexachlorobenzene	78		83		88		83		93	

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
NS	Indicates that this compound was not spiked.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2640104-1	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101936.D
Run Date	10/20/2017 6:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	7.16	11.2	
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	9.09	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene			NS

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.94	69
13C6-1,4-Dichlorobenzene	200	7.16	81
13C6-1,2,3-Trichlorobenzene	200	9.49	73
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	69
13C6-Pentachlorobenzene	200	12.52	84
13C6-Hexachlorobenzene	200	14.14	87

M Indicates that a peak has been manually integrated.
U Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank (Reagent)**	Sampling Date	n/a
ALS Sample ID	WG2640104-4	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101937.D
Run Date	10/20/2017 7:18
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	7.16	<10	U
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	9.09	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene			NS

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.92	61
13C6-1,4-Dichlorobenzene	200	7.16	73
13C6-1,2,3-Trichlorobenzene	200	9.49	63
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	59
13C6-Pentachlorobenzene	200	12.52	71
13C6-Hexachlorobenzene	200	14.15	72

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-1	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101940.D
Run Date	10/20/2017 8:27
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.97	993	
1,3-Dichlorobenzene	7.12	187	
1,4-Dichlorobenzene	7.19	97.4	B
1,2-Dichlorobenzene	7.47	105	
1,3,5-Trichlorobenzene	8.59	13.7	M
1,2,4-Trichlorobenzene	9.10	43.7	
1,2,3-Trichlorobenzene	9.49	23.4	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.69	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	12.52	<10	U
Hexachlorobenzene	14.15	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.50	111

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.97	55
13C6-1,4-Dichlorobenzene	200	7.19	74
13C6-1,2,3-Trichlorobenzene	200	9.49	66
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	63
13C6-Pentachlorobenzene	200	12.52	74
13C6-Hexachlorobenzene	200	14.14	76

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-2	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101941.D
Run Date	10/20/2017 8:50
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.98	832	
1,3-Dichlorobenzene	7.12	158	
1,4-Dichlorobenzene	7.19	81.6	B
1,2-Dichlorobenzene	7.47	88.2	
1,3,5-Trichlorobenzene	8.59	12.1 M	
1,2,4-Trichlorobenzene	9.10	40	
1,2,3-Trichlorobenzene	9.49	12.3	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.69	<10	U
1,2,3,4-Tetrachlorobenzene	11.19	<10	U
Pentachlorobenzene	12.52	<10	U
Hexachlorobenzene	14.15	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.49	114

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.98	57
13C6-1,4-Dichlorobenzene	200	7.19	75
13C6-1,2,3-Trichlorobenzene	200	9.49	69
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	67
13C6-Pentachlorobenzene	200	12.52	84
13C6-Hexachlorobenzene	200	14.14	89

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-3	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101942.D
Run Date	10/20/2017 9:14
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	5.00	1300	
1,3-Dichlorobenzene	7.12	219	
1,4-Dichlorobenzene	7.19	95.3	B
1,2-Dichlorobenzene	7.47	126	
1,3,5-Trichlorobenzene	8.59	16.7	M
1,2,4-Trichlorobenzene	9.10	42.4	
1,2,3-Trichlorobenzene	9.50	13.6	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.69	10.3	
1,2,3,4-Tetrachlorobenzene	11.19	<10	U
Pentachlorobenzene	12.52	<10	U
Hexachlorobenzene	14.14	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.50	121

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	5.00	58
13C6-1,4-Dichlorobenzene	200	7.19	81
13C6-1,2,3-Trichlorobenzene	200	9.49	71
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	67
13C6-Pentachlorobenzene	200	12.52	81
13C6-Hexachlorobenzene	200	14.14	84

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(16-20) BLANK #1**	Sampling Date	n/a
ALS Sample ID	L2007004-4	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101938.D
Run Date	10/20/2017 7:41
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	7.20	22.3	B
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	9.10	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.50	122

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	5.00	51
13C6-1,4-Dichlorobenzene	200	7.20	60
13C6-1,2,3-Trichlorobenzene	200	9.49	59
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	58
13C6-Pentachlorobenzene	200	12.52	73
13C6-Hexachlorobenzene	200	14.14	79

U Indicates that this compound was not detected above the MDL.

B Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-5	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101943.D
Run Date	10/20/2017 9:37
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.91	1310	
1,3-Dichlorobenzene	7.10	213	
1,4-Dichlorobenzene	7.18	106	B
1,2-Dichlorobenzene	7.46	123	
1,3,5-Trichlorobenzene	8.59	15.2	M
1,2,4-Trichlorobenzene	9.09	45.8	
1,2,3-Trichlorobenzene	9.49	19.3	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.69	<10	U
1,2,3,4-Tetrachlorobenzene	11.19	<10	U
Pentachlorobenzene	12.52	<10	U
Hexachlorobenzene	14.14	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.49	114

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.91	55
13C6-1,4-Dichlorobenzene	200	7.17	73
13C6-1,2,3-Trichlorobenzene	200	9.49	64
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	60
13C6-Pentachlorobenzene	200	12.52	73
13C6-Hexachlorobenzene	200	14.14	78

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-6	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101944.D
Run Date	10/20/2017 10:00
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	4.95	731	
1,3-Dichlorobenzene	7.12	171	
1,4-Dichlorobenzene	7.19	89.6	B
1,2-Dichlorobenzene	7.46	97.6	
1,3,5-Trichlorobenzene	8.59	12.9 M	
1,2,4-Trichlorobenzene	9.10	42.8	
1,2,3-Trichlorobenzene	9.49	11.7 M	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.70	<10	U
1,2,3,4-Tetrachlorobenzene	11.19	<10	U
Pentachlorobenzene	12.52	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.50	121

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.95	93 M
13C6-1,4-Dichlorobenzene	200	7.19	75
13C6-1,2,3-Trichlorobenzene	200	9.49	66
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	62
13C6-Pentachlorobenzene	200	12.52	78
13C6-Hexachlorobenzene	200	14.14	83

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-7	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101945.D
Run Date	10/20/2017 10:23
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	5.04	2190	
1,3-Dichlorobenzene	7.14	301	
1,4-Dichlorobenzene	7.21	122	
1,2-Dichlorobenzene	7.48	176	
1,3,5-Trichlorobenzene	8.59	21.8	
1,2,4-Trichlorobenzene	9.10	59.2	
1,2,3-Trichlorobenzene	9.50	33.4	M
1,2,3,5/1,2,4,5-Tetrachlorobenzen	10.69	10.2	
1,2,3,4-Tetrachlorobenzene	11.19	<10	U
Pentachlorobenzene	12.52	<10	U
Hexachlorobenzene	14.14	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.50	115

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	5.04	57
13C6-1,4-Dichlorobenzene	200	7.21	83
13C6-1,2,3-Trichlorobenzene	200	9.49	73
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	68
13C6-Pentachlorobenzene	200	12.52	83
13C6-Hexachlorobenzene	200	14.14	88

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(36-40) BLANK #2**	Sampling Date	n/a
ALS Sample ID	L2007004-8	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101939.D
Run Date	10/20/2017 8:04
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Chlorobenzene	NotFnd	<10	U
1,3-Dichlorobenzene	NotFnd	<10	U
1,4-Dichlorobenzene	7.20	19.9	B
1,2-Dichlorobenzene	NotFnd	<10	U
1,3,5-Trichlorobenzene	NotFnd	<10	U
1,2,4-Trichlorobenzene	NotFnd	<10	U
1,2,3-Trichlorobenzene	NotFnd	<10	U
1,2,3,5/1,2,4,5-Tetrachlorobenzen	NotFnd	<10	U
1,2,3,4-Tetrachlorobenzene	NotFnd	<10	U
Pentachlorobenzene	NotFnd	<10	U
Hexachlorobenzene	NotFnd	<10	U

Field Sampling Standards	**ng spiked**		**%Rec**
1-Bromo-2,3-Dichlorobenzene	400	10.49	114

Extraction Standards			**%Rec**
13C6-Chlorobenzene	200	4.98	51
13C6-1,4-Dichlorobenzene	200	7.20	72
13C6-1,2,3-Trichlorobenzene	200	9.49	67
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	64
13C6-Pentachlorobenzene	200	12.52	79
13C6-Hexachlorobenzene	200	14.14	83

U Indicates that this compound was not detected above the MDL.

B Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2640104-2	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 %		
Percent Moisture	n/a		
Split Ratio	5		

Approved:
Andrew Reid
--e-signature--
20-Oct-2017

Run Information	**Run 1**
Filename	17101934.D
Run Date	10/20/2017 6:09
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
Chlorobenzene			NS	
1,3-Dichlorobenzene	200	7.13	128	M
1,4-Dichlorobenzene	200	7.20	90	
1,2-Dichlorobenzene	200	7.48	107	
1,3,5-Trichlorobenzene	200	8.59	97	
1,2,4-Trichlorobenzene	200	9.10	97	
1,2,3-Trichlorobenzene	200	9.49	95	
1,2,3,5/1,2,4,5-Tetrachlorobenzen	400	10.70	111	
1,2,3,4-Tetrachlorobenzene	200	11.19	114	
Pentachlorobenzene	200	12.52	115	
Hexachlorobenzene	200	14.14	113	
Field Sampling Standards	**ng spiked**		**%Rec**	
1-Bromo-2,3-Dichlorobenzene			NS	
Extraction Standards			**%Rec**	
13C6-Chlorobenzene	200	4.98	71	
13C6-1,4-Dichlorobenzene	200	7.20	89	
13C6-1,2,3-Trichlorobenzene	200	9.49	96	
13C6-1,2,3,4-Tetrachlorobenzene	200	11.19	75	
13C6-Pentachlorobenzene	200	12.52	91	
13C6-Hexachlorobenzene	200	14.14	93	

M	Indicates that a peak has been manually integrated.
NS	Indicates that this compound was not spiked.

ALS Environmental

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2007004		Mississauga, ON L5J 2Y4
Date of Report	24-Oct-17		CANADA
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 Covanta

COMMENTS: **Chlorophenols as acetate derivatives by SIM GC/MS**

Both samples L2007004-4 (Field Blank) and -7 (Unit #2 Test #3) showed an absence of field spike recoveries.
There is no other evidence that these traps were not spiked prior to sampling. This does represent a source of some concern with respect to the validity of the data for these two samples. It is worthy of note that despite the absence of field standard recoveries, there is reasonable recovery of the extraction standards both for the chlorophenol analyses and for other SVOCs. Therefore there is no evidence for any compromise in the laboratory post sampling processing of these samples.
Nor has there been evidence for field spike recovery losses on the other SVOC analyses on these train samples.

Certified by:

Ron McLeod, PhD
Director, Air Toxics and Special Chemistries

ALS Environmental

Sample Analysis Summary Report

Sample Name	Media Blank	Method Blank	17-21800-SVOC-(15) TEST#1 #1 APC OUTLET	17-21800-SVOC-(610) TEST#2 #1 APC OUTLET	17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET	17-21800-SVOC-(16-20) BLANK #1
ALS Sample ID	WG2640104-1	WG2640104-4	L2007004-1	L2007004-2	L2007004-3	L2007004-4
Sample Size	1	1	1	1	1	1
Sample units	sample	sample	sample	sample	sample	sample
Moisture Content	n/a	n/a	n/a	n/a	n/a	n/a
Matrix	QC	QC	Stack	Stack	Stack	Stack
Sampling Date	n/a	n/a	n/a	n/a	n/a	n/a
Extraction Date	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17	16-Oct-17
Target Analytes	**ng/sample**	**ng/sample**	**ng/sample**	**ng/sample**	**ng/sample**	**ng/sample**
2-Chlorophenol	<50 U	<50 U	108 M	94.9 M	119 ,R	<50 U
3-Chlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
4-Chlorophenol	<50 U	<50 U	59.4	63.5	74.4	<50 U
2,6-Dichlorophenol	60.2 ,R	<50 U	57.9 M,R	51.2 ,R	<50 U	<50 U
2,4/2,5-Dichlorophenol	72 M,R	<50 U	59.9 M	<50 U	<50 U	<50 U
3,5-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,3-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
3,4-Dichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,4,6-Trichlorophenol	<50 U	<50 U	76.9	73.8	100	<50 U
2,3,6-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,5-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,4,5-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,4-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
3,4,5-Trichlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
2,3,4,5-Tetrachlorophenol	<50 U	<50 U	<50 U	<50 U	<50 U	<50 U
Pentachlorophenol	53.2 M	<50 U	<50 U	<50 U	<50 U	<50 U
Extraction Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
2-Fluorophenol	59 M	59 M	58	52	80	30 M
d5-Phenol	88 M	79 M	69 M,R	57 M,R	83 ,R	37 M
d4-2-Chlorophenol	81 M	75	87	79	116	39 M
2,4,6-Tribromophenol	53 M	71	85	76	100	40
13C-Pentachlorophenol	89 M	142	130	105	112	110
Field Spike	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	NS	NS	64	45	68	NR

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
NS	Not Spiked
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NR	Not Recovered

ALS Environmental

Sample Analysis Summary Report

Sample Name	17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET		17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET		17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET		17-21800-SVOC-(36-40) BLANK #2		Laboratory Control Sample	
ALS Sample ID	L2007004-5		L2007004-6		L2007004-7		L2007004-8		WG2640104-2	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		%	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	Stack		Stack		Stack		Stack		QC	
Sampling Date	n/a		n/a		n/a		n/a		n/a	
Extraction Date	16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**% Recovery**	
2-Chlorophenol	94.9	M	98.4	M	127	M	73.8	M	48	,R
3-Chlorophenol	<50	U	<50	U	<50	U	<50	U	81	
4-Chlorophenol	<50	U	57.1	M,R	52		<50	U	67	
2,6-Dichlorophenol	<50	U	60.7	,R	54.5	,R	53.2	M,R	21	M,R
2,4/2,5-Dichlorophenol	<50	U	<50	U	<50	U	<50	U	50	
3,5-Dichlorophenol	<50	U	<50	U	<50	U	52.4	M	78	
2,3-Dichlorophenol	<50	U	<50	U	<50	U	<50	U	107	
3,4-Dichlorophenol	<50	U	<50	U	<50	U	<50	U	78	
2,4,6-Trichlorophenol	66.8		74.2		<50	U	<50	U	21	
2,3,6-Trichlorophenol	<50	U	<50	U	<50	U	<50	U	58	
2,3,5-Trichlorophenol	<50	U	<50	U	<50	U	<50	U	50	M
2,4,5-Trichlorophenol	<50	U	<50	U	<50	U	<50	U	66	
2,3,4-Trichlorophenol	<50	U	<50	U	<50	U	<50	U	56	
3,4,5-Trichlorophenol	<50	U	<50	U	<50	U	<50	U	69	
2,3,5,6/2,3,4,6-Tetrachlorophenol	<50	U	<50	U	<50	U	<50	U	112	M
2,3,4,5-Tetrachlorophenol	<50	U	<50	U	<50	U	<50	U	87	
Pentachlorophenol	<50	U	<50	U	<50	U	<50	U	125	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2-Fluorophenol	51	M	48	M	30		51	M	26	M
d5-Phenol	61	M	52	M,R	45	M	64	,R	64	M
d4-2-Chlorophenol	80		84		67		85		80	,R
2,4,6-Tribromophenol	90		97		19	M	72		44	
13C-Pentachlorophenol	103		111		77		129		123	
Field Spike	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	69		67		NR		35		NS	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.
NS	Not Spiked
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NR	Not Recovered

ALS Environmental

Laboratory Method Blank Analysis Report

Sample Name	**Media Blank**	Sampling Date	n/a
ALS Sample ID	WG2640104-1	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
--e-signature--
24-Oct-2017

Run Information	**Run 1**
Filename	17102315.D
Run Date	10/23/2017 18:29
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	NotFnd	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	NotFnd	<50	U
2,6-Dichlorophenol	9.56	60.2	,R
2,4/2,5-Dichlorophenol	9.56	72 M	,R
3,5-Dichlorophenol	9.86	<50	U
2,3-Dichlorophenol	10.08	<50	U
3,4-Dichlorophenol	10.33	<50	U
2,4,6-Trichlorophenol	10.66	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.28	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	13.79	53.2 M	

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.50	59 M	
d5-Phenol	800	6.61	88 M	
d4-2-Chlorophenol	800	8.21	81 M	
2,4,6-Tribromophenol	800	13.13	53 M	
13C-Pentachlorophenol	800	13.78	89 M	

Field Spike			**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	800	NotFnd	NS	

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
NS	Not Spiked
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2640104-4	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
--e-signature--
24-Oct-2017

Run Information	**Run 1**
Filename	17102316.D
Run Date	10/23/2017 18:54
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	NotFnd	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	NotFnd	<50	U
2,6-Dichlorophenol	NotFnd	<50	U
2,4/2,5-Dichlorophenol	NotFnd	<50	U
3,5-Dichlorophenol	NotFnd	<50	U
2,3-Dichlorophenol	NotFnd	<50	U
3,4-Dichlorophenol	10.33	<50	U
2,4,6-Trichlorophenol	NotFnd	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	11.65	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	NotFnd	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.49	59	M
d5-Phenol	800	6.60	79	M
d4-2-Chlorophenol	800	8.20	75	
2,4,6-Tribromophenol	800	13.13	71	
13C-Pentachlorophenol	800	13.78	142	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	NotFnd	NS

	M	Indicates that a peak has been manually integrated.
	U	Indicates that this compound was not detected above the LOR.
NS	NS	Not Spiked
	B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-1	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
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24-Oct-2017

Run Information	**Run 1**
Filename	17102318.D
Run Date	10/23/2017 19:44
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.23	108	M
3-Chlorophenol	8.50	<50	U
4-Chlorophenol	8.57	59.4	
2,6-Dichlorophenol	9.57	57.9	M ,R
2,4/2,5-Dichlorophenol	9.74	59.9	M
3,5-Dichlorophenol	9.86	<50	U
2,3-Dichlorophenol	10.07	<50	U
3,4-Dichlorophenol	10.26	<50	U
2,4,6-Trichlorophenol	10.67	76.9	
2,3,6-Trichlorophenol	11.09	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	11.21	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	11.70	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.32	<50	U
2,3,4,5-Tetrachlorophenol	12.81	<50	U
Pentachlorophenol	13.79	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.51	58	
d5-Phenol	800	6.62	69	M ,R
d4-2-Chlorophenol	800	8.21	87	
2,4,6-Tribromophenol	800	13.13	85	
13C-Pentachlorophenol	800	13.79	130	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.85	64

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-2	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
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24-Oct-2017

Run Information	**Run 1**
Filename	17102319.D
Run Date	10/23/2017 20:09
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.23	94.9	M
3-Chlorophenol	8.50	<50	U
4-Chlorophenol	8.57	63.5	
2,6-Dichlorophenol	9.57	51.2	,R
2,4/2,5-Dichlorophenol	9.74	<50	U
3,5-Dichlorophenol	9.85	<50	U
2,3-Dichlorophenol	10.06	<50	U
3,4-Dichlorophenol	10.34	<50	U
2,4,6-Trichlorophenol	10.67	73.8	
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	13.79	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.51	52	
d5-Phenol	800	6.62	57	M ,R
d4-2-Chlorophenol	800	8.21	79	
2,4,6-Tribromophenol	800	13.13	76	
13C-Pentachlorophenol	800	13.79	105	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.84	45

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-3	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
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24-Oct-2017

Run Information	**Run 1**
Filename	17102320.D
Run Date	10/23/2017 20:35
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.24	119	,R
3-Chlorophenol	8.51	<50	U
4-Chlorophenol	8.58	74.4	
2,6-Dichlorophenol	9.54	<50	U
2,4/2,5-Dichlorophenol	9.74	<50	U
3,5-Dichlorophenol	9.86	<50	U
2,3-Dichlorophenol	10.07	<50	U
3,4-Dichlorophenol	10.30	<50	U
2,4,6-Trichlorophenol	10.67	100	
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.32	<50	U
2,3,4,5-Tetrachlorophenol	12.81	<50	U
Pentachlorophenol	13.79	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.58	80	
d5-Phenol	800	6.68	83	,R
d4-2-Chlorophenol	800	8.23	116	
2,4,6-Tribromophenol	800	13.13	100	
13C-Pentachlorophenol	800	13.79	112	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.85	68

U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(16-20) BLANK #1**	Sampling Date	n/a
ALS Sample ID	L2007004-4	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
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24-Oct-2017

Run Information	**Run 1**
Filename	17102321.D
Run Date	10/23/2017 21:00
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.24	<50	U
3-Chlorophenol	NotFnd	<50	U
4-Chlorophenol	8.55	<50	U
2,6-Dichlorophenol	9.57	<50	U
2,4/2,5-Dichlorophenol	9.73	<50	U
3,5-Dichlorophenol	9.86	<50	U
2,3-Dichlorophenol	10.07	<50	U
3,4-Dichlorophenol	10.32	<50	U
2,4,6-Trichlorophenol	10.66	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	11.57	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	NotFnd	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.51	30	M
d5-Phenol	800	6.62	37	M
d4-2-Chlorophenol	800	8.21	39	M
2,4,6-Tribromophenol	800	13.13	40	
13C-Pentachlorophenol	800	13.78	110	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.84	NR

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR. Not Recovered
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
NR	Not Recovered

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-5	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
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24-Oct-2017

Run Information	**Run 1**
Filename	17102322.D
Run Date	10/23/2017 21:25
Final Volume	1 mL
Dilution Factor	1
Analysis Units	n/a
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.23	94.9	M
3-Chlorophenol	8.50	<50	U
4-Chlorophenol	8.57	<50	U
2,6-Dichlorophenol	9.56	<50	U
2,4/2,5-Dichlorophenol	9.74	<50	U
3,5-Dichlorophenol	9.85	<50	U
2,3-Dichlorophenol	10.06	<50	U
3,4-Dichlorophenol	10.34	<50	U
2,4,6-Trichlorophenol	10.67	66.8	
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.32	<50	U
2,3,4,5-Tetrachlorophenol	12.72	<50	U
Pentachlorophenol	13.79	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.49	51	M
d5-Phenol	800	6.60	61	M
d4-2-Chlorophenol	800	8.21	80	
2,4,6-Tribromophenol	800	13.13	90	
13C-Pentachlorophenol	800	13.79	103	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.84	69

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-6	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
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24-Oct-2017

Run Information	**Run 1**
Filename	17102323.D
Run Date	10/23/2017 21:50
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.23	98.4	M
3-Chlorophenol	8.50	<50	U
4-Chlorophenol	8.57	57.1	M ,R
2,6-Dichlorophenol	9.57	60.7	,R
2,4/2,5-Dichlorophenol	9.74	<50	U
3,5-Dichlorophenol	9.85	<50	U
2,3-Dichlorophenol	NotFnd	<50	U
3,4-Dichlorophenol	NotFnd	<50	U
2,4,6-Trichlorophenol	10.67	74.2	
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	NotFnd	<50	U
3,4,5-Trichlorophenol	11.70	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.32	<50	U
2,3,4,5-Tetrachlorophenol	12.81	<50	U
Pentachlorophenol	13.79	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.50	48	M
d5-Phenol	800	6.61	52	M ,R
d4-2-Chlorophenol	800	8.21	84	
2,4,6-Tribromophenol	800	13.13	97	
13C-Pentachlorophenol	800	13.79	111	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.85	67

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-7	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
--e-signature--
24-Oct-2017

Run Information	**Run 1**
Filename	17102324.D
Run Date	10/23/2017 22:15
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.23	127	M
3-Chlorophenol	8.50	<50	U
4-Chlorophenol	8.57	52	
2,6-Dichlorophenol	9.57	54.5	,R
2,4/2,5-Dichlorophenol	9.74	<50	U
3,5-Dichlorophenol	9.86	<50	U
2,3-Dichlorophenol	10.06	<50	U
3,4-Dichlorophenol	NotFnd	<50	U
2,4,6-Trichlorophenol	10.67	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	11.61	<50	U
3,4,5-Trichlorophenol	11.70	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	12.32	<50	U
2,3,4,5-Tetrachlorophenol	12.81	<50	U
Pentachlorophenol	13.78	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.51	30	
d5-Phenol	800	6.62	45	M
d4-2-Chlorophenol	800	8.21	67	
2,4,6-Tribromophenol	800	13.13	19	M
13C-Pentachlorophenol	800	13.79	77	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	NotFnd	NR

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NR	Not Recovered

ALS Environmental

Sample Analysis Report

Sample Name	**17-21800-SVOC-(36-40) BLANK #2**	Sampling Date	n/a
ALS Sample ID	L2007004-8	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
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24-Oct-2017

Run Information	**Run 1**
Filename	17102317.D
Run Date	10/23/2017 19:19
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
2-Chlorophenol	8.24	73.8	M
3-Chlorophenol	8.55	<50	U
4-Chlorophenol	8.55	<50	U
2,6-Dichlorophenol	9.57	53.2	M ,R
2,4/2,5-Dichlorophenol	9.73	<50	U
3,5-Dichlorophenol	9.86	52.4	M
2,3-Dichlorophenol	10.07	<50	U
3,4-Dichlorophenol	NotFnd	<50	U
2,4,6-Trichlorophenol	10.67	<50	U
2,3,6-Trichlorophenol	NotFnd	<50	U
2,3,5-Trichlorophenol	NotFnd	<50	U
2,4,5-Trichlorophenol	NotFnd	<50	U
2,3,4-Trichlorophenol	11.57	<50	U
3,4,5-Trichlorophenol	NotFnd	<50	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	NotFnd	<50	U
2,3,4,5-Tetrachlorophenol	NotFnd	<50	U
Pentachlorophenol	NotFnd	<50	U

Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.50	51	M
d5-Phenol	800	6.61	64	,R
d4-2-Chlorophenol	800	8.21	85	
2,4,6-Tribromophenol	800	13.13	72	
13C-Pentachlorophenol	800	13.79	129	

Field Spike			**% Rec**
2,6-Dichloro-4-Fluorophenol(FS)	800	8.85	35

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the LOR.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Not Spiked

ALS Environmental

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a
ALS Sample ID	WG2640104-2	Extraction Date	16-Oct-17
Analysis Method	SIM GC/MS		
Analysis Type	LCS		
Sample Matrix	QC		
Sample Size	1 %		
L2007004	n/a		
Split Ratio	5		

Approved:
Yuliya Sharun
--e-signature--
24-Oct-2017

Run Information	**Run 1**
Filename	17102312.D
Run Date	10/23/2017 17:15
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-4
Column	HP-5MS USP190366H

Target Analytes	**ug spiked**	**Ret. Time**	**% Recovery**	**Flags**
2-Chlorophenol	800	8.23	48	,R
3-Chlorophenol	800	8.50	81	
4-Chlorophenol	800	8.57	67	
2,6-Dichlorophenol	800	9.54	21 M	,R
2,4/2,5-Dichlorophenol	1600	9.74	50	
3,5-Dichlorophenol	800	9.86	78	
2,3-Dichlorophenol	800	10.06	107	
3,4-Dichlorophenol	800	10.30	78	
2,4,6-Trichlorophenol	800	10.67	21	
2,3,6-Trichlorophenol	800	11.09	58	
2,3,5-Trichlorophenol	800	11.15	50 M	
2,4,5-Trichlorophenol	800	11.21	66	
2,3,4-Trichlorophenol	800	11.61	56	
3,4,5-Trichlorophenol	800	11.72	69	
2,3,5,6/2,3,4,6-Tetrachlorophenol	1600	12.32	112 M	
2,3,4,5-Tetrachlorophenol	800	12.81	87	
Pentachlorophenol	800	13.79	125	
Extraction Standards			**% Rec**	
2-Fluorophenol	800	6.51	26 M	
d5-Phenol	800	6.62	64 M	
d4-2-Chlorophenol	800	8.21	80	,R
2,4,6-Tribromophenol	800	13.13	44	
13C-Pentachlorophenol	800	13.78	123	
Field Spike			**% Rec**	
2,6-Dichloro-4-Fluorophenol(FS)	800	NotFnd	NS	

M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
NS	Not Spiked

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2007004		Mississauga, ON L5J 2Y4
Date of Report	23-Oct-17		CANADA
Date of Sample Receipt	13-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 COVANTA

COMMENTS: **PAH by CARB method 429 (LR option)- Isotope dilution**

There were levels of naphthalene and tetralin detected in the the method blank, likely due to contribution from the sampling medium. Sample results may be elevated, as indicated.

There is a contribution of approximately 160ng of 1-methylnaphthylene to all samples and lab QC that appears to originate in a labelled standard spiking solution for one of the other tests. All results are elevated by approximately 160ng for this target.

Certified by: Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		Method Blank (Reagent)		17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET		17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET		17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET		17-21800-SVOC-(16-20) BLANK #1	
ALS Sample ID	WG2640104-1		WG2640104-4		L2007004-1		L2007004-2		L2007004-3		L2007004-4	
Sample Size	1		1		1		1		1		1	
Sample units	sample		sample		sample		sample		sample		sample	
Moisture Content	n/a		n/a		n/a		n/a		n/a		n/a	
Matrix	QC		QC		Stack		Stack		Stack		Stack	
Sampling Date	n/a		n/a		n/a		n/a		n/a		n/a	
Extraction Date	16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**	
Naphthalene	49.3		<10	U	149	B	141	M,B	140	B	70.0	B
2-Methylnaphthalene	<10	U	<10	U	32.7		30.3		37.4		10.8	
1-Methylnaphthalene	158		172		171	B	165	B	168	B	160	B
Acenaphthylene	<10	U	<10	U	<10	U	<10	U	11.2		<10	U
Acenaphthene	<10	U	<10	U	13.0		<10	U	20.2	M	<10	U
Fluorene	<10	U	<10	U	15.5		41.4		22.8		14.3	M
Phenanthrene	<10	U	<10	U	114		193		150		22.8	
Anthracene	<10	U	<10	U	22.2	M	22.5	M	26.2		<10	U
Fluoranthene	<10	U	<10	U	49.1		53.6	M	103		11.0	M
Pyrene	<10	U	<10	U	81.8		56.6		202		12.6	M
Benzo(a)Anthracene	<10	U	<10	U	<10	U	<10	U	10.2		<10	U
Chrysene/Triphenylene/Benzo(b)anthracene	<10	U	<10	U	<10	U	<15.5	R	<17.9	R	<10	U
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(k/j)Fluoranthene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(e)Pyrene	<10	U	<10	U	37.6	M	18.1	M	123		<10	U
Benzo(a)Pyrene	<10	U	<10	U	<10	U	<10	U	23.2	M	<10	U
Perylene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Indeno(1,2,3-cd)Pyrene	<10	U	<10	U	31.8	M	20.6	M	39.9		<10	U
Dibenzo(a,c/a,h)Anthracene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(g,h,i)Perylene	<10	U	<10	U	166	M	85.8	M	234	M	43.2	M
Additional Analytes												
Tetralin	416	R	<10	U	286	M,B	280	M,B	283	M,B	121	M,B
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Biphenyl	<10	U	<10	U	31.0	M	23.9	M	45.0	M	<10	U
o-Terphenyl	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
1-Methylphenanthrene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
9-Methylphenanthrene	<10	U	<10	U	11.1		13.9		15.1		<10	U
2-methylanthracene	<10	U	<10	U	16.9		23.3		27.0		<10	U
9,10-dimethylanthracene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
m-terphenyl	<10	U	<10	U	<10	U	<10	U	10.6	M	<10	U
p-terphenyl	<10	U	<10	U	<10	U	<10	U	19.3	M	<10	U
Benzo(a)fluorene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
Benzo(b)fluorene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
7,12-Dimethylbenzo(a)anthracene	<10	U	<10	U	<10	U	<10	U	<10	U	<10	U
3-Methylcholanthrene	<50	U	<50	U	<50	U	<50	U	<50	U	<50	U
Picene	<50	U	<50	U	<50	U	<50	U	<50	U	<50	U
Dibenzo(a,e)pyrene	<50	U	<50	U	<50	U	<50	U	<50	U	<50	U
Coronene	<50	U	<50	U	<50	U	<50	U	<50	U	<50	U
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	NS		NS		74.2		72.5		68.1		76.5	
Fluorene D10	NS		NS		64		74.7		71.5		78.4	
Terphenyl D14(Surr.)	NS		NS		85		80.1		88.4		84.5	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	89.7		77.7		77.4		83.6		86.5		71.8	
2-Methylnaphthalene-D10	100.2		82.2		85.9		96.2		97.9		84.4	
Acenaphthylene D8	90.8		71.1		88.8		93.4		101.4		69.2	
Phenanthrene D10	103.6		90.3		98.6		102.9		90.1		98.8	
Anthracene-D10	87.5		83.2		85.8		98.3		83.7		53.2	
Fluoranthene D10	103.0		92.3		86.3		101.3		95.6		93.0	
Benz(a)Anthracene-D12	98.5		74.3		96.4		103.3		114.4		82.1	
Chrysene D12	78.5		72.4		66.2		66.8		76.6		60.6	M
Benzo(b)Fluoranthene-D12	103.1		85.4		95.8		115.2		109.7		97.9	
Benzo(k)Fluoranthene-D12	87.1		79.9		77.8		89.3		80.6		84.4	
Benzo(a)Pyrene D12	85.3		76.8		88.2		98.8		92.9		62.3	
Perylene D12	87.7		73.1		89.6		99.8		96.0		73.3	
Indeno(1,2,3,cd)Pyrene-D12	77.7	M	77.8	M	76.0	M	110.0	M	109.5	M	70.8	M
Dibenz(a,h)Anthracene-D14	87.0	M	76.7	M	76.3		89.1		94.5	M	74.2	M
Benzo(g,h,i)Perylene D12	98.3	M	96.8	M	85.4	M	90.1	M	85.2	M	77.0	M

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.
NS	Indicates that this compound was not spiked.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET		17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET		17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET		17-21800-SVOC-(36-40) BLANK #2		Laboratory Control Sample	
ALS Sample ID	L2007004-5		L2007004-6		L2007004-7		L2007004-8		WG2640104-2	
Sample Size	1		1		1		1		1	
Sample units	sample		sample		sample		sample		%	
Moisture Content	n/a		n/a		n/a		n/a		n/a	
Matrix	Stack		Stack		Stack		Stack		QC	
Sampling Date	n/a		n/a		n/a		n/a		n/a	
Extraction Date	16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17		16-Oct-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**		**ng/sample**		**%**	
Naphthalene	292	B	212	B	125	B	81.1	B	124.3	
2-Methylnaphthalene	52.9		41.8		22.9		17.4		NS	
1-Methylnaphthalene	196	B	174	B	163	B	159	B	NS	
Acenaphthylene	134		<10	U	<10	U	<10	U	108.9	
Acenaphthene	19.8	M	<10	U	<10	U	<10	U	105.4	
Fluorene	57.0		31.1		13.1		<10	U	112.3	
Phenanthrene	218		215		97.7		31.9		115.7	
Anthracene	29.7		17.8	M	14.0		<10	U	118.7	
Fluoranthene	119		78.3		89.6		26.2	M	114.9	
Pyrene	188		151		125		35.1	M	112.0	
Benzo(a)Anthracene	14.2	M	<10	U	18.4	M	<10	U	102.1	
Chrysene/Triphenylene/Benzo(b)anthi	<16.6	R	<12.2	R	<17.6	R	<10	U	120.3	
Benzo(b)Fluoranthene	<10	U	<10	U	<10	U	<10	U	103.2	
Benzo(k/j)Fluoranthene	<10	U	<10	U	<10	U	<10	U	128.9	
Benzo(e)Pyrene	107		112	M	80.4		<10	U	NS	
Benzo(a)Pyrene	19.8	M	16.1	M	21.8	M	<10	U	111.8	
Perylene	<10	U	<10	U	<10	U	<10	U	NS	
Indeno(1,2,3-cd)Pyrene	135		133		88.4		<10	U	112.4	M
Dibenzo(a,c/a,h)Anthracene	<10	U	<10	U	<10	U	<10	U	127.1	M
Benzo(g,h,i)Perylene	423	M	368	M	264	M	38.3	M	123.2	M
Additional Analytes										
Tetralin	232	M,B	303	M,B	232	M,B	202	M,B		
2-Chloronaphthalene	<10	U	<10	U	<10	U	<10	U		
Biphenyl	51.3	M	40.7	M	53.6	M	<10	U		
o-Terphenyl	<10	U	<10	U	<10	U	<10	U		
1-Methylphenanthrene	<10	U	<10	U	<10	U	<10	U		
9-Methylphenanthrene	10.2		19.5		11.6		<10	U		
2-methylanthracene	13.4		27.3		18.2		<10	U		
9,10-dimethylanthracene	<73.3	R	<37.7	R	<18.5	R	<10	U		
m-terphenyl	<10	U	<10	U	<10	U	<10	U		
p-terphenyl	<10	U	<10	U	<10	U	<10	U		
Benzo(a)fluorene	<10	U	<10	U	<10	U	<10	U		
Benzo(b)fluorene	<10	U	<10	U	<10	U	<10	U		
7,12-Dimethylbenzo(a)anthracene	<10	U	<10	U	<10	U	<10	U		
3-Methylcholanthrene	<50	U	<50	U	<50	U	<50	U		
Picene	<50	U	<50	U	<50	U	<50	U		
Dibenzo(a,e)pyrene	<50	U	<50	U	<50	U	<50	U		
Coronene	<50	U	<50	U	<50	U	<50	U		
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10	76.2		73.6		75.2		75.7		NS	
Fluorene D10	71.3		72.8		69.5		76.1		NS	
Terphenyl D14(Surr.)	86.9		86.1		84.5		82.3		NS	
Extraction Standards	**% Rec**		**% Rec**		**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	74.7		79.6	M	85.7		79.7		94.3	
2-Methylnaphthalene-D10	83.2		89.9		96.4		91.5		105.2	
Acenaphthylene D8	78.9		93.0		92.6		83.0		96.1	
Phenanthrene D10	92.0		88.0		93.0		101.9		108.6	
Anthracene-D10	80.9		82.3		79.0		82.8		92.3	
Fluoranthene D10	86.0		90.6		95.2		95.9		105.3	
Benz(a)Anthracene-D12	87.2		103.0		112.0		92.0		96.4	
Chrysene D12	59.2		68.0		77.8		64.1	M	76.3	
Benzo(b)Fluoranthene-D12	96.6		104.4		111.4		100.1		99.7	
Benzo(k)Fluoranthene-D12	73.4		77.0		81.8	M	82.9		93.2	
Benzo(a)Pyrene D12	84.5		95.6		81.5		85.9		90.1	
Perylene D12	85.2		96.9		86.1		87.6		93.1	
Indeno(1,2,3,cd)Pyrene-D12	85.0	M	106.9	M	80.5	M	81.8	M	95.0	M
Dibenz(a,h)Anthracene-D14	70.8		96.0	M	77.0		81.1	M	96.5	M
Benzo(g,h,i)Perylene D12	74.2	M	83.1	M	82.7	M	78.0	M	107.7	M

U	Indicates that this compound was not detected above the LOD.
M	Indicates that a peak has been manually integrated.
B	Indicates that this compound was detected in the method blank at greater than 10% of the sample value.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.
NS	Indicates that this compound was not spiked.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a
ALS Sample ID	WG2640104-1	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102019.D
Run Date	10/20/2017 20:57
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	9.19	49.3	
2-Methylnaphthalene	10.37	<10	U
1-Methylnaphthalene	10.55	158	
Acenaphthylene	NotFnd	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	13.08	<10	U
Phenanthrene	14.69	<10	U
Anthracene	14.77	<10	U
Fluoranthene	16.81	<10	U
Pyrene	17.21	<10	U
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)a	NotFnd	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k/j)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	NotFnd	<10	U
Additional Analytes			
Tetralin	8.94	416	R
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	NotFnd	<10	U
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**	**% Rec**
1-Methylnaphthalene-D10		NS
Fluorene D10		NS
Terphenyl D14(Surr.)		NS

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	400	9.16	89.7		50-150
2-Methylnaphthalene-D10	400	10.32	100.2		50-150
Acenaphthylene D8	400	11.88	90.8		50-150
Phenanthrene D10	400	14.66	103.6		50-150
Anthracene-D10	400	14.74	87.5		50-150
Fluoranthene D10	400	16.77	103.0		50-150
Benz(a)Anthracene-D12	400	19.65	98.5		50-150
Chrysene D12	400	19.72	78.5		50-150
Benzo(b)Fluoranthene-D12	400	21.90	103.1		50-150
Benzo(k)Fluoranthene-D12	400	21.95	87.1		50-150
Benzo(a)Pyrene D12	400	22.52	85.3		50-150
Perylene D12	400	22.67	87.7		50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.57	77.7	M	50-150
Dibenz(a,h)Anthracene-D14	400	24.62	87.0	M	50-150
Benzo(g,h,i)Perylene D12	400	24.97	98.3	M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
NS	Indicates that this compound was not spiked.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank (Reagent)**	Sampling Date	n/a
ALS Sample ID	WG2640104-4	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	blank		
Sample Matrix	QC		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102020.D
Run Date	10/20/2017 21:30
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	9.19	<10	U
2-Methylnaphthalene	10.37	<10	U
1-Methylnaphthalene	10.55	172	
Acenaphthylene	NotFnd	<10	U
Acenaphthene	NotFnd	<10	U
Fluorene	NotFnd	<10	U
Phenanthrene	14.70	<10	U
Anthracene	NotFnd	<10	U
Fluoranthene	NotFnd	<10	U
Pyrene	17.21	<10	U
Benzo(a)Anthracene	NotFnd	<10	U
Chrysene/Triphenylene/Benzo(b)a	NotFnd	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k/j)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	NotFnd	<10	U
Benzo(a)Pyrene	NotFnd	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	NotFnd	<10	U
Additional Analytes			
Tetralin	NotFnd	<10	U
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	NotFnd	<10	U
o-Terphenyl	NotFnd	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	NotFnd	<10	U
2-methylanthracene	NotFnd	<10	U
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**	**% Rec**
1-Methylnaphthalene-D10		NS
Fluorene D10		NS
Terphenyl D14(Surr.)		NS

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	400	9.17	77.7		50-150
2-Methylnaphthalene-D10	400	10.32	82.2		50-150
Acenaphthylene D8	400	11.88	71.1		50-150
Phenanthrene D10	400	14.67	90.3		50-150
Anthracene-D10	400	14.75	83.2		50-150
Fluoranthene D10	400	16.77	92.3		50-150
Benz(a)Anthracene-D12	400	19.65	74.3		50-150
Chrysene D12	400	19.73	72.4		50-150
Benzo(b)Fluoranthene-D12	400	21.90	85.4		50-150
Benzo(k)Fluoranthene-D12	400	21.96	79.9		50-150
Benzo(a)Pyrene D12	400	22.52	76.8		50-150
Perylene D12	400	22.68	73.1		50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.58	77.8	M	50-150
Dibenz(a,h)Anthracene-D14	400	24.62	76.7	M	50-150
Benzo(g,h,i)Perylene D12	400	24.98	96.8	M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
NS	Indicates that this compound was not spiked.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(1-5) TEST#1 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-1	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102023.D
Run Date	10/20/2017 23:10
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	9.19	149	B
2-Methylnaphthalene	10.37	32.7	
1-Methylnaphthalene	10.55	171	B
Acenaphthylene	11.89	<10	U
Acenaphthene	12.21	13.0	
Fluorene	13.08	15.5	
Phenanthrene	14.69	114	
Anthracene	14.77	22.2	M
Fluoranthene	16.80	49.1	
Pyrene	17.21	81.8	
Benzo(a)Anthracene	19.68	<10	U
Chrysene/Triphenylene/Benzo(b)a	19.77	<10	U
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k/j)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	22.45	37.6	M
Benzo(a)Pyrene	22.57	<10	U
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	24.59	31.8	M
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	25.00	166	M
Additional Analytes			
Tetralin	8.94	286	M B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	11.20	31.0	M
o-Terphenyl	15.48	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	15.74	11.1	
2-methylanthracene	15.78	16.9	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	NotFnd	<10	U
p-terphenyl	NotFnd	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	10.49	74.2
Fluorene D10	500	13.03	64
Terphenyl D14(Surr.)	500	17.65	85

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	400	9.17	77.4	50-150
2-Methylnaphthalene-D10	400	10.32	85.9	50-150
Acenaphthylene D8	400	11.88	88.8	50-150
Phenanthrene D10	400	14.65	98.6	50-150
Anthracene-D10	400	14.73	85.8	50-150
Fluoranthene D10	400	16.76	86.3	50-150
Benz(a)Anthracene-D12	400	19.64	96.4	50-150
Chrysene D12	400	19.72	66.2	50-150
Benzo(b)Fluoranthene-D12	400	21.90	95.8	50-150
Benzo(k)Fluoranthene-D12	400	21.95	77.8	50-150
Benzo(a)Pyrene D12	400	22.51	88.2	50-150
Perylene D12	400	22.67	89.6	50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	76.0 M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	76.3	50-150
Benzo(g,h,i)Perylene D12	400	24.96	85.4 M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(6-10) TEST#2 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-2	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102024.D
Run Date	10/20/2017 23:43
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	9.19	141	M	B
2-Methylnaphthalene	10.37	30.3		
1-Methylnaphthalene	10.55	165		B
Acenaphthylene	11.89	<10	U	
Acenaphthene	NotFnd	<10	U	
Fluorene	13.08	41.4		
Phenanthrene	14.69	193		
Anthracene	14.77	22.5	M	
Fluoranthene	16.80	53.6	M	
Pyrene	17.21	56.6		
Benzo(a)Anthracene	19.68	<10	U	
Chrysene/Triphenylene/Benzo(b)a	19.77	<15.5		R
Benzo(b)Fluoranthene	NotFnd	<10	U	
Benzo(k/j)Fluoranthene	NotFnd	<10	U	
Benzo(e)Pyrene	22.46	18.1	M	
Benzo(a)Pyrene	NotFnd	<10	U	
Perylene	NotFnd	<10	U	
Indeno(1,2,3-cd)Pyrene	24.59	20.6	M	
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U	
Benzo(g,h,i)Perylene	25.01	85.8	M	
Additional Analytes				
Tetralin	8.94	280	M	B
2-Chloronaphthalene	NotFnd	<10	U	
Biphenyl	11.20	23.9	M	
o-Terphenyl	NotFnd	<10	U	
1-Methylphenanthrene	NotFnd	<10	U	
9-Methylphenanthrene	15.74	13.9		
2-methylanthracene	15.78	23.3		
9,10-dimethylanthracene	NotFnd	<10	U	
m-terphenyl	NotFnd	<10	U	
p-terphenyl	NotFnd	<10	U	
Benzo(a)fluorene	NotFnd	<10	U	
Benzo(b)fluorene	NotFnd	<10	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U	
3-Methylcholanthrene	NotFnd	<50	U	
Picene	NotFnd	<50	U	
Dibenzo(a,e)pyrene	NotFnd	<50	U	
Coronene	NotFnd	<50	U	

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	10.49	72.5
Fluorene D10	500	13.03	74.7
Terphenyl D14(Surr.)	500	17.65	80.1

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	400	9.17	83.6	50-150
2-Methylnaphthalene-D10	400	10.32	96.2	50-150
Acenaphthylene D8	400	11.88	93.4	50-150
Phenanthrene D10	400	14.65	102.9	50-150
Anthracene-D10	400	14.74	98.3	50-150
Fluoranthene D10	400	16.76	101.3	50-150
Benz(a)Anthracene-D12	400	19.64	103.3	50-150
Chrysene D12	400	19.72	66.8	50-150
Benzo(b)Fluoranthene-D12	400	21.89	115.2	50-150
Benzo(k)Fluoranthene-D12	400	21.95	89.3	50-150
Benzo(a)Pyrene D12	400	22.51	98.8	50-150
Perylene D12	400	22.67	99.8	50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	110.0 M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	89.1	50-150
Benzo(g,h,i)Perylene D12	400	24.96	90.1 M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(11-15) TEST#3 #1 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-3	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102025.D
Run Date	10/21/2017 0:16
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	9.19	140	B
2-Methylnaphthalene	10.37	37.4	
1-Methylnaphthalene	10.55	168	B
Acenaphthylene	11.89	11.2	
Acenaphthene	12.21	20.2	M
Fluorene	13.08	22.8	
Phenanthrene	14.69	150	
Anthracene	14.77	26.2	
Fluoranthene	16.80	103	
Pyrene	17.21	202	
Benzo(a)Anthracene	19.68	10.2	
Chrysene/Triphenylene/Benzo(b)a	19.76	<17.9	R
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k/j)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	22.46	123	
Benzo(a)Pyrene	22.55	23.2	M
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	24.60	39.9	
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	25.00	234	M
Additional Analytes			
Tetralin	8.94	283	M B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	11.20	45.0	M
o-Terphenyl	15.48	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	15.74	15.1	
2-methylanthracene	15.78	27.0	
9,10-dimethylanthracene	NotFnd	<10	U
m-terphenyl	17.38	10.6	M
p-terphenyl	17.69	19.3	M
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	10.31	68.1
Fluorene D10	500	13.03	71.5
Terphenyl D14(Surr.)	500	17.65	88.4

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	400	9.17	86.5	50-150
2-Methylnaphthalene-D10	400	10.31	97.9	50-150
Acenaphthylene D8	400	11.88	101.4	50-150
Phenanthrene D10	400	14.65	90.1	50-150
Anthracene-D10	400	14.73	83.7	50-150
Fluoranthene D10	400	16.76	95.6	50-150
Benz(a)Anthracene-D12	400	19.64	114.4	50-150
Chrysene D12	400	19.72	76.6	50-150
Benzo(b)Fluoranthene-D12	400	21.89	109.7	50-150
Benzo(k)Fluoranthene-D12	400	21.95	80.6	50-150
Benzo(a)Pyrene D12	400	22.51	92.9	50-150
Perylene D12	400	22.67	96.0	50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	109.5 M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	94.5 M	50-150
Benzo(g,h,i)Perylene D12	400	24.96	85.2 M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(16-20) BLANK #1**		Sampling Date	n/a	
ALS Sample ID	L2007004-4		Extraction Date	16-Oct-17	
Analysis Method	PAH by CARB 429				
Analysis Type	sample				
Sample Matrix	Stack				Approved:
Sample Size	1	sample			*Andrew Reid*
Percent Moisture	n/a				--e-signature--
Split Ratio	5		Workgroup	WG2640104	23-Oct-2017

Run Information	**Run 1**
Filename	17102021.D
Run Date	10/20/2017 22:04
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	9.19	70.0		B
2-Methylnaphthalene	10.37	10.8		
1-Methylnaphthalene	10.55	160		B
Acenaphthylene	NotFnd	<10	U	
Acenaphthene	12.21	<10	U	
Fluorene	13.08	14.3	M	
Phenanthrene	14.69	22.8		
Anthracene	14.77	<10	U	
Fluoranthene	16.80	11.0	M	
Pyrene	17.21	12.6	M	
Benzo(a)Anthracene	NotFnd	<10	U	
Chrysene/Triphenylene/Benzo(b)a	19.77	<10	U	
Benzo(b)Fluoranthene	NotFnd	<10	U	
Benzo(k/j)Fluoranthene	NotFnd	<10	U	
Benzo(e)Pyrene	NotFnd	<10	U	
Benzo(a)Pyrene	NotFnd	<10	U	
Perylene	NotFnd	<10	U	
Indeno(1,2,3-cd)Pyrene	NotFnd	<10	U	
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U	
Benzo(g,h,i)Perylene	25.01	43.2	M	
Additional Analytes				
Tetralin	8.94	121	M	B
2-Chloronaphthalene	NotFnd	<10	U	
Biphenyl	NotFnd	<10	U	
o-Terphenyl	NotFnd	<10	U	
1-Methylphenanthrene	NotFnd	<10	U	
9-Methylphenanthrene	NotFnd	<10	U	
2-methylanthracene	NotFnd	<10	U	
9,10-dimethylanthracene	NotFnd	<10	U	
m-terphenyl	NotFnd	<10	U	
p-terphenyl	NotFnd	<10	U	
Benzo(a)fluorene	NotFnd	<10	U	
Benzo(b)fluorene	NotFnd	<10	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U	
3-Methylcholanthrene	NotFnd	<50	U	
Picene	NotFnd	<50	U	
Dibenzo(a,e)pyrene	NotFnd	<50	U	
Coronene	NotFnd	<50	U	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	500	10.49	76.5	
Fluorene D10	500	13.03	78.4	
Terphenyl D14(Surr.)	500	17.65	84.5	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	400	9.17	71.8	50-150
2-Methylnaphthalene-D10	400	10.32	84.4	50-150
Acenaphthylene D8	400	11.88	69.2	50-150
Phenanthrene D10	400	14.65	98.8	50-150
Anthracene-D10	400	14.73	53.2	50-150
Fluoranthene D10	400	16.76	93.0	50-150
Benz(a)Anthracene-D12	400	19.64	82.1	50-150
Chrysene D12	400	19.72	60.6 M	50-150
Benzo(b)Fluoranthene-D12	400	21.89	97.9	50-150
Benzo(k)Fluoranthene-D12	400	21.95	84.4	50-150
Benzo(a)Pyrene D12	400	22.51	62.3	50-150
Perylene D12	400	22.67	73.3	50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.57	70.8 M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	74.2 M	50-150
Benzo(g,h,i)Perylene D12	400	24.97	77.0 M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(21-25) TEST#1 #2 APC OUTLET**		Sampling Date	n/a	
ALS Sample ID	L2007004-5		Extraction Date	16-Oct-17	
Analysis Method	PAH by CARB 429				
Analysis Type	sample				
Sample Matrix	Stack				Approved:
Sample Size	1	sample			*Andrew Reid*
Percent Moisture	n/a				--e-signature--
Split Ratio	5		Workgroup	WG2640104	23-Oct-2017

Run Information	**Run 1**
Filename	17102026.D
Run Date	10/21/2017 0:49
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	9.19	292		B
2-Methylnaphthalene	10.37	52.9		
1-Methylnaphthalene	10.55	196		B
Acenaphthylene	11.89	134		
Acenaphthene	12.21	19.8	M	
Fluorene	13.08	57.0		
Phenanthrene	14.69	218		
Anthracene	14.77	29.7		
Fluoranthene	16.80	119		
Pyrene	17.21	188		
Benzo(a)Anthracene	19.68	14.2	M	
Chrysene/Triphenylene/Benzo(b)a	19.77	<16.6		R
Benzo(b)Fluoranthene	NotFnd	<10	U	
Benzo(k/j)Fluoranthene	NotFnd	<10	U	
Benzo(e)Pyrene	22.46	107		
Benzo(a)Pyrene	22.55	19.8	M	
Perylene	NotFnd	<10	U	
Indeno(1,2,3-cd)Pyrene	24.59	135		
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U	
Benzo(g,h,i)Perylene	25.00	423	M	
Additional Analytes				
Tetralin	8.94	232	M	B
2-Chloronaphthalene	NotFnd	<10	U	
Biphenyl	11.20	51.3	M	
o-Terphenyl	15.48	<10	U	
1-Methylphenanthrene	NotFnd	<10	U	
9-Methylphenanthrene	15.74	10.2		
2-methylanthracene	15.78	13.4		
9,10-dimethylanthracene	17.34	<73.3		R
m-terphenyl	17.38	<10	U	
p-terphenyl	17.69	<10	U	
Benzo(a)fluorene	NotFnd	<10	U	
Benzo(b)fluorene	NotFnd	<10	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U	
3-Methylcholanthrene	NotFnd	<50	U	
Picene	NotFnd	<50	U	
Dibenzo(a,e)pyrene	NotFnd	<50	U	
Coronene	NotFnd	<50	U	

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	10.49	76.2
Fluorene D10	500	13.03	71.3
Terphenyl D14(Surr.)	500	17.65	86.9

Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	400	9.16	74.7	50-150
2-Methylnaphthalene-D10	400	10.31	83.2	50-150
Acenaphthylene D8	400	11.88	78.9	50-150
Phenanthrene D10	400	14.65	92.0	50-150
Anthracene-D10	400	14.73	80.9	50-150
Fluoranthene D10	400	16.76	86.0	50-150
Benz(a)Anthracene-D12	400	19.64	87.2	50-150
Chrysene D12	400	19.72	59.2	50-150
Benzo(b)Fluoranthene-D12	400	21.89	96.6	50-150
Benzo(k)Fluoranthene-D12	400	21.95	73.4	50-150
Benzo(a)Pyrene D12	400	22.51	84.5	50-150
Perylene D12	400	22.67	85.2	50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	85.0 M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	70.8	50-150
Benzo(g,h,i)Perylene D12	400	24.96	74.2 M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(26-30) TEST#2 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-6	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102027.D
Run Date	10/21/2017 1:22
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**
Naphthalene	9.19	212	B
2-Methylnaphthalene	10.37	41.8	
1-Methylnaphthalene	10.55	174	B
Acenaphthylene	11.89	<10	U
Acenaphthene	12.20	<10	U
Fluorene	13.08	31.1	
Phenanthrene	14.69	215	
Anthracene	14.77	17.8	M
Fluoranthene	16.80	78.3	
Pyrene	17.21	151	
Benzo(a)Anthracene	19.69	<10	U
Chrysene/Triphenylene/Benzo(b)a	19.76	<12.2	R
Benzo(b)Fluoranthene	NotFnd	<10	U
Benzo(k/j)Fluoranthene	NotFnd	<10	U
Benzo(e)Pyrene	22.46	112	M
Benzo(a)Pyrene	22.55	16.1	M
Perylene	NotFnd	<10	U
Indeno(1,2,3-cd)Pyrene	24.59	133	
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U
Benzo(g,h,i)Perylene	25.00	368	M
Additional Analytes			
Tetralin	8.94	303	M B
2-Chloronaphthalene	NotFnd	<10	U
Biphenyl	11.20	40.7	M
o-Terphenyl	15.47	<10	U
1-Methylphenanthrene	NotFnd	<10	U
9-Methylphenanthrene	15.74	19.5	
2-methylanthracene	15.77	27.3	
9,10-dimethylanthracene	17.34	<37.7	R
m-terphenyl	17.38	<10	U
p-terphenyl	17.69	<10	U
Benzo(a)fluorene	NotFnd	<10	U
Benzo(b)fluorene	NotFnd	<10	U
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U
3-Methylcholanthrene	NotFnd	<50	U
Picene	NotFnd	<50	U
Dibenzo(a,e)pyrene	NotFnd	<50	U
Coronene	NotFnd	<50	U

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	10.49	73.6
Fluorene D10	500	13.03	72.8
Terphenyl D14(Surr.)	500	17.65	86.1

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	400	9.17	79.6	M	50-150
2-Methylnaphthalene-D10	400	10.31	89.9		50-150
Acenaphthylene D8	400	11.87	93.0		50-150
Phenanthrene D10	400	14.65	88.0		50-150
Anthracene-D10	400	14.73	82.3		50-150
Fluoranthene D10	400	16.76	90.6		50-150
Benz(a)Anthracene-D12	400	19.64	103.0		50-150
Chrysene D12	400	19.72	68.0		50-150
Benzo(b)Fluoranthene-D12	400	21.89	104.4		50-150
Benzo(k)Fluoranthene-D12	400	21.95	77.0		50-150
Benzo(a)Pyrene D12	400	22.51	95.6		50-150
Perylene D12	400	22.67	96.9		50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	106.9	M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	96.0	M	50-150
Benzo(g,h,i)Perylene D12	400	24.96	83.1	M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(31-35) TEST#3 #2 APC OUTLET**	Sampling Date	n/a
ALS Sample ID	L2007004-7	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102028.D
Run Date	10/21/2017 1:55
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	9.20	125		B
2-Methylnaphthalene	10.37	22.9		
1-Methylnaphthalene	10.55	163		B
Acenaphthylene	11.89	<10	U	
Acenaphthene	12.20	<10	U	
Fluorene	13.08	13.1		
Phenanthrene	14.69	97.7		
Anthracene	14.77	14.0		
Fluoranthene	16.80	89.6		
Pyrene	17.21	125		
Benzo(a)Anthracene	19.68	18.4	M	
Chrysene/Triphenylene/Benzo(b)a	19.76	<17.6		R
Benzo(b)Fluoranthene	NotFnd	<10	U	
Benzo(k/j)Fluoranthene	NotFnd	<10	U	
Benzo(e)Pyrene	22.46	80.4		
Benzo(a)Pyrene	22.55	21.8	M	
Perylene	NotFnd	<10	U	
Indeno(1,2,3-cd)Pyrene	24.59	88.4		
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U	
Benzo(g,h,i)Perylene	25.00	264	M	
Additional Analytes				
Tetralin	8.94	232	M	B
2-Chloronaphthalene	NotFnd	<10	U	
Biphenyl	11.20	53.6	M	
o-Terphenyl	15.47	<10	U	
1-Methylphenanthrene	NotFnd	<10	U	
9-Methylphenanthrene	15.74	11.6		
2-methylanthracene	15.78	18.2		
9,10-dimethylanthracene	17.34	<18.5		R
m-terphenyl	17.38	<10	U	
p-terphenyl	17.69	<10	U	
Benzo(a)fluorene	NotFnd	<10	U	
Benzo(b)fluorene	NotFnd	<10	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U	
3-Methylcholanthrene	NotFnd	<50	U	
Picene	NotFnd	<50	U	
Dibenzo(a,e)pyrene	NotFnd	<50	U	
Coronene	NotFnd	<50	U	

Field Sampling Standards	**ng spiked**		**% Rec**
1-Methylnaphthalene-D10	500	10.49	75.2
Fluorene D10	500	13.03	69.5
Terphenyl D14(Surr.)	500	17.65	84.5

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	400	9.17	85.7		50-150
2-Methylnaphthalene-D10	400	10.32	96.4		50-150
Acenaphthylene D8	400	11.88	92.6		50-150
Phenanthrene D10	400	14.65	93.0		50-150
Anthracene-D10	400	14.73	79.0		50-150
Fluoranthene D10	400	16.76	95.2		50-150
Benz(a)Anthracene-D12	400	19.64	112.0		50-150
Chrysene D12	400	19.72	77.8		50-150
Benzo(b)Fluoranthene-D12	400	21.89	111.4		50-150
Benzo(k)Fluoranthene-D12	400	21.95	81.8	M	50-150
Benzo(a)Pyrene D12	400	22.51	81.5		50-150
Perylene D12	400	22.67	86.1		50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	80.5	M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	77.0		50-150
Benzo(g,h,i)Perylene D12	400	24.96	82.7	M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion and is reported as an estimated maximum concentration.

ALS Life Sciences

Sample Analysis Report

Sample Name	**17-21800-SVOC-(36-40) BLANK #2**	Sampling Date	n/a
ALS Sample ID	L2007004-8	Extraction Date	16-Oct-17
Analysis Method	PAH by CARB 429		
Analysis Type	sample		
Sample Matrix	Stack		
Sample Size	1 sample		
Percent Moisture	n/a		
Split Ratio	5	Workgroup	WG2640104

Approved:
Andrew Reid
--e-signature--
23-Oct-2017

Run Information	**Run 1**
Filename	17102022.D
Run Date	10/20/2017 22:37
Final Volume	1 mL
Dilution Factor	1
Analysis Units	ng/sample
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**Ret. Time**	**Concentration ng/sample**	**Flags**	
Naphthalene	9.20	81.1		B
2-Methylnaphthalene	10.37	17.4		
1-Methylnaphthalene	10.55	159		B
Acenaphthylene	11.89	<10	U	
Acenaphthene	NotFnd	<10	U	
Fluorene	13.08	<10	U	
Phenanthrene	14.69	31.9		
Anthracene	14.77	<10	U	
Fluoranthene	16.80	26.2	M	
Pyrene	17.21	35.1	M	
Benzo(a)Anthracene	19.69	<10	U	
Chrysene/Triphenylene/Benzo(b)a	19.77	<10	U	
Benzo(b)Fluoranthene	NotFnd	<10	U	
Benzo(k/j)Fluoranthene	NotFnd	<10	U	
Benzo(e)Pyrene	22.46	<10	U	
Benzo(a)Pyrene	NotFnd	<10	U	
Perylene	NotFnd	<10	U	
Indeno(1,2,3-cd)Pyrene	24.60	<10	U	
Dibenzo(a,c/a,h)Anthracene	NotFnd	<10	U	
Benzo(g,h,i)Perylene	25.01	38.3	M	
Additional Analytes				
Tetralin	8.94	202	M	B
2-Chloronaphthalene	NotFnd	<10	U	
Biphenyl	NotFnd	<10	U	
o-Terphenyl	NotFnd	<10	U	
1-Methylphenanthrene	NotFnd	<10	U	
9-Methylphenanthrene	NotFnd	<10	U	
2-methylanthracene	NotFnd	<10	U	
9,10-dimethylanthracene	NotFnd	<10	U	
m-terphenyl	NotFnd	<10	U	
p-terphenyl	NotFnd	<10	U	
Benzo(a)fluorene	NotFnd	<10	U	
Benzo(b)fluorene	NotFnd	<10	U	
7,12-Dimethylbenzo(a)anthracene	NotFnd	<10	U	
3-Methylcholanthrene	NotFnd	<50	U	
Picene	NotFnd	<50	U	
Dibenzo(a,e)pyrene	NotFnd	<50	U	
Coronene	NotFnd	<50	U	

Field Sampling Standards	**ng spiked**		**% Rec**	
1-Methylnaphthalene-D10	500	10.49	75.7	
Fluorene D10	500	13.03	76.1	
Terphenyl D14(Surr.)	500	17.65	82.3	
Extraction Standards			**% Rec**	**Limits**
Naphthalene D8	400	9.17	79.7	50-150
2-Methylnaphthalene-D10	400	10.32	91.5	50-150
Acenaphthylene D8	400	11.88	83.0	50-150
Phenanthrene D10	400	14.65	101.9	50-150
Anthracene-D10	400	14.73	82.8	50-150
Fluoranthene D10	400	16.76	95.9	50-150
Benz(a)Anthracene-D12	400	19.64	92.0	50-150
Chrysene D12	400	19.72	64.1 M	50-150
Benzo(b)Fluoranthene-D12	400	21.89	100.1	50-150
Benzo(k)Fluoranthene-D12	400	21.95	82.9	50-150
Benzo(a)Pyrene D12	400	22.51	85.9	50-150
Perylene D12	400	22.67	87.6	50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.56	81.8 M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	81.1 M	50-150
Benzo(g,h,i)Perylene D12	400	24.96	78.0 M	50-150

M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the MDL.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**		Sampling Date	n/a	
ALS Sample ID	WG2640104-2		Extraction Date	16-Oct-17	
Analysis Method	PAH by CARB 429				
Analysis Type	LCS				
Sample Matrix	QC				Approved:
Sample Size	1	%			*Andrew Reid*
Percent Moisture	n/a				--e-signature--
Split Ratio	5		Workgroup	WG2640104	23-Oct-2017

Run Information	**Run 1**
Filename	17102017.D
Run Date	10/20/2017 19:51
Final Volume	1 mL
Dilution Factor	1
Analysis Units	% Rec
Instrument	MSD-2
Column	HP-5MS USP384151H

Target Analytes	**ug spiked**	**Ret. Time**	**%**	**Flags**	**Limits**
Naphthalene	400	9.20	124.3		50-150
2-Methylnaphthalene	0		NS		
1-Methylnaphthalene	0		NS		
Acenaphthylene	400	11.89	108.9		50-150
Acenaphthene	400	12.21	105.4		50-150
Fluorene	400	13.08	112.3		50-150
Phenanthrene	400	14.69	115.7		50-150
Anthracene	400	14.77	118.7		50-150
Fluoranthene	400	16.80	114.9		50-150
Pyrene	400	17.21	112.0		50-150
Benzo(a)Anthracene	400	19.69	102.1		50-150
Chrysene/Triphenylene/Benzo(b)a	400	19.77	120.3		50-150
Benzo(b)Fluoranthene	400	21.94	103.2		50-150
Benzo(k/j)Fluoranthene	400	21.99	128.9		50-150
Benzo(e)Pyrene	0		NS		
Benzo(a)Pyrene	400	22.56	111.8		50-150
Perylene	0		NS		
Indeno(1,2,3-cd)Pyrene	400	24.60	112.4	M	50-150
Dibenzo(a,c/a,h)Anthracene	400	24.66	127.1	M	50-150
Benzo(g,h,i)Perylene	400	25.01	123.2	M	50-150

Field Sampling Standards	**ng spiked**	**% Rec**
1-Methylnaphthalene-D10		NS
Fluorene D10		NS
Terphenyl D14(Surr.)		NS

Extraction Standards			**% Rec**		**Limits**
Naphthalene D8	400	9.17	94.3		30-150
2-Methylnaphthalene-D10	400	10.32	105.2		30-150
Acenaphthylene D8	400	11.88	96.1		30-150
Phenanthrene D10	400	14.66	108.6		50-150
Anthracene-D10	400	14.74	92.3		50-150
Fluoranthene D10	400	16.77	105.3		50-150
Benz(a)Anthracene-D12	400	19.64	96.4		50-150
Benzo(b)Fluoranthene-D12	400	21.90	99.7		50-150
Benzo(k)Fluoranthene-D12	400	21.96	93.2		50-150
Benzo(a)Pyrene D12	400	22.52	90.1		30-150
Perylene D12	400	22.67	93.1		50-150
Indeno(1,2,3,cd)Pyrene-D12	400	24.57	95.0	M	50-150
Dibenz(a,h)Anthracene-D14	400	24.61	96.5	M	50-150
Benzo(g,h,i)Perylene D12	400	24.97	107.7	M	50-150

M	Indicates that a peak has been manually integrated.
NS	Indicates that this compound was not spiked.

APPENDIX 18

Acid Gas Recovery Data Sheets
(8 page)

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: Oct. 10/17

Test No.: 1

Test Location: Unit 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS1a
Probe Rinse Residue

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

CONTAINER TS2

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

SEAL CONTAINER TS2

CONTAINER TS3

Impinger #1 0.1 N H_2SO4	
Empty Wt:	523.1
Initial Wt:	624.2
Final Wt:	745.9
1 Gain:	121.7
Colour:	CLEAR

Impinger #2 0.1 N H_2SO4	
Empty Wt:	670.9
Initial Wt:	771.1
Final Wt:	803.9
2 Gain:	32.8
Colour:	CLEAR

Impinger #3 EMPTY	
Empty Wt:	~~624.0~~ 623.2
Final Wt:	626.3
3 Gain:	3.1
Colour:	CLEAR

CONTAINER TS3 WEIGHTS	
Empty Wt:	424.8
With Imp. 1,2,3 Soln:	773.2
Imp. 1,2,3 Volume:	348.4
After Rinse:	886.7
Total TS3:	461.9

Impinger #4 Silica Gel	
Initial Wt:	902.0
Final Wt:	914.0
4 Gain:	12.0

SAMPLE IDENTIFICATION	17-21800-M26A-
TS1(Probe Rinse-Acetone)	
TS2(Filter)	
TS3(Impinger 1,2,3 Sol'n)	1

Train Loaded By: DY

Train Recovered By: AN

Recovery Witnessed By:

Date: Oct. 10/17

CWTR = 1+2+3: 157.6

WCBDA= 4: 12.0

B

Method 26A Recovery Sheet

Client :	Covanta DYEC
Project No.:	21800
Date:	OCT. 10/17
Test No.:	2
Test Location:	UNIT 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS1a
Probe Rinse Residue

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

CONTAINER TS2

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

SEAL CONTAINER TS2

CONTAINER TS3

	Impinger #1 0.1 N H_2SO_4	
	Empty Wt:	656.1
	Initial Wt:	756.8
	Final Wt:	889.8
1	Gain:	133.0
	Colour:	CLEAR

	Impinger #2 0.1 N H_2SO_4	
	Empty Wt:	668.5
	Initial Wt:	765.5
	Final Wt:	792.2
2	Gain:	26.7
	Colour:	CLEAR

	Impinger #3 EMPTY	
	Empty Wt:	473.4
	Final Wt:	477.6
3	Gain:	4.2
	Colour:	CLEAR

	Impinger #4 Silica Gel	
	Initial Wt:	983.1
	Final Wt:	994.8
4	Gain:	11.7

SAMPLE IDENTIFICATION	17-21800-M26A-
TS1(Probe Rinse-Acetone)	
TS2(Filter)	
TS3(Impinger 1,2,3 Sol'n)	2

CONTAINER TS3 WEIGHTS	
Empty Wt:	425.7
With Imp. 1,2,3 Soln:	775.5
Imp. 1,2,3 Volume:	349.8
After Rinse:	902.1
Total TS3:	496.4

Train Loaded By: DLA
Train Recovered By: AN
Recovery Witnessed By:
Date: OCT. 10/17

CWTR = 1+2+3:	163.9
WCBDA= 4:	11.7

A

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: OCT. 10/17

Test No.: 3

Test Location: UNIT 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS1a Probe Rinse Residue	
Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

SEAL CONTAINER TS2

Impinger #1 0.1 N H_2SO4	
Empty Wt:	528.7
Initial Wt:	630.5
Final Wt:	765.4
1 Gain:	134.9
Colour:	CLEAR

Impinger #2 0.1 N H_2SO4	
Empty Wt:	695.3
Initial Wt:	777.8
Final Wt:	799.4
2 Gain:	21.6
Colour:	CLEAR

Impinger #3 EMPTY	
Empty Wt:	623.6
Final Wt:	627.1
3 Gain:	3.5
Colour:	CLEAR

Impinger #4 Silica Gel	
Initial Wt:	914.0
Final Wt:	923.1
4 Gain:	9.1

SAMPLE IDENTIFICATION	17-21800-M26A
TS1(Probe Rinse-Acetone)	—
TS2(Filter)	—
TS3(Impinger 1,2,3 Sol'n)	3

CONTAINER TS3 WEIGHTS	
Empty Wt:	424.9
With Imp. 1,2,3 Soln:	788.3
Imp. 1,2,3 Volume:	363.4
After Rinse:	886.5
Total TS3:	461.6

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 10/17

CWTR = 1+2+3: 160.0 ✓

WCBDA= 4: 9.1

B

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: OCT. 11/17

Test No.: 1

Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #1 0.1 N H_2SO4		
Empty Wt:	528.7	
Initial Wt:	630.5	
Final Wt:	779.9	
1 Gain:	149.4	
Colour:	CC	

Impinger #4 Silica Gel		
Initial Wt:	922.9	
Final Wt:	931.1	
4 Gain:	8.2	

MARK FLUID LEVEL

Seal and label container TS1

SEAL CONTAINER TS2

Impinger #2 0.1 N H_2SO4		
Empty Wt:	675.2	
Initial Wt:	776.8	
Final Wt:	802.6	
2 Gain:	25.8	
Colour:	CC	

CONTAINER TS1a
Probe Rinse Residue

Initial Wt:
Post-Test Wt (1):
Post-Test Wt (2):
Post-Test Wt (3):
Final Wt:
Gain:
Colour:

Impinger #3 EMPTY		
Empty Wt:	623.8	
Final Wt:	627.0	
3 Gain:	3.2	
Colour:	CC	

SAMPLE IDENTIFICATION	17-21800-M26A –
TS1(Probe Rinse-Acetone)	—
TS2(Filter)	—
TS3(Impinger 1,2,3 Sol'n)	4

CONTAINER TS3 WEIGHTS	
Empty Wt:	427.2
With Imp. 1,2,3 Soln:	807.0
Imp. 1,2,3 Volume:	379.8
After Rinse:	907.1
Total TS3:	479.9

✓

CWTR = 1+2+3:	178.4

WCBDA= 4:	8.2

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 11/17

B

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: OCT. 11/17

Test No.: 2

Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

MARK FLUID LEVEL

Seal and label container TS1

CONTAINER TS1a Probe Rinse Residue	
Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

SEAL CONTAINER TS2

Impinger #1 0.1 N H_2SO4	
Empty Wt:	660.0
Initial Wt:	764.7
Final Wt:	906.6
1 Gain:	141.9
Colour:	CC

Impinger #2 0.1 N H_2SO4	
Empty Wt:	672.9
Initial Wt:	775.4
Final Wt:	801.4
2 Gain:	26.0
Colour:	CC

Impinger #3 EMPTY	
Empty Wt:	478.2
Final Wt:	481.7
3 Gain:	3.5
Colour:	CC

Impinger #4 Silica Gel	
Initial Wt:	994.7
Final Wt:	1004.5
4 Gain:	9.8

CONTAINER TS3 WEIGHTS	
Empty Wt:	424.0
With Imp. 1,2,3 Soln:	801.4
Imp. 1,2,3 Volume:	377.4
After Rinse:	915.6
Total TS3:	491.6

SAMPLE IDENTIFICATION	17-21800-M26A-
TS1(Probe Rinse-Acetone)	—
TS2(Filter)	—
TS3(Impinger 1,2,3 Sol'n)	5

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 11/17

CWTR = 1+2+3: 171.4 ✓

WCBDA= 4: 9.8

A

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: OCT. 11/17

Test No.: 3

Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	527.8
Initial Wt:	626.9
Final Wt:	762.7
1 Gain:	135.8
Colour:	CC

Impinger #4 Silica Gel	
Initial Wt:	931.0
Final Wt:	941.2
4 Gain:	10.2

MARK FLUID LEVEL

Seal and label container TS1

SEAL CONTAINER TS2

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	675.2
Initial Wt:	774.6
Final Wt:	797.5
2 Gain:	22.9
Colour:	CC

CONTAINER TS1a
Probe Rinse Residue

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #3 EMPTY	
Empty Wt:	623.2
Final Wt:	626.9
3 Gain:	3.7
Colour:	CC

SAMPLE IDENTIFICATION	17-21800-M26A-
TS1(Probe Rinse-Acetone)	—
TS2(Filter)	—
TS3(Impinger 1,2,3 Sol'n)	6

CONTAINER TS3 WEIGHTS	
Empty Wt:	423.5
With Imp. 1,2,3 Soln:	782.9
Imp. 1,2,3 Volume:	359.4
After Rinse:	900.6
Total TS3:	477.1

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 11/17

CWTR = 1+2+3: 162.4 ✓

WCBDA= 4: 10.2

B

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: OCT. 10/17

Test No.: BLANK 1

Test Location: UNIT 1

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #1 0.1 N H_2SO_4		
Empty Wt:	529.0	
Initial Wt:	629.3	
Final Wt:	629.3	
1 Gain:	0	
Colour:	CLEAR	

Impinger #4 Silica Gel		
Initial Wt:	947.0	
Final Wt:	947.0	
4 Gain:	0	

MARK FLUID LEVEL

Seal and label container TS1

SEAL CONTAINER TS2

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	675.1
Initial Wt:	777.6
Final Wt:	777.6
2 Gain:	0
Colour:	CLEAR

CONTAINER TS1a Probe Rinse Residue	
Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #3 EMPTY	
Empty Wt:	623.9
Final Wt:	623.9
3 Gain:	0
Colour:	—

SAMPLE IDENTIFICATION	17-21800-M26A -
TS1(Probe Rinse-Acetone)	—
TS2(Filter)	—
TS3(Impinger 1,2,3 Sol'n)	BLANK 1

CONTAINER TS3 WEIGHTS		
Empty Wt:	423.8	
With Imp. 1,2,3 Soln:	~~207.4~~ 631.2	
Imp. 1,2,3 Volume:	207.4	
After Rinse:	~~313.7~~ 737.5	
Total TS3:	313.7	

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 10/17

CWTR = 1+2+3:	0

WCBDA= 4:	0

Method 26A Recovery Sheet

Client : Covanta DYEC

Project No.: 21800

Date: OCT. 11/17

Test No.: BLANK 2

Test Location: UNIT 2

Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	Filter	Impingers 1, 2, 3	Impinger 4
	Filter ID:		

CONTAINER TS1	CONTAINER TS2	CONTAINER TS3

Container TS1 Weights	
Empty Wt:	
After Acetone Rinse:	
Total TS1:	

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #1 0.1 N H_2SO_4	
Empty Wt:	531.3
Initial Wt:	633.2
Final Wt:	633.2
1 Gain:	0
Colour:	CC

Impinger #4 Silica Gel	
Initial Wt:	875.1
Final Wt:	875.1
4 Gain:	0

MARK FLUID LEVEL

Seal and label container TS1

SEAL CONTAINER TS2

Impinger #2 0.1 N H_2SO_4	
Empty Wt:	673.1
Initial Wt:	777.7
Final Wt:	777.7
2 Gain:	0
Colour:	CC

CONTAINER TS1a
Probe Rinse Residue

Initial Wt:	
Post-Test Wt (1):	
Post-Test Wt (2):	
Post-Test Wt (3):	
Final Wt:	
Gain:	
Colour:	

Impinger #3 EMPTY	
Empty Wt:	620.2
Final Wt:	620.2
3 Gain:	0
Colour:	—

SAMPLE IDENTIFICATION	17-21800-M26A -
TS1(Probe Rinse-Acetone)	
TS2(Filter)	
TS3(Impinger 1,2,3 Sol'n)	Blank 2

CONTAINER TS3 WEIGHTS	
Empty Wt:	424.1
With Imp. 1,2,3 Soln:	626.6
Imp. 1,2,3 Volume:	~~725.7~~ 202.5
After Rinse:	725.7
Total TS3:	301.6

Train Loaded By: AN

Train Recovered By: AN

Recovery Witnessed By:

Date: OCT. 11/17

CWTR = 1+2+3: 0

WCBDA= 4: 0

APPENDIX 19

VOST Analytical Reports
(3 pages)

1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road
ALS WO#:	L2007472		Mississauga, ON L5J 2Y4
Date of Report	26-Oct-17		CANADA
Date of Sample Receipt	16-Oct-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 Covanta

COMMENTS: **VOCs via SW846 Method 5041A/8260B**

NS = Not spiked
E = indicates that compound response exceeds instrument calibration range of 2.0 ug for methylene chloride
Ketone data by VOST analyses are estimated values only

The absence of Trichlorotrifluorethane and 1,3-Butadiene was determined as an absence of a measurable peak at the expected masses for these compounds.

The results for Trichlorotrifluoroethane; 1,3-Butadiene; Isopropylbenzene; Dichlorodifluoromethane; Ethylene Dibromide; 1,3,5-trimethylbenzene are semi-quantitative due to being outside the normal volatility range for method 0030/0031.

For the sample 17-21800-VOST-(9A, 9B) TEST#3 PAIR#1 #1 APC OUTLET, the recovery of the d10-ethylbenzene field standard was anomolously high, indicating that there may be an interference present.

The following synonyms are noted:

Mesitylene	has been reported as:	1,3,5-Trimethylbenzene
Tetrachloroethylene	has been reported as:	Tetrachloroethene
Cumene	has been reported as:	Isopropylbenzene
1,1,2-Trichloroethylene	has been reported as:	Trichloroethene

Certified by:

Steve Kennedy
Technical Supervisor

ALS Environmental

Sample Analysis Summary Report

Instrument	MSD-3				Sample Matrix	VOST Tube											
Column	Rxi-624Sil MS 1426839				Analysis Units	ug/sample											
Acquisition Start Date	20-Oct-17																
Sample Name		**Laboratory Method Blank**	**Laboratory Control Sample**	**17-21800-VOST-(15A, 15B) TEST#1 FIELD BLANK #1 APC OUTLET**	**17-21800-VOST-(2A, 2B) TEST#1 PAIR#2 #1 APC OUTLET**	**17-21800-VOST-(3A, 3B) TEST#1 PAIR#3#1 APC OUTLET**	**17-21800-VOST-(7A, 7B) TEST#2 PAIR#3 #1 APC OUTLET**	**17-21800-VOST-(8A, 8B) TEST#2 PAIR#4 #1 APC OUTLET**	**17-21800-VOST-(10A, 10B) TEST#3 PAIR#2 #1 APC OUTLET**	**17-21800-VOST-(12A, 12B) TEST#3 PAIR#4 #1 APC OUTLET**	**17-21800-VOST-(17A, 17B) TEST#1 PAIR#2 #2 APC OUTLET**	**17-21800-VOST-(19A, 19B) TEST#1 PAIR#4 #2 APC OUTLET**	**17-21800-VOST-(22A, 22B) TEST#2 PAIR#3 #2 APC OUTLET**	**17-21800-VOST-(23A, 23B) TEST#2 PAIR#4 #2 APC OUTLET**	**17-21800-VOST-(25A, 25B) TEST#3 PAIR#2 #2 APC OUTLET**	**17-21800-VOST-(26A, 26B) TEST#3 PAIR#4 #2 APC OUTLET**	**Recovery Control Limits**
ALS Sample ID		WG2644539-1	WG2644539-2	L2007472-4	L2007472-2	L2007472-3	L2007472-6	L2007472-7	L2007472-9	L2007472-10	L2007472-14	L2007472-15	L2007472-17	L2007472-18	L2007472-21	L2007472-22	
Filename		17102006.D	17102005.D	17102007.D	17102008.D	17102009.D	17102010.D	17102011.D	17102012.D	17102013.D	17102014.D	17102015.D	17102016.D	17102017.D	17102018.D	17102019.D	
Dilution																	
Sampling date				10/12/2017	10/12/2017	10/12/2017	10/12/2017	10/12/2017	10/13/2017	10/13/2017	10/12/2017	10/12/2017	10/12/2017	10/12/2017	10/13/2017	10/13/2017	
Acquisition Time		10/20/2017 12:58	10/20/2017 12:19	10/20/2017 13:36	10/20/2017 14:01	10/20/2017 14:27	10/20/2017 14:52	10/20/2017 15:17	10/20/2017 15:42	10/20/2017 16:08	10/20/2017 16:33	10/20/2017 16:58	10/20/2017 17:24	10/20/2017 17:49	10/20/2017 18:14	10/20/2017 18:39	
Target Analyte	**RL ug/sample**	**Conc. ug/sample**	**% Rec**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	
Dichlorodifluoromethane	0.02	<0.02	114	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Vinyl Chloride	0.02	<0.02	98	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Bromomethane	0.09	<0.09	138	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	
Trichlorofluoromethane	0.02	<0.02	105	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
1,1-Dichloroethene	0.01	<0.01	89	<0.01	<0.01	<0.01	0.093	0.097	<0.01	<0.01	<0.01	<0.01	<0.01	0.090	<0.01	<0.01	
Acetone	0.1	<0.1	117	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Methylene Chloride	0.1	<0.1	91	<0.1	0.138	<0.1	0.249	<0.1	0.173	<0.1	2.80 E	0.478	<0.1	<0.1	<0.1	<0.1	
trans,1,2-Dichloroethene	0.01	<0.01	97	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
2-Butanone	0.01	<0.01	129	0.038	0.032	0.011	0.018	0.012	0.014	<0.01	0.019	0.030	0.024	0.039	0.050	0.015	
Chloroform	0.01	<0.01	100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	
1,1,1-Trichloroethane	0.01	<0.01	109	<0.01	<0.01	<0.01	0.040	0.040	<0.01	<0.01	<0.01	<0.01	<0.01	0.072	<0.01	<0.01	
Carbon Tetrachloride	0.01	<0.01	121	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Benzene	0.05	<0.05	89	<0.05	0.051	<0.05	0.065	<0.05	<0.05	<0.05	<0.05	<0.05	0.057	0.051	0.223	<0.05	
1,2-Dichloroethane	0.01	<0.01	104	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Trichloroethene	0.01	<0.01	104	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
1,2-Dichloropropane	0.01	<0.01	90	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Bromodichloromethane	0.01	<0.01	115	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Toluene	0.05	<0.05	80	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Tetrachloroethene	0.01	<0.01	94	<0.01	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	
Chlorodibromomethane	0.01	<0.01	95	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Ethylene Dibromide	0.02	<0.02	95	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Ethylbenzene	0.01	<0.01	83	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
M&P-Xylene	0.03	<0.03	83	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
O-Xylene	0.01	<0.01	84	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Styrene	0.02	<0.02	78	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.275	<0.02	
Bromoform	0.01	<0.01	110	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Isopropylbenzene	0.02	<0.02	83	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
1,3,5-Trimethylbenzene	0.02	<0.02	81	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Trichlorotrifluoroethane	0.05	<0.05	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
1,3-Butadiene	0.05	<0.05	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Field Standard		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	
d10-Ethylbenzene		63	87	106	69	68	48	08	55	30	133	64	74	128	78	50	
Surrogate Standards		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
d4-1,2-Dichloroethane		104	95	104	106	106	104	103	104	106	106	103	104	103	102	97	50-150
d8-Toluene		90	91	90	88	89	86	90	89	92	93	89	91	92	79	90	50-150
4-Bromofluorobenzene		102	111	98	99	96	98	94	97	87	99	98	98	92	95	94	50-150
Internal Standards		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
Bromochloromethane		130	118	87	95	96	99	92	97	91	94	98	102	92	101	116	50-200
1,4-Difluorobenzene		163	125	106	113	113	116	109	115	108	110	118	120	110	122	140	50-200
d5-Chlorobenzene		167	119	108	116	115	121	107	117	102	109	120	120	105	137	137	50-200

NS indicates that compound was not spiked

E indicates that compound response exceeds instrument calibration range of 2.0 ug for methylene chloride

ALS Environmental

Sample Analysis Summary Report

Instrument MSD-3
Column Rxi-624Sil MS 1426839
Acquisition Start Date 18-Oct-17

Sample Matrix VOST Tube
Analysis Units ug/sample

Sample Name		Laboratory Method Blank	Laboratory Control Sample	17-21800-VOST-(14A, 41B) TRIP BLANK #1 APC OUTLET	17-21800-VOST-(13A, 13B) FIELD BLANK #1 APC OUTLET	17-21800-VOST-(30A, 30B) TEST#2 FIELD BLANK #2 APC OUTLET	17-21800-VOST-(1A, 1B) TEST#1 PAIR#1 #1 APC OUTLET	17-21800-VOST-(5A, 5B) TEST#2 PAIR#1 #1 APC OUTLET	17-21800-VOST-(9A, 9B) TEST#3 PAIR#1 #1 APC OUTLET	17-21800-VOST-(16A, 16B) TEST#1 PAIR#1 #2 APC OUTLET	17-21800-VOST-(20A, 20B) TEST#2 PAIR#1 #2 APC OUTLET	17-21800-VOST-(24A, 24B) TEST#3 PAIR#1 #2 APC OUTLET	Recovery Control Limits
ALS Sample ID		WG2642312-1	WG2642312-2	L2007472-12	L2007472-11	L2007472-19	L2007472-1	L2007472-5	L2007472-8	L2007472-13	L2007472-16	L2007472-20	
Filename		17101805.D	17101804.D	17101806.D	17101807.D	17101808.D	17101809.D	17101810.D	17101811.D	17101812.D	17101813.D	17101814.D	
Dilution													
Sampling date				10/13/2017	10/13/2017	10/12/2017	10/12/2017	10/12/2017	10/13/2017	10/12/2017	10/12/2017	10/13/2017	
Acquisition Time		10/18/2017 12:38	10/18/2017 12:00	10/18/2017 13:03	10/18/2017 13:29	10/18/2017 13:54	10/18/2017 14:19	10/18/2017 14:45	10/18/2017 15:10	10/18/2017 15:36	10/18/2017 16:01	10/18/2017 16:26	
Target Analyte	**RL ug/sample**	**Conc. ug/sample**	**% Rec**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	
Dichlorodifluoromethane	0.02	<0.02	130	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Vinyl Chloride	0.02	<0.02	101	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Bromomethane	0.09	<0.09	101	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	
Trichlorofluoromethane	0.02	<0.02	114	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
1,1-Dichloroethene	0.01	<0.01	78	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Acetone	0.1	<0.1	66	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.165	<0.1	<0.1	
Methylene Chloride	0.1	<0.1	77	<0.1	<0.1	<0.1	1.716	0.133	0.153	1.545	<0.1	<0.1	
trans,1,2-Dichloroethene	0.01	<0.01	65	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
2-Butanone	0.01	<0.01	51	<0.01	0.012	<0.01	<0.01	<0.01	0.041	0.027	0.033	0.033	
Chloroform	0.01	<0.01	66	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
1,1,1-Trichloroethane	0.01	<0.01	75	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Carbon Tetrachloride	0.01	<0.01	102	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Benzene	0.05	<0.05	90	<0.05	<0.05	<0.05	0.090	<0.05	0.240	<0.05	0.149	<0.05	
1,2-Dichloroethane	0.01	<0.01	76	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Trichloroethene	0.01	<0.01	99	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
1,2-Dichloropropane	0.01	<0.01	91	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Bromodichloromethane	0.01	<0.01	95	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Toluene	0.05	<0.05	74	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.106	<0.05	<0.05	
Tetrachloroethene	0.01	<0.01	77	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.017	
Chlorodibromomethane	0.01	<0.01	82	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Ethylene Dibromide	0.02	<0.02	80	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Ethylbenzene	0.01	<0.01	86	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	
M&P-Xylene	0.03	<0.03	90	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.038	<0.03	<0.03	
O-Xylene	0.01	<0.01	90	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	
Styrene	0.02	<0.02	80	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Bromoform	0.01	<0.01	76	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Isopropylbenzene	0.02	<0.02	88	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
1,3,5-Trimethylbenzene	0.02	<0.02	89	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Trichlorotrifluoroethane	0.05	<0.05	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
1,3-Butadiene	0.05	<0.05	NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Field Standard		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	
d10-Ethylbenzene		92	118	98	108	104	85	83	404	80	84	94	
Surrogate Standards		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
d4-1,2-Dichloroethane		113	86	113	117	119	119	118	114	115	119	119	50-150
d8-Toluene		92	95	94	93	93	90	90	81	94	91	97	50-150
4-Bromofluorobenzene		98	113	94	91	93	100	98	98	95	105	98	50-150
Internal Standards		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
Bromochloromethane		92	105	86	93	98	70	79	81	104	85	93	50-200
1,4-Difluorobenzene		112	94	105	106	113	102	96	94	115	99	106	50-200
d5-Chlorobenzene		111	89	102	101	109	106	97	107	113	101	102	50-200

NS indicates that compound was not spiked

APPENDIX 20

Aldehydes Recovery Data Sheets
(8 page)

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	1
Test Location:	~~APC~~ OUTLET 1 UNIT
Test Date:	OCT 12/17

Impingers 1, 2, 3 & 4

Sample ID:

Impinger 1 (15 ml DNPH)	
Empty Mass:	97.6
Initial Mass:	113.2
Final Mass:	116.6
Gain:	3.4

Imp. 1, 2 and 3 plus rinsings	
Colour:	Yellow
Bottle empty:	115.9
Mass with impingers:	148.3
With DNPH rinse:	155.9
With ~~Hexane~~ Toluene rinse:	160.3
Total sample:	44.4

Impinger 2 (15 ml DNPH)	
Empty Mass:	99.5
Initial Mass:	114.7
Final Mass:	114.7
Gain:	0.0

Impinger 3 (Empty)	
Initial Mass:	86.5
Final Mass:	86.6
Gain:	0.1

Impinger 4 (Silica Gel)	
Initial Mass:	109.1
Final Mass:	109.8
Gain:	0.7

B

Total Moisture Gain:	4.2 ✓

Train Loaded By:	AN
Train Recovered By:	RM
Recovery Witnessed By:	MA
Date:	OCT 12/17

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	2
Test Location:	UNIT #1 OUTLET
Test Date:	OCT 12/17

Impingers 1, 2, 3 & 4

Sample ID: 17-21800-M430-2

Impinger 1 (15 ml DNPH)	
Empty Mass:	98.5
Initial Mass:	109.8
Final Mass:	112.9
Gain:	3.1

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	116.3
Mass with impingers:	143.1
With DNPH rinse:	157.2
With Hexane rinse:	167.4
Total sample:	51.1

Impinger 2 (15 ml DNPH)	
Empty Mass:	100.3
Initial Mass:	113.2
Final Mass:	112.7
Gain:	-0.5

Impinger 3 (Empty)	
Initial Mass:	87.2
Final Mass:	87.0
Gain:	-0.2

Impinger 4 (Silica Gel)	
Initial Mass:	109.7
Final Mass:	111.1
Gain:	1.4

Total Moisture Gain:	3.8 ✓

Train Loaded By:	DM
Train Recovered By:	DM
Recovery Witnessed By:	—
Date:	OCT 12/17

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	3
Test Location:	OUTLET UNIT 1
Test Date:	OCT 13/17

Impingers 1, 2, 3 & 4

Sample ID:	3

Impinger 1 (15 ml DNPH)	
Empty Mass:	98.4
Initial Mass:	113.4
Final Mass:	116.6
Gain:	3.2

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	115.9
Mass with impingers:	146.6
With DNPH rinse:	158.8
With Hexane rinse:	167.8
Total sample:	51.9

Impinger 2 (15 ml DNPH)	
Empty Mass:	100.3
Initial Mass:	113.7
Final Mass:	113.3
Gain:	-0.4

Impinger 3 (Empty)	
Initial Mass:	87.2
Final Mass:	86.8
Gain:	+0.4

Impinger 4 (Silica Gel)	
Initial Mass:	111.1
Final Mass:	112.5
Gain:	1.4

Total Moisture Gain:	3.8 ✓

Train Loaded By:	RM
Train Recovered By:	RM
Recovery Witnessed By:	—
Date:	OCT 13/17

B

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	1
Test Location:	UNIT #2 - OUTLET
Test Date:	OCTOBER 12, 2017

Impingers 1, 2, 3 & 4

Sample ID: 17-21800-M430-4

Impinger 1 (15 ml DNPH)	
Empty Mass:	99.0
Initial Mass:	115.3
Final Mass:	119.6
Gain:	~~YELLOW~~ 4.3

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	115.0
Mass with impingers:	150.0
With DNPH rinse:	163.8
With ~~Hexane~~ Toluene rinse:	176.0
Total sample:	61.0

Impinger 2 (15 ml DNPH)	
Empty Mass:	86.3
Initial Mass:	101.5
Final Mass:	101.5
Gain:	YELLOW 0

Impinger 3 (Empty)	
Initial Mass:	98.9
Final Mass:	98.9 0
Gain:	~~0~~

D

Impinger 4 (Silica Gel)	
Initial Mass:	117.3
Final Mass:	117.7
Gain:	0.4

Total Moisture Gain:	4.7 ✓

Train Loaded By:	AN
Train Recovered By:	JG
Recovery Witnessed By:	
Date:	OCTOBER 12, 2017.

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	2
Test Location:	UNIT #2 OUTLET
Test Date:	OCTOBER 12, 2017

Impingers 1, 2, 3 & 4

Sample ID:

Impinger 1 (15 ml DNPH)	
Empty Mass:	99.3
Initial Mass:	117.0
Final Mass:	121.0
Gain:	4.0

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	118.8
Mass with impingers:	154.3
With DNPH rinse:	172.7
With ~~Hexane~~ TOLUENE rinse:	186.5
Total sample:	627

Impinger 2 (15 ml DNPH)	
Empty Mass:	86.8
Initial Mass:	101.3
Final Mass:	100.9
Gain:	-0.4

Impinger 3 (Empty)	
Initial Mass:	99.2
Final Mass:	99.1
Gain:	-0.1

Impinger 4 (Silica Gel)	
Initial Mass:	117.7
Final Mass:	118.7
Gain:	1.0

Total Moisture Gain:	4.5 ✓

Train Loaded By:	JG
Train Recovered By:	JG
Recovery Witnessed By:	
Date:	OCTOBER 12, 2017

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	3
Test Location:	UNIT 2 OUTLET
Test Date:	OCTOBER 13, 2017.

Impingers 1, 2, 3 & 4	Sample ID: 17-21800-M430-6

Impinger 1 (15 ml DNPH)	
Empty Mass:	99.4
Initial Mass:	116.7
Final Mass:	119.8
Gain:	3.1

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	115.6
Mass with impingers:	152.2
With DNPH rinse:	164.9
With ~~Hexane~~ Toluene rinse:	180.3
Total sample:	64.7

Impinger 2 (15 ml DNPH)	
Empty Mass:	87.0
Initial Mass:	103.3
Final Mass:	103.5
Gain:	0.2

Impinger 3 (Empty)	
Initial Mass:	99.2
Final Mass:	99.1
Gain:	-.1

Impinger 4 (Silica Gel)	
Initial Mass:	118.7
Final Mass:	119.7
Gain:	1.0

Total Moisture Gain:	4.2 ✓

Train Loaded By:	JG
Train Recovered By:	JG
Recovery Witnessed By:	
Date:	OCTOBER 13, 2017.

D

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	BLANK 1
Test Location:	OUTLET UNIT 1
Test Date:	OCT 13/17

Impingers 1, 2, 3 & 4

Sample ID: BLANK 1

Impinger 1 (15 ml DNPH)	
Empty Mass:	97.7
Initial Mass:	113.4
Final Mass:	113.4
Gain:	0

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	116.9
Mass with impingers:	147.1
With DNPH rinse:	160.0
With Hexane rinse:	180.2
Total sample:	

Impinger 2 (15 ml DNPH)	
Empty Mass:	99.5
Initial Mass:	115.0
Final Mass:	115.0
Gain:	0

Impinger 3 (Empty)	
Initial Mass:	86.5
Final Mass:	86.5
Gain:	0

Impinger 4 (Silica Gel)	
Initial Mass:	109.9
Final Mass:	109.9
Gain:	0

Total Moisture Gain: 0

Train Loaded By: RM

Train Recovered By: RM

Recovery Witnessed By: —

Date: OCT 13/17

Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21800
Test No.:	OUTLET UNIT 2
Test Location:	BLANK 2
Test Date:	OCT 12/17

Impingers 1, 2, 3 & 4

Sample ID:

Impinger 1 (15 ml DNPH)	
Empty Mass:	98.5
Initial Mass:	114.0
Final Mass:	114.0
Gain:	✓

Imp. 1, 2 and 3 plus rinsings	
Colour:	YELLOW
Bottle empty:	116.0
Mass with impingers:	144.2
With DNPH rinse:	157.5
With Hexane rinse:	172.0
Total sample:	56.0

Impinger 2 (15 ml DNPH)	
Empty Mass:	100.2
Initial Mass:	114.0
Final Mass:	114.0
Gain:	✓

Impinger 3 (Empty)	
Initial Mass:	97.3
Final Mass:	97.3
Gain:	✓

Impinger 4 (Silica Gel)	
Initial Mass:	113.1
Final Mass:	113.1
Gain:	✓

Total Moisture Gain:	✓

Train Loaded By:	RM
Train Recovered By:	RM
Recovery Witnessed By:	—
Date:	OCT 12/17

APPENDIX 21

Aldehydes Analytical Reports
(16 pages)

ALS Environmental

27-Oct-2017

Rachael Stolys
ALS
1435 Norjohn Court
Unit 1
Burlington, Ontario L7L0E6

Tel: (905) 331-3111
Fax:

Re: 21800- Covanta Work Order: **1710662**

Dear Rachael,

ALS Environmental received 9 samples on 18-Oct-2017 09:40 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 16.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 27-Oct-17

Client: ALS
Project: 21800- Covanta
Work Order: 1710662

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1710662-01	17-21800-M430-TEST 1 (#1 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-02	17-21800-M430-TEST 2 (#1 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-03	17-21800-M430-TEST 3 (#1 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-04	17-21800-M430-BLANK 1 (#1 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-05	17-21800-M430-TEST 4 (#2 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-06	17-21800-M430-TEST 5 (#2 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-07	17-21800-M430-TEST 6 (#2 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-08	17-21800-M430-BLANK 2 (#2 APC OUTLET)	Air		10/18/2017	10/18/2017 09:40	☐
1710662-09	17-21800-M430-TRIP SPIKE	Air		10/18/2017	10/18/2017 09:40	☐

Client:	ALS
Project:	21800- Covanta
Work Order:	1710662

Case Narrative

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

Trip Spike:
1710662-09A (@ 8 ug/sample)
Acetald 9.86%
Form 52.12 %
Acrolein 0%

1710662-09A DUP (@ 80 ug/sample)
Acetald 1.01%
Form 75.07 %

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TEST 1 (#1 APC OUTLET)
Lab ID: 1710662-01
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**0.74**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**0.73**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TEST 2 (#1 APC OUTLET)
Lab ID: 1710662-02
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**0.75**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**1.4**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TEST 3 (#1 APC OUTLET)
Lab ID: 1710662-03
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**0.77**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**1.4**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-BLANK 1 (#1 APC OUTLET)
Lab ID: 1710662-04
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**0.82**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**0.97**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TEST 4 (#2 APC OUTLET)
Lab ID: 1710662-05
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**1.1**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**1.6**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TEST 5 (#2 APC OUTLET)
Lab ID: 1710662-06
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			CARB430		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**1.1**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**1.7**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TEST 6 (#2 APC OUTLET)
Lab ID: 1710662-07
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**1.4**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**1.8**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-BLANK 2 (#2 APC OUTLET)
Lab ID: 1710662-08
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**0.49**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		10	µg/sample	10	10/25/2017 10:54 AM
formaldehyde	**0.88**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: *27-Oct-17*

Client: ALS
Project: 21800- Covanta
Work Order: 1710662
Sample ID: 17-21800-M430-TRIP SPIKE
Lab ID: 1710662-09
Collection Date: 10/18/2017
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
ALDEHYDES BY CARB 430			**CARB430**		Prep Date: **10/24/2017**	Analyst: **MHW**
Acetaldehyde	**0.79**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM
Acrolein	ND		20	µg/sample	20	10/25/2017 10:54 AM
formaldehyde	**4.2**		**0.20**	**µg/sample**	1	10/25/2017 10:54 AM

Note:

ALS Environmental

Date: 27-Oct-17

Client: ALS

Work Order: 1710662

Project: 21800- Covanta

QC BATCH REPORT

Batch ID: **46579** Instrument ID: **HPLC2** Method: **CARB430**

MBLK Sample ID: **MBLK-46579-46579** Units: **µg/sample** Analysis Date: **10/25/2017 10:54 AM**

Client ID: Run ID: **HPLC2_171025A** SeqNo: **1623133** Prep Date: **10/24/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	ND	0.20								
Acrolein	ND	1.0								
formaldehyde	ND	0.20								

LCS Sample ID: **LCS-46579-46579** Units: **µg/sample** Analysis Date: **10/25/2017 10:54 AM**

Client ID: Run ID: **HPLC2_171025A** SeqNo: **1623134** Prep Date: **10/24/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	2.02	0.20	2	0	101	70-130	0			
formaldehyde	1.878	0.20	2	0	93.9	70-130	0			

LCSD Sample ID: **LCSD-46579-46579** Units: **µg/sample** Analysis Date: **10/25/2017 10:54 AM**

Client ID: Run ID: **HPLC2_171025A** SeqNo: **1623145** Prep Date: **10/24/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acetaldehyde	2.404	0.20	2	0	120	70-130	2.02	17.4	20	
formaldehyde	2.267	0.20	2	0	113	70-130	1.878	18.8	20	

The following samples were analyzed in this batch:

1710662-01A	1710662-02A	1710662-03A
1710662-04A	1710662-05A	1710662-06A
1710662-07A	1710662-08A	1710662-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: *27-Oct-17*

Analytical Comments

Client: ALS
Project: 21800- Covanta
Work Order: 1710662

Method	Type:	SampID	SeqNo	Analysis	Comments
Batch 46579					
	Prep	1710662-01A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 3mL
	Prep	1710662-02A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 10mL
	Prep	1710662-03A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 10mL
	Prep	1710662-04A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 24mL
	Prep	1710662-05A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 13mL
	Prep	1710662-06A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 10mL
	Prep	1710662-07A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 12mL
	Prep	1710662-08A	0	Prep analyte(s) Liquid Chromatography	Toluene layer: 11mL

Client: ALS
Project: 21800- Covanta
WorkOrder: 1710662

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/sample	

ALS Environmental

Sample Receipt Checklist

Client Name: **ALS-BURLINGTON** Date/Time Received: **18-Oct-17 09:40**

Work Order: **1710662** Received by: **SNH**

Checklist completed by: Shawn Smythe 18-Oct-17 Reviewed by: Shawn Smythe 18-Oct-17

eSignature | Date | eSignature | Date

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.4		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

APPENDIX 22

SVOC and VOST Proof Data
(7 pages)

ALS Life Sciences
1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Rachael Stolys	**Client Name:**	ORTECH Environmental
ALS Project ID:	ORT100	**Client Address:**	804 Southdown Road Mississauga, ON L5J 2Y4 CANADA
ALS WO#:	L1988306		
Date of Report	29-Sep-17	**Client Contact:**	Chris Belore
		Client Project ID:	21800 Covanta

COMMENTS:

Toxic PCB Congeners by GC/HRMS (EPA 1668C)
PCDD/F by EPA M23
Chlorophenols as acetate derivatives by SIM GC/MS
CB by LRGC/MS - Isotope dilution
PAH by CARB method 429 (LR option)- Isotope dilution
VOCs via SW846 Method 5041A/8260B

Certified by:

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

ALS Life sciences

Sample Analysis summary Report

Sample Name	GLASSWARE PROOF (1 OF 2)	GLASSWARE PROOF (2 OF 2)
ALS Sample ID	L1988306-37	L1988306-38
Sample Size	1	1
Sample size units	proof	proof
Percent Moisture	n/a	n/a
Sample Matrix	Media Prep	Media Prep
Sampling Date	n/a	n/a
Extraction Date	27-Sep-17	27-Sep-17
Polychlorinated Dibenzo(p)dioxins	**pg**	**pg**
PCB-81	<0.73	2.80
PCB-77	<0.85	4.37
PCB-123	<0.98	<0.89
PCB-118	<0.82	<8.2
PCB-114	<0.92	<0.81
PCB-105	<0.90	5.39
PCB-126	<1.0	<2.7
PCB-167	<0.95	<1.9
PCB-156	<0.99	<1.8
PCB-157	<1.1	<1.8
PCB-169	<1.1	<1.9
PCB-189	<0.46	<0.95
Field Spikes	**% Rec**	**% Rec**
13C12-PCB-95	NS	NS
13C12-PCB-153	NS	NS
Extraction Standards		
13C12-PCB-81	79	58
13C12-PCB-77	81	63
13C12-PCB-123	76	65
13C12-PCB-118	81	57
13C12-PCB-114	77	62
13C12-PCB-105	78	62
13C12-PCB-126	77	63
13C12-PCB-167	81	57
13C12-PCB-156	79	59
13C12-PCB-157	76	57
13C12-PCB-169	79	61
13C12-PCB-189	88	72
Cleanup Standards		
13C12-PCB-28	NS	NS
13C12-PCB-111	NS	NS
Toxic Equivalency (WHO 2005)		
Lower Bound PCB TEQ	0.00	0.00144
Mid Point PCB TEQ	0.0668	0.300
Upper Bound PCB TEQ	0.134	0.329

ALS Life sciences

Sample Analysis summary Report

Sample Name	GLASSWARE PROOF (1 OF 2)	GLASSWARE PROOF (2 OF 2)
ALS Sample ID	L1988306-37	L1988306-38
Sample Size	1	1
Sample size units	Proof	Proof
Percent Moisture	n/a	n/a
Sample Matrix	Media Prep	Media Prep
Sampling Date	n/a	n/a
Extraction Date	27-Sep-17	27-Sep-17
Target Analytes	**pg**	**pg**
2,3,7,8-TCDD	<0.60	<3.4
1,2,3,7,8-PeCDD	<0.36	<2.1
1,2,3,4,7,8-HxCDD	<0.47	<3.0
1,2,3,6,7,8-HxCDD	<0.37	<2.3
1,2,3,7,8,9-HxCDD	<0.41	<2.6
1,2,3,4,6,7,8-HpCDD	1.65	<2.1
OCDD	1.65	<4.0
2,3,7,8-TCDF	<0.36	<2.5
1,2,3,7,8-PeCDF	<2.7	<2.6
2,3,4,7,8-PeCDF	<2.6	<2.5
1,2,3,4,7,8-HxCDF	<0.38	<1.6
1,2,3,6,7,8-HxCDF	<0.31	<1.3
2,3,4,6,7,8-HxCDF	<0.35	<1.5
1,2,3,7,8,9-HxCDF	<0.43	<1.8
1,2,3,4,6,7,8-HpCDF	0.460	<0.75
1,2,3,4,7,8,9-HpCDF	<0.23	<0.97
OCDF	0.810	<2.5
Field Spike Standards	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS
Extraction Standards		
13C12-2,3,7,8-TCDD	76	58
13C12-1,2,3,7,8-PeCDD	88	83
13C12-1,2,3,6,7,8-HxCDD	74	55
13C12-1,2,3,4,6,7,8-HpCDD	100	81
13C12-OCDD	101	81
13C12-2,3,7,8-TCDF	77	58
13C12-1,2,3,7,8-PeCDF	84	77
13C12-1,2,3,6,7,8-HxCDF	75	56
13C12-1,2,3,4,6,7,8-HpCDF	96	81
Cleanup Standard		
13C12-1,2,3,7,8,9-HxCDF	NS	NS
Homologue Group Totals	**pg**	**pg**
Total-TCDD	<0.60	<3.4
Total-PeCDD	<0.36	<2.1
Total-HxCDD	<0.47	<3.0
Total-HpCDD	1.65	<2.0
Total-TCDF	0.680	<2.5
Total-PeCDF	<2.7	<2.6
Total-HxCDF	1.06	<1.8
Total-HpCDF	0.460	<0.97
Toxic Equivalency - (WHO 2005)		
Lower Bound PCDD/F TEQ (WHO 2005)	0.0218	0.00
Mid Point PCDD/F TEQ (WHO 2005)	1.09	4.02
Upper Bound PCDD/F TEQ (WHO 2005)	2.15	8.03

ALS Environmental

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF (1 OF 2)		GLASSWARE PROOF (2 OF 2)	
ALS Sample ID	WG2626168-1		L1988306-37		L1988306-38	
Sample Size	1		1		1	
Sample units	sample		sample		sample	
Moisture Content	n/a		n/a		n/a	
Matrix	QC		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a	
Extraction Date	27-Sep-17		27-Sep-17		27-Sep-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**	
2-Chlorophenol	<40	U	<40	U	<40	U
3-Chlorophenol	<40	U	<40	U	<40	U
4-Chlorophenol	<40	U	<40	U	<40	U
2,6-Dichlorophenol	<40	U	<40	U	<40	U
2,4/2,5-Dichlorophenol	<40	U	<40	U	<40	U
3,5-Dichlorophenol	<40	U	<40	U	<40	U
2,3-Dichlorophenol	<40	U	<40	U	<40	U
3,4-Dichlorophenol	<40	U	<40	U	<40	U
2,4,6-Trichlorophenol	<40	U	<40	U	<40	U
2,3,6-Trichlorophenol	<40	U	<40	U	<40	U
2,3,5-Trichlorophenol	<40	U	<40	U	<40	U
2,4,5-Trichlorophenol	<40	U	<40	U	<40	U
2,3,4-Trichlorophenol	<40	U	<40	U	<40	U
3,4,5-Trichlorophenol	<40	U	<40	U	<40	U
2,3,5,6/2,3,4,6-Tetrachlorophenol	<40	U	<40	U	<40	U
2,3,4,5-Tetrachlorophenol	<40	U	<40	U	<40	U
Pentachlorophenol	<40	U	<40	U	<40	U
Extraction Standards	**% Rec**		**% Rec**		**% Rec**	
2-Fluorophenol	77		75		85	M
d5-Phenol	78		79		83	M
d4-2-Chlorophenol	80		78		83	
2,4,6-Tribromophenol	78		71		101	
13C-Pentachlorophenol	89		100		115	

U	Indicates that this compound was not detected above the LOR.
M	Indicates that a peak has been manually integrated.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank	GLASSWARE PROOF (1 OF 2)	GLASSWARE PROOF (2 OF 2)
ALS Sample ID	WG2626168-1	L1988306-37	L1988306-38
Sample Size	1	1	1
Sample units	sample	sample	sample
Moisture Content	n/a	n/a	n/a
Matrix	QC	Media Prep	Media Prep
Sampling Date	n/a	n/a	n/a
Extraction Date	27-Sep-17	27-Sep-17	27-Sep-17
Target Analytes	**ng/sample**	**ng/sample**	**ng/sample**
Chlorobenzene	<8 U	<8 U	<8 U
1,3-Dichlorobenzene	<8 U	<8 U	<8 U
1,4-Dichlorobenzene	<8 U	<8 U	<8 U
1,2-Dichlorobenzene	<8 U	<8 U	<8 U
1,3,5-Trichlorobenzene	<8 U	<8 U	<8 U
1,2,4-Trichlorobenzene	<8 U	<8 U	<8 U
1,2,3-Trichlorobenzene	<8 U	<8 U	<8 U
1,2,3,5/1,2,4,5-Tetrachlorobenzene	<8 U	<8 U	<8 U
1,2,3,4-Tetrachlorobenzene	<8 U	<8 U	<8 U
Pentachlorobenzene	<8 U	<8 U	<8 U
Hexachlorobenzene	<8 U	<8 U	<8 U
Extraction Standards	**%Rec**	**%Rec**	**%Rec**
13C6-Chlorobenzene	65	52	72
13C6-1,4-Dichlorobenzene	70	71	82
13C6-1,2,3-Trichlorobenzene	60	65	74
13C6-1,2,3,4-Tetrachlorobenzene	48	51	51
13C6-Pentachlorobenzene	50	73	63
13C6-Hexachlorobenzene	104	96	115

U Indicates that this compound was not detected above the LOD.
M Indicates that a peak has been manually integrated.

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	Method Blank		GLASSWARE PROOF (1 OF 2)		GLASSWARE PROOF (2 OF 2)	
ALS Sample ID	WG2626168-1		L1988306-37		L1988306-38	
Sample Size	1		1		1	
Sample units	sample		sample		sample	
Moisture Content	n/a		n/a		n/a	
Matrix	QC		Media Prep		Media Prep	
Sampling Date	n/a		n/a		n/a	
Extraction Date	27-Sep-17		27-Sep-17		27-Sep-17	
Target Analytes	**ng/sample**		**ng/sample**		**ng/sample**	
Naphthalene	<8.0	U	<8.0	U	33.6	
2-Methylnaphthalene	<8.0	U	<8.0	U	<8.0	U
1-Methylnaphthalene	<8.0	U	<8.0	U	<8.0	U
Acenaphthylene	<8.0	U	<8.0	U	<8.0	U
Acenaphthene	<8.0	U	<8.0	U	<8.0	U
Fluorene	<8.0	U	<8.0	U	<8.0	U
Phenanthrene	<8.0	U	<8.0	U	<8.0	U
Anthracene	<8.0	U	<8.0	U	<8.0	U
Fluoranthene	<8.0	U	<8.0	U	<8.0	U
Pyrene	<8.0	U	<8.0	U	<8.0	U
Benzo(a)Anthracene	<8.0	U	<8.0	U	<8.0	U
Chrysene	<8.0	U	<8.0	U	<8.0	U
Benzo(b)Fluoranthene	<8.0	U	<8.0	U	<8.0	U
Benzo(k)Fluoranthene	<8.0	U	<8.0	U	11.6	M,R
Benzo(e)Pyrene	<8.0	U	<8.0	U	<8.0	U
Benzo(a)Pyrene	<8.0	U	<8.0	U	<8.0	U
Perylene	<8.0	U	<8.0	U	<8.0	U
Indeno(1,2,3-cd)Pyrene	<8.0	U	<8.0	U	<8.0	U
Dibenzo(a,h)Anthracene	<8.0	U	<8.0	U	<8.0	U
Benzo(g,h,i)Perylene	<8.0	U	<8.0	U	<8.0	U
Additional Analytes						
Tetralin	<8.0	U	<8.0	U	<8.0	U
Quinoline	<8.0	U	<8.0	U	<8.0	U
2-Chloronaphthalene	<8.0	U	<8.0	U	<8.0	U
Biphenyl	<8.0	U	<8.0	U	<8.0	U
o-Terphenyl	<8.0	U	<8.0	U	<8.0	U
1-Methylphenanthrene	<8.0	U	<8.0	U	<8.0	U
9-Methylphenanthrene	<8.0	U	<8.0	U	<8.0	U
2-methylanthracene	<8.0	U	<8.0	U	<8.0	U
9,10-dimethylanthracene	<8.0	U	<8.0	U	<8.0	U
m-terphenyl	<8.0	U	<8.0	U	<8.0	U
p-terphenyl	<8.0	U	<8.0	U	<8.0	U
Benzo(a)fluorene	<8.0	U	<8.0	U	<8.0	U
Benzo(b)fluorene	<8.0	U	<8.0	U	<8.0	U
Benzo(b)anthracene	<8.0	U	<8.0	U	<8.0	U
Benzo(j)fluoranthene	<8.0	U	<8.0	U	<8.0	U
7,12-Dimethylbenzo(a)anthracene	<8.0	U	<8.0	U	<8.0	U
3-Methylcholanthrene	<40	U	<40	U	<40	U
Dibenz(a,j)acridine	<40	U	<40	U	<40	U
7H-Dibenzo(c,g)carbazole	<40	U	<40	U	<40	U
Picene	<40	U	<40	U	<40	U
Dibenzo(a,e)pyrene	<40	U	<40	U	<40	U
dibenzo(a,i)pyrene	<40	U	<40	U	<40	U
Coronene	<40	U	<40	U	<40	U
Field Sampling Standards	**% Rec**		**% Rec**		**% Rec**	
1-Methylnaphthalene-D10						
Fluorene D10						
Terphenyl D14(Surr.)						
Extraction Standards	**% Rec**		**% Rec**		**% Rec**	
Naphthalene D8	89.6		96.1		101.9	
2-Methylnaphthalene-D10	88.3		96.5		100.2	
Acenaphthylene D8	83.8		90.9		93.6	
Phenanthrene D10	103.1		101.9		111.9	
Anthracene-D10	94.4		100.6		110.9	
Fluoranthene D10	85.8		93.5		104.3	
Benz(a)Anthracene-D12	76.7		88.7		99.3	
Chrysene D12	56.8		68		76.7	
Benzo(b)Fluoranthene-D12	85.4		96.6		101.2	
Benzo(k)Fluoranthene-D12	82.8		91.7		125.5	
Benzo(a)Pyrene D12	90.7		92.8		100.6	
Perylene D12	79.6		85.3		116.1	
Indeno(1,2,3,cd)Pyrene-D12	86.5		94.2		92.8	
Dibenz(a,h)Anthracene-D14	82		88.7		92.8	
Benzo(g,h,i)Perylene D12	87.6		91		87.5	

U Indicates that this compound was not detected above the LOD.

M Indicates that a peak has been manually integrated.

R Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.

ALS Environmental

Sample Analysis Summary Report

Instrument	MSD-3	Sample Matrix	VOST Tube
Column	Rxi-624Sil MS 1426839	Analysis Units	ug/sample
Acquisition Start Date	9/27/2017		

Sample Name		Laboratory Method Blank	VOST PROOF #1	VOST PROOF #2	VOST PROOF #3	Recovery Control Limtis
ALS Sample ID		WG2626390-1	L1988306-76	L1988306-77	L1988306-78	
Filename		17092703.D	17092704.D	17092705.D	17092706.D	
Dilution		n/a	n/a	n/a	n/a	
		Blank	sample	sample	sample	
Sampling date		n/a	n/a	n/a	n/a	
Acquisition Time		9/27/2017 14:37	9/27/2017 15:03	9/27/2017 15:28	9/27/2017 15:54	
Target Analyte	**RL ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	**Conc. ug/sample**	
Dichlorodifluoromethane	0.02	<0.02	<0.02	<0.02	<0.02	
Vinyl Chloride	0.02	<0.02	<0.02	<0.02	<0.02	
Bromomethane	0.09	<0.09	<0.09	<0.09	<0.09	
Trichlorofluoromethane	0.02	<0.02	<0.02	<0.02	<0.02	
1,1-Dichloroethene	0.01	<0.01	<0.01	<0.01	<0.01	
Acetone	0.1	<0.1	<0.1	<0.1	<0.1	
Methylene Chloride	0.1	<0.1	<0.1	<0.1	<0.1	
trans,1,2-Dichloroethene	0.01	<0.01	<0.01	<0.01	<0.01	
2-Butanone	0.01	<0.01	<0.01	<0.01	<0.01	
Chloroform	0.01	<0.01	<0.01	<0.01	<0.01	
1,1,1-Trichloroethane	0.01	<0.01	<0.01	<0.01	<0.01	
Carbon Tetrachloride	0.01	<0.01	<0.01	<0.01	<0.01	
Benzene	0.05	<0.05	<0.05	<0.05	<0.05	
1,2-Dichloroethane	0.01	<0.01	<0.01	<0.01	<0.01	
Trichloroethene	0.01	<0.01	<0.01	<0.01	<0.01	
1,2-Dichloropropane	0.01	<0.01	<0.01	<0.01	<0.01	
Bromodichloromethane	0.01	<0.01	<0.01	<0.01	<0.01	
Toluene	0.05	<0.05	<0.05	<0.05	<0.05	
Tetrachloroethene	0.01	<0.01	<0.01	<0.01	<0.01	
Chlorodibromomethane	0.01	<0.01	<0.01	<0.01	<0.01	
Ethylene Dibromide	0.02	<0.02	<0.02	<0.02	<0.02	
Ethylbenzene	0.01	<0.01	<0.01	<0.01	<0.01	
M&P-Xylene	0.03	<0.03	<0.03	<0.03	<0.03	
O-Xylene	0.01	<0.01	<0.01	<0.01	<0.01	
Styrene	0.02	<0.02	<0.02	<0.02	<0.02	
Bromoform	0.01	<0.01	<0.01	<0.01	<0.01	
Isopropylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	
1,3,5-Trimethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	
Trichlorotrifluoroethane	0.05	<0.05	<0.05	<0.05	<0.05	
1,3-Butadiene	0.05	<0.05	<0.05	<0.05	<0.05	
Field Standard		**% Rec**	**% Rec**	**% Rec**	**% Rec**	
d10-Ethylbenzene		120	102	101	101	
Surrogate Standards		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
d4-1,2-Dichloroethane		117	119	119	120	50-150
d8-Toluene		87	86	82	82	50-150
4-Bromofluorobenzene		91	92	90	91	50-150
Internal Standards		**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
Bromochloromethane		106	107	103	107	50-200
1,4-Difluorobenzene		139	135	133	133	50-200
d5-Chlorobenzene		126	123	124	126	50-200

APPENDIX 23

ORTECH Equipment Calibration Data
(44 pages)

ORTECH Environmental
Pitot Tube Calibration

Date	January 24, 2017
Probe/Pitot ID	S6
MII Number	B03767
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.19	0.125	0.175	0.845	0.0012
(0.25")	9.09	0.200	0.280	0.845	0.0012
	10.95	0.290	0.410	0.841	0.0030
	13.41	0.435	0.610	0.844	0.0005
	15.35	0.570	0.800	0.844	0.0001
			Mean	0.844	0.0012
Without Nozzle	7.04	0.120	0.165	0.852	0.0043
	9.09	0.200	0.275	0.852	0.0043
	10.86	0.285	0.400	0.844	0.0044
	13.33	0.430	0.600	0.846	0.0019
	14.80	0.530	0.740	0.846	0.0022
			Mean	0.848	0.0034

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	January 24, 2017
Probe/Pitot ID	S7A
MII Number	COE20112
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.33	0.130	0.180	0.849	0.0025
(0.25")	9.09	0.200	0.275	0.852	0.0055
	11.14	0.300	0.420	0.845	0.0021
	13.49	0.440	0.620	0.842	0.0049
	14.80	0.530	0.740	0.846	0.0010
			Mean	0.847	0.0032
Without Nozzle	7.04	0.120	0.170	0.840	0.0020
	8.86	0.190	0.270	0.838	0.0033
	11.04	0.295	0.410	0.848	0.0061
	13.02	0.410	0.585	0.837	0.0050
	14.80	0.530	0.740	0.846	0.0041
			Mean	0.842	0.0041

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	January 24, 2017
Probe/Pitot ID	15E
MII Number	COE 20113
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.19	0.125	0.175	0.845	0.0021
(0.25")	9.09	0.200	0.275	0.852	0.0056
	11.23	0.305	0.420	0.852	0.0049
	13.49	0.440	0.615	0.845	0.0014
	14.94	0.540	0.765	0.840	0.0071
			Mean	0.847	0.0042

Without Nozzle	7.19	0.125	0.175	0.845	0.0023
	9.09	0.200	0.280	0.845	0.0023
	11.14	0.300	0.410	0.855	0.0079
	13.49	0.440	0.610	0.849	0.0018
	15.08	0.550	0.775	0.842	0.0051
			Mean	0.847	0.0039

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	January 24, 2017
Probe/Pitot ID	15D
Mil Number	B03778
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	**93-T62-SP-012**

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.04	0.120	0.169	0.842	0.0045
(0.25")	8.86	0.190	0.262	0.851	0.0044
	11.23	0.305	0.430	0.842	0.0049
	13.64	0.450	0.625	0.848	0.0014
	15.08	0.550	0.760	0.850	0.0036
			Mean	0.847	0.0038
Without Nozzle	7.04	0.120	0.170	0.840	0.0059
	8.86	0.190	0.265	0.846	0.0007
	11.14	0.300	0.420	0.845	0.0009
	13.64	0.450	0.620	0.851	0.0059
	14.80	0.530	0.740	0.846	0.0002
			Mean	0.846	0.0027

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated. (Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental
Pitot Tube Calibration

Date	January 24, 2017
Probe/Pitot ID	SP6
Mil Number	COE20098
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Consulting Inc.
Calibrated By	Dan Turton
Signature	
Reviewed/Accepted By	

$$Cp = Cpstd * \sqrt{\frac{Pstd}{Ps}}$$

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H_2O Pstd	Velocity Head S-Type Pitot in. H_2O Ps	S-Type Pitot Coefficient Cp_s	Deviation From The Mean
With Nozzle	7.19	0.125	0.175	0.845	0.0017
(0.25")	8.86	0.190	0.265	0.846	0.0001
	10.95	0.290	0.405	0.846	0.0007
	13.02	0.410	0.560	0.855	0.0088
	14.80	0.530	0.750	0.840	0.0062
			Mean	0.846	0.0035
Without Nozzle	7.04	0.120	0.170	0.840	0.0030
	9.09	0.200	0.280	0.845	0.0020
	10.86	0.285	0.400	0.844	0.0010
	12.86	0.400	0.560	0.845	0.0020
	14.66	0.520	0.735	0.841	0.0020
			Mean	0.843	0.0020

Note: Pitots must always be used in the orientation that they are calibrated in (marked F for front and B for back).

Acceptance Criteria:
The Cp of Standard Pitots must be in the range of 0.99 ±0.01.
For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the Ontario Source Testing Code. If the pitot meets these measurement requirements it is assigned a Cp of 0.84. Otherwise, calculate the absolute differences between the average pitot tube coefficient and the coefficient obtained for each of the wind tunnel settings. The average of these differences must not exceed 0.01. Otherwise, the calibration must be repeated.
(Environment Canada Reference Method EPS 1/RM/8, Section 6).

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 4
Date	June 19, 2017
Barometric Pressure	29.26
System Leak Check	< .001 cfm @ 27"Hg

MII NUMBERS	
DGM	COE 20090
Gasometer	A01463
Barometer	COE20028

Calibrated By	J.Grollman
signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
88.00	23.30	64.70	3.043	21.0	618.703	621.850	3.147	85	0.8	95	0.993	6
88.10	23.10	65.00	3.058	21.0	612.446	615.583	3.137	82.5	0.8	75	0.996	6
87.70	22.90	64.80	3.048	21.0	615.583	618.703	3.120	85	0.8	95	1.003	6
86.70	22.80	63.90	3.006	21.0	621.850	624.893	3.043	87	1.8	78	1.015	4
87.70	23.50	64.20	3.020	21.0	624.893	627.971	3.078	87	1.8	78	1.008	4
87.70	22.90	64.80	3.048	21.0	627.971	631.070	3.099	87.5	1.8	79	1.012	4
87.80	21.50	66.30	3.119	21.0	631.070	634.243	3.173	86.5	3.4	79	1.005	3
87.20	20.70	66.50	3.128	21.0	634.243	637.419	3.176	87	3.4	80	1.008	3
87.20	20.40	66.80	3.142	21.0	637.419	640.607	3.188	88	3.4	79	1.011	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	1.006
BEFORE	0.979

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Omega DP 116
MII	COE 20090
Date	June 18, 2017
Calibrated By	J. Grollman
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	34	32	0.0
70		70	0.0
100		100	0.0
200		201	-0.5
250		251	-0.4
300		301	-0.3
400		399	0.3
500		498	0.4
600		600	0.0
700		701	-0.1
800		801	-0.1
900		901	-0.1
1000		1001	-0.1
1100		1101	-0.1
1200		1201	-0.1
1250		1251	-0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Manometer Calibration Data

Date	JUNE 18, 2017	Calibrated By	J. GROULX
Manometer Number	Team 4	Signature	
Manometer MII Number	COE 20090	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.875	NA	0.870	-0.6
0-1.0	0.535		0.531	-0.8
	0.235		0.236	0.4
	8.40		8.400	0.0
1.0-10.0	4.20		4.200	0.0
	1.53		1.520	-0.7

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 2
Date	July 12, 2017
Barometric Pressure	29.47
System Leak Check	< .001 cfm @ 21 "Hg

MII NUMBERS	
DGM	COE 20092
Gasometer	A01463
Barometer	COE20028

Calibrated By	Angela Nolan
Signature	Angela Nolan
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{\text{Vstd } ft^3}{\text{Vdgm } ft^3} \quad \frac{\text{Tdgm } ^\circ F+460}{\text{Tstd } ^\circ F+460} \quad \frac{\text{Pbar (in. Hg)}}{\text{(Pbar in. Hg+DGMPressure/13.6)}}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
80.30	20.00	60.30	2.836	23.5	407.775	410.614	2.839	75.5	0.7	75	1.000	6
84.20	26.20	58.00	2.728	23.5	410.614	413.326	2.712	74	0.7	73	1.004	6
83.70	24.20	59.50	2.799	23.5	415.452	418.261	2.809	74	0.7	73	0.994	6
84.70	20.30	64.40	3.029	23.5	418.415	421.445	3.030	74	1.8	73	0.995	4
85.10	20.80	64.30	3.025	23.5	421.445	424.474	3.029	74	1.8	73	0.994	4
84.30	20.00	64.30	3.025	23.5	424.474	427.500	3.026	74	1.8	73	0.995	4
85.50	20.40	65.10	3.062	23.5	427.645	430.712	3.067	74	3.3	73	0.990	3
85.50	20.20	65.30	3.072	23.5	430.712	433.764	3.052	74.5	3.3	74	0.999	3
86.00	20.60	65.40	3.076	23.5	433.764	436.839	3.075	74.5	3.3	74	0.993	3

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.996
BEFORE	0.986

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 2
MII	COE 20092
Date	July 12, 2017
Calibrated By	Angela Nolan
Signature	Angela Nolan
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	70		0.0
100	100		0.0
200	201		-0.5
250	252		-0.8
300	302		-0.7
400	400		0.0
500	500		0.0
600	602		-0.3
700	701		-0.1
800	801		-0.1
900	901		-0.1
1000	1002		-0.2
1100	1102		-0.2
1200	1203		-0.3
1250	1253		-0.2

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Manometer Calibration Data

Date	July 12, 2017	Calibrated By	Angela Nolan
Manometer Number	Team 2	Signature	Angela Nolan
Manometer MII Number	COE 20092	Reviewed and Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O Before Adjustment	Manometer Reading "H_2O After Adjustment	Reference Manometer Reading "H_2O	Percent Difference %
	0.250	NA	0.239	-4.6
0-1.0	0.579		0.562	-3.0
	0.921		0.913	-0.9
	2.19		2.19	0.0
1.0-10.0	5.17		5.17	0.0
	8.63		8.68	0.6

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 3
Date	July 12, 2017
Barometric Pressure	29.47
System Leak Check	<0.001 cfm @ 21 "Hg

MII NUMBERS	
DGM	COE 20093
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Angela Nolan
Signature	Angela Nolan
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
82.50	19.00	63.50	2.987	24.0	240.013	243.055	3.042	73	0.84	73	0.976	6
84.30	20.70	63.60	2.992	24.0	243.055	246.083	3.028	73	0.84	73	0.982	6
83.50	20.20	63.30	2.978	24.0	246.083	249.099	3.016	74	0.84	74	0.983	6
84.70	20.80	63.90	3.006	24.0	249.237	252.265	3.028	74	1.9	75	0.986	4
83.90	20.40	63.50	2.987	24.0	252.265	255.277	3.012	74.5	1.9	74	0.986	4
85.00	21.30	63.70	2.996	24.0	255.277	258.305	3.028	75.5	1.9	75	0.985	4
85.10	20.10	65.00	3.058	24.0	258.500	261.557	3.057	75.5	3.4	75	0.992	3
84.80	19.90	64.90	3.053	24.0	261.557	264.618	3.061	75.5	3.4	75	0.990	3
83.40	18.40	65.00	3.058	24.0	264.618	267.689	3.071	75.5	3.4	75	0.988	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.985
BEFORE	0.978

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 3
MII	COE 20093
Date	July 12, 2017
Calibrated By	~~Andrew Saikaley~~ Angela Nolan
Signature	Angela Nolan
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	69		1.4
100	99		1.0
200	200		0.0
250	250		0.0
300	300		0.0
400	399		0.3
500	498		0.4
600	600		0.0
700	701		-0.1
800	800		0.0
900	901		-0.1
1000	1001		-0.1
1100	1102		-0.2
1200	1202		-0.2
1250	1251		-0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Manometer Calibration Data

Date	July 12, 2017	Calibrated By	Angela Nolan
Manometer Number	Team 3	Signature	Angela Nolan
Manometer MII Number	COE 20093	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.281	NA	0.269	-4.5
0-1.0	0.533		0.528	-0.9
	0.841		0.837	-0.5
	2.10		2.07	-1.4
1.0-10.0	5.72		5.73	0.2
	8.31		8.32	0.1

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Team 1
Date	July 12, 2017
Barometric Pressure	29.44
System Leak Check	< .001 cfm @ 22 "Hg

MII NUMBERS	
DGM	COE 20094
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Angela Nolan
Signature	Angela Nolan
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Make sure to inspect pump before each calibration

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
84.40	22.60	61.80	2.907	23.5	351.054	354.017	2.963	78	0.75	76	0.986	6
84.20	22.90	61.30	2.884	23.5	354.017	356.925	2.908	74.5	0.75	73	0.990	6
83.40	21.90	61.50	2.893	23.5	356.925	359.864	2.939	75	0.75	74	0.984	6
85.50	20.30	65.20	3.067	23.5	360.037	363.141	3.104	75	1.9	74	0.985	4
84.40	19.20	65.20	3.067	23.5	363.141	366.236	3.095	74.5	1.9	74	0.987	4
84.30	19.10	65.20	3.067	23.5	366.236	369.323	3.087	74.5	1.9	74	0.989	4
84.30	20.10	64.20	3.020	23.5	369.607	372.650	3.043	74.5	3.4	74	0.984	3
82.90	12.10	70.80	3.330	23.5	372.650	375.997	3.347	74.5	3.4	74	0.987	3.33
84.20	20.60	63.60	2.992	23.5	375.997	379.000	3.003	74.5	3.4	74	0.988	3

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.987
BEFORE	0.983

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03 - J005**
Trendicator Type	**Team 1**
MII	**COE 20094**
Date	**July 12, 2017**
Calibrated By	**Angela Nolan**
Signature	Angela Nolan
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	**Tredicator Display Value**		**Percent Difference**
	Before Adjustment (°F)	**After Adjustment (°F)**	**(%)**
32	32	NA	0.0
70	70		0.0
100	100		0.0
200	201		-0.5
250	251		-0.4
300	302		-0.7
400	400		0.0
500	500		0.0
600	601		-0.2
700	700		0.0
800	800		0.0
900	900		0.0
1000	1000		0.0
1100	1100		0.0
1200	1200		0.0
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Manometer Calibration Data

Date	July 12, 2017	Calibrated By	Angela Nolan
Manometer Number	Team 1	Signature	Angela Nolan
Manometer MII Number	COE 20094	Reviewed/Accepted By	
Calibrated Against	Omega HHP		
MII Number	B02679		
Calibration Procedure	03 - J010		

Front Leg

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.252	NA	0.252	0.0
0-1.0	0.548		0.544	-0.7
	0.860		0.864	0.5
	2.15		2.13	-0.9
1.0-10.0	5.21		5.23	0.4
	8.07	V	8.04	-0.4

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Control Box #4
Date	September 7, 2017
Barometric Pressure	29.38
System Leak Check	< .001 cfm @ 25 "Hg

MII NUMBERS	
DGM	A04713
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Andrew Saikaley
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
82.80	14.70	68.10	3.203	23.0	208.815	212.105	3.290	79.5	0.6	75	0.983	6
82.90	15.40	67.50	3.175	23.0	212.105	215.397	3.292	82	0.6	77	0.979	6
82.80	15.70	67.10	3.156	23.0	215.397	218.672	3.275	83	0.6	78	0.980	6
81.80	19.60	62.20	2.926	23.0	218.672	221.733	3.061	86	1	80	0.976	4
81.90	19.00	62.90	2.959	23.0	221.733	224.835	3.102	86.5	1	80	0.975	4
82.70	19.70	63.00	2.963	23.0	224.835	227.944	3.109	88	1	81	0.977	4
82.90	21.50	61.40	2.888	23.0	227.944	230.970	3.026	89	1.7	82	0.978	3
83.10	20.80	62.30	2.931	23.0	230.970	234.053	3.083	89.5	1.7	82	0.975	3
82.60	20.00	62.60	2.945	23.0	234.053	237.153	3.100	91	1.7	83	0.977	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	0.978
BEFORE	1.006

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	OMEGA DP116
MII	A04713
Date	September 7, 2017
Calibrated By	Andrew Saikaley
Signature	
Reviewed and Accepted By	Angela Nolan

Fluke Calibrator Output (COE 20024) (°F)	Trendicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	NA	0.0
70	70		0.0
100	100		0.0
200	201		-0.5
250	251		-0.4
300	301		-0.3
400	400		0.0
500	499		0.2
600	601		-0.2
700	701		-0.1
800	800		0.0
900	900		0.0
1000	1001		-0.1
1100	1101		-0.1
1200	1201		-0.1
1250	1250		0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03 - J004
Meter Number	Control Box # 9
Date	July 19, 2017
Barometric Pressure	29.56
System Leak Check	<0.001 cfm @ 25"Hg

MII NUMBERS	
DGM	A12007
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Jarrad Forsyth
Signature	Jarrad Forsyth
Reviewed and Accepted By	Angela Nolan

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
83.60	18.20	65.40	3.076	23.5	674.128	677.172	3.044	84	0.6	81	1.027	6
83.50	18.90	64.60	3.039	23.5	679.160	682.185	3.025	86	0.6	82	1.025	6
83.40	18.70	64.70	3.043	23.5	682.185	685.212	3.027	87	0.6	83	1.028	6
83.50	19.50	64.00	3.011	23.5	689.979	693.004	3.025	90.5	1.4	85	1.022	4
83.40	19.40	64.00	3.011	23.5	693.004	696.047	3.043	91	1.4	86	1.017	4
83.25	19.65	63.60	2.992	23.5	696.047	699.068	3.021	91.5	1.4	86	1.019	4
83.30	20.00	63.30	2.978	23.5	704.430	707.442	3.012	94.5	2.5	88	1.020	3
83.30	20.20	63.10	2.968	23.5	707.442	710.445	3.003	94.5	2.5	88	1.019	3
83.40	20.30	63.10	2.968	23.5	710.445	713.466	3.021	95	2.5	89	1.014	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	1.021
BEFORE	1.005

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	**03 - J005**
Trendicator Type	**Omega DP116**
MII	**A12007**
Date	**July 19, 2017**
Calibrated By	**Jarrad Forsyth**
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°F)	**Tredicator Display Value**		**Percent Difference**
	Before Adjustment (°F)	**After Adjustment (°F)**	**(%)**
32	34	32	0.0
70		70	0.0
100		100	0.0
200		201	-0.5
250		252	-0.8
300		301	-0.3
400		399	0.3
500		499	0.2
600		600	0.0
700		700	0.0
800		800	0.0
900		900	0.0
1000		1000	0.0
1100		1101	-0.1
1200		1200	0.0
1250	1252	1250	0.0

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental
Dry Gas Meter Calibration Data

Calibration Procedure	03 -J004
Meter Number	Control Box#12
Date	July 17, 2017
Barometric Pressure	29.53
System Leak Check	<0.001 cfm @ 24"Hg

MII NUMBERS	
DGM	B03700
Gasometer	A01463
Barometer	COE 20028

Calibrated By	Jarrad Forsyth
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading ft^3		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°F	in. H_2O	°F	Factor	min.
83.70	22.00	61.70	2.902	24.0	594.555	597.535	2.980	91.5	0.7	94	1.002	6
83.80	22.10	61.70	2.902	24.0	597.535	600.511	2.976	91.5	0.7	94	1.003	6
83.30	21.70	61.60	2.898	24.0	600.511	603.494	2.983	91.5	0.7	94	0.999	6
84.10	19.20	64.90	3.053	24.0	568.485	571.591	3.106	88.5	1.65	91	1.003	4
84.20	21.40	62.80	2.954	24.0	571.591	574.598	3.007	89.5	1.55	92	1.005	4
84.00	21.30	62.70	2.949	24.0	574.598	577.592	2.994	89.5	1.55	91	1.008	4
83.80	20.80	63.00	2.963	24.0	582.655	585.670	3.015	91	2.75	94	1.005	3
83.80	20.55	63.25	2.975	24.0	585.670	588.689	3.019	91	2.75	94	1.008	3
83.65	20.50	63.15	2.971	24.0	588.689	591.727	3.038	92	2.75	95	1.002	3

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE	1.004
BEFORE	1.024

ORTECH Environmental
Trendicator Calibration

Calibration Procedure	**03 - J005**
Trendicator Type	**Omega DP116**
MII	**B03700**
Date	**July 17, 2017**
Calibrated By	**Jarrad Forsyth**
Signature	Jarrad Forsyth
Reviewed and Accepted By	Angela Nolan

Fluke Calibrator Output (COE 20024) (°F)	Tredicator Display Value		Percent Difference
	Before Adjustment (°F)	After Adjustment (°F)	(%)
32	32	32	0.0
70	69	70	0.0
100	99	100	0.0
200	201	201	-0.5
250	251	251	-0.4
300	301	301	-0.3
400	399	400	0.0
500	498	499	0.2
600	600	600	0.0
700	700	701	-0.1
800	800	800	0.0
900	900	900	0.0
1000	1001	1001	-0.1
1100	1101	1101	-0.1
1200	1201	1201	-0.1
1250	1250	1251	-0.1

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading})}{\text{micromite}} \times 100$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03-J004
Meter Number	M05498
Date	September 13, 2017
Barometric Pressure	29.38
System Leak Check	NDL @ 21' Hg

MII NUMBERS	
DGM	M05498
Gasometer	A01463
Barometer	COE 20028

Calibrated By	J. Grollman
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ ("Hg)}{(Pbar\ "Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
81.10	51.10	30.00	1.411	21.0	1316.51	1358.11	1.469	26.0	1.9	24.0	0.972	38	1.1
51.10	36.60	14.50	0.682	21.0	1358.11	1377.98	0.702	26.0	1.9	24.0	0.984	18	1.1
82.90	68.70	14.20	0.668	21.0	1377.98	1397.71	0.697	26.0	1.9	24.0	0.970	18	1.1
54.80	45.00	9.80	0.461	21.0	1303.14	1316.51	0.472	25.0	1.1	23.0	0.987	28	0.5
70.50	63.40	7.10	0.334	21.0	1281.66	1291.50	0.347	24.0	1.1	23.0	0.968	21	0.5
63.40	54.80	8.60	0.405	21.0	1291.50	1303.14	0.411	25.0	1.1	24.0	0.995	25	0.5

Acceptance Criteria:

Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE

1Lpm	0.975
0.5 Lpm	0.983

Revision June 5, 2007

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	**03-J005**
Trendicator Type	**Nutech**
MII	**M05498**
Date	**September 13, 2017**
Calibrated By	**J. Grollman**
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	**Tredicator Display Value**		**Percent Difference**
	Before Adjustment (°C)	**After Adjustment (°C)**	**(%)**
0	0	NA	0.0
10	10		0.0
20	20		0.0
50	50		0.0
75	75		0.0
100	100		0.0
125	125		0.0
150	150		0.0
200	200		0.0
300	300		0.0
400	400		0.0
500	500		0.0
600	601		-0.2

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:
Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Dry Gas Meter Calibration Data

Calibration Procedure	03-J004
Meter Number	Vost 2
Date	September 12, 2017
Barometric Pressure	29.59
System Leak Check	NDL @ 21 "Hg

MII NUMBERS	
DGM	A10117
Gasometer	A01463
Barometer	COE20028

Calibrated By	J. Grollman
Signature	
Reviewed and Accepted By	

ft^3= cm* 1.332 litres per cm/28.3168 litres per ft^3

$$DGMCF = \frac{Vstd\ ft^3}{Vdgm\ ft^3} \quad \frac{Tdgm\ ^\circ F+460}{Tstd\ ^\circ F+460} \quad \frac{Pbar\ (in.\ Hg)}{(Pbar\ in.\ Hg+DGMPressure/13.6)}$$

Gasometer Reading cm			Gasometer Volume	Gasometer Temperature	DGM Reading L		DGM Volume	DGM Average Temperature	DGM Pressure	DGM Outlet	DGM Calibration	Time	Flow Rate
Initial	Final	cm	ft^3	°C	Initial	Final	ft^3	°C	in. H_2O	°C	Factor	min.	lpm
50.70	29.40	21.30	1.002	21.0	6451.380	6480.440	1.026	29.0	2.3	29.0	0.997	29	1.0
61.50	30.40	31.10	1.463	21.0	6380.425	6422.990	1.503	29.0	2.3	29.0	0.994	42	1.0
71.70	50.70	21.00	0.988	21.0	6422.990	6451.380	1.003	27.0	2.3	27.0	1.000	28	1.0
78.50	66.40	12.10	0.569	21.0	6303.500	6319.730	0.573	27.0	1.4	27.0	1.010	27	0.6
66.40	55.30	11.10	0.522	21.0	6319.730	6334.760	0.531	27.0	1.4	27.0	1.000	26	0.6
55.30	41.50	13.80	0.649	21.0	6334.760	6353.500	0.662	27.0	1.4	27.0	0.997	32	0.6

Acceptance Criteria:
Individual values of DGM calibration factor must be within ± 1.5% of the average value.
If not the calibration must be repeated. Also, the DGMCF average value must be 1.00 ± 0.05, otherwise the meter must be repaired and/or adjusted as necessary and recalibrated prior to use.
(Environment Canada Reference Method EPS 1/RM/8, Section 6)

DGMCF AVERAGE

1Lpm	0.997
0.5 Lpm	1.002

Revision June 5, 2007

ORTECH Environmental

Trendicator Calibration

Calibration Procedure	03-J005
Trendicator Type	Nutech
MII	A10117
Date	September 13, 2017
Calibrated By	J. Grollman
Signature	
Reviewed and Accepted By	

Fluke Calibrator Output (COE 20024) (°C)	Tredicator Display Value		Percent Difference
	Before Adjustment (°C)	After Adjustment (°C)	(%)
0	0	NA	0.0
10	10		0.0
20	20		0.0
50	50		0.0
75	75		0.0
100	100		0.0
125	126		-0.8
150	150		0.0
200	200		0.0
300	299		0.3
400	398		0.5
500	499		0.2
600	599		0.2

$$\% \text{ Difference} = \frac{(\text{micromite} - \text{after adjustment reading}) \times 100}{\text{micromite}}$$

Acceptance Criteria:

Trendicator display must read within ± 1.5% of the micromite value at each output. Otherwise, the Trendicator must be repaired and/or adjusted as necessary, and recalibrated prior to use. (MOE Source Testing Code, Version #2, Method 5)

ORTECH Environmental

Manometer Calibration Data

Date	July 18, 2017	Calibrated By	Jarrad Forsyth
Manometer Number	3	Signature	Jarrad Forsyth
Manometer MII Number	A02086	Reviewed/Accepted By	Angela Nolan
Calibrated Against	HHP-100A		
MII Number	B02679		
Calibration Procedure	03 - J010		

Manometer Scale "H_2O	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.375	NA	0.375	0.0
0-0.5	0.258		0.259	0.6
	0.140		0.141	0.7
	0.750		0.750	0.0
0-1.0	0.520		0.519	-0.2
	0.255		0.256	0.4
	1.50		1.46	-2.7
0-2.0	1.01		0.98	-2.7
	0.41		0.41	-0.7
	7.60		7.53	-0.9
0-10.0	5.05		5.02	-0.6
	2.51		2.51	0.0

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

ORTECH Environmental
Manometer Calibration Data

Date	April 17, 2017	Calibrated By	Andrew Saikaley
Manometer Number	5	Signature	
Manometer MII Number	B00717	Reviewed/Accepted By	Angela Nolan
Calibrated Against	HHP-100A		
MII Number	B02679		
Calibration Procedure	03 - J010		

Manometer Scale "H_20	Manometer Reading "H_2O		Reference Manometer Reading "H_2O	Percent Difference %
	Before Adjustment	After Adjustment		
	0.131	NA	0.137	4.4
0-0.5	0.283		0.286	1.0
	0.443		0.439	-0.9
	0.243		0.247	1.6
0-1.0	0.543		0.547	0.7
	0.917		0.914	-0.3
	0.46		0.45	-2.2
0-2.0	1.06		1.06	0.0
	1.67		1.65	-1.2
	2.60		2.59	-0.4
0-10.0	5.52		5.50	-0.4
	8.96		8.89	-0.8

$$\text{Percent Difference} = \frac{(\text{Ref. Manometer} - \text{Instrument Reading})}{\text{Ref. Manometer}} \times 100$$

Acceptance Criteria:
The manometer being calibrated must be within ± 5.0% of the Standard value at each reading. Otherwise, the manometer must be repaired and/or adjusted as necessary and recalibrated prior to use. Manometers must be capable of measuring velocity pressure to within 0.005 "H_2O on the 0 to 1 inch scale, and 0.05 "H_2O on the 1 to 10 inch scales.
(Environment Canada Reference Method 1/RM/8, Section 2)

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CERTIFICATE OF CALIBRATION

Customer: ORTECH ENVIRONMENTAL
804 SOUTHDOWN ROAD
MISSISSAUGA, ON L5J 2Y4

PO Number: 20000-J2318

Certificate/SO Number: 9-8389A-20-1 Revision 0

Manufacturer: Mitutoyo
Model Number: 500-196
Description: Digital Caliper
Serial Number: 0242066
ID: B03922

As-Found: Out Of Tolerance
As-Left: In Tolerance

Calibration Date: Jan 12, 2017
Due Date: Jan 12, 2018

Calibrated To: Manufacturer Specification
Calibration Procedure: 1-AC12178-5

The Calibration Services are performed in compliance with the Lab Quality System and adheres to ANSI/ISO/ASQ 9001:2008. The instruments serviced are calibrated using standards traceable to the SI units through the National Institute of Standards and Technology (NIST) or other recognized national metrology institutes (NMIs) and/or natural physical constants or by comparison to consensus standards. All calibrations have been performed using processes having a TAR of 4:1 or better, unless otherwise noted in the Calibration Measurement Data. Calibrations at TAR thresholds of 4:1 or better provide reasonable confidence that the instrument is within the stated tolerances. Out of tolerance data points are marked with an asterisk (*).

Notes:
The OOT readings were verified. Received out of tolerance, Calibrated, Returned in tolerance.

As Found Data

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found	OOT	TAR
Function Check							
Parallelism Check			P	P	F	*	
Length Measure							
Scale Linearity	0.0000in	±(0.001 in)	-0.0010	0.0010	0.0000 in		
	1.5000in	±(0.001 in)	1.4990	1.5010	1.4960 in	*	
	3.0000in	±(0.001 in)	2.9990	3.0010	2.9955 in	*	
	4.5000in	±(0.001 in)	4.4990	4.5010	4.4960 in	*	
	6.0000in	±(0.001 in)	5.9990	6.0010	5.9960 in	*	
Length Measure I.D.	1.0000in	±(0.001 in)	0.9990	1.0010	1.0060 in	*	
Length Measure Depth	1.0000in	±(0.001 in)	0.9990	1.0010	0.9990 in		
Length Measure Step	1.0000in	±(0.001 in)	0.9990	1.0010	0.9990 in		
Function Check							
Inch to mm conversion			P	P	P		

As Left Data

Description	Setpoints	Accuracy	Low Limit	High Limit	As Left	OOT	TAR

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CERTIFICATE OF CALIBRATION

Customer: ORTECH ENVIRONMENTAL
804 SOUTHDOWN ROAD
MISSISSAUGA, ON L5J 2Y4

PO Number: 20000-J2318

Certificate/SO Number: 9-8389A-20-1 Revision 0

Function Check						
Parallelism Check			P	P	P	
Length Measure						
Scale Linearity	0.0000in	±(0.001 in)	-0.0010	0.0010	0.0000 in	
	1.5000in	±(0.001 in)	1.4990	1.5010	1.5000 in	
	3.0000in	±(0.001 in)	2.9990	3.0010	2.9995 in	
	4.5000in	±(0.001 in)	4.4990	4.5010	4.5000 in	
	6.0000in	±(0.001 in)	5.9990	6.0010	6.0000 in	
Length Measure I.D.	1.0000in	±(0.001 in)	0.9990	1.0010	1.0010 in	
Length Measure Depth	1.0000in	±(0.001 in)	0.9990	1.0010	0.9990 in	
Length Measure Step	1.0000in	±(0.001 in)	0.9990	1.0010	0.9990 in	
Function Check						
Inch to mm conversion			P	P	P	

Traceable Standards

Asset	Manufacturer	Model Number	Description	Cal Date	Due Date	Traceability Number
M004	Coventry Gauge Ltd	C-84	Gage Block Set, 84 pcs.	26-Aug-16	26-Aug-17	9-&M004-4-1
M457	Starrett Tru-Stone Tech. Div.	80942	Granite Surface Plate	28-Dec-16	31-Dec-17	9-&M457-5-1

Environmental Data

Temperature	Relative Humidity	Temp / RH Asset
68.85°F /20.47°C	35.20%	LEM-0003

Calibrated At:
916 Gateway
Burlington, ON L7L 5K7

Facility Responsible:
916 Gateway
Burlington, ON L7L 5K7
800-828-1470

Calibrated By:
Digitally Signed On January 12, 2017
By Steve Snelling
Steve Snelling
Calibration Technician

Reviewed By:
Digitally Signed On January 12, 2017
By Robert Whittaker
Robert Whittaker
Lab Manager

Unit Barcode: 471A0022135

Date Received: January 09, 2017
Service Level : R5

Customer Number: 9-321995-000

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SUPPLEMENTAL REPORT

CALIBRATION LAB OUT OF TOLERANCE DATA AS FOUND

Customer: ORTECH ENVIRONMENTAL

PO Number: 20000-J2318

Certificate/SO Number: 9-8389A-20-1 Revision 0

Manufacturer: Mitutoyo
Model Number: 500-196
Description: Digital Caliper
Serial Number: 0242066
ID: B03922

Service Type: R5

Calibration Date: Jan 12, 2017
Due Date: Jan 12, 2018

Calibration Procedure: 1-AC12178-5

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found	OOT	TUR
Function Check							
Parallelism Check			P	P	F	*	
Length Measure							
	1.5000in	±(0.001 in)	1.4990	1.5010	1.4960 in	*	
	3.0000in	±(0.001 in)	2.9990	3.0010	2.9955 in	*	
	4.5000in	±(0.001 in)	4.4990	4.5010	4.4960 in	*	
	6.0000in	±(0.001 in)	5.9990	6.0010	5.9960 in	*	
Length Measure I.D.	1.0000in	±(0.001 in)	0.9990	1.0010	1.0060 in	*	

As Found Data recorded on January 12, 2017

Temperature: 68.9°F / 20.5°C Relative Humidity: 35% Temp/RH Asset LEM-0003

Asset	Manufacturer	Model	Description	Cal Date	Due Date	Traceability Numbers
M004	Coventry Gauge Ltd	C-84	Gage Block Set, 84 pcs.	Aug 26, 2016	Aug 26, 2017	9-&M004-4-1
M457	Starrett Tru-Stone Tech. Div.	80942	Granite Surface Plate	Dec 28, 2016	Dec 31, 2017	9-&M457-5-1

Remarks:

The OOT readings were verified. Received out of tolerance, Calibrated, Returned in tolerance.

Field not applicable. (P = Pass, F = Fail)

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 11, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	Constatine	Analyzer ID	Ratfiche
Test Location:	Unit 1 - Outlet	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.002				
High	90.18	A2	90.37	B2	C				
Mid	51.3	A4	51.05	B4		51.4	D4	-0.7	E4
Low	30.6	A3	30	B3		30.7	D3	-2.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.03	-0.03
Mid	30	29.3	0.7

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 11, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	Constatine	Analyzer ID	Ratfiche
Test Location:	Unit 1 - Outlet	Test	2

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.002				
High	90.18	A2	90.37	B2	C				
Mid	51.3	A4	51.05	B4		51.4	D4	-0.7	E4
Low	30.6	A3	30	B3		30.7	D3	-2.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0.03	0	0.03
Mid	29.3	29.2	0.1

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 11, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	Constatine	Analyzer ID	Ratfiche
Test Location:	Unit 1 - Outlet	Test	3

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.002				
High	90.18	A2	90.37	B2	C				
Mid	51.3	A4	51.05	B4		51.4	D4	-0.7	E4
Low	30.6	A3	30	B3		30.7	D3	-2.2	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.2	29.5	-0.3

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	30		43
Run 2	30		45
Run 3	30		41
Average	**30**		**43**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 10, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 1 - Inlet	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	0.990				
High	90.18	A2	89.3	B2	C				
Mid	51.3	A4	51.62	B4		50.8	D4	1.6	E4
Low	30.6	A3	30.45	B3		30.3	D3	0.5	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	30.45	29.9	0.6

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 10, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 1 - Inlet	Test	2

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	0.990					
High	90.18	A2	89.3	B2		C				
Mid	51.3	A4	51.62	B4			50.8	D4	1.6	E4
Low	30.6	A3	30.45	B3			30.3	D3	0.5	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.88	30.5	-0.6

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 10, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 1 - Inlet	Test	3

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)	Initial Analyzer Response (B)	Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)	Calibration Error % ((B)-(D)/AX100
Zero	0 A1	0 B1	0.990		
High	90.18 A2	89.3 B2	C		
Mid	51.3 A4	51.62 B4		50.8 D4	1.6 E4
Low	30.6 A3	30.45 B3		30.3 D3	0.5 E3
					Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0.05	-0.05
Mid	30.45	31.7	-1.3
			Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 11, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 2 - Outlet	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.002				
High	90.18	A2	90.4	B2	C				
Mid	51.3	A4	51.92	B4		51.4	D4	1.0	E4
Low	30.6	A3	30.1	B3		30.7	D3	-1.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	30.1	29.8	0.3

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 11, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 2 - Outlet	Test	2

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)		Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.002					
High	90.18	A2	90.4	B2		C				
Mid	51.3	A4	51.92	B4			51.4	D4	1.0	E4
Low	30.6	A3	30.1	B3			30.7	D3	-1.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.78	29.6	0.2

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 11, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 2 - Outlet	Test	3

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.002				
High	90.18	A2	90.4	B2	C				
Mid	51.3	A4	51.92	B4		51.4	D4	1.0	E4
Low	30.6	A3	30.1	B3		30.7	D3	-1.9	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.6	29.8	-0.2

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 10, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 2 - Inlet	Test	1

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.004				
High	90.18	A2	90.53	B2	C				
Mid	51.3	A4	51.38	B4		51.5	D4	-0.2	E4
Low	30.6	A3	29.5	B3		30.7	D3	-4.0	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	29.5	30.2	-0.7

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 10, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 2 - Inlet	Test	2

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.004				
High	90.18	A2	90.53	B2	C				
Mid	51.3	A4	51.38	B4		51.5	D4	-0.2	E4
Low	30.6	A3	29.5	B3		30.7	D3	-4.0	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	30.2	30.8	-0.6

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

Total Hydrocarbon Reference Method 25A Calibration Data Sheet
Method 25A:SOP Number 95-T62-SP001

Project Number:	21800	Date:	October 10, 2017
Company:	COVANTA	Operator:	J. Grollman
Location:	DYEC	Analyzer ID	Ratfiche
Test Location:	Unit 2 - Inlet	Test	3

THC Full Scale Setting	**100**
Zero Gas (ppm)	<0.1 ppm
Low Gas Value (ppm)	20-35 % full scale setting
Mid Gas Value (ppm)	45-55 % full scale setting
High Gas Value (ppm)	80-90 % full scale setting

Perform analyzer calibration as per manufacturers instructions.
Calculate the linearity factor "C" based on the zero and high gas values. Based on the calculated linearity, predict the analyzer response for low and mid values (D3 and D4). Calculate calibration error with the low and mid (B3 and B4) gasses.

	Cal.Gas Value (A)		Initial Analyzer Response (B)		Linearity (B2-B1)/(A2-A1)	Predicted Response (A X C)		Calibration Error % ((B)-(D)/AX100	
Zero	0	A1	0	B1	1.004				
High	90.18	A2	90.53	B2	C				
Mid	51.3	A4	51.38	B4		51.5	D4	-0.2	E4
Low	30.6	A3	29.5	B3		30.7	D3	-4.0	E3

Criteria +/-5%

Note: If the calibration Error (E3 and E4) are greater than 5%, repeat the procedure until values are acceptable.

Perform test. At the completion of the test or hourly; Calculate the calibration drift as a percent of full scale value.
Introduce the zero and mid level gases at the probe and record data as the system final response.

	System Initial Response (F)	System Final Response (G)	Calibration Drift (G-F)/span*100
Zero	0	0	0
Mid	30.8	32.7	-1.9

Criteria 3%

Calculate systen response time by introducing zero gas to the probe, record time to reach 95% of calibration gas value.
Repeat with upscale gas. Perform three runs and calculate average of the runs.

	Zero Response Time (seconds)		Upscale Response Time (seconds)
Run 1	15		20
Run 2	15		20
Run 3	15		20
Average	**15**		**20**

APPENDIX 24

Particulate and Metals Test Emission Calculations
(24 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	1 - Particulate & Metals
Date:	October 10, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	6.36 mm
DRY REF GAS VOLUME SAMPLED	3.645 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.7 °C
AVERAGE GAS MOISTURE BY VOLUME	16.6 %
AVERAGE GAS VELOCITY	18.11 m/s
BAROMETRIC PRESSURE (Station)	100.982 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	98.492 Kpa
OXYGEN CONCENTRATION	8.74 %
CARBON DIOXIDE CONCENTRATION	10.61 %
CARBON MONOXIDE CONCENTRATION	9.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.75 m^3/s
DRY REF GAS FLOWRATE	15.59 Rm^3/s
DRY ADJ GAS FLOWRATE	19.15 Rm^3/s
WET REF GAS FLOWRATE	18.70 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.2 mg
	-FILTER	5.2 mg
	-TOTAL	6.4 mg
DRY REF GAS VOLUME SAMPLED		3.645 m^3
PARTICULATE CONC. - ACTUAL		1.023 mg/m^3
PARTICULATE CONC. - DRY REF		1.756 mg/m^3
PARTICULATE CONC. - DRY ADJ		1.430 mg/m^3
PARTICULATE CONC. - WET REF		1.465 mg/m^3
PARTICULATE EMISSION RATE		0.027374 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	5.2		
DGMCF	0.996	**Probe (mg)**	1.2		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	510.7		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	22.2		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.48 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.74
CO2%	10.61
COppm	9.3

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	391.73	0.65	288	55	75	73	1.4	3.0		16.98	
	2.5	393.44	0.68	285	51	76	74	1.5	3.0		17.33	102.9
	5	395.08	0.66	283	50	76	73	1.5	3.0		17.05	96.2
2	7.5	396.73	0.77	284	49	76	74	1.8	3.5		18.43	98.2
	10	398.52	0.73	281	49	76	74	1.7	3.5		17.91	98.6
	12.5	400.19	0.72	288	50	77	74	1.8	3.5		17.87	94.3
3	15	402.00	0.72	288	48	77	74	1.8	3.5		17.87	103.3
	17.5	403.79	0.71	288	47	77	74	1.75	3.5		17.74	102.2
	20	405.59	0.7	288	47	77	74	1.65	3.5		17.62	103.5
4	22.5	407.35	0.71	288	47	77	74	1.6	3.5		17.74	101.9
	25	409.09	0.71	288	47	77	74	1.6	3.5		17.74	100.0
	27.5	410.82	0.71	288	48	77	74	1.6	3.5		17.74	99.4
5	30	412.53	0.71	288	49	78	75	1.6	3.5		17.74	98.3
	32.5	414.26	0.71	288	49	78	75	1.6	3.5		17.74	99.2
	35	416.01	0.69	288	49	78	75	1.6	3.5		17.49	100.4
6	37.5	417.73	0.67	287	49	78	75	1.6	3.5		17.23	100.1
	40	419.42	0.67	287	49	78	75	1.55	3.5		17.23	99.7
	42.5	421.13	0.67	287	48	78	75	1.55	3.5		17.23	100.9
7	45	422.82	0.66	288	48	78	75	1.5	3.5		17.11	99.7
	47.5	424.52	0.66	288	48	78	75	1.5	3.5		17.11	101.1
	50	426.23	0.66	287	48	79	76	1.5	3.5		17.10	101.7
8	52.5	427.90	0.7	288	48	78	75	1.6	3.5		17.62	99.1
	55	429.65	0.7	288	47	78	76	1.6	3.5		17.62	101.1
	57.5	431.40	0.7	287	47	79	76	1.6	3.5		17.61	101.0
9	60	433.15	0.75	287	48	79	76	1.7	4.0		18.23	100.8
	62.5	434.97	0.75	288	48	79	76	1.7	4.0		18.24	101.3
	65	436.77	0.74	287	49	80	76	1.7	4.0		18.10	100.3
10	67.5	438.59	0.83	286	49	80	76	2	4.0		19.16	101.9
	70	440.49	0.82	287	49	80	77	2	4.0		19.06	100.5
	72.5	442.39	0.83	287	49	80	76	2	4.0		19.17	101.1
11	75	444.29	0.85	287	50	80	77	2.05	4.0		19.40	100.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	5.2		
DGMCF	0.996	**Probe (mg)**	1.2		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	510.7		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	22.2		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.48 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.74
CO2%	10.61
COppm	9.3

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	446.25	0.86	287	49	80	76	2.05	4.0		19.52	102.4
	80	448.19	0.87	287	51	81	77	2.05	4.0		19.63	100.9
12	82.5	450.14	0.86	288	52	80	77	2.05	4.0		19.53	100.6
	85	452.10	0.86	287	52	81	77	2.05	4.0		19.52	101.9
	87.5	454.04	0.86	287	52	80	77	2.05	4.0		19.52	100.7
	90	456.06								0.48		104.9
1	0	456.54	0.83	280	62	80	77	2	4.0		19.08	
	2.5	458.40	0.77	280	49	80	77	1.8	4.0		18.38	97.9
	5	460.29	0.9	285	48	80	77	2.1	4.0		19.94	103.2
2	7.5	462.23	0.86	286	47	80	77	2	4.0		19.50	98.4
	10	464.22	0.84	288	47	80	77	2	4.0		19.30	103.3
	12.5	466.14	0.83	288	48	80	77	2	4.0		19.19	101.0
3	15	468.05	0.81	284	47	80	77	1.9	4.0		18.90	101.0
	17.5	469.99	0.82	284	47	80	77	1.9	4.0		19.02	103.6
	20	471.86	0.82	284	47	80	77	1.9	4.0		19.02	99.2
4	22.5	473.75	0.8	288	45	80	77	1.9	4.0		18.84	100.3
	25	475.64	0.75	288	45	80	77	1.8	4.0		18.24	101.8
	27.5	477.47	0.76	289	45	80	77	1.8	4.0		18.37	101.8
5	30	479.27	0.74	288	46	80	77	1.75	4.0		18.12	99.5
	32.5	481.09	0.74	289	46	80	77	1.75	4.0		18.13	101.9
	35	482.89	0.75	289	46	81	77	1.75	4.0		18.25	100.8
6	37.5	484.67	0.73	289	47	80	77	1.7	4.0		18.01	99.0
	40	486.49	0.72	289	46	81	78	1.7	4.0		17.88	102.7
	42.5	488.26	0.71	288	47	80	78	1.7	4.0		17.74	100.3
7	45	490.04	0.63	288	47	81	78	1.5	4.0		16.72	101.6
	47.5	491.73	0.62	288	47	81	77	1.5	4.0		16.58	102.3
	50	493.38	0.62	288	47	81	78	1.4	4.0		16.58	100.8
8	52.5	495.02	0.67	289	48	81	78	1.6	4.0		17.25	100.0
	55	496.74	0.67	289	47	81	78	1.6	4.0		17.25	101.1
	57.5	498.44	0.67	289	48	81	77	1.6	4.0		17.25	99.9
9	60	500.15	0.69	288	48	81	78	1.6	4.0		17.49	100.6

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	5.2		
DGMCF	0.996	**Probe (mg)**	1.2		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	510.7		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	22.2		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.48 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.74
CO2%	10.61
COppm	9.3

Measured H2O
16.6 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	501.88	0.69	288	48	81	78	1.6	4.0		17.49	100.1
	65	503.61	0.73	288	49	81	78	1.7	4.0		17.99	100.1
10	67.5	505.38	0.74	287	50	81	78	1.7	4.0		18.10	99.6
	70	507.16	0.75	287	49	81	77	1.7	4.0		18.23	99.4
	72.5	508.96	0.75	287	49	82	78	1.7	4.0		18.23	99.9
11	75	510.75	0.75	287	50	81	78	1.7	4.0		18.23	99.2
	77.5	512.52	0.76	287	51	82	78	1.7	4.0		18.35	98.2
	80	514.30	0.75	287	51	82	78	1.7	4.0		18.23	98.0
12	82.5	516.10	0.73	287	52	82	78	1.7	4.0		17.98	99.8
	85	517.98	0.73	287	53	82	78	1.7	4.0		17.98	105.6
	87.5	519.65	0.73	287	53	82	78	1.7	4.0		17.98	93.8
	90	521.45										101.1

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 - Particulate & Metals
Date:	October 10, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	6.36 mm
DRY REF GAS VOLUME SAMPLED	3.567 m^3
AVGERGE ISOKINETICITY	101.8 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.2 °C
AVERAGE GAS MOISTURE BY VOLUME	16.9 %
AVERAGE GAS VELOCITY	17.59 m/s
BAROMETRIC PRESSURE (Station)	100.982 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	98.492 Kpa
OXYGEN CONCENTRATION	8.67 %
CARBON DIOXIDE CONCENTRATION	10.58 %
CARBON MONOXIDE CONCENTRATION	9.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.99 m^3/s
DRY REF GAS FLOWRATE	15.06 Rm^3/s
DRY ADJ GAS FLOWRATE	18.61 Rm^3/s
WET REF GAS FLOWRATE	18.14 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.9 mg
	-FILTER	8.3 mg
	-TOTAL	10.2 mg
DRY REF GAS VOLUME SAMPLED		3.567 m^3
PARTICULATE CONC. - ACTUAL		1.657 mg/m^3
PARTICULATE CONC. - DRY REF		2.860 mg/m^3
PARTICULATE CONC. - DRY ADJ		2.315 mg/m^3
PARTICULATE CONC. - WET REF		2.376 mg/m^3
PARTICULATE EMISSION RATE		0.043079 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	8.3		
DGMCF	0.996	**Probe (mg)**	1.9		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	507.6		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	26.5		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.46 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.67
CO2%	10.58
COppm	9.7

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	21.91	0.71	288	63	81	79	1.6	4.0		17.76	
	2.5	24.00	0.78	287	67	81	79	1.8	4.0		18.60	119.5
	5	25.86	0.77	287	64	81	79	1.8	4.0		18.48	101.4
2	7.5	27.72	0.77	287	62	81	79	1.8	4.0		18.48	102.1
	10	29.56	0.77	287	60	80	78	1.8	4.0		18.48	101.0
	12.5	31.39	0.77	287	59	81	79	1.8	4.0		18.48	100.6
3	15	33.25	0.71	286	58	80	78	1.7	4.0		17.74	102.1
	17.5	35.03	0.7	287	57	81	78	1.7	4.0		17.62	101.8
	20	36.83	0.7	287	57	81	79	1.7	4.0		17.62	103.7
4	22.5	38.62	0.7	288	56	81	79	1.7	4.0		17.63	103.0
	25	40.39	0.7	288	55	81	79	1.7	4.0		17.63	101.9
	27.5	42.17	0.71	288	56	82	79	1.7	4.0		17.76	102.5
5	30	43.96	0.72	288	56	81	79	1.7	4.0		17.88	102.2
	32.5	45.75	0.7	288	56	82	79	1.7	4.0		17.63	101.6
	35	47.52	0.7	288	55	82	79	1.7	4.0		17.63	101.8
6	37.5	49.29	0.69	288	55	83	79	1.4	4.0		17.51	101.8
	40	51.07	0.7	288	55	82	79	1.7	4.0		17.63	103.0
	42.5	52.84	0.69	289	56	83	79	1.7	4.0		17.52	101.8
7	45	54.60	0.7	289	55	83	80	1.7	4.0		17.65	102.0
	47.5	56.36	0.64	289	54	83	80	1.6	4.0		16.87	101.1
	50	58.11	0.62	290	53	83	80	1.5	4.0		16.62	105.1
8	52.5	59.76	0.64	290	53	83	80	1.5	4.0		16.88	100.8
	55	61.44	0.66	289	52	84	80	1.5	4.0		17.13	101.0
	57.5	63.13	0.65	290	52	84	80	1.5	4.0		17.02	99.9
9	60	64.81	0.68	289	51	83	80	1.6	4.0		17.39	100.1
	62.5	66.54	0.67	289	51	84	80	1.6	4.0		17.26	100.8
	65	68.28	0.68	289	51	85	81	1.6	4.0		17.39	102.1
10	67.5	70.03	0.73	290	51	85	81	1.7	4.0		18.03	101.7
	70	71.83	0.78	290	51	85	81	1.9	4.0		18.64	101.1
	72.5	73.68	0.78	289	50	85	81	1.9	4.0		18.63	100.5
11	75	75.55	0.78	289	50	85	81	1.9	4.0		18.63	101.6

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	8.3		
DGMCF	0.996	**Probe (mg)**	1.9		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	507.6		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	26.5		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.46 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.67
CO2%	10.58
COppm	9.7

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	77.42	0.79	289	50	85	81	1.9	4.0		18.75	101.6
	80	79.29	0.8	288	50	85	81	1.9	4.0		18.85	100.9
12	82.5	81.16	0.78	289	51	86	81	1.8	4.0		18.63	100.2
	85	83.02	0.78	289	51	86	82	1.8	4.0		18.63	100.9
	87.5	84.90	0.79	289	51	86	81	1.8	4.0		18.75	101.9
	90	86.76								0.46		100.3
1	0	87.22	0.57	287	65	85	82	1.3	4.0		15.90	
	2.5	88.80	0.57	287	52	85	82	1.3	4.0		15.90	100.0
	5	90.38	0.71	287	49	85	82	1.7	4.0		17.75	100.0
2	7.5	92.14	0.68	287	48	85	82	1.6	4.0		17.37	99.9
	10	93.91	0.65	287	48	85	82	1.5	4.0		16.98	102.6
	12.5	95.66	0.61	288	48	85	82	1.3	4.0		16.46	103.8
3	15	97.33	0.6	286	49	85	82	1.4	4.0		16.30	102.2
	17.5	98.97	0.6	286	48	85	82	1.4	4.0		16.30	101.1
	20	100.63	0.6	287	49	85	82	1.4	4.0		16.32	102.4
4	22.5	102.27	0.55	288	50	86	83	1.3	4.0		15.63	101.2
	25	103.85	0.52	288	50	86	83	1.2	3.5		15.20	101.7
	27.5	105.37	0.51	288	50	86	83	1.2	3.5		15.05	100.6
5	30	106.86	0.51	288	50	86	83	1.2	3.5		15.05	99.6
	32.5	108.36	0.5	289	50	86	83	1.2	3.5		14.91	100.2
	35	109.83	0.5	289	50	86	83	1.2	3.5		14.91	99.3
6	37.5	111.37	0.61	287	59	85	83	1.5	4.0		16.45	104.0
	40	112.99	0.6	287	53	85	82	1.4	4.0		16.32	99.1
	42.5	114.64	0.59	288	53	85	83	1.4	4.0		16.19	101.8
7	45	116.29	0.57	288	53	85	83	1.3	4.0		15.91	102.7
	47.5	117.92	0.65	288	54	85	83	1.6	4.0		16.99	103.1
	50	119.57	0.68	287	55	85	83	1.7	4.0		17.37	97.8
8	52.5	121.33	0.73	288	49	85	83	1.8	4.0		18.01	102.0
	55	123.13	0.73	288	46	85	83	1.8	4.0		18.01	100.8
	57.5	124.94	0.78	288	46	85	83	1.8	4.0		18.61	101.3
9	60	126.80	0.81	288	46	84	83	1.9	4.0		18.97	100.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	8.3		
DGMCF	0.996	**Probe (mg)**	1.9		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	507.6		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	26.5		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.46 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.67
CO2%	10.58
COppm	9.7

Measured H2O
16.9 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	128.72	0.82	288	47	85	83	1.9	4.0		19.09	**102.2**
	65	130.63	0.8	288	49	85	83	1.9	4.0		18.85	**100.9**
10	67.5	132.52	0.84	288	50	85	83	2	4.0		19.32	**101.1**
	70	134.48	0.85	288	51	85	83	2	4.0		19.43	**102.3**
	72.5	136.41	0.84	288	51	85	83	2	4.5		19.32	**100.2**
11	75	138.36	0.88	288	53	85	83	2.1	5.0		19.77	**101.8**
	77.5	140.37	0.87	288	55	85	83	2.1	5.0		19.66	**102.6**
	80	142.37	0.88	288	56	85	83	2.1	5.0		19.77	**102.6**
12	82.5	144.37	0.74	288	58	85	83	1.8	4.5		18.13	**102.1**
	85	146.26	0.76	287	59	85	83	1.8	4.5		18.36	**105.1**
	87.5	148.14	0.74	287	61	85	83	1.8	4.5		18.12	**103.1**
	90	149.98										**102.2**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 - Particulate & Metals
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.36 mm
DRY REF GAS VOLUME SAMPLED	3.473 m^3
AVGERGE ISOKINETICITY	99.4 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.0 °C
AVERAGE GAS MOISTURE BY VOLUME	15.6 %
AVERAGE GAS VELOCITY	17.09 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-2.510 Kpa
ABSOLUTE GAS PRESSURE	99.217 Kpa
OXYGEN CONCENTRATION	8.34 %
CARBON DIOXIDE CONCENTRATION	11.14 %
CARBON MONOXIDE CONCENTRATION	6.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.24 m^3/s
DRY REF GAS FLOWRATE	15.02 Rm^3/s
DRY ADJ GAS FLOWRATE	19.06 Rm^3/s
WET REF GAS FLOWRATE	17.80 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.7 mg
	-FILTER	0.3 mg
	-TOTAL	2 mg
DRY REF GAS VOLUME SAMPLED		3.473 m^3
PARTICULATE CONC. - ACTUAL		0.343 mg/m^3
PARTICULATE CONC. - DRY REF		0.576 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.454 mg/m^3
PARTICULATE CONC. - WET REF		0.486 mg/m^3
PARTICULATE EMISSION RATE		0.008653 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	TT

Pitot Factor	0.847	**Filter (mg)**	0.3		
DGMCF	1.006	**Probe (mg)**	1.7		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	449.9		
Static Pressure	-10.080 "H_2O	**WCBDA (g)**	20.9		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.53 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.34
CO2%	11.14
COppm	6.8

Measured H2O
15.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	52.11	0.81	285	63	63	67	1.8	5.0		18.79	
	2.5	54.07	0.81	286	52	75	63	1.8	5.0		18.80	107.9
	5	55.88	0.81	286	51	80	65	1.8	5.0		18.80	98.9
2	7.5	57.87	0.82	285	51	75	64	1.7	5.0		18.90	108.1
	10	59.73	0.85	285	51	65	65	1.8	5.0		19.24	100.9
	12.5	61.57	0.83	286	52	64	71	1.8	5.0		19.03	98.9
3	15	63.39	0.84	286	53	64	64	1.7	5.0		19.14	98.6
	17.5	65.21	0.82	286	53	64	65	1.7	5.0		18.91	98.6
	20	67.00	0.82	286	54	65	64	1.7	5.0		18.91	98.1
4	22.5	68.82	0.76	286	54	64	64	1.6	5.0		18.21	99.7
	25	70.58	0.8	286	54	64	64	1.7	5.0		18.68	100.2
	27.5	72.36	0.78	286	54	65	64	1.65	5.0		18.45	98.8
5	30	74.14	0.74	287	54	65	66	1.6	5.0		17.98	100.0
	32.5	75.85	0.76	287	55	71	66	1.6	5.0		18.22	98.5
	35	77.66	0.75	287	55	65	66	1.6	5.0		18.10	102.3
6	37.5	79.36	0.66	287	55	66	70	1.5	5.0		16.98	97.2
	40	81.05	0.72	288	55	69	66	1.6	5.0		17.75	102.5
	42.5	82.76	0.73	288	55	69	66	1.6	5.0		17.87	99.5
7	45	84.55	0.76	288	55	70	67	1.6	5.0		18.23	103.5
	47.5	86.32	0.7	288	55	69	66	1.5	5.0		17.50	100.1
	50	88.02	0.68	288	55	70	65	1.4	5.0		17.25	100.3
8	52.5	89.65	0.7	288	55	70	68	1.5	5.0		17.50	97.6
	55	91.33	0.71	288	55	70	67	1.5	5.0		17.62	98.9
	57.5	93.03	0.7	287	55	71	66	1.5	5.0		17.49	99.4
9	60	94.73	0.76	287	55	70	66	1.6	5.0		18.22	100.1
	62.5	96.48	0.73	287	55	71	67	1.6	5.0		17.86	99.0
	65	98.22	0.71	287	54	71	67	1.6	5.0		17.61	100.2
10	67.5	99.98	0.71	286	54	71	67	1.6	5.0		17.60	102.8
	70	101.71	0.69	286	54	71	67	1.55	5.0		17.35	101.0
	72.5	103.41	0.69	285	53	71	68	1.5	5.0		17.34	100.6
11	75	105.11	0.6	285	53	71	67	1.2	5.0		16.17	100.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	TT

Pitot Factor	0.847	**Filter (mg)**	0.3		
DGMCF	1.006	**Probe (mg)**	1.7		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	449.9		
Static Pressure	-10.080 "H_2O	**WCBDA (g)**	20.9		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.53 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.34
CO2%	11.14
COppm	6.8

Measured H2O
15.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	106.65	0.6	285	53	71	68	1.25	5.0		16.17	97.6
	80	108.19	0.62	285	53	72	69	1.3	5.0		16.44	97.5
12	82.5	109.79	0.42	285	53	71	69	0.75	5.0		13.53	99.5
	85	111.08	0.42	286	53	72	69	0.75	5.0		13.54	97.4
	87.5	112.32	0.42	286	53	71	68	0.77	4.5		13.54	93.6
	90	113.58								0.53		95.3
1	0	114.11	0.79	285	65	67	69	1.7	5.5		18.55	
	2.5	116.06	0.78	284	56	68	67	1.65	5.5		18.42	108.0
	5	117.83	0.81	284	53	72	68	1.75	5.5		18.77	98.7
2	7.5	119.54	0.8	284	52	75	68	1.8	5.5		18.66	93.2
	10	121.41	0.82	284	52	79	68	1.8	5.5		18.89	102.2
	12.5	123.29	0.82	284	53	83	69	1.75	5.5		18.89	101.1
3	15	125.15	0.81	284	52	85	69	1.75	5.5		18.77	99.6
	17.5	126.99	0.78	284	52	88	70	1.7	5.5		18.42	98.9
	20	128.80	0.78	285	53	90	71	1.7	5.5		18.43	98.8
4	22.5	130.56	0.66	285	53	91	72	1.5	6.0		16.96	95.9
	25	132.25	0.64	285	53	92	71	1.45	6.0		16.70	99.8
	27.5	133.94	0.66	284	52	93	71	1.5	6.0		16.95	101.4
5	30	135.42	0.51	287	52	93	71	1.1	5.0		14.93	87.3
	32.5	136.89	0.55	285	53	91	72	1.15	5.0		15.48	98.7
	35	138.39	0.54	286	52	91	73	1.1	5.0		15.35	97.0
6	37.5	139.89	0.51	286	52	91	72	1	5.0		14.92	97.9
	40	141.35	0.49	286	52	92	73	0.9	5.0		14.62	98.1
	42.5	142.77	0.49	286	52	92	73	0.95	5.0		14.62	97.1
7	45	144.21	0.63	286	52	93	72	1.4	5.0		16.58	98.5
	47.5	145.85	0.61	285	52	93	74	1.3	5.0		16.30	99.0
	50	147.47	0.61	285	52	93	73	1.3	5.0		16.30	99.1
8	52.5	149.10	0.65	285	52	93	74	1.45	5.5		16.83	99.8
	55	150.79	0.65	285	52	93	73	1.45	5.5		16.83	100.2
	57.5	152.50	0.67	286	52	93	74	1.5	5.5		17.10	101.5
9	60	154.22	0.7	287	53	93	74	1.6	6.0		17.49	100.6

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate & Metals	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	TT

Pitot Factor	0.847	**Filter (mg)**	0.3		
DGMCF	1.006	**Probe (mg)**	1.7		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	449.9		
Static Pressure	-10.080 "H_2O	**WCBDA (g)**	20.9		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.53 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.34
CO2%	11.14
COppm	6.8

Measured H2O
15.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	155.99	0.68	285	53	92	74	1.5	6.0		17.21	**101.3**
	65	157.69	0.68	285	54	92	74	1.5	6.0		17.21	**98.7**
10	67.5	159.41	0.6	285	52	92	74	1.3	5.5		16.17	**99.8**
	70	160.99	0.61	285	51	93	74	1.3	5.5		16.30	**97.6**
	72.5	162.59	0.62	285	50	93	74	1.35	5.5		16.44	**97.9**
11	75	164.24	0.49	285	49	94	75	0.96	5.0		14.61	**100.2**
	77.5	165.72	0.49	285	49	94	75	0.96	5.0		14.61	**100.8**
	80	167.13	0.49	285	48	95	75	0.98	5.0		14.61	**96.0**
12	82.5	168.58	0.48	285	48	95	75	1	5.0		14.46	**98.7**
	85	170.05	0.48	285	48	95	76	1	5.0		14.46	**101.1**
	87.5	171.49	0.49	285	48	96	75	1	5.0		14.61	**98.9**
	90	172.94										**98.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 - Particulate & Metals
Date:	October 11, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.985
NOZZLE DIAMETER	6.36 mm
DRY REF GAS VOLUME SAMPLED	3.507 m^3
AVGERGE ISOKINETICITY	101.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.1 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	17.29 m/s
BAROMETRIC PRESSURE (Station)	101.490 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.224 Kpa
OXYGEN CONCENTRATION	7.83 %
CARBON DIOXIDE CONCENTRATION	11.23 %
CARBON MONOXIDE CONCENTRATION	9.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.54 m^3/s
DRY REF GAS FLOWRATE	14.89 Rm^3/s
DRY ADJ GAS FLOWRATE	19.66 Rm^3/s
WET REF GAS FLOWRATE	18.01 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2 mg
	-FILTER	4.2 mg
	-TOTAL	6.2 mg
DRY REF GAS VOLUME SAMPLED		3.507 m^3
PARTICULATE CONC. - ACTUAL		1.031 mg/m^3
PARTICULATE CONC. - DRY REF		1.768 mg/m^3
PARTICULATE CONC. - DRY ADJ		1.339 mg/m^3
PARTICULATE CONC. - WET REF		1.462 mg/m^3
PARTICULATE EMISSION RATE		0.026324 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	4.2		
DGMCF	0.985	**Probe (mg)**	2		
Barometric Pressure	29.97 "Hg	**CWTR (g)**	521.7		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	17.1		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.46 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.83
CO2%	11.23
COppm	9.6

Measured H2O
17.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	58.44	0.63	278	66	70	71	1.5	3.0		16.55	
	2.5	60.01	0.67	278	53	71	73	1.7	3.0		17.07	95.8
	5	61.70	0.66	278	48	71	73	1.7	3.0		16.94	99.8
2	7.5	63.41	0.66	277	46	71	73	1.7	3.0		16.93	101.7
	10	65.13	0.67	277	48	71	74	1.7	3.0		17.06	102.2
	12.5	66.83	0.67	278	47	72	75	1.7	3.0		17.07	100.2
3	15	68.52	0.58	285	48	71	76	1.5	3.0		15.96	99.5
	17.5	70.15	0.57	285	48	72	77	1.4	3.0		15.82	103.6
	20	71.74	0.58	285	47	72	78	1.4	3.0		15.96	101.7
4	22.5	73.32	0.64	287	50	72	79	1.6	3.0		16.78	100.1
	25	74.95	0.63	288	47	72	80	1.6	3.0		16.66	98.4
	27.5	76.58	0.63	288	47	73	80	1.6	3.0		16.66	99.1
5	30	78.22	0.65	288	46	73	81	1.6	3.0		16.93	99.7
	32.5	79.87	0.65	287	45	74	81	1.6	3.0		16.91	98.6
	35	81.52	0.66	287	47	74	81	1.7	3.0		17.04	98.5
6	37.5	83.20	0.61	287	44	74	81	1.6	3.0		16.39	99.5
	40	84.85	0.61	287	43	74	81	1.6	3.0		16.39	101.6
	42.5	86.50	0.6	287	43	74	82	1.6	3.0		16.25	101.6
7	45	88.14	0.53	287	43	74	82	1.3	3.0		15.27	101.8
	47.5	89.64	0.53	287	43	74	85	1.3	3.0		15.27	99.0
	50	91.14	0.53	287	44	75	83	1.3	3.0		15.27	98.7
8	52.5	92.66	0.62	287	43	75	83	1.6	3.0		16.52	100.1
	55	94.30	0.65	287	43	75	83	1.7	3.0		16.91	99.9
	57.5	96.01	0.65	287	42	75	83	1.7	3.0		16.91	101.8
9	60	97.74	0.71	287	43	78	82	1.8	3.0		17.68	103.0
	62.5	99.50	0.72	287	43	76	82	1.8	3.0		17.80	100.1
	65	101.26	0.7	287	43	75	81	1.8	3.0		17.55	99.6
10	67.5	103.03	0.76	288	43	75	81	2	3.0		18.30	101.7
	70	104.84	0.75	287	43	75	82	2	3.0		18.17	100.0
	72.5	106.68	0.73	287	43	75	84	1.9	3.0		17.92	102.1
11	75	108.50	0.76	287	44	76	85	2	3.0		18.29	102.2

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	4.2		
DGMCF	0.985	**Probe (mg)**	2		
Barometric Pressure	29.97 "Hg	**CWTR (g)**	521.7		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	17.1		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.46 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.83
CO2%	11.23
COppm	9.6

Measured H2O
17.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	110.35	0.78	287	45	75	86	2	3.0		18.53	101.6
	80	112.24	0.78	287	43	76	86	2	3.0		18.53	102.5
12	82.5	114.09	0.76	287	43	76	87	2	3.0		18.29	100.2
	85	115.95	0.76	287	43	76	87	2	3.0		18.29	102.0
	87.5	117.82	0.75	287	43	76	87	2	3.0		18.17	102.5
	90	119.70								0.46		103.8
1	0	120.16	0.63	287	54	75	76	1.6	3.0		16.65	
	2.5	121.83	0.63	287	44	75	78	1.6	3.0		16.65	101.6
	5	123.48	0.63	287	42	75	80	1.6	3.0		16.65	100.2
2	7.5	125.14	0.63	287	42	75	82	1.6	3.0		16.65	100.6
	10	126.79	0.64	287	42	75	83	1.6	3.0		16.78	99.8
	12.5	128.45	0.63	287	42	75	84	1.6	3.0		16.65	99.5
3	15	130.11	0.69	285	42	75	85	1.8	3.0		17.40	100.2
	17.5	131.85	0.7	286	42	75	86	1.8	3.0		17.54	100.2
	20	133.62	0.7	286	42	75	86	1.8	3.0		17.54	101.2
4	22.5	135.38	0.71	286	42	75	86	1.8	3.0		17.67	100.6
	25	137.13	0.74	286	42	76	87	1.9	3.0		18.04	99.3
	27.5	138.95	0.7	287	42	76	87	1.8	3.0		17.55	101.0
5	30	140.71	0.68	286	42	76	87	1.8	3.0		17.29	100.5
	32.5	142.46	0.68	286	43	76	87	1.8	3.0		17.29	101.3
	35	144.22	0.68	286	43	76	87	1.8	3.0		17.29	101.9
6	37.5	145.96	0.66	286	43	77	87	1.7	3.0		17.03	100.7
	40	147.71	0.68	286	43	77	87	1.8	3.0		17.29	102.7
	42.5	149.47	0.67	286	44	77	87	1.8	3.0		17.16	101.8
7	45	151.22	0.62	287	44	77	87	1.6	3.0		16.52	102.0
	47.5	152.91	0.6	287	44	77	87	1.6	3.0		16.25	102.4
	50	154.57	0.61	286	44	77	87	1.6	3.0		16.37	102.2
8	52.5	156.23	0.67	286	44	77	88	1.8	3.0		17.16	101.3
	55	157.98	0.72	286	43	77	88	1.9	3.5		17.79	101.9
	57.5	159.78	0.69	287	44	77	88	1.9	3.5		17.43	101.1
9	60	161.60	0.75	287	44	77	88	2	3.5		18.17	104.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	4.2		
DGMCF	0.985	**Probe (mg)**	2		
Barometric Pressure	29.97 "Hg	**CWTR (g)**	521.7		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	17.1		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.46 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.83
CO2%	11.23
COppm	9.6

Measured H2O
17.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	163.45	0.74	287	43	77	88	2	3.5		18.05	**101.9**
	65	165.31	0.72	287	44	77	88	2	3.5		17.80	**103.2**
10	67.5	167.15	0.78	285	44	78	88	2.1	4.0		18.50	**103.5**
	70	169.05	0.83	287	44	77	87	2.2	4.0		19.11	**102.4**
	72.5	171.00	0.76	288	44	78	87	2	4.0		18.30	**102.3**
11	75	172.87	0.84	287	44	78	87	2.2	4.0		19.23	**102.4**
	77.5	174.83	0.82	287	44	78	87	2.2	4.0		19.00	**102.1**
	80	176.80	0.75	287	44	77	87	2	4.0		18.17	**103.8**
12	82.5	178.69	0.73	287	44	77	87	1.9	3.5		17.92	**104.2**
	85	180.52	0.77	286	45	77	87	2	3.5		18.40	**102.3**
	87.5	182.41	0.76	287	45	77	87	2	4.0		18.29	**102.8**
	90	184.31										**104.1**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	2 - Particulate & Metals
Date:	October 11, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.985
NOZZLE DIAMETER	6.36 mm
DRY REF GAS VOLUME SAMPLED	3.609 m^3
AVGERGE ISOKINETICITY	101.1 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.5 °C
AVERAGE GAS MOISTURE BY VOLUME	16.8 %
AVERAGE GAS VELOCITY	17.73 m/s
BAROMETRIC PRESSURE (Station)	101.422 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.156 Kpa
OXYGEN CONCENTRATION	7.91 %
CARBON DIOXIDE CONCENTRATION	11.21 %
CARBON MONOXIDE CONCENTRATION	9.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.20 m^3/s
DRY REF GAS FLOWRATE	15.35 Rm^3/s
DRY ADJ GAS FLOWRATE	20.14 Rm^3/s
WET REF GAS FLOWRATE	18.44 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.1 mg
	-FILTER	0.1 mg
	-TOTAL	1.2 mg
DRY REF GAS VOLUME SAMPLED		3.609 m^3
PARTICULATE CONC. - ACTUAL		0.195 mg/m^3
PARTICULATE CONC. - DRY REF		0.332 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.253 mg/m^3
PARTICULATE CONC. - WET REF		0.277 mg/m^3
PARTICULATE EMISSION RATE		0.005103 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0.1		
DGMCF	0.985	**Probe (mg)**	1.1		
Barometric Pressure	29.95 "Hg	**CWTR (g)**	514.7		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	19.5		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.21
COppm	9.6

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	84.78	0.85	287	65	71	71	2.2	3.5		19.33	
	2.5	86.64	0.84	287	60	71	72	2.2	3.5		19.21	97.8
	5	88.59	0.9	287	57	71	74	2.3	4.0		19.89	103.1
2	7.5	90.58	0.86	287	55	71	76	2.2	4.0		19.44	101.5
	10	92.55	0.86	287	55	71	77	2.2	4.0		19.44	102.5
	12.5	94.51	0.87	287	55	72	79	2.2	4.0		19.55	101.9
3	15	96.47	0.88	287	54	71	80	2.2	4.0		19.66	101.1
	17.5	98.44	0.91	287	52	72	81	2.2	4.0		20.00	101.0
	20	100.45	0.88	287	52	72	81	2.2	4.0		19.66	101.1
4	22.5	102.43	0.7	285	51	72	82	1.8	3.0		17.52	101.3
	25	104.20	0.7	285	50	73	82	1.8	3.0		17.52	101.2
	27.5	105.98	0.69	285	50	73	83	1.75	3.0		17.39	101.7
5	30	107.68	0.65	286	50	73	83	1.7	3.0		16.89	97.7
	32.5	109.37	0.65	287	50	73	84	1.7	3.0		16.90	100.1
	35	111.07	0.63	288	49	74	84	1.6	3.0		16.65	100.7
6	37.5	112.72	0.65	288	49	74	85	1.7	3.0		16.91	99.2
	40	114.42	0.65	288	49	74	85	1.7	3.0		16.91	100.6
	42.5	116.13	0.64	288	49	74	85	1.7	3.0		16.78	101.2
7	45	117.83	0.64	288	49	74	86	1.7	3.0		16.78	101.4
	47.5	119.54	0.62	289	48	75	86	1.65	3.0		16.53	101.9
	50	121.23	0.63	288	48	75	87	1.7	3.0		16.65	102.3
8	52.5	122.92	0.7	289	48	75	86	1.8	3.0		17.56	101.3
	55	124.65	0.7	289	47	75	86	1.85	3.0		17.56	98.6
	57.5	126.41	0.73	289	44	75	86	1.9	3.5		17.93	100.3
9	60	128.20	0.75	289	43	75	86	1.9	3.5		18.18	99.9
	62.5	130.01	0.74	288	43	76	86	1.9	3.5		18.04	99.6
	65	131.81	0.75	288	43	76	86	1.9	3.5		18.17	99.6
10	67.5	133.63	0.81	288	42	76	86	2.1	4.0		18.88	100.0
	70	135.53	0.81	288	42	76	86	2.1	4.0		18.88	100.5
	72.5	137.44	0.79	288	42	76	86	2.1	4.0		18.64	101.1
11	75	139.34	0.8	287	42	76	86	2.1	4.0		18.75	101.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0.1		
DGMCF	0.985	**Probe (mg)**	1.1		
Barometric Pressure	29.95 "Hg	**CWTR (g)**	514.7		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	19.5		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.21
COppm	9.6

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	141.25	0.83	287	42	76	86	2.2	4.0		19.10	101.6
	80	143.19	0.81	288	42	76	86	2.1	4.0		18.88	101.4
12	82.5	145.13	0.77	287	42	76	86	2.1	4.0		18.39	102.7
	85	147.04	0.77	287	42	76	86	2.1	4.0		18.39	103.6
	87.5	148.94	0.79	287	42	76	86	2.1	4.0		18.63	103.0
	90	150.87								0.41		103.3
1	0	151.28	0.6	287	47	75	76	1.5	3.0		16.24	
	2.5	152.96	0.62	287	43	75	79	1.5	3.0		16.51	104.1
	5	154.59	0.63	287	43	75	81	1.6	3.0		16.64	99.1
2	7.5	156.23	0.62	287	43	75	82	1.6	3.0		16.51	98.8
	10	157.86	0.64	287	43	75	83	1.6	3.0		16.77	98.9
	12.5	159.54	0.63	287	43	75	84	1.6	3.0		16.64	100.2
3	15	161.23	0.8	286	43	75	85	2.1	4.0		18.74	101.5
	17.5	163.10	0.8	286	43	75	85	2.1	4.0		18.74	99.6
	20	165.01	0.81	286	43	75	85	2.1	4.0		18.85	101.7
4	22.5	166.90	0.68	287	44	75	85	1.8	3.5		17.29	100.1
	25	168.66	0.73	286	43	75	85	1.9	4.0		17.90	101.7
	27.5	170.46	0.69	286	42	75	85	1.8	4.0		17.40	100.3
5	30	172.25	0.66	286	42	75	85	1.7	4.0		17.02	102.6
	32.5	174.00	0.65	286	41	75	85	1.7	3.5		16.89	102.5
	35	175.73	0.64	285	41	76	85	1.7	3.5		16.75	102.1
6	37.5	177.45	0.59	285	41	75	85	1.6	3.0		16.08	102.2
	40	179.10	0.61	285	41	75	85	1.6	3.0		16.35	102.2
	42.5	180.76	0.59	285	41	75	86	1.6	3.0		16.08	101.1
7	45	182.39	0.53	285	41	75	85	1.4	3.0		15.24	100.8
	47.5	183.95	0.53	285	41	75	85	1.4	3.0		15.24	101.9
	50	185.48	0.52	285	41	75	85	1.4	3.0		15.10	99.9
8	52.5	187.06	0.52	285	41	75	85	1.4	3.0		15.10	104.1
	55	188.67	0.6	285	41	75	86	1.6	3.5		16.22	106.1
	57.5	190.31	0.61	285	41	76	86	1.6	3.5		16.35	100.6
9	60	191.94	0.67	285	41	75	86	1.8	4.0		17.14	99.1

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - Particulate & Metals	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0.1		
DGMCF	0.985	**Probe (mg)**	1.1		
Barometric Pressure	29.95 "Hg	**CWTR (g)**	514.7		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	19.5		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.41 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.21
COppm	9.6

Measured H2O
16.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	193.70	0.68	285	41	76	86	1.8	4.0		17.26	102.2
	65	195.42	0.68	285	41	75	86	1.8	4.0		17.26	99.1
10	67.5	197.17	0.76	285	42	75	86	2	4.0		18.25	100.9
	70	198.99	0.78	285	42	76	86	2	4.0		18.49	99.3
	72.5	200.85	0.76	286	43	76	86	2	4.0		18.26	100.1
11	75	202.70	0.8	286	43	76	85	2.1	4.0		18.74	100.9
	77.5	204.60	0.81	286	43	76	85	2.1	4.0		18.85	101.1
	80	206.49	0.83	287	43	76	85	2.2	4.0		19.10	100.0
12	82.5	208.43	0.82	287	44	76	85	2.2	4.0		18.98	101.5
	85	210.38	0.87	287	44	76	85	2.3	4.5		19.55	102.6
	87.5	212.38	0.8	287	44	77	84	2.1	4.0		18.75	102.2
	90	214.32										103.3

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	3 - Particulate and Metals
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.985
NOZZLE DIAMETER	6.36 mm
DRY REF GAS VOLUME SAMPLED	3.424 m^3
AVGERGE ISOKINETICITY	99.9 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.7 °C
AVERAGE GAS MOISTURE BY VOLUME	16.6 %
AVERAGE GAS VELOCITY	16.95 m/s
BAROMETRIC PRESSURE (Station)	101.626 Kpa
STATIC PRESSURE	-2.291 Kpa
ABSOLUTE GAS PRESSURE	99.335 Kpa
OXYGEN CONCENTRATION	7.94 %
CARBON DIOXIDE CONCENTRATION	11.24 %
CARBON MONOXIDE CONCENTRATION	9.6 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.04 m^3/s
DRY REF GAS FLOWRATE	14.75 Rm^3/s
DRY ADJ GAS FLOWRATE	19.30 Rm^3/s
WET REF GAS FLOWRATE	17.69 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.6 mg
	-FILTER	0.1 mg
	-TOTAL	1.7 mg
DRY REF GAS VOLUME SAMPLED		3.424 m^3
PARTICULATE CONC. - ACTUAL		0.292 mg/m^3
PARTICULATE CONC. - DRY REF		0.497 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.379 mg/m^3
PARTICULATE CONC. - WET REF		0.414 mg/m^3
PARTICULATE EMISSION RATE		0.007322 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate and Metals	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	TT

Pitot Factor	0.847	**Filter (mg)**	0.1		
DGMCF	0.985	**Probe (mg)**	1.6		
Barometric Pressure	30.01 "Hg	**CWTR (g)**	472.4		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	28.4		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.52 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.94
CO2%	11.24
COppm	9.6

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	14.81	0.77	285	72	74	74	1.9	3.0		18.35	
	2.5	16.59	0.76	286	67	74	75	1.9	3.0		18.24	97.6
	5	18.40	0.76	286	66	74	75	1.9	3.0		18.24	99.9
2	7.5	20.19	0.76	287	64	74	78	1.9	3.0		18.25	98.7
	10	21.99	0.76	286	63	74	80	1.9	3.0		18.24	99.1
	12.5	23.79	0.76	286	63	75	82	1.9	3.0		18.24	98.8
3	15	25.60	0.73	286	63	75	83	1.85	3.0		17.87	99.1
	17.5	27.39	0.71	285	62	75	84	1.8	3.0		17.62	99.9
	20	29.14	0.76	286	61	76	85	1.95	3.0		18.24	98.9
4	22.5	30.95	0.69	286	59	76	86	1.8	3.0		17.38	98.8
	25	32.70	0.68	286	58	76	86	1.8	3.0		17.25	100.1
	27.5	34.44	0.69	286	57	77	87	1.8	3.0		17.38	100.2
5	30	36.18	0.62	286	57	77	87	1.65	3.0		16.47	99.3
	32.5	37.85	0.62	286	57	77	88	1.65	3.0		16.47	100.5
	35	39.53	0.6	286	56	78	88	1.55	3.0		16.21	101.0
6	37.5	41.17	0.53	286	55	78	88	1.3	3.0		15.23	100.1
	40	42.70	0.53	286	55	78	88	1.3	3.0		15.23	99.3
	42.5	44.21	0.54	286	55	78	89	1.4	3.0		15.37	98.0
7	45	45.76	0.59	286	55	79	89	1.55	3.0		16.07	99.6
	47.5	47.38	0.59	286	55	79	90	1.55	3.0		16.07	99.6
	50	48.99	0.6	286	55	79	90	1.55	3.0		16.21	98.9
8	52.5	50.64	0.61	286	55	79	90	1.6	3.0		16.34	100.5
	55	52.30	0.61	286	55	79	90	1.6	3.0		16.34	100.3
	57.5	53.96	0.62	286	54	80	90	1.6	3.0		16.47	100.3
9	60	55.63	0.67	286	54	80	90	1.75	3.0		17.12	100.0
	62.5	57.35	0.66	287	54	80	90	1.75	3.0		17.01	99.1
	65	59.08	0.68	287	55	80	91	1.8	3.0		17.26	100.5
10	67.5	60.84	0.95	287	55	80	91	2.45	4.0		20.40	100.6
	70	62.84	1	287	55	80	91	2.6	4.0		20.93	96.9
	72.5	64.95	0.62	285	54	81	91	1.65	3.0		16.46	99.7
11	75	66.66	0.58	285	55	81	89	1.5	3.0		15.92	102.1

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate and Metals	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	TT

Pitot Factor	0.847	**Filter (mg)**	0.1		
DGMCF	0.985	**Probe (mg)**	1.6		
Barometric Pressure	30.01 "Hg	**CWTR (g)**	472.4		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	28.4		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.52 ft°	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.94
CO2%	11.24
COppm	9.6

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	68.27	0.58	286	56	81	89	1.5	3.0		15.93	99.5
	80	69.88	0.58	285	56	80	90	1.5	3.0		15.92	99.6
12	82.5	71.49	0.59	285	57	80	90	1.55	3.0		16.06	99.5
	85	73.12	0.57	286	57	80	90	1.5	3.0		15.79	99.9
	87.5	74.74	0.56	285	58	80	90	1.5	3.0		15.65	101.1
	90	76.38								0.52		103.2
1	0	76.90	0.72	285	69	77	77	1.9	3.0		17.74	
	2.5	78.67	0.7	283	60	77	78	1.8	3.0		17.47	99.8
	5	80.40	0.72	283	56	77	80	1.85	3.0		17.72	98.7
2	7.5	82.18	0.81	283	54	77	83	2.1	3.0		18.79	99.9
	10	84.04	0.77	283	54	77	86	2	3.0		18.32	98.2
	12.5	85.89	0.78	283	54	77	87	2	3.0		18.44	99.9
3	15	87.75	0.76	284	55	78	88	2	3.0		18.21	99.7
	17.5	89.61	0.72	285	55	78	89	1.9	3.0		17.74	100.9
	20	91.40	0.73	285	55	78	90	1.95	3.0		17.86	99.7
4	22.5	93.22	0.7	286	56	79	90	1.9	3.0		17.50	100.6
	25	94.99	0.72	286	56	79	91	1.9	3.0		17.75	99.9
	27.5	96.82	0.71	286	56	79	91	1.9	3.0		17.63	101.7
5	30	98.60	0.65	287	57	80	91	1.7	3.0		16.88	99.6
	32.5	100.33	0.66	287	57	80	91	1.75	3.0		17.01	101.1
	35	102.06	0.66	287	58	80	92	1.75	3.0		17.01	100.4
6	37.5	103.77	0.61	287	58	80	92	1.65	3.0		16.35	99.1
	40	105.45	0.61	287	59	81	92	1.65	3.0		16.35	101.3
	42.5	107.13	0.61	288	59	81	92	1.65	3.0		16.36	101.2
7	45	108.79	0.63	288	60	81	92	1.65	3.0		16.63	100.0
	47.5	110.48	0.62	288	61	81	93	1.65	3.0		16.49	100.2
	50	112.18	0.62	287	62	81	93	1.65	3.0		16.48	101.5
8	52.5	113.85	0.64	287	61	81	93	1.75	3.0		16.75	99.7
	55	115.58	0.64	287	59	82	93	1.7	3.0		16.75	101.7
	57.5	117.32	0.61	287	58	82	93	1.6	3.0		16.35	102.1
9	60	118.99	0.64	286	57	82	93	1.7	3.0		16.74	100.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - Particulate and Metals	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	TT

Pitot Factor	0.847	**Filter (mg)**	0.1		
DGMCF	0.985	**Probe (mg)**	1.6		
Barometric Pressure	30.01 "Hg	**CWTR (g)**	472.4		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	28.4		
Nozzle	0.2505 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.52 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.94
CO2%	11.24
COppm	9.6

Measured H2O
16.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	120.70	0.64	285	57	82	93	1.7	3.0		16.73	100.3
	65	122.42	0.65	284	56	82	93	1.7	3.0		16.84	100.8
10	67.5	124.13	0.62	283	55	82	93	1.6	3.0		16.44	99.4
	70	125.81	0.6	281	55	82	95	1.55	3.0		16.15	99.9
	72.5	127.44	0.62	281	56	82	93	1.6	3.0		16.42	98.2
11	75	129.12	0.56	282	56	82	93	1.45	3.0		15.61	99.8
	77.5	130.70	0.56	281	56	82	93	1.45	3.0		15.60	98.8
	80	132.29	0.58	281	56	82	93	1.5	3.0		15.88	99.3
12	82.5	133.91	0.56	282	56	82	93	1.45	3.0		15.61	99.4
	85	135.50	0.56	281	56	82	93	1.45	3.0		15.60	99.4
	87.5	137.09	0.56	281	56	82	93	1.45	3.0		15.60	99.3
	90	138.66										98.1

APPENDIX 25

Particle Size Distribution Test Emission Calculations
(12 pages)

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	October-10-17
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	1
Test Location:	APC Outlet No. 2

Project No.: 21800
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.987
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.82
Static Pressure ("H_2O)	-9.20
Oxygen Content (%)	7.84
Carbon Dioxide Content (%)	11.17
Carbon Monoxide Content (PPM)	17.9
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.34 Rft^3/min*	9.7 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.6 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.0 Rft^3*	1.162 Rm^3*
Average Cyclone I Cut Diameter		10.30 µm
Average Cyclone IV Cut Diameter		2.42 µm
Average Isokineticity		103.2 %
Stack Gas Physical Parameters		
B_{ws}	16.8 % v/v	
Average m	219.5 (dimensionless)	
M_d	30.10 lbs/lbs mole	
M_w	28.07 lbs/lbs mole	
Average T_s	285 °F	141 °C
Average U_s	55.1 ft/s	16.8 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	52710 ACFM	24.9 m^3/s
Wet Reference Q_s	37008 SCFM*	17.5 Rm^3/s*
Dry Reference Q_s	30802 SCFM*	14.5 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	1.03 mg/Rm^3*	0.015 g/s
Total Part. (b)	6.46 mg/Rm^3*	0.094 g/s
PM_{10} Part. (b)	5.68 mg/Rm^3*	0.083 g/s
$PM_{2.5}$ Part. (b)	5.51 mg/Rm^3*	0.080 g/s
Cond. Part.	5.42 mg/Rm^3*	0.079 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	526.1	668.5	757.6		840.5
final volume or weight (ml or mg)	688.2	669.0	755.8		851.9
gain in volume or weight (ml or mg)	162.1	0.5	-1.8	0.0	11.4
				TOTAL	172.2

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.9	0.2	<0.1		6.3

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: October-10-17	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21800
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 2	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	9.60	13.23	0.68	0.35	283	78	77	0.35	4.0	56.7	11.40	2.84	86.0
	2	9.60	9.20	16.10	0.60	0.35	284	78	77	0.35	4.0	53.3	11.58	2.92	89.6
	3	18.80	9.00	18.79	0.58	0.35	285	78	77	0.35	4.0	52.5	10.06	2.29	111.2
	4	27.80	9.10	22.00	0.54	0.35	285	78	77	0.35	4.0	50.6	10.14	2.32	114.0
	5	36.90	9.30	25.21	0.58	0.35	284	78	77	0.35	4.0	52.4	9.87	2.21	114.3
	6	46.20	10.60	28.62	0.76	0.35	285	78	77	0.35	4.0	60.1	9.88	2.22	99.7
		56.80		32.50											
2	1	0.00	9.50	32.50	0.67	0.35	285	80	79	0.35	4.0	56.4	10.05	2.28	103.7
	2	9.50	10.10	35.91	0.63	0.35	285	80	79	0.35	4.0	54.7	10.26	2.37	103.9
	3	19.60	10.60	39.43	0.64	0.35	285	80	79	0.35	4.0	55.1	10.31	2.39	102.4
	4	30.20	10.90	43.10	0.58	0.35	287	80	79	0.35	4.0	52.5	10.11	2.31	110.7
	5	41.10	11.00	46.98	0.65	0.35	286	80	79	0.35	4.0	55.6	10.48	2.46	99.3
	6	52.10	11.10	50.70	0.80	0.35	286	80	79	0.35	4.0	61.7	9.50	2.07	102.8
		63.20		55.01											
Averages					**0.64**		**285**	**78**		**0.35**		**55.1**	**10.30**	**2.42**	**103.2**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	October-10-17
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 2

Project No.: 21800
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.987
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.81
Static Pressure ("H_2O)	-9.20
Oxygen Content (%)	8.26
Carbon Dioxide Content (%)	10.79
Carbon Monoxide Content (PPM)	17
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.2 l/min*
Cyclone Qs_{actual}	0.61 ft^3/min	17.3 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.6 Rft^3*	1.208 Rm^3*
Average Cyclone I Cut Diameter		9.99 µm
Average Cyclone IV Cut Diameter		2.27 µm
Average Isokineticity		106.3 %
Stack Gas Physical Parameters		
B_{ws}	16.1 % v/v	
Average m	220.4 (dimensionless)	
M_d	30.06 lbs/lbs mole	
M_w	28.12 lbs/lbs mole	
Average T_s	285 °F	141 °C
Average U_s	56.0 ft/s	17.1 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53485 ACFM	25.2 m^3/s
Wet Reference Q_s	37518 SCFM*	17.7 Rm^3/s*
Dry Reference Q_s	31480 SCFM*	14.9 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.91 mg/Rm^3*	0.014 g/s
Total Part. (b)	5.96 mg/Rm^3*	0.089 g/s
PM_{10} Part. (b)	5.71 mg/Rm^3*	0.085 g/s
$PM_{2.5}$ Part. (b)	5.47 mg/Rm^3*	0.081 g/s
Cond. Part.	5.05 mg/Rm^3*	0.075 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	475.1	635.9	757.3		831.6
final volume or weight (ml or mg)	637.2	636.3	756.0		840.8
gain in volume or weight (ml or mg)	162.1	0.4	-1.3	0.0	9.2
				TOTAL	170.4

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.3	0.3	0.5		6.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: October-10-17	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21800
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 2	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.80	55.04	0.80	0.35	286	79	79	0.38	4.0	61.6	10.00	2.27	96.0
	2	10.80	9.40	58.98	0.66	0.35	287	80	79	0.38	4.0	56.0	9.91	2.23	107.2
	3	20.20	9.10	62.46	0.62	0.35	288	80	80	0.38	4.0	54.3	10.00	2.27	109.3
	4	29.30	9.40	65.79	0.63	0.35	288	81	80	0.38	4.0	54.8	10.33	2.40	103.6
	5	38.70	9.60	69.08	0.60	0.35	285	81	80	0.38	4.0	53.3	10.32	2.39	105.9
	6	48.30	10.20	72.44	0.65	0.35	285	81	80	0.38	4.0	55.5	9.49	2.07	114.6
		58.50		76.46											
2	1	0.00	11.10	76.46	0.80	0.35	284	84	82	0.38	4.0	61.6	10.05	2.28	95.1
	2	11.10	10.00	80.51	0.67	0.35	286	85	83	0.38	4.0	56.4	9.99	2.26	105.1
	3	21.10	9.40	84.20	0.57	0.35	286	86	83	0.38	4.0	52.0	10.14	2.32	111.6
	4	30.50	9.90	87.60	0.62	0.35	286	86	83	0.38	4.0	54.3	9.92	2.24	110.2
	5	40.40	9.80	91.29	0.62	0.35	282	86	84	0.38	4.0	54.1	9.85	2.20	110.9
	6	50.20	10.10	94.98	0.70	0.35	282	87	85	0.38	4.0	57.5	9.91	2.22	103.6
		60.30		98.76											
Averages					**0.66**		**285**	**82**		**0.38**		**56.0**	**9.99**	**2.27**	**106.3**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	October-10-17
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 2

Project No.: 21800
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.987
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.83
Static Pressure ("H_2O)	-9.20
Oxygen Content (%)	8.30
Carbon Dioxide Content (%)	10.73
Carbon Monoxide Content (PPM)	15.2
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.1 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	16.9 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.3 Rft^3*	1.198 Rm^3*
Average Cyclone I Cut Diameter		10.10 µm
Average Cyclone IV Cut Diameter		2.30 µm
Average Isokineticity		104.9 %
Stack Gas Physical Parameters		
B_{ws}	15.5 % v/v	
Average m	220.5 (dimensionless)	
M_d	30.05 lbs/lbs mole	
M_w	28.18 lbs/lbs mole	
Average T_s	284 °F	140 °C
Average U_s	55.9 ft/s	17.0 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53464 ACFM	25.2 m^3/s
Wet Reference Q_s	37579 SCFM*	17.7 Rm^3/s*
Dry Reference Q_s	31746 SCFM*	15.0 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.75 mg/Rm^3*	0.011 g/s
Total Part. (b)	5.18 mg/Rm^3*	0.078 g/s
PM_{10} Part. (b)	4.76 mg/Rm^3*	0.071 g/s
$PM_{2.5}$ Part. (b)	4.51 mg/Rm^3*	0.068 g/s
Cond. Part.	4.43 mg/Rm^3*	0.066 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	488.5	602.2	673.4		806.5
final volume or weight (ml or mg)	641.9	602.5	672.0		816.1
gain in volume or weight (ml or mg)	153.4	0.3	-1.4	0.0	9.6
				TOTAL	161.9

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.5	0.3	<0.1		5.3

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: October-10-17	**Plant:** DYEC	**Test No.:** 3	**Project No.:** 21800
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 2	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.90	98.83	0.80	0.35	286	85	85	0.38	6.0	61.5	10.34	2.40	91.9
	2	10.90	9.90	102.70	0.62	0.35	285	85	85	0.38	6.0	54.1	9.89	2.22	110.9
	3	20.80	9.60	106.44	0.56	0.35	284	85	85	0.38	6.0	51.4	10.02	2.27	114.5
	4	30.40	9.70	110.00	0.55	0.35	274	85	85	0.38	6.0	50.6	10.07	2.28	113.6
	5	40.10	9.50	113.56	0.59	0.35	284	85	85	0.38	6.0	52.8	9.98	2.25	112.1
	6	49.60	9.90	117.10	0.60	0.35	284	85	85	0.38	6.0	53.2	10.16	2.32	108.5
		59.50		120.70											
2	1	0.00	10.90	120.70	0.85	0.35	283	85	84	0.38	6.0	63.3	10.34	2.40	88.8
	2	10.90	10.00	124.56	0.71	0.35	286	85	85	0.38	6.0	58.0	10.12	2.31	100.5
	3	20.90	9.20	128.22	0.62	0.35	286	85	85	0.38	6.0	54.2	10.05	2.28	108.6
	4	30.10	9.60	131.62	0.68	0.35	287	85	85	0.38	6.0	56.8	10.15	2.32	102.4
	5	39.70	9.60	135.12	0.72	0.35	287	85	84	0.38	6.0	58.4	9.98	2.26	101.9
	6	49.30	10.20	138.70	0.68	0.35	287	85	84	0.38	6.0	56.8	10.18	2.33	102.0
		59.50		142.40											
Averages					**0.67**		**284**	**85**		**0.38**		**55.9**	**10.10**	**2.30**	**104.9**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date: October-11-17	
Client: Covanta	
Plant: DYEC	
Location: Courtice, Ontario	
Test No.: 1	
Test Location: APC Outlet No. 1	

Project No.: 21800
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.996
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.97
Static Pressure ("H_2O)	-9.60
Oxygen Content (%)	8.57
Carbon Dioxide Content (%)	10.85
Carbon Monoxide Content (PPM)	18.7
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	10.0 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	17.0 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.2 Rft^3*	1.195 Rm^3*
Average Cyclone I Cut Diameter		10.11 µm
Average Cyclone IV Cut Diameter		2.31 µm
Average Isokineticity		106.0 %
Stack Gas Physical Parameters		
B_{ws}	16.3 % v/v	
Average m	220.7 (dimensionless)	
M_d	30.08 lbs/lbs mole	
M_w	28.11 lbs/lbs mole	
Average T_s	287 °F	141 °C
Average U_s	55.2 ft/s	16.8 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	52744 ACFM	24.9 m^3/s
Wet Reference Q_s	37110 SCFM*	17.5 Rm^3/s*
Dry Reference Q_s	31065 SCFM*	14.7 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.84 mg/Rm^3*	0.012 g/s
Total Part. (b)	6.94 mg/Rm^3*	0.10 g/s
PM_{10} Part. (b)	6.27 mg/Rm^3*	0.092 g/s
$PM_{2.5}$ Part. (b)	6.19 mg/Rm^3*	0.091 g/s
Cond. Part.	6.11 mg/Rm^3*	0.090 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	476.7	636.0	756.1		840.6
final volume or weight (ml or mg)	640.7	636.2	754.5		849.1
gain in volume or weight (ml or mg)	164.0	0.2	-1.6	0.0	8.5
				TOTAL	171.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.8	0.1	<0.1	0.0	7.3

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: October-11-17	**Plant:** DYEC	**Test No.:** 1	**Project No.:** 21800
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 1	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.90	50.27	0.77	0.35	286	71	68	0.38	4.0	60.3	10.22	2.35	95.0
	2	10.90	10.70	54.01	0.58	0.35	286	69	67	0.38	4.0	52.4	10.20	2.34	109.7
	3	21.60	10.20	57.68	0.54	0.35	286	69	67	0.38	4.0	50.5	10.18	2.33	114.1
	4	31.80	9.80	61.19	0.61	0.35	287	69	67	0.38	4.0	53.7	10.02	2.27	109.9
	5	41.60	9.80	64.64	0.62	0.35	286	69	67	0.38	4.0	54.1	9.99	2.26	109.2
	6	51.40	9.30	68.10	0.65	0.35	286	69	67	0.38	4.0	55.4	10.00	2.26	106.6
		60.70		71.38											
2	1	0.00	10.00	71.38	0.73	0.35	286	69	67	0.38	4.0	58.7	10.10	2.30	99.2
	2	10.00	10.20	74.86	0.61	0.35	287	70	67	0.38	4.0	53.7	10.25	2.36	106.4
	3	20.20	10.00	78.34	0.63	0.35	287	70	67	0.38	4.0	54.6	10.23	2.35	104.9
	4	30.20	9.80	81.76	0.63	0.35	287	69	67	0.38	4.0	54.6	10.14	2.32	106.2
	5	40.00	9.60	85.15	0.67	0.35	287	70	67	0.38	4.0	56.3	10.04	2.28	104.4
	6	49.60	9.30	88.52	0.70	0.35	287	70	67	0.38	4.0	57.6	9.90	2.23	104.2
		58.90		91.85											
Averages					**0.65**		**287**	**68**		**0.38**		**55.2**	**10.11**	**2.31**	**106.0**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	October-11-17
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	2
Test Location:	APC Outlet No. 1

Project No.: 21800
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.996
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.96
Static Pressure ("H_2O)	-10.00
Oxygen Content (%)	8.60
Carbon Dioxide Content (%)	10.86
Carbon Monoxide Content (PPM)	16.1
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.36 Rft^3/min*	10.1 l/min*
Cyclone Qs_{actual}	0.60 ft^3/min	17.0 l/min
Stack Gas Sampling Parameters		
V_{ms}	42.3 Rft^3*	1.197 Rm^3*
Average Cyclone I Cut Diameter		10.10 µm
Average Cyclone IV Cut Diameter		2.30 µm
Average Isokineticity		105.7 %
Stack Gas Physical Parameters		
B_{ws}	15.9 % v/v	
Average m	220.9 (dimensionless)	
M_d	30.08 lbs/lbs mole	
M_w	28.16 lbs/lbs mole	
Average T_s	286 °F	141 °C
Average U_s	55.4 ft/s	16.9 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	52963 ACFM	25.0 m^3/s
Wet Reference Q_s	37234 SCFM*	17.6 Rm^3/s*
Dry Reference Q_s	31324 SCFM*	14.8 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.42 mg/Rm^3*	0.0062 g/s
Total Part. (b)	5.52 mg/Rm^3*	0.082 g/s
PM_{10} Part. (b)	5.27 mg/Rm^3*	0.078 g/s
$PM_{2.5}$ Part. (b)	5.18 mg/Rm^3*	0.077 g/s
Cond. Part.	5.10 mg/Rm^3*	0.075 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	488.6	604.4	671.7		815.6
final volume or weight (ml or mg)	648.8	602.4	670.2		825.0
gain in volume or weight (ml or mg)	160.2	-2.0	-1.5	0.0	9.4
				TOTAL	166.1

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.3	<0.1	0.1		6.1

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: October-11-17	**Plant:** DYEC	**Test No.:** 2	**Project No.:** 21800
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 1	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	10.80	91.91	0.82	0.35	287	68	67	0.38	4.0	62.3	10.18	2.34	92.7
	2	10.80	9.40	95.64	0.61	0.35	287	67	67	0.38	4.0	53.7	9.93	2.24	111.4
	3	20.20	9.10	99.00	0.63	0.35	287	68	68	0.38	4.0	54.6	10.08	2.30	107.3
	4	29.30	9.70	102.19	0.65	0.35	287	68	66	0.38	4.0	55.5	9.95	2.24	107.7
	5	39.00	9.70	105.65	0.65	0.35	287	68	66	0.38	4.0	55.5	10.09	2.30	105.5
	6	48.70	10.00	109.04	0.65	0.35	287	68	67	0.38	4.0	55.5	9.89	2.22	108.6
		58.70		112.64											
2	1	0.00	10.60	112.64	0.80	0.35	285	68	66	0.38	4.0	61.4	10.23	2.35	93.0
	2	10.60	9.70	116.27	0.63	0.35	286	68	66	0.38	4.0	54.6	10.28	2.37	104.2
	3	20.30	9.80	119.57	0.56	0.35	285	68	66	0.38	4.0	51.4	10.10	2.30	113.3
	4	30.10	9.80	122.99	0.59	0.35	285	68	66	0.38	4.0	52.8	10.16	2.32	109.4
	5	39.90	10.10	126.38	0.59	0.35	285	68	66	0.38	4.0	52.8	10.15	2.32	109.6
	6	50.00	10.30	129.88	0.64	0.35	285	68	66	0.38	4.0	55.0	10.13	2.31	105.6
		60.30		133.46											
Averages					**0.65**		**286**	**67**		**0.38**		**55.4**	**10.10**	**2.30**	**105.7**

EPA Draft Method - $PM_{10/2.5}$ Calculations

Date:	October-11-17
Client:	Covanta
Plant:	DYEC
Location:	Courtice, Ontario
Test No.:	3
Test Location:	APC Outlet No. 1

Project No.: 21800
Operator: DU

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m^2)	1.48
No. of Traverses	2
No. of Points Per Traverse	6
Data Readings Per Point	1
DGMCF	0.996
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.93
Static Pressure ("H_2O)	-10.00
Oxygen Content (%)	8.68
Carbon Dioxide Content (%)	10.76
Carbon Monoxide Content (PPM)	17.2
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone Sampling Parameters		
Cyclone Qs_{ST}	0.35 Rft^3/min*	9.9 l/min*
Cyclone Qs_{actual}	0.59 ft^3/min	16.8 l/min
Stack Gas Sampling Parameters		
V_{ms}	41.8 Rft^3*	1.184 Rm^3*
Average Cyclone I Cut Diameter		10.22 µm
Average Cyclone IV Cut Diameter		2.35 µm
Average Isokineticity		103.1 %
Stack Gas Physical Parameters		
B_{ws}	15.5 % v/v	
Average m	221.4 (dimensionless)	
M_d	30.07 lbs/lbs mole	
M_w	28.20 lbs/lbs mole	
Average T_s	287 °F	142 °C
Average U_s	56.1 ft/s	17.1 m/s
Stack Area	15.9 ft^2	1.48 m^2
Actual Q_s	53655 ACFM	25.3 m^3/s
Wet Reference Q_s	37632 SCFM*	17.8 Rm^3/s*
Dry Reference Q_s	31813 SCFM*	15.0 Rm^3/s*

Summary of Particulate Emission Rates	Dry Ref. Conc.	Emission Rate
Total Part. (a)	0.42 mg/Rm^3*	0.0063 g/s
Total Part. (b)	9.21 mg/Rm^3*	0.14 g/s
PM_{10} Part. (b)	9.12 mg/Rm^3*	0.14 g/s
$PM_{2.5}$ Part. (b)	8.87 mg/Rm^3*	0.13 g/s
Cond. Part.	8.78 mg/Rm^3*	0.13 g/s

(a) does not include condensibles
(b) includes condensibles

Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	527.6	671.6	755.8		851.6
final volume or weight (ml or mg)	683.2	668.9	753.8		860.0
gain in volume or weight (ml or mg)	155.6	-2.7	-2.0	0.0	8.4
				TOTAL	159.3

Particulate Weight Gains	>10mm	<10mm, >2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.1	0.3	<0.1		10.4

*Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

Test Data Page Calculations

Date: October-11-17	**Plant:** DYEC	**Test No.:** 3	**Project No.:** 21800
Client: Covanta	**Location:** Courtice, Ontario	**Test location:** APC Outlet No. 1	**Operator:** DU

Port No.	Point	Clock Time (min)	Dwell Time (min)	Dry Gas Meter (ft^3)	Delta P ("H_2O)	Desired cfm	Stack Temp (°F)	Meter Temp Outlet (°F)	Meter Temp Inlet (°F)	Meter Pressure DH ("H_2O)	Pump Vacuum Gauge ("Hg)	Stack Gas Velocity (ft/s)	Cyclone I Cut Diam. (mm)	Cyclone IV Cut Diam. (mm)	ISO (%)
1	1	0.00	11.10	33.53	0.78	0.35	288	68	66	0.38	4.0	60.8	10.25	2.36	94.4
	2	11.10	9.60	37.35	0.63	0.35	287	67	66	0.38	4.0	54.6	10.25	2.36	105.0
	3	20.70	9.80	40.65	0.57	0.35	287	67	66	0.38	4.0	51.9	10.23	2.35	110.8
	4	30.50	9.90	44.03	0.59	0.35	286	67	65	0.38	4.0	52.8	10.14	2.32	110.0
	5	40.40	9.90	47.48	0.64	0.35	286	67	66	0.38	4.0	55.0	10.21	2.35	104.6
	6	50.30	9.90	50.90	0.68	0.35	286	67	66	0.38	4.0	56.7	10.13	2.31	102.7
		60.20		54.36											
2	1	0.00	11.00	54.36	0.76	0.35	286	67	66	0.38	4.0	59.9	10.27	2.37	95.2
	2	11.00	9.80	58.13	0.63	0.35	286	67	66	0.38	4.0	54.6	10.35	2.40	103.4
	3	20.80	9.20	61.45	0.63	0.35	286	67	66	0.38	4.0	54.6	10.12	2.31	106.8
	4	30.00	9.50	64.67	0.66	0.35	289	68	66	0.38	4.0	55.9	10.32	2.39	101.8
	5	39.50	9.50	67.91	0.70	0.35	289	68	67	0.38	4.0	57.6	10.26	2.37	99.7
	6	49.00	9.80	71.18	0.74	0.35	289	68	67	0.38	4.0	59.2	10.08	2.29	99.4
		58.80		74.64											
Averages					**0.67**		**287**	**67**		**0.38**		**56.1**	**10.22**	**2.35**	**103.1**

APPENDIX 26

Acid Gases Test Emission Calculations
(12 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	1 M26A
Date:	October 10, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	1.006
NOZZLE DIAMETER	6.44 mm
DRY REF GAS VOLUME SAMPLED	1.284 m^3
AVGERGE ISOKINETICITY	100.9 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.9 °C
AVERAGE GAS MOISTURE BY VOLUME	15.2 %
AVERAGE GAS VELOCITY	18.29 m/s
BAROMETRIC PRESSURE (Station)	100.982 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	98.492 Kpa
OXYGEN CONCENTRATION	8.93 %
CARBON DIOXIDE CONCENTRATION	10.53 %
CARBON MONOXIDE CONCENTRATION	9.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.03 m^3/s
DRY REF GAS FLOWRATE	16.04 Rm^3/s
DRY ADJ GAS FLOWRATE	19.39 Rm^3/s
WET REF GAS FLOWRATE	18.92 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.284 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 M26A	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	1.006	**Probe (mg)**	0		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	157.6		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	12		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.93
CO2%	10.53
COppm	9.5

Measured H2O
15.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	17.05	0.82	285	67	74	74	2	5.0		18.98	
2	5	20.90	0.75	285	50	72	74	1.8	5.0		18.15	**100.3**
3	10	24.72	0.93	287	47	73	74	2.3	5.0		20.24	**104.2**
4	15	28.94	0.85	287	47	74	74	2	5.0		19.35	**103.6**
5	20	32.91	0.8	286	51	76	75	1.8	5.0		18.76	**101.8**
6	25	36.67	0.7	286	54	77	76	1.6	4.5		17.55	**99.0**
7	30	40.18	0.75	286	56	77	76	1.7	4.7		18.16	**98.5**
8	35	43.85	0.75	285	59	78	76	1.7	4.7		18.15	**99.5**
9	40	47.52	0.75	285	56	79	79	1.7	4.7		18.15	**99.4**
10	45	51.18	0.78	285	47	79	76	1.8	5.0		18.51	**98.7**
11	50	54.98	0.68	285	52	79	76	1.6	4.7		17.28	**100.8**
12	55	58.59	0.6	285	52	80	77	1.4	4.5		16.23	**102.5**
	60	61.98										**102.3**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 M26A
Date:	October 10, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT		0.847
DGM CORRECTION FACTOR		1.006
NOZZLE DIAMETER		6.44 mm
DRY REF GAS VOLUME SAMPLED		1.273 m^3
AVGERGE ISOKINETICITY		101.5 %
STACK DIAMETER		1.37 m
LENGTH		0.00 m
WIDTH		0.00 m
AREA OF STACK or DUCT		1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE		140.1 °C
AVERAGE GAS MOISTURE BY VOLUME		15.8 %
AVERAGE GAS VELOCITY		18.12 m/s
BAROMETRIC PRESSURE (Station)		100.982 Kpa
STATIC PRESSURE		-2.490 Kpa
ABSOLUTE GAS PRESSURE		98.492 Kpa
OXYGEN CONCENTRATION		8.59 %
CARBON DIOXIDE CONCENTRATION		10.70 %
CARBON MONOXIDE CONCENTRATION		7.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE		26.77 m^3/s
DRY REF GAS FLOWRATE		15.81 Rm^3/s
DRY ADJ GAS FLOWRATE		19.65 Rm^3/s
WET REF GAS FLOWRATE		18.78 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.273 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 M26A	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	1.006	**Probe (mg)**	0		
Barometric Pressure	29.82 "Hg	**CWTR (g)**	163.9		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	11.7		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.59
CO2%	10.70
COppm	7.7

Measured H2O
15.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	62.36	0.78	285	67	77	76	1.8	5.0		18.53	
2	5	66.22	0.95	284	63	79	76	2.2	5.5		20.43	**103.2**
3	10	70.43	0.9	286	59	76	76	2.1	5.2		19.92	**101.8**
4	15	74.50	0.9	285	57	80	77	2.1	5.2		19.90	**101.5**
5	20	78.58	0.81	286	54	79	77	1.8	5.0		18.89	**101.3**
6	25	82.41	0.75	286	52	79	77	1.7	5.0		18.18	**100.3**
7	30	86.14	0.65	287	51	80	77	1.5	5.0		16.94	**101.5**
8	35	89.62	0.71	286	52	80	77	1.6	5.0		17.69	**101.6**
9	40	93.24	0.7	285	52	80	77	1.6	5.0		17.55	**101.1**
10	45	96.88	0.66	280	55	79	77	1.5	5.0		16.99	**102.3**
11	50	100.37	0.6	280	57	79	77	1.4	5.0		16.20	**100.7**
12	55	103.73	0.6	280	94	79	77	1.4	5.0		16.20	**101.7**
	60	107.06										**100.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	3 M26A
Date:	October 10, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847	
DGM CORRECTION FACTOR	1.006	
NOZZLE DIAMETER	6.44	mm
DRY REF GAS VOLUME SAMPLED	1.241	m^3
AVGERGE ISOKINETICITY	99.7	%
STACK DIAMETER	1.37	m
LENGTH	0.00	m
WIDTH	0.00	m
AREA OF STACK or DUCT	1.48	m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.2	°C
AVERAGE GAS MOISTURE BY VOLUME	15.6	%
AVERAGE GAS VELOCITY	17.96	m/s
BAROMETRIC PRESSURE (Station)	100.948	Kpa
STATIC PRESSURE	-2.490	Kpa
ABSOLUTE GAS PRESSURE	98.458	Kpa
OXYGEN CONCENTRATION	8.49	%
CARBON DIOXIDE CONCENTRATION	10.74	%
CARBON MONOXIDE CONCENTRATION	8.9	ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.53	m^3/s
DRY REF GAS FLOWRATE	15.69	Rm^3/s
DRY ADJ GAS FLOWRATE	19.66	Rm^3/s
WET REF GAS FLOWRATE	18.60	Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0	mg
	-FILTER	0	mg
	-TOTAL	0	mg
DRY REF GAS VOLUME SAMPLED		1.241	m^3
PARTICULATE CONC. - ACTUAL		0.000	mg/m^3
PARTICULATE CONC. - DRY REF		0.000	mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000	mg/m^3
PARTICULATE CONC. - WET REF		0.000	mg/m^3
PARTICULATE EMISSION RATE		0.000000	g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 M26A	**Test Location:**	APC Outlet No. 1
Date:	October 10, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	1.006	**Probe (mg)**	0		
Barometric Pressure	29.81 "Hg	**CWTR (g)**	160		
Static Pressure	-10.000 "H_2O	**WCBDA (g)**	9.1		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.49
CO2%	10.74
COppm	8.9

Measured H2O
15.6 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	7.59	0.75	285	67	77	77	1.7	4.5		18.16	
2	5	11.16	0.92	283	55	76	77	2.1	5.0		20.09	**97.1**
3	10	15.22	0.89	284	51	79	77	2	5.0		19.77	**99.7**
4	15	19.24	0.8	285	50	79	78	1.8	5.0		18.76	**100.2**
5	20	23.08	0.75	285	50	83	78	1.7	4.5		18.16	**100.8**
6	25	26.81	0.75	285	50	81	79	1.7	4.5		18.16	**100.8**
7	30	30.52	0.65	285	50	82	79	1.5	4.5		16.91	**100.3**
8	35	34.01	0.67	285	51	81	79	1.5	4.5		17.17	**101.2**
9	40	37.48	0.73	286	52	82	79	1.7	4.5		17.93	**99.2**
10	45	41.05	0.73	286	51	82	79	1.7	4.5		17.93	**97.8**
11	50	44.66	0.6	285	50	82	80	1.4	4.5		16.25	**98.9**
12	55	48.00	0.6	279	50	83	80	1.4	4.5		16.18	**100.7**
	60	51.32										**99.6**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 - M26A
Date:	October 11, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.987
NOZZLE DIAMETER	6.44 mm
DRY REF GAS VOLUME SAMPLED	1.266 m^3
AVGERGE ISOKINETICITY	101.9 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.9 °C
AVERAGE GAS MOISTURE BY VOLUME	16.7 %
AVERAGE GAS VELOCITY	18.04 m/s
BAROMETRIC PRESSURE (Station)	101.524 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.258 Kpa
OXYGEN CONCENTRATION	7.9 %
CARBON DIOXIDE CONCENTRATION	11.22 %
CARBON MONOXIDE CONCENTRATION	8.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.66 m^3/s
DRY REF GAS FLOWRATE	15.66 Rm^3/s
DRY ADJ GAS FLOWRATE	20.57 Rm^3/s
WET REF GAS FLOWRATE	18.81 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.266 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - M26A	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	29.98 "Hg	**CWTR (g)**	178.4		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	8.2		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.9
CO2%	11.22
COppm	8.5

Measured H2O
16.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	42.75	0.8	285	66	73	72	1.9	2.5		18.71	
2	5	46.58	0.88	287	45	72	72	2.1	3.0		19.65	**101.1**
3	10	50.55	0.85	287	45	72	72	2.1	3.0		19.31	**100.2**
4	15	54.53	0.8	287	45	73	73	1.9	3.0		18.74	**102.2**
5	20	58.38	0.75	287	45	74	73	1.85	3.0		18.14	**101.7**
6	25	62.16	0.7	288	46	75	73	1.8	3.0		17.54	**103.0**
7	30	65.86	0.7	287	46	75	73	1.7	2.5		17.53	**104.3**
8	35	69.44	0.74	287	45	76	73	1.8	3.0		18.02	**100.8**
9	40	73.16	0.74	287	45	76	73	1.8	3.0		18.02	**101.8**
10	45	76.90	0.7	282	45	77	74	1.7	2.5		17.47	**102.4**
11	50	80.51	0.64	282	44	78	74	1.6	2.5		16.70	**101.0**
12	55	84.00	0.64	282	45	78	74	1.6	2.5		16.70	**102.0**
	60	87.48										**101.7**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	2 - M26A
Date:	October 11, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.987
NOZZLE DIAMETER	6.44 mm
DRY REF GAS VOLUME SAMPLED	1.273 m^3
AVGERGE ISOKINETICITY	101.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	140.6 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	18.15 m/s
BAROMETRIC PRESSURE (Station)	101.456 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.190 Kpa
OXYGEN CONCENTRATION	7.78 %
CARBON DIOXIDE CONCENTRATION	11.28 %
CARBON MONOXIDE CONCENTRATION	10.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.81 m^3/s
DRY REF GAS FLOWRATE	15.84 Rm^3/s
DRY ADJ GAS FLOWRATE	21.00 Rm^3/s
WET REF GAS FLOWRATE	18.92 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.273 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - M26A	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	29.96 "Hg	**CWTR (g)**	171.4		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	9.8		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.78
CO2%	11.28
COppm	10.0

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	89.83	0.72	285	64	73	73	1.8	3.0		17.74	
2	5	93.60	0.8	284	49	73	73	1.9	3.0		18.69	104.3
3	10	97.41	0.84	285	46	72	72	2	3.0		19.16	99.9
4	15	101.32	0.78	285	46	73	72	1.9	3.0		18.46	100.3
5	20	105.14	0.66	285	46	74	72	1.6	2.5		16.98	101.6
6	25	108.66	0.64	285	45	75	73	1.6	2.5		16.72	101.6
7	30	112.14	0.72	286	49	76	73	1.8	3.0		17.75	101.8
8	35	115.79	0.7	286	45	77	73	1.8	3.0		17.50	100.7
9	40	119.47	0.7	286	45	77	73	1.75	3.0		17.50	102.9
10	45	123.08	0.82	286	45	77	73	2	3.0		18.94	100.9
11	50	127.02	0.83	284	45	78	73	2	3.0		19.03	101.8
12	55	130.94	0.85	284	47	78	73	2	3.0		19.26	100.5
	60	134.83										98.5

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	3 - M26A
Date:	October 11, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.987
NOZZLE DIAMETER	6.44 mm
DRY REF GAS VOLUME SAMPLED	1.259 m^3
AVGERGE ISOKINETICITY	101.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	139.6 °C
AVERAGE GAS MOISTURE BY VOLUME	15.7 %
AVERAGE GAS VELOCITY	17.73 m/s
BAROMETRIC PRESSURE (Station)	101.456 Kpa
STATIC PRESSURE	-2.266 Kpa
ABSOLUTE GAS PRESSURE	99.190 Kpa
OXYGEN CONCENTRATION	7.91 %
CARBON DIOXIDE CONCENTRATION	11.23 %
CARBON MONOXIDE CONCENTRATION	9.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.20 m^3/s
DRY REF GAS FLOWRATE	15.61 Rm^3/s
DRY ADJ GAS FLOWRATE	20.48 Rm^3/s
WET REF GAS FLOWRATE	18.53 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.259 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - M26A	**Test Location:**	APC Outlet No. 2
Date:	October 11, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	29.96 "Hg	**CWTR (g)**	162.4		
Static Pressure	-9.100 "H_2O	**WCBDA (g)**	10.2		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.23
COppm	9.8

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	36.67	0.72	285	67	73	72	1.8	2.0		17.72	
2	5	40.50	0.85	283	67	72	71	2.1	2.0		19.23	**105.5**
3	10	44.49	0.81	283	49	72	71	2	2.0		18.77	**101.3**
4	15	48.39	0.76	285	49	72	72	1.9	2.0		18.21	**101.4**
5	20	52.16	0.66	286	49	72	72	1.6	2.0		16.98	**101.2**
6	25	55.66	0.6	286	50	74	71	1.45	2.0		16.19	**100.8**
7	30	59.00	0.72	286	52	75	71	1.8	2.0		17.73	**100.8**
8	35	62.69	0.76	287	54	75	71	1.9	2.0		18.23	**101.6**
9	40	66.50	0.7	287	56	76	71	1.7	2.0		17.50	**102.2**
10	45	70.13	0.72	280	58	76	71	1.8	2.0		17.66	**101.3**
11	50	73.79	0.78	284	59	77	72	2	2.0		18.43	**100.3**
12	55	77.66	0.61	268	58	77	72	1.5	2.0		16.12	**102.0**
	60	81.09										**101.0**

APPENDIX 27

SVOC Test Emission Calculations
(44 pages)

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	1 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.844
DGM CORRECTION FACTOR	0.996
NOZZLE DIAMETER	6.49 mm
DRY REF GAS VOLUME SAMPLED	4.949 m^3
AVGERGE ISOKINETICITY	100.5 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	141.3 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	17.49 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-2.510 Kpa
ABSOLUTE GAS PRESSURE	99.217 Kpa
OXYGEN CONCENTRATION	8.35 %
CARBON DIOXIDE CONCENTRATION	11.13 %
CARBON MONOXIDE CONCENTRATION	6.8 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.85 m^3/s
DRY REF GAS FLOWRATE	15.26 Rm^3/s
DRY ADJ GAS FLOWRATE	19.35 Rm^3/s
WET REF GAS FLOWRATE	18.21 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.949 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	CB

Pitot Factor	0.844	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	682		
Static Pressure	-10.080 "H_2O	**WCBDA (g)**	20.2		
Nozzle	0.2555 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.35
CO2%	11.13
COppm	6.8

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	74.91	0.56	286	62	66	64	1.35	5.0		15.60	
	5	78.44	0.57	286	44	65	64	1.35	5.0		15.73	112.2
2	10	81.43	0.57	286	44	64	63	1.4	5.5		15.73	94.3
	15	84.62	0.58	286	44	65	64	1.4	5.5		15.87	100.8
3	20	87.83	0.67	286	43	65	64	1.6	6.0		17.06	100.4
	25	91.10	0.67	286	42	65	64	1.6	6.0		17.06	95.2
4	30	94.51	0.74	286	42	66	64	1.8	7.0		17.93	99.3
	35	98.10	0.75	286	41	66	64	1.8	7.0		18.05	99.4
5	40	101.72	0.83	286	41	66	64	2	7.5		18.99	99.5
	45	105.51	0.85	287	41	67	65	2	7.5		19.23	99.1
6	50	109.35	0.78	289	41	67	65	1.9	7.5		18.44	99.1
	55	113.14	0.78	288	42	67	65	1.9	7.5		18.43	102.2
7	60	116.95	0.56	289	42	68	66	1.4	7.0		15.63	102.7
	65	120.27	0.56	288	43	68	66	1.4	7.0		15.62	105.4
8	70	123.57	0.5	288	43	68	66	1.1	6.0		14.76	104.7
	75	126.62	0.5	288	44	69	66	1.1	6.0		14.76	102.3
9	80	129.55	0.63	287	44	69	67	1.5	6.5		16.55	98.2
	85	132.73	0.63	287	44	69	67	1.5	6.5		16.55	94.9
10	90	136.05	0.78	287	44	69	67	1.9	7.0		18.42	99.0
	95	139.71	0.77	286	43	69	67	1.9	7.0		18.29	98.2
11	100	143.41	0.84	286	43	69	67	2.1	7.8		19.10	99.9
	105	147.26	0.84	287	44	69	67	2.1	8.0		19.11	99.5
12	110	151.15	0.88	287	45	69	67	2.3	8.0		19.56	100.6
	115	155.13	0.88	287	46	70	68	2.3	8.0		19.56	100.7
	120	159.20								0.43		102.7
1	0	159.63	0.46	284	51	69	67	1	6.0		14.12	
	5	162.68	0.49	284	46	69	68	1	6.0		14.57	106.1
2	10	165.61	0.5	284	45	69	68	1	6.0		14.72	98.7
	15	168.52	0.5	284	45	69	68	1	6.0		14.72	97.0
3	20	171.36	0.74	285	44	70	68	1.8	7.5		17.92	94.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	CB

Pitot Factor	0.844	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	682		
Static Pressure	-10.080 "H_2O	**WCBDA (g)**	20.2		
Nozzle	0.2555 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.35
CO2%	11.13
COppm	6.8

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	174.80	0.74	285	43	70	68	1.9	7.8		17.92	94.4
4	30	178.40	0.77	285	44	70	69	1.9	7.8		18.28	98.9
	35	182.18	0.84	284	44	71	69	2.1	8.5		19.08	101.7
5	40	186.10	0.81	283	44	71	69	2.1	8.5		18.72	100.8
	45	189.88	0.8	284	44	71	69	2	8.5		18.62	99.0
6	50	193.88	0.74	287	45	71	70	1.9	8.0		17.94	105.4
	55	197.65	0.73	287	44	72	70	1.9	8.0		17.82	103.4
7	60	201.41	0.55	288	45	72	70	1.3	7.0		15.48	103.7
	65	204.76	0.56	288	45	72	70	1.25	7.0		15.62	106.4
8	70	207.95	0.7	286	45	72	70	1.7	7.5		17.44	100.4
	75	211.40	0.72	286	45	73	71	1.7	7.5		17.68	97.1
9	80	214.93	0.8	287	45	73	71	2	8.5		18.65	97.7
	85	218.68	0.8	287	45	73	71	2	8.5		18.65	98.6
10	90	222.55	0.82	287	45	73	71	2	8.5		18.88	101.8
	95	226.45	0.82	287	46	73	71	2	8.5		18.88	101.3
11	100	230.24	0.87	287	46	73	71	2.2	9.0		19.45	98.5
	105	234.16	0.86	287	46	74	72	2.2	9.0		19.34	98.9
12	110	238.24	0.89	287	46	74	71	2.2	9.0		19.67	103.4
	115	242.29	0.88	287	46	74	72	2.2	9.0		19.56	101.0
	120	246.50										105.4

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 1
Test No.:	2 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT		0.844
DGM CORRECTION FACTOR		0.996
NOZZLE DIAMETER		6.49 mm
DRY REF GAS VOLUME SAMPLED		4.827 m^3
AVGERGE ISOKINETICITY		100.4 %
STACK DIAMETER		1.37 m
LENGTH		0.00 m
WIDTH		0.00 m
AREA OF STACK or DUCT		1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE		141.5 °C
AVERAGE GAS MOISTURE BY VOLUME		15.7 %
AVERAGE GAS VELOCITY		17.03 m/s
BAROMETRIC PRESSURE (Station)		101.592 Kpa
STATIC PRESSURE		-2.465 Kpa
ABSOLUTE GAS PRESSURE		99.127 Kpa
OXYGEN CONCENTRATION		8.37 %
CARBON DIOXIDE CONCENTRATION		11.01 %
CARBON MONOXIDE CONCENTRATION		10.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE		25.16 m^3/s
DRY REF GAS FLOWRATE		14.91 Rm^3/s
DRY ADJ GAS FLOWRATE		18.87 Rm^3/s
WET REF GAS FLOWRATE		17.70 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.827 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	CB

Pitot Factor	0.844	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	643.7		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	18.8		
Nozzle	0.2555 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.44 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.37
CO2%	11.01
COppm	10.4

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	46.95	0.84	286	71	73	72	2.1	6.0		19.10	
	5	50.75	0.83	287	58	73	73	2.1	6.0		18.99	96.9
2	10	54.59	0.84	287	53	73	72	2.1	6.0		19.11	98.5
	15	58.41	0.84	287	51	73	72	2.1	6.0		19.11	97.5
3	20	62.32	0.8	287	49	73	73	2	6.0		18.65	99.8
	25	66.16	0.8	288	48	73	72	2	6.0		18.66	100.3
4	30	70.06	0.75	288	47	73	72	1.9	6.0		18.07	102.0
	35	73.77	0.75	288	47	73	72	1.6	6.0		18.07	100.2
5	40	77.46	0.72	288	47	74	72	1.8	5.5		17.70	99.6
	45	81.24	0.7	288	47	74	72	1.7	5.5		17.46	104.1
6	50	84.88	0.6	287	47	74	72	1.5	5.0		16.15	101.6
	55	88.24	0.6	288	48	74	72	1.5	5.0		16.16	101.2
7	60	91.56	0.71	287	47	74	72	1.7	5.5		17.57	100.1
	65	95.13	0.71	288	47	74	72	1.7	5.5		17.58	98.9
8	70	98.66	0.75	288	47	74	73	1.9	6.0		18.07	97.8
	75	102.42	0.75	288	47	74	73	1.9	6.0		18.07	101.4
9	80	106.24	0.71	288	47	75	73	1.7	6.0		17.58	103.0
	85	109.83	0.71	288	47	75	73	1.7	6.0		17.58	99.3
10	90	113.41	0.65	288	48	75	73	1.6	5.5		16.82	99.0
	95	116.90	0.64	287	48	75	73	1.6	5.5		16.68	100.9
11	100	120.36	0.58	287	48	75	73	1.4	5.0		15.88	100.7
	105	123.75	0.55	286	48	75	73	1.3	5.0		15.45	103.6
12	110	126.90	0.47	286	49	75	73	1.1	4.5		14.28	98.8
	115	129.80	0.48	286	50	75	73	1.1	4.5		14.44	98.3
	120	132.87								0.44		103.0
1	0	133.31	0.81	286	62	74	73	2	6.5		18.75	
	5	137.03	0.8	287	51	75	73	2.1	7.0		18.65	96.4
2	10	140.91	0.77	287	50	74	73	2	6.5		18.30	101.2
	15	144.76	0.8	288	49	75	73	2.1	7.0		18.66	102.4
3	20	148.64	0.76	288	48	75	73	2	7.0		18.19	101.2

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	October 12, 2017	**Operator:**	CB

Pitot Factor	0.844	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	643.7		
Static Pressure	-9.900 "H_2O	**WCBDA (g)**	18.8		
Nozzle	0.2555 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.44 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.37
CO2%	11.01
COppm	10.4

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	152.50	0.82	289	48	75	73	2.1	7.0		18.91	103.3
4	30	156.38	0.81	289	48	75	73	2.1	7.0		18.79	100.0
	35	160.25	0.81	290	49	75	73	2.1	7.0		18.80	100.4
5	40	164.10	0.7	290	49	75	74	1.8	6.5		17.48	99.9
	45	167.80	0.7	290	49	75	74	1.75	6.5		17.48	103.2
6	50	171.45	0.61	289	49	75	73	1.45	5.5		16.31	101.7
	55	174.75	0.6	289	50	76	74	1.5	6.0		16.17	98.5
7	60	178.04	0.65	288	50	76	74	1.6	6.0		16.82	98.8
	65	181.46	0.61	287	50	76	74	1.6	6.0		16.28	98.7
8	70	184.88	0.64	287	51	76	74	1.65	6.0		16.68	101.8
	75	188.35	0.68	287	51	76	74	1.75	6.0		17.19	100.8
9	80	191.90	0.64	285	51	76	74	1.65	6.0		16.66	100.1
	85	195.40	0.61	283	52	76	74	1.6	6.0		16.24	101.6
10	90	198.85	0.46	283	52	76	74	1	5.0		14.10	102.4
	95	201.70	0.45	280	52	76	74	1.1	5.0		13.92	97.3
11	100	204.61	0.45	280	52	76	74	1.1	5.0		13.92	100.2
	105	207.51	0.45	280	52	77	74	1.1	5.0		13.92	99.9
12	110	210.40	0.45	280	52	76	74	1.2	5.0		13.92	99.5
	115	213.34	0.45	280	53	76	74	1.2	5.0		13.92	101.3
	120	216.27										101.0

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test Location:	APC Outlet No. 1
Test No.:	3 - SVOC
Date:	October 13, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT		0.844
DGM CORRECTION FACTOR		0.996
NOZZLE DIAMETER		6.49 mm
DRY REF GAS VOLUME SAMPLED		4.848 m^3
AVGERGE ISOKINETICITY		99.0 %
STACK DIAMETER		1.37 m
LENGTH		0.00 m
WIDTH		0.00 m
AREA OF STACK or DUCT		1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	142.0 °C
AVERAGE GAS MOISTURE BY VOLUME	15.8 %
AVERAGE GAS VELOCITY	17.39 m/s
BAROMETRIC PRESSURE (Station)	101.388 Kpa
STATIC PRESSURE	-2.478 Kpa
ABSOLUTE GAS PRESSURE	98.911 Kpa
OXYGEN CONCENTRATION	8.69 %
CARBON DIOXIDE CONCENTRATION	10.75 %
CARBON MONOXIDE CONCENTRATION	15.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.69 m^3/s
DRY REF GAS FLOWRATE	15.17 Rm^3/s
DRY ADJ GAS FLOWRATE	18.71 Rm^3/s
WET REF GAS FLOWRATE	18.02 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.848 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	October 13, 2017	**Operator:**	TT

Pitot Factor	0.844	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	650.1		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	17.6		
Nozzle	0.2555 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.3 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.69
CO2%	10.75
COppm	15.1

Measured H2O
15.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	17.70	0.85	281	70	76	75	2	6.0		19.18	
	5	21.42	0.71	288	48	76	74	1.7	6.0		17.61	93.3
2	10	24.97	0.68	288	48	76	74	1.7	6.0		17.23	97.9
	15	28.50	0.67	288	48	76	74	1.65	6.0		17.11	99.5
3	20	32.01	0.63	289	48	77	75	1.55	6.0		16.60	99.7
	25	35.41	0.64	289	48	77	75	1.6	6.0		16.73	99.4
4	30	38.86	0.66	289	47	77	75	1.65	6.0		16.99	100.1
	35	42.37	0.66	289	47	77	74	1.65	6.0		16.99	100.3
5	40	45.87	0.71	289	47	77	74	1.75	6.0		17.62	100.1
	45	49.49	0.71	289	47	77	74	1.75	6.0		17.62	99.9
6	50	53.15	0.66	289	47	77	75	1.65	6.0		16.99	101.0
	55	56.63	0.66	289	47	78	75	1.65	6.0		16.99	99.4
7	60	60.10	0.66	288	47	78	75	1.6	6.0		16.98	99.1
	65	63.56	0.64	288	47	78	75	1.55	6.0		16.72	98.7
8	70	66.99	0.67	287	47	77	75	1.65	6.0		17.09	99.4
	75	70.51	0.67	287	48	78	75	1.65	6.0		17.09	99.7
9	80	74.02	0.67	286	47	78	75	1.65	6.0		17.08	99.3
	85	77.54	0.67	286	47	78	75	1.65	6.0		17.08	99.5
10	90	81.04	0.61	286	47	77	75	1.5	6.0		16.30	99.0
	95	84.44	0.59	286	47	78	75	1.4	6.0		16.03	100.8
11	100	87.71	0.6	286	48	78	75	1.45	6.0		16.17	98.5
	105	90.95	0.6	286	48	78	75	1.45	6.0		16.17	96.8
12	110	94.26	0.4	286	48	78	75	0.85	5.0		13.20	98.9
	115	96.86	0.42	286	49	78	75	0.92	5.0		13.52	95.0
	120	99.51								0.3		94.5
1	0	99.81	0.87	286	64	78	75	2.15	8.0		19.47	
	5	103.77	0.87	287	48	77	75	2.15	8.0		19.48	98.4
2	10	107.79	0.88	287	47	77	75	2.2	8.0		19.59	100.0
	15	111.87	0.88	288	47	77	75	2.15	8.0		19.60	101.0
3	20	115.88	0.82	288	46	77	75	2	8.0		18.92	99.3

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, Ontario
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 1
Date:	October 13, 2017	**Operator:**	TT

Pitot Factor	0.844	**Filter (mg)**	0		
DGMCF	0.996	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	650.1		
Static Pressure	-9.950 "H_2O	**WCBDA (g)**	17.6		
Nozzle	0.2555 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.3 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.69
CO2%	10.75
COppm	15.1

Measured H2O
15.8 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	119.74	0.82	288	45	77	75	2	8.0		18.92	**99.0**
4	30	123.59	0.86	288	45	77	75	2.15	8.0		19.38	**98.7**
	35	127.54	0.85	288	45	77	75	2.1	8.0		19.27	**98.9**
5	40	131.52	0.8	288	45	77	75	1.95	7.5		18.69	**100.3**
	45	135.36	0.82	289	46	77	75	2	7.5		18.94	**99.7**
6	50	139.23	0.76	289	46	77	75	1.85	7.5		18.23	**99.3**
	55	142.98	0.75	289	46	78	75	1.85	7.5		18.11	**99.9**
7	60	146.72	0.65	289	46	78	75	1.6	7.0		16.86	**100.2**
	65	150.18	0.64	289	47	78	75	1.55	7.0		16.73	**99.5**
8	70	153.62	0.77	289	47	78	75	1.9	7.5		18.35	**99.7**
	75	157.35	0.79	289	47	78	75	2	8.0		18.59	**98.7**
9	80	161.21	0.8	288	47	77	75	1.95	8.0		18.69	**100.8**
	85	165.02	0.8	287	47	78	75	1.95	8.0		18.68	**98.9**
10	90	168.85	0.75	287	47	78	75	1.8	7.5		18.09	**99.3**
	95	172.55	0.71	287	47	78	76	1.7	7.5		17.60	**99.0**
11	100	176.18	0.67	287	47	78	76	1.6	7.0		17.09	**99.7**
	105	179.65	0.65	287	47	78	76	1.6	7.0		16.84	**98.1**
12	110	183.12	0.43	287	47	78	76	0.97	5.5		13.69	**99.6**
	115	185.90	0.43	286	48	79	76	1	5.5		13.68	**97.9**
	120	188.68										**97.8**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	1 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.987
NOZZLE DIAMETER	6.44 mm
DRY REF GAS VOLUME SAMPLED	5.021 m^3
AVGERGE ISOKINETICITY	100.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	138.7 °C
AVERAGE GAS MOISTURE BY VOLUME	15.3 %
AVERAGE GAS VELOCITY	17.77 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-2.336 Kpa
ABSOLUTE GAS PRESSURE	99.391 Kpa
OXYGEN CONCENTRATION	8.05 %
CARBON DIOXIDE CONCENTRATION	11.14 %
CARBON MONOXIDE CONCENTRATION	9.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.25 m^3/s
DRY REF GAS FLOWRATE	15.78 Rm^3/s
DRY ADJ GAS FLOWRATE	20.49 Rm^3/s
WET REF GAS FLOWRATE	18.64 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		5.021 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	651.2		
Static Pressure	-9.380 "H_2O	**WCBDA (g)**	16.9		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.48 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.05
CO2%	11.14
COppm	9.2

Measured H2O
15.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	82.42	0.8	282	62	66	65	1.9	4.0		18.61	
	5	86.18	0.8	285	48	67	66	1.9	4.0		18.65	99.2
2	10	89.79	0.83	285	46	67	67	1.95	5.0		18.99	95.2
	15	93.61	0.83	285	45	68	67	1.95	5.0		18.99	98.8
3	20	97.43	0.83	285	44	69	67	2	5.0		18.99	98.7
	25	101.29	0.81	286	43	70	67	2	5.0		18.77	99.7
4	30	105.14	0.78	286	43	71	67	1.9	5.0		18.42	100.6
	35	108.94	0.75	286	43	72	68	1.8	5.0		18.07	101.1
5	40	112.66	0.7	286	44	72	68	1.7	4.7		17.45	100.7
	45	116.27	0.7	286	43	72	68	1.7	4.7		17.45	101.1
6	50	119.81	0.63	287	45	73	68	1.5	4.5		16.57	99.2
	55	123.23	0.6	287	43	74	69	1.4	4.2		16.17	100.9
7	60	126.51	0.69	287	43	74	69	1.7	4.7		17.34	99.0
	65	130.06	0.66	287	43	75	70	1.6	4.7		16.96	100.0
8	70	133.57	0.69	286	44	75	70	1.7	4.7		17.33	100.8
	75	137.13	0.71	286	43	75	70	1.7	4.7		17.58	100.0
9	80	140.66	0.71	287	43	76	70	1.7	5.0		17.59	97.7
	85	144.26	0.71	286	43	76	71	1.7	5.0		17.58	99.6
10	90	147.86	0.71	286	43	76	71	1.7	5.0		17.58	99.5
	95	151.45	0.68	286	44	76	71	1.65	5.0		17.20	99.2
11	100	155.03	0.6	285	44	76	72	1.5	4.5		16.15	101.1
	105	158.38	0.6	281	46	78	73	1.5	4.5		16.10	100.5
12	110	161.72	0.55	277	44	78	72	1.3	4.0		15.38	99.6
	115	164.92	0.58	260	44	76	72	1.4	4.5		15.61	99.5
	120	168.18								0.48		97.8
1	0	168.66	0.65	245	61	73	72	1.7	5.5		16.35	
	5	172.22	0.72	245	46	73	73	1.9	6.0		17.21	100.1
2	10	176.16	0.75	246	45	74	73	1.9	6.0		17.57	105.3
	15	179.95	0.71	245	45	74	72	1.8	6.0		17.09	99.2
3	20	183.71	0.74	285	45	75	74	1.8	6.0		17.93	101.1

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	651.2		
Static Pressure	-9.380 "H_2O	**WCBDA (g)**	16.9		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.48 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.05
CO2%	11.14
COppm	9.2

Measured H2O
15.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	187.41	0.74	286	46	75	72	1.8	6.0		17.95	99.9
4	30	191.10	0.71	286	46	76	73	1.7	6.0		17.58	99.9
	35	194.78	0.71	286	46	77	73	1.7	6.0		17.58	101.5
5	40	198.42	0.71	285	46	77	73	1.7	6.0		17.57	100.3
	45	202.06	0.75	286	46	78	73	1.9	6.0		18.07	100.2
6	50	205.86	0.75	286	46	78	73	1.9	6.0		18.07	101.8
	55	209.66	0.75	286	46	78	74	1.9	6.0		18.07	101.8
7	60	213.41	0.66	287	47	78	74	1.6	6.0		16.96	100.4
	65	216.99	0.66	286	47	79	74	1.6	6.0		16.95	102.2
8	70	220.54	0.72	286	48	79	75	1.8	6.0		17.70	101.2
	75	224.17	0.74	286	47	79	74	1.85	6.2		17.95	99.0
9	80	227.93	0.76	286	48	79	75	1.85	6.2		18.19	101.2
	85	231.69	0.78	285	47	80	75	1.9	6.5		18.41	99.8
10	90	235.53	0.84	286	47	80	75	2.1	7.0		19.12	100.5
	95	239.50	0.84	286	47	80	75	2.1	7.0		19.12	100.2
11	100	243.49	0.84	286	47	80	76	2.1	7.0		19.12	100.7
	105	247.45	0.84	286	47	80	76	2.1	7.0		19.12	99.9
12	110	251.44	0.9	285	47	80	76	2.2	7.2		19.78	100.6
	115	255.55	0.9	286	47	80	76	2.2	7.2		19.79	100.1
	120	259.74										102.1

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	2 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT		0.847
DGM CORRECTION FACTOR		0.987
NOZZLE DIAMETER		6.44 mm
DRY REF GAS VOLUME SAMPLED		4.974 m^3
AVGERGE ISOKINETICITY		100.8 %
STACK DIAMETER		1.37 m
LENGTH		0.00 m
WIDTH		0.00 m
AREA OF STACK or DUCT		1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE		140.7 °C
AVERAGE GAS MOISTURE BY VOLUME		16.1 %
AVERAGE GAS VELOCITY		17.77 m/s
BAROMETRIC PRESSURE (Station)		101.592 Kpa
STATIC PRESSURE		-2.291 Kpa
ABSOLUTE GAS PRESSURE		99.301 Kpa
OXYGEN CONCENTRATION		7.91 %
CARBON DIOXIDE CONCENTRATION		11.26 %
CARBON MONOXIDE CONCENTRATION		10.2 ppm

FLOWRATE

ACTUAL GAS FLOWRATE		26.26 m^3/s
DRY REF GAS FLOWRATE		15.54 Rm^3/s
DRY ADJ GAS FLOWRATE		20.40 Rm^3/s
WET REF GAS FLOWRATE		18.54 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.974 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	683.3		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	20.6		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.42 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.26
COppm	10.2

Measured H2O
16.1 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	60.44	0.68	275	67	76	75	1.7	6.5		17.11	
	5	64.20	0.72	286	58	76	75	1.7	6.5		17.74	105.8
2	10	67.78	0.72	286	57	75	75	1.7	6.5		17.74	98.6
	15	71.32	0.72	286	56	76	75	1.7	6.5		17.74	97.6
3	20	74.85	0.72	285	54	75	75	1.7	7.0		17.72	97.2
	25	78.42	0.72	286	54	77	75	1.7	7.0		17.74	98.3
4	30	82.05	0.72	285	54	78	75	1.7	7.0		17.72	99.9
	35	85.72	0.72	286	53	79	75	1.7	7.0		17.74	100.8
5	40	89.38	0.69	286	52	79	76	1.7	7.0		17.36	100.5
	45	93.03	0.69	286	53	79	76	1.7	7.0		17.36	102.3
6	50	96.66	0.67	286	53	80	76	1.6	7.0		17.11	101.7
	55	100.23	0.67	286	53	80	76	1.6	7.0		17.11	101.4
7	60	103.79	0.67	286	53	81	76	1.6	7.0		17.11	101.1
	65	107.35	0.67	286	51	81	77	1.6	7.0		17.11	101.0
8	70	110.90	0.74	286	53	81	77	1.8	7.5		17.98	100.7
	75	114.56	0.77	287	51	81	77	1.9	8.0		18.35	98.8
9	80	118.35	0.77	287	50	81	77	1.9	8.0		18.35	100.4
	85	122.15	0.77	287	50	82	78	1.9	8.0		18.35	100.6
10	90	125.94	0.77	287	50	82	78	1.9	8.0		18.35	100.2
	95	129.74	0.77	287	50	81	78	1.9	8.0		18.35	100.5
11	100	133.52	0.8	286	50	82	78	2	8.5		18.70	100.0
	105	137.40	0.82	286	50	82	78	2	8.5		18.93	100.6
12	110	141.30	0.82	286	50	82	78	2	8.5		18.93	99.9
	115	145.23	0.82	286	51	82	78	2	8.5		18.93	100.6
	120	149.17								0.42		100.9
1	0	149.59	0.68	275	68	80	78	1.7	8.5		17.11	
	5	153.33	0.73	281	54	79	79	1.8	8.5		17.80	104.5
2	10	157.06	0.73	282	50	79	78	1.8	8.5		17.81	101.0
	15	160.79	0.7	283	50	80	78	1.75	8.5		17.45	101.2
3	20	164.51	0.72	289	51	80	78	1.8	8.5		17.77	103.0

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	October 12, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	683.3		
Static Pressure	-9.200 "H_2O	**WCBDA (g)**	20.6		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.42 ft³	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.91
CO2%	11.26
COppm	10.2

Measured H2O
16.1 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	168.17	0.72	286	51	80	78	1.8	8.5		17.74	100.4
4	30	171.85	0.73	286	51	80	78	1.8	8.5		17.86	100.7
	35	175.53	0.73	286	52	81	78	1.8	8.5		17.86	100.0
5	40	179.18	0.71	287	52	81	78	1.8	8.5		17.63	99.1
	45	182.84	0.71	287	53	82	78	1.8	8.5		17.63	100.8
6	50	186.52	0.66	287	53	82	78	1.6	8.5		16.99	101.3
	55	190.10	0.66	287	54	83	80	1.6	8.5		16.99	102.2
7	60	193.71	0.56	285	51	82	79	1.4	8.0		15.63	102.7
	65	197.00	0.56	283	49	82	79	1.4	8.0		15.61	101.6
8	70	200.42	0.64	284	48	82	79	1.6	8.2		16.70	105.5
	75	203.88	0.66	285	48	82	79	1.7	8.5		16.97	100.0
9	80	207.41	0.73	285	47	83	79	1.8	8.5		17.85	100.5
	85	211.11	0.73	285	47	83	79	1.8	8.5		17.85	100.1
10	90	214.78	0.78	285	47	83	79	1.9	9.0		18.45	99.3
	95	218.55	0.8	285	47	83	79	2	9.5		18.68	98.7
11	100	222.42	0.8	286	47	83	80	2	9.5		18.70	100.1
	105	226.29	0.82	286	48	82	80	2.1	10.0		18.93	100.1
12	110	230.28	0.8	286	48	82	80	2	10.0		18.70	102.0
	115	234.19	0.8	286	48	83	80	2	10.0		18.70	101.2
	120	238.13										101.9

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	APC Outlet No. 2
Test No.:	3 - SVOC
Date:	October 13, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT		0.847
DGM CORRECTION FACTOR		0.987
NOZZLE DIAMETER		6.44 mm
DRY REF GAS VOLUME SAMPLED		4.977 m^3
AVGERGE ISOKINETICITY		101.1 %
STACK DIAMETER		1.37 m
LENGTH		0.00 m
WIDTH		0.00 m
AREA OF STACK or DUCT		1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE		140.1 °C
AVERAGE GAS MOISTURE BY VOLUME		16.3 %
AVERAGE GAS VELOCITY		17.78 m/s
BAROMETRIC PRESSURE (Station)		101.388 Kpa
STATIC PRESSURE		-2.278 Kpa
ABSOLUTE GAS PRESSURE		99.110 Kpa
OXYGEN CONCENTRATION		7.85 %
CARBON DIOXIDE CONCENTRATION		11.27 %
CARBON MONOXIDE CONCENTRATION		20.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE		26.27 m^3/s
DRY REF GAS FLOWRATE		15.52 Rm^3/s
DRY ADJ GAS FLOWRATE		20.45 Rm^3/s
WET REF GAS FLOWRATE		18.54 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		4.977 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	October 13, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	692.6		
Static Pressure	-9.150 "H_2O	**WCBDA (g)**	20		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.91 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.85
CO2%	11.27
COppm	20.5

Measured H2O
16.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	38.85	0.84	285	68	77	76	2	8.0		19.17	
	5	42.72	0.88	288	52	77	76	2.2	9.5		19.66	98.5
2	10	46.70	0.91	288	51	76	76	2.2	9.5		19.99	99.3
	15	50.82	0.91	288	50	77	76	2.2	9.5		19.99	101.1
3	20	54.91	0.91	288	50	77	76	2.2	9.5		19.99	100.3
	25	59.03	0.91	288	49	78	76	2.2	9.5		19.99	101.0
4	30	63.10	0.82	288	49	78	76	2	9.5		18.98	99.7
	35	67.12	0.82	288	49	79	76	2	9.5		18.98	103.7
5	40	71.08	0.75	287	49	80	77	1.9	9.0		18.14	102.1
	45	74.96	0.75	287	49	80	77	1.9	9.0		18.14	104.3
6	50	78.82	0.67	288	49	80	77	1.6	8.0		17.16	103.7
	55	82.41	0.67	287	50	81	77	1.6	8.0		17.14	102.1
7	60	85.97	0.67	286	50	80	77	1.6	8.0		17.13	101.1
	65	89.53	0.67	286	50	81	77	1.6	8.0		17.13	101.1
8	70	93.08	0.7	286	50	81	77	1.7	8.0		17.51	100.7
	75	96.69	0.7	285	50	81	78	1.7	8.0		17.50	100.2
9	80	100.31	0.7	286	50	81	78	1.7	8.0		17.51	100.3
	85	103.92	0.7	286	50	82	78	1.7	8.0		17.51	100.1
10	90	107.54	0.68	286	50	81	78	1.7	8.0		17.26	100.3
	95	111.13	0.68	286	50	81	78	1.7	8.0		17.26	101.0
11	100	114.69	0.56	286	50	82	78	1.4	8.0		15.66	100.2
	105	118.04	0.56	273	51	81	79	1.4	8.0		15.53	103.7
12	110	121.33	0.56	274	51	82	79	1.4	8.0		15.54	101.0
	115	124.63	0.56	274	51	82	79	1.4	8.0		15.54	101.2
	120	127.92								0.91		100.9
1	0	128.83	0.8	285	65	80	79	2	10.5		18.71	
	5	132.76	0.8	285	50	79	79	2	10.5		18.71	102.0
2	10	136.72	0.88	285	48	79	79	2.1	10.5		19.62	102.8
	15	140.69	0.88	286	47	79	79	2.1	11.0		19.63	98.3
3	20	144.72	0.82	286	46	79	78	2	11.0		18.95	99.9

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	APC Outlet No. 2
Date:	October 13, 2017	**Operator:**	DT

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.987	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	692.6		
Static Pressure	-9.150 "H_2O	**WCBDA (g)**	20		
Nozzle	0.2535 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.91 ft^3	
Length	0.000 ft	**Reading Interval**		5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.85
CO2%	11.27
COppm	20.5

Measured H2O
16.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	25	148.71	0.82	287	46	79	78	2	11.0		18.97	102.5
4	30	152.67	0.78	287	47	79	79	2	10.5		18.50	101.8
	35	156.63	0.76	287	47	80	78	1.9	10.5		18.26	104.3
5	40	160.47	0.7	288	47	79	78	1.7	10.0		17.54	102.4
	45	164.14	0.7	287	47	79	78	1.7	10.0		17.52	102.1
6	50	167.77	0.63	287	47	80	78	1.5	9.0		16.62	100.9
	55	171.25	0.63	288	48	80	78	1.5	9.0		16.64	101.8
7	60	174.74	0.7	287	48	80	78	1.7	9.5		17.52	102.2
	65	178.31	0.7	287	48	80	78	1.7	9.5		17.52	99.2
8	70	181.90	0.74	287	48	80	78	1.9	10.0		18.02	99.7
	75	185.59	0.72	287	48	80	78	1.6	10.0		17.77	99.7
9	80	189.28	0.71	287	48	80	78	1.6	10.0		17.65	101.0
	85	192.91	0.71	287	48	81	79	1.6	10.0		17.65	100.1
10	90	196.54	0.68	287	48	81	79	1.6	10.0		17.27	99.9
	95	200.16	0.68	286	49	81	79	1.6	9.5		17.26	101.8
11	100	203.72	0.62	278	49	82	79	1.5	9.0		16.39	100.1
	105	207.17	0.6	263	49	82	79	1.5	9.0		15.96	100.9
12	110	210.62	0.62	262	49	82	79	1.5	9.0		16.21	101.5
	115	214.05	0.62	262	49	82	79	1.5	9.0		16.21	99.2
	120	217.47										98.9

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet Unit No. 1
Test No.:	1 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.04 mm
DRY REF GAS VOLUME SAMPLED	3.166 m^3
AVGERGE ISOKINETICITY	102.2 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	166.8 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	17.63 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-0.620 Kpa
ABSOLUTE GAS PRESSURE	101.107 Kpa
OXYGEN CONCENTRATION	7.61 %
CARBON DIOXIDE CONCENTRATION	11.13 %
CARBON MONOXIDE CONCENTRATION	8.5 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.05 m^3/s
DRY REF GAS FLOWRATE	14.76 Rm^3/s
DRY ADJ GAS FLOWRATE	19.82 Rm^3/s
WET REF GAS FLOWRATE	17.62 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.166 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 12, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	437.4		
Static Pressure	-2.490 "H_2O	**WCBDA (g)**	11.7		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.6 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.61
CO2%	11.13
COppm	8.5

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures				ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
				Stack °F	Imp. Out °F	DGM Out °F	DGM In °F					
1	0	91.51	0.48	333	71	76	78	0.7	5.0		14.79	
	2.5	92.77	0.46	338	58	79	76	0.7	5.0		14.52	100.1
	5	94.00	0.46	334	56	80	76	0.7	5.5		14.49	100.0
2	7.5	95.21	0.55	333	56	83	76	0.9	6.0		15.83	98.1
	10	96.63	0.56	334	52	80	77	0.9	6.0		15.98	104.9
	12.5	98.07	0.55	335	53	85	78	0.9	6.5		15.85	105.7
3	15	99.49	0.57	334	49	85	77	0.95	7.0		16.13	104.7
	17.5	100.87	0.62	334	49	83	77	1	7.0		16.82	100.0
	20	102.31	0.67	336	48	85	78	1.15	8.0		17.50	100.2
4	22.5	103.85	0.67	336	47	86	79	1.15	8.0		17.50	103.0
	25	105.39	0.62	336	46	86	79	1.1	8.0		16.84	102.8
	27.5	106.92	0.6	334	45	87	80	1	8.5		16.54	106.2
5	30	108.43	0.57	333	44	89	81	0.9	8.5		16.11	106.2
	32.5	109.82	0.59	335	44	90	81	1	8.5		16.42	99.9
	35	111.26	0.57	333	44	90	82	1	8.5		16.11	101.8
6	37.5	112.64	0.61	334	45	91	83	1.05	9.0		16.68	99.0
	40	114.11	0.63	334	44	92	84	1.1	9.5		16.95	101.8
	42.5	115.63	0.63	333	46	93	85	1.1	9.5		16.94	103.4
7	45	117.17	0.75	332	44	93	85	1.25	11.5		18.47	104.6
	47.5	118.82	0.75	332	43	95	87	1.25	11.5		18.47	102.6
	50	120.47	0.73	331	43	95	86	1.2	11.5		18.21	102.3
8	52.5	122.10	0.73	331	44	96	87	1.2	12.0		18.21	102.4
	55	123.72	0.74	331	44	97	88	1.25	12.0		18.34	101.6
	57.5	125.35	0.74	331	44	98	88	1.25	12.0		18.34	101.4
9	60	126.96	0.75	331	47	98	89	1.3	12.5		18.46	100.0
	62.5	128.60	0.75	331	44	99	90	1.3	12.5		18.46	101.1
	65	130.23	0.8	331	43	100	91	1.4	13.5		19.07	100.3
10	67.5	131.97	0.8	332	45	100	91	1.4	13.5		19.08	103.5
	70	133.65	0.76	331	42	101	91	1.3	13.5		18.58	100.0
	72.5	135.26	0.76	330	42	101	92	1.3	13.5		18.57	98.2
11	75	136.95	0.65	329	41	102	91	1.1	13.5		17.17	102.9

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 12, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	437.4		
Static Pressure	-2.490 "H_2O	**WCBDA (g)**	11.7		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.6 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.61
CO2%	11.13
COppm	8.5

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	138.56	0.66	328	41	102	93	1.1	13.5		17.29	105.9
	80	140.15	0.69	327	42	103	94	1.2	14.0		17.66	103.5
12	82.5	141.74	0.7	328	41	103	94	1.2	14.0		17.80	101.0
	85	143.35	0.69	328	41	104	94	1.2	14.0		17.67	101.6
	87.5	144.96	0.69	328	43	105	96	1.2	14.0		17.67	102.3
	90	146.57								0.6		102.0
1	0	147.17	0.6	334	69	92	90	1	5.0		16.54	
	2.5	148.62	0.61	334	49	93	90	1.05	5.0		16.68	100.5
	5	150.15	0.62	334	46	93	89	1.05	5.0		16.82	105.1
2	7.5	151.68	0.6	334	44	93	90	1	5.5		16.54	104.4
	10	153.16	0.59	333	42	94	90	1	5.5		16.40	102.5
	12.5	154.62	0.59	333	41	94	89	1	5.5		16.40	101.8
3	15	156.06	0.73	333	41	95	89	1.25	7.5		18.24	100.5
	17.5	157.68	0.73	333	40	95	89	1.25	7.5		18.24	101.7
	20	159.31	0.72	333	41	97	90	1.25	7.5		18.11	102.3
4	22.5	160.93	0.73	332	40	97	89	1.25	8.0		18.23	102.1
	25	162.52	0.73	333	40	97	90	1.25	8.0		18.24	99.5
	27.5	164.13	0.72	334	40	98	91	1.25	8.0		18.12	100.8
5	30	165.73	0.7	335	40	100	91	1.2	8.5		17.88	100.7
	32.5	167.32	0.71	335	40	101	91	1.2	8.5		18.01	101.4
	35	168.95	0.7	334	40	100	92	1.2	8.5		17.87	103.1
6	37.5	170.57	0.66	333	40	101	92	1.15	9.0		17.34	103.1
	40	172.16	0.65	332	40	101	93	1.1	9.0		17.20	104.1
	42.5	173.71	0.65	332	40	101	93	1.1	9.0		17.20	102.0
7	45	175.25	0.73	332	41	102	94	1.3	10.0		18.23	101.4
	47.5	176.86	0.73	332	41	102	94	1.3	10.0		18.23	99.9
	50	178.54	0.74	333	41	103	94	1.3	10.0		18.36	104.2
8	52.5	180.22	0.79	332	41	104	95	1.4	12.0		18.96	103.5
	55	181.95	0.8	332	41	104	95	1.4	12.0		19.08	102.9
	57.5	183.70	0.78	332	41	105	95	1.35	12.0		18.84	103.5
9	60	185.43	0.79	331	41	105	96	1.35	12.0		18.95	103.5

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 12, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	437.4		
Static Pressure	-2.490 "H_2O	**WCBDA (g)**	11.7		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.6 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.61
CO2%	11.13
COppm	8.5

Measured H2O
16.2 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	187.16	0.79	331	42	106	96	1.35	12.0		18.95	**102.7**
	65	188.86	0.8	330	42	106	97	1.4	12.5		19.06	**100.8**
10	67.5	190.56	0.79	330	42	107	96	1.4	12.5		18.94	**100.0**
	70	192.30	0.79	330	42	107	97	1.4	12.5		18.94	**103.0**
	72.5	194.05	0.8	331	42	107	98	1.4	13.0		19.07	**103.5**
11	75	195.79	0.75	330	42	107	98	1.3	13.0		18.45	**102.3**
	77.5	197.50	0.73	333	42	107	98	1.3	13.0		18.24	**103.7**
	80	199.20	0.75	330	43	109	98	1.3	13.0		18.45	**104.7**
12	82.5	200.90	0.74	330	43	108	99	1.3	13.0		18.33	**102.9**
	85	202.58	0.74	330	43	108	99	1.3	13.0		18.33	**102.4**
	87.5	204.27	0.74	330	43	109	99	1.3	13.0		18.33	**103.0**
	90	205.95										**102.3**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet Unit No. 1
Test No.:	2 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.04 mm
DRY REF GAS VOLUME SAMPLED	3.196 m^3
AVGERGE ISOKINETICITY	101.9 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	167.3 °C
AVERAGE GAS MOISTURE BY VOLUME	15.4 %
AVERAGE GAS VELOCITY	17.74 m/s
BAROMETRIC PRESSURE (Station)	101.592 Kpa
STATIC PRESSURE	-0.620 Kpa
ABSOLUTE GAS PRESSURE	100.972 Kpa
OXYGEN CONCENTRATION	7.65 %
CARBON DIOXIDE CONCENTRATION	11.01 %
CARBON MONOXIDE CONCENTRATION	13.3 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.21 m^3/s
DRY REF GAS FLOWRATE	14.95 Rm^3/s
DRY ADJ GAS FLOWRATE	20.01 Rm^3/s
WET REF GAS FLOWRATE	17.69 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.196 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 12, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	418.3		
Static Pressure	-2.490 "H_2O	**WCBDA (g)**	10.6		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.65 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.65
CO2%	11.01
COppm	13.3

Measured H2O
15.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	6.71	0.51	332	77	86	84	0.8	3.0		15.22	
	2.5	8.06	0.52	333	71	86	84	0.8	3.0		15.38	101.7
	5	9.42	0.51	334	67	87	85	0.8	3.0		15.24	101.5
2	7.5	10.76	0.52	335	65	88	84	0.8	3.0		15.40	100.8
	10	12.10	0.5	333	64	90	84	0.8	3.0		15.08	99.9
	12.5	13.44	0.51	332	63	88	84	0.8	3.5		15.22	101.6
3	15	14.78	0.55	332	61	88	84	0.9	4.5		15.81	100.7
	17.5	16.22	0.55	332	59	90	85	0.9	4.5		15.81	104.2
	20	17.65	0.56	333	58	91	85	0.9	4.5		15.96	103.2
4	22.5	19.08	0.56	333	56	91	85	0.9	5.0		15.96	102.3
	25	20.50	0.55	333	54	92	86	0.9	5.0		15.82	101.6
	27.5	21.94	0.55	333	53	94	87	0.9	5.0		15.82	103.7
5	30	23.38	0.56	333	51	94	87	0.9	5.5		15.96	103.5
	32.5	24.82	0.56	334	51	95	88	0.9	5.5		15.97	102.5
	35	26.25	0.55	333	50	95	88	0.9	5.5		15.82	101.7
6	37.5	27.67	0.55	332	49	96	88	0.9	6.0		15.81	101.8
	40	29.08	0.56	332	49	97	89	0.95	6.0		15.95	101.0
	42.5	30.51	0.56	332	49	98	90	0.95	6.0		15.95	101.3
7	45	31.93	0.76	332	49	98	91	1.3	7.5		18.58	100.4
	47.5	33.62	0.76	332	48	99	91	1.3	7.5		18.58	102.6
	50	35.34	0.77	332	48	100	92	1.3	7.5		18.71	104.3
8	52.5	37.05	0.8	332	47	101	92	1.4	8.5		19.07	102.8
	55	38.81	0.81	332	47	102	93	1.4	8.5		19.19	103.8
	57.5	40.56	0.81	333	47	103	94	1.4	8.5		19.20	102.4
9	60	42.29	0.82	333	47	103	94	1.45	9.0		19.32	101.1
	62.5	44.05	0.83	333	47	104	95	1.45	9.0		19.43	102.2
	65	45.81	0.83	333	47	105	95	1.45	9.0		19.43	101.4
10	67.5	47.55	0.78	333	47	105	96	1.4	9.5		18.84	100.2
	70	49.27	0.78	333	47	106	96	1.4	9.5		18.84	102.0
	72.5	51.00	0.77	333	48	106	97	1.4	9.5		18.72	102.5
11	75	52.70	0.75	332	48	106	97	1.35	9.5		18.46	101.3

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 12, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	418.3		
Static Pressure	-2.490 "H_2O	**WCBDA (g)**	10.6		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.65 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.65
CO2%	11.01
COppm	13.3

Measured H2O
15.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	54.40	0.74	332	48	107	98	1.3	9.5		18.34	102.6
	80	56.08	0.74	333	48	107	98	1.3	9.5		18.35	101.9
12	82.5	57.76	0.72	332	48	108	98	1.3	9.5		18.09	101.9
	85	59.43	0.73	332	49	108	99	1.3	9.5		18.21	102.6
	87.5	61.09	0.73	331	49	108	99	1.3	9.5		18.20	101.2
	90	62.76								0.65		101.7
1	0	63.41	0.65	336	75	96	94	1.1	5.0		17.23	
	2.5	64.99	0.67	336	60	97	93	1.15	5.0		17.49	103.8
	5	66.55	0.66	336	53	95	93	1.15	5.0		17.36	101.0
2	7.5	68.11	0.66	336	51	96	92	1.15	5.0		17.36	101.9
	10	69.65	0.68	336	50	97	93	1.2	6.0		17.62	100.6
	12.5	71.26	0.67	336	49	97	92	1.15	6.0		17.49	103.5
3	15	72.86	0.72	336	48	98	92	1.2	6.5		18.13	103.7
	17.5	74.47	0.74	336	48	98	93	1.3	7.0		18.38	100.5
	20	76.14	0.75	336	48	99	93	1.3	7.0		18.51	102.8
4	22.5	77.81	0.72	336	47	100	93	1.2	7.0		18.13	102.0
	25	79.44	0.73	336	47	100	94	1.25	7.5		18.26	101.5
	27.5	81.06	0.75	337	47	101	94	1.3	7.5		18.52	100.1
5	30	82.73	0.74	337	47	102	94	1.3	7.5		18.40	101.8
	32.5	84.39	0.71	337	47	102	95	1.2	8.0		18.02	101.8
	35	86.05	0.72	337	47	104	95	1.2	8.0		18.15	103.8
6	37.5	87.69	0.68	336	47	103	95	1.2	8.0		17.62	101.7
	40	89.30	0.67	336	47	104	96	1.15	8.5		17.49	102.7
	42.5	90.87	0.65	335	47	104	96	1.15	8.5		17.22	100.7
7	45	92.44	0.73	334	48	104	97	1.3	9.0		18.24	102.2
	47.5	94.10	0.72	332	48	105	97	1.3	9.5		18.09	101.8
	50	95.78	0.72	333	48	106	97	1.3	9.5		18.10	103.6
8	52.5	97.41	0.73	332	48	106	98	1.3	9.5		18.21	100.4
	55	99.11	0.78	332	48	106	98	1.4	10.0		18.83	103.9
	57.5	100.83	0.78	332	48	107	98	1.4	10.0		18.83	101.7
9	60	102.60	0.79	331	48	108	99	1.4	10.0		18.94	104.6

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 12, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	30 "Hg	**CWTR (g)**	418.3		
Static Pressure	-2.490 "H_2O	**WCBDA (g)**	10.6		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.65 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.65
CO2%	11.01
COppm	13.3

Measured H2O
15.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	104.31	0.78	331	48	108	98	1.4	10.0		18.81	100.1
	65	106.05	0.78	330	49	108	99	1.4	10.0		18.80	102.6
10	67.5	107.78	0.79	331	49	108	99	1.4	10.0		18.94	101.9
	70	109.46	0.78	330	49	109	100	1.4	10.0		18.80	98.4
	72.5	111.18	0.78	331	49	109	100	1.4	11.0		18.81	101.1
11	75	112.89	0.78	330	50	109	101	1.4	11.5		18.80	100.6
	77.5	114.63	0.77	330	50	109	101	1.35	11.5		18.68	102.2
	80	116.37	0.77	329	50	109	101	1.35	12.0		18.67	102.9
12	82.5	118.07	0.77	330	51	110	101	1.35	12.5		18.68	100.4
	85	119.79	0.79	330	51	110	101	1.4	13.5		18.92	101.6
	87.5	121.52	0.8	330	51	110	101	1.4	13.5		19.04	100.9
	90	123.25										100.3

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet Unit No. 1
Test No.:	3 - SVOC
Date:	October 13, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.846
DGM CORRECTION FACTOR	1.004
NOZZLE DIAMETER	6.04 mm
DRY REF GAS VOLUME SAMPLED	3.220 m^3
AVGERGE ISOKINETICITY	101.4 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	167.2 °C
AVERAGE GAS MOISTURE BY VOLUME	15.7 %
AVERAGE GAS VELOCITY	18.06 m/s
BAROMETRIC PRESSURE (Station)	101.388 Kpa
STATIC PRESSURE	-0.585 Kpa
ABSOLUTE GAS PRESSURE	100.803 Kpa
OXYGEN CONCENTRATION	8.02 %
CARBON DIOXIDE CONCENTRATION	10.75 %
CARBON MONOXIDE CONCENTRATION	16.7 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.68 m^3/s
DRY REF GAS FLOWRATE	15.15 Rm^3/s
DRY ADJ GAS FLOWRATE	19.71 Rm^3/s
WET REF GAS FLOWRATE	17.98 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.220 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 13, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	433.3		
Static Pressure	-2.350 "H_2O	**WCBDA (g)**	8.5		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.02
CO2%	10.75
COppm	16.7

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	23.97	0.49	332	77	87	86	0.8	2.5		14.95	
	2.5	25.32	0.51	333	63	87	85	0.8	2.5		15.26	103.5
	5	26.62	0.51	333	58	87	85	0.85	3.5		15.26	97.9
2	7.5	27.97	0.5	333	57	89	86	0.85	3.5		15.11	101.7
	10	29.30	0.5	333	57	89	85	0.85	4.0		15.11	100.9
	12.5	30.62	0.49	332	57	88	85	0.85	4.0		14.95	100.2
3	15	31.92	0.58	332	57	90	86	1	5.0		16.26	99.7
	17.5	33.36	0.58	333	55	91	86	1	5.0		16.28	101.3
	20	34.81	0.57	333	54	92	87	1	5.0		16.13	102.0
4	22.5	36.25	0.6	333	53	93	87	1.05	5.5		16.55	102.0
	25	37.74	0.6	333	52	93	88	1.05	5.5		16.55	102.7
	27.5	39.22	0.59	334	52	95	88	1.05	6.0		16.43	102.0
5	30	40.69	0.59	334	51	95	89	1.05	6.0		16.43	102.0
	32.5	42.16	0.59	334	52	96	89	1.05	6.0		16.43	101.9
	35	43.62	0.59	335	51	97	90	1.05	6.0		16.44	101.1
6	37.5	45.07	0.62	334	51	99	91	1.1	7.5		16.84	100.3
	40	46.61	0.63	334	50	99	91	1.1	7.5		16.97	103.6
	42.5	48.16	0.63	334	50	100	92	1.05	7.5		16.97	103.4
7	45	49.69	0.81	334	51	100	92	1.4	9.0		19.25	101.9
	47.5	51.35	0.81	334	50	101	93	1.4	9.5		19.25	97.6
	50	53.07	0.81	333	49	103	93	1.4	9.5		19.23	100.9
8	52.5	54.80	0.83	334	49	103	94	1.45	10.5		19.48	101.3
	55	56.55	0.82	333	49	104	95	1.45	10.5		19.35	101.2
	57.5	58.30	0.82	333	49	104	95	1.45	11.0		19.35	101.6
9	60	60.05	0.82	332	49	105	97	1.45	11.0		19.34	101.6
	62.5	61.77	0.83	332	50	106	97	1.45	11.5		19.46	99.5
	65	63.53	0.83	332	50	107	97	1.45	12.0		19.46	101.1
10	67.5	65.30	0.79	331	50	107	98	1.4	12.0		18.97	101.6
	70	67.06	0.78	331	51	108	98	1.35	12.0		18.85	103.4
	72.5	68.76	0.78	331	51	108	99	1.35	12.0		18.85	100.4
11	75	70.46	0.72	330	51	108	99	1.3	12.0		18.10	100.3

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 13, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	433.3		
Static Pressure	-2.350 "H_2O	**WCBDA (g)**	8.5		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.02
CO2%	10.75
COppm	16.7

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	72.13	0.7	328	52	109	100	1.2	12.0		17.82	102.5
	80	73.77	0.69	327	52	109	100	1.2	12.0		17.68	101.7
12	82.5	75.39	0.65	328	52	110	100	1.15	12.0		17.17	101.1
	85	76.98	0.66	328	52	110	100	1.15	12.0		17.31	102.2
	87.5	78.56	0.67	326	53	110	101	1.2	12.5		17.41	100.8
	90	80.19								0.43		103.0
1	0	80.62	0.72	335	77	102	94	1.2	4.5		18.16	
	2.5	82.25	0.71	336	54	100	93	1.2	4.5		18.04	101.3
	5	83.85	0.74	336	51	96	93	1.25	5.0		18.42	100.5
2	7.5	85.46	0.75	336	48	96	93	1.3	5.0		18.54	99.4
	10	87.12	0.75	336	47	98	94	1.3	5.5		18.54	101.8
	12.5	88.78	0.75	336	46	100	93	1.3	5.5		18.54	101.5
3	15	90.46	0.76	336	46	99	93	1.3	6.0		18.67	102.7
	17.5	92.11	0.75	335	46	100	94	1.3	6.0		18.53	100.3
	20	93.73	0.73	335	46	101	93	1.3	6.5		18.28	98.8
4	22.5	95.40	0.71	335	45	100	94	1.25	6.5		18.03	103.3
	25	97.02	0.69	335	45	101	94	1.25	6.5		17.77	101.6
	27.5	98.63	0.72	334	45	102	94	1.25	7.0		18.14	102.3
5	30	100.29	0.68	334	45	102	95	1.2	7.0		17.63	103.1
	32.5	101.90	0.69	335	45	103	95	1.2	7.0		17.77	102.8
	35	103.50	0.69	335	45	103	95	1.2	7.5		17.77	101.4
6	37.5	105.12	0.69	336	45	105	95	1.2	7.5		17.79	102.7
	40	106.73	0.7	335	46	105	96	1.2	7.5		17.90	101.9
	42.5	108.31	0.73	336	46	106	97	1.3	8.0		18.29	99.1
7	45	109.94	0.81	335	46	105	96	1.4	9.0		19.26	100.1
	47.5	111.68	0.81	335	46	107	97	1.4	9.5		19.26	101.5
	50	113.43	0.81	334	46	107	98	1.4	9.5		19.25	101.9
8	52.5	115.16	0.84	334	46	107	98	1.5	10.5		19.60	100.5
	55	116.97	0.85	335	46	107	98	1.5	10.5		19.73	103.3
	57.5	118.79	0.86	334	46	108	99	1.5	10.5		19.83	103.3
9	60	120.58	0.86	333	45	108	99	1.5	11.0		19.82	100.8

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	Quench Inlet Unit No. 1
Date:	October 13, 2017	**Operator:**	TS

Pitot Factor	0.846	**Filter (mg)**	0		
DGMCF	1.004	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	433.3		
Static Pressure	-2.350 "H_2O	**WCBDA (g)**	8.5		
Nozzle	0.2378 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.43 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	8.02
CO2%	10.75
COppm	16.7

Measured H2O
15.7 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	122.37	0.86	333	44	109	99	1.5	11.0		19.82	**100.7**
	65	124.16	0.86	332	44	109	100	1.5	11.0		19.81	**100.7**
10	67.5	125.94	0.85	331	44	110	100	1.5	11.0		19.68	**99.9**
	70	127.71	0.85	331	44	110	100	1.5	11.5		19.68	**99.8**
	72.5	129.50	0.84	332	44	110	101	1.5	11.5		19.57	**100.9**
11	75	131.28	0.79	333	44	111	101	1.4	11.5		18.99	**100.9**
	77.5	133.03	0.78	332	44	111	101	1.4	11.5		18.86	**102.3**
	80	134.77	0.78	331	44	111	102	1.4	12.0		18.85	**102.3**
12	82.5	136.50	0.77	330	45	112	101	1.4	12.0		18.72	**101.5**
	85	138.21	0.77	330	44	111	101	1.4	12.0		18.72	**101.0**
	87.5	139.93	0.78	324	44	111	102	1.4	12.0		18.77	**101.6**
	90	141.68										**102.3**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet No. 2
Test No.:	1A - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	1.021
NOZZLE DIAMETER	6.10 mm
DRY REF GAS VOLUME SAMPLED	1.665 m^3
AVGERGE ISOKINETICITY	100.6 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	167.1 °C
AVERAGE GAS MOISTURE BY VOLUME	16.0 %
AVERAGE GAS VELOCITY	18.47 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-0.635 Kpa
ABSOLUTE GAS PRESSURE	101.092 Kpa
OXYGEN CONCENTRATION	7.57 %
CARBON DIOXIDE CONCENTRATION	11.14 %
CARBON MONOXIDE CONCENTRATION	11.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	27.29 m^3/s
DRY REF GAS FLOWRATE	15.49 Rm^3/s
DRY ADJ GAS FLOWRATE	20.86 Rm^3/s
WET REF GAS FLOWRATE	18.45 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.665 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1A - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	1.021	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	0		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	0		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.57
CO2%	11.14
COppm	11.0

Measured H2O
16.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	34.72	0.66	333	60	73	74	0.9	3.5		17.35	
	2.5	36.23	0.69	333	55	74	75	1	4.0		17.74	102.5
	5	37.77	0.65	332	53	74	76	0.9	4.0		17.21	102.1
2	7.5	39.23	0.67	333	52	72	77	0.9	4.0		17.49	99.6
	10	40.69	0.68	332	50	73	79	0.9	4.0		17.60	98.2
	12.5	42.18	0.69	332	49	73	81	1	5.0		17.73	99.2
3	15	43.73	0.69	332	48	74	81	0.9	5.0		17.73	102.2
	17.5	45.24	0.72	333	46	74	83	1	5.5		18.13	99.5
	20	46.78	0.71	333	45	74	84	1	6.0		18.00	99.2
4	22.5	48.32	0.7	333	44	75	85	1	6.0		17.87	99.8
	25	49.83	0.7	333	44	75	86	1	6.0		17.87	98.4
	27.5	51.34	0.73	334	43	76	87	1.1	7.0		18.26	98.3
5	30	52.92	0.73	334	42	76	88	1.1	7.0		18.26	100.6
	32.5	54.51	0.72	334	42	77	90	1.1	7.0		18.14	101.2
	35	56.08	0.7	334	42	78	90	1.1	7.0		17.88	100.3
6	37.5	57.64	0.7	334	42	79	92	1.1	8.0		17.88	101.0
	40	59.24	0.7	333	42	79	93	1.1	8.0		17.87	103.3
	42.5	60.82	0.72	333	43	80	94	1.1	8.0		18.13	101.8
7	45	62.44	0.79	333	42	81	95	1.3	9.0		18.99	102.8
	47.5	64.16	0.8	333	44	81	96	1.3	9.5		19.11	104.0
	50	65.87	0.83	334	42	86	97	1.3	10.0		19.47	102.7
8	52.5	67.62	0.8	334	42	82	99	1.3	10.0		19.12	102.7
	55	69.34	0.79	333	42	83	98	1.2	10.0		18.99	103.0
	57.5	71.04	0.78	333	42	83	99	1.2	10.0		18.87	102.3
9	60	72.72	0.8	333	42	84	99	1.2	10.0		19.11	101.7
	62.5	74.39	0.8	333	43	84	100	1.2	10.5		19.11	99.7
	65	76.07	0.82	332	43	85	101	1.2	10.5		19.33	100.2
10	67.5	77.74	0.81	333	43	85	101	1.3	11.5		19.23	98.2
	70	79.44	0.82	332	43	86	102	1.3	12.0		19.33	100.6
	72.5	81.16	0.81	332	43	86	102	1.2	12.0		19.21	100.9

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1A - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	1.021	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	0		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	0		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.57
CO2%	11.14
COppm	11.0

Measured H2O
16.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures				ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
				Stack °F	Imp. Out °F	DGM Out °F	DGM In °F					
11	75	82.90	0.79	331	44	87	102	1.2	12.0		18.96	**102.7**
	77.5	84.57	0.8	332	44	87	104	1.2	12.0		19.09	**99.7**
	80	86.25	0.79	332	44	88	103	1.2	12.0		18.98	**99.5**
12	82.5	87.93	0.8	332	44	88	105	1.2	12.0		19.09	**100.2**
	85	89.59	0.78	332	46	88	104	1.2	12.0		18.85	**98.2**
	87.5	91.25	0.79	331	45	89	104	1.2	12.5		18.96	**99.5**
	90	92.89										**97.5**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet No. 2
Test No.:	1B - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.978
NOZZLE DIAMETER	6.10 mm
DRY REF GAS VOLUME SAMPLED	1.542 m^3
AVGERGE ISOKINETICITY	102.4 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	168.0 °C
AVERAGE GAS MOISTURE BY VOLUME	16.0 %
AVERAGE GAS VELOCITY	16.84 m/s
BAROMETRIC PRESSURE (Station)	101.727 Kpa
STATIC PRESSURE	-0.635 Kpa
ABSOLUTE GAS PRESSURE	101.092 Kpa
OXYGEN CONCENTRATION	7.57 %
CARBON DIOXIDE CONCENTRATION	11.14 %
CARBON MONOXIDE CONCENTRATION	11.0 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	24.89 m^3/s
DRY REF GAS FLOWRATE	14.10 Rm^3/s
DRY ADJ GAS FLOWRATE	18.98 Rm^3/s
WET REF GAS FLOWRATE	16.78 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.542 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1B - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	0		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	0		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.57
CO2%	11.14
COppm	11.0

Measured H2O
16.0 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	43.61	0.47	333	60	68	67	0.6	3.5		14.65	
	2.5	44.90	0.5	337	59	69	74	0.7	4.0		15.14	100.5
	5	46.29	0.48	337	55	69	78	0.6	4.5		14.84	104.5
2	7.5	47.67	0.52	336	52	71	80	0.65	5.0		15.43	105.4
	10	49.09	0.51	335	49	71	82	0.6	5.0		15.27	103.8
	12.5	50.49	0.5	336	47	73	84	0.6	5.0		15.13	103.1
3	15	51.88	0.54	336	46	74	85	0.65	5.0		15.73	103.0
	17.5	53.33	0.52	336	45	74	87	0.6	5.0		15.43	103.2
	20	54.76	0.51	336	45	75	88	0.6	5.5		15.28	103.6
4	22.5	56.18	0.51	335	46	76	90	0.6	5.5		15.27	103.6
	25	57.58	0.5	335	45	77	90	0.6	5.5		15.12	101.8
	27.5	59.07	0.51	335	46	78	92	0.6	5.5		15.27	109.4
5	30	60.36	0.5	335	46	78	92	0.6	6.0		15.12	93.5
	32.5	61.73	0.5	335	46	79	93	0.6	6.0		15.12	100.3
	35	63.09	0.51	335	46	80	96	0.6	6.0		15.27	99.4
6	37.5	64.44	0.54	335	46	80	94	0.7	6.5		15.72	97.3
	40	65.87	0.57	335	46	81	95	0.75	7.5		16.15	100.4
	42.5	67.43	0.6	336	46	81	96	0.75	7.5		16.58	106.4
7	45	68.98	0.85	339	47	82	97	1	10.0		19.77	103.0
	47.5	70.80	0.8	335	46	82	98	0.95	10.0		19.13	101.7
	50	72.61	0.82	336	46	82	99	0.95	10.0		19.38	103.9
8	52.5	74.41	0.87	335	46	83	99	1	11.0		19.95	102.0
	55	76.27	0.82	334	46	83	100	0.95	10.5		19.36	102.2
	57.5	78.09	0.78	334	47	84	100	0.9	10.5		18.88	102.8
9	60	79.86	0.77	333	47	84	100	0.9	10.5		18.75	102.4
	62.5	81.61	0.78	334	48	84	100	0.9	11.0		18.88	101.9
	65	83.34	0.78	334	48	84	100	0.9	11.0		18.88	100.1
10	67.5	85.08	0.74	334	49	85	101	0.9	11.5		18.39	100.7
	70	86.83	0.71	333	49	85	101	0.9	11.5		18.00	103.8
	72.5	88.56	0.7	333	50	85	101	0.8	11.0		17.87	104.7

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	1B - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	30.04 "Hg	**CWTR (g)**	0		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	0		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		1	
		Number of points / Port		12	

Combustion Gases	
O2%	7.57
CO2%	11.14
COppm	11.0

Measured H2O
16.0 %

				Temperatures								
Point	Time	DGM Reading	ΔP "H2O	Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
11	75	90.25	0.61	333	50	85	101	0.75	11.0		16.68	**102.9**
	77.5	91.90	0.64	331	51	85	101	0.75	11.0		17.07	**107.7**
	80	93.52	0.64	331	51	85	101	0.75	11.0		17.07	**103.1**
12	82.5	95.12	0.65	331	51	86	101	0.75	11.0		17.20	**101.8**
	85	96.71	0.67	331	52	86	101	0.8	11.5		17.46	**100.3**
	87.5	98.33	0.64	331	52	86	101	0.75	11.5		17.07	**100.7**
	90	99.92										**101.1**

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet No. 2
Test No.:	2 - SVOC
Date:	October 12, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.978
NOZZLE DIAMETER	6.10 mm
DRY REF GAS VOLUME SAMPLED	3.213 m^3
AVGERGE ISOKINETICITY	103.0 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	169.3 °C
AVERAGE GAS MOISTURE BY VOLUME	16.4 %
AVERAGE GAS VELOCITY	17.59 m/s
BAROMETRIC PRESSURE (Station)	101.626 Kpa
STATIC PRESSURE	-0.635 Kpa
ABSOLUTE GAS PRESSURE	100.991 Kpa
OXYGEN CONCENTRATION	7.5 %
CARBON DIOXIDE CONCENTRATION	11.26 %
CARBON MONOXIDE CONCENTRATION	11.4 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	26.00 m^3/s
DRY REF GAS FLOWRATE	14.60 Rm^3/s
DRY ADJ GAS FLOWRATE	19.76 Rm^3/s
WET REF GAS FLOWRATE	17.47 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.213 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	30.01 "Hg	**CWTR (g)**	453.1		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	9.2		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.36 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.5
CO2%	11.26
COppm	11.4

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	0.59	0.67	334	60	80	83	0.8	4.5		17.52	
	2.5	2.24	0.67	336	60	80	88	0.8	5.0		17.54	105.4
	5	4.07	0.61	336	58	80	91	0.7	4.5		16.73	116.5
2	7.5	5.54	0.65	336	58	81	92	0.7	5.0		17.27	97.8
	10	7.10	0.65	336	55	81	92	0.7	5.0		17.27	100.3
	12.5	8.62	0.64	336	51	81	94	0.8	5.0		17.14	97.7
3	15	10.22	0.67	335	49	82	95	0.8	5.0		17.53	103.5
	17.5	11.83	0.66	335	49	82	96	0.8	5.0		17.40	101.6
	20	13.43	0.67	335	48	83	97	0.8	5.0		17.53	101.6
4	22.5	15.02	0.68	336	48	83	98	0.8	5.5		17.67	100.0
	25	16.65	0.68	336	48	84	98	0.8	5.5		17.67	101.8
	27.5	18.27	0.66	336	48	84	99	0.8	6.0		17.41	101.0
5	30	19.90	0.65	336	48	85	99	0.8	6.0		17.27	103.1
	32.5	21.51	0.66	336	49	85	100	0.8	6.0		17.41	102.5
	35	23.13	0.66	336	49	86	101	0.8	6.0		17.41	102.3
6	37.5	24.73	0.66	336	49	86	101	0.8	6.5		17.41	100.8
	40	26.35	0.68	339	48	87	102	0.8	7.0		17.70	102.1
	42.5	28.01	0.66	336	47	87	102	0.8	7.0		17.41	103.1
7	45	29.67	0.75	336	46	87	103	0.9	8.0		18.56	104.4
	47.5	31.41	0.74	335	45	87	103	0.9	8.0		18.42	102.6
	50	33.15	0.75	336	45	87	104	0.9	8.0		18.56	103.2
8	52.5	34.88	0.77	335	45	87	103	0.9	8.0		18.79	101.9
	55	36.65	0.79	336	45	88	104	1	9.0		19.04	103.0
	57.5	38.50	0.8	336	44	88	104	1	9.0		19.16	106.1
9	60	40.33	0.79	336	44	88	104	1	9.5		19.04	104.3
	62.5	42.15	0.82	336	44	88	104	1	11.0		19.40	104.4
	65	44.07	0.81	336	44	88	105	0.9	10.5		19.28	108.1
10	67.5	45.95	0.77	337	44	88	105	0.9	10.0		18.81	106.4
	70	47.77	0.8	337	45	88	106	0.9	10.5		19.18	105.7
	72.5	49.59	0.87	338	45	88	105	1	12.0		20.01	103.6
11	75	51.48	0.72	337	45	88	106	0.9	11.5		18.19	103.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	30.01 "Hg	**CWTR (g)**	453.1		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	9.2		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.36 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.5
CO2%	11.26
COppm	11.4

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	53.30	0.69	336	45	88	105	0.8	10.0		17.80	109.2
	80	54.95	0.7	336	46	89	105	0.8	9.0		17.93	101.2
12	82.5	56.59	0.69	335	46	89	105	0.8	10.0		17.79	99.7
	85	58.27	0.69	335	46	89	106	0.8	10.0		17.79	102.8
	87.5	59.94	0.71	336	46	86	106	0.8	10.0		18.05	102.1
	90	61.64								0.36		102.8
1	0	62.00	0.52	339	60	81	82	0.6	4.0		15.48	
	2.5	63.35	0.52	339	58	80	85	0.6	5.0		15.48	98.1
	5	64.78	0.52	338	54	80	88	0.6	5.0		15.47	103.7
2	7.5	66.19	0.54	338	53	80	90	0.6	6.0		15.76	101.9
	10	67.65	0.54	338	53	81	91	0.6	6.0		15.76	103.4
	12.5	69.09	0.55	339	53	81	92	0.6	6.0		15.92	101.8
3	15	70.57	0.56	340	52	82	93	0.7	7.0		16.07	103.6
	17.5	72.01	0.56	340	52	83	94	0.7	7.0		16.07	99.8
	20	73.65	0.55	340	52	83	95	0.6	7.0		15.93	113.5
4	22.5	75.13	0.57	339	52	83	96	0.7	7.0		16.21	103.2
	25	76.65	0.56	339	52	83	97	0.7	8.0		16.06	104.0
	27.5	78.16	0.56	339	52	84	97	0.7	8.0		16.06	104.1
5	30	79.66	0.56	340	53	84	97	0.7	8.0		16.07	103.4
	32.5	81.16	0.56	340	53	84	98	0.7	8.0		16.07	103.4
	35	82.65	0.56	340	53	85	98	0.6	8.0		16.07	102.6
6	37.5	84.12	0.57	340	53	85	99	0.7			16.22	101.1
	40	85.64	0.57	340	53	85	100	0.7	9.0		16.22	103.6
	42.5	87.18	0.56	339	53	86	100	0.7	9.0		16.06	104.9
7	45	88.70	0.8	338	52	86	101	1	12.0		19.19	104.3
	47.5	90.41	0.76	337	51	86	102	1	13.0		18.69	98.1
	50	92.26	0.79	337	51	87	103	0.95	13.0		19.06	108.7
8	52.5	94.11	0.79	336	51	87	104	0.95	13.0		19.04	106.4
	55	95.93	0.79	335	51	87	104	0.95	13.0		19.03	104.5
	57.5	97.74	0.78	335	51	87	104	0.9	13.0		18.91	103.9
9	60	99.53	0.77	335	51	88	104	0.9	13.0		18.79	103.4

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	2 - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 12, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	30.01 "Hg	**CWTR (g)**	453.1		
Static Pressure	-2.550 "H_2O	**WCBDA (g)**	9.2		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.36 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.5
CO2%	11.26
COppm	11.4

Measured H2O
16.4 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	101.27	0.76	335	52	88	105	0.9	13.0		18.67	101.0
	65	102.99	0.8	336	52	88	105	0.9	14.0		19.16	100.4
10	67.5	104.77	0.75	336	52	88	105	0.9	14.0		18.56	101.4
	70	106.54	0.76	335	52	89	105	0.9	14.0		18.67	104.1
	72.5	108.32	0.76	336	52	89	105	0.9	14.0		18.68	103.8
11	75	110.04	0.66	335	53	89	105	0.8	14.0		17.40	100.4
	77.5	111.73	0.65	335	53	89	105	0.7	13.5		17.26	105.8
	80	113.37	0.66	335	54	89	105	0.7	13.0		17.40	103.4
12	82.5	114.96	0.65	335	54	89	105	0.7	13.0		17.26	99.5
	85	116.53	0.66	335	54	89	105	0.7	13.0		17.40	99.0
	87.5	118.11	0.67	335	51	89	105	0.7	13.0		17.53	98.9
	90	119.67										96.9

ORTECH Environmental

Plant:	Covanta DYEC
Plant Location:	Courtice, ON
Test Location:	Quench Inlet No. 2
Test No.:	3 - SVOC
Date:	October 13, 2017

STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.847
DGM CORRECTION FACTOR	0.978
NOZZLE DIAMETER	6.10 mm
DRY REF GAS VOLUME SAMPLED	3.114 m^3
AVGERGE ISOKINETICITY	101.4 %
STACK DIAMETER	1.37 m
LENGTH	0.00 m
WIDTH	0.00 m
AREA OF STACK or DUCT	1.48 m^3

STACK GAS PHYSICAL PARAMETERS

AVERAGE GAS TEMPERATURE	168.3 °C
AVERAGE GAS MOISTURE BY VOLUME	17.3 %
AVERAGE GAS VELOCITY	17.50 m/s
BAROMETRIC PRESSURE (Station)	101.388 Kpa
STATIC PRESSURE	-0.560 Kpa
ABSOLUTE GAS PRESSURE	100.828 Kpa
OXYGEN CONCENTRATION	7.52 %
CARBON DIOXIDE CONCENTRATION	11.27 %
CARBON MONOXIDE CONCENTRATION	23.1 ppm

FLOWRATE

ACTUAL GAS FLOWRATE	25.86 m^3/s
DRY REF GAS FLOWRATE	14.38 Rm^3/s
DRY ADJ GAS FLOWRATE	19.43 Rm^3/s
WET REF GAS FLOWRATE	17.38 Rm^3/s

PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		3.114 m^3
PARTICULATE CONC. - ACTUAL		0.000 mg/m^3
PARTICULATE CONC. - DRY REF		0.000 mg/m^3
PARTICULATE CONC. - DRY ADJ		0.000 mg/m^3
PARTICULATE CONC. - WET REF		0.000 mg/m^3
PARTICULATE EMISSION RATE		0.000000 g/s

Note: * Reference conditions refers to 25 deg C (77 deg F) and 101.325 kPa (29.92 in. Hg)

Note: Dry Adj condition refers to 25 deg C (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 13, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	464.9		
Static Pressure	-2.250 "H_2O	**WCBDA (g)**	13		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.56 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.52
CO2%	11.27
COppm	23.1

Measured H2O
17.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
1	0	20.56	0.64	336	60	81	83	0.7	4.0		17.19	
	2.5	22.12	0.67	337	60	82	88	0.75	5.0		17.60	102.7
	5	23.72	0.63	336	60	82	89	0.7	5.0		17.05	102.5
2	7.5	25.28	0.69	336	60	82	92	0.8	6.0		17.85	102.8
	10	26.88	0.69	336	58	83	94	0.8	6.0		17.85	100.5
	12.5	28.47	0.67	336	56	83	94	0.8	6.5		17.59	99.6
3	15	30.06	0.71	336	52	84	96	0.8	7.5		18.10	101.1
	17.5	31.73	0.72	336	50	84	97	0.8	7.5		18.23	102.9
	20	33.45	0.71	337	49	85	99	0.8	7.5		18.11	105.1
4	22.5	35.12	0.72	336	48	85	99	0.8	8.0		18.23	102.6
	25	36.78	0.7	336	48	86	100	0.8	8.0		17.98	101.2
	27.5	38.42	0.7	336	48	86	100	0.8	8.0		17.98	101.2
5	30	40.04	0.69	336	48	87	101	0.8	8.0		17.85	100.0
	32.5	41.65	0.68	336	48	87	101	0.75	8.0		17.72	99.9
	35	43.26	0.68	336	47	87	102	0.8	8.5		17.72	100.6
6	37.5	44.87	0.67	336	47	88	103	0.8	9.0		17.59	100.5
	40	46.48	0.67	335	47	88	103	0.8	9.0		17.58	101.1
	42.5	48.10	0.67	335	48	88	103	0.8	9.0		17.58	101.7
7	45	49.71	0.75	335	48	89	103	0.9	10.5		18.59	101.0
	47.5	51.42	0.75	336	48	89	104	0.9	10.5		18.61	101.4
	50	53.13	0.73	335	48	89	105	0.8	11.0		18.35	101.3
8	52.5	54.84	0.74	334	48	89	105	0.8	11.0		18.46	102.5
	55	56.55	0.78	335	48	90	106	0.9	12.0		18.96	101.8
	57.5	58.30	0.73	333	48	90	105	0.8	11.5		18.32	101.3
9	60	60.03	0.75	333	48	90	106	0.8	11.5		18.57	103.5
	62.5	61.74	0.77	333	49	90	106	0.9	12.0		18.82	100.8
	65	63.48	0.76	333	49	90	106	0.9	12.0		18.69	101.3
10	67.5	65.21	0.75	333	49	90	106	0.85	12.0		18.57	101.4
	70	66.95	0.74	333	49	90	106	0.85	12.5		18.45	102.6
	72.5	68.65	0.75	333	50	91	106	0.8	12.5		18.57	100.9
11	75	70.34	0.66	333	50	91	106	0.75	12.0		17.42	99.6

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 13, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	464.9		
Static Pressure	-2.250 "H_2O	**WCBDA (g)**	13		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.56 ft³	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.52
CO2%	11.27
COppm	23.1

Measured H2O
17.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	77.5	72.01	0.66	333	50	91	106	0.7	12.0		17.42	104.9
	80	73.63	0.68	333	50	91	106	0.75	12.5		17.68	101.7
12	82.5	75.27	0.67	333	50	91	106	0.75	12.5		17.55	101.5
	85	76.90	0.7	333	51	91	106	0.8	13.0		17.94	101.6
	87.5	78.58	0.72	333	51	91	106	0.8	13.5		18.20	102.5
	90	80.28								0.56		102.2
1	0	80.84	0.47	333	60	84	87	0.5	3.5		14.70	
	2.5	82.11	0.46	335	58	83	87	0.5	4.0		14.56	96.7
	5	83.40	0.46	336	52	83	91	0.55	4.0		14.57	99.5
2	7.5	84.71	0.5	336	50	84	93	0.6	4.5		15.19	100.8
	10	86.07	0.49	336	50	84	95	0.6	4.5		15.04	100.1
	12.5	87.46	0.495	336	50	84	96	0.6	4.5		15.12	103.1
3	15	88.80	0.49	336	50	85	96	0.6	4.5		15.04	98.8
	17.5	90.16	0.5	336	50	85	96	0.6	4.5		15.19	100.3
	20	91.51	0.51	336	50	86	98	0.6	5.0		15.34	99.3
4	22.5	92.84	0.5	336	50	86	99	0.65	5.0		15.19	96.3
	25	94.23	0.51	336	50	86	100	0.65	5.0		15.34	101.5
	27.5	95.65	0.5	336	50	87	100	0.6	5.5		15.19	102.6
5	30	97.06	0.5	336	51	87	102	0.6	6.0		15.19	102.8
	32.5	98.46	0.5	336	51	88	102	0.6	6.0		15.19	101.9
	35	99.85	0.52	337	51	88	102	0.65	6.0		15.50	101.1
6	37.5	101.26	0.54	336	51	88	102	0.65	6.0		15.79	100.6
	40	102.69	0.54	336	51	89	103	0.65	6.0		15.79	100.1
	42.5	104.13	0.52	336	51	89	103	0.6	9.0		15.49	100.6
7	45	105.55	0.81	336	52	89	104	0.95	9.0		19.34	101.1
	47.5	107.26	0.87	336	52	90	105	1	10.0		20.04	97.5
	50	109.08	0.86	337	51	90	106	1	10.0		19.94	100.0
8	52.5	110.91	0.87	336	51	90	107	1	10.0		20.04	101.1
	55	112.76	0.88	335	51	90	107	1	11.0		20.14	101.4
	57.5	114.61	0.87	335	52	91	108	1	11.0		20.03	100.8
9	60	116.45	0.82	335	52	91	108	0.9	11.0		19.44	100.6

ORTECH Environmental

Plant:	Covanta DYEC	**Plant Location:**	Courtice, ON
Test No.:	3 - SVOC	**Test Location:**	Quench Inlet No. 2
Date:	October 13, 2017	**Operator:**	AS

Pitot Factor	0.847	**Filter (mg)**	0		
DGMCF	0.978	**Probe (mg)**	0		
Barometric Pressure	29.94 "Hg	**CWTR (g)**	464.9		
Static Pressure	-2.250 "H_2O	**WCBDA (g)**	13		
Nozzle	0.24 inches				
Stack Diameter	4.500 ft	**Leak Check Volume**		0.56 ft^3	
Length	0.000 ft	**Reading Interval**		2.5 minutes	
Width	0.000 ft	**Number of Ports**		2	
		Number of points / Port		12	

Combustion Gases	
O2%	7.52
CO2%	11.27
COppm	23.1

Measured H2O
17.3 %

Point	Time	DGM Reading	ΔP "H2O	Temperatures Stack °F	Imp. Out °F	DGM Out °F	DGM In °F	ΔH "H2O	Vacuum "Hg	Leak Check Volume	Velocity m/s	Isokinetic %
	62.5	118.26	0.8	334	52	91	108	0.9	11.0		19.19	**102.0**
	65	120.05	0.82	335	52	91	108	0.9	11.5		19.44	**102.0**
10	67.5	121.86	0.77	334	53	92	108	0.85	11.0		18.83	**102.0**
	70	123.64	0.76	335	54	92	108	0.85	11.0		18.72	**103.3**
	72.5	125.39	0.77	334	53	92	108	0.85	11.5		18.83	**102.3**
11	75	127.14	0.66	333	52	92	108	0.8	11.0		17.42	**101.6**
	77.5	128.83	0.67	333	52	92	108	0.8	11.0		17.55	**105.9**
	80	130.48	0.65	333	53	92	108	0.75	11.0		17.29	**102.6**
12	82.5	132.12	0.64	333	52	92	108	0.75	11.0		17.16	**103.5**
	85	133.74	0.64	333	52	92	108	0.75	11.0		17.16	**103.0**
	87.5	135.35	0.65	333	51	92	108	0.75	11.0		17.29	**102.4**
	90	136.95										**101.0**

APPENDIX 28

ORTECH Total Hydrocarbon CEM Data
(4 pages)

Covanta - Durham York Energy Centre

Total Hydrocarbon Sampling at the Boiler No. 1 Quench Inlet

	Test No. 1 October 10, 2017		Test No. 2 October 10, 2017		Test No. 3 October 10, 2017	
	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg
Time	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry
10:25	0.9		11:45	0.0	12:50	0.0	
10:26	1.2		11:46	0.0	12:51	0.0	
10:27	1.2		11:47	0.0	12:52	0.0	
10:28	1.2		11:48	0.0	12:53	0.0	
10:29	1.2		11:49	0.0	12:54	0.0	
10:30	1.2		11:50	0.0	12:55	0.0	
10:31	1.2		11:51	0.0	12:56	0.2	
10:32	1.2		11:52	0.0	12:57	0.0	
10:33	1.2		11:53	0.0	12:58	0.0	
10:34	1.2	1.2	11:54	0.1	0.0	12:59	0.0	0.0
10:35	1.2	1.2	11:55	0.0	0.0	13:00	0.0	0.0
10:36	1.2	1.2	11:56	0.0	0.0	13:01	0.2	0.0
10:37	1.2	1.2	11:57	0.0	0.0	13:02	0.0	0.0
10:38	1.2	1.2	11:58	0.0	0.0	13:03	0.0	0.0
10:39	1.2	1.2	11:59	0.0	0.0	13:04	0.0	0.0
10:40	1.2	1.2	12:00	0.0	0.0	13:05	0.0	0.1
10:41	1.2	1.2	12:01	0.0	0.0	13:06	0.2	0.0
10:42	1.2	1.2	12:02	0.0	0.0	13:07	0.0	0.0
10:43	1.2	1.2	12:03	0.0	0.0	13:08	0.0	0.0
10:44	1.2	1.2	12:04	0.0	0.0	13:09	0.1	0.1
10:45	1.2	1.2	12:05	0.0	0.0	13:10	0.1	0.1
10:46	1.2	1.2	12:06	0.0	0.0	13:11	0.1	0.0
10:47	1.2	1.2	12:07	0.0	0.0	13:12	0.0	0.0
10:48	1.7	1.3	12:08	0.4	0.0	13:13	0.1	0.1
10:49	1.2	1.3	12:09	1.5	0.2	13:14	0.1	0.1
10:50	1.2	1.3	12:10	1.5	0.3	13:15	0.1	0.1
10:51	1.2	1.3	12:11	1.5	0.5	13:16	0.1	0.1
10:52	1.2	1.3	12:12	0.8	0.6	13:17	0.0	0.1
10:53	0.6	1.2	12:13	0.0	0.6	13:18	0.0	0.1
10:54	0.0	1.1	12:14	0.0	0.6	13:19	0.0	0.1
10:55	0.0	1.0	12:15	0.0	0.6	13:20	0.1	0.1
10:56	0.0	0.8	12:16	0.0	0.6	13:21	0.1	0.1
10:57	0.0	0.7	12:17	0.0	0.6	13:22	0.2	0.1
10:58	0.0	0.6	12:18	0.0	0.5	13:23	0.2	0.1
10:59	0.0	0.4	12:19	0.0	0.4	13:24	0.1	0.1
11:00	0.0	0.3	12:20	0.0	0.2	13:25	0.1	0.1
11:01	0.0	0.2	12:21	0.0	0.1	13:26	0.2	0.1
11:02	0.0	0.1	12:22	0.0	0.0	13:27	0.1	0.1
11:03	0.0	0.0	12:23	0.0	0.0	13:28	0.1	0.1
11:04	0.0	0.0	12:24	0.0	0.0	13:29	0.0	0.1
11:05	0.0	0.0	12:25	0.0	0.0	13:30	0.0	0.1
11:06	0.0	0.0	12:26	0.0	0.0	13:31	0.0	0.1
11:07	0.0	0.0	12:27	0.0	0.0	13:32	0.0	0.1
11:08	0.0	0.0	12:28	0.3	0.0	13:33	0.0	0.1
11:09	0.0	0.0	12:29	0.0	0.0	13:34	0.0	0.1
11:10	0.0	0.0	12:30	0.0	0.0	13:35	0.0	0.0
11:11	0.0	0.0	12:31	0.0	0.0	13:36	0.0	0.0
11:12	0.0	0.0	12:32	0.0	0.0	13:37	0.0	0.0
11:13	0.0	0.0	12:33	0.0	0.0	13:38	0.0	0.0
11:14	0.0	0.0	12:34	0.0	0.0	13:39	0.0	0.0
11:15	0.0	0.0	12:35	0.0	0.0	13:40	0.0	0.0
11:16	0.0	0.0	12:36	0.0	0.0	13:41	0.0	0.0
11:17	0.0	0.0	12:37	0.0	0.0	13:42	0.0	0.0
11:18	0.0	0.0	12:38	0.0	0.0	13:43	0.0	0.0
11:19	0.0	0.0	12:39	0.0	0.0	13:44	0.0	0.0
11:20	0.0	0.0	12:40	0.0	0.0	13:45	0.0	0.0
11:21	0.0	0.0	12:41	0.0	0.0	13:46	0.0	0.0
11:22	0.0	0.0	12:42	0.0	0.0	13:47	0.0	0.0
11:23	0.0	0.0	12:43	0.0	0.0	13:48	0.2	0.0
11:24	0.0	0.0	12:44	0.0	0.0	13:49	0.2	0.0
11:25	0.0	0.0	12:45	0.0	0.0	13:50	0.2	0.1
Min	0.0	0.0	Min	0.0	0.0	Min	0.0	0.0
Max	1.7	1.3	Max	1.5	0.6	Max	0.2	0.1
Avg	0.6	0.6	Avg	0.1	0.1	Avg	0.1	0.0

Covanta - Durham York Energy Centre

Total Hydrocarbon Sampling at the Boiler No. 1 BH Outlet

Test No. 1 October 11, 2017			Test No. 2 October 11, 2017			Test No. 3 October 11, 2017		
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry	Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
09:03	0.7		10:13	0.0		11:18	0.1	
09:04	0.7		10:14	0.1		11:19	0.0	
09:05	0.2		10:15	0.1		11:20	0.0	
09:06	0.4		10:16	0.1		11:21	0.0	
09:07	0.1		10:17	0.2		11:22	0.2	
09:08	0.5		10:18	0.1		11:23	0.0	
09:09	0.5		10:19	0.1		11:24	0.0	
09:10	0.8		10:20	0.0		11:25	0.0	
09:11	0.4		10:21	0.4		11:26	0.2	
09:12	0.5	0.5	10:22	0.0	0.1	11:27	0.0	0.1
09:13	0.2	0.4	10:23	0.1	0.1	11:28	0.0	0.0
09:14	0.3	0.4	10:24	0.1	0.1	11:29	0.0	0.0
09:15	0.1	0.4	10:25	0.0	0.1	11:30	0.0	0.0
09:16	0.2	0.4	10:26	0.0	0.1	11:31	0.0	0.0
09:17	0.2	0.4	10:27	0.2	0.1	11:32	0.0	0.0
09:18	0.1	0.3	10:28	0.2	0.1	11:33	0.0	0.0
09:19	0.3	0.3	10:29	0.1	0.1	11:34	0.0	0.0
09:20	0.2	0.2	10:30	0.0	0.1	11:35	0.1	0.0
09:21	0.1	0.2	10:31	0.0	0.1	11:36	0.0	0.0
09:22	0.3	0.2	10:32	0.0	0.1	11:37	0.1	0.0
09:23	0.5	0.2	10:33	0.0	0.1	11:38	0.0	0.0
09:24	0.2	0.2	10:34	0.0	0.1	11:39	0.1	0.0
09:25	0.5	0.3	10:35	0.0	0.1	11:40	0.0	0.0
09:26	0.2	0.3	10:36	0.0	0.1	11:41	0.0	0.0
09:27	0.3	0.3	10:37	0.0	0.0	11:42	0.1	0.0
09:28	0.2	0.3	10:38	0.0	0.0	11:43	0.0	0.0
09:29	0.2	0.3	10:39	0.0	0.0	11:44	0.0	0.0
09:30	0.4	0.3	10:40	0.1	0.0	11:45	0.0	0.0
09:31	0.2	0.3	10:41	0.0	0.0	11:46	0.1	0.0
09:32	0.3	0.3	10:42	0.0	0.0	11:47	0.0	0.0
09:33	0.0	0.2	10:43	0.1	0.0	11:48	0.0	0.0
09:34	0.2	0.2	10:44	0.0	0.0	11:49	0.0	0.0
09:35	0.3	0.2	10:45	0.0	0.0	11:50	0.0	0.0
09:36	0.7	0.3	10:46	0.0	0.0	11:51	0.0	0.0
09:37	0.0	0.2	10:47	0.1	0.0	11:52	0.0	0.0
09:38	0.1	0.2	10:48	0.0	0.0	11:53	0.0	0.0
09:39	0.3	0.2	10:49	0.0	0.0	11:54	0.0	0.0
09:40	0.0	0.2	10:50	0.0	0.0	11:55	0.0	0.0
09:41	0.0	0.2	10:51	0.0	0.0	11:56	0.0	0.0
09:42	0.3	0.2	10:52	0.0	0.0	11:57	0.0	0.0
09:43	0.0	0.2	10:53	0.0	0.0	11:58	0.0	0.0
09:44	0.1	0.2	10:54	0.0	0.0	11:59	0.1	0.0
09:45	0.1	0.2	10:55	0.0	0.0	12:00	0.0	0.0
09:46	0.2	0.1	10:56	0.0	0.0	12:01	0.0	0.0
09:47	0.1	0.1	10:57	0.0	0.0	12:02	0.0	0.0
09:48	0.0	0.1	10:58	0.1	0.0	12:03	0.0	0.0
09:49	0.0	0.1	10:59	0.0	0.0	12:04	0.0	0.0
09:50	0.2	0.1	11:00	0.0	0.0	12:05	0.0	0.0
09:51	0.1	0.1	11:01	0.0	0.0	12:06	0.0	0.0
09:52	0.0	0.1	11:02	0.1	0.0	12:07	0.0	0.0
09:53	0.1	0.1	11:03	0.0	0.0	12:08	0.0	0.0
09:54	0.1	0.1	11:04	0.0	0.0	12:09	0.0	0.0
09:55	0.5	0.1	11:05	0.1	0.0	12:10	0.1	0.0
09:56	0.0	0.1	11:06	0.0	0.0	12:11	0.2	0.0
09:57	0.0	0.1	11:07	0.0	0.0	12:12	0.0	0.0
09:58	0.0	0.1	11:08	0.0	0.0	12:13	0.0	0.0
09:59	0.0	0.1	11:09	0.0	0.0	12:14	0.0	0.0
10:00	0.2	0.1	11:10	0.0	0.0	12:15	0.0	0.0
10:01	0.0	0.1	11:11	0.1	0.0	12:16	0.0	0.0
10:02	0.4	0.1	11:12	0.1	0.0	12:17	0.0	0.0
10:03	0.7	0.2	11:13	0.0	0.0	12:18	0.0	0.0
Min	0.0	0.1	Min	0.0	0.0	Min	0.0	0.0
Max	0.8	0.5	Max	0.4	0.1	Max	0.2	0.1
Avg	0.2	0.2	Avg	0.0	0.0	Avg	0.0	0.0

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Total Hydrocarbon Sampling at the Boiler No. 2 Quench Inlet

	Test No. 1 October 10, 2017	
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
14:50	0.3	
14:51	0.4	
14:52	0.1	
14:53	0.2	
14:54	0.0	
14:55	0.0	
14:56	0.0	
14:57	0.0	
14:58	0.0	
14:59	0.0	0.1
15:00	0.0	0.1
15:01	0.0	0.0
15:02	0.0	0.0
15:03	0.0	0.0
15:04	0.4	0.0
15:05	0.0	0.0
15:06	0.0	0.0
15:07	0.0	0.0
15:08	0.0	0.0
15:09	0.0	0.0
15:10	0.0	0.0
15:11	0.0	0.0
15:12	0.0	0.0
15:13	0.0	0.0
15:14	0.0	0.0
15:15	0.0	0.0
15:16	0.0	0.0
15:17	0.0	0.0
15:18	0.0	0.0
15:19	0.0	0.0
15:20	0.0	0.0
15:21	0.0	0.0
15:22	0.0	0.0
15:23	0.0	0.0
15:24	0.0	0.0
15:25	0.0	0.0
15:26	0.0	0.0
15:27	0.0	0.0
15:28	0.0	0.0
15:29	0.0	0.0
15:30	0.0	0.0
15:31	0.0	0.0
15:32	0.0	0.0
15:33	0.0	0.0
15:34	0.0	0.0
15:35	0.0	0.0
15:36	0.0	0.0
15:37	0.0	0.0
15:38	0.0	0.0
15:39	1.2	0.1
15:40	0.0	0.1
15:41	0.0	0.1
15:42	0.0	0.1
15:43	0.0	0.1
15:44	0.6	0.2
15:45	0.0	0.2
15:46	0.0	0.2
15:47	0.0	0.2
15:48	0.0	0.2
15:49	0.0	0.1
15:50	0.0	0.1
Min	0.0	0.0
Max	1.2	0.2
Avg	0.1	0.0

	Test No. 2 October 10, 2017	
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
15:55	0.1	
15:56	0.0	
15:57	0.0	
15:58	0.9	
15:59	0.0	
16:00	0.0	
16:01	0.0	
16:02	0.0	
16:03	0.0	
16:04	0.0	0.1
16:05	0.0	0.1
16:06	0.0	0.1
16:07	0.0	0.1
16:08	0.0	0.0
16:09	0.0	0.0
16:10	0.0	0.0
16:11	0.0	0.0
16:12	0.0	0.0
16:13	0.0	0.0
16:14	0.0	0.0
16:15	0.0	0.0
16:16	0.0	0.0
16:17	0.0	0.0
16:18	0.0	0.0
16:19	0.0	0.0
16:20	0.0	0.0
16:21	0.0	0.0
16:22	0.0	0.0
16:23	0.0	0.0
16:24	0.0	0.0
16:25	0.0	0.0
16:26	0.0	0.0
16:27	0.0	0.0
16:28	0.0	0.0
16:29	0.0	0.0
16:30	0.0	0.0
16:31	0.0	0.0
16:32	0.0	0.0
16:33	0.0	0.0
16:34	0.0	0.0
16:35	0.0	0.0
16:36	0.0	0.0
16:37	0.0	0.0
16:38	0.0	0.0
16:39	0.0	0.0
16:40	0.0	0.0
16:41	0.0	0.0
16:42	0.0	0.0
16:43	0.0	0.0
16:44	0.0	0.0
16:45	0.0	0.0
16:46	0.0	0.0
16:47	0.0	0.0
16:48	0.0	0.0
16:49	0.0	0.0
16:50	0.0	0.0
16:51	0.0	0.0
16:52	0.0	0.0
16:53	0.0	0.0
16:54	0.0	0.0
16:55	0.0	0.0
Min	0.0	0.0
Max	0.9	0.1
Avg	0.0	0.0

	Test No. 3 October 10, 2017	
Time	THC - 1 min ppm, dry	THC - 10 min Avg ppm, dry
17:00	0.0	
17:01	0.0	
17:02	0.0	
17:03	0.0	
17:04	0.2	
17:05	0.0	
17:06	0.6	
17:07	0.0	
17:08	0.0	
17:09	0.0	0.1
17:10	0.0	0.1
17:11	0.0	0.1
17:12	0.0	0.1
17:13	0.0	0.1
17:14	0.0	0.1
17:15	0.0	0.1
17:16	0.0	0.0
17:17	0.0	0.0
17:18	0.0	0.0
17:19	0.0	0.0
17:20	0.0	0.0
17:21	0.0	0.0
17:22	0.0	0.0
17:23	0.0	0.0
17:24	0.0	0.0
17:25	0.2	0.0
17:26	0.0	0.0
17:27	0.0	0.0
17:28	0.0	0.0
17:29	0.0	0.0
17:30	0.0	0.0
17:31	0.0	0.0
17:32	0.0	0.0
17:33	0.0	0.0
17:34	0.0	0.0
17:35	0.0	0.0
17:36	0.0	0.0
17:37	0.0	0.0
17:38	0.0	0.0
17:39	0.0	0.0
17:40	0.0	0.0
17:41	0.0	0.0
17:42	0.0	0.0
17:43	0.0	0.0
17:44	0.0	0.0
17:45	0.0	0.0
17:46	0.1	0.0
17:47	0.0	0.0
17:48	0.0	0.0
17:49	0.0	0.0
17:50	0.0	0.0
17:51	0.0	0.0
17:52	0.0	0.0
17:53	0.0	0.0
17:54	0.0	0.0
17:55	0.0	0.0
17:56	0.0	0.0
17:57	0.0	0.0
17:58	0.0	0.0
17:59	0.0	0.0
18:00	0.0	0.0
Min	0.0	0.0
Max	0.6	0.1
Avg	0.0	0.0

Covanta - Durham York Energy Centre

Total Hydrocarbon Sampling at the Boiler No. 2 BH Outlet

	Test No. 1 October 11, 2017		Test No. 2 October 11, 2017		Test No. 3 October 11, 2017	
	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg	THC - 1 min	THC - 10 min Avg
Time	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry	ppm, dry
12:54	1.0		14:01	1.3		15:10	1.8	
12:55	1.3		14:02	1.5		15:11	1.8	
12:56	1.2		14:03	0.8		15:12	1.4	
12:57	1.8		14:04	0.8		15:13	0.7	
12:58	1.5		14:05	1.2		15:14	0.4	
12:59	1.4		14:06	1.0		15:15	0.9	
13:00	1.8		14:07	0.8		15:16	0.5	
13:01	1.0		14:08	0.9		15:17	0.5	
13:02	0.7		14:09	0.3		15:18	0.3	
13:03	0.6	1.2	14:10	1.4	1.0	15:19	1.2	0.9
13:04	1.0	1.2	14:11	0.7	0.9	15:20	0.6	0.8
13:05	1.5	1.2	14:12	0.4	0.8	15:21	0.2	0.7
13:06	1.3	1.3	14:13	0.9	0.8	15:22	0.0	0.5
13:07	0.8	1.2	14:14	0.3	0.8	15:23	0.8	0.5
13:08	1.4	1.1	14:15	0.2	0.7	15:24	0.8	0.6
13:09	1.1	1.1	14:16	0.4	0.6	15:25	0.5	0.5
13:10	0.9	1.0	14:17	0.8	0.6	15:26	0.5	0.5
13:11	1.3	1.1	14:18	1.1	0.6	15:27	0.6	0.6
13:12	0.7	1.1	14:19	0.5	0.7	15:28	0.6	0.6
13:13	0.9	1.1	14:20	1.4	0.7	15:29	0.6	0.5
13:14	0.8	1.1	14:21	0.5	0.6	15:30	1.0	0.6
13:15	1.3	1.1	14:22	1.1	0.7	15:31	1.3	0.7
13:16	1.1	1.0	14:23	0.9	0.7	15:32	0.4	0.7
13:17	0.1	1.0	14:24	0.4	0.7	15:33	0.8	0.7
13:18	0.3	0.9	14:25	0.6	0.8	15:34	0.2	0.6
13:19	0.2	0.8	14:26	0.0	0.7	15:35	0.1	0.6
13:20	1.0	0.8	14:27	0.9	0.7	15:36	0.4	0.6
13:21	0.3	0.7	14:28	0.9	0.7	15:37	0.8	0.6
13:22	0.5	0.6	14:29	0.4	0.7	15:38	0.7	0.6
13:23	0.8	0.6	14:30	0.9	0.7	15:39	0.1	0.6
13:24	1.4	0.7	14:31	0.8	0.7	15:40	0.2	0.5
13:25	0.6	0.6	14:32	0.4	0.6	15:41	0.3	0.4
13:26	0.6	0.6	14:33	1.0	0.6	15:42	0.5	0.4
13:27	1.0	0.7	14:34	0.9	0.7	15:43	0.9	0.4
13:28	0.9	0.7	14:35	1.1	0.7	15:44	0.0	0.4
13:29	0.7	0.8	14:36	0.3	0.7	15:45	1.1	0.5
13:30	0.6	0.8	14:37	0.3	0.7	15:46	0.8	0.5
13:31	1.0	0.8	14:38	0.5	0.6	15:47	0.2	0.5
13:32	0.7	0.9	14:39	0.9	0.7	15:48	0.0	0.4
13:33	0.4	0.8	14:40	0.4	0.7	15:49	0.1	0.4
13:34	0.6	0.7	14:41	1.3	0.7	15:50	0.2	0.4
13:35	0.7	0.7	14:42	0.9	0.8	15:51	0.3	0.4
13:36	0.2	0.7	14:43	0.3	0.7	15:52	0.4	0.4
13:37	0.1	0.6	14:44	0.7	0.7	15:53	0.2	0.3
13:38	0.6	0.6	14:45	0.8	0.6	15:54	0.5	0.4
13:39	0.7	0.6	14:46	0.6	0.7	15:55	0.3	0.3
13:40	0.9	0.6	14:47	0.6	0.7	15:56	0.1	0.2
13:41	0.6	0.6	14:48	0.5	0.7	15:57	0.2	0.2
13:42	0.8	0.6	14:49	0.7	0.7	15:58	0.4	0.3
13:43	0.3	0.5	14:50	0.9	0.7	15:59	0.7	0.3
13:44	0.3	0.5	14:51	0.4	0.6	16:00	0.0	0.3
13:45	0.8	0.5	14:52	0.7	0.6	16:01	0.9	0.4
13:46	0.4	0.5	14:53	0.7	0.7	16:02	0.8	0.4
13:47	0.7	0.6	14:54	0.5	0.6	16:03	0.7	0.5
13:48	0.3	0.6	14:55	0.4	0.6	16:04	0.0	0.4
13:49	1.3	0.6	14:56	0.5	0.6	16:05	0.4	0.4
13:50	0.0	0.5	14:57	0.5	0.6	16:06	1.3	0.5
13:51	0.9	0.6	14:58	0.6	0.6	16:07	0.2	0.5
13:52	0.3	0.5	14:59	0.9	0.6	16:08	0.1	0.5
13:53	1.4	0.6	15:00	0.1	0.5	16:09	0.2	0.5
13:54	0.5	0.7	15:01	0.9	0.6	16:10	1.0	0.6
Min	0.0	0.5	Min	0.0	0.5	Min	0.0	0.2
Max	1.8	1.3	Max	1.5	1.0	Max	1.8	0.9
Avg	0.8	0.8	Avg	0.7	0.7	Avg	0.5	0.5

APPENDIX 29

Dispersion Modelling Results
for the October 2017 Testing Program
(17 pages)

TECHNICAL MEMORANDUM

DATE November 13, 2017 **PROJECT No.** 1784320

TO Leon Brasowski
Covanta Energy

CC Anthony Ciccone

FROM Katherine Armstrong **EMAIL** ksarmstrong@golder.com

CALPUFF MODELLING OF 2017 COMPLIANCE SOURCE TESTING RESULTS FROM THE DURHAM YORK ENERGY CENTRE

1.0 INTRODUCTION

Covanta Durham York Renewable Energy LP (Covanta) operates the Durham York Energy Centre (DYEC) under the multi-media Environmental Compliance Approval (ECA) 7306-8FDKNX, as amended. The ECA application was supported with an Emission Summary and Dispersion Modelling (ESDM) Report prepared by Golder Associates Ltd (Golder) using the CALPUFF dispersion model version 6.263, with results compared to Ministry of Environment and Climate Change (MOECC) Point of Impingement (POI) standards listed in Schedule 3 of Ontario Regulation (O.Reg.) 419/05 as of 2011.

Condition 7, Testing, Monitoring and Auditing, of the current ECA requires annual source testing be completed at the DYEC for over 100 different contaminants. According to Schedule "E" Source Testing Procedures, of the ECA, a source testing report is required that includes the following:

> *8. (7) the results of dispersion calculations in accordance with the O.Reg. 419/05, indicating the maximum concentration of the test contaminants, at the point of impingement.*
>
> *8. (8) an updated site wide emission source inventory to assess the aggregate point of impingement concentrations of the test contaminants.*

This memorandum summarizes the modelling results for the October 2017 compliance source testing program using the same CALPUFF model and other input data sets used in the ESDM Report, however, the results are compared to current O.Reg. 419/05 limits.

2.0 EMISSION RATES

Compliance source testing was completed by Ortech Environmental in October 2017 for each of the two combustion train units and results were provided to Golder on a mass per time basis. Three tests were completed for each unit and averaged. The average emission rates for each unit were then summed together to provide the total stack emission rate of each contaminant to be modelled. Where source testing results indicated that the measured concentration is below the instrumentation detection limit, the full detection limit was used in the emission rate calculation for conservatism.

Emission rates for which source testing data was available were converted to grams per second (g/s) and are provided in an updated Site-wide Emission Inventory included in Appendix A. This emission inventory includes emissions from silo filling and diesel generator testing taken from the ESDM report, in addition to source test emissions from the main stack.

In response to clarifications provided by the MOECC of December 9, 2016, two different emission rates were calculated for Total Particulate Matter:

1. Filterable fraction emission rate only; and
2. Total Particulate Matter (Sum of condensable and filterable fractions).

As source testing for the condensable fraction of total particulate matter is not required pursuant to Schedule "D": of the ECA, the condensable content of $PM_{2.5}$ was used.

3.0 MODELLING

As part of the ECA application, the MOECC approved the use of the CALPUFF modelling software and CALMET meteorological data to demonstrate compliance with Ontario Regulation 419/05 Schedule 3 standards at the DYEC. This same modelling approach has been used for this update. The following models and pre- and post-processors were used in the assessment:

- CALMET diagnostic meteorological model (v. 5.8, level 070623);
- CALPUFF dispersion model (v. 6.263, level 080827);
- CALPOST post processor (v. 6.221, Level 080724);
- BPIP building downwash preprocessor (v. 04274);
- POSTUTIL post processor (v.1.64, Level 101025).

These model versions are consistent with those used in the original ESDM report. Dispersion Modelling inputs are described in the following subsections.

3.1 Model Domain

The CALPUFF Model domain used in this assessment is the same as the domain used in the previous Environmental Assessment (EA) and ESDM Report. It extends 40 km by 30 Km and is centred approximately 5 km north of the Site. This domain covers more than the air quality study area but will ensure that plumes are tracked beyond the furthest receptor locations to ensure the worst case ground level concentrations are considered at all receptors.

3.2 Meteorology, Land Use and Terrain Data

The meteorology and terrain data used in this assessment is the same as the meteorology and terrain data used in the EA and ESDM Report.

3.3 Receptors

The receptors used in this assessment are the same as the receptors used in the ESDM Report. They include gridded ground level receptors to meet the requirements of O.Reg. 419/05 in addition to 400 discrete receptors to represent locations of interest. They include hospitals, nursing homes, schools, daycares, senior citizen centres, the nearest residential receptors, specific watersheds and water bodies and parks.

3.4 Building Downwash

The buildings used in this assessment to represent building downwash are the same as the buildings used in the ESDM Report. Building wake effects were considered in this assessment using the U.S. EPA's Building Profile Input Program (BPIP-ISC). The inputs into this pre-processor include the coordinates and heights of the buildings and stacks. The output data from BPIP is used in the building wake effect calculations. No changes were made to the BPIP input or output file for this assessment.

3.5 Deposition

CALPUFF has the capability to account for wet and dry deposition of substances that would reduce ground level concentrations at POIs. However, the deposition algorithm has not been implemented for conservatism and to maintain consistency with the ESDM report and previous EA for maximum POI predictions.

3.6 Thermal Internal Boundary layer

CALPUFF contains an option to account for sub-grid coastal influences on plume dispersion such as the development of a thermal internal boundary layer (TIBL). Given the proximity of the proposed Facility to Lake Ontario (approximately 500m) and the grid size (250m), variations in coastline location within the grid cells near the proposed facility were accounted for in the dispersion modelling. To achieve this, a digitized sub-grid coastline, extending to the boundaries of the air quality study area was included as an additional input. This is consistent with the approach used in the ESDM report.

3.7 Averaging Times and Conversions

CALPUFF can predict 1-hour average values. Many of the relevant Schedule 3 standards are based on a 24-hour averaging time, which is also provided by CALPUFF. Several of the modelled contaminants have averaging periods less than 1 hour. For these contaminants, the 1 hour average concentration was converted using the conversion factors listed in Table 4-1 of Air Dispersion Modelling Guidance for Ontario (ADMGO). For example, the hourly concentrations can be converted to a 10-min average by multiplying the hour value by 1.65. This is consistent with the approach used in the ESDM report.

In 2016, a number of O.Reg 419/05 standards were updated or modified to include Point of Impingement (POI) limits based on an annual averaging period. CALPUFF can predict annual average values, therefore the CALPOST input file was modified to provide this output in addition to outputs for the 1 hour, 24 hour and 30 day averaging periods already provided.

3.8 Chemical Transformation

For the purposes of assessing project contributions to Secondary Particulate Matter (SPM) formation, chemical transformation was considered in the CALPUFF modelling of particulate matter. To model the chemical transformation of emitted NO, NO_2 and SO_2 into HNO_3, NO_3 and SO_4, CALPUFFs RIVAD/ARM3 mechanism was used. The flag MCHEM is set to 1 for model runs used to produce concentrations of particulate matter. This setting requires the input of monthly background ozone concentrations. The monthly background ozone data used in the modelling of secondary particulate matter is consistent with that used in the EA and is summarised below in Table 1.

Table 1: Background Ozone Concentrations used for Chemical Transformation Modelling

Month	Ozone Concentrations (ppb)
January	13.70
February	18.50
March	24.22
April	11.09
May	32.29
June	33.63
July	16.32
August	21.33
September	12.63
October	15.39
November	17.10
December	20.91

Chemical transformations were only modelled to calculate additional concentrations of particulate matter that is created as part of secondary transformations. Reported concentrations of NO_2 and SO_2 do not include the effects of depletion due to chemical transformation. The flag MCHEM is set to 0 for model runs used to produce concentrations of all other contaminants. This is consistent with the approach used in the ESDM report

3.9 Dispersion Modelling Options

The options used in the CALPUFF dispersion model are summarized in the Table 1. The model options used are consistent with those used in the ESDM report. In the ESDM report, Exhibit 9 indicated that Puff splitting was used, however this was a typographical error and this option was not actually used in the modelling. To maintain consistency with the ESDM report, puff splitting was not modelled for this assessment.

Table 2: CALPUFF Options and Flags

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MGAUSS	1	1	Vertical distribution used in the near field
MCTADJ	3	3	Terrain adjustment method (3 used for partial plume path adjustment)
MCTSG	0	0	Subgrid-Scale complex terrain flag
MSLUG	0	0	Near-field puffs modelled as elongated
MTRANS	1	1	Transitional Plume Rise modelled

Flag	Value used in ESDM Report	Value Used in this Assessment	Comments
MTIP	1	1	Stack-tip downwash
MBDW	2	2	Method used to simulate building downwash 1 = ISC method; 2 = PRIME method
MSHEAR	0	0	Vertical wind shear modelled above stack top
MSPLIT	0*	0	Puff splitting allowed 0 = No; 1 = Yes ** NB: Value of "1" reported in ESDM Report but value of "0" actually used in ESDM Report modelling*
MCHEM	1 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	1 (For SPM, PM_{10} and $PM_{2.5}$) 0 (All other Contaminants)	Chemical Transformation Scheme 0 = chemical transformation not modeled 1 = transformation rates computed internally (MESOPUFF II scheme)
MAQCHEM	0	0	Aqueous phase transformation flag (only used if MCHEM =1 or 3)
MWET	0	0	Wet removal modelled 0 = NO; 1 = Yes
MDRY	0	0	Dry deposition modelled 0 = NO; 1 = Yes
MTILT	0	0	Gravitational settling (plume tilt) modelled
MDISP	2	2	Methods used to compute dispersion coefficients 2 = (dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u*, w*, L, etc.)
MTURBVW	3	3	Sigma measurements used (Used only if MDISP = 1or 5)
MDISP2	3	3	Back-up method used to compute dispersion when measured turbulence data are missing (Used only if MDISP=1 or 5)
MTAULY	0	0	Method used for Lagrangian timescale for Sigma-y (used only if MDISP=1,2 or MSIDP2=1,2)
MTAUADV	0	0	Method used for Advective-Decay timescale for Turbulence (used only if MDISP=2 or MDISP2=2)
MCTURB	1	1	Method used to compute turbulence sigma-v & sigma-w using micrometeorological variables (Used only if MDISP = 2 or MDISP2 = 2)
MROUGH	0	0	PG sigma y,z adjusted for roughness
MPARTL	1	1	Partial plume penetration of elevated inversion
MTINV	0	0	Strength of temp inversion provided in PROFILE.DAT extended records
MPDF	1	1	Probability Distribution Function used for dispersion under convective conditions 0 = NO; 1 = Yes
MSGTIBL	1	1	Sub-grid TIBL module used for shore line
MBCON	0	0	Boundary conditions (concentration) modeled
MFOG	0	0	Configure for FOG Model output
MREG	0	0	Test options specified to see if they conform to regulatory values

3.10 Source Parameters

Stack Exhaust temperature and flow rate were updated to match the stack characteristics at the time of source testing. All other source parameters are consistent with those used in the ESDM Report. The source parameters modelled are provided in Table 3, below:

Table 3: Modelled Source Parameters

Source ID	Stack Height [m]	Stack Diameter [m]	Exit velocity [m/s]	Exhaust Temperature [K]
STCK1	87.6 (No Change)	1.7 (No Change)	22.37 (UPDATED)	414.2 (UPDATED)

The ESDM Report includes an additional modelling scenario which include emissions from silo loading and the standby generator (Scenario H). The predominant contaminants from these sources are particulate from the silo loading and nitrogen oxides from the generator. These two contaminants were assessed and it was determined that, since the Main Stack emissions presented in this report are less than those in the ESDM Report, dispersion modelling would show a decrease in the point of impingement concentration for these two contaminants. As a result, additional dispersion modelling for Scenario H was not conducted.

4.0 MODELLING RESULTS

Modelling was completed for emissions from the main stack only, using a unit emission rate to generate dispersion factors in µg/m³ per g/s for 10-minute, ½ - hour, 1 hour, 24 hour, 30 day and annual averaging periods. The resulting dispersion factors are presented in Table 4, below:

Table 4: Modelling Dispersion Factors

Averaging Period	10-min	½- hr	1-hr	24-hr	30-day	Annual
Dispersion Factor [µg/m³ per g/s]	32.38	23.55	19.63	1.03	0.12	0.03

The average emission rate for each contaminant presented in Appendix A was multiplied by the applicable dispersion factor above to calculate the maximum point of impingement concentration for emissions from the main stack. The modelled POI concentrations were compared to the Schedule 3 standards listed in O.Reg. 419/05 and in the case of $PM_{2.5}$ and PM_{10}, the MOECC AAQC.

The MOECC has recently updated the list of standards and guidelines for facilities to assess their emissions against, namely the Air Contaminants Benchmark (ACB) List, dated December 2016, which includes standards and guidelines (Benchmark 1) and screening levels (Benchmark 2). The ACB List is required to be used to assess point of impingement (POI) concentrations of contaminants released into the air.

Contaminants released by the Facility that do not have Benchmark 1 standards or guidelines in the ACB List are considered to be 'Contaminants with No MOECC POI Limits'. Where applicable, predicted POI concentrations of Contaminants with No MOECC POI Limits were screened against the Benchmark 2 screening levels in the ACB List or the de minimus limit.

The modelled concentrations of all compounds assessed were below their relevant MOECC standards. The Emission Summary Table has been updated and is included in Appendix B. It has been modified to include reference to the new ACB List and to meet the requirements of the updated MOECC guidance document "Procedure for preparing an Emission Summary and Dispersion Modelling Report" (PIBs 3614e04, February 2017).

The contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 21% of the relevant one hour limit.

As stated above, the ESDM Report includes an additional modelling scenario which include emissions from silo loading and the standby generator (Scenario H). The predominant contaminants from these sources are particulate from the silo loading and nitrogen oxides from the generator. These two contaminants were assessed and it was determined that, since the Main Stack emissions presented in this report are less than those in the ESDM Report, dispersion modelling would show a decrease in the point of impingement concentration for these two contaminants. As a result, additional dispersion modelling for Scenario H was not conducted.

5.0 SUMMARY OF MODELLING UPDATES

The dispersion modelling for the DYEC was updated to reflect data obtained from Voluntary November 2017 source testing. A summary of the changes made to the modelling are provided in Table 5, below.

Table 5: ECA Concordance Table

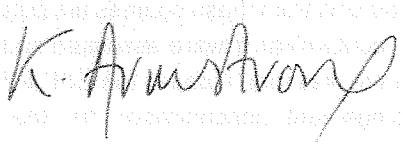
Modelling Inputs	Changes from ESDM Report
Emission Rates	Updated to use November 2017 Source Testing Data. List of contaminants assessed expanded to include all contaminants for which source testing data was performed.
Model and Model Version	No Change
Meteorology and Terrain data	No Change
Receptors	No Change
Building Downwash	No Change
Deposition	No Change
Chemical Transformations	No Change
Thermal Internal Boundary Layer	No Change
Averaging Times and Conversions	CALPOST input file was modified to generate annual averaging to account for new O.Reg. 419/05 standards introduced in 2016 that include annual averaging periods.
Dispersion Modelling Options	No Change
Background Air Quality Concentrations	Ozone background data used in secondary particulate modelling updated to match EA.
Emission Summary Table	Updated to include new O.Reg. 419/05 standards introduced in 2016 and contaminants that were not included in the ESDM report but for which source testing data was available.

6.0 CONCLUSIONS

This assessment was completed to document compliance with Condition 8(7) and 8(8) of Schedule E of the ECA for the DYEC. The results of this assessment demonstrate that the Facility is operating in compliance with the POI limits listed in s.20 of O. Reg. 419/05.

7.0 CLOSURE

We trust this memorandum meets your needs at this time. Should you have any questions please contact the undersigned.



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Air Quality Specialist

Anthony Ciccone, Ph.D., P.Eng.
Principal

BSF/KSA/AC/ng

https://golderassociates.sharepoint.com/sites/16154g/deliverables/october source testing/final/1784320-tm-rev0 13nov2017 covanta updated modelling memo.docx

APPENDIX A
Site-Wide Emission Inventory

Appendix A
Site-Wide Emission Inventory

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am^3/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
1A	Main Stack - Oct 2017 Source Testing Conditions	50.78	141	1.7	87.6	(680538, 4860346)	1 – methylnaphthalene	630-08-0	1.08E-06	1,24, annual	ST	Above-Average	100%
							1,1,2-Trichloroethane	7446-09-5	2.45E-05	1,24, annual	ST	Above-Average	100%
							1,2,3,4-tetrachlorobenzene	N/A	6.23E-08	1,24, annual	ST	Above-Average	100%
							1,2,3-trichlorobenzene	N/A	1.18E-07	1,24, annual	ST	Above-Average	100%
							1,2,4 – Trichlorobenzene	N/A	2.84E-07	1,24, annual	ST	Above-Average	100%
							1,2,4,5-Tetrachlorobenzene	N/A	6.28E-08	1,24, annual	ST	Above-Average	100%
							1,2-Dichlorobenzene	N/A	7.44E-07	1,24, annual	ST	Above-Average	100%
							1,2-Dichloroethane	7439-92-1	1.51E-05	1,24, annual	ST	Above-Average	100%
							1,2-Dichloropropane	7440-43-9	1.51E-05	1,24, annual	ST	Above-Average	100%
							1,3,5-trichlorobenzene	7439-97-6	9.60E-08	1,24, annual	ST	Above-Average	100%
							1,3-Butadiene	7664-39-3	7.54E-05	1,24, annual	ST	Above-Average	100%
							1,3-Dichlorobenzene	N/A	1.30E-06	1,24, annual	ST	Above-Average	100%
							1,4-Dichlorobenzene	7647-01-0	6.15E-07	1,24, annual	ST	Above-Average	100%
							1-Methylphenanthrene	7664-41-7	6.23E-08	1,24, annual	ST	Above-Average	100%
							2 – methylnaphthalene	10102-44-0	2.27E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,5-tetrachlorophenol	10102-44-1	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,3,4,6-Tetrachlorophenol	N/A	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,3,4-trichlorophenol	7440-36-0	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,3,5,6-tetrachlorophenol	7440-38-2	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,3,5-trichlorophenol	7440-39-3	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,3,6-trichlorophenol	7440-41-7	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,3-dichlorophenol	18540-29-9	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,4,5-trichlorophenol	7440-47-3	3.12E-07	1,24, annual	ST	Above-Average	100%
							2,4,6-Trichlorophenol	7440-48-4	4.59E-07	1,24, annual	ST	Above-Average	100%
							2,4-Dichlorophenol	7440-02-0	3.22E-07	1,24, annual	ST	Above-Average	100%
							2,6-dichlorophenol	7440-22-4	3.37E-07	1,24, annual	ST	Above-Average	100%
							2-Butanone	7782-49-2	4.52E-05	1,24, annual	ST	Above-Average	100%
							2-Chloronaphthalene	7440-28-0	6.23E-08	1,24, annual	ST	Above-Average	100%
							2-Methylanthracene	7440-62-2	1.31E-07	1,24, annual	ST	Above-Average	100%
							2-monochlorophenol	7440-66-6	6.67E-07	1,24, annual	ST	Above-Average	100%
							3,4,5-trichlorophenol	95-50-1	3.12E-07	1,24, annual	ST	Above-Average	100%
							3,4-dichlorophenol	95-50-1	3.12E-07	1,24, annual	ST	Above-Average	100%
							3,5-dichlorophenol	95-94-3	3.12E-07	1,24, annual	ST	Above-Average	100%
							3-Methylchloranthene	120-82-1	3.12E-07	1,24, annual	ST	Above-Average	100%
							3-monochlorophenol	58-90-2	3.12E-07	1,24, annual	ST	Above-Average	100%
							4-monochlorophenol	88-06-2	3.70E-07	1,24, annual	ST	Above-Average	100%
							7,12-Dimethylbenz(a)anthracene	120-83-2	6.23E-08	1,24, annual	ST	Above-Average	100%
							9,10-Dimethylanthracene	87-86-5	1.66E-07	1,24, annual	ST	Above-Average	100%
							9-Methylphenanthrene	118-74-1	8.45E-08	1,24, annual	ST	Above-Average	100%
							Acenaphthene	608-93-5	8.63E-08	1,24, annual	ST	Above-Average	5%
							Acenaphthylene	208-96-8	1.94E-07	1,24, annual	ST	Above-Average	6%
							Acetaldehyde	83-32-9	9.30E-04	1,24, annual	ST	Above-Average	99%
							Acetone	120-12-7	1.62E-04	1,24, annual	ST	Above-Average	100%
							Acrolein	56-55-3	9.54E-03	1,24, annual	ST	Above-Average	100%
							Ammonia	205-99-2	1.18E-02	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Anthracene	207-08-9	1.38E-07	1,24, annual	ST	Above-Average	25%
							Antimony	238-84-6	2.82E-06	1,24, annual	ST	Above-Average	100%
							Arsenic	243-17-4	1.71E-06	1,24, annual	ST	Above-Average	100%
							Barium	191-24-2	5.53E-05	1,24, annual	ST	Above-Average	100%
							Benzene	50-32-8	1.23E-04	1,24, annual	ST	Above-Average	33%
							Benzo(a)anthracene	192-97-2	7.56E-08	1,24, annual	ST	Above-Average	27%
							Benzo(a)fluorene	92-51-3	6.23E-08	1,24, annual	ST	Above-Average	100%
							Benzo(a)pyrene	218-01-9	1.05E-07	1,24, annual	ST	Above-Average	55%
							Benzo(b)fluoranthene	215-58-7	6.23E-08	1,24, annual	ST	Above-Average	15%
							Benzo(b)fluorene	53-70-3	6.23E-08	1,24, annual	ST	Above-Average	100%
							Benzo(e)pyrene	206-44-0	4.98E-07	1,24, annual	ST	Above-Average	100%
							Benzo(g,h,i)perylene	86-73-7	1.60E-06	1,24, annual	ST	Above-Average	100%
							Benzo(k)fluoranthene	193-39-5	6.23E-08	1,24, annual	ST	Above-Average	47%
							Beryllium	90-12-0	1.71E-06	1,24, annual	ST	Above-Average	100%
							Biphenyl	91-57-6	2.55E-07	1,24, annual	ST	Above-Average	100%
							Bromodichloromethane	91-20-3	1.51E-05	1,24, annual	ST	Above-Average	100%
							Bromoform	198-55-0	1.51E-05	1,24, annual	ST	Above-Average	100%
							Bromomethane	85-01-8	1.36E-04	1,24, annual	ST	Above-Average	100%
							Cadmium	129-00-0	1.53E-06	1,24, annual	ST	Above-Average	100%
							Carbon Monoxide	119-64-2	4.62E-01	1,24, annual	ST	Above-Average	64%
							Carbon tetrachloride	84-15-1	1.51E-05	1,24, annual	ST	Above-Average	100%
							Chlorobenzene	75-07-0	1.68E-05	1,24, annual	ST	Above-Average	100%
							Chloroform	71-43-2	1.51E-05	1,24, annual	ST	Above-Average	100%
							Chromium (hexavalent)	75-27-4	3.34E-05	1,24, annual	ST	Above-Average	100%
							Chrysene	75-25-2	9.33E-08	1,24, annual	ST	Above-Average	16%
							Cobalt	74-83-9	3.38E-06	1,24, annual	ST	Above-Average	100%
							Copper	56-23-5	5.83E-05	1,24, annual	ST	Above-Average	100%
							Coronene	67-66-3	3.12E-07	1,24, annual	ST	Above-Average	100%
							Cumene (isopropylbenzene)	75-71-8	3.02E-05	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,c)anthracene	75-34-3	6.23E-08	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,e)pyrene	75-09-2	3.12E-07	1,24, annual	ST	Above-Average	100%
							Dibenzo(a,h)anthracene	100-41-4	6.23E-08	1,24, annual	ST	Above-Average	35%
							Dibromochloromethane	106-93-4	1.51E-05	1,24, annual	ST	Above-Average	100%
							Dichlorodifluoromethane	50-00-0	3.02E-05	1,24, annual	ST	Above-Average	100%
							Dichloroethene, 1,1 -	127-18-4	2.81E-05	1,24, annual	ST	Above-Average	100%
							Dichloromethane	108-88-3	9.04E-04	1,24, annual	ST	Above-Average	100%
							Dioxins, Furans and Dioxin- like PCBs	71-55-6	3.40E-10	1,24, annual	ST	Above-Average	100%
							Ethylbenzene	86-42-0	1.52E-05	1,24, annual	ST	Above-Average	100%
							Ethylene Dibromide	79-01-6	3.02E-05	1,24, annual	ST	Above-Average	100%
							Fluoranthene	75-69-4	5.13E-07	1,24, annual	ST	Above-Average	28%
							Fluorides	75-01-4	4.16E-03	1,24, annual	ST	Above-Average	100%
							Fluorine	1330-20-7	1.88E-07	1,24, annual	ST	Above-Average	100%
							Formaldehyde	7440-50-8	1.36E-03	1,24, annual	ST	Above-Average	98%
							Hexachlorobenzene	7439-96-5	6.23E-08	1,24, annual	ST	Above-Average	100%
							Hydrogen Chloride	7439-98-7	1.53E-01	1,24, annual	ST	Above-Average	100%
							Indeno(1,2,3 – cd)pyrene	541-73-1	4.67E-07	1,24, annual	ST	Above-Average	78%
							Lead	106-46-7	1.59E-05	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							M&P-Xylene	108-70-3	4.66E-05	1,24, annual	ST	Above-Average	100%
							Manganese	87-61-6	4.66E-05	1,24, annual	ST	Above-Average	100%
							Mercury	634-66-2	7.74E-06	1,24, annual	ST	Above-Average	100%
							Mesitylene (1,3,5-Trimethylbenzene)	95-57-8	3.02E-05	1,24, annual	ST	Above-Average	100%
							Molybdenum	108-43-0	1.82E-04	1,24, annual	ST	Above-Average	100%
							m-Terphenyl	106-48-9	6.29E-08	1,24, annual	ST	Above-Average	100%
							Naphthalene	87-65-0	1.10E-06	1,24, annual	ST	Above-Average	3%
							Nickel	591-35-5	3.95E-05	1,24, annual	ST	Above-Average	100%
							Nitrogen Oxides	576-24-9	4.27E+00	1,24, annual	ST	Above-Average	44%
							Nitrogen Oxides	95-77-2	4.27E+00	1,24, annual	ST	Above-Average	44%
							O-terphenyl	933-75-5	6.23E-08	1,24, annual	ST	Above-Average	100%
							O-Xylene	933-78-8	1.54E-05	1,24, annual	ST	Above-Average	100%
							Pentachlorobenzene	95-95-4	6.23E-08	1,24, annual	ST	Above-Average	100%
							Pentachlorophenol	15950-66-0	3.12E-07	1,24, annual	ST	Above-Average	100%
							Perylene	609-19-8	6.23E-08	1,24, annual	ST	Above-Average	100%
							Phenanthrene	935-95-5	1.03E-06	1,24, annual	ST	Above-Average	7%
							Picene	4901-51-3	3.12E-07	1,24, annual	ST	Above-Average	100%
							PM10 (Condensable and Filterable)	91-58-7	1.82E-01	1,24, annual	ST	Above-Average	100%
							PM10 (Filterable Only)	191-07-1	9.54E-03	1,24, annual	ST	Above-Average	100%
							PM2.5 (Condensable and Filterable)	192-65-4	1.76E-01	1,24, annual	ST	Above-Average	100%
							PM2.5 (Filterable Only)	781-43-1	4.13E-03	1,24, annual	ST	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	57-97-6	3.40E-10	1,24, annual	ST	Above-Average	100%
							p-Terphenyl	613-12-7	7.20E-08	1,24, annual	ST	Above-Average	100%
							Pyrene	56-49-5	8.37E-07	1,24, annual	ST	Above-Average	41%
							Selenium	832-69-9	8.56E-06	1,24, annual	ST	Above-Average	100%
							Silver	883-20-5	1.71E-06	1,24, annual	ST	Above-Average	100%
							Styrene	213-46-7	7.40E-05	1,24, annual	ST	Above-Average	100%
							Sulphur Dioxide	92-06-8	5.73E-02	1,24, annual	ST	Above-Average	75%
							Tetrachloroethene	92-94-4	1.78E-05	1,24, annual	ST	Above-Average	100%
							Tetralin	217-59-4	1.68E-06	1,24, annual	ST	Above-Average	100%
							Thallium	67-64-1	1.71E-06	1,24, annual	ST	Above-Average	100%
							Toluene	106-99-0	8.47E-05	1,24, annual	ST	Above-Average	48%
							Total Chromium (and compounds)	78-93-3	3.34E-05	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Condensable and Filterable)	108-90-7	2.11E-01	1,24, annual	ST	Above-Average	100%
							Total Particulate Matter (Filterable Only)	98-82-8	3.93E-02	1,24, annual	ST	Above-Average	100%
							trans,1,2-Dichloroethene	124-48-1	1.51E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethane, 1,1,1 -	107-06-2	2.53E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethene	156-60-5	1.51E-05	1,24, annual	ST	Above-Average	100%
							Trichloroethylene, 1,1,2 -	78-87-5	1.78E-05	1,24, annual	ST	Above-Average	100%
							Trichlorofluoromethane	108-67-8	3.02E-05	1,24, annual	ST	Above-Average	100%
							Trichlorotrifluoroethane	100-42-5	7.54E-05	1,24, annual	ST	Above-Average	100%
							Triphenylene	79-00-5	9.33E-08	1,24, annual	ST	Above-Average	100%
							Vanadium	76-13-1	8.56E-07	1,24, annual	ST	Above-Average	100%
							Vinyl chloride	179601-23-1	3.02E-05	1,24, annual	ST	Above-Average	100%
							Xylenes, m-, p- and o-	95-47-6	6.20E-05	1,24, annual	ST	Above-Average	50%
							Zinc	107-02-8	1.61E-04	1,24, annual	ST	Above-Average	100%

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
2	Silo Filling	0.31	Ambient	0.10	5.4864	(680551,4860359)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
		0.31	Ambient	0.10	4.8768	(680513,4860332)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
		0.31	Ambient	0.10	3.9624	(680517,4860333)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
		0.31	Ambient	0.10	12.4	(680537,4860391)	Total Particulate Matter	N/A	1.07E-02	1	EC	Above-Average	14%
							PM_{10}	N/A	1.07E-02	1	EC	Above-Average	17%
							$PM_{2.5}$	N/A	1.07E-02	1	EC	Above-Average	17%
3	Stand-by generator	1.16	265.85	0.2	3	(680475,4860419)	Carbon Monoxide	630-08-0	2.56E-01	½	EF	Marginal	36%
							Nitrogen Oxides	10102-44-0	1.12E+00	½	EF	Marginal	12%
							Sulphur Dioxide	7446-09-5	1.88E-02	½	EF	Above-Average	25%
							Total Particulate Matter	N/A	3.25E-02	½	EF	Above-Average	43%
							Filterable TSP	N/A	2.03E-02	½	EF	Above-Average	100%
							PM_{10}	N/A	1.88E-02	½	EF	Above-Average	30%
							$PM_{2.5}$	N/A	1.88E-02	½	EF	Above-Average	30%
							Sulphuric Acid	7664-93-9	2.88E-04	½	EC	Above-Average	100%
							Benzene	71-43-2	2.54E-04	½	EF	Marginal	67%
							Toluene	108-88-3	9.21E-05	½	EF	Marginal	52%
							Xylenes, m-, p- and o-	1330-20-7	6.32E-05	½	EF	Marginal	50%
							Propylene	115-07-1	9.14E-04	½	EF	Marginal	100%
							Formaldehyde	50-00-0	2.58E-05	½	EF	Marginal	2%
							Acetaldehyde	75-07-0	8.26E-06	½	EF	Marginal	<1%
							Acrolein	107-02-8	2.58E-06	½	EF	Marginal	<1%
							Naphthalene	91-20-3	4.26E-05	½	EF	Marginal	97%
							Acenaphthylene	208-96-8	3.02E-06	½	EF	Marginal	94%
							Acenaphthene	83-32-9	1.53E-06	½	EF	Marginal	95%
							Fluorene	86-73-7	4.19E-06	½	EF	Marginal	100%
							Phenanthrene	85-01-8	1.34E-05	½	EF	Marginal	93%
							Anthracene	120-12-7	4.03E-07	½	EF	Marginal	75%
							Fluoranthene	206-44-0	1.32E-06	½	EF	Marginal	72%
							Pyrene	129-00-0	1.22E-06	½	EF	Marginal	59%
							Benzo(a)anthracene	56-55-3	2.04E-07	½	EF	Marginal	73%
							Chrysene	218-01-9	5.01E-07	½	EF	Marginal	84%
							Benzo(b)fluoranthene	205-99-2	3.64E-07	½	EF	Marginal	85%
							Benzo(k)fluoranthene	207-08-9	7.14E-08	½	EF	Marginal	53%
							Benzo(a)pyrene	50-32-8	8.42E-08	½	EF	Marginal	45%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	½	EF	Marginal	22%
							Dibenzo(a,h)anthracene	53-70-3	1.13E-07	½	EF	Marginal	65%
							Benzo(ghi)perylene	191-24-2	1.82E-07	½	EF	Marginal	100%

APPENDIX B
Emission Summary Table

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	MOECC POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark[a]	Percentage of MOECC Limit [%]	Notes	Version of Date of ACB List
1 – methylnaphthalene	90-12-0	1.08E-06	Calpuff	1.11E-06	24-hour	12	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
1,2,4 – Trichlorobenzene	120-82-1	2.84E-07	Calpuff	2.92E-07	24-hour	400	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
1,2,4,5-Tetrachlorobenzene	95-94-3	6.28E-08	Calpuff	6.45E-08	24-hour	1	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
1,2-Dichlorobenzene	95-50-1	7.44E-07	Calpuff	1.46E-05	1-hour	30500	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
2 – methylnaphthalene	91-57-6	2.27E-07	Calpuff	2.33E-07	24-hour	10	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
2,3,4,6-Tetrachlorophenol	58-90-2	3.12E-07	Calpuff	3.20E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
2,4,6-Trichlorophenol	88-06-2	4.59E-07	Calpuff	4.71E-07	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
2,4-Dichlorophenol	120-83-2	3.22E-07	Calpuff	3.30E-07	24-hour	77	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
3-Methylchloranthene	56-49-5	3.12E-07	Calpuff	3.20E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
7,12-Dimethylbenz(a)anthracene	57-97-6	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Acenaphthene	83-32-9	8.63E-08	Calpuff	8.86E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Acenaphthylene	208-96-8	1.94E-07	Calpuff	1.99E-07	24-hour	3.5	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Acetaldehyde	75-07-0	9.30E-04	Calpuff	9.55E-04	24-hour	500	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Acetaldehyde	75-07-0	9.30E-04	Calpuff	2.19E-02	1/2-hour	500	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Acetaldehyde	75-07-0	9.30E-04	Calpuff	9.55E-04	24-hour	5000	—	Sch. 6	URT	—	<1%	—	13/12/2016
Acrolein	107-02-8	9.54E-03	Calpuff	9.79E-03	24-hour	0.4	Health	Sch. 3	Standard	B1	2%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Acrolein	107-02-8	9.54E-03	Calpuff	1.87E-01	1-hour	4.5	Health	Sch. 3	Standard	B1	4%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Acrolein	107-02-8	9.54E-03	Calpuff	9.79E-03	24-hour	4	—	Sch. 6	URT	—	<1%	—	13/12/2016
Ammonia	7664-41-7	1.18E-02	Calpuff	1.21E-02	24-hour	100	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Ammonia	7664-41-7	1.18E-02	Calpuff	1.21E-02	24-hour	1000	—	Sch. 6	URT	—	<1%	—	13/12/2016
Anthracene	120-12-7	1.38E-07	Calpuff	1.41E-07	24-hour	0.2	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Antimony	7440-36-0	2.82E-06	Calpuff	2.90E-06	24-hour	25	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Arsenic	7440-38-2	1.71E-06	Calpuff	1.76E-06	24-hour	0.3	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Barium	7440-39-3	5.53E-05	Calpuff	5.68E-05	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Benzene	71-43-2	1.23E-04	Calpuff	3.95E-06	Annual	0.45	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 19, Table 2, 3, URT - Note 4, Table 4)	13/12/2016
Benzene	71-43-2	1.23E-04	Calpuff	1.26E-04	24-hour	100	—	Sch. 6	URT	—	<1%	—	13/12/2016
Benzene	71-43-2	1.23E-04	Calpuff	3.95E-06	Annual	4.5	—	—	AAV	—	<1%	—	13/12/2016
Benzo(a)anthracene	56-55-3	7.56E-08	Calpuff	7.76E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Benzo(a)fluorene	238-84-6	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Benzo(a)pyrene	50-32-8	1.05E-07	Calpuff	3.38E-09	Annual	0.00001	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 7, 19, Table 2, 3, URT - Note 4, Table 4)	13/12/2016
Benzo(a)pyrene	50-32-8	1.05E-07	Calpuff	1.08E-07	24-hour	0.005	—	Sch. 6	URT	—	<1%	—	13/12/2016
Benzo(a)pyrene	50-32-8	1.05E-07	Calpuff	3.38E-09	Annual	0.0001	—	—	AAV	—	<1%	—	13/12/2016
Benzo(b)fluoranthene	205-99-2	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Benzo(b)fluorene	243-17-4	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Benzo(e)pyrene	192-97-2	4.98E-07	Calpuff	5.11E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Benzo(g,h,i)perylene	191-24-2	1.60E-06	Calpuff	1.65E-06	24-hour	1.2	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Benzo(k)fluoranthene	207-08-9	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Beryllium	7440-41-7	1.71E-06	Calpuff	1.76E-06	24-hour	0.01	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Biphenyl	92-51-3	2.55E-07	Calpuff	2.62E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Bromodichloromethane	75-27-4	1.51E-05	Calpuff	1.55E-05	24-hour	0.01	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Bromoform	75-25-2	1.51E-05	Calpuff	1.55E-05	24-hour	55	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Bromomethane	74-83-9	1.36E-04	Calpuff	1.39E-04	24-hour	1350	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Cadmium	7440-43-9	1.63E-06	Calpuff	1.67E-06	24-hour	0.025	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Cadmium	7440-43-9	1.63E-06	Calpuff	1.67E-06	24-hour	0.25	—	Sch. 6	URT	—	<1%	—	13/12/2016
Carbon Monoxide	630-08-0	4.62E-01	Calpuff	1.09E+01	1/2-hour	6000	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 9)	13/12/2016
Carbon tetrachloride	56-23-5	1.51E-05	Calpuff	1.55E-05	24-hour	2.4	Health	Sch. 3	Standard	B1	<1%	ACB List (Note URT - Note 4, Table 4)	13/12/2016
Carbon tetrachloride	56-23-5	1.51E-05	Calpuff	1.55E-05	24-hour	24	—	Sch. 6	URT	—	<1%	—	13/12/2016
Chloroform	67-66-3	1.51E-05	Calpuff	1.55E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Chloroform	67-66-3	1.51E-05	Calpuff	1.55E-05	24-hour	100	—	Sch. 6	URT	—	<1%	—	13/12/2016
Chromium (hexavalent)	18540-29-9	3.34E-05	Calpuff	3.43E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Chrysene	218-01-9	9.33E-08	Calpuff	9.58E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Cobalt	7440-48-4	3.38E-06	Calpuff	3.47E-06	24-hour	0.1	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Copper	7440-50-8	5.83E-05	Calpuff	5.98E-05	24-hour	50	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Dibenzo(a,c)anthracene	215-58-7	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	MOECC POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark*	Percentage of MOECC Limit [%]	Notes	Version of Date of ACB List
Dibenzo(a,h)anthracene	53-70-3	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Dichlorodifluoromethane	75-71-8	3.02E-05	Calpuff	3.10E-05	24-hour	500000	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 10)	13/12/2016
Dichloroethene, 1,1 -	75-34-3	2.81E-05	Calpuff	2.89E-05	24-hour	165	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Dichloroethene, 1,1 -	75-34-3	2.81E-05	Calpuff	2.89E-05	24-hour	1650	—	Sch. 6	URT	—	<1%	—	13/12/2016
Dichloromethane	75-09-2	9.04E-04	Calpuff	9.28E-04	24-hour	220	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Dichloromethane	75-09-2	9.04E-04	Calpuff	9.28E-04	24-hour	22000	—	Sch. 6	URT	—	<1%	—	13/12/2016
Dioxins, Furans and Dioxin- like PCBs	N/A	3.40E-10	Calpuff	3.49E-10	24-hour	0.0000001	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 8, 8a, Table 1, URT - Note 4, Table 4)	13/12/2016
Ethylbenzene	100-41-4	1.52E-05	Calpuff	1.56E-05	24-hour	1000	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Ethylbenzene	100-41-4	1.52E-05	Calpuff	4.92E-04	10-minute	1900	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	13/12/2016
Ethylbenzene	100-41-4	1.52E-05	Calpuff	1.56E-05	24-hour	10000	—	Sch. 6	URT	—	<1%	—	13/12/2016
Ethylene Dibromide	106-93-4	3.02E-05	Calpuff	3.10E-05	24-hour	3	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Fluoranthene	206-44-0	5.13E-07	Calpuff	5.26E-07	24-hour	140	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Fluorides	7664-39-3	4.16E-03	Calpuff	4.27E-03	24-hour	0.86	Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 20)	13/12/2016
Fluorides	7664-39-3	4.16E-03	Calpuff	4.85E-04	30-day	0.34	Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 20)	13/12/2016
Fluorides	7664-39-3	4.16E-03	Calpuff	4.27E-03	24-hour	1.72	Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 20)	13/12/2016
Fluorides	7664-39-3	4.16E-03	Calpuff	4.85E-04	30-day	0.69	Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 20)	13/12/2016
Fluorides	7664-39-3	4.16E-03	Calpuff	4.27E-03	24-hour	3.44	Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 20)	13/12/2016
Fluorides	7664-39-3	4.16E-03	Calpuff	4.85E-04	30-day	1.38	Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 20)	13/12/2016
Fluorine	86-73-7	1.88E-07	Calpuff	1.93E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Formaldehyde	50-00-0	1.36E-03	Calpuff	1.40E-03	24-hour	65	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Hexachlorobenzene	118-74-1	6.23E-08	Calpuff	6.40E-08	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Hexachlorobenzene	118-74-1	6.23E-08	Calpuff	6.40E-08	24-hour	0.01	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Hydrogen Chloride	7647-01-0	1.53E-01	Calpuff	1.57E-01	24-hour	20	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Hydrogen Chloride	7647-01-0	1.53E-01	Calpuff	1.57E-01	24-hour	200	—	Sch. 6	URT	—	<1%	—	13/12/2016
Indeno(1,2,3 – cd)pyrene	193-39-5	4.67E-07	Calpuff	4.80E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Lead	7439-92-1	1.59E-05	Calpuff	1.63E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Lead	7439-92-1	1.59E-05	Calpuff	1.85E-06	30-day	0.2	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Lead	7439-92-1	1.59E-05	Calpuff	1.63E-05	24-hour	2	—	Sch. 6	URT	—	<1%	—	13/12/2016
Manganese	7439-96-5	4.66E-05	Calpuff	4.79E-05	24-hour	0.4	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Manganese	7439-96-5	4.66E-05	Calpuff	4.79E-05	24-hour	4	—	Sch. 6	URT	—	<1%	—	13/12/2016
Mercury	7439-97-6	7.74E-06	Calpuff	7.95E-06	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Molybdenum	7439-98-7	1.82E-04	Calpuff	1.87E-04	24-hour	120	Particulate	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Naphthalene	91-20-3	1.10E-06	Calpuff	1.13E-06	24-hour	22.5	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	13/12/2016
Naphthalene	91-20-3	1.10E-06	Calpuff	3.57E-05	10-minute	50	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	13/12/2016
Nickel	7440-02-0	3.95E-05	Calpuff	1.27E-06	Annual	0.04	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 19, Table 2, 3, URT - Note 4, Table 4)	13/12/2016
Nickel	7440-02-0	3.95E-05	Calpuff	4.06E-05	24-hour	2	—	Sch. 6	URT	—	<1%	—	13/12/2016
Nickel	7440-02-0	3.95E-05	Calpuff	1.27E-06	Annual	0.4	—	—	AAV	—	<1%	—	13/12/2016
Nitrogen Oxides	10102-44-0	4.27E+00	Calpuff	4.39E+00	24-hour	200	Health	Sch. 3	Standard	B1	2%	ACB List (Notes 2, 17)	13/12/2016
Nitrogen Oxides	10102-44-0	4.27E+00	Calpuff	8.39E+01	1-hour	400	Health	Sch. 3	Standard	B1	21%	ACB List (Notes 2, 17)	13/12/2016
O-terphenyl	84-15-1	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
PM_{10} (Condensable and Filterable)	N/A	1.82E-01	Calpuff	1.21	24-hour	50	—	—	AAQC	—	2%	—	13/12/2016
PM_{10} (Filterable Only)	N/A	9.54E-03	Calpuff	1.04	24-hour	50	—	—	AAQC	—	2%	—	13/12/2016
$PM_{2.5}$ (Condensable and Filterable)	N/A	1.76E-01	Calpuff	1.21	24-hour	30	—	—	AAQC	—	4%	—	13/12/2016
$PM_{2.5}$ (Filterable Only)	N/A	4.13E-03	Calpuff	1.03	24-hour	30	—	—	AAQC	—	3%	—	13/12/2016
Pentachlorobenzene	608-93-5	6.23E-08	Calpuff	6.40E-08	24-hour	3	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Pentachlorophenol	87-86-5	3.12E-07	Calpuff	3.20E-07	24-hour	20	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Perylene	198-55-0	6.23E-08	Calpuff	6.40E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Phenanthrene	85-01-8	1.03E-06	Calpuff	1.05E-06	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Pyrene	129-00-0	8.37E-07	Calpuff	8.60E-07	24-hour	0.2	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Selenium	7782-49-2	8.56E-06	Calpuff	8.78E-06	24-hour	10	Health	Sch. 3	Guideline	B1	<1%	—	13/12/2016
Silver	7440-22-4	1.71E-06	Calpuff	1.76E-06	24-hour	1	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Sulphur Dioxide	7446-09-5	5.73E-02	Calpuff	5.88E-02	24-hour	275	Health & Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2)	13/12/2016
Sulphur Dioxide	7446-09-5	5.73E-02	Calpuff	1.12E+00	1-hour	690	Health & Vegetation	Sch. 3	Standard	B1	<1%	ACB List (Note 2)	13/12/2016

Appendix B
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period	MOECC POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark*	Percentage of MOECC Limit [%]	Notes	Version of Date of ACB List
Tetrachloroethene	127-18-4	1.78E-05	Calpuff	1.83E-05	24-hour	360	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Tetrachloroethene	127-18-4	1.78E-05	Calpuff	1.83E-05	24-hour	3600	—	Sch. 6	URT	—	<1%	—	13/12/2016
Tetralin	119-64-2	1.68E-06	Calpuff	1.72E-06	24-hour	1200	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Thallium	7440-28-0	1.71E-06	Calpuff	1.76E-06	24-hour	0.24	Health	Sch. 3	SL-JSL	B2	Below SL-JSL	—	13/12/2016
Toluene	108-88-3	8.47E-05	Calpuff	8.70E-05	24-hour	2000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	13/12/2016
Total Chromium (and compounds)	7440-47-3	3.34E-05	Calpuff	1.08E-06	Annual	0.00014	Health	Sch. 3	Standard	B1	<1%	ACB List (Notes 11, 19, Table 2, 3, URT - Note 4, Table 4)	13/12/2016
Total Chromium (and compounds)	7440-47-3	3.34E-05	Calpuff	3.43E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 11a, URT - Note 4, Table 4)	13/12/2016
Total Chromium (and compounds)	7440-47-3	3.34E-05	Calpuff	3.43E-05	24-hour	5	—	Sch. 6	URT	—	<1%	—	13/12/2016
Total Chromium (and compounds)	7440-47-3	3.34E-05	Calpuff	3.43E-05	24-hour	0.07	—	Sch. 6	URT	—	<1%	—	13/12/2016
Total Chromium (and compounds)	7440-47-3	3.34E-05	Calpuff	1.08E-06	Annual	0.0014	—	—	AAV	—	<1%	—	13/12/2016
Total Particulate Matter (Condensable and Filterable)	N/A	2.11E-01	Calpuff	1.24	24-hour	120	Visibility	Sch. 3	Standard	B1	1%	—	13/12/2016
Total Particulate Matter (Filterable only)	N/A	3.93E-02	Calpuff	1.07	24-hour	120	Visibility	Sch. 3	Standard	B1	<1%	—	13/12/2016
Trichloroethane, 1,1,1 -	71-55-6	2.53E-05	Calpuff	2.59E-05	24-hour	115000	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Trichloroethene	86-42-0	1.51E-05	Calpuff	1.55E-05	24-hour	0.1	—	—	De Minimus	—	Below De Minimus	—	13/12/2016
Trichloroethylene, 1,1,2 -	79-01-6	1.78E-05	Calpuff	1.83E-05	24-hour	12	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Trichloroethylene, 1,1,2 -	79-01-6	1.78E-05	Calpuff	1.83E-05	24-hour	1200	—	Sch. 6	URT	—	<1%	—	13/12/2016
Trichlorofluoromethane	75-69-4	3.02E-05	Calpuff	3.10E-05	24-hour	6000	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 10)	13/12/2016
Vanadium	7440-62-2	8.56E-07	Calpuff	8.78E-07	24-hour	2	Health	Sch. 3	Standard	B1	<1%	—	13/12/2016
Vinyl chloride	75-01-4	3.02E-05	Calpuff	3.10E-05	24-hour	1	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	13/12/2016
Vinyl chloride	75-01-4	3.02E-05	Calpuff	3.10E-05	24-hour	100	—	Sch. 6	URT	—	<1%	—	13/12/2016
Xylenes, m-, p- and o-	1330-20-7	6.20E-05	Calpuff	6.36E-05	24-hour	730	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	13/12/2016
Xylenes, m-, p- and o-	1330-20-7	6.20E-05	Calpuff	2.01E-03	10-minute	3000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	13/12/2016
Xylenes, m-, p- and o-	1330-20-7	6.20E-05	Calpuff	6.36E-05	24-hour	7300	—	Sch. 6	URT	—	<1%	—	13/12/2016
Zinc	7440-66-6	1.61E-04	Calpuff	1.66E-04	24-hour	120	Particulate	Sch. 3	Standard	B1	<1%	—	13/12/2016

*The MOECC has recently updated the list of standards and guidelines for facilities to assess their emissions against, namely the Air Contaminants Benchmark (ACB) List, dated December 2016, which includes standards and guidelines (Benchmark 1 or B1) and screening levels (Benchmark 2 or B2)

APPENDIX 30

DYEC CEMS 1-Hour Average Data
(4 pages)

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m³	mg/m³ @ 11% O_2		mg/m³ @ 11% O_2		mg/m³ @ 11% O_2		mg/m³ @ 11% O_2		mg/m³ @ 11% O_2	%
Date	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
10-Oct-17	9:00	9.14	0.19	10		0		106		2		0	9
10-Oct-17	10:00	8.73	0.19	9		0		115		2		0	8
10-Oct-17	11:00	8.59	0.19	8		0		109		2		0	8
10-Oct-17	12:00	8.64	0.19	9	9.0	0		108		2		0	8
10-Oct-17	13:00	8.45	0.19	8	8.5	0		110		2		0	8
10-Oct-17	14:00	8.47	0.19	8	8.3	0		114		2		0	8
10-Oct-17	15:00	8.80	0.19	11	9.0	0		111		2		0	8
10-Oct-17	16:00	8.72	0.19	8	8.8	0		110		2		0	8
10-Oct-17	17:00	8.67	0.19	9	9.0	0		114		2		0	8
10-Oct-17	18:00	8.51	0.19	8	9.0	0		109		2		0	8
10-Oct-17	19:00	8.52	0.19	9	8.5	0		111		2		0	8
10-Oct-17	20:00	8.69	0.19	9	8.8	0		106		1		0	8
10-Oct-17	21:00	8.35	0.20	9	8.8	0		109		2		0	8
10-Oct-17	22:00	8.58	0.19	8	8.8	0		113		2		0	8
10-Oct-17	23:00	8.47	0.20	8	8.5	0		112		2		0	8
11-Oct-17	0:00	8.79	0.19	11	9.0	0		111		2		0	8
11-Oct-17	1:00	9.02	0.19	18	11.3	0		110		2		0	8
11-Oct-17	2:00	8.71	0.19	9	11.5	0		111		2		0	8
11-Oct-17	3:00	9.00	0.19	12	12.5	0		110		1		0	8
11-Oct-17	4:00	8.88	0.19	19	14.5	0		111		1		0	8
11-Oct-17	5:00	8.77	0.19	19	14.8	0		120		1		0	8
11-Oct-17	6:00	8.69	0.19	9	14.8	0		115		1		0	8
11-Oct-17	7:00	8.62	0.19	9	14.0	0		120		2		0	8
11-Oct-17	8:00	8.56	0.20	11	12.0	0	0.0	111	112	1	1.8	0	8
11-Oct-17	9:00	8.66	0.19	20	12.3	0	0.0	111	112	1	1.7	0	8
11-Oct-17	10:00	8.49	0.20	15	13.8	0	0.0	107	111	1	1.7	0	8
11-Oct-17	11:00	8.45	0.20	17	15.8	0	0.0	109	111	2	1.7	0	8
11-Oct-17	12:00	8.60	0.20	15	16.8	0	0.0	107	111	2	1.7	0	8
11-Oct-17	13:00	8.66	0.20	14	15.3	0	0.0	114	112	2	1.7	0	8
11-Oct-17	14:00	8.48	0.20	13	14.8	0	0.0	110	111	2	1.7	0	8
11-Oct-17	15:00	8.72	0.19	15	14.3	0	0.0	113	111	2	1.7	0	8
11-Oct-17	16:00	8.74	0.19	16	14.5	4	0.2	110	111	2	1.7	0	8
11-Oct-17	17:00	8.54	0.20	15	14.8	1	0.2	111	111	2	1.7	0	8
11-Oct-17	18:00	8.97	0.19	21	16.8	4	0.4	110	111	1	1.6	0	8
11-Oct-17	19:00	8.72	0.19	15	16.8	16	1.0	111	111	2	1.6	0	8
11-Oct-17	20:00	8.85	0.19	10	15.3	30	2.3	113	112	3	1.7	0	8
11-Oct-17	21:00	8.47	0.20	16	15.5	2	2.4	108	112	3	1.8	0	8
11-Oct-17	22:00	8.89	0.19	13	13.5	0	2.4	110	111	3	1.8	0	8
11-Oct-17	23:00	8.87	0.19	14	13.3	7	2.7	109	111	2	1.8	0	8
12-Oct-17	0:00	8.99	0.19	15	14.5	35	4.1	112	111	3	1.8	0	8
12-Oct-17	1:00	8.79	0.19	11	13.3	19	4.9	110	111	3	1.9	0	8
12-Oct-17	2:00	8.63	0.19	9	12.3	1	5.0	113	111	3	1.9	0	8
12-Oct-17	3:00	8.96	0.19	11	11.5	7	5.3	108	111	2	2.0	0	8
12-Oct-17	4:00	8.99	0.19	8	9.8	1	5.3	113	111	2	2.0	0	8
12-Oct-17	5:00	8.80	0.19	12	10.0	0	5.3	122	112	2	2.0	0	8
12-Oct-17	6:00	8.72	0.19	12	10.8	0	5.3	116	112	2	2.1	0	8
12-Oct-17	7:00	8.42	0.20	6	9.5	0	5.3	127	112	2	2.1	0	8
12-Oct-17	8:00	8.41	0.20	7	9.3	1	5.3	122	112	2	2.1	0	8
12-Oct-17	9:00	8.41	0.20	6	7.8	0	5.3	107	112	2	2.2	0	8
12-Oct-17	10:00	8.42	0.20	7	6.5	0	5.3	112	112	2	2.2	0	8
12-Oct-17	11:00	8.32	0.20	6	6.5	0	5.3	113	113	2	2.2	0	8
12-Oct-17	12:00	8.25	0.20	6	6.3	0	5.3	109	113	2	2.2	0	7
12-Oct-17	13:00	8.51	0.20	7	6.5	0	5.3	112	113	2	2.2	0	8
12-Oct-17	14:00	8.43	0.20	9	7.0	0	5.3	109	113	2	2.2	0	8
12-Oct-17	15:00	8.48	0.20	9	7.8	2	5.4	111	112	2	2.2	0	8
12-Oct-17	16:00	8.49	0.20	10	8.8	0	5.3	110	112	2	2.2	0	8
12-Oct-17	17:00	8.15	0.20	11	9.8	0	5.2	103	112	2	2.2	0	7
12-Oct-17	18:00	8.37	0.20	9	9.8	0	5.0	110	112	2	2.3	0	8
12-Oct-17	19:00	8.44	0.20	9	9.8	0	4.4	111	112	2	2.3	0	8
12-Oct-17	20:00	8.59	0.19	9	9.5	0	3.1	112	112	2	2.2	0	8
12-Oct-17	21:00	7.94	0.20	12	9.8	0	3.0	111	112	1	2.1	0	7
12-Oct-17	22:00	8.58	0.20	10	10.0	0	3.0	108	112	2	2.1	0	8
12-Oct-17	23:00	8.76	0.19	9	10.0	0	2.8	109	112	2	2.1	0	8
13-Oct-17	0:00	8.44	0.20	12	10.8	0	1.3	109	112	2	2.0	0	8
13-Oct-17	1:00	8.44	0.20	9	10.0	0	0.5	113	112	2	2.0	0	8
13-Oct-17	2:00	8.75	0.19	9	9.8	0	0.5	108	112	2	2.0	0	8
13-Oct-17	3:00	8.73	0.19	11	10.3	0	0.2	111	112	2	2.0	0	8
13-Oct-17	4:00	8.75	0.19	16	11.3	0	0.1	107	112	2	2.0	0	8
13-Oct-17	5:00	9.16	0.19	12	12.0	0	0.1	119	112	2	2.0	0	8
13-Oct-17	6:00	9.85	0.17	24	15.8	0	0.1	105	111	2	2.0	0	9
13-Oct-17	7:00	8.55	0.19	13	16.3	0	0.1	117	111	2	2.0	0	8
13-Oct-17	8:00	8.41	0.20	12	15.3	0	0.1	115	110	2	2.0	0	8

Covanta - Durham York Energy Centre
Boiler No. 1 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
13-Oct-17	9:00	8.71	0.19	11	15.0	0	0.1	107	110	2	2.0	0	8
13-Oct-17	10:00	8.65	0.19	11	11.8	0	0.1	112	110	2	2.0	0	8
13-Oct-17	11:00	8.73	0.19	17	12.8	0	0.1	109	110	2	2.0	0	8
13-Oct-17	12:00	8.67	0.19	18	14.3	0	0.1	108	110	2	2.0	0	8
13-Oct-17	13:00	8.68	0.19	11	14.3	0	0.1	108	110	2	2.0	0	8
13-Oct-17	14:00	8.67	0.19	14	15.0	0	0.1	115	110	2	2.0	0	8
	Min	7.94	0.17	6	6.3	0	0.0	103	110	1	1.6	0	7
	Max	9.85	0.20	24	16.8	35	5.4	127	113	3	2.3	0	9
	Avg	8.65	0.19	12	11.5	2	2.4	111	112	2	2.0	0	8
	Std Dev	0.26	0.006	3.9	2.9	5.9	2.3	4.02	0.6	0.5	0.2	-	0.3

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
Date	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
10-Oct-17	9:00	8.28	0.19	17		0		111		5		0	8
10-Oct-17	10:00	8.00	0.20	12		0		108		5		0	8
10-Oct-17	11:00	7.94	0.20	17		0		113		5		0	8
10-Oct-17	12:00	7.77	0.20	14	15.0	0		109		5		0	7
10-Oct-17	13:00	8.16	0.20	20	15.8	0		109		5		0	8
10-Oct-17	14:00	8.45	0.19	14	16.3	0		115		5		0	8
10-Oct-17	15:00	8.29	0.19	12	15.0	0		110		6		0	8
10-Oct-17	16:00	8.22	0.19	25	17.8	0		109		5		0	8
10-Oct-17	17:00	8.23	0.19	11	15.5	0		110		5		0	8
10-Oct-17	18:00	8.24	0.19	16	16.0	0		114		5		0	8
10-Oct-17	19:00	8.18	0.19	13	16.3	0		110		5		0	8
10-Oct-17	20:00	8.28	0.19	17	14.3	0		105		5		0	8
10-Oct-17	21:00	8.27	0.20	14	15.0	0		110		5		0	8
10-Oct-17	22:00	7.93	0.20	12	14.0	0		113		5		0	8
10-Oct-17	23:00	7.98	0.20	13	14.0	0		108		5		0	8
11-Oct-17	0:00	8.18	0.20	10	12.3	0		113		6		0	8
11-Oct-17	1:00	8.06	0.20	9	11.0	0		111		5		0	8
11-Oct-17	2:00	8.54	0.19	9	10.3	0		111		5		0	8
11-Oct-17	3:00	8.37	0.19	10	9.5	0		112		5		0	8
11-Oct-17	4:00	8.58	0.19	12	10.0	0		109		4		0	8
11-Oct-17	5:00	8.04	0.20	12	10.8	0		118		4		0	7
11-Oct-17	6:00	8.05	0.20	8	10.5	0		108		6		0	8
11-Oct-17	7:00	8.04	0.20	9	10.3	0		124		5		0	8
11-Oct-17	8:00	7.99	0.20	8	9.3	0	0.0	108	111	5	5.0	0	8
11-Oct-17	9:00	7.79	0.20	7	8.0	0	0.0	111	111	5	5.0	0	8
11-Oct-17	10:00	7.94	0.20	11	8.8	0	0.0	108	111	6	5.1	0	8
11-Oct-17	11:00	7.78	0.20	9	8.8	0	0.0	111	111	5	5.1	0	7
11-Oct-17	12:00	7.86	0.20	8	8.8	0	0.0	113	111	6	5.1	0	7
11-Oct-17	13:00	8.06	0.20	9	9.3	0	0.0	110	111	6	5.2	0	8
11-Oct-17	14:00	7.81	0.20	8	8.5	0	0.0	108	111	5	5.2	0	7
11-Oct-17	15:00	7.84	0.20	8	8.3	0	0.0	113	111	6	5.2	0	7
11-Oct-17	16:00	7.32	0.21	9	8.5	1	0.0	115	111	5	5.2	0	7
11-Oct-17	17:00	8.19	0.20	10	8.8	0	0.0	106	111	5	5.2	0	8
11-Oct-17	18:00	8.49	0.19	15	10.5	0	0.0	112	111	5	5.2	0	8
11-Oct-17	19:00	8.36	0.20	13	11.8	0	0.0	114	111	5	5.2	0	8
11-Oct-17	20:00	8.04	0.20	12	12.5	4	0.2	110	112	6	5.2	0	8
11-Oct-17	21:00	8.40	0.19	9	12.3	15	0.8	106	111	7	5.3	0	8
11-Oct-17	22:00	8.19	0.20	12	11.5	5	1.0	111	111	6	5.3	0	8
11-Oct-17	23:00	8.12	0.20	13	11.5	8	1.4	104	111	6	5.4	0	8
12-Oct-17	0:00	8.32	0.20	11	11.3	25	2.4	113	111	7	5.4	0	8
12-Oct-17	1:00	8.52	0.19	14	12.5	16	3.1	114	111	7	5.5	0	8
12-Oct-17	2:00	8.43	0.19	13	12.8	5	3.3	111	111	5	5.5	0	8
12-Oct-17	3:00	8.39	0.20	13	12.8	9	3.7	110	111	5	5.5	0	8
12-Oct-17	4:00	8.14	0.20	10	12.5	2	3.8	117	111	4	5.5	0	8
12-Oct-17	5:00	8.70	0.19	14	12.5	0	3.8	127	112	4	5.5	0	8
12-Oct-17	6:00	8.44	0.19	14	12.8	0	3.8	98	111	5	5.5	0	8
12-Oct-17	7:00	8.10	0.20	18	14.0	0	3.8	119	111	4	5.4	0	7
12-Oct-17	8:00	8.06	0.20	12	14.5	0	3.8	114	111	4	5.4	0	8
12-Oct-17	9:00	8.13	0.20	8	13.0	0	3.8	111	111	4	5.3	0	8
12-Oct-17	10:00	7.96	0.20	7	11.3	0	3.8	112	112	5	5.3	0	8
12-Oct-17	11:00	7.88	0.20	8	8.8	0	3.8	109	112	5	5.3	0	7
12-Oct-17	12:00	8.28	0.20	10	8.3	0	3.8	111	111	5	5.3	0	8
12-Oct-17	13:00	8.05	0.20	10	8.8	0	3.8	106	111	5	5.2	0	8
12-Oct-17	14:00	8.07	0.20	7	8.8	0	3.8	112	111	5	5.2	0	8
12-Oct-17	15:00	8.19	0.20	7	8.5	1	3.8	112	111	5	5.2	0	8
12-Oct-17	16:00	7.92	0.20	6	7.5	2	3.8	109	111	5	5.2	0	8
12-Oct-17	17:00	7.71	0.21	11	7.8	0	3.8	108	111	5	5.2	0	7
12-Oct-17	18:00	7.78	0.20	11	8.8	0	3.8	111	111	5	5.2	0	7
12-Oct-17	19:00	7.98	0.20	16	11.0	0	3.8	111	111	5	5.2	0	8
12-Oct-17	20:00	8.11	0.20	11	12.3	0	3.7	107	111	5	5.1	0	8
12-Oct-17	21:00	8.08	0.20	10	12.0	0	3.0	115	111	4	5.0	0	8
12-Oct-17	22:00	7.91	0.20	10	11.8	0	2.8	112	111	4	4.9	0	8
12-Oct-17	23:00	8.40	0.19	15	11.5	0	2.5	105	111	5	4.9	0	8
13-Oct-17	0:00	7.78	0.20	14	12.3	0	1.5	114	111	4	4.8	0	7
13-Oct-17	1:00	8.12	0.20	14	13.3	0	0.8	108	111	5	4.7	0	8
13-Oct-17	2:00	8.28	0.19	12	13.8	0	0.6	110	111	4	4.6	0	8
13-Oct-17	3:00	8.56	0.19	10	12.5	0	0.2	114	111	5	4.6	0	8
13-Oct-17	4:00	8.40	0.19	11	11.8	0	0.1	115	111	4	4.6	0	8
13-Oct-17	5:00	8.43	0.19	13	11.5	0	0.1	117	111	4	4.6	0	8
13-Oct-17	6:00	8.45	0.19	12	11.5	0	0.1	118	112	5	4.6	0	8
13-Oct-17	7:00	8.26	0.20	20	14.0	0	0.1	117	112	5	4.7	0	8
13-Oct-17	8:00	8.25	0.20	20	16.3	0	0.1	111	111	5	4.7	0	8

Covanta - Durham York Energy Centre
Boiler No. 2 CEMS

		BH Outlet											Scrubber Inlet
		O_2	CO_2	CO		SO_2		NOx		HCl		THC	O_2
		%	kg/m^3	mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2		mg/m^3 @ 11% O_2	%
	Time	1-hr	1-hr	1-hr	Rolling 4-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	Rolling 24-hr	1-hr	1-hr
13-Oct-17	9:00	7.69	0.21	20	18.0	0	0.1	106	111	5	4.8	0	7
13-Oct-17	10:00	7.82	0.20	16	19.0	0	0.1	114	111	5	4.8	0	7
13-Oct-17	11:00	7.64	0.21	20	19.0	0	0.1	112	111	5	4.8	0	7
13-Oct-17	12:00	8.06	0.20	16	18.0	0	0.1	109	111	5	4.8	0	8
13-Oct-17	13:00	8.32	0.19	13	16.3	0	0.1	108	111	5	4.8	0	8
13-Oct-17	14:00	8.43	0.19	14	15.8	0	0.1	113	112	5	4.8	0	8
	Min	7.32	0.19	6	7.5	0	0.0	98	111	4	4.6	0	7
	Max	8.70	0.21	25	19.0	25	3.8	127	112	7	5.5	0	8
	Avg	8.13	0.20	12	12.2	1	1.7	111	111	5	5.1	0	8
	Std Dev	0.26	0.01	3.7	2.9	4.0	1.7	4.22	0.2	0.7	0.3	-	0.4