

Report:

Covanta Durham York Renewable Energy Limited Partnership May 2016 Emission Testing Program at the Durham York Energy Centre

Date: June 13, 2016





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Table of Contents

			Page
	EXEC	CUTIVE SUMMARY	6
1.	INTR	ODUCTION	15
2.	PRO	CESS DESCRIPTION	15
	2.1	Control Equipment	16
	2.2	Continuous Emission Monitoring Systems	
3.	SAM	PLING LOCATIONS	17
4.	SAM	PLING PROCEDURES	18
	4.1	General	18
	4.2	Particulate and Metals	19
	4.3	Particle Size Distribution	20
	4.4	Semi-Volatile Organic Compounds	20
	4.5	Acid Gases	21
	4.6	Volatile Organic Compounds	22
	4.7	Aldehydes	23
	4.8	Combustion Gases	24
5.	SAM	PLE RECOVERY AND ANALYSIS	25
	5.1	Particulate and Metals	25
	5.2	Particle Size Distribution	26
	5.3	Semi-Volatile Organic Compounds	27
	5.4	Acid Gases	28
	5.5	Volatile Organics Train Recovery	29
	5.6	Aldehydes	30
6.	INTE	RNAL AND EXTERNAL QA/QC PROGRAM	
	6.1	General	30
	6.2	Pre-Test Activities	
	6.3	Emission Testing QA/QC Results	31
	6.4	Sample Recovery, Handling and Custody	
	6.5	Analytical Results	
		6.5.1 Metals Sample Analysis QA/QC	34
		6.5.2 Acid Gas Sample Analysis QA/QC	35
		6.5.3 Aldehyde Sample Analysis QA/QC	
		6.5.4 SVOC Sample Analysis QA/QC	
		6.5.5 Volatile Organic Compound Analysis QA/QC	



Table of Contents

			Page
7.	RESU	LTS AND DISCUSSION	37
	7.1	Stack Gas Sampling Parameters	38
	7.2	Stack Gas Physical Parameters	38
	7.3	Volumetric Flowrate Data	39
	7.4	Particulate Emission Data	39
	7.5	Acid Gases	41
	7.6	Combustion Gas Emission Data	41
	7.7	Metal Emission Data	43
	7.8	Mercury Emission Data	44
	7.9	Semi-Volatile Organic Emission Data	45
		7.9.1 Dioxins and Furans Emission Data	45
		7.9.2 Chlorobenzene and Chlorophenol Emission Data	48
		7.9.3 Polycyclic Aromatic Hydrocarbon Emission Data	50
	7.10	Aldehydes	50
	7.11	Volatile Organic Emission Data	51
8.	DISPE	ERSION MODELLING	51
	8.1	Source Parameters	52
	8.2	Modelling Results	52
9.	FACIL	ITY PROCESS DATA	57
10.	CONC	CLUSIONS	60



List of Appendices

APPENDIX 1	Boiler No. 1 BH Outlet Data Tables
APPENDIX 2	Boiler No. 2 BH Outlet Data Tables
APPENDIX 3	Particulate and Metals Field Data Sheets
APPENDIX 4	Particle Size Distribution Field Data Sheets
APPENDIX 5	SVOC Data Sheets
APPENDIX 6	Acid Gas Field Data Sheets
APPENDIX 7	VOST Field Data Sheets
APPENDIX 8	Aldehydes Field Data Sheets
APPENDIX 9	ORTECH Sample Log
APPENDIX 10	Particulate and Metals Train Recovery Data Sheets
APPENDIX 11	Inorganics Analytical Reports
APPENDIX 12	Particle Size Distribution Train Recovery Data Sheets
APPENDIX 13	Condensable Particulate Analytical Report
APPENDIX 14	SVOC Train Recovery Data Sheets
APPENDIX 15	SVOC Analytical Report
APPENDIX 16	Acid Gas Recovery Data Sheets
APPENDIX 17	VOST Analytical Reports
APPENDIX 18	Aldehydes Recovery Data Sheets
APPENDIX 19	Aldehydes Analytical Reports
APPENDIX 20	SVOC and VOST Proof Data
APPENDIX 21	ORTECH Equipment Calibration Data
APPENDIX 22	Particulate and Metals Test Emission Calculations at the Boiler No. 1 BH Outlet
APPENDIX 23	Particle Size Distribution Test Emission Calculations at the Boiler No. 1 BH Outlet
APPENDIX 24	Acid Gases Test Emission Calculations at the Boiler No. 1 BH Outlet
APPENDIX 25	SVOC Test Emission Calculations at the Boiler No. 1 BH Outlet
APPENDIX 26	Particulate and Metals Test Emission Calculations at the Boiler No. 2 BH Outlet
APPENDIX 27	Particle Size Distribution Test Emission Calculations at the Boiler No. 2 BH Outlet
APPENDIX 28	Acid Gases Test Emission Calculations at the Boiler No. 2 BH Outlet
APPENDIX 29	SVOC Test Emission Calculations at the Boiler No. 2 BH Outlet
APPENDIX 30	CALPUFF Zip Files (CD)
APPENDIX 31	DYEC CEMS 1-Hour Average Data and ORTECH THC Data
APPENDIX 32	DYEC AMESA Dioxin and Furan Analytical Report and Results



EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between May 2 and May 11, 2016. The emission testing program was performed to satisfy the agreement the facility has with the Regions of Durham and York to conduct emission testing twice per year.

Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX Section 7(1) 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." The initial source testing program under Amended ECA No. 7306-8FDKNX was conducted in September/October 2015.

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.

Triplicate emission tests were completed for particulate matter, metals, semi-volatile organic compounds, aldehydes, acid gases, volatile organic compounds and combustion gases at the BH Outlet 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
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. Instack 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 CEMS.

Since relative accuracy and system bias testing performed in the Fall of 2015 demonstrated that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, 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 six days when isokinetic testing was performed at each unit was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. A seventh day of testing was conducted at Boiler No. 2, however only three hours of single point sampling were conducted. Concentration data measured by ORTECH between April 19 and April 20, 2016 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 a new framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs. 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 only 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, was used to assess against the in-stack limit detailed in Schedule C of the ECA.



The average results for the tests conducted at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Limit	Boiler No. 1	Boiler No. 2	Combined Boilers
Power Output (MWh/day)*	-	-	-	378 ⁽⁷⁾
Average Combustion Zone Temp. (°C)*	-	1216	1246	1231 ⁽⁸⁾
Steam (tonnes/day)*	-	749	797	1546 ⁽⁷⁾
MSW Combusted (tonnes/day)*	-	189	209	398 ⁽⁷⁾
NOx Reagent Injection Rate (liters/day)*	ı	644	1076	1720 ⁽⁷⁾
Carbon Injection (kg/day)*	ı	114	117	231 ⁽⁷⁾
Lime Injection (kg/day)*	-	3801	4476	8277 ⁽⁷⁾
Stack Temperature (°C)	-	142	140	141 ⁽⁸⁾
Moisture Content (%)	-	16.1	15.6	15.9 ⁽⁸⁾
Velocity (m/s)	-	16.7	17.3	-
Static Pressure (kPa)	-	-2.76	-2.47	-2.62 ⁽⁸⁾
Absolute Pressure (kPa)	-	97.9	98.1	98.0 ⁽⁸⁾
Actual Flowrate (m ³ /s)	ı	24.7	25.6	1
Dry Reference Flowrate (Rm ³ /s) (1)	ı	14.4	15.1	29.5 ⁽⁷⁾
Oxygen (%)*	ı	7.38	8.17	7.78 ⁽⁸⁾
Carbon Dioxide (%)*	-	11.8	11.3	11.6 ⁽⁸⁾
Particulate (mg/Rm³) (2)	9	<0.62	<0.48	<0.55 ⁽⁸⁾
Mercury (μg/Rm³) ⁽²⁾	15	0.44	0.27	0.36 ⁽⁸⁾
Cadmium (μg/Rm³) (2)	7	<0.043	<0.043	<0.043 (8)
Lead (μg/Rm³) ⁽²⁾	50	0.27	0.22	0.25 (8)
Dioxins and Furans (pg TEQ/Rm ³) (3)	60	<818	<12.1	<415 ⁽⁸⁾
Hydrochloric Acid (mg/Rm³) (4)*	9	5.6	5.4	5.5 ⁽⁸⁾
Sulphur Dioxide (mg/Rm ³) (4)*	35	0.2	0	0.1 (8)
Nitrogen Oxides (mg/Rm³) (4)*	121	111	111	111 (8)
Total Hydrocarbons (ppm, dry) (5)	50	0.8	0.9	0.9 (8)
Carbon Monoxide (mg/Rm³) (6)*	40	22.5	29.8	26.2 ⁽⁸⁾

- * based on process data or CEM data provided by Covanta
- (1) dry at 25°C and 1 atmosphere
- (2) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
- (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) maximum calculated rolling arithmetic average of 24 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
- (5) average of six half-hour tests conducted by ORTECH between April 19 and April 20, 2016 measured at an undiluted location, reported on a dry basis expressed as equivalent methane
- (6) maximum calculated rolling arithmetic average of 4 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
- (7) total for combined Boilers
- (8) average for combined Boilers



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 point of impingement criteria detailed in Ontario Regulation 419/05.

The CALPUFF dispersion modelling results for the May 2016 emission testing program are provided in the following tables based on calculated ground level point of impingement concentrations for the average total Main Stack emissions. As shown in the following tables, the calculated impingement concentrations were well below the allowable impingement concentrations for all of the contaminants. The point of impingement concentration was less than 26.4% of the standard, guideline or upper risk threshold limit provided in Ontario Regulation 419/05 for each contaminant.

A scenario provided in the DYEC Emission Summary and Dispersion Modelling (ESDM) Report includes 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.



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Inorganic Compounds

Contaminant	Boiler No. 1 BH Outlet Average	Boiler No. 2 BH Outlet Average	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable	Status of Allowable
	Emission Rate	Emission Rate				Concentration	
Base Case - 24 hour			1.00 g/s	1.29 μg/m ³			
Base Case - 1 hour			1.00 g/s	25.1 μg/m ³			
Base Case - 1/2 hour			1.00 g/s	30.1 μg/m ³			
Base Case - 30 day			1.00 g/s	0.117 μg/m ³			
Filterable Particulate Matter	<12.1 mg/s	<9.23 mg/s	<21.3 mg/s	0.028 μg/m ³	120 μg/m ³	0.023	S
Hydrogen Chloride *	77.9 mg/s	77.5 mg/s	155 mg/s	0.20 μg/m ³	20 μg/m³	1.00	S
Hydrogen Fluoride	<2.49 mg/s	<2.54 mg/s	<5.03 mg/s	$0.0065 \mu g/m^3$	$0.86 \mu g/m^3$	0.75	S
Hydrogen Fluoride	<2.49 mg/s	<2.54 mg/s	<5.03 mg/s	$0.00059 \mu g/m^3$	$0.34 \mu g/m^3$	0.17	S - 30 day
Ammonia	6.07 mg/s	42.8 mg/s	48.9 mg/s	0.063 μg/m ³	$100 \mu g/m^3$	0.063	S
Sulphur Dioxide **	0 g/s	0 g/s	0 g/s	0 μg/m³	275 μg/m³	<0.0001	S
Sulphur Dioxide **	0 g/s	0 g/s	0 g/s	0 μg/m³	690 $\mu g/m^3$	<0.0001	S - 1 hour
Nitrogen Oxides **	2.12 g/s	2.08 g/s	4.20 g/s	5.42 μg/m ³	200 μg/m ³	2.71	S
Nitrogen Oxides **	2.12 g/s	2.08 g/s	4.20 g/s	105 μg/m³	400 $\mu g/m^3$	26.4	S - 1 hour
Carbon Monoxide **	0.29 g/s	0.33 g/s	0.62 g/s	18.6 $\mu g/m^3$	6000 μg/m ³	0.31	S - 1/2 hour

S - Standard

G - Guideline

URT - Upper Risk Threshold

^{*} Measured by ORTECH using the acid gases test train.

^{**} Emission data calculated using the CEM data measured by DYEC and the volumetric flowrates measured by ORTECH between May 2-4 and May 9-11, 2016. Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Semi-Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m³			
Base Case - 1 hour			1.00 g/s	25.1 μg/m ³			
Dioxins, Furans and Dioxin-Like PCBs (TEQ)*	14.5 ng TEQ/s	0.22 ng TEQ/s	14.7 ng TEQ/s	0.019 pg TEQ/m ³	1 pg TEQ/m³	1.90	URT
Naphthalene	<1.25 μg/s	<1.25 μg/s	<2.50 μg/s	0.0000032 μg/m ³	22.5 μg/m ³	<0.0001	G
Biphenyl	<1.25 μg/s	<1.25 µg/s	<2.50 μg/s	0.000063 μg/m ³	$60 \mu g/m^3$	0.00010	G - 1 hour
Benzo (a) pyrene	<0.63 µg/s	<0.62 µg/s	<1.25 μg/s	$0.0000016 \mu g/m^3$	$0.0011 \ \mu g/m^3$	0.15	G
1,2-Dichlorobenzene	<0.63 µg/s	<0.62 μg/s	<1.25 μg/s	0.000031 μg/m ³	30500 μg/m ³	<0.0001	G - 1 hour
1,4-Dichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 μg/s	$0.0000016 \mu g/m^3$	95 $\mu g/m^3$	<0.0001	S
1,2,4-Trichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 μg/s	$0.0000016 \mu g/m^3$	400 μg/m ³	<0.0001	G
Pentachlorophenol	1.17 μg/s	0.84 μg/s	2.01 μg/s	0.0000026 μg/m ³	20 μg/m ³	<0.0001	G

S - Standard

G - Guideline

URT - Upper Risk Threshold

^{*} Calculated using the WHO (O. Reg. 419/05) toxicity equivalence factors and half the detection limit for those isomers not detected in quantities greater than the reportable detection limit. Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Metals

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m ³			
Antimony	<0.0033 mg/s	<0.0034 mg/s	<0.0067 mg/s	0.0000086 μg/m ³	25 μg/m³	<0.0001	S
Arsenic	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.3 \mu g/m^3$	0.00072	G
Barium (as water soluble)	0.031 mg/s	0.028 mg/s	0.059 mg/s	$0.000077 \mu g/m^3$	$10 \mu g/m^3$	0.00077	G
Beryllium	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.01 \mu g/m^3$	0.022	S
Cadmium	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.025 \mu g/m^3$	0.0086	S
Chromium	0.063 mg/s	0.037 mg/s	0.099 mg/s	$0.00013 \mu g/m^3$	1.5 $\mu g/m^3$	0.0086	G
Cobalt	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.1 \mu g/m^3$	0.0022	G
Copper	0.030 mg/s	0.032 mg/s	0.062 mg/s	$0.000080 \mu g/m^3$	$50 \mu g/m^3$	0.00016	S
Lead	0.0052 mg/s	0.0043 mg/s	0.0094 mg/s	$0.000012 \mu g/m^3$	$0.5 \mu g/m^3$	0.0024	S
Manganese (as compounds)	0.024 mg/s	0.022 mg/s	0.045 mg/s	$0.000058 \mu g/m^3$	2.5 $\mu g/m^{3}$	0.0023	G
Mercury	0.0086 mg/s	0.0052 mg/s	0.014 mg/s	$0.000018 \mu g/m^3$	2 μg/m ³	0.00089	S
Molybdenum	0.15 mg/s	0.19 mg/s	0.34 mg/s	$0.00044 \mu g/m^3$	$120 \mu g/m^3$	0.00037	G
Nickel	0.067 mg/s	0.081 mg/s	0.15 mg/s	$0.00019 \mu g/m^3$	2 μg/m ³	0.0095	S
Selenium	<0.0038 mg/s	<0.0055 mg/s	<0.0093 mg/s	$0.000012 \mu g/m^3$	$10 \mu g/m^3$	0.00012	G
Silver	<0.0017 mg/s	<0.0017 mg/s	<0.0033 mg/s	0.0000043 μg/m ³	$1 \mu g/m^3$	0.00043	S
Vanadium	<0.00063 mg/s	<0.00063 mg/s	<0.0013 mg/s	$0.0000016 \mu g/m^3$	$2 \mu g/m^3$	<0.0001	S
Zinc	0.038 mg/s	0.014 mg/s	0.053 mg/s	0.000068 μg/m ³	120 μg/m ³	<0.0001	S

S - Standard

URT - Upper Risk Threshold

Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

G - Guideline



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Imping	vable gement atration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m ³				
Base Case - 1 hour			1.00 g/s	25.1 μg/m ³				
Acetone	0.045 mg/s	0.098 mg/s	0.14 mg/s	0.00018 μg/m ³	11880	μg/m³	<0.0001	S
Benzene	0.026 mg/s	0.020 mg/s	0.046 mg/s	$0.000059 \mu g/m^3$	100	$\mu g/m^3$	<0.0001	URT
Bromoform	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	$0.000027 \mu g/m^3$	55	$\mu g/m^3$	<0.0001	G
Bromomethane	<0.010 mg/s	<0.011 mg/s	<0.021 mg/s	$0.000027 \mu g/m^3$	1350	$\mu g/m^3$	<0.0001	G
1,3-Butadiene	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	300	$\mu g/m^3$	<0.0001	URT
2-Butanone	<0.025 mg/s	<0.028 mg/s	<0.053 mg/s	0.000068 μg/m ³	1000	$\mu g/m^3$	<0.0001	S
Carbon Tetrachloride	<0.011 mg/s	<0.012 mg/s	<0.023 mg/s	$0.000030 \mu g/m^3$	2.4	$\mu g/m^3$	0.0012	S
Chloroform	0.026 mg/s	0.020 mg/s	0.046 mg/s	$0.000059 \mu g/m^3$	1	$\mu g/m^3$	0.0059	S
Cumene (Isopropylbenzene)	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	400	$\mu g/m^3$	<0.0001	S
Dichlorodifluoromethane	<0.024 mg/s	<0.017 mg/s	<0.041 mg/s	0.000053 μg/m ³	500000	$\mu g/m^3$	<0.0001	G
trans,1,2-Dichloroethene	<0.0068 mg/s	<0.0077 mg/s	<0.015 mg/s	$0.000019 \mu g/m^3$	105	$\mu g/m^3$	<0.0001	G
Ethylbenzene	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	$0.000027 \mu g/m^3$	1000	$\mu g/m^3$	<0.0001	S
Ethylene Dibromide	<0.0068 mg/s	<0.0077 mg/s	<0.015 mg/s	$0.000019 \mu g/m^3$	3	$\mu g/m^3$	0.00062	G
Mesitylene (1,3,5-Trimethylbenzene)	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	220	$\mu g/m^3$	<0.0001	S
Methylene Chloride	<0.019 mg/s	<0.016 mg/s	<0.035 mg/s	$0.000045 \mu g/m^3$	220	$\mu g/m^3$	<0.0001	G
Styrene	<0.0082 mg/s	<0.0094 mg/s	<0.018 mg/s	$0.000023 \mu g/m^3$	400	$\mu g/m^3$	<0.0001	S
Tetrachloroethene	<0.012 mg/s	<0.020 mg/s	<0.032 mg/s	$0.000041 \mu g/m^3$	360	$\mu g/m^3$	<0.0001	S
Toluene	0.029 mg/s	0.047 mg/s	0.076 mg/s	0.000098 μg/m ³	2000	$\mu g/m^3$	<0.0001	G
1,1,1-Trichloroethane	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 μg/m ³	115000	μg/m³	<0.0001	S
Trichloroethene	<0.0075 mg/s	<0.0084 mg/s	<0.016 mg/s	0.000021 μg/m ³	12	μg/m³	0.00017	S
Trichlorotrifluoroethane	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	800000	μg/m ³	<0.0001	S
Trichlorofluoromethane	<0.0071 mg/s	<0.0077 mg/s	<0.015 mg/s	0.000019 μg/m ³	6000	μg/m³	<0.0001	G
Total Xylenes	<0.020 mg/s	<0.023 mg/s	<0.043 mg/s	0.000055 μg/m ³	730	μg/m ³	<0.0001	S
Vinyl Chloride	<0.0089 mg/s	<0.010 mg/s	<0.019 mg/s	0.000024 μg/m ³	1	μg/m³	0.0024	S
Acetaldehyde	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.0025 μg/m ³	500	μg/m³	0.00050	S
Formaldehyde	0.81 mg/s	<0.41 mg/s	<1.22 mg/s	$0.0016 \mu g/m^3$	65	$\mu g/m^3$	0.0024	S
Acrolein	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.0025 μg/m ³	0.4	μg/m³	0.63	S
Acrolein	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.049 μg/m ³	4.5	μg/m³	1.09	S - 1 hour

S - Standard

URT - Upper Risk Threshold

Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

G - Guideline



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 1623 tonnes of steam per day for the two Boilers combined, with the exception of May 5, 2016. On May 5, 2016 feed was stopped at Boiler No. 1 at 13:28 however no testing was conducted on Boiler No. 1 on May 5. 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 for each Boiler).
- The in-stack concentrations of the components listed in the ECA were all below the concentration limits provided in the ECA with the exception of dioxins and furans measured at the Baghouse Outlet of Boiler No. 1.
- 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 the standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines, upper risk thresholds and "to be updated" guidelines.

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.



1. INTRODUCTION

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between May 2 and May 11, 2016. The emission testing program was performed to satisfy the agreement the facility has with the Regions of Durham and York to conduct emission testing twice per year.

Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX Section 7(1) 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." The initial source testing program under Amended ECA No. 7306-8FDKNX was conducted in September/October 2015.

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.

The triplicate emission tests were conducted at each location between May 2 and May 11, 2016.

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 Scrubber 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
					CO (Low)	0-500 ppm
	Carrilalaan	Environmental SA	MAID OOOO	2684	CO (High)	0-2000 ppm
1	Scrubber Inlet	Environmental SA	MIR 9000	2684	HCI	0-1500 ppm
	illet				O ₂ (Dry)	0-25%
		Ametek	RM CEM O₂/IQ	10217710-2	O ₂ (Wet)	0-25%
					NO _X	0-500 ppm
					SO ₂	0-200 ppm
		Facility and such al CA	NAID OOOO	2606	HCI	0-100 ppm
		Environmental SA	MIR 9000	2686	HF	0-100 ppm
					O ₂ (Dry)	0-25%
4	DI Contlet				CO ₂	0-25%
1	BH Outlet	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
		Environmental SA	MIR 9000	2685	CO (Low)	0-500 ppm
	Scrubber				CO (High)	0-2000 ppm
2	Inlet				HCI	0-1500 ppm
	iiilet				O ₂ (Dry)	0-25%
		Ametek	RM CEM O2/IQ	10218084-1	O ₂ (Wet)	0-25%
					NO _X	0-500 ppm
					SO ₂	0-200 ppm
		Environmental SA	MIR 9000	2687	HCl	0-100 ppm
		Environmental SA	WIIK 9000	2087	HF	0-100 ppm
					O ₂ (Dry)	0-25%
2	BH Outlet				CO ₂	0-25%
2	BH Outlet	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. A third port is located approximately 0.6 meters above the two sampling ports and 45 degrees apart. The two 6-inch sampling ports were used for isokinetic sampling; the third port was used for non-isokinetic sampling.

The BH Outlet duct has an inside diameter of 1.37 meters (54 inches) at the sampling ports. The two six 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 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 Scrubber Inlet sampling locations on each Boiler on September 22, 2015. The cyclonic flow checks were performed using an Stype 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 Scrubber Inlet	Average <15°	6.6	No
Boiler No. 2 Scrubber 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.

The triplicate emission tests were conducted at the Boiler No. 1 BH Outlet and the Boiler No. 2 BH Outlet from May 2 to May 11, 2016 for each contaminant group. 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
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 performed in the Fall of 2015 demonstrated that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, 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. Total hydrocarbon concentrations measured by ORTECH at Boiler No. 1 BH Outlet on April 20, 2016 and Boiler No. 2 BH Outlet on April 19, 2016 following US EPA Method 25A are also included in the report. The total hydrocarbon data measured by ORTECH was used to assess against the in-stack emissions limits 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 guartz fiber filter with a low metal background
- The first impinger was initially empty to collect moisture
- The second and third impingers initially contained 100 mL each of 5% nitric acid/10% hydrogen peroxide solution to collect metals
- The fourth impinger was initially empty
- The fifth and sixth impingers initially contained 100 mL each of 4% potassium permanganate/10% sulphuric acid solution to collect mercury
- The seventh 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 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 3.

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 (m³/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 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 performed at each sample location are provided collectively in Appendix 4.

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 using the sampling train and sampling procedures outlined in Environment Canada Report EPS 1/RM/2. Major components of the sampling train were as follows:

- A glass nozzle and probe liner assembly
- A clean and proven glass fiber filter was used
- 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 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 fifteen minutes for a total actual sampling time of three hundred and 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 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 5.

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 m³/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 H₂SO₄
- 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. Since the test train was not being used to sample for particulate matter, the MOECC verbally approved the use of single point sampling prior to the start of the acid gas tests.

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 6.

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 m³/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 7.

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.

Major components of the test train were as follows:

- A glass probe liner assembly was used.
- The first and second impingers contained approximately 10 ml of 0.05% 2,4dinitrophenylhydrazine (DNPH) in 2N HCl
- The third impinger was initially empty
- The fourth 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 8.

4.8 Combustion Gases

In September 2015 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. Relative accuracy and system bias testing was conducted again for the THC analyzers in April 2016 as the analyzers were moved from the Scrubber Inlet to the BH Outlet sample location. 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 Scrubber Inlet.

DYEC provided 1-hour average concentrations for each clock hour using the 1-minute combustion gas data measured by the DYEC CEMs from May 2 to May 11, 2016. The data provided was adjusted to 11% oxygen using the oxygen measured by the CEMs for each clock hour. 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 measured by ORTECH at Boiler No. 1 BH Outlet on April 20, 2016 and Boiler No. 2 BH Outlet on April 19, 2016 following US EPA Method 25A are also included in the report. The total hydrocarbon data measured by ORTECH 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 Maxxam (Mississauga location). Copies of Sample Logs/Chain of Custody Forms for all samples submitted for chemical analysis are provided in Appendix 9.

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 10.

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 four 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 fifth and sixth 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 fifth and sixth 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 EPA Method 29 (modified). It should be noted that the metals sampling and analysis procedures (US EPA Method 29) are validated for only 17 metals including Sb, As, Ba, Be, Cd, Co, Cr, Cu, Pb, Mn, Hg, Ni, P, Se, Ag, Tl and Zn. However, the method was used for all metals included in the program.

The inorganic analytical report is provided in Appendix 11.

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 12.

The particle size distribution (PSD) samples were recovered in much the same way as the particulate samples from the particulate and metals train. 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 backup filter were rinsed with acetone in 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 results are presented in the inorganic analytical report in Appendix 11 and the condensable particulate matter analytical report is provided in Appendix 13.

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 14.

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. The 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 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 utube 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 Maxxam 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.

The SVOC analytical report is provided in Appendix 15.

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 16. The acid gases analytical results are presented the inorganic analytical report in Appendix 11.

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 Maxxam 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 17.



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 then rinsed with a small amount of high purity 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 transported to the laboratory for analysis.

Analysis for formaldehyde, acetaldehyde and acrolein was performed via LC/UV. The sample recovery data sheets are provided in Appendix 18 and the analytical results are presented in Appendix 19.

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 combined proof rinse of all of the sampling probes used as part of the Semi-Volatile Organics Train was also submitted to the analytical laboratory for analysis. The proving data for the combined probe rinses was also acceptable.

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, including the combined probe rinse, and VOST tubes is provided in Appendix 20.

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 21.

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 testing was completed. Preliminary testing involved collecting data necessary to perform the required calculations for choosing a nozzle size to permit isokinetic sampling.

The internal diameter of each duct was measured 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 $120^{\circ}\text{C} \pm 14^{\circ}\text{C}$ 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 shipping samples used the master sample log/chain of custody form to document the transfer of the samples to the appropriate 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 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

The condensable particulate matter analytical report indicated that two of the secondary filters were torn. Note it is typical for filters to have small tears around the edges. This is primarily caused by the edges of the filter being compressed between the filter housing requiring the use of Teflon tweezers to remove it. There should be minimal impact to data quality caused by the small tears.



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 this program on Test No. 1 at Boiler No. 1 BH Outlet. The relative percent difference was less than 7.3% well within the acceptable limit of less than ±20%, for elements that are greater than 5 times the minimum detection limit.
- One blank spike (performed as a pre-digestion spike) was analyzed. All of the recovery results were between 94-112%. The acceptable limit is 85-115% of the true value.
- One matrix spike (performed as a post digestion spike) was analyzed. All of the recovery results were between 89-100%. 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 reanalyzed:

- 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.



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. The relative percent difference was less than 3.2% well within the acceptable limit of less than ±20%, for fractions that are greater than 5 times the minimum detection limit.
- One blank spike (performed as a pre-digestion spike) was analyzed. All of the recovery results were between 100-104% within the acceptable limit of 90-110% of the true value.
- One matrix spike (performed as a post digestion spike) was analyzed. All of the recovery results were between 94-103% 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 reanalyzed:

- 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 involved suppressed ion chromatography-conductivity detection. 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:

- Blank spike samples were analyzed with the test samples. The recovery results of the blank spike samples were 102% for hydrogen chloride, 96% for hydrogen fluoride and 102% for ammonia, within the acceptable range of 90-110%.
- Matrix spike (spike confirmation) samples were analyzed with every 20 samples to confirm the identity of each peak. The recovery results of the matrix spike samples were 97% for hydrogen chloride, 91% for hydrogen fluoride and 102% for ammonia, within the acceptable range of 80-120%.



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

- 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 LC/UV. Laboratory control samples, a spike sample and a travel spike sample were analyzed with the test samples. The recoveries for the travel spike were 28.8% for acrolein, 95.6% for formaldehyde and 93.0% for acetaldehyde.

The concentration of formaldehyde detected in the blank sample was similar to the concentrations detected in the test samples. The test results for formaldehyde may be elevated due to the high blank results.

Acrolein was not detected in any of the test or blank train samples in quantities greater than the reportable detection limit.

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.

After extraction of the dioxin and furan train samples, staff at Maxxam added internal standards to all samples prior to analysis and surrogate standards were added to the filters and XAD resin prior to extraction. The analytical reports include the lists of the analytical surrogate standards and internal standards used. The analysis of samples involved complex sample extraction and cleanup, followed by GC/MS or HRMS/MS analysis.



The quality assurance activities conducted by the analytical laboratory are detailed in the Quality Assurance Report provided in the analytical report. The report notes that there was a low recovery for D10-Anthracene surrogate for Test No. 3 at BH Outlet No. 1 and Test No. 2 at BH Outlet No. 2. However, the report also states the overall quality control for this analysis meets acceptability criteria.

All other QA/QC activities met the performance specifications as stated in the analytical report. The dioxin and furan surrogate recoveries were between 61-127%.

The analytical laboratory report identifies responses in the chlorinated diphenylether channel that elute at similar retention times to 2,3,4,7,8-pentachlorodibenzofuran, 1,2,3,7,8,9-hexachlorodibenzofuran and octachlorodibenzofuran isomer test results. This response produces a positive bias on these isomers. 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.

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.

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

The analytical report includes the list of surrogate standards used. The surrogate recoveries for each of the surrogates should be between 50-150%. The recoveries for each sample were between 89-132%.

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.

Combustion gases, including hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide were measured during the emission testing program by the DYEC CEMS. Total hydrocarbon concentrations were also measured by ORTECH at Boiler No. 1 BH Outlet on April 20, 2016 and Boiler No. 2 BH Outlet on April 19, 2016.



Tables referenced in this report for the tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet between May 2 and May 11, 2016 are provided in Appendix 1 and Appendix 2, respectively.

Detailed test schedules are provided in Table 1 and Table 2.

7.1 Stack Gas Sampling Parameters

Emission test calculations for the particulate and metals, particle size, acid gases, and SVOC tests conducted at the Boiler No. 1 BH Outlet are provided in Appendix 22 to Appendix 25, respectively.

Emission test calculations for the particulate and metals, particle size, acid gases, and SVOC tests conducted at the Boiler No. 2 BH Outlet are provided in Appendix 26 to Appendix 29, respectively.

Stack gas sampling parameters for the tests conducted at each location are summarized in Table 3. 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. The average values from the isokinetic tests at each site are summarized below:

Stack Gas Parameter*	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Gas Temperature (°C)	142	140
Moisture by Volume (%)	16.1	15.6
Velocity (m/s)	16.7	17.3
Static Pressure (kPa)	-2.76	-2.47
Absolute Pressure (kPa)	97.9	98.1
Carbon Dioxide by Volume (%)**	11.8	11.3
Oxygen by Volume (%)**	7.38	8.17

^{*} 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. The average flowrate values from the tests at each site are summarized below:

Stack Gas Parameter*	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Flowrate (m ³ /s)	24.7	25.6
Dry Reference Flowrate (Rm ³ /s)**	14.4	15.1
Dry Adjusted Flowrate (Rm ³ /s)***	19.6	19.4
Wet Reference Flowrate (Rm ³ /s)**	17.1	17.9

- * 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 each location is presented in Table 6.

Average particulate emission data for each location is summarized below:

Particulate Emission Parameter	Boiler No. 1 BH Outlet	Boiler No. 2 BH Outlet
Actual Conc. (mg/m ³)	<0.49	<0.36
Dry Reference Conc. (mg/Rm³)*	<0.84	<0.61
Dry Adjusted Conc. (mg/Rm ³)**	<0.62	<0.48
Wet Reference Conc. (mg/Rm ³)*	<0.71	<0.52
Emission Rate (mg/s)	<12.1	<9.23

- * 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 (<0.62 mg/Rm³, adjusted to 11% oxygen) and the Boiler No. 2 BH Outlet (<0.48 mg/Rm³, adjusted to 11% oxygen) were well below the maximum limit (9 mg/Rm³, adjusted to 11% oxygen) stated in the ECA.

The amount of particulate detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 1 was 1.80 mg and 0.7 mg, respectively. The amount of particulate detected in the blank sampling train filter and acetone probe rinse samples for Boiler No. 2 was 1.5 mg and 0.5 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.



Note particulate was not detected, in quantities greater than the analytical detection limit (0.3 mg), on the Test No. 3 filter for Boiler No. 1 and all of the filters for Boiler No. 2. The detection limit was used to determine emission data.

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

PM ₁₀ and PM _{2.5}	PN	PM ₁₀		1 _{2.5}
Emission Parameter	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
Actual Conc. (mg/m³)	<0.88	<2.43	<0.60	<0.52
Dry Reference Conc. (mg/Rm ³)*	<1.53	<4.08	<1.04	<0.87
Dry Adjusted Conc. (mg/Rm ³)**	<1.10	<3.21	<0.75	<0.68
Wet Reference Conc. (mg/Rm ³)*	<1.28	<3.46	<0.87	<0.73
Emission Rate (mg/s)	<22.7	<63.1	<15.5	<13.4

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

Although the particle size distribution tests and the particulate and metals tests were conducted on different days, it is noted that the PM_{10} and $PM_{2.5}$ emission data was greater than the total particulate emission data measured using the particulate and metals test trains. This is mainly due to the higher detection limits and the smaller sample volume for the particle size test trains relative to the particulate and metals trains. The data was not blank corrected.

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

Condensable Particulate Emission	Inorganic Fraction		Organic Fraction	
Parameter	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
Actual Conc. (mg/m³)	6.77	6.92	<0.58	0.77
Dry Reference Conc. (mg/Rm ³)*	11.7	11.6	<1.01	1.30
Dry Adjusted Conc. (mg/Rm ³)**	8.42	9.14	<0.73	1.02
Wet Reference Conc. (mg/Rm ³)*	9.80	9.85	<0.84	1.10
Emission Rate (mg/s)	174	180	<15.0	20.0

- 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 6.5 mg for the inorganic fraction. The amount of condensable particulate detected in the blank sampling train for Boiler No. 2 was 7.5 mg for the inorganic 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.

7.5 Acid Gases

Hydrogen chloride, hydrogen fluoride and ammonia emission data for the tests conducted at each location are presented in Table 9. Hydrogen fluoride was not detected in any of the test samples in quantities greater than the reportable detection limit. The reportable detection limit was used to calculate hydrogen fluoride emission data. Hydrogen chloride and ammonia were detected in quantities greater than the reportable detection limit in all of the samples collected.

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	Hydrogen Chloride		Hydrogen Fluoride		Ammonia	
Emission Parameter	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2
Actual Conc. (mg/m³)	3.17	2.96	<0.10	<0.097	0.25	1.63
Dry Reference Conc. (mg/Rm ³)*	5.42	5.04	<0.17	<0.17	0.42	2.78
Dry Adjusted Conc. (mg/Rm ³)**	4.02	3.99	<0.13	<0.13	0.31	2.20
Wet Reference Conc. (mg/Rm ³)*	4.54	4.27	<0.15	<0.14	0.35	2.35
Emission Rate (mg/s)	77.9	77.5	<2.49	<2.54	6.07	42.8
Dry Adjusted Conc. (ppm)**	2.70	2.67	<0.16	<0.16	0.45	3.16

at 25°C and 1 atmosphere

Hydrogen chloride, hydrogen fluoride and ammonia were not detected in the blank samples in quantities greater than the reportable 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. 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.

Oxygen was also measured continuously by the DYEC CEMS at the Scrubber Inlet.

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



DYEC provided 1-hour average concentrations for each clock hour from May 2 to May 11, 2016. A 24-hour rolling average was determined for hydrogen chloride, nitrogen oxides and sulphur dioxide using the 1-hour average data for the six 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 six 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. The maximum concentration, along with the in-stack limit stated in the ECA, is summarized in the following table for each component.

Combustion Gases		Maximum Concentration	
Emission Parameter	Limit	Boiler No. 1	Boiler No. 2
BH Outlet:			
Oxygen (%, 1-hr)	-	8.93	9.06
Carbon Dioxide (kg/Rm ³ , 1-hr)**	-	0.23	0.22
Carbon Monoxide (mg/Rm³, 4-hr)*	40	22.5	29.8
Sulphur Dioxide (mg/Rm ³ , 24-hr)*	35	0.2	0
Nitrogen Oxides (mg/Rm³, 24-hr)*	121	111	111
Hydrogen Chloride (mg/Rm ³ , 24-hr)*	9	5.6	5.4
Total Hydrocarbons (mg/Rm ³ , 1-hr)*	-	1	1
Scrubber Inlet:			
Oxygen (%, 1-hr)	-	9	8

^{*} dry at reference conditions, adjusted to 11% oxygen

Concentration data measured by ORTECH between April 19 and April 20, 2016 at the BH Outlet sampling locations was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA. The average THC concentration, along with the in-stack limit stated in the ECA, is summarized in the following table.

Combustion Gases		Average Co	ncentration
Emission Parameter	Limit	Boiler No. 1	Boiler No. 2
BH Outlet: Total Hydrocarbons (ppm, dry expressed as equivalent methane)	50	0.8	0.9

^{**} dry at reference conditions



7.7 Metal Emission Data

Metal analytical results for the tests performed at each location are given in Tables 11, 12 and 13 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 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, respectively. Table 22 summarizes the average metal emission data for the tests performed.

Table 23 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 fractions were 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 fractions 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/m³)	<0.034	<0.033
Dry Reference Conc. (μg/Rm ³)*	<0.059	<0.056
Dry Adjusted Conc. (μg/Rm³)**	<0.043	<0.043
Wet Reference Conc. (μg/Rm ³)*	<0.049	<0.047
Emission Rate (mg/s)	<0.00083	<0.00084

- 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/m³)	0.21	0.17
Dry Reference Conc. (μg/Rm ³)*	0.36	0.28
Dry Adjusted Conc. (μg/Rm³)**	0.27	0.22
Wet Reference Conc. (μg/Rm ³)*	0.30	0.24
Emission Rate (mg/s)	0.0052	0.0043

at 25°C and 1 atmosphere

The cadmium and lead dry adjusted concentrations were well below the maximum in-stack emission limits stated in the ECA (7 μ g/Rm³, adjusted to 11% oxygen for cadmium and 50 μ g/Rm³, 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 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/m³)	0.35	0.20
Dry Reference Conc. (μg/Rm³)*	0.60	0.35
Dry Adjusted Conc. (μg/Rm³)**	0.44	0.27
Wet Reference Conc. (μg/Rm³)*	0.50	0.29
Emission Rate (mg/s)	0.0086	0.0052

at 25°C and 1 atmosphere

The mercury dry adjusted concentrations were well below the maximum in-stack emission limit stated in the ECA of 15 μ g/Rm³, adjusted to 11% oxygen.

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

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



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 and polycyclic aromatic hydrocarbons.

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	Number of Chlorine Atoms	Molecular	Number of Isomers Per
Abbreviation	Per Molecule	Formula	Congener Group
Dioxins			
M1CDD	1	C ₁₂ H ₇ CIO ₂	2
D2CDD	2	$C_{12}H_6CI_2O_2$	10
T3CDD	3	$C_{12}H_5Cl_3O_2$	14
T4CDD	4	$C_{12}H_4CI_4O_2$	22
P5CDD	5	$C_{12}H_3CI_5O_2$	14
H6CDD	6	$C_{12}H_2CI_6O_2$	10
H7CDD	7	$C_{12}H_1CI_7O_2$	2
O8CDD	8	$C_{12}CI_8O_2$	1
Furans			
M1CDF	1	C ₁₂ H ₇ CIO	4
D2CDF	2	$C_{12}H_6CI_2O$	16
T3CDF	3	$C_{12}H_5CI_3O$	28
T4CDF	4	$C_{12}H_4CI_4O$	38
P5CDF	5	$C_{12}H_3CI_5O$	28
H6CDF	6	C ₁₂ H ₂ Cl ₆ O	16
H7CDF	7	C ₁₂ H ₁ Cl ₇ O	4
O8CDF	8	C ₁₂ Cl ₈ O	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 are given in Table 24 to Table 32. The results are shown as congener groups from T4CDF to O8CDF and T4CDD to O8CDD, as normally required by the MOECC.

The average dioxin and furan congener group emission rates are summarized below:

Dioxin and Furan Congener	Boiler	No. 1	Boiler No. 2	
Emission Parameter	Dioxins	Furans	Dioxins	Furans
Actual Conc. (ng/m³)	27.9	<8.55	0.40	<0.19
Dry Reference Conc. (ng/Rm ³)*	47.9	<14.7	0.67	<0.32
Dry Adjusted Conc. (ng/Rm ³)**	35.5	<10.9	0.51	<0.25
Wet Reference Conc. (ng/Rm ³)*	40.0	<12.3	0.56	<0.27
Emission Rate (ng/s)	667	<204	9.93	<4.80

- * 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. 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. 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. 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 method preferred by the MOECC, which uses International Toxicity Equivalency Factors (I-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.

The MOECC "Summary of Standards and Guidelines to Support Ontario Regulation 419/05 — Air Pollution — Local Air Quality", dated April 2012, provides a new framework for calculating dioxin and furan toxicity equivalent concentrations which includes emission data for 12 dioxin-like PCBs.

Tables 44 to 49 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 shows 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. As 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	Boiler No. 2
Actual Conc. (pg TEQ/m³)	609	8.95
Dry Reference Conc. (pg TEQ/Rm ³)*	1044	15.2
Dry Adjusted Conc. (pg TEQ/Rm ³)**	774	11.7
Wet Reference Conc. (pg TEQ/Rm ³)*	874	12.7
Emission Rate (ng TEQ/s)	14.5	0.22

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) is summarized below. Dioxin and furan toxicity equivalent emission data calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit are used for comparison with the in-stack emission limits specified in the ECA.

Dioxin and Furan Isomer Emission Parameter	Boiler No. 1	Boiler No. 2	
Dry Adjusted Conc. (pg TEQ/Rm ³)*	<818	<12.1	

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

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.

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



The average total chlorobenzene emission data for each sampling location is presented below:

Chlorobenzenes Emission Parameter	Boiler No. 1	Boiler No. 2
Actual Conc. (ng/m³)	<262	<249
Dry Reference Conc. (ng/Rm ³)*	<450	<423
Dry Adjusted Conc. (ng/Rm ³)**	<334	<324
Wet Reference Conc. (ng/Rm ³)*	<376	<354
Emission Rate (μg/s)	<6.28	<6.24

- * 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. All of the blank analyses, for both the blank train and the laboratory blank, were below the reportable detection limits. 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.

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

The average total chlorophenol emission data for each sampling location is presented below:

Chlorophenol Emission Parameter	Boiler No. 1	Boiler No. 2
Actual Conc. (ng/m³)	<565	<482
Dry Reference Conc. (ng/Rm ³)*	<970	<819
Dry Adjusted Conc. (ng/Rm ³)**	<719	<627
Wet Reference Conc. (ng/Rm³)*	<811	<686
Emission Rate (μg/s)	<13.5	<12.1

- * 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. All of the blank analyses, for both the blank train and the laboratory blank, were below the reportable detection limits. 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 were also analyzed for select polycyclic aromatic hydrocarbon (PAH) compounds. Dibenzo(a,c)anthracene co-elutes with picene on the GC/MS. The data reported for dibenzo(a,c)anthracene represents the total of the Dibenzo(a,c)anthracene and picene.

None of the PAH compounds were detected in quantities greater than the analytical detection limits for any of the tests performed at either unit.

Analytical results and PAH emission data for the tests performed are provided in Table 71, 72 and Table 73 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, respectively. A summary of the average emission data is given in Table 79.

Table 80 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 each location is presented in Table 81.

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

Aldehydes	Acetaldehyde		Formal	dehyde	Acrolein		
Emission Parameter	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	Boiler No. 1	Boiler No. 2	
Actual Conc. (μg/m³)	<38.9	<40.3	34.3	16.1	<38.9	<40.3	
Dry Reference Conc. (μg/Rm³)*	<66.8	<69.6	58.8	27.9	<66.8	<69.6	
Dry Adjusted Conc. (μg/Rm ³)**	<49.5	<53.2	43.6	21.3	<49.5	<53.2	
Wet Reference Conc. (μg/Rm ³)*	<56.2	<58.1	49.4	23.3	<56.2	<58.1	
Emission Rate (mg/s)	<0.92	<1.03	0.81	0.41	<0.92	<1.03	

^{*} at 25°C and 1 atmosphere

Formaldehyde was detected in the blank samples in relatively high quantities in comparison to those found in the test samples. Acetaldehyde was not detected in either of the blank samples. Acrolein was not detected in the blank samples or any of the test samples in quantities greater than the reportable detection limit. The blank analysis was not subtracted from the test sample analyses during calculation of the emission data.

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



7.11 Volatile Organic Emission Data

Three twenty minute runs were completed for each test 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 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, respectively. The average volatile organic emission data is summarized in Table 93.

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 reportable detection limit for calculation purposes.

Analysis of blank adsorbent tubes is provided in Table 94. 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 are generally below the analytical detection limit. 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 (Version 5.8.4) and CALPOST model (Version 6.221). The CALPUFF model was selected as it was the model used in the current facility Emission Summary and Dispersion Modelling (ESDM) Report, dated March 2011 (Golder Associates Report Number 10-1151-0343 (3000)) and during the Fall 2015 emission testing program. The MOECC granted a request for the use of CALPUFF in August 2010.

The meteorological data used in the dispersion modelling is the same data used in the ESDM Report and was provided by Golder Associates. Unless otherwise stated, all dispersion modelling parameters are the same as those used in the ESDM Report dispersion modelling Scenario A.



8.1 Source Parameters

The source parameters used in the dispersion modelling are included in the following table. The exit velocity and stack temperature were calculated based on the measurements at each BH Outlet during source testing. The coordinates are UTM NAD 83, Zone 17.

		Release		Stack Inside			
	Source	Height	Temp.	Diameter	Exit Velocity	X	Υ
Source ID	Description	(m)	(K)	(m)	(m/s)	(m)	(m)
STCK1	Main Stack	87.6	414	1.7	22.1	680,538	4,860,346

8.2 Modelling Results

The model was run with a unit emission rate generating dispersion factors in $\mu g/m^3$ per g/s for the ½-hr, 1-hr, 24-hr and 30-day averaging periods. Meteorological outliers were not removed from the model results. The dispersion factors are presented in the table below.

Averaging Period	½-hr	1-hr	24-hr	30-day
Maximum POI Dispersion Factor (μg/m³ per g/s)	30.1	25.1	1.29	0.117

For each contaminant, the applicable dispersion factor was multiplied by the total of the average emission rate for each of the two Boilers generated from source testing to obtain the maximum Point of Impingement (POI) concentration. The CALPUFF modelling files are provided on CD in Appendix 30.

The CALPUFF dispersion modelling results for the May 2016 emission testing program are provided in the following tables based on calculated ground level point of impingement concentrations for the average total Main Stack emissions.

The predicted POI concentration, calculated based on the average total emission rate, for each contaminant included in the emission testing program was well below the applicable standard, guideline or upper risk threshold.

A scenario provided in the DYEC Emission Summary and Dispersion Modelling (ESDM) Report includes 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.



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Inorganic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable	Status of Allowable Concentration
	Limbsion Race	Limbsion Race				concentration	Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m ³			
Base Case - 1 hour			1.00 g/s	25.1 $\mu g/m^3$			
Base Case - 1/2 hour			1.00 g/s	30.1 $\mu g/m^3$			
Base Case - 30 day			1.00 g/s	$0.117 \mu g/m^3$			
Filterable Particulate Matter	<12.1 mg/s	<9.23 mg/s	<21.3 mg/s	0.028 μg/m ³	120 μg/m³	0.023	S
Hydrogen Chloride *	77.9 mg/s	77.5 mg/s	155 mg/s	0.20 μg/m ³	20 μg/m³	1.00	S
Hydrogen Fluoride	<2.49 mg/s	<2.54 mg/s	<5.03 mg/s	$0.0065 \mu g/m^3$	$0.86 \mu g/m^3$	0.75	S
Hydrogen Fluoride	<2.49 mg/s	<2.54 mg/s	<5.03 mg/s	$0.00059 \mu g/m^3$	$0.34 \mu g/m^3$	0.17	S - 30 day
Ammonia	6.07 mg/s	42.8 mg/s	48.9 mg/s	$0.063 \mu g/m^3$	$100 \mu g/m^3$	0.063	S
Sulphur Dioxide **	0 g/s	0 g/s	0 g/s	0 μg/m ³	275 μg/m ³	<0.0001	S
Sulphur Dioxide **	0 g/s	0 g/s	0 g/s	$0 \mu g/m^3$	690 μg/m³	<0.0001	S - 1 hour
Nitrogen Oxides **	2.12 g/s	2.08 g/s	4.20 g/s	5.42 $\mu g/m^3$	200 $\mu g/m^3$	2.71	S
Nitrogen Oxides **	2.12 g/s	2.08 g/s	4.20 g/s	105 $\mu g/m^3$	400 $\mu g/m^3$	26.4	S - 1 hour
Carbon Monoxide **	0.29 g/s	0.33 g/s	0.62 g/s	18.6 μg/m³	6000 μg/m ³	0.31	S - 1/2 hour

S - Standard

G - Guideline

URT - Upper Risk Threshold

^{*} Measured by ORTECH using the acid gases test train.

^{**} Emission data calculated using the CEM data measured by DYEC and the volumetric flowrates measured by ORTECH between May 2-4 and May 9-11, 2016. Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Semi-Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m³			
Base Case - 1 hour			1.00 g/s	25.1 μg/m ³			
Dioxins, Furans and Dioxin-Like PCBs (TEQ)*	14.5 ng TEQ/s	0.22 ng TEQ/s	14.7 ng TEQ/s	0.019 pg TEQ/m ³	1 pg TEQ/m³	1.90	URT
Naphthalene	<1.25 μg/s	<1.25 μg/s	<2.50 μg/s	0.0000032 μg/m ³	22.5 μg/m ³	<0.0001	G
Biphenyl	<1.25 μg/s	<1.25 μg/s	<2.50 μg/s	$0.000063 \mu g/m^3$	$60 \mu g/m^3$	0.00010	G - 1 hour
Benzo (a) pyrene	<0.63 µg/s	<0.62 μg/s	<1.25 μg/s	$0.0000016 \mu g/m^3$	$0.0011 \ \mu g/m^3$	0.15	G
1,2-Dichlorobenzene	<0.63 µg/s	<0.62 μg/s	<1.25 μg/s	0.000031 μg/m ³	30500 μg/m ³	<0.0001	G - 1 hour
1,4-Dichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 μg/s	0.0000016 μg/m ³	95 μg/m³	<0.0001	S
1,2,4-Trichlorobenzene	<0.63 µg/s	<0.62 µg/s	<1.25 μg/s	0.0000016 μg/m ³	400 $\mu g/m^3$	<0.0001	G
Pentachlorophenol	1.17 μg/s	0.84 μg/s	2.01 μg/s	0.0000026 μg/m ³	20 μg/m ³	<0.0001	G

S - Standard

G - Guideline

URT - Upper Risk Threshold

^{*} Calculated using the WHO (O. Reg. 419/05) toxicity equivalence factors and half the detection limit for those isomers not detected in quantities greater than the reportable detection limit. Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Metals

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m ³			
Antimony	<0.0033 mg/s	<0.0034 mg/s	<0.0067 mg/s	0.0000086 μg/m ³	25 μg/m³	<0.0001	S
Arsenic	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.3 \mu g/m^3$	0.00072	G
Barium (as water soluble)	0.031 mg/s	0.028 mg/s	0.059 mg/s	$0.000077 \mu g/m^3$	$10 \mu g/m^3$	0.00077	G
Beryllium	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.01 \mu g/m^3$	0.022	S
Cadmium	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.025 \mu g/m^3$	0.0086	S
Chromium	0.063 mg/s	0.037 mg/s	0.099 mg/s	$0.00013 \mu g/m^3$	1.5 $\mu g/m^3$	0.0086	G
Cobalt	<0.00083 mg/s	<0.00084 mg/s	<0.0017 mg/s	$0.0000022 \mu g/m^3$	$0.1 \mu g/m^3$	0.0022	G
Copper	0.030 mg/s	0.032 mg/s	0.062 mg/s	$0.000080 \mu g/m^3$	$50 \mu g/m^3$	0.00016	S
Lead	0.0052 mg/s	0.0043 mg/s	0.0094 mg/s	$0.000012 \mu g/m^3$	$0.5 \mu g/m^3$	0.0024	S
Manganese (as compounds)	0.024 mg/s	0.022 mg/s	0.045 mg/s	$0.000058 \mu g/m^3$	$2.5 \mu g/m^3$	0.0023	G
Mercury	0.0086 mg/s	0.0052 mg/s	0.014 mg/s	$0.000018 \mu g/m^3$	$2 \mu g/m^3$	0.00089	S
Molybdenum	0.15 mg/s	0.19 mg/s	0.34 mg/s	$0.00044 \mu g/m^3$	$120 \mu g/m^3$	0.00037	G
Nickel	0.067 mg/s	0.081 mg/s	0.15 mg/s	$0.00019 \mu g/m^3$	$2 \mu g/m^3$	0.0095	S
Selenium	<0.0038 mg/s	<0.0055 mg/s	<0.0093 mg/s	$0.000012~\mu g/m^3$	$10 \mu g/m^3$	0.00012	G
Silver	<0.0017 mg/s	<0.0017 mg/s	<0.0033 mg/s	$0.0000043 \mu g/m^3$	$1 \mu g/m^3$	0.00043	S
Vanadium	<0.00063 mg/s	<0.00063 mg/s	<0.0013 mg/s	$0.0000016~\mu g/m^3$	$2 \mu g/m^3$	<0.0001	S
Zinc	0.038 mg/s	0.014 mg/s	0.053 mg/s	0.000068 μg/m ³	120 μg/m ³	<0.0001	S

S - Standard

URT - Upper Risk Threshold

Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

G - Guideline



Main Stack with Both Boilers Operating Regulation 419 Dispersion Modeling Results using CALPUFF for Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingeme Concentrati	nt of	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.29 μg/m³			
Base Case - 1 hour			1.00 g/s	25.1 μg/m ³			
Acetone	0.045 mg/s	0.098 mg/s	0.14 mg/s	0.00018 μg/m ³	11880 μg/n	n ³ <0.0001	S
Benzene	0.026 mg/s	0.020 mg/s	0.046 mg/s	$0.000059 \mu g/m^3$	100 μg/n	n ³ <0.0001	URT
Bromoform	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 μg/m ³	55 μg/n	n ³ <0.0001	G
Bromomethane	<0.010 mg/s	<0.011 mg/s	<0.021 mg/s	$0.000027 \mu g/m^3$	1350 μg/n	n ³ <0.0001	G
1,3-Butadiene	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	$0.000046 \mu g/m^3$	300 μg/n	n ³ <0.0001	URT
2-Butanone	<0.025 mg/s	<0.028 mg/s	<0.053 mg/s	0.000068 μg/m ³	1000 μg/n	n ³ <0.0001	S
Carbon Tetrachloride	<0.011 mg/s	<0.012 mg/s	<0.023 mg/s	0.000030 μg/m ³	2.4 μg/n	n ³ 0.0012	S
Chloroform	0.026 mg/s	0.020 mg/s	0.046 mg/s	0.000059 μg/m ³	1 μg/n	n ³ 0.0059	S
Cumene (Isopropylbenzene)	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	400 μg/n	n ³ <0.0001	S
Dichlorodifluoromethane	<0.024 mg/s	<0.017 mg/s	<0.041 mg/s	0.000053 μg/m ³	500000 μg/n	n ³ <0.0001	G
trans,1,2-Dichloroethene	<0.0068 mg/s	<0.0077 mg/s	<0.015 mg/s	$0.000019 \mu g/m^3$	105 μg/n	n ³ <0.0001	G
Ethyl benzene	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 μg/m ³	1000 μg/n	n ³ <0.0001	S
Ethylene Dibromide	<0.0068 mg/s	<0.0077 mg/s	<0.015 mg/s	$0.000019 \mu g/m^3$	3 μg/n	n ³ 0.00062	G
Mesitylene (1,3,5-Trimethylbenzene)	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	220 μg/n	n ³ <0.0001	S
Methylene Chloride	<0.019 mg/s	<0.016 mg/s	<0.035 mg/s	0.000045 μg/m ³	220 μg/n	n ³ <0.0001	G
Styrene	<0.0082 mg/s	<0.0094 mg/s	<0.018 mg/s	$0.000023 \mu g/m^3$	400 μg/n	n ³ <0.0001	S
Tetrachloroethene	<0.012 mg/s	<0.020 mg/s	<0.032 mg/s	0.000041 μg/m ³	360 μg/n	n ³ <0.0001	S
Toluene	0.029 mg/s	0.047 mg/s	0.076 mg/s	0.000098 μg/m ³	2000 μg/n	n ³ <0.0001	G
1,1,1-Trichloroethane	<0.0096 mg/s	<0.011 mg/s	<0.021 mg/s	0.000027 μg/m ³	115000 μg/n	n ³ <0.0001	S
Trichloroethene	<0.0075 mg/s	<0.0084 mg/s	<0.016 mg/s	0.000021 μg/m ³	12 μg/n	n ³ 0.00017	S
Trichlorotrifluoroethane	<0.017 mg/s	<0.019 mg/s	<0.036 mg/s	0.000046 μg/m ³	800000 μg/n	n ³ <0.0001	S
Trichlorofluoromethane	<0.0071 mg/s	<0.0077 mg/s	<0.015 mg/s	0.000019 μg/m ³	6000 μg/n	n ³ <0.0001	G
Total Xylenes	<0.020 mg/s	<0.023 mg/s	<0.043 mg/s	0.000055 μg/m ³	730 μg/n	n ³ <0.0001	S
Vinyl Chloride	<0.0089 mg/s	<0.010 mg/s	<0.019 mg/s	0.000024 μg/m ³	1 μg/n	n ³ 0.0024	S
Acetaldehyde	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.0025 μg/m ³	500 μg/n	n ³ 0.00050	S
Formaldehyde	0.81 mg/s	<0.41 mg/s	<1.22 mg/s	$0.0016 \mu g/m^3$	65 μg/n	n ³ 0.0024	S
Acrolein	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	0.0025 μg/m ³	0.4 μg/n	n ³ 0.63	S
Acrolein	<0.92 mg/s	<1.03 mg/s	<1.95 mg/s	$0.049 \mu g/m^3$	4.5 μg/n	n ³ 1.09	S - 1 hour

S - Standard

URT - Upper Risk Threshold

Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

G - Guideline



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:

- Hydrogen Chloride (mg/Rm³, adjusted to 11% oxygen)
- Nitrogen Oxides (mg/Rm³, adjusted to 11% oxygen)
- Sulphur Dioxide (mg/Rm³, adjusted to 11% oxygen)
- Carbon Monoxide (mg/Rm³, adjusted to 11% oxygen)
- Oxygen (% volume, dry)
- Carbon Dioxide (kg/Rm³)
- Total Hydrocarbons (mg/Rm³, 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 from May 2 to May 11, 2016. The data provided was adjusted to 11% oxygen using the oxygen measured by the CEMs for each clock hour. 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.

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 31.

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.

Since relative accuracy and system bias testing demonstrated that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, 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.



The DYEC AMESA Dioxin and Furan sampling monitor was operating during the SVOC emission testing conducted on May 5, May 9, May 10 and May 11, 2016. An AMESA sample was collected during each SVOC test period, on the test days specified above, and was submitted to Maxxam for analysis. The volume sampled for each AMESA sample was supplied to ORTECH by Covanta and the emission data was calculated by ORTECH using the volumetric flowrates measured during the corresponding isokinetic SVOC test conducted by ORTECH during the source testing program. The AMESA dioxin and furan emission data and analytical report for the samples collected are provided in Appendix 32.

The AMESA cartridge and the probe rinse sample were collected for each isokinetic test and analyzed separately. The dioxin and furan emission data was calculated in two ways; with the probe rinse and AMESA cartridge combined and with the AMESA cartridge only. A comparison of the dioxin and furan toxicity equivalent factor results, calculated using the NATO/CCMS (1989) toxicity equivalence factors and the full detection limit is summarized below.

Unit No.	Test No.	AMESA with Probe Rinse (pg TEQ/Rm ³ *)	AMESA without Probe Rinse (pg TEQ/Rm ³ *)	Stack Test (pg TEQ/Rm ³ *)
1	1	<869	<430	<1169
1	2	<265	<61.3	<678
1	3	<62.0	<24.3	<606
1	Average	<399	<172	<818
2	1	<150	<12.4	<14.0
2	2	<44.6	<7.54	<9.63
2	3	<99.4	<8.93	<12.6
2	Average	<97.9	<9.62	<12.1

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



Facility process data was also supplied by DYEC personnel for each test day. The process data is summarized below:

		Aux.	Fuel	Avg. Cor	nbustion					NO _x Re	eagent				,
		Comb		Zone	Temp.	Ste	am	MSW Co	mbusted	Inj. I	Rate	Carbon	Inj. Rate	Lime Ir	nj. Rate
	Power	(m ³	³/d)	(°	C)	(tonn	es/d)	(tonn	ies/d)	(lite	rs/d)	(kg	g/d)	(kg	g/d)
	Output*	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler	Boiler
Test Date	(MWh/d)	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2
02-May-16	388	215	465	1193	1233	754	770	197	204	741	1076	119	117	4100	4288
03-May-16	383	234	441	1214	1242	774	793	200	205	634	1133	119	116	3731	4227
04-May-16	392	845	1124	1232	1244	797	800	196	204	689	993	119	116	3920	4462
5-May-16**	310	3168	0	1220	1243	498	800	112	205	606	870	82	117	2835	4569
09-May-16	387	0	0	1223	1243	810	809	203	210	529	1118	119	118	3800	4527
10-May-16	390	0	0	1211	1264	803	802	207	216	643	1082	119	118	4006	4548
11-May-16	394	0	0	1221	1252	806	802	211	218	664	1258	119	117	4213	4709
Average	378	637	290	1216	1246	749	797	189	209	644	1076	114	117	3801	4476

^{*} Gross turbine output

^{**} Boiler No. 1 stopped feed at 13:28 on May 5, 2016



10. CONCLUSIONS

The main conclusions which can be drawn from the present 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 1623 tonnes of steam per day for the two Boilers combined, with the exception of May 5, 2016. On May 5, 2016 feed was stopped at Boiler No. 1 at 13:28 however no testing was conducted on Boiler No. 1 on May 5. 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 for each Boiler).
- The in-stack concentrations of the components listed in the ECA were all below the concentration limits provided in the ECA with the exception of dioxins and furans measured at the Baghouse Outlet of Boiler No. 1.
- 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 the standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines, upper risk thresholds and "to be updated" guidelines.

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.

Since relative accuracy and system bias testing demonstrated that the CEMS met the performance parameters detailed in Schedule F of the ECA, the data recorded by the facility 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 six day test period at each unit was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA.

Concentration data measured by ORTECH between April 19 and April 20, 2016 at the BH Outlet sampling locations was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.



The average results for the tests conducted at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Limit	Boiler No. 1	Boiler No. 2	Combined Boilers
Power Output (MWh/day)*	-	-	-	378 ⁽⁷⁾
Average Combustion Zone Temp. (°C)*	-	1216	1246	1231 ⁽⁸⁾
Steam (tonnes/day)*	-	749	797	1546 ⁽⁷⁾
MSW Combusted (tonnes/day)*	-	189	209	398 ⁽⁷⁾
NOx Reagent Injection Rate (liters/day)*	-	644	1076	1720 ⁽⁷⁾
Carbon Injection (kg/day)*	-	114	117	231 ⁽⁷⁾
Lime Injection (kg/day)*	-	3801	4476	8277 ⁽⁷⁾
Stack Temperature (°C)	-	142	140	141 (8)
Moisture Content (%)	-	16.1	15.6	15.9 ⁽⁸⁾
Velocity (m/s)	-	16.7	17.3	-
Static Pressure (kPa)	-	-2.76	-2.47	-2.62 ⁽⁸⁾
Absolute Pressure (kPa)	-	97.9	98.1	98.0 ⁽⁸⁾
Actual Flowrate (m ³ /s)	-	24.7	25.6	-
Dry Reference Flowrate (Rm ³ /s) (1)	-	14.4	15.1	29.5 ⁽⁷⁾
Oxygen (%)*	i	7.38	8.17	7.78 ⁽⁸⁾
Carbon Dioxide (%)*	-	11.8	11.3	11.6 (8)
Particulate (mg/Rm³) (2)	9	<0.62	<0.48	<0.55 ⁽⁸⁾
Mercury (μg/Rm³) ⁽²⁾	15	0.44	0.27	0.36 (8)
Cadmium (μg/Rm³) (2)	7	<0.043	<0.043	<0.043 (8)
Lead (μg/Rm³) ⁽²⁾	50	0.27	0.22	0.25 (8)
Dioxins and Furans (pg TEQ/Rm ³) (3)	60	<818	<12.1	<415 ⁽⁸⁾
Hydrochloric Acid (mg/Rm ³) (4)*	9	5.6	5.4	5.5 ⁽⁸⁾
Sulphur Dioxide (mg/Rm³) (4)*	35	0.2	0	0.1 (8)
Nitrogen Oxides (mg/Rm ³) (4)*	121	111	111	111 (8)
Total Hydrocarbons (ppm, dry) (5)	50	0.8	0.9	0.9 (8)
Carbon Monoxide (mg/Rm³) (6)*	40	22.5	29.8	26.2 ⁽⁸⁾

- * based on process data or CEM data provided by Covanta
- (1) dry at 25°C and 1 atmosphere
- (2) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
- (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) maximum calculated rolling arithmetic average of 24 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
- (5) average of six half-hour tests conducted by ORTECH between April 19 and April 20, 2016 measured at an undiluted location, reported on a dry basis expressed as equivalent methane
- (6) maximum calculated rolling arithmetic average of 4 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
- (7) total for combined Boilers
- (8) average for combined Boilers



APPENDIX 1

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

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

Particulate and Metals Trains

Test	Test Date	Samplin	Sampling Time*	
Number		Start	Finish	min
1	May 2, 2016	10:45	14:16	180
2	May 2, 2016	15:00	18:14	180
3	May 4, 2016	14:56	18:05	180

Paticle Size Distribution Trains

Test Test Date		Samplin	Sampling Time*	
Number		Start	Finish	min
1	May 3, 2016	10:03	12:05	119.5
2	May 3, 2016	13:37	15:47	119.75
3	May 3, 2016	17:10	19:11	119.75

Acid Gases Trains

Test	Test Date	Samplin	Sampling Time*	
Number		Start	Finish	min
1	May 2, 2016	11:09	12:09	60
2	May 2, 2016	12:47	13:47	60
3	May 2, 2016	15:01	16:01	60

Semi-Volatile Organic Compounds Trains

Test	Test Date	Samplin	Sampling Time*	
Number		Start	Finish	min
A Communication of the Communi				
1	May 9, 2016	10:05	16:12	360
2	May 10, 2016	8:53	15:05	360
3	May 11, 2016	8:20	14:28	360
3	May 11, 2016	8:20	14:28	360

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

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

Acrolein and Aldehydes Trains

Test	Test Date	Samplin	g Period	Sampling Time
Number		Start	Finish	min
1	May 9, 2016	10:14	11:14	60
2	May 9, 2016	11:24	12:24	60
3	May 9, 2016	12:33	13:33	60

Volatile Organic Compounds Trains

Test	Tube	Test Date	Samplin	g Period	Sampling Time
Number	Pair		Start	Finish	min
1	1	May 10, 2016	8:54	9:14	20
	2	May 10, 2016	9:23	9:43	20
	3	May 10, 2016	9:51	10:11	20
	4	May 10, 2016	10:19	10:39	20
2	1	May 10, 2016	10:49	11:09	20
	2	May 10, 2016	11:15	11:35	20
	3	May 10, 2016	11:45	12:05	20
	4	May 10, 2016	12:12	12:32	20
3	1	May 10, 2016	12:44	13:04	20
Single-	2	May 10, 2016	13:13	13:33	20
	3	May 10, 2016	13:44	14:04	20
	4	May 10, 2016	14:39	14:59	20

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

Particulate and Metals Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzie Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.841	0.983	6.45	3.427	100.9
2	0.841	0.983	6.45	3.513	100.0
3	0.841	0.983	6.43	3.321	100.6

Paticle Size Distribution Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzle Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.846	0.983	4.50	1.234	103.3
2	0.846	0.983	4.50	1.225	109.1
3	0.846	0.983	4.50	1.213	107.5

Acid Gases Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzle Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.841	0.980	6.48	1.181	100.3
2	0.841	0.980	6.48	1.158	100.0
3	0.841	0.980	6.48	1.124	98.6

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube Coefficient	Dry Gas Meter	Nozzle Diameter	Gas Volume Sampled Rm ³ *	Percentage of Isokineticity
1	0.841	Factor 0.983	mm 6.43	6.539	
2 3	0.841 0.841	0.983 0.983	6.43 6.43	6.656 6.860	100.7 100.8

^{*} 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	143	16.2	16.5	-2.32	98.4	11.7	7.46
2	141	15.3	16.8	-2.32	98.4	11.2	7.75
3	143	15.6	16.3	-3.04	96.7	11.7	7.09
Average	142	15.7	16.5	-2.56	97.8	11.6	7.43

Paticle 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	18.2	-3.01	97.3	11.6	7.40
2	140	15.8	16. 9	-3.01	97.2	12.2	6.82
3	141	16.3	17.2	-3.01	97.0	11.8	7.22
Average	141	16.3	17.4	-3.01	97.2	11.9	7.15

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	145	16.5	17.1	-2.32	98.4	12.0	7.17
2	142	16.2	16.7	-2.32	98.4	11.7	7.53
3	141	15.1	16.1	-2.32	98.4	11.8	7.24
Average	143	15.9	16.6	-2.32	98.4	11.8	7.31

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	143	16.1	15.9	-2.57	98.5	11.8	7.51
2	143	16.1	16.1	-2.81	98.7	11.8	7.67
3	143	16.5	16.7	-2.79	98.6	11.9	7.53
Average	143	16.2	16.2	-2.72	98.6	11.8	7.57

^{*} 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 m³/s	Dry Reference Flowrate Rm³/s *	Flowrate Flowrate	
1	24.4	14.2	19.3	17.0
2 .	24.9	14.7	19.5	17.4
3	24.1	13.9	19.4	16.5
Average	24.4	14.3	19.4	16.9

Paticle Size Distribution Trains

Test No.	Flowrate Flowrate Flowra		Dry Adjusted Flowrate Rm³/s **	Wet Reference Flowrate Rm³/s*
1	26.8	15.4	21.0	18.5
2	24.9	14.5	20.6	17.2
3	25.3	14.6	20.2	17.4
Average	25.7	14.8	20.6	17.7

Acid Gases Trains ***

Test No.	Actual Flowrate m³/s	Dry Reference Flowrate Rm³/s *	Dry Adjusted Flowrate Rm³/s **	Wet Reference Flowrate Rm³/s*	
1	25.3	14.6	20.3	17.5	
2	24.6	14.4	19.4	17.2	
3	23.9	14.2	19.5	16.7	
Average	24.6	14.4	19.7	17.1	

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m³/s	Dry Reference Flowrate Rm³/s *	Dry Adjusted Flowrate Rm³/s **	e Flowrate		
1	23.5	13.7	18.5	16.3		
2	23.8	13.9	18.6	16.6		
3	24.6	14.3	19.4	17.2		
Average	23.9	14.0	18.8	16.7		

^{*} 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	Partic	ulate Colle	cted	Dry Gas		Particulate	Concentration		Particulate
No.	Probe	Main	Total	Volume	Actual	Dry	Dry	Wet	Emission
	Rinse	Filter		Sampled		Reference	Adjusted	Reference	Rate
	mg	mg	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm ³ **	mg/Rm³*	mg/s
1	3.1	1.30	4.40	3.427	0.75	1.28	0.95	1.08	18.3
2	1.9	1.20	3.10	3.513	0.52	0.88	0.66	0.75	13.0
3	0.9	<0.30	<1.20	3.321	<0.21	<0.36	<0.26	<0.31	<5.02
Average					<0.49	<0.84	<0.62	<0.71	<12.1

^{*} 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 PM₁₀ Emission Data

PM_{2.5}

	Total	Dry Volume		PM _{2.5} C	oncentration		Emission
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate
No.	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
1	<1.6	1.234	<0.75	<1.30	<0.95	<1.08	<20.0
2	<0.5	1.225	< 0.24	< 0.41	< 0.29	< 0.34	<5.91
3	<1.7	1.213	<0.81	<1.40	<1.01	<1.17	<20.4
Average			<0.60	<1.04	<0.75	<0.87	<15.5
Blank	<0.5						

PM₁₀

	Total	Dry Volume	attiettaatuu eta mattiettiin ta mattietaan kantain kantain kantain kantain kantain kantain kantain kantain kan	***************************************	Emission		
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate
No.	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
1	<2.1	1.234	<0.98	<1.70	<1.25	<1.42	<26.2
2	<1.0	1.225	< 0.47	<0.82	<0.57	<0.69	<11.8
3	<2.5	1.213	<1.19	<2.06	<1.49	<1.72	<30.1
Average			<0.88	<1.53	<1.10	<1.28	<22.7
Blank	<1.0						

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

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

Inorganic Condensable Particulate

	Total	Dry Volume	y Volume Inorganic Condensable Particulate Concentration					
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate	
No.	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s	
1	15	1.234	7.00	12.2	8.91	10.1	187	
2	16	1.225	7.60	13.1	9.18	11.0	189	
3	12	1.213	5.70	9.89	7.16	8.28	144	
Average			6.77	11.7	8.42	9.80	174	
Blank	6.5							

Organic Condensable Particulate

	Total	Dry Volume	Or	Organic Condensable Particulate Concentration					
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate		
No.	mg	Rm ³ *	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s		
1	1.2	1.234	0.56	0.97	0.71	0.81	15.0		
2	<1.0	1.225	< 0.47	<0.82	<0.57	<0.69	<11.8		
3	1.5	1.213	0.71	1.24	0.89	1.03	18.0		
Average			<0.58	<1.01	<0.73	<0.84	<15.0		
Blank	<1.0								

- 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

	HCl	Dry Volume		HCI			
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
	4.400	4 4 0 4	247	2.72	2.74	2.44	F2.0
1	4400	1.181	2.17	3.73	2.74	3.11	52.9
2	7500	1.158	3.77	6.48	4.77	5.41	92.0
3	6800	1.124	3.57	6.05	4.56	5.11	88.9
Average			3.17	5.42	4.02	4.54	77.9
Blank	<200						

Hydrogen Fluoride

	HF Dry Volume Hydrogen Fluoride Concentration						HF
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	mg/m³	mg/Rm³*	mg/Rm ³ **	mg/Rm³*	mg/s
1	<200	1.181	<0.099	<0.17	<0.12	<0.14	<2.40
2	<200	1.158	< 0.10	<0.17	< 0.13	< 0.14	<2.45
3	<200	1.124	<0.11	<0.18	<0.13	<0.15	<2.62
Average			<0.10	<0.17	<0.13	<0.15	<2.49
Blank	<200						

Ammonia

	Ammonia Dry Volume Ammonia Concentration						Ammonia	
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate	
No.	μg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s	
1	227	1.181	0.11	0.19	0.14	0.16	2.72	
2	529	1.158	0.27	0.46	0.34	0.38	6.48	
3	689	1.124	0.36	0.61	0.46	0.52	9.01	
Average			0.25	0.42	0.31	0.35	6.07	
Blank	<23.6							

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit), 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 May 2 to May 4, 2016 and May 9 to May 11, 2016

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	6.42	7.52	8.93
BH Outlet	Carbon Dioxide (kg/Rm³, 1 hr Avg) *	0.17	0.21	0.23
BH Outlet	Carbon Monoxide (mg/Rm³, 1 hr Avg) *	5	15	28
BH Outlet	Carbon Monoxide (mg/Rm³, 4 hr Avg) *	5.8	14.8	22.5
BH Outlet	Sulphur Dioxide (mg/Rm³, 1 hr Avg) *	0	0	2
BH Outlet	Sulphur Dioxide (mg/Rm³, 24 hr Avg) *	0	0	0.2
BH Outlet	Nitrogen Oxides (mg/Rm³, 1 hr Avg) *	93	108	126
BH Outlet	Nitrogen Oxides (mg/Rm³, 24 hr Avg) *	105	108	111
BH Outlet	Hydrogen Chloride (mg/Rm³, 1 hr Avg) *	2	5	10
BH Outlet	Hydrogen Chloride (mg/Rm³, 24 hr Avg) *	4.2	5.0	5.6
BH Outlet	Total Hydrocarbons (mg/Rm³, 1 hr Avg) *	0	0	1
Scrubber Inlet	Oxygen (%, 1 hr Avg)	7	8	9

Data measured by the ORTECH CEMS on April 20, 2016

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
BH Outlet	1	Total Hydrocarbons (ppm dry) **	0	0.5	1.0
BH Outlet	2	Total Hydrocarbons (ppm dry) **	0.2	1.9	6.6
BH Outlet	3	Total Hydrocarbons (ppm dry) **	0.3	0.8	1.7
BH Outlet	4	Total Hydrocarbons (ppm dry) **	0.2	0.6	1.0
BH Outlet	5	Total Hydrocarbons (ppm dry) **	0.2	0.6	1.0
BH Outlet	6	Total Hydrocarbons (ppm dry) **	0	0.3	0.5
Average		Total Hydrocarbons (ppm dry) **		0.8	

- * Reference conditions, dry basis adjusted to 11% oxygen
- ** Half hour tests reported on a dry basis as equivalent methane

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

Metal	Probe & Filter	Impingers	Total
	Hydrofluoric Acid Digest	& Rinses	Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	6.4	3.2	9.60
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	30.6	1.36	32.0
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	6.3	6.30
Lead	0.88	0.65	1.53
Manganese	3.1	3.79	6.89
Mercury *	0.018	2.91	2.93
Molybdenum	44.4	<0.25	44.4
Nickel	25.8	1.25	27.1
Selenium	<2.0	<0.50	<0.50
Silver	<0.40	< 0.10	< 0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	12	5.6	17.6
Total			152

^{*} Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit, "<MDL").

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	Impingers	Total
	Hydrofluoric Acid Digest	& Rinses	Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	<6.0	3.5	3.50
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	2.32	2.31	4.63
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	8.0	8.00
Lead	0.48	0.58	1.06
Manganese	1.5	3.39	4.89
Mercury *	<0.015	2.13	2.13
Molybdenum	20.3	<0.25	20.3
Nickel	1.4	1.31	2.71
Selenium	<2.0	1.15	1.15
Silver	<0.40	<0.10	<0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	4.0	4.00
Total			55.5

^{*} Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit, "<MDL").

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	Impingers	Total
4	Hydrofluoric Acid Digest	& Rinses	Collected
	μg	μg	μg
A 1: a	40.00	40.20	40.00
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	7.1	2.4	9.50
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	7.15	1.46	8.61
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	7.6	7.60
Lead	0.66	0.46	1.12
Manganese	2.3	2.86	5.16
Mercury *	<0.015	1.13	1.13
Molybdenum	44.1	<0.25	44.1
Nickel	17.2	1.13	18.3
Selenium	<2.0	1.08	1.08
Silver	<0.40	<0.10	<0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	6.0	6.00
Total			106

^{*} Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit, "<MDL").

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
					0.10	0.000
Antimony	<0.80	<0.14	<0.23	<0.17	<0.19	<0.0033
Arsenic	<0.20	<0.034	<0.058	<0.043	<0.049	<0.00083
Barium	9.60	1.63	2.80	2.06	2.34	0.040
Beryllium	<0.20	<0.034	<0.058	<0.043	< 0.049	<0.00083
Cadmium	< 0.20	<0.034	<0.058	< 0.043	< 0.049	<0.00083
Chromium	32.0	5.43	9.33	6.86	7.79	0.13
Cobalt	< 0.20	< 0.034	<0.058	< 0.043	< 0.049	<0.00083
Copper	6.30	1.07	1.84	1.35	1.54	0.026
Lead	1.53	0.26	0.45	0.33	0.37	0.0063
Manganese	6.89	1.17	2.01	1.48	1.68	0.029
Mercury	2.93	0.50	0.85	0.63	0.71	0.012
Molybdenum	44.4	7.54	13.0	9.53	10.8	0.18
Nickel	27.1	4.59	7.89	5.81	6.59	0.11
Selenium	<0.50	<0.085	<0.15	<0.11	<0.12	<0.0021
Silver	< 0.40	<0.068	<0.12	<0.086	<0.097	<0.0017
Thallium	<1.00	<0.17	< 0.29	<0.21	< 0.24	< 0.0041
Vanadium	<0.15	<0.025	< 0.044	< 0.032	< 0.037	< 0.00062
Zinc	17.6	2.99	5.14	3.78	4.29	0.073
Total	152	25.8	44.3	32.6	37.0	0.63

Dry Gas Volume Sampled (Rm ³ *):	3.427
Actual Flowrate (m³/s) :	24.4
Dry Reference Flowrate (Rm³/s*) :	14.2
Dry Adjusted Flowrate (Rm³/s**):	19.3
Wet Reference Flowrate (Rm³/s*):	17.0

^{*} 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. 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
			0.00	.0.47	.0.40	0.000
Antimony	<0.80	<0.13	<0.23	<0.17	<0.19	<0.0033
Arsenic	<0.20	<0.034	<0.057	<0.043	<0.048	<0.00084
Barium	3.50	0.59	1.00	0.75	0.84	0.015
Beryllium	<0.20	<0.034	<0.057	<0.043	<0.048	<0.00084
Cadmium	<0.20	<0.034	<0.057	< 0.043	<0.048	<0.00084
Chromium	4.63	0.78	1.32	0.99	1.11	0.019
Cobalt	<0.20	< 0.034	<0.057	< 0.043	<0.048	<0.00084
Copper	8.00	1.34	2.28	1.72	1.92	0.033
Lead	1.06	0.18	0.30	0.23	0.25	0.0044
Manganese	4.89	0.82	1.39	1.05	1.18	0.020
Mercury	2.13	0.36	0.61	0.46	0.51	0.0089
Molybdenum	20.3	3.41	5.78	4.36	4.88	0.085
Nickel	2.71	0.46	0.77	0.58	0.65	0.011
Selenium	1.15	0.19	0.33	0.25	0.28	0.0048
Silver	< 0.40	< 0.067	<0.11	<0.086	<0.096	< 0.0017
Thallium	<1.00	<0.17	<0.28	<0.21	<0.24	<0.0042
Vanadium	< 0.15	<0.025	< 0.043	< 0.032	<0.036	<0.00063
Zinc	4.00	0.67	1.14	0.86	0.96	0.017
Total	55.5	9.33	15.8	11.9	13.4	0.23

Dry Gas Volume Sampled (Rm³*):	3.513
Actual Flowrate (m³/s) :	24.9
Dry Reference Flowrate (Rm³/s*) :	14.7
Dry Adjusted Flowrate (Rm³/s**):	19.5
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

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	<0.80	< 0.14	< 0.24	<0.17	<0.20	<0.0033
Arsenic	<0.20	<0.035	<0.060	< 0.043	<0.051	<0.00084
Barium	9.50	1.65	2.86	2.05	2.41	0.040
Beryllium	<0.20	<0.035	<0.060	< 0.043	<0.051	<0.00084
Cadmium	<0.20	<0.035	<0.060	< 0.043	<0.051	<0.00084
Chromium	8.61	1.50	2.59	1.86	2.18	0.036
Cobalt	< 0.20	<0.035	< 0.060	< 0.043	<0.051	< 0.00084
Copper	7.60	1.32	2.29	1.64	1.93	0.032
Lead	1.12	0.19	0.34	0.24	0.28	0.0047
Manganese	5.16	0.90	1.55	1.11	1.31	0.022
Mercury	1.13	0.20	0.34	0.24	0.29	0.0047
Molybdenum	44.1	7.66	13.3	9.51	11.2	0.18
Nickel	18.3	3.18	5.52	3.95	4.65	0.077
Selenium	1.08	0.19	0.33	0.23	0.27	0.0045
Silver	< 0.40	< 0.069	<0.12	<0.086	<0.10	< 0.0017
Thallium	<1.00	<0.17	<0.30	<0.22	<0.25	< 0.0042
Vanadium	< 0.15	<0.026	<0.045	<0.032	<0.038	< 0.00063
Zinc	6.00	1.04	1.81	1.29	1.52	0.025
Total	106	18.4	31.9	22.8	26.8	0.44

Dry Gas Volume Sampled (Rm ³ *):	3.321
Actual Flowrate (m³/s) :	24.1
Dry Reference Flowrate (Rm³/s*) :	13.9
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*):	16.5

^{*} 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	####		Coefficient		
•	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/m³	μg/m³	μg/m³	μg/m³	%
Antimony	< 0.14	< 0.13	< 0.14	<0.14	1.7
Arsenic	< 0.034	< 0.034	<0.035	< 0.034	1.7
Barium	1.63	0.59	1.65	1.29	47.1
Beryllium	< 0.034	< 0.034	<0.035	<0.034	1.7
Cadmium	< 0.034	< 0.034	<0.035	<0.034	1.7
Chromium	5.43	0.78	1.50	2.57	97.5
Cobalt	< 0.034	< 0.034	<0.035	< 0.034	1.7
Copper	1.07	1.34	1.32	1.24	12.2
Lead .	0.26	0.18	0.19	0.21	20.5
Manganese	1.17	0.82	0.90	0.96	19.1
Mercury	0.50	0.36	0.20	0.35	42.9
Molybdenum	7.54	3.41	7.66	6.20	39.0
Nickel	4.59	0.46	3.18	2.74	76.7
Selenium	<0.085	0.19	0.19	<0.16	39.3
Silver	<0.068	< 0.067	< 0.069	<0.068	1.7
Thallium	<0.17	<0.17	<0.17	< 0.17	1.7
Vanadium	<0.025	<0.025	<0.026	< 0.026	1.7
Zinc	2.99	0.67	1.04	1.57	79.4
Total	25.8	9.33	18.4	17.8	46.2

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

Metal			Coefficient		
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*	%
Antimony	<0.23	<0.23	<0.24	<0.23	2.8
Arsenic	<0.058	<0.057	<0.060	<0.059	2.8
Barium	2.80	1.00	2.86	2.22	47.7
Beryllium	<0.058	<0.057	<0.060	<0.059	2.8
Cadmium	<0.058	< 0.057	<0.060	< 0.059	2.8
Chromium	9.33	1.32	2.59	4.41	97.5
Cobalt	<0.058	< 0.057	<0.060	<0.059	2.8
Copper	1.84	2.28	2.29	2.13	12.0
Lead	0.45	0.30	0.34	0.36	20.8
Manganese	2.01	1.39	1.55	1.65	19.4
Mercury	0.85	0.61	0.34	0.60	42.7
Molybdenum	13.0	5.78	13.3	10.7	39.7
Nickel	7.89	0.77	5.52	4.73	76.7
Selenium	<0.15	0.33	0.33	< 0.27	39.1
Silver	< 0.12	<0.11	< 0.12	< 0.12	2.8
Thallium	< 0.29	<0.28	< 0.30	< 0.29	2.8
Vanadium	<0.044	< 0.043	<0.045	< 0.044	2.8
Zinc	5.14	1.14	1.81	2.69	79.5
Total	44.3	15.8	31.9	30.7	46.6

^{*} 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 C	oncentration		Coefficient
	Test No. 1 μg/Rm³**	Test No. 2 μg/Rm³**	Test No. 3 μg/Rm³**	Average μg/Rm³**	of Variation %
	0.47		0.47	0.47	
Antimony	<0.17	<0.17	<0.17	<0.17	0.3
Arsenic	<0.043	<0.043	<0.043	<0.043	0.3
Barium	2.06	0.75	2.05	1.62	46.5
Beryllium	<0.043	<0.043	<0.043	<0.043	0.3
Cadmium	<0.043	<0.043	<0.043	<0.043	0.3
Chromium	6.86	0.99	1.86	3.24	97.9
Cobalt	< 0.043	< 0.043	<0.043	< 0.043	0.3
Copper	1.35	1.72	1.64	1.57	12.2
Lead	0.33	0.23	0.24	0.27	20.6
Manganese	1.48	1.05	1.11	1.21	19.1
Mercury	0.63	0.46	0.24	0.44	43.4
Molybdenum	9.53	4.36	9.51	7.80	38.2
Nickel	5.81	0.58	3.95	3.45	76.8
Selenium	< 0.11	0.25	0.23	< 0.20	39.3
Silver	< 0.086	<0.086	<0.086	<0.086	0.3
Thallium	<0.21	<0.21	<0.22	< 0.22	0.3
Vanadium	< 0.032	<0.032	<0.032	<0.032	0.3
Zinc	3.78	0.86	1.29	1.98	79.7
Total	32.6	11.9	22.8	22.4	46.1

^{**} 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*	%
Antimony	<0.19	< 0.19	<0.20	<0.20	2.8
Arsenic	< 0.049	<0.048	<0.051	< 0.049	2.8
Barium	2.34	0.84	2.41	1.86	47.5
Beryllium	< 0.049	<0.048	<0.051	<0.049	2.8
Cadmium	< 0.049	<0.048	<0.051	< 0.049	2.8
Chromium	7.79	1.11	2.18	3.70	97.0
Cobalt	< 0.049	<0.048	<0.051	<0.049	2.8
Copper	1.54	1.92	1.93	1.80	12.5
Lead	0.37	0.25	0.28	0.30	20.2
Manganese	1.68	1.18	1.31	1.39	18.8
Mercury	0.71	0.51	0.29	0.50	42.3
Molybdenum	10.8	4.88	11,2	8.96	39.5
Nickel	6.59	0.65	4.65	3.96	76.4
Selenium	< 0.12	0.28	0.27	<0.22	39.5
Silver	<0.097	< 0.096	< 0.10	<0.098	2.8
Thallium	< 0.24	<0.24	<0.25	<0.25	2.8
Vanadium	< 0.037	< 0.036	<0.038	< 0.037	2.8
Zinc	4.29	0.96	1.52	2.26	78.9
Total	37.0	13.4	26.8	25.7	46.1

^{*} 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						
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s	of Variation %			
Antimony	<0.0033	<0.0033	<0.0033	<0.0033	0.6			
Arsenic	<0.00083	< 0.00084	<0.00084	<0.00083	0.6			
Barium	0.040	0.015	0.040	0.031	46.2			
Beryllium	<0.00083	<0.00084	<0.00084	<0.00083	0.6			
Cadmium	<0.00083	< 0.00084	<0.00084	<0.00083	0.6			
Chromium	0.13	0.019	0.036	0.063	97.5			
Cobalt	<0.00083	<0.00084	< 0.00084	<0.00083	0.6			
Copper	0.026	0.033	0.032	0.030	12.7			
Lead	0.0063	0.0044	0.0047	0.0052	20.1			
Manganese	0.029	0.020	0.022	0.024	18.6			
Mercury	0.012	0.0089	0.0047	0.0086	43.1			
Molybdenum	0.18	0.085	0.18	0.15	37.9			
Nickel	0.11	0.011	0.077	0.067	76.6			
Selenium	< 0.0021	0.0048	0.0045	<0.0038	39.6			
Silver	< 0.0017	<0.0017	< 0.0017	< 0.0017	0.6			
Thallium	< 0.0041	< 0.0042	< 0.0042	< 0.0042	0.6			
Vanadium	<0.00062	< 0.00063	<0.00063	< 0.00063	0.6			
Zinc	0.073	0.017	0.025	0.038	79.2			
Total	0.63	0.23	0.44	0.43	45.7			

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	< 0.14	<0.23	<0.17	<0.20	<0.0033
Arsenic	< 0.034	<0.059	<0.043	< 0.049	<0.00083
Barium	1.29	2.22	1.62	1.86	0.031
Beryllium	< 0.034	<0.059	<0.043	< 0.049	<0.00083
Cadmium	< 0.034	< 0.059	< 0.043	< 0.049	<0.00083
Chromium	2.57	4.41	3.24	3.70	0.063
Cobalt	< 0.034	< 0.059	< 0.043	<0.049	<0.00083
Copper	1.24	2.13	1.57	1.80	0.030
Lead	0.21	0.36	0.27	0.30	0.0052
Manganese	0.96	1.65	1.21	1.39	0.024
Mercury	0.35	0.60	0.44	0.50	0.0086
Molybdenum	6.20	10.7	7.80	8.96	0.15
Nickel	2.74	4.73	3.45	3.96	0.067
Selenium	< 0.16	<0.27	<0.20	<0.22	<0.0038
Silver	<0.068	<0.12	<0.086	<0.098	<0.0017
Thallium	< 0.17	<0.29	<0.22	<0.25	< 0.0042
Vanadium	<0.026	< 0.044	<0.032	< 0.037	<0.00063
Zinc	1.57	2.69	1.98	2.26	0.038
Total	17.8	30.7	22.4	25.7	0.43

^{*} 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	Impingers & Rinses	Total Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	17.9	2.0	19.9
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	2.06	0.81	2.87
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	3.7	3.70
Lead	<0.40	0.31	0.31
Manganese	<1.5	1.94	1.94
Mercury *	<0.015	0.72	0.72
Molybdenum	32.6	<0.25	32.6
Nickel	<1.0	1.55	1.55
Selenium	<2.0	<0.50	<0.50
Silver	<0.40	<0.10	< 0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	<2.5	<10.0
Total			77.2

^{*} Hydrofluoric acid digest not included in the total.

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). 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.

^{**} Includes the permanganate impingers.

TABLE 24

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Congener Group Emission Data

Test No. 1

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	5900	0.53	0.90	0.67	0.76	12.4
Pentachlorodibenzo-p-dioxins	52200	4.65	7.98	5.91	6.71	109
Hexachlorodibenzo-p-dioxins	173000	15.4	26.5	19.6	22.2	362
Heptachlorodibenzo-p-dioxins	125000	11.1	19.1	14.2	16.1	262
Octachlorodibenzo-p-dioxin	35800	3.19	5.47	4.05	4.60	75.0
Total	391900	34.9	59.9	44.4	50.4	821

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	9090	0.81	1.39	1.03	1.17	19.0
Pentachlorodibenzofurans	22100	1.97	3.38	2.50	2.84	46.3
Hexachlorodibenzofurans	47800	4.26	7.31	5.41	6.14	100
Heptachlorodibenzofurans	40100	3.58	6.13	4.54	5.15	84.0
Octachlorodibenzofuran	<9500	<0.85	<1.45	<1.08	<1.22	<19.9
Total	<128590	<11.5	<19.7	<14.6	<16.5	<269

Dry Gas Volume Sampled (Rm ³ *):	6.539
Actual Flowrate (m³/s) :	23.5
Dry Reference Flowrate (Rm³/s*):	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*):	16.3

^{*} At 25°C and 1 atmosphere

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

TABLE 25

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Congener Group Emission Data

Test No. 2

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	4680	0.41	0.70	0.53	0.59	9.77
Pentachlorodibenzo-p-dioxins	33400	2.93	5.02	3.75	4.20	69.8
Hexachlorodibenzo-p-dioxins	118000	10.4	17.7	13.2	14.8	246
Heptachlorodibenzo-p-dioxins	93200	8.18	14.0	10.5	11.7	195
Octachlorodibenzo-p-dioxin	28400	2.49	4.27	3.19	3.57	59.3
Total	277680	24.4	41.7	31.2	34.9	580

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
Total children dib consessiones	CECO	0.50	0.00	0.74	0.92	12.7
Tetrachlorodibenzofurans	6560	0.58	0.99	0.74	0.83	13.7
Pentachlorodibenzofurans	15100	1.32	2.27	1.70	1.90	31.5
Hexachlorodibenzofurans	31700	2.78	4.76	3.56	3.99	66.2
Heptachlorodibenzofurans	27900	2.45	4.19	3.13	3.51	58.3
Octachlorodibenzofuran	<7700	<0.68	<1.16	<0.86	<0.97	<16.1
Total	<88960	<7.81	<13.4	<9.99	<11.2	<186

Dry Gas Volume Sampled (Rm³*):	6.656
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*) :	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

^{*} At 25°C and 1 atmosphere

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

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

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
	2200	0.00	0.40	0.05	0.40	
Tetrachlorodibenzo-p-dioxins	3280	0.28	0.48	0.35	0.40	6.84
Pentachlorodibenzo-p-dioxins	27000	2.29	3.94	2.90	3.27	56.3
Hexachlorodibenzo-p-dioxins	104000	8.81	15.2	11.2	12.6	217
Heptachlorodibenzo-p-dioxins	126000	10.7	18.4	13.5	15.3	263
Octachlorodibenzo-p-dioxin	27200	2.30	3.97	2.92	3.30	56.7
Total	287480	24.4	41.9	30.9	34.8	599

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	5090	0.42	0.74	0.55	0.63	10.6
Pentachlorodibenzofurans	11200	0.43 0.95	1.63	1.20	0.62 1.36	10.6 23.3
Hexachlorodibenzofurans	27700	2.35	4.04	2.98	3.36	57.7
Heptachlorodibenzofurans	23700	2.01	3.45	2.55	2.87	49.4
Octachlorodibenzofuran	<7500	<0.64	<1.09	<0.81	<0.91	<15.6
Total	<75190	<6.37	<11.0	<8.08	<9.11	<157

Dry Gas Volume Sampled (Rm³*):	6.860
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*) :	17.2

^{*} At 25°C and 1 atmosphere

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

TABLE 27

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Congener Group Actual Concentrations

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.53	0.41	0.28	0.40	30.7
Pentachlorodibenzo-p-dioxins	4.65	2.93	2.29	3.29	37.2
Hexachlorodibenzo-p-dioxins	15.4	10.4	8.81	11.5	30.0
Heptachlorodibenzo-p-dioxins	11.1	8.18	10.7	10.0	16.0
Octachlorodibenzo-p-dioxin	3.19	2.49	2.30	2.66	17.6
Total	34.9	24.4	24.4	27.9	21.9

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Totrocklesselikesselisses	0.01	0.50	0.42	0.64	24.5
Tetrachlorodibenzofurans	0.81	0.58	0.43	0.61	31.6
Pentachlorodibenzofurans	1.97	1.32	0.95	1.41	36.5
Hexachlorodibenzofurans	4.26	2.78	2.35	3.13	32.1
Heptachlorodibenzofurans	3.58	2.45	2.01	2.68	30.2
Octachlorodibenzofuran	<0.85	<0.68	<0.64	<0.72	15.6
Total	<11.5	<7.81	<6.37	<8.55	30.7

TABLE 28

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Congener Group Dry Reference Concentrations

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.90	0.70	0.48	0.69	30.6
Pentachlorodibenzo-p-dioxins	7.98	5.02	3.94	5.65	37.1
Hexachlorodibenzo-p-dioxins	26.5	17.7	15.2	19.8	29.9
Heptachlorodibenzo-p-dioxins	19.1	14.0	18.4	17.2	16.1
Octachlorodibenzo-p-dioxin	5.47	4.27	3.97	4.57	17.5
Total	59.9	41.7	41.9	47.9	21.9

Congener	нестийского от	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	1.39	0.99	0.74	1.04	31.5
Pentachlorodibenzofurans	3.38	2.27	1.63	2.43	36.4
Hexachlorodibenzofurans	7.31	4.76	4.04	5.37	32.0
Heptachlorodibenzofurans	6.13	4.19	3.45	4.59	30.1
Octachlorodibenzofuran	<1.45	<1.16	<1.09	<1.23	15.5
Total	<19.7	<13.4	<11.0	<14.7	30.7

^{*} 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

Congener		Coefficient			
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
					_
Tetrachlorodibenzo-p-dioxins	0.67	0.53	0.35	0.52	30.7
Pentachlorodibenzo-p-dioxins	5.91	3.75	2.90	4.19	37.1
Hexachlorodibenzo-p-dioxins	19.6	13.2	11.2	14.7	29.9
Heptachlorodibenzo-p-dioxins	14.2	10.5	13.5	12.7	15.5
Octachlorodibenzo-p-dioxin	4.05	3.19	2.92	3.39	17.5
Total	44.4	31.2	30.9	35.5	21.7

Congener		Coefficient			
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
Tetrachlorodibenzofurans	1.03	0.74	0.55	0.77	31.5
Pentachlorodibenzofurans	2.50	1.70	1.20	1.80	36.4
Hexachlorodibenzofurans	5.41	3.56	2.98	3.98	31.9
Heptachlorodibenzofurans	4.54	3.13	2.55	3.41	30.1
Octachlorodibenzofuran	<1.08	<0.86	<0.81	<0.92	15.5
Total	<14.6	<9.99	<8.08	<10.9	30.6

^{*} 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

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.76	0.59	0.40	0.58	31.0
Pentachlorodibenzo-p-dioxins	6.71	4.20	3.27	4.73	37.6
Hexachlorodibenzo-p-dioxins	22.2	14.8	12.6	16.6	30.4
Heptachlorodibenzo-p-dioxins	16.1	11.7	15.3	14.4	16.1
Octachlorodibenzo-p-dioxin	4.60	3.57	3.30	3.82	18.0
Total	50.4	34.9	34.8	40.0	22.3

Congener	TO THE CONTROL OF THE	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	1.17	0.83	0.62	0.87	32.0
Pentachlorodibenzofurans	2.84	1.90	1.36	2.03	36.9
Hexachlorodibenzofurans	6.14	3.99	3.36	4.50	32.5
Heptachlorodibenzofurans	5.15	3.51	2.87	3.85	30.6
Octachlorodibenzofuran	<1.22	<0.97	<0.91	<1.03	16.0
Total	<16.5	<11.2	<9.11	<12.3	31.2

^{*} 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

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%%
Tetrachlorodibenzo-p-dioxins	12.4	9.77	6.84	9.66	28.6
Pentachlorodibenzo-p-dioxins	109	69.8	56.3	78.5	35.2
Hexachlorodibenzo-p-dioxins	362	246	217	275	28.0
Heptachlorodibenzo-p-dioxins	262	195	263	240	16.3
Octachlorodibenzo-p-dioxin	75.0	59.3	56.7	63.7	15.6
Total	821	580	599	667	20.1

Congener		Coefficient			
Group	Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	of Variation %
Tetrachlorodibenzofurans	19.0	13.7	10.6	14.5	29.5
Pentachlorodibenzofurans	46.3	31.5	23.3	33.7	34.5
Hexachlorodibenzofurans	100	66.2	57 <i>.</i> 7	74.7	30.0
Heptachlorodibenzofurans	84.0	58.3	49.4	63.9	28.1
Octachlorodibenzofuran	<19.9	<16.1	<15.6	<17.2	13.6
Total	<269	<186	<157	<204	28.7

TABLE 32

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Summary of Dioxin and Furan Congener Group Emission Data

Congener Group	Actual Concentration	Dry Reference Concentration		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	0.40	0.69	0.52	0.58	9.66
Pentachlorodibenzo-p-dioxins	3.29	5.65	4.19	4.73	78.5
Hexachlorodibenzo-p-dioxins	11.5	19.8	14.7	16.6	275
Heptachlorodibenzo-p-dioxins	10.0	17.2	12.7	14.4	240
Octachlorodibenzo-p-dioxin	2.66	4.57	3.39	3.82	63.7
Total	27.9	47.9	35.5	40.0	667

Congener Group	Actual Concentration	- · · · · · · · · · · · · · · · · · · ·		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.61	1.04	0.77	0.87	14.5
Pentachlorodibenzofurans	1.41	2.43	1.80	2.03	33.7
Hexachlorodibenzofurans	3.13	5.37	3.98	4.50	74.7
Heptachlorodibenzofurans	2.68	4.59	3.41	3.85	63.9
Octachlorodibenzofuran	<0.72	<1.23	<0.92	<1.03	17.2
Total	<8.55	<14.7	<10.9	<12.3	204

^{*} 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	Laboratory Blank
	pg	pg
Tetrachlorodibenzo-p-dioxins	<7.0	<7.8
Pentachlorodibenzo-p-dioxins	<8.7	<7.2
Hexachlorodibenzo-p-dioxins	<11	<9.1
Heptachlorodibenzo-p-dioxins	10.6	<5.9
Octachlorodibenzo-p-dioxin	28.2	25.4
Total	<65.5	<55.4

Congener Group	Blank Train	Laboratory Blank
	pg	pg
Tetrachlorodibenzofurans	<6.2	<3.9
Pentachlorodibenzofurans	<8.0	<5.8
Hexachlorodibenzofurans	<6.0	<6.0
Heptachlorodibenzofurans	<4.8	<6.1
Octachlorodibenzofuran	<6.3	<6.0
Total	<31.3	<27.8

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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
isomei		pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
	pg	ρ5/111	pg/ Nill	pg/itti	pg/ Mil	118/3
2378-tetrachlorodibenzo-p-dioxin	54.7	4.88	8.37	6.19	7.03	0.11
12378-pentachlorodibenzo-p-dioxin	1180	105	180	134	152	2.47
123478-hexachlorodibenzo-p-dioxin	4510	402	690	511	580	9.45
123678-hexachlorodibenzo-p-dioxin	14700	1311	2248	1665	1889	30.8
123789-hexachlorodibenzo-p-dioxin	22900	2042	3502	2593	2943	48.0
1234678-heptachlorodibenzo-p-dioxin	62100	5536	9497	7033	7982	130
Octachlorodibenzo-p-dioxin	35800	3192	5475	4054	4602	75.0
2378-tetrachlorodibenzofuran	309	27.5	47.3	35.0	39.7	0.65
12378-pentachlorodibenzofuran	978	87.2	150	111	126	2.05
23478-pentachlorodibenzofuran	<3400	<303	<520	<385	<437	<7.12
123478-hexachlorodibenzofuran	11200	999	1713	1268	1440	23.5
123678-hexachlorodibenzofuran	5630	502	861	638	724	11.8
234678-hexachlorodibenzofuran	10100	900	1545	1144	1298	21.2
123789-hexachlorodibenzofuran	<750	<66.9	<115	<84.9	<96.4	<1.57
1234678-heptachlorodibenzofuran	20200	1801	3089	2288	2596	42.3
1234789-heptachlorodibenzofuran	4670	416	714	529	600	9.78
Octachlorodibenzofuran	<9500	<847	<1453	<1076	<1221	<19.9
PCB 81	240	21.4	36.7	27.2	30.8	0.50
PCB 77	540	48.1	82.6	61.2	69.4	1.13
PCB 123	<110	<9.81	<16.8	<12.5	<14.1	< 0.23
PCB 118	3200	285	489	362	411	6.70
PCB 114	<97	<8.65	<14.8	<11.0	<12.5	<0.20
PCB 105	1300	116	199	147	167	2.72
PCB 126	920	82.0	141	104	118	1.93
PCB 167	230	20.5	35.2	26.0	29.6	0.48
PCB 156 + PCB 157	1300	116	199	147	167	2.72
PCB 169	840	74.9	128	95.1	108	1.76
PCB 189	1400	125	214	159	180	2.93
Total Dioxins & Furans Only	<207982	<18542	<31806	<23554	<26733	<436
Total PCBs Only	<10177	<907	<1556	<1153	<1308	<21.3
Total Dioxins & Furans and PCBs	<218159	<19450	<33363	<24706	<28041	<457

Dry Gas Volume Sampled (Rm ³ *):	6.539
Actual Flowrate (m ³ /s):	23.5
Dry Reference Flowrate (Rm³/s*):	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*) :	16.3

^{*} At 25°C and 1 atmosphere

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

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
isoniei		pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
	pg	pg/m-	pg/Kiii	hR\viii.	pg/ Mili	ng/s
2378-tetrachlorodibenzo-p-dioxin	26.0	2.28	3.91	2.92	3.27	0.054
12378-pentachlorodibenzo-p-dioxin	703	61.7	106	78.9	88.4	1.47
123478-hexachlorodibenzo-p-dioxin	2960	260	445	332	372	6.18
123678-hexachlorodibenzo-p-dioxin	8490	745	1276	953	1068	17.7
123789-hexachlorodibenzo-p-dioxin	9870	866	1483	1108	1242	20.6
1234678-heptachlorodibenzo-p-dioxin	46300	4063	6956	5198	5825	96.7
Octachlorodibenzo-p-dioxin	28400	2492	4267	3189	3573	59.3
2378-tetrachlorodibenzofuran	243	21.3	36.5	27.3	30.6	0.51
12378-pentachlorodibenzofuran	575	50.5	86.4	64.6	72.3	1.20
23478-pentachlorodibenzofuran	<2000	<175	<300	<225	<252	<4.18
123478-hexachlorodibenzofuran	7670	673	1152	861	965	16.0
123678-hexachlorodibenzofuran	3690	324	554	414	464	7.71
234678-hexachlorodibenzofuran	6200	544	931	696	780	12.9
123789-hexachlorodibenzofuran	<460	<40.4	<69.1	<51.6	<57.9	< 0.96
1234678-heptachlorodibenzofuran	14100	1237	2118	1583	1774	29.4
1234789-heptachlorodibenzofuran	3250	285	488	365	409	6.79
Octachlorodibenzofuran	<7700	<676	<1157	<865	<969	<16.1
PCB 81	160	14.0	24.0	18.0	20.1	0.33
PCB 77	390	34.2	58.6	43.8	49.1	0.81
PCB 123	<67	<5.88	<10.1	<7.52	<8.43	< 0.14
PCB 118	2100	184	316	236	264	4.39
PCB 114	<120	<10.5	<18.0	<13.5	<15.1	< 0.25
PCB 105	810	71.1	122	90.9	102	1.69
PCB 126	520	45.6	78.1	58.4	65.4	1.09
PCB 167	<180	<15.8	<27.0	<20.2	<22.6	<0.38
PCB 156 + PCB 157	920	80.7	138	103	116	1.92
PCB 169	600	52.6	90.1	67.4	75.5	1.25
PCB 189	1100	96.5	165	124	138	2.30
Total Dioxins & Furans Only	<142637	<12516	<21430	<16015	<17944	<298
Total PCBs Only	<6967	<611	<1047	<782	<876	<14.5
Total Dioxins & Furans and PCBs	<149604	<13127	<22477	<16797	<18821	<312

Dry Gas Volume Sampled (Rm³*):	6.656
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*):	16.6

^{*} At 25°C and 1 atmosphere

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

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

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	24.5	2.08	3.57	2.63	2.97	0.051
12378-pentachlorodibenzo-p-dioxin	545	46.2	79.4	58.6	66.1	1.14
123478-hexachlorodibenzo-p-dioxin	2730	231	398	293	331	5.69
123678-hexachlorodibenzo-p-dioxin	7400	627	1079	795	897	15.4
123789-hexachlorodibenzo-p-dioxin	9470	802	1380	1018	1148	19.7
1234678-heptachlorodibenzo-p-dioxin	90100	7635	13134	9681	10920	188
Octachlorodibenzo-p-dioxin	27200	2305	3965	2923	3296	56.7
2378-tetrachlorodibenzofuran	181	15.3	26.4	19.4	21.9	0.38
12378-pentachlorodibenzofuran	445	37.7	64.9	47.8	53.9	0.93
23478-pentachlorodibenzofuran	<1500	<127	<219	<161	<182	<3.13
123478-hexachlorodibenzofuran	6160	522	898	662	747	12.8
123678-hexachlorodibenzofuran	2920	247	426	314	354	6.09
234678-hexachlorodibenzofuran	5710	484	832	614	692	11.9
123789-hexachlorodibenzofuran	<330	<28.0	<48.1	<35.5	<40.0	< 0.69
1234678-heptachlorodibenzofuran	12000	1017	1749	1289	1454	25.0
1234789-heptachlorodibenzofuran	2820	239	411	303	342	5.88
Octachlorodibenzofuran	<7500	<636	<1093	<806	<909	<15.6
PCB 81	120	10.2	17.5	12.9	14.5	0.25
PCB 77	330	28.0	48.1	35.5	40.0	0.69
PCB 123	<74	<6.27	<10.8	<7.95	<8.97	<0.15
PCB 118	1100	93.2	160	118	133	2.29
PCB 114	84	7.12	12.2	9.03	10.2	0.18
PCB 105	500	42.4	72.9	53.7	60.6	1.04
PCB 126	370	31.4	53.9	39.8	44.8	0.77
PCB 167	130	11.0	19.0	14.0	15.8	0.27
PCB 156 + PCB 157	<520	<44.1	<75.8	<55.9	<63.0	<1.08
PCB 169	430	36.4	62.7	46.2	52.1	0.90
PCB 189	<680	<57.6	<99.1	<73.1	<82.4	<1.42
Total Dioxins & Furans Only	<177036	<15002	<25807	<19023	<21456	<369
Total PCBs Only	<4338	<368	<632	<466	<526	<9.04
Total Dioxins & Furans and PCBs	<181374	<15369	<26439	<19489	<21981	<378

Dry Gas Volume Sampled (Rm ³ *):	6.860
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*) :	17.2

^{*} At 25°C and 1 atmosphere

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

TABLE 37

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Specific Isomer Actual Concentrations

Specific		Actual Con	centration		Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	4.88	2.28	2.08	3.08	50.7
12378-pentachlorodibenzo-p-dioxin	105	61.7	46.2	71.0	43.1
123478-hexachlorodibenzo-p-dioxin	402	260	231	298	30.7
123678-hexachlorodibenzo-p-dioxin	1311	745	627	894	40.9
123789-hexachlorodibenzo-p-dioxin	2042	866	802	1237	56.4
1234678-heptachlorodibenzo-p-dioxin	5536	4063	7635	5745	31.3
Octachlorodibenzo-p-dioxin	3192	2492	2305	2663	17.6
2378-tetrachlorodibenzofuran	27.5	21.3	15.3	21.4	28.5
12378-pentachlorodibenzofuran	87.2	50.5	37.7	58.5	44.0
23478-pentachlorodibenzofuran	<303	<175	<127	<202	45.0
123478-hexachlorodibenzofuran	999	673	522	731	33.3
123678-hexachlorodibenzofuran	502	324	247	358	36.5
234678-hexachlorodibenzofuran	900	544	484	643	35.0
123789-hexachlorodibenzofuran	<66.9	<40.4	<28.0	<45.1	44.1
1234678-heptachlorodibenzofuran	1801	1237	1017	1352	29.9
1234789-heptachlorodibenzofuran	416	285	239	313	29.4
Octachlorodibenzofuran	<847	<676	<636	<719	15.6
PCB 81	21.4	14.0	10.2	15.2	37.5
PCB 77	48.1	34.2	28.0	36.8	28.1
PCB 123	<9.81	<5.88	<6.27	<7.32	29.6
PCB 118	285	184	93.2	188	51.2
PCB 114	<8.65	<10.5	7.12	<8.77	19.5
PCB 105	116	71.1	42.4	76.4	48.5
PCB 126	82.0	45.6	31.4	53.0	49.3
PCB 167	20.5	<15.8	11.0	<15.8	30.1
PCB 156 + PCB 157	116	80.7	<44.1	<80.2	44.8
PCB 169	74.9	52.6	36.4	54.7	35.3
PCB 189	125	96.5	<57.6	<93.0	36.3
Total Dioxins & Furans Only	<18542	<12516	<15002	<15353	19.7
Total PCBs Only	<907	<611	<368	<629	43.0
Total Dioxins & Furans and PCBs	<19450	<13127	<15369	<15982	20.1

TABLE 38

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific	·				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	8.37	3.91	3.57	5.28	50.7
12378-pentachlorodibenzo-p-dioxin	180	106	79.4	122	43.0
123478-hexachlorodibenzo-p-dioxin	690	445	398	511	30.7
123678-hexachlorodibenzo-p-dioxin	2248	1276	1079	1534	40.8
123789-hexachlorodibenzo-p-dioxin	3502	1483	1380	2122	56.4
1234678-heptachlorodibenzo-p-dioxin	9497	6956	13134	9862	31.5
Octachlorodibenzo-p-dioxín	5475	4267	3965	4569	17.5
2378-tetrachlorodibenzofuran	47.3	36.5	26.4	36.7	28.4
12378-pentachlorodibenzofuran	150	86.4	64.9	100	43.9
23478-pentachlorodibenzofuran	<520	<300	<219	<346	45.0
123478-hexachlorodibenzofuran	1713	1152	898	1254	33.2
123678-hexachlorodibenzofuran	861	554	426	614	36.4
234678-hexachlorodibenzofuran	1545	931	832	1103	35.0
123789-hexachlorodibenzofuran	<115	<69.1	<48.1	<77.3	44.0
1234678-heptachlorodibenzofuran	3089	2118	1749	2319	29.8
1234789-heptachlorodibenzofuran	714	488	411	538	29.3
Octachlorodibenzofuran	<1453	<1157	<1093	<1234	15.5
PCB 81	36.7	24.0	17.5	26.1	37.4
PCB 77	82.6	58.6	48.1	63.1	28.0
PCB 123	<16.8	<10.1	<10.8	<12.6	29.5
PCB 118	489	316	160	322	51.2
PCB 114	<14.8	<18.0	12.2	<15.0	19.3
PCB 105	199	122	72.9	131	48.4
PCB 126	141	78.1	53.9	90.9	49.2
PCB 167	35.2	<27.0	19.0	<27.1	30.0
PCB 156 + PCB 157	199	138	<75.8	<138	44.7
PCB 169	128	90.1	62.7	93.8	35.2
PCB 189	214	165	<99.1	<159	36.2
Total Dioxins & Furans Only	<31806	<21430	<25807	<26348	19.8
Total PCBs Only	<1556	<1047	<632	<1078	42.9
Total Dioxins & Furans and PCBs	<33363	<22477	<26439	<27426	20.1

^{*} At 25°C and 1 atmosphere

TABLE 39

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific		Dry Adjusted Concentration					
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%		
2378-tetrachlorodibenzo-p-dioxin	6.19	2.92	2.63	3.92	50.5		
12378-pentachlorodibenzo-p-dioxin	134	78.9	58.6	90.4	43.0		
123478-hexachlorodibenzo-p-dioxin	511	332	293	379	30.6		
123678-hexachlorodibenzo-p-dioxin	1665	953	795	1138	40.7		
123789-hexachlorodibenzo-p-dioxin	2593	1108	1018	1573	56.2		
1234678-heptachlorodibenzo-p-dioxin	7033	5198	9681	7304	30.9		
Octachlorodibenzo-p-dioxin	4054	3189	2923	3389	17.5		
2378-tetrachlorodibenzofuran	35.0	27.3	19.4	27.2	28.5		
12378-pentachlorodibenzofuran	111	64.6	47.8	74.4	43.8		
23478-pentachlorodibenzofuran	<385	<225	<161	<257	44.9		
123478-hexachlorodibenzofuran	1268	861	662	930	33.2		
123678-hexachlorodibenzofuran	638	414	314	455	36.4		
234678-hexachlorodibenzofuran	1144	696	614	818	34.9		
123789-hexachlorodibenzofuran	<84.9	<51.6	<35.5	<57.3	44.0		
1234678-heptachlorodibenzofuran	2288	1583	1289	1720	29.8		
1234789-heptachlorodibenzofuran	529	365	303	399	29.3		
Octachlorodibenzofuran	<1076	<865	<806	<915	15.5		
PCB 81	27.2	18.0	12.9	19.3	37.4		
PCB 77	61.2	43.8	35.5	46.8	28.0		
PCB 123	<12.5	<7.52	<7.95	<9.31	29.4		
PCB 118	362	236	118	239	51.1		
PCB 114	<11.0	<13.5	9.03	<11.2	20.0		
PCB 105	147	90.9	53.7	97.3	48.4		
PCB 126	104	58.4	39.8	67.4	49.2		
PCB 167	26.0	<20.2	14.0	<20.1	30.1		
PCB 156 + PCB 157	147	103	<55.9	<102	44.7		
PCB 169	95.1	67.4	46.2	69.6	35.3		
PCB 189	159	124	<73.1	<118	36.3		
Total Dioxins & Furans Only	<23554	<16015	<19023	<19530	19.4		
Total PCBs Only	<1153	<782	<466	<800	42.9		
Total Dioxins & Furans and PCBs	<24706	<16797	<19489	<20331	19.8		

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

TABLE 40

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific	N	Coefficient			
Isomer	Test No. 1 Test No. 2		Test No. 3 Average		of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	7.03	3.27	2.97	4.42	51.2
12378-pentachlorodibenzo-p-dioxin	152	88.4	66.1	102	43.5
123478-hexachlorodibenzo-p-dioxin	580	372	331	428	31.2
123678-hexachlorodibenzo-p-dioxin	1889	1068	897	1285	41.3
123789-hexachlorodibenzo-p-dioxin	2943	1242	1148	1778	56.9
1234678-heptachlorodibenzo-p-dioxin	7982	5825	10920	8242	31.0
Octachlorodibenzo-p-dioxin	4602	3573	3296	3824	18.0
 2378-tetrachlorodibenzofuran	39.7	30.6	21.9	30.7	28.9
12378-pentachlorodibenzofuran	126	72.3	53.9	84.0	44.4
23478-pentachlorodibenzofuran	<437	<252	<182	<290	45.5
123478-hexachlorodibenzofuran	1440	965	747	1050	33.7
123678-hexachlorodibenzofuran	724	464	354	514	36.9
234678-hexachlorodibenzofuran	1298	780	692	923	35.5
123789-hexachlorodibenzofuran	<96.4	<57.9	<40.0	<64.8	44.5
1234678-heptachlorodibenzofuran	2596	1774	1454	1942	30.3
1234789-heptachlorodibenzofuran	600	409	342	450	29.8
Octachlorodibenzofuran	<1221	<969	<909	<1033	16.0
PCB 81	30.8	20.1	14.5	21.8	37.9
PCB 77	69.4	49.1	40.0	52.8	28.5
PCB 123	<14.1	<8.43	<8.97	<10.5	30.0
PCB 118	411	264	133	270	51.6
PCB 114	<12.5	<15.1	10.2	<12.6	19.6
PCB 105	167	102	60.6	110	48.9
PCB 126	118	65.4	44.8	76.2	49.7
PCB 167	29.6	<22.6	15.8	<22.7	30.5
PCB 156 + PCB 157	167	116	<63.0	<115	45.1
PCB 169	108	75.5	52.1	78.5	35.7
PCB 189	180	138	<82.4	<134	36.6
Total Dioxins & Furans Only	<26733	<17944	<21456	<22044	20.1
Total PCBs Only	<1308	<876	<526	<903	43.4
Total Dioxins & Furans and PCBs	<28041	<18821	<21981	<22948	20.4

^{*} At 25°C and 1 atmosphere

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

Specific	NESCONDENIES COM AN EMPLOYMENT AND AN AND AN AND AN AND AN AND AND AND	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	0.11	0.054	0.051	0.073	48.8
12378-pentachlorodibenzo-p-dioxin	2.47	1.47	1.14	1.69	41.1
123478-hexachlorodibenzo-p-dioxin	9.45	6.18	5.69	7.11	28.7
123678-hexachlorodibenzo-p-dioxin	30.8	17.7	15.4	21.3	38.9
123789-hexachlorodibenzo-p-dioxin	48.0	20.6	19.7	29.4	54.5
1234678-heptachlorodibenzo-p-dioxin	130	96.7	188	138	33.4
Octachlorodibenzo-p-dioxin	75.0	59.3	56.7	63.7	15.6
2378-tetrachlorodibenzofuran	0.65	0.51	0.38	0.51	26.4
12378-pentachlorodibenzofuran	2.05	1.20	0.93	1.39	42.0
23478-pentachlorodibenzofuran	<7.12	<4.18	<3.13	<4.81	43.1
123478-hexachlorodibenzofuran	23.5	16.0	12.8	17.4	31.3
123678-hexachlorodibenzofuran	11.8	7.71	6.09	8.53	34.5
234678-hexachlorodibenzofuran	21.2	12.9	11.9	15.3	33.1
123789-hexachlorodibenzofuran	<1.57	<0.96	<0.69	<1.07	42.1
1234678-heptachlorodibenzofuran	42.3	29.4	25.0	32.3	27.9
1234789-heptachlorodibenzofuran	9.78	6.79	5.88	7.48	27.3
Octachlorodibenzofuran	<19.9	<16.1	<15.6	<17.2	13.6
PCB 81	0.50	0.33	0.25	0.36	35.5
PCB 77	1.13	0.81	0.69	0.88	26.0
PCB 123	<0.23	<0.14	<0.15	<0.17	27.8
PCB 118	6.70	4.39	2.29	4.46	49.5
PCB 114	<0.20	<0.25	0.18	<0.21	18.2
PCB 105	2.72	1.69	1.04	1.82	46.6
PCB 126	1.93	1.09	0.77	1.26	47.4
PCB 167	0.48	<0.38	0.27	<0.38	28.0
PCB 156 + PCB 157	2.72	1.92	<1.08	<1.91	42.9
PCB 169	1.76	1.25	0.90	1.30	33.3
PCB 189	2.93	2.30	<1.42	<2.22	34.3
Total Dioxins & Furans Only	<436	<298	<369	<368	18.8
Total PCBs Only	<21.3	<14.5	<9.04	<15.0	41.1
Total Dioxins & Furans and PCBs	<457	<312	<378	<383	18.9

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

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	3.08	5.28	3.92	4.42	0.073
12378-pentachlorodibenzo-p-dioxin	71.0	122	90.4	102	1.69
123478-hexachlorodibenzo-p-dioxin	298	511	379	428	7.11
123678-hexachlorodibenzo-p-dioxin	894	1534	1138	1285	21.3
123789-hexachlorodibenzo-p-dioxin	1237	2122	1573	1778	29.4
1234678-heptachlorodibenzo-p-dioxin	5745	9862	7304	8242	138
Octachlorodibenzo-p-dioxin	2663	4569	3389	3824	63.7
2378-tetrachlorodibenzofuran	21.4	36.7	27.2	30.7	0.51
12378-pentachlorodibenzofuran	58.5	100	74.4	84.0	1.39
23478-pentachlorodibenzofuran	<202	<346	<257	<290	<4.81
123478-hexachlorodibenzofuran	731	1254	930	1050	17.4
123678-hexachlorodibenzofuran	358	614	455	514	8.53
234678-hexachlorodibenzofuran	643	1103	818	923	15.3
123789-hexachlorodibenzofuran	<45.1	<77.3	<57.3	<64.8	<1.07
1234678-heptachlorodibenzofuran	1352	2319	1720	1942	32.3
1234789-heptachlorodibenzofuran	313	538	399	450	7.48
Octachlorodibenzofuran	<719	<1234	<915	<1033	<17.2
PCB 81	15.2	26.1	19.3	21.8	0.36
PCB 77	36.8	63.1	46.8	52.8	0.88
PCB 123	<7.32	<12.6	<9.31	<10.5	<0.17
PCB 118	188	322	239	270	4.46
PCB 114	<8.77	<15.0	<11.2	<12.6	<0.21
PCB 105	76.4	131	97.3	110	1.82
PCB 126	53.0	90.9	67.4	76.2	1.26
PCB 167	<15.8	<27.1	<20.1	<22.7	<0.38
PCB 156 + PCB 157	<80.2	<138	<102	<115	<1.91
PCB 169	54.7	93.8	69.6	78.5	1.30
PCB 189	<93.0	<159	<118	<134	<2.22
Total Dioxins & Furans Only	<15353	<26348	<19530	<22044	<368
Total PCBs Only	<629	<1078	<800	<903	<15.0
Total Dioxins & Furans and PCBs	<15982	<27426	<20331	<22948	<383

^{*} At 25°C and 1 atmosphere

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

TABLE 43

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Blank Dioxin and Furan Specific Isomer Analyses

2378-tetrachlorodibenzo-p-dioxin 12378-pentachlorodibenzo-p-dioxin 123478-hexachlorodibenzo-p-dioxin	7rain pg <5.7 <8.7 <6.0 <6.0 <5.4	8lank pg <5.6 <7.2 <6.4 <6.5
12378-pentachlorodibenzo-p-dioxin 123478-hexachlorodibenzo-p-dioxin	<5.7 <8.7 <6.0 <6.0	<5.6 <7.2 <6.4
12378-pentachlorodibenzo-p-dioxin 123478-hexachlorodibenzo-p-dioxin	<8.7 <6.0 <6.0	<7.2 <6.4
12378-pentachlorodibenzo-p-dioxin 123478-hexachlorodibenzo-p-dioxin	<8.7 <6.0 <6.0	<7.2 <6.4
123478-hexachlorodibenzo-p-dioxin	<6.0 <6.0	<6.4
	<6.0	
		<0.5
123678-hexachlorodibenzo-p-dioxin	<5.4	-۵ ۵
123789-hexachlorodibenzo-p-dioxin	40.5	<5.8
1234678-heptachlorodibenzo-p-dioxin	10.6	<5.9
Octachlorodibenzo-p-dioxin	28.2	25.4
2378-tetrachlorodibenzofuran	<3.8	<3.9
12378-pentachlorodibenzofuran	<8.0	<5.8
23478-pentachlorodibenzofuran	<8.0	<5.8
123478-hexachlorodibenzofuran	<6.0	<6.0
123678-hexachlorodibenzofuran	<5.5	<5.5
234678-hexachlorodibenzofuran	<6.0	<6.0
123789-hexachlorodibenzofuran	<6.6	<6.6
1234678-heptachlorodibenzofuran	<4.4	<5.6
1234789-heptachlorodibenzofuran	<5.3	<6.8
Octachlorodibenzofuran	<6.3	<6.0
PCB 81	<64	<120
PCB 77	<63	<120
PCB 123	<57	<110
PCB 118	440	<98
PCB 114	<49	<95
PCB 105	<150	<99
PCB 126	<51	<99
PCB 167	<90	<57
PCB 156 + PCB 157	<84	<53
PCB 169	<90	<56
PCB 189	<80	<100
Total Dioxins & Furans Only	<131	<121
Total PCBs Only	<1218	<1007
Total Dioxins & Furans and PCBs	<1349	<1128

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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	Toxicity	Actual Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	
2378-tetrachlorodibenzo-p-dioxin	1.000	4.88	2.28	2.08	3.08	
12378-pentachlorodibenzo-p-dioxin	1.000	105	61.7	46.2	71.0	
123478-hexachlorodibenzo-p-dioxin	0.100	40.2	26.0	23.1	29.8	
123678-hexachlorodibenzo-p-dioxin	0.100	131	74.5	62.7	89.4	
123789-hexachlorodibenzo-p-dioxin	0.100	204	86.6	80.2	124	
1234678-heptachlorodibenzo-p-dioxin	0.010	55.4	40.6	76.3	57.4	
Octachlorodibenzo-p-dioxin	0.0003	0.96	0.75	0.69	0.80	
2378-tetrachlorodibenzofuran	0.100	2.75	2.13	1.53	2.14	
12378-pentachlorodibenzofuran	0.030	2.62	1.51	1.13	1.75	
23478-pentachlorodibenzofuran	0.300	<90.9	<52 <i>.</i> 6	<38.1	<60.6	
123478-hexachlorodibenzofuran	0.100	99.9	67.3	52.2	73.1	
123678-hexachlorodibenzofuran	0.100	50.2	32.4	24.7	35.8	
234678-hexachlorodibenzofuran	0.100	90.0	54.4	48.4	64.3	
123789-hexachlorodibenzofuran	0.100	<6.69	<4.04	<2.80	<4.51	
1234678-heptachlorodibenzofuran	0.010	18.0	12.4	10.2	13.5	
1234789-heptachlorodibenzofuran	0.010	4.16	2.85	2.39	3.13	
Octachlorodibenzofuran	0.0003	<0.25	<0.20	<0.19	<0.22	
PCB 81	0.0003	0.0064	0.0042	0.0031	0.0046	
PCB 77	0.0001	0.0048	0.0034	0.0028	0.0037	
PCB 123	0.00003	<0.00029	<0.00018	<0.00019	<0.00022	
PCB 118	0.00003	0.0086	0.0055	0.0028	0.0056	
PCB 114	0.00003	<0.00026	<0.00032	0.00021	<0.00026	
PCB 105	0.00003	0.0035	0.0021	0.0013	0.0023	
PCB 126	0.100	8.20	4.56	3.14	5.30	
PCB 167	0.00003	0.00062	<0.00047	0.00033	<0.00047	
PCB 156 + PCB 157	0.00003	0.0035	0.0024	<0.0013	< 0.0024	
PCB 169	0.030	2.25	1.58	1.09	1.64	
PCB 189	0.00003	0.0037	0.0029	<0.0017	<0.0028	
Total Dioxins & Furans Only		<907	<522	<473	<634	
Total PCBs Only		<10.5	<6.16	<4.24	<6.96	
Total Dioxins & Furans and PCBs		<918	<528	<477	<641	

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

TABLE 45

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Somer Equivalency Test No. 1 Test No. 2 Factor pg TEQ/Rm³* pg TeQ/Rm³*		
2378-tetrachlorodibenzo-p-dioxin 1.000 8.37 3.91 12378-pentachlorodibenzo-p-dioxin 1.000 180 106 123478-hexachlorodibenzo-p-dioxin 0.100 69.0 44.5 123678-hexachlorodibenzo-p-dioxin 0.100 225 128 123789-hexachlorodibenzo-p-dioxin 0.100 350 148 1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-heptachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-pentachlorodibenzo-p-dioxin 0.100 4.73 3.65 12378-pentachlorodibenzo-furan 0.100 4.73 3.65 12378-pentachlorodibenzo-furan 0.300 4.49 2.59 23478-pentachlorodibenzo-furan 0.100 171 115 123478-hexachlorodibenzo-furan 0.100 171 115 123478-hexachlorodibenzo-furan 0.100 154 93.1 123478-heptachlorodibenzo-furan 0.100 154 93.1 123	Test No. 3	Average
12378-pentachlorodibenzo-p-dioxin 1.000 180 106 123478-hexachlorodibenzo-p-dioxin 0.100 69.0 44.5 123678-hexachlorodibenzo-p-dioxin 0.100 225 128 123789-hexachlorodibenzo-p-dioxin 0.100 350 148 1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156 <90.1 123478-hexachlorodibenzofuran 0.100 171 115 123678-hexachlorodibenzofuran 0.100 154 93.1 123789-hexachlorodibenzofuran 0.100 154 93.1 1234789-heptachlorodibenzofuran 0.010 30.9 21.2 1234789-heptachlorodibenzofuran 0.010 7.14 4.88 Octachlorodibenzofuran 0.0003 0.011 0.0072 PCB 77	* pg TEQ/Rm³*	pg TEQ/Rm³*
12378-pentachlorodibenzo-p-dioxin 1.000 180 106 123478-hexachlorodibenzo-p-dioxin 0.100 69.0 44.5 123678-hexachlorodibenzo-p-dioxin 0.100 225 128 123789-hexachlorodibenzo-p-dioxin 0.100 350 148 1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.100 171 115 123478-hexachlorodibenzofuran 0.100 171 115 123678-hexachlorodibenzofuran 0.100 154 93.1 123789-hexachlorodibenzofuran 0.100 154 93.1 123789-hexachlorodibenzofuran 0.010 30.9 21.2 1234789-heptachlorodibenzofuran 0.010 7.14 4.88 Octachlorodibenzofuran 0.000 7.14 4.88 Octachlorodibenzofuran 0.000 0.001 0.0083 0.0059	3.57	5.28
123478-hexachlorodibenzo-p-dioxin 0.100 69.0 44.5 123678-hexachlorodibenzo-p-dioxin 0.100 225 128 123789-hexachlorodibenzo-p-dioxin 0.100 350 148 1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	79.4	122
123678-hexachlorodibenzo-p-dioxin 0.100 225 128 123789-hexachlorodibenzo-p-dioxin 0.100 350 148 1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	39.8	51.1
123789-hexachlorodibenzo-p-dioxin 0.100 350 148 1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	108	153
1234678-heptachlorodibenzo-p-dioxin 0.010 95.0 69.6 Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	138	212
Octachlorodibenzo-p-dioxin 0.0003 1.64 1.28 2378-tetrachlorodibenzofuran 0.100 4.73 3.65 12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	131	98.6
12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	1.19	1.37
12378-pentachlorodibenzofuran 0.030 4.49 2.59 23478-pentachlorodibenzofuran 0.300 <156	2.64	2.67
23478-pentachlorodibenzofuran 0.300 <156	2.64	3.67
123478-hexachlorodibenzofuran 0.100 171 115 123678-hexachlorodibenzofuran 0.100 86.1 55.4 234678-hexachlorodibenzofuran 0.100 154 93.1 123789-hexachlorodibenzofuran 0.100 <11.5	1.95	3.01
123678-hexachlorodibenzofuran 0.100 86.1 55.4 234678-hexachlorodibenzofuran 0.100 154 93.1 123789-hexachlorodibenzofuran 0.100 <11.5	<65.6	<104
234678-hexachlorodibenzofuran 0.100 154 93.1 123789-hexachlorodibenzofuran 0.100 <11.5	89.8	125
123789-hexachlorodibenzofuran 0.100 <11.5	42.6	61.4
1234678-heptachlorodibenzofuran 0.010 30.9 21.2 1234789-heptachlorodibenzofuran 0.010 7.14 4.88 Octachlorodibenzofuran 0.0003 <0.44	83.2	110
1234789-heptachlorodibenzofuran 0.010 7.14 4.88 Octachlorodibenzofuran 0.0003 <0.44	<4.81	<7.73
Octachlorodibenzofuran 0.0003 <0.44 <0.35 PCB 81 0.0003 0.011 0.0072 PCB 77 0.0001 0.0083 0.0059 PCB 123 0.00003 <0.00050	17.5	23.2
PCB 81 0.0003 0.011 0.0072 PCB 77 0.0001 0.0083 0.0059 PCB 123 0.00003 <0.00050	4.11	5.38
PCB 77 0.0001 0.0083 0.0059 PCB 123 0.00003 <0.00050	<0.33	<0.37
PCB 123 0.00003 <0.00050	0.0052	0.0078
PCB 118 0.00003 0.015 0.0095 PCB 114 0.00003 <0.00045	0.0048	0.0063
PCB 114 0.00003 <0.00045	<0.00032	<0.00038
PCB 105 0.00003 0.0060 0.0037 PCB 126 0.100 14.1 7.81 PCB 167 0.00003 0.0011 <0.00081	0.0048	0.0097
PCB 126 0.100 14.1 7.81 PCB 167 0.00003 0.0011 <0.00081	0.00037	<0.00045
PCB 167 0.00003 0.0011 <0.00081	0.0022	0.0039
PCB 156 + PCB 157 0.00003 0.0060 0.0041	5.39	9.09
	0.00057	<0.00081
PCB 169 0.030 3.85 2.70	< 0.0023	<0.0041
	1.88	2.81
PCB 189 0.00003 0.0064 0.0050	<0.0030	<0.0048
Total Dioxins & Furans Only <1556 <894	<814	<1088
Total PCBs Only <18.0 <10.6	<7.30	<11.9
Total Dioxins & Furans and PCBs <1574 <905	<821	<1100

^{*} At 25°C and 1 atmosphere

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

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	Toxicity				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *
2378-tetrachlorodibenzo-p-dioxin	1.000	6.19	2.92	2.63	3.92
12378-pentachlorodibenzo-p-dioxin	1.000	134	78.9	58.6	90.4
123478-hexachlorodibenzo-p-dioxin	0.100	51.1	33.2	29.3	37.9
123678-hexachlorodibenzo-p-dioxin	0.100	166	95.3	79.5	114
123789-hexachlorodibenzo-p-dioxin	0.100	259	111	102	157
1234678-heptachlorodibenzo-p-dioxin	0.010	70.3	52.0	96.8	73.0
Octachlorodibenzo-p-dioxin	0.0003	1.22	0.96	0.88	1.02
2378-tetrachlorodibenzofuran	0.100	3.50	2.73	1.94	2.72
12378-pentachlorodibenzofuran	0.030	3.32	1.94	1.43	2.23
23478-pentachlorodibenzofuran	0.300	<116	<67.4	<48.4	<77.1
123478-hexachlorodibenzofuran	0.100	127	86.1	66.2	93.0
123678-hexachlorodibenzofuran	0.100	63.8	41.4	31.4	45.5
234678-hexachlorodibenzofuran	0.100	114	69.6	61.4	81.8
123789-hexachlorodibenzofuran	0.100	<8.49	<5.16	<3.55	<5.73
1234678-heptachlorodibenzofuran	0.010	22.9	15.8	12.9	17.2
1234789-heptachlorodibenzofuran	0.010	5.29	3.65	3.03	3.99
Octachlorodibenzofuran	0.0003	<0.32	<0.26	<0.24	<0.27
PCB 81	0.0003	0.0082	0.0054	0.0039	0.0058
PCB 77	0.0001	0.0061	0.0044	0.0035	0.0047
PCB 123	0.00003	<0.00037	<0.00023	<0.00024	<0.00028
PCB 118	0.00003	0.011	0.0071	0.0035	0.0072
PCB 114	0.00003	<0.00033	<0.00040	0.00027	<0.00033
PCB 105	0.00003	0.0044	0.0027	0.0016	0.0029
PCB 126	0.100	10.4	5.84	3.98	6.74
PCB 167	0.00003	0.00078	<0.00061	0.00042	<0.00060
PCB 156 + PCB 157	0.00003	0.0044	0.0031	<0.0017	< 0.0031
PCB 169	0.030	2.85	2.02	1.39	2.09
PCB 189	0.00003	0.0048	0.0037	<0.0022	<0.0036
Total Dioxins & Furans Only		<1153	<668	<600	<807
Total PCBs Only		<13.3	<7.89	<5.38	<8.86
Total Dioxins & Furans and PCBs		<1166	<676	<605	<816

^{*} 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.

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	Toxicity	unum un poli premi li in est depti u uni mulan li independenti en est est est est un un un de un en en est est	Toxicity Dry Adjusted Concentration					
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average			
	Factor	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm ³ *	pg TEQ/Rm ³ *			
2378-tetrachlorodibenzo-p-dioxin	1.000	6.19	2.92	2.63	3.92			
12378-pentachlorodibenzo-p-dioxin	0.500	66.8	39.5	29.3	45.2			
123478-hexachlorodibenzo-p-dioxin	0.100	51.1	33.2	29.3	37.9			
123678-hexachlorodibenzo-p-dioxin	0.100	166	95.3	79.5	114			
123789-hexachlorodibenzo-p-dioxin	0.100	259	111	102	157			
1234678-heptachlorodibenzo-p-dioxin	0.010	70.3	52.0	96.8	73.0			
Octachlorodibenzo-p-dioxin	0.001	4.05	3.19	2.92	3.39			
2378-tetrachlorodibenzofuran	0.100	3.50	2.73	1.94	2.72			
12378-pentachlorodibenzofuran	0.050	5.54	3.23	2.39	3.72			
23478-pentachlorodibenzofuran	0.500	<193	<112	<80.6	<128			
123478-hexachlorodibenzofuran	0.100	127	86.1	66.2	93.0			
123678-hexachlorodibenzofuran	0.100	63.8	41.4	31.4	45.5			
234678-hexachlorodibenzofuran	0.100	114	69.6	61.4	81.8			
123789-hexachlorodibenzofuran	0.100	<8.49	<5.16	<3.55	<5.73			
1234678-heptachlorodibenzofuran	0.010	22.9	15.8	12.9	17.2			
1234789-heptachlorodibenzofuran	0.010	5.29	3.65	3.03	3.99			
Octachlorodibenzofuran	0.001	<1.08	<0.86	<0.81	<0.92			
Total Dioxins & Furans		<1169	<678	<606	<818			
In-Stack Emission Limit					60			

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

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 47

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific	Toxicity		Wet Reference	Concentration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	7.03	3.27	2.97	4.42
12378-pentachlorodibenzo-p-dioxin	1.000	152	88.4	66.1	102
123478-hexachlorodibenzo-p-dioxin	0.100	58.0	37.2	33.1	42.8
123678-hexachlorodibenzo-p-dioxin	0.100	189	107	89.7	128
123789-hexachlorodibenzo-p-dioxin	0.100	294	124	115	178
1234678-heptachlorodibenzo-p-dioxin	0.010	79.8	58.2	109	82.4
Octachlorodibenzo-p-dioxin	0.0003	1.38	1.07	0.99	1.15
2378-tetrachlorodibenzofuran	0.100	3.97	3.06	2.19	3.07
12378-pentachlorodibenzofuran	0.030	3.77	2.17	1.62	2.52
23478-pentachlorodibenzofuran	0.300	<131	<75.5	<54.5	<87.0
123478-hexachlorodibenzofuran	0.100	144	96.5	74.7	105
123678-hexachlorodibenzofuran	0.100	72.4	46.4	35.4	51.4
234678-hexachlorodibenzofuran	0.100	130	78.0	69.2	92.3
123789-hexachlorodibenzofuran	0.100	<9.64	<5.79	<4.00	<6.48
1234678-heptachlorodibenzofuran	0.010	26.0	17.7	14.5	19.4
1234789-heptachlorodibenzofuran	0.010	6.00	4.09	3.42	4.50
Octachlorodibenzofuran	0.0003	<0.37	<0.29	<0.27	<0.31
PCB 81	0.0003	0.0093	0.0060	0.0044	0.0066
PCB 77	0.0001	0.0069	0.0049	0.0040	0.0053
PCB 123	0.00003	< 0.00042	<0.00025	<0.00027	<0.00032
PCB 118	0.00003	0.012	0.0079	0.0040	0.0081
PCB 114	0.00003	< 0.00037	<0.00045	0.00031	<0.00038
PCB 105	0.00003	0.0050	0.0031	0.0018	0.0033
PCB 126	0.100	11.8	6.54	4.48	7.62
PCB 167	0.00003	0.00089	<0.00068	0.00047	<0.00068
PCB 156 + PCB 157	0.00003	0.0050	0.0035	< 0.0019	<0.0035
PCB 169	0.030	3.24	2.26	1.56	2.36
PCB 189	0.00003	0.0054	0.0042	<0.0025	<0.0040
Total Dioxins & Furans Only		<1308	<749	<677	<911
Total PCBs Only		<15.1	<8.84	<6.07	<10.0
Total Dioxins & Furans and PCBs		<1323	<758	<683	<921

^{*} At 25°C and 1 atmosphere

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

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

Specific	Toxicity		Emissio	n Rate			
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average		
	Factor	ng TEQ/s	ng TEQ/s	ng TEQ/s	ng TEQ/s		
2378-tetrachlorodibenzo-p-dioxin	1.000	0.11	0.054	0.051	0.073		
12378-pentachlorodibenzo-p-dioxin	1.000	2.47	1.47	1.14	1.69		
123478-hexachlorodibenzo-p-dioxin	0.100	0.94	0.62	0.57	0.71		
123678-hexachlorodibenzo-p-dioxin	0.100	3.08	1.77	1.54	2.13		
123789-hexachlorodibenzo-p-dioxin	0.100	4.80	2.06	1.97	2.94		
1234678-heptachlorodibenzo-p-dioxin	0.010	1.30	0.97	1.88	1.38		
Octachlorodibenzo-p-dioxin	0.0003	0.023	0.018	0.017	0.019		
2378-tetrachlorodibenzofuran	0.100	0.065	0.051	0.038	0.051		
12378-pentachlorodibenzofuran	0.030	0.061	0.036	0.028	0.042		
23478-pentachlorodibenzofuran	0.300	<2.14	<1.25	< 0.94	<1.44		
123478-hexachlorodibenzofuran	0.100	2.35	1.60	1.28	1.74		
123678-hexachlorodibenzofuran	0.100	1.18	0.77	0.61	0.85		
234678-hexachlorodibenzofuran	0.100	2.12	1.29	1.19	1.53		
123789-hexachlorodibenzofuran	0.100	<0.16	< 0.096	< 0.069	<0.11		
1234678-heptachlorodibenzofuran	0.010	0.42	0.29	0.25	0.32		
1234789-heptachlorodibenzofuran	0.010	0.098	0.068	0.059	0.075		
Octachlorodibenzofuran	0.0003	<0.0060	<0.0048	<0.0047	<0.0052		
PCB 81	0.0003	0.00015	0.00010	0.000075	0.00011		
PCB 77	0.0001	0.00011	0.000081	0.000069	0.000088		
PCB 123	0.00003	< 0.0000069	<0.0000042	<0.000046	<0.0000052		
PCB 118	0.00003	0.00020	0.00013	0.000069	0.00013		
PCB 114	0.00003	<0.0000061	<0.0000075	0.0000053	<0.000063		
PCB 105	0.00003	0.000082	0.000051	0.000031	0.000055		
PCB 126	0.100	0.19	0.11	0.077	0.13		
PCB 167	0.00003	0.000014	<0.000011	0.0000081	<0.000011		
PCB 156 + PCB 157	0.00003	0.000082	0.000058	<0.000033	<0.000057		
PCB 169	0.030	0.053	0.038	0.027	0.039		
PCB 189	0.00003	0.000088	0.000069	<0.000043	<0.000066		
Total Dioxins & Furans Only		<21.3	<12.4	<11.6	<15.1		
Total PCBs Only		<0.25	<0.15	<0.10	< 0.17		
Total Dioxins & Furans and PCBs		<21.6	<12.6	<11.7	<15.3		

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

TABLE 49
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet
Immary of Dioxin and Furan Toxicity Equivalent Emissic

Summary of Dioxin and Furan Toxicity Equivalent Emission Data Calculated Using the Full Detection Limit

Specific	Actual	Dry Reference Concentration	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm ³ *	pg TEQ/Rm ³ **	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodíbenzo-p-dioxin	3.08	5.28	3.92	4.42	0.073
12378-pentachlorodibenzo-p-dioxin	71.0	122	90.4	102	1.69
123478-hexachlorodibenzo-p-dioxin	29.8	51.1	37.9	42.8	0.71
123678-hexachlorodibenzo-p-dioxin	89.4	153	114	128	2.13
123789-hexachlorodibenzo-p-dioxin	124	212	157	178	2.94
1234678-heptachlorodibenzo-p-dioxin	57.4	98.6	73.0	82.4	1.38
Octachlorodibenzo-p-dioxin	0.80	1.37	1.02	1.15	0.019
·					
2378-tetrachlorodibenzofuran	2.14	3.67	2.72	3.07	0.051
12378-pentachlorodibenzofuran	1.75	3.01	2.23	2.52	0.042
23478-pentachlorodibenzofuran	<60.6	<104	<77.1	<87.0	<1.44
123478-hexachlorodibenzofuran	73.1	125	93.0	105	1.74
123678-hexachlorodibenzofuran	35.8	61.4	45.5	51.4	0.85
234678-hexachlorodibenzofuran	64.3	110	81.8	92.3	1.53
123789-hexachlorodibenzofuran	<4.51	<7.73	<5.73	<6.48	< 0.11
1234678-heptachlorodibenzofuran	13.5	23.2	17.2	19.4	0.32
1234789-heptachlorodibenzofuran	3.13	5.38	3.99	4.50	0.075
Octachlorodibenzofuran	<0.22	<0.37	<0.27	<0.31	<0.0052
PCB 81	0.0046	0.0078	0.0058	0.0066	0.00011
PCB 77	0.0037	0.0063	0.0047	0.0053	0.00011
PCB 123	<0.00022	<0.0003	<0.00028	<0.0033	<0.000088
PCB 118	0.0056	0.0097	0.0072	0.0081	0.00013
PCB 114	<0.00026	<0.0037	<0.00033	<0.0038	<0.00013
PCB 105	0.0023	0.0039	0.0029	0.0033	0.000055
PCB 126	5.30	9.09	6.74	7.62	0.00033
PCB 167	<0.00047	<0.00081	<0.00060	<0.00068	<0.00011
PCB 156 + PCB 157	<0.0024	<0.0041	<0.0031	<0.0035	<0.000011
PCB 169	1.64	2.81	2.09	2.36	0.00037
PCB 189	<0.0028	<0.0048	< 0.0036	<0.0040	<0.00066
Total Dioxins & Furans Only	<634	<1088	<807	<911	<15.1
Total PCBs Only	<6.96	<11.9	<8.86	<10.0	<0.17
Total Dioxins & Furans and PCBs	<641	<11.9	<816	<921	<15.3

^{*} At 25°C and 1 atmosphere

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

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

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

	924000000000000000000000000000000000000				
Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm ^{3*}	pg TEQ/Rm3**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	3.08	5.28	3.92	4.42	0.073
12378-pentachlorodibenzo-p-dioxin	71.0	122	90.4	102	1.69
123478-hexachlorodibenzo-p-dioxin	29.8	51.1	37.9	42.8	0.71
123678-hexachlorodibenzo-p-dioxin	89.4	153	114	128	2.13
123789-hexachlorodibenzo-p-dioxin	124	212	157	178	2.94
1234678-heptachlorodibenzo-p-dioxin	57.4	98.6	73.0	82.4	1.38
Octachlorodibenzo-p-dioxin	0.80	1.37	1.02	1.15	0.019
2378-tetrachlorodibenzofuran	2.14	3.67	2.72	3.07	0.051
12378-pentachlorodibenzofuran	1.75	3.01	2.23	2.52	0.042
23478-pentachlorodibenzofuran	30.3	52.0	38.5	43.5	0.72
123478-hexachlorodibenzofuran	73.1	125	93.0	105	1.74
123678-hexachlorodibenzofuran	35.8	61.4	45.5	51.4	0.85
234678-hexachlorodibenzofuran	64.3	110	81.8	92.3	1.53
123789-hexachlorodibenzofuran	2.25	3.87	2.87	3.24	0.054
1234678-heptachlorodibenzofuran	13.5	23.2	17.2	19.4	0.32
1234789-heptachlorodibenzofuran	3.13	5.38	3.99	4.50	0.075
Octachlorodibenzofuran	0.11	0.19	0.14	0.15	0.0026
PCB 81	0.0046	0.0078	0.0058	0.0066	0.00011
PCB 77	0.0037	0.0063	0.0047	0.0053	0.000088
PCB 123	0.00011	0.00019	0.00014	0.00016	0.0000026
PCB 118	0.0056	0.0097	0.0072	0.0081	0.00013
PCB 114	0.00017	0.00029	0.00021	0.00024	0.0000040
PCB 105	0.0023	0.0039	0.0029	0.0033	0.000055
PCB 126	5.30	9.09	6.74	7.62	0.13
PCB 167	0.00039	0.00068	0.00050	0.00057	0.0000094
PCB 156 + PCB 157	0.0022	0.0037	0.0028	0.0031	0.000052
PCB 169	1.64	2.81	2.09	2.36	0.039
PCB 189	0.0025	0.0043	0.0032	0.0036	0.000059
Total Dioxins & Furans Only	602	1032	765	864	14.4
Total PCBs Only	6.96	11.9	8.86	10.0	0.17
Total Dioxins & Furans and PCBs	609	1044	774	874	14.5

^{*} At 25°C and 1 atmosphere

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.

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

TABLE 51

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

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	0.31	27.6	47.4	35.1	39.8	0.65
1,4-Dichlorobenzene	0.31	27.6	47.4	35.1	39.8	0.65
1,2-Dichlorobenzene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Total Dichlorobenzene	<0.92	<82.0	<141	<104	<118	<1.93
1,3,5-trichlorobenzene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
1,2,4-trichlorobenzene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
1,2,3-trichlorobenzene	< 0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Total Trichlorobenzene	<0.90	<80.2	<138	<102	<116	<1.89
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
1,2,3,4-tetrachlorobenzene	< 0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Total Tetrachlorobenzene	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
Pentachlorobenzene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Hexachlorobenzene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Total Chlorobenzenes	<3.02	<269	<462	<342	<388	<6.33

Dry Gas Volume Sampled (Rm³*) :	6.539
Actual Flowrate (m³/s) :	23.5
Dry Reference Flowrate (Rm³/s*) :	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*) :	16.3

^{*} At 25°C and 1 atmosphere

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

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
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
1,4-Dichlorobenzene	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
1,2-Dichlorobenzene	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Total Dichlorobenzene	<0.90	<79.0	<135	<101	<113	<1.88
1,3,5-trichlorobenzene	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
1,2,4-trichlorobenzene	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
1,2,3-trichlorobenzene	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Total Trichlorobenzene	<0.90	<79.0	<135	<101	<113	<1.88
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
1,2,3,4-tetrachlorobenzene	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Total Tetrachlorobenzene	<0.60	<52.6	<90.1	<67.4	<75.5	<1.25
Pentachlorobenzene	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Hexachlorobenzene	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Total Chlorobenzenes	<3.00	<263	<451	<337	<377	<6.27

Dry Gas Volume Sampled (Rm ³ *) :	6,656
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*):	16.6

^{*} At 25°C and 1 atmosphere

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

TABLE 53

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

Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Collected	Concentration	Concentration	Concentration	Concentration	Rate
μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
					<0.63
<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
<0.90	<76.3	<131	<96.7	<109	<1.88
<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
< 0.30	<25.4	<43.7	<32.2	<36.4	<0.63
< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
<0.90	<76.3	<131	<96.7	<109	<1.88
<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
<0.60	<50.8	<87.5	<64.5	<72.7	<1.25
<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
<3.00	<254	<437	<322	<364	<6.25
	Collected μg <0.30 <0.30 <0.30 <0.90 <0.30 <0.30 <0.30 <0.30 <0.30 <0.30 <0.30 <0.30 <0.30 <0.30 <0.30	Collected Concentration μg ng/m³ <0.30	Collected Concentration Concentration μg ng/m³ ng/Rm³* <0.30	Collected Concentration Concentration Concentration μg ng/m³ ng/Rm³** ng/Rm³** <0.30	Collected μg Concentration ng/m³ Concentration ng/Rm³** Concentration ng/Rm³** Concentration ng/Rm³** <0.30

Dry Gas Volume Sampled (Rm ³ *) :	6.860
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*):	17.2

^{*} At 25°C and 1 atmosphere

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

TABLE 54

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Actual Concentrations for Chlorobenzenes

Specific			Coefficient		
lsomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
1,3-Dichlorobenzene	27.6	<26.3	<25.4	<26.5	4.2
1,4-Dichlorobenzene	27.6	<26.3	<25.4	<26.5	4.2
1,2-Dichlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
Total Dichlorobenzene	<82.0	<79.0	<76.3	<79.1	3.6
1,3,5-trichlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
1,2,4-trichlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
1,2,3-trichlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
Total Trichlorobenzene	<80.2	<79.0	<76.3	<78.5	2.6
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<26.7	<26.3	<25.4	<26.2	2.6
1,2,3,4-tetrachlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
Total Tetrachlorobenzene	<53.5	<52.6	<50.8	<52.3	2.6
Pentachlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
Hexachlorobenzene	<26.7	<26.3	<25.4	<26.2	2.6
Total Chlorobenzenes	<269	<263	<254	<262	2.9

TABLE 55

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Dry Reference Concentrations for Chlorobenzenes

Specific	Dry Reference Concentration				Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
1,3-Dichlorobenzene	47.4	<45.1	<43.7	<45.4	4.1
1,4-Dichlorobenzene	47.4	<45.1	<43.7	<45.4	4.1
1,2-Dichlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
Total Dichlorobenzene	<141	<135	<131	<136	3.5
1,3,5-trichlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
1,2,4-trichlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
1,2,3-trichlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
Total Trichlorobenzene	<138	<135	<131	<135	2.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<45.9	<45.1	<43.7	<44.9	2.4
1,2,3,4-tetrachlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
Total Tetrachlorobenzene	<91.8	<90.1	<87 <i>.</i> 5	<89.8	2.4
Pentachlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
Hexachlorobenzene	<45.9	<45.1	<43.7	<44.9	2.4
Total Chlorobenzenes	<462	<451	<437	<450	2.7

^{*} At 25°C and 1 atmosphere

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

Specific		Coefficient			
lsomer	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
1,3-Dichlorobenzene	35.1	<33.7	<32.2	<33.7	4.3
1,4-Dichlorobenzene	35.1	<33.7	<32.2	<33.7	4.3
1,2-Dichlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
Total Dichlorobenzene	<104	<101	<96.7	<101	3.7
1,3,5-trichlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
1,2,4-trichlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
1,2,3-trichlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
Total Trichlorobenzene	<102	<101	<96.7	<99.9	2.8
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<34.0	<33.7	<32.2	<33.3	2.8
1,2,3,4-tetrachlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
Total Tetrachlorobenzene	<67.9	<67.4	<64.5	<66.6	2.8
Pentachlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
Hexachlorobenzene	<34.0	<33.7	<32.2	<33.3	2.8
Total Chlorobenzenes	<342	<337	<322	<334	3.1

^{*} 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	W	let Reference	Concentratio	n	Coefficient	
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%%	
1,3-Dichlorobenzene	39.8	<37.7	<36.4	<38.0	4.6	
1,4-Dichlorobenzene	39.8	<37.7	<36.4	<38.0	4.6	
1,2-Dichlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
Total Dichlorobenzene	<118	<113	<109	<114	4.0	
1,3,5-trichlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
1,2,4-trichlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
1,2,3-trichlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
Total Trichlorobenzene	<116	<113	<109	<113	3.0	
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<38.6	<37.7	<36.4	<37.6	3.0	
1,2,3,4-tetrachlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
Total Tetrachlorobenzene	<77.1	<75.5	<72.7	<75.1	3.0	
Pentachlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
Hexachlorobenzene	<38.6	<37.7	<36.4	<37.6	3.0	
Total Chlorobenzenes	<388	<377	<364	<376	3.3	

^{*} At 25°C and 1 atmosphere

TABLE 58

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Emission Rates for Chlorobenzenes

Specific	TO STATE OF THE ST	Emissic	n Rate		Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/s	μg/s	μg/s	μg/s	%
1,3-Dichlorobenzene	0.65	<0.63	< 0.63	<0.63	2.1
1,4-Dichlorobenzene	0.65	<0.63	< 0.63	< 0.63	2.1
1,2-Dichlorobenzene	< 0.63	< 0.63	< 0.63	<0.63	0.3
Total Dichlorobenzene	<1.93	<1.88	<1.88	<1.89	1.5
1,3,5-trichlorobenzene	<0.63	<0.63	<0.63	<0.63	0.3
1,2,4-trichlorobenzene	< 0.63	< 0.63	< 0.63	< 0.63	0.3
1,2,3-trichlorobenzene	< 0.63	< 0.63	< 0.63	< 0.63	0.3
Total Trichlorobenzene	<1.89	<1.88	<1.88	<1.88	0.3
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.63	<0.63	<0.63	<0.63	0.3
1,2,3,4-tetrachlorobenzene	< 0.63	< 0.63	< 0.63	< 0.63	0.3
Total Tetrachlorobenzene	<1.26	<1.25	<1.25	<1.25	0.3
Pentachlorobenzene	<0.63	<0.63	<0.63	<0.63	0.3
Hexachlorobenzene	<0.63	<0.63	<0.63	<0.63	0.3
Total Chlorobenzenes	<6.33	<6.27	<6.25	<6.28	0.6

TABLE 59

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Summary of Emission Data for Chlorobenzenes

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	<26.5	<45.4	<33.7	<38.0	<0.63
1,4-Dichlorobenzene	<26.5	<45.4	<33.7	<38.0	<0.63
1,2-Dichlorobenzene	<26.2	<44.9	<33.3	<37.6	<0.63
Total Dichlorobenzene	<79.1	<136	<101	<114	<1.89
1,3,5-trichlorobenzene	<26.2	<44.9	<33.3	<37.6	<0.63
1,2,4-trichlorobenzene	<26.2	<44.9	<33.3	<37.6	< 0.63
1,2,3-trichlorobenzene	<26.2	<44.9	<33.3	<37.6	< 0.63
Total Trichlorobenzene	<78.5	<135	<99.9	<113	<1.88
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<26.2	<44.9	<33.3	<37.6	<0.63
1,2,3,4-tetrachlorobenzene	<26.2	<44.9	<33.3	<37.6	< 0.63
Total Tetrachlorobenzene	<52.3	<89.8	<66.6	<75.1	<1.25
Pentachlorobenzene	<26.2	<44.9	<33.3	<37.6	<0.63
Hexachlorobenzene	<26.2	<44.9	<33.3	<37.6	<0.63
Total Chlorobenzenes	<262	<450	<334	<376	<6.28

^{*} 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	Blank Train	Laboratory Blank
and Congener Group Totals	Total μg	Total μg
1,3-Dichlorobenzene	<0.30	<0.30
1,4-Dichlorobenzene	<0.30	<0.30
1,2-Dichlorobenzene	<0.30	<0.30
Total Dichlorobenzene	<0.90	<0.90
1,3,5-trichlorobenzene	<0.30	<0.30
1,2,4-trichlorobenzene	<0.30	<0.30
1,2,3-trichlorobenzene	<0.30	<0.30
Total Trichlorobenzene	<0.90	<0.90
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<0.30
1,2,3,4-tetrachlorobenzene	< 0.30	<0.30
Total Tetrachlorobenzene	<0.60	<0.60
Pentachlorobenzene	<0.30	<0.30
Hexachlorobenzene	< 0.30	<0.30
Total Chlorobenzenes	<3.00	<3.00

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL).

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	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
lsomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	με	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
2-monochlorophenol	0.32	28.5	48.9	36.2	41.1	0.67
3-monochlorophenol	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
4-monochlorophenol	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Total Monochlorophenols	<0.92	<82.0	<141	<104	<118	<1.93
2,6-dichlorophenol	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
2,4 & 2,5-dichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	<0.63
3,5-dichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
2,3-dichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
3,4-dichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Total Dichlorophenols	<1.50	<134	<229	<170	<193	<3.14
2,4,6-trichlorophenol	1.17	104	179	133	150	2.45
2,3,6-trichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
2,3,5-trichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
2,4,5-trichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	<0.63
2,3,4-trichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	<0.63
3,4,5-trichlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Total Trichlorophenols	<2.67	<238	<408	<302	<343	<5.59
2,3,5,6-tetrachlorophenol	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
2,3,4,6-tetrachlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
2,3,4,5-tetrachlorophenol	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Total Tetrachlorophenols	<0.90	<80.2	<138	<102	<116	<1.89
Pentachlorophenol	0.57	50.8	87.2	64.6	73.3	1.19
Total Chlorophenols	<6.56	<585	<1003	<743	<843	<13.7

Dry Gas Volume Sampled (Rm ³ *):	6.539
Actual Flowrate (m ³ /s) :	23.5
Dry Reference Flowrate (Rm³/s*) :	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*) :	16.3

^{*} At 25°C and 1 atmosphere

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

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	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μв	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
2-monochlorophenol	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
3-monochlorophenol	<0.30	<26.3	<45.1 <45.1	<33.7 <33.7	<37.7 <37.7	<0.63
4-monochlorophenol	<0.30	<26.3	<45.1 <45.1	<33.7 <33.7	<37.7 <37.7	<0.63
Total Monochlorophenols	<0.30 <0.90	<79.0	<135	<101	<113	<1.88
l otal Monochiorophenois	<0.90	9.0</td <td><135</td> <td><101</td> <td><113</td> <td><1.88</td>	<135	<101	<113	<1.88
2,6-dichlorophenol	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
2,4 & 2,5-dichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
3,5-dichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
2,3-dichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
3,4-dichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Total Dichlorophenols	<1.50	<132	<225	<168	<189	<3.13
2,4,6-trichlorophenol	1.05	92.1	158	118	132	2.19
2,3,6-trichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
2,3,5-trichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	<0.63
2,4,5-trichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
2,3,4-trichlorophenol	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
3,4,5-trichlorophenol	<0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Total Trichlorophenols	<2.55	<224	<383	<286	<321	<5.33
2,3,5,6-tetrachlorophenol	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
2,3,4,6-tetrachlorophenol	<0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
2,3,4,5-tetrachlorophenol	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Total Tetrachlorophenols	<0.90	<79.0	<135	<101	<113	<1.88
Pentachlorophenol	0.55	48.3	82.6	61.8	69.2	1.15
Total Chlorophenols	<6.40	<562	<962	<719	<805	<13.4

Dry Gas Volume Sampled (Rm ³ *) :	6.656
Actual Flowrate (m ³ /s) :	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

^{*} At 25°C and 1 atmosphere

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

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	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
2-monochlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
3-monochlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
4-monochlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	<0.63
Total Monochlorophenols	<0.90	<76.3	<131	<96.7	<109	<1.88
2,6-dichlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
2,4 & 2,5-dichlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
3,5-dichlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
2,3-dichlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
3,4-dichlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Total Dichlorophenols	<1.50	<127	<219	<161	<182	<3.13
2,4,6-trichlorophenol	1.12	94.9	163	120	136	2.33
2,3,6-trichlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
2,3,5-trichlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
2,4,5-trichlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
2,3,4-trichlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
3,4,5-trichlorophenol	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Total Trichlorophenols	<2.62	<222	<382	<282	<318	<5.46
2,3,5,6-tetrachlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
2,3,4,6-tetrachlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
2,3,4,5-tetrachlorophenol	<0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Total Tetrachlorophenols	<0.90	<76.3	<131	<96.7	<109	<1.88
Pentachlorophenol	0.56	47.5	81.6	60.2	67.9	1.17
Total Chlorophenols	<6.48	<549	<945	<696	<785	<13.5

Dry Gas Volume Sampled (Rm ³ *) :	6.860
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*):	17.2

^{*} At 25°C and 1 atmosphere

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

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

Specific	**************************************	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
2-monochlorophenol	28.5	<26.3	<25.4	<26.8	6.0
3-monochlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
4-monochlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
Total Monochlorophenols	<82.0	<79.0	<76.3	<79.1	3.6
2,6-dichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
2,4 & 2,5-dichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
3,5-dichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
2,3-dichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
3,4-dichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
Total Dichlorophenols	<134	<132	<127	<131	2.6
2,4,6-trichlorophenol	104	92.1	94.9	97.1	6.6
2,3,6-trichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
2,3,5-trichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
2,4,5-trichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
2,3,4-trichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
3,4,5-trichlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
Total Trichlorophenols	<238	<224	<222	<228	3.9
2,3,5,6-tetrachlorophenol	<26.7	<26,3	<25.4	<26.2	2.6
2,3,4,6-tetrachlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
2,3,4,5-tetrachlorophenol	<26.7	<26.3	<25.4	<26.2	2.6
Total Tetrachlorophenols	<80.2	<79.0	<76.3	<78.5	2.6
Pentachlorophenol	50.8	48.3	47.5	48.8	3.6
Total Chlorophenols	<585	<562	<549	<565	3.2

TABLE 65

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific]	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
 2-monochlorophenol	48.9	<45.1	<43.7	<45.9	5.9
3-monochlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
4-monochlorophenol	<45. 9	<45.1	<43.7	<44.9	2.4
Total Monochlorophenols	<141	<135	<131	<136	3.5
2,6-dichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,4 & 2,5-dichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
3,5-dichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,3-dichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
3,4-dichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
Total Dichlorophenols	<229	<225	<219	<224	2.4
2,4,6-trichlorophenol	179	158	163	167	6.6
2,3,6-trichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,3,5-trichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,4,5-trichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,3,4-trichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
3,4,5-trichlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
Total Trichlorophenols	<408	<383	<382	<391	3.8
2,3,5,6-tetrachlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,3,4,6-tetrachlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
2,3,4,5-tetrachlorophenol	<45.9	<45.1	<43.7	<44.9	2.4
Total Tetrachlorophenols	<138	<135	<131	<135	2.4
Pentachlorophenol	87.2	82.6	81.6	83.8	3.5
Total Chlorophenols	<1003	<962	<945	<970	3.1

^{*} 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		Dry Adjusted Concentration					
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%		
2-monochlorophenol	36.2	<33.7	<32.2	<34.1	6.0		
3-monochlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
4-monochlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
Total Monochlorophenols	<104	<101	<96.7	<101	3.7		
2,6-dichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,4 & 2,5-dichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
3,5-dichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,3-dichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
3,4-dichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
Total Dichlorophenols	<170	<168	<161	<166	2.8		
2,4,6-trichlorophenol	133	118	120	124	6.3		
2,3,6-trichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,3,5-trichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,4,5-trichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,3,4-trichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
3,4,5-trichlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
Total Trichlorophenols	<302	<286	<282	<290	3.8		
2,3,5,6-tetrachlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,3,4,6-tetrachlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
2,3,4,5-tetrachlorophenol	<34.0	<33.7	<32.2	<33.3	2.8		
Total Tetrachlorophenois	<102	<101	<96.7	<99.9	2.8		
Pentachlorophenol	64.6	61.8	60.2	62.2	3.6		
Total Chlorophenols	<743	<719	<696	<719	3.2		

^{*} 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	V	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%%
2-monochlorophenol	41.1	<37.7	<36.4	<38.4	6.4
3-monochlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
4-monochlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
Total Monochlorophenols	<118	<113	<109	<114	4.0
2,6-dichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,4 & 2,5-dichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
3,5-dichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,3-dichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
3,4-dichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
Total Dichlorophenols	<193	<189	<182	<188	3.0
2,4,6-trichlorophenol	150	132	136	139	6.9
2,3,6-trichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,3,5-trichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,4,5-trichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,3,4-trichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
3,4,5-trichlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
Total Trichlorophenols	<343	<321	<318	<327	4.3
2,3,5,6-tetrachlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,3,4,6-tetrachlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
2,3,4,5-tetrachlorophenol	<38.6	<37.7	<36.4	<37.6	3.0
Total Tetrachlorophenols	<116	<113	<109	<113	3.0
Pentachlorophenol	73.3	69.2	67.9	70.1	4.0
Total Chlorophenols	<843	<805	<785	<811	3.6

^{*} 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	THE CONTRACT OF THE CONTRACT O	Emission Rate					
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	μg/s	μg/s	μg/s	μg/s	%		
2-monochlorophenol	0.67	<0.63	<0.63	<0.64	4.0		
3-monochlorophenol	< 0.63	<0.63	< 0.63	<0.63	0.3		
4-monochlorophenol	<0.63	<0.63	<0.63	<0.63	0.3		
Total Monochlorophenols	<1.93	<1.88	<1.88	<1.89	1.5		
2,6-dichlorophenol	<0.63	<0.63	<0.63	<0.63	0.3		
2,4 & 2,5-dichlorophenol	< 0.63	< 0.63	< 0.63	< 0.63	0.3		
3,5-dichlorophenol	< 0.63	< 0.63	< 0.63	< 0.63	0.3		
2,3-dichlorophenol	< 0.63	< 0.63	< 0.63	<0.63	0.3		
3,4-dichlorophenol	< 0.63	< 0.63	< 0.63	<0.63	0.3		
Total Dichlorophenols	<3.14	<3.13	<3.13	<3.13	0.3		
2,4,6-trichlorophenol	2.45	2.19	2.33	2.33	5.6		
2,3,6-trichlorophenol	< 0.63	< 0.63	<0.63	< 0.63	0.3		
2,3,5-trichlorophenol	< 0.63	<0.63	< 0.63	< 0.63	0.3		
2,4,5-trichlorophenol	< 0.63	< 0.63	< 0.63	< 0.63	0.3		
2,3,4-trichlorophenol	< 0.63	< 0.63	< 0.63	< 0.63	0.3		
3,4,5-trichlorophenol	< 0.63	<0.63	< 0.63	<0.63	0.3		
Total Trichlorophenols	<5.59	<5.33	<5.46	<5.46	2.5		
2,3,5,6-tetrachlorophenol	<0.63	<0.63	<0.63	<0.63	0.3		
2,3,4,6-tetrachlorophenol	< 0.63	<0.63	< 0.63	<0.63	0.3		
2,3,4,5-tetrachlorophenol	< 0.63	<0.63	< 0.63	<0.63	0.3		
Total Tetrachlorophenols	<1.89	<1.88	<1.88	<1.88	0.3		
Pentachlorophenol	1.19	1.15	1.17	1.17	2.0		
Total Chlorophenols	<13.7	<13.4	<13.5	<13.5	1.4		

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	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
isomei	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
	118/1111	ng/ vin	ng/ niii	118/ 14111	μg/ 3
2-monochlorophenol	<26.8	<45.9	<34.1	<38.4	<0.64
3-monochlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
4-monochlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
Total Monochlorophenols	<79.1	<136	<101	<114	<1.89
2,6-dichlorophenol	<26.2	<44.9	<33.3	<37.6	<0.63
2,4 & 2,5-dichlorophenol	<26.2	<44.9	<33.3	<37.6	<0.63
3,5-dichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
2,3-dichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
3,4-dichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
Total Dichlorophenols	<131	<224	<166	<188	<3.13
2,4,6-trichlorophenol	97.1	167	124	139	2.33
2,3,6-trichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
2,3,5-trichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
2,4,5-trichlorophenol	<26.2	<44.9	<33.3	<37.6	<0.63
2,3,4-trichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
3,4,5-trichlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
Total Trichlorophenols	<228	<391	<290	<327	<5.46
2,3,5,6-tetrachlorophenol	<26.2	<44.9	<33.3	<37.6	<0.63
2,3,4,6-tetrachlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
2,3,4,5-tetrachlorophenol	<26.2	<44.9	<33.3	<37.6	< 0.63
Total Tetrachlorophenols	<78.5	<135	<99.9	<113	<1.88
Pentachlorophenol	48.8	83.8	62.2	70.1	1.17
Total Chlorophenols	<565	<970	<719	<811	<13.5

^{*} 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	Lab Blank	Blank Train
Group	Total μg	Total μg
2-monochlorophenol	<0.30	<0.30
3-monochlorophenol	<0.30	<0.30
4-monochlorophenol	<0.30	<0.30
Total Monochlorophenols	<0.90	<0.90
2,6-dichlorophenol	<0.30	<0.30
2,4 & 2,5-dichlorophenol	< 0.30	<0.30
3,5-dichlorophenol	<0.30	<0.30
2,3-dichlorophenol	<0.30	<0.30
3,4-dichlorophenol	<0.30	<0.30
Total Dichlorophenols	<1.50	<1.50
2,4,6-trichlorophenol	<0.30	<0.30
2,3,6-trichlorophenol	<0.30	<0.30
2,3,5-trichlorophenol	<0.30	<0.30
2,4,5-trichlorophenol	<0.30	<0.30
2,3,4-trichlorophenol	<0.30	<0.30
3,4,5-trichlorophenol	<0.30	<0.30
Total Trichlorophenols	<1.80	<1.80
2,3,5,6-tetrachlorophenol	<0.30	<0.30
2,3,4,6-tetrachlorophenol	<0.30	<0.30
2,3,4,5-tetrachlorophenol	<0.30	<0.30
Total Tetrachlorophenols	<0.90	<0.90
Pentachlorophenol	<0.30	<0.30
Total Chlorophenols	<5.40	<5.40

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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
	με	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
Acenaphthene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Acenaphthylene	<0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Anthracene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Benzo(a)anthracene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Benzo(b)fluoranthene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Benzo(k)fluoranthene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Benzo(a)fluorene	<1.2	<107	<184	<136	<154	<2.51
Benzo(b)fluorene	< 0.60	<53.5	<91.8	<67.9	<77.1	<1.26
Benzo(g,h,i)perylene	<0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Benzo(a)pyrene	<0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Benzo(e)pyrene	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
Biphenyl	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
2-Chloronaphthalene	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
Chrysene	<0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Coronene	<1.2	<107	<184	<136	<154	<2.51
Dibenzo(a,c) anthracene + Picene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Dibenz(a,h)anthracene	< 0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Dibenzo(a,e)pyrene	<1.2	<107	<184	<136	<154	<2.51
9,10-Dimethylanthracene	<1.2	<107	<184	<136	<154	<2.51
7,12-Dimethylbenzo(a)anthracene	<1.2	<107	<184	<136	<154	<2.51
Fluoranthene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Fluorene	<0.30	<26.7	<45.9	<34.0	<38.6	< 0.63
Indeno(1,2,3-cd)pyrene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
2-Methylanthracene	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
3-Methylcholanthrene	<1.2	<107	<184	<136	<154	<2.51
1-Methylnaphthalene	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
2-Methylnaphthalene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
1-Methylphenanthrene	< 0.60	<53.5	<91.8	<67.9	<77.1	<1.26
9-Methylphenanthrene	< 0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Naphthalene	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
Perylene	<1.2	<107	<184	<136	<154	<2.51
Phenanthrene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Pyrene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Quinoline	<1.2	<107	<184	<136	<154	<2.51
Tetralin	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
m-Terphenyl	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
o-Terphenyl	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
p-Terphenyl	<0.60	<53.5	<91.8	<67.9	<77.1	<1.26
Triphenylene	<0.30	<26.7	<45.9	<34.0	<38.6	<0.63
Total	<22.5	<2006	<3441	<2548	<2892	<47.1

Dry Gas Volume Sampled (Rm ³ *) :	6.539
Actual Flowrate (m³/s) :	23.5
Dry Reference Flowrate (Rm³/s*):	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*):	16.3

* 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 (was less than the analytical detection limit), 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
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
Acenaphthene	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Acenaphthylene	<0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Anthracene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Benzo(a)anthracene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Benzo(b)fluoranthene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Benzo(k)fluoranthene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Benzo(a)fluorene	<1.2	<105	<180	<135	<151	<2.51
Benzo(b)fluorene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
Benzo(g,h,i)perylene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Benzo(a)pyrene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Benzo(e)pyrene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
Biphenyl	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
2-Chloronaphthalene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
Chrysene .	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Coronene	<1.2	<105	<180	<135	<151	<2.51
Dibenzo(a,c) anthracene + Picene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Dibenz(a,h)anthracene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Dibenzo(a,e)pyrene	<1.2	<105	<180	<135	<151	<2.51
9,10-Dimethylanthracene	<1.2	<105	<180	<135	<151	<2.51
7,12-Dimethylbenzo(a)anthracene	<1.2	<105	<180	<135	<151	<2.51
Fluoranthene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Fluorene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Indeno(1,2,3-cd)pyrene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
2-Methylanthracene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
3-Methylcholanthrene	<1.2	<105	<180	<135	<151	<2.51
1-Methylnaphthalene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
2-Methylnaphthalene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
1-Methylphenanthrene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
9-Methylphenanthrene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Naphthalene	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
Perylene	<1.2	<105	<180	<135	<151	<2.51
Phenanthrene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Pyrene	< 0.30	<26.3	<45.1	<33.7	<37.7	< 0.63
Quinoline	<1.2	<105	<180	<135	<151	<2.51
Tetralin	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
m-Terphenyl	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
o-Terphenyl	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
p-Terphenyl	< 0.60	<52.6	<90.1	<67.4	<75.5	<1.25
Triphenylene	<0.30	<26.3	<45.1	<33.7	<37.7	<0.63
Total	<22.5	<1974	<3380	<2526	<2831	<47.0

Dry Gas Volume Sampled (Rm ³ *) :	6.656
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

* 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 (was less than the analytical detection limit), 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
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
Acenaphthene	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
Acenaphthylene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Anthracene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Benzo(a)anthracene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Benzo(b)fluoranthene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Benzo(k)fluoranthene	<0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Benzo(a)fluorene	<1.2	<102	<175	<129	<145	<2.50
Benzo(b)fluorene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
Benzo(g,h,i)perylene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Benzo(a)pyrene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Benzo(e)pyrene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
Biphenyl	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
2-Chloronaphthalene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
Chrysene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Coronene	<1.2	<102	<175	<129	<145	<2.50
Dibenzo(a,c) anthracene + Picene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Dibenz(a,h)anthracene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Dibenzo(a,e)pyrene	<1.2	<102	<175	<129	<145	<2.50
9,10-Dimethylanthracene	<1.2	<102	<175	<129	<145	<2.50
7,12-Dimethylbenzo(a)anthracene	<1.2	<102	<175	<12 9	<145	<2.50
Fluoranthene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Fluorene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
indeno(1,2,3-cd)pyrene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
2-Methylanthracene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
3-Methylcholanthrene	<1.2	<102	<175	<129	<145	<2.50
1-Methylnaphthalene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
2-Methylnaphthalene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
1-Methylphenanthrene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
9-Methylphenanthrene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Naphthalene	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
Perylene	<1.2	<102	<175	<129	<145	<2.50
Phenanthrene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Pyrene	< 0.30	<25.4	<43.7	<32.2	<36.4	< 0.63
Quinoline	<1.2	<102	<175	<129	<145	<2.50
Tetralin	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
m-Terphenyl	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
o-Terphenyl	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
p-Terphenyl	< 0.60	<50.8	<87.5	<64.5	<72.7	<1.25
Triphenylene	<0.30	<25.4	<43.7	<32.2	<36.4	<0.63
Total	<22.5	<1907	<3280	<2418	<2727	<46.9

Dry Gas Volume Sampled (Rm³*):	6.860
Actual Flowrate (m ³ /s) :	24.6
Dry Reference Flowrate (Rm³/s*) :	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*):	17.2

^{*} 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 (was less than the analytical detection limit), 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 Cor	centration	echinum dan solociharan omorsusana damarikea	Coefficient
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%%
Acenaphthene	<26.7	<26.3	<25.4	<26.2	2.6
Acenaphthylene	<26.7	<26.3	<25.4	<26.2	2.6
Anthracene	<26.7	<26.3	<25.4	<26.2	2.6
Benzo(a)anthracene	<26.7	<26.3	<25.4	<26.2	2.6
Benzo(b)fluoranthene	<26.7	<26.3	<25.4	<26.2	2.6
Benzo(k)fluoranthene	<26.7	<26.3	<25.4	<26.2	2.6
Benzo(a)fluorene	<107	<105	<102	<105	2.6
Benzo(b)fluorene	<53.5	<52.6	<50.8	<52.3	2.6
Benzo(g,h,i)perylene	<26.7	<26.3	<25.4	<26.2	2.6
Benzo(a)pyrene	<26.7	<26.3	<25.4	<26.2	2.6
Benzo(e)pyrene	<53.5	<52.6	<50.8	<52.3	2.6
Biphenyl	<53.5	<52.6	<50.8	<52.3	2.6
2-Chloronaphthalene	<53.5	<52.6	<50.8	<52.3	2.6
Chrysene	<26.7	<26.3	<25.4	<26.2	2.6
Coronene	<107	<105	<102	<105	2.6
Dibenzo(a,c) anthracene + Picene	<26.7	<26.3	<25.4	<26.2	2.6
Dibenz(a,h)anthracene	<26.7	<26.3	<25.4	<26.2	2.6
Dibenzo(a,e)pyrene	<107	<105	<102	<105	2.6
9,10-Dimethylanthracene	<107	<105	<102	<105	2.6
7,12-Dimethylbenzo(a)anthracene	<107	<105	<102	<105	2.6
Fluoranthene	<26.7	<26.3	<25.4	<26.2	2.6
Fluorene	<26.7	<26.3	<25.4	<26.2	2.6
Indeno(1,2,3-cd)pyrene	<26.7	<26.3	<25.4	<26.2	2.6
2-Methylanthracene	<53.5	<52.6	<50.8	<52.3	2.6
3-Methylcholanthrene	<107	<105	<102	<105	2.6
1-Methylnaphthalene	<53.5	<52.6	<50.8	<52.3	2.6
2-Methylnaphthalene	<26.7	<26.3	<25.4	<26.2	2.6
1-Methylphenanthrene	<53.5	<52.6	<50.8	<52.3	2.6
9-Methylphenanthrene	<26.7	<26.3	<25.4	<26.2	2.6
Naphthalene	<53.5	<52.6	<50.8	<52.3	2.6
Perylene	<107	<105	<102	<105	2.6
Phenanthrene	<26.7	<26.3	<25.4	<26.2	2.6
Pyrene	<26.7	<26.3	<25.4	<26.2	2.6
Quinoline	<107	<105	<102	<105	2.6
Tetralin	<53.5	<52.6	<50.8	<52.3	2.6
m-Terphenyl	<53.5	<52.6	<50.8	<52.3	2.6
o-Terphenyl	<53.5	<52.6	<50.8	<52.3	2.6
p-Terphenyl	<53.5	<52.6	<50.8	<52 <i>.</i> 3	2.6
Triphenylene	<26.7	<26.3	<25.4	<26.2	2.6
Total	<2006	<1974	<1907	<1962	2.6

TABLE 75

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound		Coefficient			
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<45.9	<45.1	<43.7	<44.9	2.4
Acenaphthylene	<45.9	<45.1	<43.7	<44.9	2.4
Anthracene	<45.9	<45.1	<43.7	<44.9	2.4
Benzo(a)anthracene	<45.9	<45.1	<43.7	<44.9	2.4
Benzo(b)fluoranthene	<45.9	<45.1	<43.7	<44.9	2.4
Benzo(k)fluoranthene	<45.9	<45.1	<43.7	<44.9	2.4
Benzo(a)fluorene	<184	<180	<175	<180	2.4
Benzo(b)fluorene	<91.8	<90.1	<87.5	<89.8	2.4
Benzo(g,h,i)perylene	<45.9	<45.1	<43.7	<44.9	2.4
Benzo(a)pyrene	<45.9	<45.1	<43.7	<44.9	2.4
Benzo(e)pyrene	<91.8	<90.1	<87.5	<89.8	2.4
Biphenyl	<91.8	<90.1	<87.5	<89.8	2.4
2-Chloronaphthalene	<91.8	<90.1	<87.5	<89.8	2.4
Chrysene	<45.9	<45.1	<43.7	<44.9	2.4
Coronene	<184	<180	<175	<180	2.4
Dibenzo(a,c) anthracene + Picene	<45.9	<45.1	<43.7	<44.9	2.4
Dibenz(a,h)anthracene	<45.9	<45.1	<43.7	<44.9	2.4
Dibenzo(a,e)pyrene	<184	<180	<175	<180	2.4
9,10-Dimethylanthracene	<184	<180	<175	<180	2.4
7,12-Dimethylbenzo(a)anthracene	<184	<180	<175	<180	2.4
Fluoranthene	<45.9	<45.1	<43.7	<44.9	2.4
Fluorene	<45.9	<45.1	<43.7	<44.9	2.4
Indeno(1,2,3-cd)pyrene	<45.9	<45.1	<43.7	<44.9	2.4
2-Methylanthracene	<91.8	<90.1	<87.5	<89.8	2.4
3-Methylcholanthrene	<184	<180	<175	<180	2.4
1-Methylnaphthalene	<91.8	<90.1	<87.5	<89.8	2.4
2-Methylnaphthalene	<45.9	<45.1	<43.7	<44.9	2.4
1-Methylphenanthrene	<91.8	<90.1	<87.5	<89.8	2.4
9-Methylphenanthrene	<45.9	<45.1	<43.7	<44.9	2.4
Naphthalene	<91.8	<90.1	<87 <i>.</i> 5	<89.8	2.4
Perylene	<184	<180	<175	<180	2.4
Phenanthrene	<45.9	<45.1	<43.7	<44.9	2.4
Pyrene	<45.9	<45.1	<43.7	<44.9	2.4
Quinoline	<184	<180	<175	<180	2.4
Tetralin	<91.8	<90.1	<87.5	<89.8	2.4
m-Terphenyl	<91.8	<90.1	<87.5	<89.8	2.4
o-Terphenyl	<91.8	<90.1	<87.5	<89.8	2.4
p-Terphenyl	<91.8	<90.1	<87.5	<89.8	2.4
Triphenylene	<45.9	<45.1	<43.7	<44.9	2.4
Total	<3441	<3380	<3280	<3367	2.4

^{*} 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			Coefficient		
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<34.0	<33.7	<32.2	<33.3	2.8
Acenaphthylene	<34.0	<33.7	<32.2	<33.3	2.8
Anthracene	<34.0	<33.7	<32.2	<33.3	2.8
Benzo(a)anthracene	<34.0	<33.7	<32.2	<33.3	2.8
Benzo(b)fluoranthene	<34.0	<33.7	<32.2	<33.3	2.8
Benzo(k)fluoranthene	<34.0	<33.7	<32.2	<33.3	2.8
Benzo(a)fluorene	<136	<135	<129	<133	2.8
Benzo(b)fluorene	<67.9	<67.4	<64.5	<66.6	2.8
Benzo(g,h,i)perylene	<34.0	<33.7	<32.2	<33.3	2.8
Benzo(a)pyrene	<34.0	<33.7	<32.2	<33.3	2.8
Benzo(e)pyrene	<67.9	<67.4	<64.5	<66.6	2.8
Biphenyl	<67.9	<67.4	<64.5	<66.6	2.8
2-Chloronaphthalene	<67.9	<67.4	<64.5	<66.6	2.8
Chrysene	<34.0	<33.7	<32.2	<33.3	2.8
Coronene	<136	<135	<129	<133	2.8
Dibenzo(a,c) anthracene + Picene	<34.0	<33.7	<32.2	<33.3	2.8
Dibenz(a,h)anthracene	<34.0	<33.7	<32.2	<33.3	2.8
Dibenzo(a,e)pyrene	<136	<135	<129	<133	2.8
9,10-Dimethylanthracene	<136	<135	<129	<133	2.8
7,12-Dimethylbenzo(a)anthracene	<136	<135	<129	<133	2.8
Fluoranthene	<34.0	<33.7	<32.2	<33.3	2.8
Fluorene	<34.0	<33.7	<32.2	<33.3	2.8
Indeno(1,2,3-cd)pyrene	<34.0	<33.7	<32.2	<33.3	2.8
2-Methylanthracene	<67.9	<67.4	<64.5	<66.6	2.8
3-Methylcholanthrene	<136	<135	<129	<133	2.8
1-Methylnaphthalene	<67.9	<67.4	<64.5	<66.6	2.8
2-Methylnaphthalene	<34.0	<33.7	<32.2	<33.3	2.8
1-Methylphenanthrene	<67.9	<67.4	<64.5	<66.6	2.8
9-Methylphenanthrene	<34.0	<33.7	<32.2	<33.3	2.8
Naphthalene	<67.9	<67.4	<64.5	<66.6	2.8
Perylene	<136	<135	<129	<133	2.8
Phenanthrene	<34.0	<33.7	<32.2	<33.3	2.8
Pyrene	<34.0	<33.7	<32.2	<33.3	2.8
Quinoline	<136	<135	<129	<133	2.8
Tetralin	<67.9	<67.4	<64.5	<66.6	2.8
m-Terphenyl	<67.9	<67.4	<64.5	<66.6	2.8
o-Terphenyl	<67.9	<67.4	<64.5	<66.6	2.8
p-Terphenyl	<67.9	<67.4	<64.5	<66.6	2.8
Triphenylene	<34.0	<33.7	<32.2	<33.3	2.8
Total	<2548	<2526	<2418	<2497	2.8

^{*} 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		Coefficient			
·	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<38.6	<37.7	<36.4	<37.6	3.0
Acenaphthylene	<38.6	<37.7 <37.7	<36.4	<37.6	3.0
Anthracene	<38.6	<37.7	<36.4	<37.6	3.0
Benzo(a)anthracene	<38.6	<37.7	<36.4	<37.6	3.0
Benzo(b)fluoranthene	<38.6	<37.7	<36.4	<37.6	3.0
Benzo(k)fluoranthene	<38.6	<37.7	<36.4	<37.6	3.0
Benzo(a)fluorene	<154	<151	<145	<150	3.0
Benzo(b)fluorene	<77.1	<75.5	<72.7	<75.1	3.0
Benzo(g,h,i)perylene	<38.6	<37.7	<36.4	<37.6	3.0
Benzo(a)pyrene	<38.6	<37.7	<36.4	<37.6	3.0
Benzo(e)pyrene	<77.1	<75.5	<72.7	<75.1	3.0
Biphenyl	<77.1	<75.5	<72.7	<75.1	3.0
2-Chloronaphthalene	<77.1	<75.5	<72.7	<75.1	3.0
Chrysene	<38.6	<37.7	<36.4	<37.6	3.0
Coronene	<154	<151	<145	<150	3.0
Dibenzo(a,c) anthracene + Picene	<38.6	<37.7	<36.4	<37.6	3.0
Dibenz(a,h)anthracene	<38.6	<37.7	<36.4	<37.6	3.0
Dibenzo(a,e)pyrene	<154	<151	<145	<150	3.0
9,10-Dimethylanthracene	<154	<151	<145	<150	3.0
7,12-Dimethylbenzo(a)anthracene	<154	<151	<145	<150	3.0
Fluoranthene	<38.6	<37.7	<36.4	<37.6	3.0
Fluorene	<38.6	<37.7	<36.4	<37.6	3.0
Indeno(1,2,3-cd)pyrene	<38.6	<37.7	<36.4	<37.6	3.0
2-Methylanthracene	<77.1	<75.5	<72.7	<75.1	3.0
3-Methylcholanthrene	<154	<151	<145	<150	3.0
1-Methylnaphthalene	<77.1	<75.5	<72.7	<75.1	3.0
2-Methylnaphthalene	<38.6	<37.7	<36.4	<37.6	3.0
1-Methylphenanthrene	<77.1	<75.5	<72.7	<75.1	3.0
9-Methylphenanthrene	<38.6	<37.7	<36.4	<37.6	3.0
Naphthalene	<77.1	<75.5	<72.7	<75.1	3.0
Perylene	<154	<151	<145	<150	3.0
Phenanthrene	<38.6	<37.7	<36.4	<37.6	3.0
Pyrene	<38.6	<37.7	<36.4	<37.6	3.0
Quinoline	<154	<151	<145	<150	3.0
Tetralin	<77.1	<75.5	<72.7	<75.1	3.0
m-Terphenyl	<77.1	<75.5	<72.7	<75.1	3.0
o-Terphenyl	<77.1	<75.5	<72.7	<75.1	3.0
p-Terphenyl	<77.1	<75.5	<72.7	<75.1	3.0
Triphenylene	<38.6	<37.7	<36.4	<37.6	3.0
Total	<2892	<2831	<2727	<2817	3.0

^{*} At 25°C and 1 atmosphere

TABLE 78

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Polycyclic Aromatic Hydrocarbon Emission Rates

Compound		t un o ricente anno esta de la composition della	Coefficient		
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/s	μg/s	μg/s	μg/s	%
Acenaphthene	<0.63	<0.63	<0.63	<0.63	0.3
Acenaphthylene	<0.63	< 0.63	< 0.63	< 0.63	0.3
Anthracene	<0.63	< 0.63	<0.63	< 0.63	0.3
Benzo(a)anthracene	<0.63	< 0.63	< 0.63	<0.63	0.3
Benzo(b)fluoranthene	<0.63	<0.63	<0.63	<0.63	0.3
Benzo(k)fluoranthene	<0.63	<0.63	< 0.63	<0.63	0.3
Benzo(a)fluorene	<2.51	<2.51	<2.50	<2.51	0.3
Benzo(b)fluorene	<1.26	<1.25	<1.25	<1.25	0.3
Benzo(g,h,i)perylene	<0.63	< 0.63	<0.63	<0.63	0.3
Benzo(a)pyrene	<0.63	< 0.63	<0.63	< 0.63	0.3
Benzo(e)pyrene	<1.26	<1.25	<1.25	<1.25	0.3
Biphenyl	<1.26	<1.25	<1.25	<1.25	0.3
2-Chloronaphthalene	<1.26	<1.25	<1.25	<1.25	0.3
Chrysene	<0.63	<0.63	<0.63	<0.63	0.3
Coronene	<2.51	<2.51	<2.50	<2.51	0.3
Dibenzo(a,c) anthracene + Picene	<0.63	<0.63	<0.63	<0.63	0.3
Dibenz(a,h)anthracene	<0.63	<0.63	< 0.63	< 0.63	0.3
Dibenzo(a,e)pyrene	<2.51	<2.51	<2.50	<2.51	0.3
9,10-Dimethylanthracene	<2.51 <2.51	<2.51	<2.50 <2.50		
7,12-Dimethylbenzo(a)anthracene	<2.51	<2.51	<2.50 <2.50	< 2.51	0.3
Fluoranthene	<0.63	<0.63		<2.51	0.3
Fluorene			< 0.63	< 0.63	0.3
Indeno(1,2,3-cd)pyrene	< 0.63	< 0.63	< 0.63	< 0.63	0.3
	< 0.63	< 0.63	< 0.63	< 0.63	0.3
2-Methylanthracene	<1.26	<1.25	<1.25	<1.25	0.3
3-Methylcholanthrene	<2.51	< 2.51	<2.50	<2.51	0.3
1-Methylnaphthalene	<1.26	<1.25	<1.25	<1.25	0.3
2-Methylnaphthalene	< 0.63	< 0.63	< 0.63	< 0.63	0.3
1-Methylphenanthrene	<1.26	<1.25	<1.25	<1.25	0.3
9-Methylphenanthrene	< 0.63	< 0.63	<0.63	< 0.63	0.3
Naphthalene	<1.26	<1.25	<1.25	<1.25	0.3
Perylene	<2.51	<2.51	<2.50	<2.51	0.3
Phenanthrene	<0.63	<0.63	<0.63	<0.63	0.3
Pyrene	<0.63	<0.63	<0.63	<0.63	0.3
Quinoline	<2.51	<2.51	<2.50	<2.51	0.3
Tetralin	<1.26	<1.25	<1.25	<1.25	0.3
m-Terphenyl	<1.26	<1.25	<1.25	<1.25	0.3
o-Terphenyl	<1.26	<1.25	<1.25	<1.25	0.3
p-Terphenyl	<1.26	<1.25	<1.25	<1.25	0.3
Triphenylene	<0.63	<0.63	<0.63	<0.63	0.3
Total	<47.1	<47.0	<46.9	<47.0	0.3

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
				on the DANAME PARKET COME TO SEE THE SEASON OF THE SEASON	
Acenaphthene	<26.2	<44.9	<33.3	<37.6	< 0.63
Acenaphthylene	<26.2	<44.9	<33.3	<37.6	<0.63
Anthracene	<26.2	<44.9	<33.3	<37.6	<0.63
Benzo(a)anthracene	<26.2	<44.9	<33.3	<37.6	<0.63
Benzo(b)fluoranthene	<26.2	<44.9	<33.3	<37.6	< 0.63
Benzo(k)fluoranthene	<26.2	<44.9	<33.3	<37.6	< 0.63
Benzo(a)fluorene	<105	<180	<133	<150	<2.51
Benzo(b)fluorene	<52.3	<89.8	<66.6	<75.1	<1.25
Benzo(g,h,i)perylene	<26.2	<44.9	<33.3	<37.6	< 0.63
Benzo(a)pyrene	<26.2	<44.9	<33.3	<37.6	< 0.63
Benzo(e)pyrene	<52.3	<89.8	<66.6	<75.1	<1.25
Biphenyl	<52.3	<89.8	<66.6	<75.1	<1.25
2-Chloronaphthalene	<52.3	<89.8	<66.6	<75.1	<1.25
Chrysene	<26.2	<44.9	<33.3	<37.6	< 0.63
Coronene	<105	<180	<133	<150	<2.51
Dibenzo(a,c) anthracene + Picene	<26.2	<44.9	<33.3	<37.6	< 0.63
Dibenz(a,h)anthracene	<26.2	<44.9	<33.3	<37.6	< 0.63
Dibenzo(a,e)pyrene	<105	<180	<133	<150	<2.51
9,10-Dimethylanthracene	<105	<180	<133	<150	<2.51
7,12-Dimethylbenzo(a)anthracene	<105	<180	<133	<150	<2.51
Fluoranthene	<26.2	<44.9	<33.3	<37.6	< 0.63
Fluorene	<26.2	<44.9	<33.3	<37.6	< 0.63
Indeno(1,2,3-cd)pyrene	<26.2	<44.9	<33.3	<37.6	< 0.63
2-Methylanthracene	<52.3	<89.8	<66.6	<75.1	<1.25
3-Methylcholanthrene	<105	<180	<133	<150	<2.51
1-Methylnaphthalene	<52.3	<89.8	<66.6	<75.1	<1.25
2-Methylnaphthalene	<26.2	<44.9	<33.3	<37.6	< 0.63
1-Methylphenanthrene	<52.3	<89.8	<66.6	<75.1	<1.25
9-Methylphenanthrene	<26.2	<44.9	<33.3	<37.6	< 0.63
Naphthalene	<52.3	<89.8	<66.6	<75.1	<1.25
Perylene	<105	<180	<133	<150	<2.51
Phenanthrene	<26.2	<44.9	<33.3	<37.6	< 0.63
Pyrene	<26.2	<44.9	<33.3	<37.6	< 0.63
Quinoline	<105	<180	<133	<150	<2.51
Tetralin	<52.3	<89.8	<66.6	<75.1	<1.25
m-Terphenyl	<52.3	<89.8	<66.6	<75.1	<1.25
o-Terphenyl	<52.3	<89.8	<66.6	<75.1	<1.25
p-Terphenyl	<52.3	<89.8	<66.6	<75.1	<1.25
Triphenylene	<26.2	<44.9	<33.3	<37.6	<0.63
Total	<1962	<3367	<2497	<2817	<47.0

^{*} 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	Laboratory
·	Train	Blank
	μg	μg
Acenaphthene	<0.30	<0.30
Acenaphthylene	<0.30	<0.30
Anthracene	<0.30	<0.30
Benzo(a)anthracene	<0.30	<0.30
Benzo(b)fluoranthene	<0.30	<0.30
Benzo(k)fluoranthene	<0.30	<0.30
Benzo(a)fluorene	<1.2	<1.2
Benzo(b)fluorene	<0.60	<0.60
Benzo(g,h,i)perylene	<0.30	<0.30
Benzo(a)pyrene	<0.30	<0.30
Benzo(e)pyrene	<0.60	<0.60
Biphenyl	<0.60	<0.60
2-Chloronaphthalene	<0.60	<0.60
Chrysene	<0.30	<0.30
Coronene	<1.2	<1.2
Dibenzo(a,c) anthracene + Picene	<0.30	<0.30
Dibenz(a,t) anthracene	<0.30	<0.30
Dibenzo(a,e)pyrene	<1.2	<1.2
9,10-Dimethylanthracene	<1.2	<1.2
7,12-Dimethylbenzo(a)anthracene	<1.2	<1.2
Fluoranthene	<0.30	<0.30
Fluorene	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	<0.30	<0.30
	<0.60	<0.60
2-Methylanthracene 3-Methylcholanthrene	<1.2	<1.2
		,
1-Methylnaphthalene	<0.60	<0.60
2-Methylnaphthalene	<0.30	<0.30
1-Methylphenanthrene	<0.60	<0.60
9-Methylphenanthrene	<0.30	<0.30
Naphthalene	<0.60	<0.60
Perylene	<1.2	<1.2
Phenanthrene	<0.30	<0.30
Pyrene	<0.30	<0.30
Quinoline	<1.2	<1.2
Tetralin	<0.60	<0.60
m-Terphenyl	<0.60	<0.60
o-Terphenyl	<0.60	<0.60
p-Terphenyl	<0.60	<0.60
Triphenylene	<0.30	<0.30
Total	<22.5	<22.5

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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

	Total	Dry Volume	Acetaldehyde Concentration Acetaldehy					
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate	
No.	ha	Rm³*	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s	
1	2	0.0299	38.9	66.8	49.5	56.1	0.92	
2	2	0.0299	37.6	64.6	47.8	54.3	0.88	
3	<2	0.0290	<40.3	<69.1	<51.1	<58.0	<0.95	
Average			<38.9	<66.8	<49.5	<56.2	<0.92	
Blank	<2							

Formaldehyde

	Total	Dry Volume		Formaldehyde			
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
1	2.2	0.0299	42.8	73.5	54.4	61.8	1.01
2	1.8	0.0310	33.9	58.1	43.0	48.8	0.80
3	1.3	0.0290	26.2	44.9	33.2	37.7	0.61
Average			34.3	58.8	43.6	49.4	0.81
Blank	0.6						

Acrolein

	Total	Dry Volume	10.7	Acrolein			
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
1	<2	0.0299	<38.9	<66.8	<49.5	<56.1	<0.92
2	<2	0.0310	<37.6	<64.6	<47.8	<54.3	<0.88
3	<2	0.0290	<40.3	<69.1	<51.1	<58.0	<0.95
Average			<38.9	<66.8	<49.5	<56.2	<0.92
Blank	<2						

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit), 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. 1 BH Outlet
Volatile Organic Analyses
Test No. 1

Compound		Cartridge Amo	unt 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	0.098	0.060	0.051	0.070	35.8	0.21
Benzene	0.043	0.037	0.034	0.038	12.4	0.11
Bromodichloromethane	0.037	0.040	0.041	0.039	5.3	0.12
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Bromomethane	< 0.015	0.015	0.015	< 0.015	_	< 0.045
1,3-Butadiene	< 0.025	< 0.025	< 0.025	<0.025	-	< 0.075
2-Butanone	< 0.036	< 0.036	< 0.036	< 0.036		< 0.11
Carbon Tetrachloride	< 0.016	< 0.016	< 0.016	< 0.016	-	<0.048
Chlorobenzene	0.012	0.012	0.012	0.012	-	0.036
Chloroform	0.036	0.039	0.039	0.038	4.6	0.11
Cumene (Isopropylbenzene)	< 0.025	<0.025	<0.025	<0.025	_	< 0.075
Dibromochloromethane	0.019	0.020	0.020	0.020	4.9	0.059
Dichlorodifluoromethane	<0.020	<0.020	<0.020	<0.020	-	<0.060
1,2-Dichloroethane	< 0.0070	<0.0070	<0.0070	<0.007	••	<0.021
trans,1,2-Dichloroethene	< 0.010	<0.010	<0.010	<0.010	_	<0.030
1,1-Dichloroethene	<0.011	<0.011	<0.011	< 0.011	-	<0.033
1,2-Dichloropropane	<0.011	<0.011	<0.011	<0.011	-	<0.033
Ethylbenzene	< 0.014	<0.014	<0.014	< 0.014	_	<0.042
Ethylene Dibromide	<0.010	<0.010	<0.010	<0.010		<0.030
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	<0.025	-	< 0.075
Methylene Chloride	< 0.019	<0.019	< 0.019	<0.019	_	<0.057
Styrene	<0.012	<0.012	<0.012	< 0.012	_	<0.036
Tetrachloroethene	<0.018	<0.018	<0.018	<0.018	_	< 0.054
Toluene	0.057	0.044	0.038	0.046	21.0	0.14
1,1,1-Trichloroethane	< 0.014	<0.014	< 0.014	< 0.014		<0.042
Trichloroethene	< 0.011	<0.011	<0.011	<0.011	_	<0.033
1,1,2-Trichloroethane	< 0.011	<0.011	< 0.016	<0.011	_	<0.033
Trichlorotrifluoroethane	<0.025	<0.025	<0.015	<0.025	-	<0.048
Trichlorofluoromethane	< 0.010	<0.010	<0.010	<0.010	_	<0.030
M&P-Xylene	<0.015	<0.015	<0.015	<0.015	_	<0.030
O-Xylene	<0.015	<0.015	<0.015	<0.015	-	<0.045
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	-	<0.039
Total	<0.71	<0.66	<0.64	<0.67	5.2	<2.01

Dry Gas Volume Sampled (Rm³*):

Run No. 1	0.0202
Run No. 2	0.0209
Run No. 3	0.0204

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining average and total analytical results for each compound, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

^{*} At 25°C and 1 atmosphere.

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

Compound		Cartridge Amo	unt Collected		Coefficient	Total
	Run No. 1	Run No. 2	Run No. 3	Average	of Variation	Collected
	Tube 4A/4B	Tube 5A/5B	Tube 6A/6B			
	<u>µ</u> g	μg	μg	μg	%	μg
Acetone	0.061	0.057	0.054	0.057	6.1	0.17
Benzene	0.032	0.032	0.027	0.031	9.1	0.092
Bromodichloromethane	0.040	0.044	0.037	0.040	8.7	0.12
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	_	< 0.042
Bromomethane	< 0.015	< 0.015	< 0.015	< 0.015	-	< 0.045
1,3-Butadiene	< 0.025	<0.025	< 0.025	<0.025	-	<0.075
2-Butanone	< 0.036	< 0.036	< 0.036	< 0.036	-	< 0.11
Carbon Tetrachloride	<0.016	< 0.016	< 0.016	< 0.016	-	< 0.048
Chlorobenzene	0.014	0.013	0.012	0.013	7.7	0.039
Chloroform	0.039	0.042	0.034	0.038	10.5	0.12
Cumene (Isopropylbenzene)	<0.025	<0.025	<0.025	<0.025	_	<0.075
Dibromochloromethane	0.021	0.023	0.018	0.021	10.5	0.062
Dichlorodifluoromethane	< 0.020	<0.020	0.152	< 0.064	119	< 0.19
1,2-Dichloroethane	< 0.0070	< 0.0070	<0.0070	<0.0070	_	<0.021
trans,1,2-Dichloroethene	< 0.010	<0.010	< 0.010	< 0.010	_	< 0.030
1,1-Dichloroethene	<0.011	<0.011	< 0.011	< 0.011	_	<0.033
1,2-Dichloropropane	<0.011	< 0.011	< 0.011	< 0.011		< 0.033
Ethylbenzene	< 0.014	< 0.014	<0.014	< 0.014	~	< 0.042
Ethylene Dibromide	< 0.010	<0.010	<0.010	< 0.010	-	<0.030
Mesitylene (1,3,5-Trimethylbenzene)	< 0.025	<0.025	<0.025	<0.025	_	< 0.075
Methylene Chloride	< 0.019	< 0.019	< 0.019	< 0.019	-	< 0.057
Styrene	<0.012	<0.012	< 0.012	< 0.012	-	< 0.036
Tetrachloroethene	<0.018	<0.018	<0.018	< 0.018	-	< 0.054
Toluene	0.038	0.037	0.031	0.035	10.7	0.11
1,1,1-Trichloroethane	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Trichloroethene	< 0.011	< 0.011	< 0.011	< 0.011	-	< 0.033
1,1,2-Trichloroethane	<0.016	< 0.016	<0.016	<0.016	_	<0.048
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	-	<0.075
Trichlorofluoromethane	<0.010	<0.010	<0.010	<0.010	-	<0.030
M&P-Xylene	<0.015	<0.015	<0.015	<0.015	-	<0.045
O-Xylene	<0.015	< 0.015	<0.015	<0.015	-	< 0.045
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	-	<0.039
Total	<0.65	<0.65	<0.75	<0.69	8.3	<2.06

Dry Gas Volume Sampled (Rm³*):

Run No. 1	0.0208
Run No. 2	0.0196
Run No. 3	0.0201

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining average and total analytical results for each compound, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

^{*} At 25°C and 1 atmosphere.

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

Compound	<u> </u>	Cartridge Amo	unt Collected	2012/1840/2010/2 0-2019/2010/2010/2010/2010	Coefficient	Total
	Run No. 1	Run No. 2	Run No. 3	Average	of Variation	Collected
	Tube 7A/7B	Tube 8A/8B	Tube 9A/9B			
	μg	μg	μg	μg	%	μg
				***************************************	COLUMN TO THE PROPERTY OF THE	
Acetone	0.071	0.063	0.073	0.069	7.7	0.21
Benzene	0.041	0.040	0.052	0.044	15.9	0.13
Bromodichloromethane	0.040	0.036	0.035	0.037	7.2	0.11
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Bromomethane	< 0.015	< 0.015	< 0.015	< 0.015	-	< 0.045
1,3-Butadiene	<0.025	<0.025	<0.025	<0.025	-	<0.075
2-Butanone	<0.036	< 0.036	< 0.036	< 0.036	-	< 0.11
Carbon Tetrachloride	<0.016	<0.016	< 0.016	< 0.016	_	< 0.048
Chlorobenzene	0.013	0.012	0.014	0.013	7.7	0.039
Chloroform	0.041	0.036	0.037	0.038	7.0	0.11
Cumene (Isopropylbenzene)	<0.025	<0.025	<0.025	<0.025		<0.075
Dibromochloromethane	0.020	0.019	0.018	0.019	4.7	0.058
Dichlorodifluoromethane	0.021	<0.020	<0.020	<0.020	2.8	< 0.061
1,2-Dichloroethane	< 0.0070	< 0.0070	< 0.0070	< 0.0070		<0.021
trans,1,2-Dichloroethene	<0.010	<0.010	< 0.010	<0.010		<0.030
1,1-Dichloroethene	< 0.011	<0.011	< 0.011	< 0.011	-	< 0.033
1,2-Dichloropropane	<0.011	< 0.011	< 0.011	< 0.011	-	<0.033
Ethylbenzene	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Ethylene Dibromide	< 0.010	<0.010	<0.010	< 0.010	-	<0.030
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	< 0.025	_	<0.075
Methylene Chloride	0.093	0.031	< 0.019	< 0.048	83.3	< 0.14
Styrene	< 0.012	< 0.012	<0.012	<0.012	-	<0.036
Tetrachloroethene	< 0.018	<0.018	<0.018	< 0.018	-	< 0.054
Toluene	0.030	0.038	0.073	0.047	48.7	0.14
1,1,1-Trichloroethane	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Trichloroethene	<0.011	< 0.011	< 0.011	< 0.011	_	< 0.033
1,1,2-Trichloroethane	<0.016	< 0.016	<0.016	< 0.016	***	<0.048
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	-	<0.075
Trichlorofluoromethane	<0.010	<0.010	0.014	< 0.011	20.4	< 0.034
M&P-Xylene	< 0.015	<0.015	< 0.015	< 0.015	-	<0.045
O-Xylene	<0.015	<0.015	<0.015	< 0.015	_	<0.045
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	-	<0.039
Total	<0.74	<0.66	<0.71	<0.70	5.5	<2.11

Dry Gas Volume Sampled (Rm³*):

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

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining average and total analytical results for each compound, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

^{*} At 25°C and 1 atmosphere.

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

Compound	Total	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	μg	μg/m³	μg/Rm³*	μg/Rm ³ **	μg/Rm³*	mg/s
Acetone	0.21	1.99	3.40	2.54	2.85	0.047
Benzene	0.11	1.08	1.85	1.38	1.55	0.026
Bromodichloromethane	0.12	1.12	1.92	1.44	1.61	0.027
Bromoform	< 0.042	< 0.40	<0.68	<0.51	<0.57	<0.0095
Bromomethane	<0.045	< 0.43	<0.73	<0.55	<0.61	< 0.010
1,3-Butadiene	<0.075	< 0.71	<1.22	<0.91	<1.02	< 0.017
2-Butanone	<0.11	<1.03	<1.76	<1.31	<1.47	< 0.024
Carbon Tetrachloride	<0.048	< 0.46	<0.78	<0.58	< 0.65	< 0.011
Chlorobenzene	0.036	0.34	0.59	0.44	0.49	0.0081
Chloroform	0.11	1.08	1.86	1.39	1.55	0.026
Cumene (Isopropylbenzene)	< 0.075	< 0.71	<1.22	< 0.91	<1.02	< 0.017
Dibromochloromethane	0.059	0.56	0.96	0.72	0.80	0.013
Dichlorodifluoromethane	< 0.060	<0.57	<0.98	<0.73	<0.82	< 0.014
1,2-Dichloroethane	< 0.021	<0.20	< 0.34	<0.26	<0.29	<0.0048
trans,1,2-Dichloroethene	< 0.030	<0.29	< 0.49	< 0.37	< 0.41	<0.0068
1,1-Dichloroethene	< 0.033	< 0.31	<0.54	< 0.40	<0.45	<0.0075
1,2-Dichloropropane	< 0.033	< 0.31	<0.54	< 0.40	< 0.45	<0.0075
Ethylbenzene	< 0.042	< 0.40	<0.68	< 0.51	<0.57	< 0.0095
Ethylene Dibromide	< 0.030	< 0.29	< 0.49	< 0.37	< 0.41	<0.0068
Mesitylene (1,3,5-Trimethylbenzene)	<0.075	< 0.71	<1.22	< 0.91	<1.02	< 0.017
Methylene Chloride	< 0.057	< 0.54	< 0.93	< 0.69	<0.78	< 0.013
Styrene	< 0.036	< 0.34	< 0.59	<0.44	< 0.49	<0.0081
Tetrachloroethene	< 0.054	< 0.51	<0.88	<0.66	< 0.74	< 0.012
Toluene	0.14	1.32	2.26	1.69	1.90	0.031
1,1,1-Trichloroethane	< 0.042	< 0.40	<0.68	<0.51	<0.57	<0.0095
Trichloroethene	< 0.033	<0.31	< 0.54	<0.40	< 0.45	< 0.0075
1,1,2-Trichloroethane	<0.048	<0.46	<0.78	<0.58	<0.65	<0.011
Trichlorotrifluoroethane	<0.075	<0.71	<1.22	<0.91	<1.02	< 0.017
Trichlorofluoromethane	< 0.030	<0.29	< 0.49	<0.37	< 0.41	<0.0068
M&P-Xylene	<0.045	< 0.43	<0.73	<0.55	< 0.61	< 0.010
O-Xylene	<0.045	<0.43	<0.73	<0.55	< 0.61	< 0.010
Vinyl Chloride	<0.039	<0.37	<0.64	<0.47	<0.53	<0.0088
Total	<2.01	<19.1	<32.7	<24.5	<27.4	<0.45

Dry Gas Volume Sampled (Rm³*) :	0.0614
Actual Flowrate (m ³ /s):	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*):	16.6

^{*} 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. 1 BH Outlet
Volatile Organic Emission Data
Test No. 2

Compound	Total	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	Conected					
	μg	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
Acetone	0.17	1.66	2.85	2.13	2.38	0.040
Benzene	0.092	0.89	1.52	1.13	1.27	0.021
Bromodichloromethane	0.12	1.17	2.00	1.50	1.68	0.028
Bromoform	<0.042	<0.41	<0.69	<0.52	<0.58	<0.0097
Bromomethane	<0.045	< 0.43	< 0.74	<0.56	<0.62	<0.010
1,3-Butadiene	<0.075	<0.72	<1.24	<0.93	<1.04	< 0.017
2-Butanone	<0.11	<1.04	<1.79	<1.34	<1.50	<0.025
Carbon Tetrachloride	<0.048	< 0.46	<0.79	<0.59	<0.66	< 0.011
Chlorobenzene	0.039	0.38	0.65	0.48	0.54	0.0090
Chloroform	0.12	1.11	1.90	1.42	1.59	0.026
Cumene (Isopropylbenzene)	< 0.075	< 0.72	<1.24	< 0.93	<1.04	< 0.017
Dibromochloromethane	0.062	0.60	1.02	0.76	0.86	0.014
Dichlorodifluoromethane	< 0.19	<1.85	<3.18	<2.37	<2.66	< 0.044
1,2-Dichloroethane	< 0.021	<0.20	<0.35	<0.26	<0.29	<0.0048
trans,1,2-Dichloroethene	< 0.030	<0.29	<0.50	< 0.37	< 0.42	< 0.0069
1,1-Dichloroethene	< 0.033	<0.32	<0.55	< 0.41	< 0.46	< 0.0076
1,2-Dichloropropane	< 0.033	<0.32	<0.55	< 0.41	< 0.46	< 0.0076
Ethylbenzene	< 0.042	<0.41	<0.69	<0.52	<0.58	< 0.0097
Ethylene Dibromide	< 0.030	<0.29	<0.50	<0.37	< 0.42	< 0.0069
Mesitylene (1,3,5-Trimethylbenzene)	<0.075	<0.72	<1.24	<0.93	<1.04	< 0.017
Methylene Chloride	<0.057	<0.55	<0.94	<0.70	<0.79	< 0.013
Styrene	< 0.036	<0.35	<0.60	< 0.45	<0.50	<0.0083
Tetrachloroethene	< 0.054	<0.52	<0.89	<0.67	<0.75	< 0.012
Toluene	0.11	1.02	1.75	1.31	1.47	0.024
1,1,1-Trichloroethane	< 0.042	< 0.41	< 0.69	<0.52	<0.58	<0.0097
Trichloroethene	< 0.033	<0.32	<0.55	< 0.41	< 0.46	< 0.0076
1,1,2-Trichloroethane	<0.048	<0.46	<0.79	<0.59	<0.66	<0.011
Trichlorotrifluoroethane	<0.075	<0.72	<1.24	<0.93	<1.04	< 0.017
Trichlorofluoromethane	< 0.030	<0.29	<0.50	<0.37	< 0.42	< 0.0069
M&P-Xylene	<0.045	< 0.43	<0.74	<0.56	<0.62	< 0.010
O-Xylene	<0.045	< 0.43	<0.74	<0.56	< 0.62	< 0.010
Vinyl Chloride	<0.039	<0.38	<0.65	<0.48	<0.54	<0.0090
Total	<2.06	<19.9	<34.1	<25.5	<28.5	<0.47

Dry Gas Volume Sampled (Rm ³ *):	0.0605
Actual Flowrate (m³/s):	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

^{*} 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. 1 BH Outlet
Volatile Organic Emission Data
Test No. 3

Compound	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
	Collected	Concentration	Concentration		Concentration	Rate
	µg	μg/m³	μg/Rm ³ *	μg/Rm ³ **	μg/Rm³*	mg/s
A+	0.21	1.07	2.20	2.52	2.02	0.047
Acetone	0.21	1.97	3.38	2.52	2.83	0.047
Benzene	0.13	1.27	2.17	1.62	1.82	0.030
Bromodichloromethane	0.11	1.06	1.81	1.35	1.52	0.025
Bromoform	<0.042	<0.40	<0.69	<0.51	<0.57	<0.0095
Bromomethane	<0.045	<0.43	<0.73	<0.55	<0.61	<0.010
1,3-Butadiene	<0.075	<0.71	<1.22	<0.91	<1.02	<0.017
2-Butanone	<0.11	<1.03	<1.76	<1.32	<1.48	<0.024
Carbon Tetrachloride	<0.048	<0.46	<0.78	<0.59	<0.66	< 0.011
Chlorobenzene	0.039	0.37	0.64	0.48	0.53	0.0088
Chloroform	0.11	1.09	1.86	1.39	1.56	0.026
Cumene (Isopropylbenzene)	<0.075	<0.71	<1.22	<0.91	<1.02	< 0.017
Dibromochloromethane	0.058	0.55	0.94	0.70	0.79	0.013
Dichlorodifluoromethane	< 0.061	<0.58	<1.00	< 0.74	<0.83	<0.014
1,2-Dichloroethane	<0.021	<0.20	<0.34	<0.26	<0.29	<0.0048
trans,1,2-Dichloroethene	<0.030	<0.29	<0.49	<0.37	< 0.41	<0.0068
1,1-Dichloroethene	< 0.033	< 0.31	< 0.54	<0.40	< 0.45	<0.0075
1,2-Dichloropropane	< 0.033	<0.31	< 0.54	< 0.40	<0.45	<0.0075
Ethylbenzene	< 0.042	< 0.40	< 0.69	<0.51	<0.57	< 0.0095
Ethylene Dibromide	< 0.030	< 0.29	< 0.49	<0.37	< 0.41	<0.0068
Mesitylene (1,3,5-Trimethylbenzene)	< 0.075	<0.71	<1.22	< 0.91	<1.02	< 0.017
Methylene Chloride	< 0.14	<1.36	<2.33	<1.74	<1.95	< 0.032
Styrene	< 0.036	< 0.34	< 0.59	< 0.44	< 0.49	<0.0082
Tetrachloroethene	< 0.054	< 0.51	<0.88	<0.66	< 0.74	< 0.012
Toluene	0.14	1.34	2.30	1.72	1.93	0.032
1,1,1-Trichloroethane	< 0.042	<0.40	< 0.69	<0.51	<0.57	<0.0095
Trichloroethene	< 0.033	<0.31	<0.54	< 0.40	< 0.45	<0.0075
1,1,2-Trichloroethane	<0.048	<0.46	<0.78	<0.59	<0.66	<0.011
Trichlorotrifluoroethane	<0.075	<0.71	<1.22	<0.91	<1.02	< 0.017
Trichlorofluoromethane	< 0.034	<0.32	<0.55	<0.41	<0.46	<0.0077
M&P-Xylene	<0.045	< 0.43	<0.73	< 0.55	<0.61	< 0.010
O-Xylene	<0.045	< 0.43	<0.73	<0.55	<0.61	<0.010
Vinyl Chloride	<0.039	<0.37	<0.64	<0.48	<0.53	<0.0088
Total	<2.11	<20.1	<34.5	<25.8	<28.9	<0.48

Dry Gas Volume Sampled (Rm ³ *):	0.0613
Actual Flowrate (m ³ /s):	23.8
Dry Reference Flowrate (Rm³/s*) :	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*):	16.6

^{*} 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/m³	μg/m³	μg/m³	μg/m³
		-		-
Acetone	1.99	1.66	1.97	1.87
Benzene	1.08	0.89	1.27	1.08
Bromodichloromethane	1.12	1.17	1.06	1.12
Bromoform	<0.40	< 0.41	<0.40	< 0.40
Bromomethane	< 0.43	<0.43	<0.43	<0.43
1,3-Butadiene	<0.71	<0.72	<0.71	< 0.72
2-Butanone	<1.03	<1.04	<1.03	<1.03
Carbon Tetrachloride	<0.46	<0.46	<0.46	< 0.46
Chlorobenzene	0.34	0.38	0.37	0.36
Chloroform	1.08	1.11	1.09	1.09
Cumene (Isopropylbenzene)	< 0.71	< 0.72	<0.71	< 0.72
Dibromochloromethane	0.56	0.60	0.55	0.57
Dichlorodifluoromethane	<0.57	<1.85	<0.58	<1.00
1,2-Dichloroethane	<0.20	<0.20	<0.20	<0.20
trans,1,2-Dichloroethene	<0.29	<0.29	<0.29	<0.29
1,1-Dichloroethene	< 0.31	< 0.32	<0.31	< 0.32
1,2-Dichloropropane	< 0.31	< 0.32	< 0.31	< 0.32
Ethylbenzene	< 0.40	< 0.41	< 0.40	< 0.40
Ethylene Dibromide	< 0.29	<0.29	<0.29	< 0.29
Mesitylene (1,3,5-Trimethylbenzene)	<0.71	<0.72	<0.71	<0.72
Methylene Chloride	<0.54	<0.55	<1.36	<0.82
Styrene	< 0.34	<0.35	<0.34	< 0.34
Tetrachloroethene	<0.51	<0.52	<0.51	<0.52
Toluene	1.32	1.02	1.34	1.23
1,1,1-Trichloroethane	<0.40	<0.41	<0.40	< 0.40
Trichloroethene	<0.31	<0.32	<0.31	< 0.32
1,1,2-Trichloroethane	<0.46	< 0.46	<0.46	<0.46
Trichlorotrifluoroethane	<0.71	<0.72	<0.71	<0.72
Trichlorofluoromethane	<0.29	<0.29	<0.32	<0.30
M&P-Xylene	<0.43	<0.43	<0.43	< 0.43
O-Xylene	<0.43	<0.43	<0.43	<0.43
Vinyl Chloride	<0.37	<0.38	<0.37	<0.37
Total	<19.1	<19.9	<20.1	<19.7

TABLE 89

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Volatile Organic Dry Reference Concentrations

Compound	Dry Reference Concentration			ности по тенеро на боре на 1994 М М М М М М М на постанива на предвада за предвада на предвада на предвада на п
	Test No. 1	Test No. 2	Test No. 3	Average
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*
Acetone	3.40	2.85	3.38	3.21
Benzene	1.85	1.52	2.17	1.85
Bromodichloromethane	1.92	2.00	1.81	1.91
Bromoform	<0.68	<0.69	<0.69	< 0.69
Bromomethane	<0.73	<0.74	<0.73	< 0.74
1,3-Butadiene	<1.22	<1.24	<1.22	<1.23
2-Butanone	<1.76	<1.79	<1.76	<1.77
Carbon Tetrachloride	<0.78	<0.79	<0.78	<0.79
Chlorobenzene	0.59	0.65	0.64	0.62
Chloroform	1.86	1.90	1.86	1.87
Cumene (Isopropylbenzene)	<1.22	<1.24	<1.22	<1.23
Dibromochloromethane	0.96	1.02	0.94	0.97
Dichlorodifluoromethane	<0.98	<3.18	<1.00	<1.72
1,2-Dichloroethane	<0.34	<0.35	< 0.34	< 0.34
trans,1,2-Dichloroethene	< 0.49	<0.50	< 0.49	< 0.49
1,1-Dichloroethene	<0.54	<0.55	<0.54	< 0.54
1,2-Dichloropropane	< 0.54	<0.55	< 0.54	<0.54
Ethylbenzene	<0.68	<0.69	<0.69	< 0.69
Ethylene Dibromide	< 0.49	<0.50	<0.49	< 0.49
Mesitylene (1,3,5-Trimethylbenzene)	<1.22	<1.24	<1.22	<1.23
Methylene Chloride	< 0.93	<0.94	<2.33	<1.40
Styrene	<0.59	<0.60	<0.59	<0.59
Tetrachloroethene	<0.88	<0.89	<0.88	<0.88
Toluene	2.26	1.75	2.30	2.11
1,1,1-Trichloroethane	<0.68	< 0.69	< 0.69	< 0.69
Trichloroethene	<0.54	<0.55	<0.54	<0.54
1,1,2-Trichloroethane	<0.78	<0.79	<0.78	< 0.79
Trichlorotrifluoroethane	<1.22	<1.24	<1.22	<1.23
Trichlorofluoromethane	< 0.49	<0.50	<0.55	<0.51
M&P-Xylene	<0.73	<0.74	<0.73	< 0.74
O-Xylene	<0.73	<0.74	<0.73	< 0.74
Vinyl Chloride	<0.64	<0.65	<0.64	<0.64
Total	<32.7	<34.1	<34.5	<33.8

^{*} 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/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*		
				2.40		
Acetone	2.54	2.13	2.52	2.40		
Benzene	1.38	1.13	1.62	1.38		
Bromodichloromethane	1.44	1.50	1.35	1.43		
Bromoform	<0.51	<0.52	<0.51	<0.51		
Bromomethane	<0.55	<0.56	<0.55	<0.55		
1,3-Butadiene	<0.91	<0.93	<0.91	<0.92		
2-Butanone	<1.31	<1.34	<1.32	<1.32		
Carbon Tetrachloride	<0.58	<0.59	<0.59	<0.59		
Chlorobenzene	0.44	0.48	0.48	0.47		
Chloroform	1.39	1.42	1.39	1.40		
Cumene (Isopropylbenzene)	<0.91	<0.93	<0.91	< 0.92		
Dibromochloromethane	0.72	0.76	0.70	0.73		
Dichlorodifluoromethane	< 0.73	<2.37	<0.74	<1.28		
1,2-Dichloroethane	<0.26	<0.26	<0.26	< 0.26		
trans,1,2-Dichloroethene	<0.37	<0.37	< 0.37	< 0.37		
1,1-Dichloroethene	< 0.40	< 0.41	< 0.40	< 0.40		
1,2-Dichloropropane	< 0.40	< 0.41	< 0.40	< 0.40		
Ethylbenzene	<0.51	<0.52	<0.51	< 0.51		
Ethylene Dibromide	<0.37	<0.37	<0.37	< 0.37		
Mesitylene (1,3,5-Trimethylbenzene)	<0.91	<0.93	<0.91	< 0.92		
Methylene Chloride	< 0.69	<0.70	<1.74	<1.05		
Styrene	< 0.44	< 0.45	< 0.44	< 0.44		
Tetrachloroethene	<0.66	< 0.67	<0.66	< 0.66		
Toluene	1.69	1.31	1.72	1.57		
1,1,1-Trichloroethane	<0.51	<0.52	<0.51	< 0.51		
Trichloroethene	<0.40	<0.41	<0.40	<0.40		
1,1,2-Trichloroethane	<0.58	<0.59	<0.59	<0.59		
Trichlorotrifluoroethane	<0.91	<0.93	<0.91	<0.92		
Trichlorofluoromethane	<0.37	<0.37	<0.41	<0.38		
M&P-Xylene	<0.55	<0.56	<0.55	<0.55		
O-Xylene	<0.55	<0.56	<0.55	<0.55		
Vinyl Chloride	<0.47	<0.48	<0.48	<0.48		
Total	<24.5	<25.5	<25.8	<25.2		

^{*} 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/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*
Acetone	2.85	2.38	2.83	2.69
Benzene	1.55	1.27	1.82	1.55
Bromodichloromethane	1.61	1.68	1.52	1.60
Bromoform	<0.57	<0.58	<0.57	<0.58
Bromomethane	<0.61	<0.62	<0.61	< 0.62
1,3-Butadiene	<1.02	<1.04	<1.02	<1.03
2-Butanone	<1.47	<1.50	<1.48	<1.48
Carbon Tetrachloride	<0.65	<0.66	<0.66	<0.66
Chlorobenzene	0.49	0.54	0.53	0.52
Chloroform	1.55	1.59	1.56	1.57
Cumene (Isopropylbenzene)	<1.02	<1.04	<1.02	<1.03
Dibromochloromethane	0.80	0.86	0.79	0.82
Dichlorodifluoromethane	<0.82	<2.66	<0.83	<1.44
1,2-Dichloroethane	<0.29	<0.29	<0.29	<0.29
trans,1,2-Dichloroethene	< 0.41	< 0.42	< 0.41	< 0.41
1,1-Dichloroethene	< 0.45	< 0.46	<0.45	< 0.45
1,2-Dichloropropane	< 0.45	<0.46	< 0.45	< 0.45
Ethylbenzene	<0.57	<0.58	<0.57	<0.58
Ethylene Dibromide	< 0.41	< 0.42	< 0.41	< 0.41
Mesitylene (1,3,5-Trimethylbenzene)	<1.02	<1.04	<1.02	<1.03
Methylene Chloride	<0.78	<0.79	<1.95	<1.17
Styrene	< 0.49	<0.50	< 0.49	< 0.49
Tetrachloroethene	< 0.74	<0.75	< 0.74	< 0.74
Toluene	1.90	1.47	1.93	1.76
1,1,1-Trichloroethane	<0.57	<0.58	<0.57	<0.58
Trichloroethene	< 0.45	<0.46	< 0.45	< 0.45
1,1,2-Trichloroethane	<0.65	<0.66	<0.66	< 0.66
Trichlorotrifluoroethane	<1.02	<1.04	<1.02	<1.03
Trichlorofluoromethane	< 0.41	<0.42	< 0.46	< 0.43
M&P-Xylene	< 0.61	<0.62	< 0.61	<0.62
O-Xylene	< 0.61	<0.62	< 0.61	<0.62
Vinyl Chloride	<0.53	<0.54	<0.53	<0.53
Total	<27.4	<28.5	<28.9	<28.3

^{*} 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	Test No. 2	Test No. 3	Average		
	mg/s	mg/s	mg/s	mg/s		
Acetone	0.047	0.040	0.047	0.045		
Benzene	0.026	0.021	0.030	0.026		
Bromodichloromethane	0.027	0.028	0.025	0.027		
Bromoform	<0.0095	<0.0097	<0.0095	<0.0096		
Bromomethane	< 0.010	< 0.010	<0.010	< 0.010		
1,3-Butadiene	< 0.017	<0.017	<0.017	< 0.017		
2-Butanone	< 0.024	<0.025	<0.024	<0.025		
Carbon Tetrachloride	< 0.011	<0.011	<0.011	<0.011		
Chlorobenzene	0.0081	0.0090	0.0088	0.0087		
Chloroform	0.026	0.026	0.026	0.026		
Cumene (Isopropylbenzene)	< 0.017	< 0.017	< 0.017	<0.017		
Dibromochloromethane	0.013	0.014	0.013	0.014		
Dichlorodifluoromethane	< 0.014	< 0.044	< 0.014	< 0.024		
1,2-Dichloroethane	< 0.0048	<0.0048	<0.0048	<0.0048		
trans,1,2-Dichloroethene	< 0.0068	< 0.0069	<0.0068	< 0.0068		
1,1-Dichloroethene	< 0.0075	<0.0076	<0.0075	< 0.0075		
1,2-Dichloropropane	< 0.0075	<0.0076	<0.0075	< 0.0075		
Ethylbenzene	< 0.0095	<0.0097	<0.0095	< 0.0096		
Ethylene Dibromide	<0.0068	< 0.0069	<0.0068	<0.0068		
Mesitylene (1,3,5-Trimethylbenzene)	< 0.017	<0.017	<0.017	< 0.017		
Methylene Chloride	< 0.013	< 0.013	<0.032	< 0.019		
Styrene	<0.0081	< 0.0083	<0.0082	<0.0082		
Tetrachloroethene	< 0.012	< 0.012	< 0.012	< 0.012		
Toluene	0.031	0.024	0.032	0.029		
1,1,1-Trichloroethane	<0.0095	<0.0097	<0.0095	<0.0096		
Trichloroethene	<0.0075	<0.0076	<0.0075	<0.0075		
1,1,2-Trichloroethane	<0.011	<0.011	<0.011	<0.011		
Trichlorotrifluoroethane	<0.017	<0.017	<0.017	<0.017		
Trichlorofluoromethane	<0.0068	<0.0069	<0.0077	<0.0071		
M&P-Xylene	< 0.010	<0.010	<0.010	< 0.010		
O-Xylene	<0.010	<0.010	<0.010	<0.010		
Vinyl Chloride	<0.0088	<0.0090	<0.0088	<0.0089		
Total	<0.45	<0.47	<0.48	<0.47		

TABLE 93

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet

Summary of Volatile Organic Emission Data

Compound	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	μg/m³	μg/Rm³*	μg/Rm³*	μg/Rm³*	mg/s
Acetone	1.87	3.21	2.40	2.69	0.045
Benzene	1.08	1.85	1.38	1.55	0.026
Bromodichloromethane	1.12	1.91	1.43	1.60	0.027
Bromoform	<0.40	< 0.69	<0.51	<0.58	<0.0096
Bromomethane	< 0.43	< 0.74	<0.55	< 0.62	< 0.010
1,3-Butadiene	< 0.72	<1.23	<0.92	<1.03	< 0.017
2-Butanone	<1.03	<1.77	<1.32	<1.48	<0.025
Carbon Tetrachloride	<0.46	<0.79	<0.59	<0.66	< 0.011
Chlorobenzene	0.36	0.62	0.47	0.52	0.0087
Chloroform	1.09	1.87	1.40	1.57	0.026
Cumene (Isopropylbenzene)	<0.72	<1.23	<0.92	<1.03	< 0.017
Dibromochloromethane	0.57	0.97	0.73	0.82	0.014
Dichlorodifluoromethane	<1.00	<1.72	<1.28	<1.44	< 0.024
1,2-Dichloroethane	<0.20	< 0.34	<0.26	<0.29	<0.0048
trans,1,2-Dichloroethene	<0.29	< 0.49	<0.37	< 0.41	< 0.0068
1,1-Dichloroethene	<0.32	< 0.54	< 0.40	< 0.45	<0.0075
1,2-Dichloropropane	<0.32	<0.54	< 0.40	<0.45	<0.0075
Ethylbenzene	<0.40	< 0.69	<0.51	<0.58	<0.0096
Ethylene Dibromide	<0.29	< 0.49	< 0.37	< 0.41	<0.0068
Mesitylene (1,3,5-Trimethylbenzene)	<0.72	<1.23	<0.92	<1.03	< 0.017
Methylene Chloride	<0.82	<1.40	<1.05	<1.17	< 0.019
Styrene	< 0.34	<0.59	< 0.44	< 0.49	<0.0082
Tetrachloroethene	<0.52	<0.88	< 0.66	<0.74	< 0.012
Toluene	1.23	2.11	1.57	1.76	0.029
1,1,1-Trichloroethane	< 0.40	< 0.69	<0.51	<0.58	<0.0096
Trichloroethene	< 0.32	<0.54	< 0.40	< 0.45	<0.0075
1,1,2-Trichloroethane	< 0.46	<0.79	< 0.59	<0.66	< 0.011
Trichlorotrifluoroethane	<0.72	<1.23	<0.92	<1.03	<0.017
Trichlorofluoromethane	<0.30	<0.51	<0.38	<0.43	<0.0071
M&P-Xylene	< 0.43	<0.74	<0.55	<0.62	<0.010
O-Xylene	< 0.43	<0.74	<0.55	<0.62	<0.010
Vinyl Chloride	<0.37	<0.64	<0.48	<0.53	<0.0089
Total	<19.7	<33.8	<25.2	<28.3	<0.47

^{*} 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	Field Blank	Field Blank	Trip Blank	Method
	Tube 10A/10B	Tube 15A/15B	Tube 21A/21B	Tube 30A/30B	Blank
	μg	μg	μg	μg	μg
Acetone	<0.045	<0.045	<0.045	<0.045	<0.045
Benzene	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090
Bromodichloromethane	<0.011	<0.011	<0.011	< 0.011	<0.011
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	<0.014
Bromomethane	<0.015	<0.015	< 0.015	<0.015	<0.015
1,3-Butadiene	<0.025	<0.025	<0.025	<0.025	<0.025
2-Butanone	<0.036	<0.036	<0.036	<0.036	<0.036
Carbon Tetrachloride	<0.016	<0.016	<0.016	< 0.016	<0.016
Chlorobenzene	<0.011	<0.011	<0.011	<0.011	< 0.011
Chloroform	<0.011	<0.011	<0.011	<0.011	<0.011
Cumene (Isopropylbenzene)	<0.025	<0.025	<0.025	<0.025	<0.025
Dibromochloromethane	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090
Dichlorodifluoromethane	<0.020	<0.020	<0.020	<0.020	<0.020
1,2-Dichloroethane	< 0.0070	<0.0070	< 0.0070	<0.0070	<0.0070
trans,1,2-Dichloroethene	< 0.010	< 0.010	<0.010	<0.010	< 0.010
1,1-Dichloroethene	<0.011	< 0.011	< 0.011	<0.011	< 0.011
1,2-Dichloropropane	< 0.011	< 0.011	< 0.011	<0.011	< 0.011
Ethylbenzene	< 0.014	< 0.014	< 0.014	<0.014	< 0.014
Ethylene Dibromide	< 0.010	< 0.010	<0.010	<0.010	< 0.010
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	<0.025	<0.025
Methylene Chloride	< 0.019	< 0.019	< 0.019	< 0.019	< 0.019
Styrene	< 0.012	< 0.012	< 0.012	< 0.012	<0.012
Tetrachloroethene	<0.018	<0.018	<0.018	<0.018	< 0.018
Toluene	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
1,1,1-Trichloroethane	< 0.014	<0.014	< 0.014	< 0.014	< 0.014
Trichloroethene	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
1,1,2-Trichloroethane	<0.016	< 0.016	<0.016	<0.016	<0.016
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	<0.025
Trichlorofluoromethane	< 0.010	< 0.010	<0.010	<0.010	<0.010
M&P-Xylene	<0.015	<0.015	<0.015	< 0.015	<0.015
O-Xylene	< 0.015	<0.015	<0.015	<0.015	<0.015
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	<0.013
Total	<0.52	<0.52	<0.52	<0.52	<0.52

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining the total analytical results for each compound, 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
(95 pages)

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

Particulate and Metals Trains

Test	Test Date	Sampling Period		Sampling Time*
Number		Start	Finish	min
1	May 3, 2016	8:47	11:55	180
2	May 3, 2016	12:51	16:04	180
3	May 4, 2016	14:59	18:12	180

Paticle Size Distribution Trains

Test	Test Date	Sampling Period		Sampling Time*
Number		Start	Finish	min
1	May 2, 2016	10:44	12:47	122
2	May 2, 2016	13:58	16:00	122
3	May 2, 2016	18:11	20:13	120

Acid Gases Trains

Test	Test Date	Sampling Period		Sampling Time*
Number		Start	Finish	min
1	May 3, 2016	10:04	11:04	60
2	May 3, 2016	11:18	12:18	60
3	May 3, 2016	13:02	14:02	60

Semi-Volatile Organic Compounds Trains

Test	Test Date	Sampling Period		Sampling Time*
Number	rite in	Start	Finish	min
resta, electric				
1	May 5, 2016	9:19	15:28	360
2	May 9, 2016	10:10	16:18	360
3	May 10, 2016	8:56	15:09	360

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

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

Acrolein and Aldehydes Trains

Test	Test Date	Sampling Period		Sampling Time
Number		Start	Finish	min
1	May 6, 2016	9:12	10:12	60
2	May 6, 2016	10:33	11:33	60
3	May 6, 2016	12:56	13:56	60

Volatile Organic Compounds Trains

Test	Tube	Test Date	Samplin	g Period	Sampling Time
Number	Pair		Start	Finish	min

1	1	May 4, 2016	9:13	9:33	20
	2	May 4, 2016	9:41	10:01	20
	3	May 4, 2016	10:08	10:28	20
	4	May 4, 2016	10:39	10:59	20
2	1	May 5, 2016	9:20	9:40	20
	2	May 5, 2016	9:48	10:08	20
	3	May 5, 2016	10:18	10:38	20
	4	May 5, 2016	10:45	11:05	20
3	1	May 5, 2016	13:06	13:26	20
***************************************	2	May 5, 2016	13:34	13:54	20
sidvensideb	3	May 5, 2016	14:01	14:21	20
	4	May 5, 2016	14:27	14:47	20

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

Particulate and Metals Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzie Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.841	0.984	6.45	3.714	99.9
2	0.841	0.984	6.45	3.523	99.0
3	0.848	0.984	6.46	3.559	100.1

Paticle Size Distribution Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzle Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.846	0.984	4.50	1.263	105.0
2	0.846	0.984	4.50	1.194	100.4
3	0.846	0.984	4.50	1.133	92.7

Acid Gases Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzle Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.841	0.980	6.48	1.184	98.5
2	0.841	0.980	6.48	1.256	99.1
3	0.841	0.980	6.48	1.191	100.2

Semi-Volatile Organic Compounds Trains

Test No.	Pitot Tube	Dry Gas Meter	Nozzle Diameter	Gas Volume Sampled	Percentage of Isokineticity
	Coefficient	Factor	mm	Rm³ *	%
1	0.848	0.984	6.46	7.287	101.1
2	0.848	0.984	6.46	6.961	100.0
3	0.848	0.984	6.46	7.048	99.3

^{*} 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	143	15.5	18.0	-2.49	97.9	10.9	8.41
2	140	15.3	17.1	-2.49	97.7	11.2	8.22
3	140	15.4	17.1	-2.49	97.2	11.2	8.06
Average	141	15.4	17.4	-2.49	97.6	11.1	8.23

Paticle 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	139	15.0	17.4	-2.26	98.5	11.2	8.42
2	138	15.2	17.4	-2.41	98.3	11.4	8.11
3	139	15.6	18.1	-2.41	98.3	11.3	8.29
Average	139	15.3	17.6	-2.36	98.3	11.3	8.27

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	144	15.2	17.3	-2.49	97.9	11.1	8.21
2	145	15.5	18.3	-2.49	97.8	10.8	8.77
3	143	15.8	17.2	-2.49	97.7	11.2	8.18
Average	144	15.5	17.6	-2.49	97.8	11.0	8.39

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	140	16.2	17.5	-2.57	97.6	11.4	7.99
2	138	16.1	16.6	-2.57	98.5	11.6	7.90
3	139	15.7	16.8	-2.57	99.0	11.4	8.12
Average	139	16.0	17.0	-2.57	98.3	11.5	8.00

^{*} 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	Dry Reference Flowrate	Dry Adjusted Flowrate	Wet Reference Flowrate
	m³/s	Rm³/s *	Rm³/s **	Rm³/s*
1	26.6	15.6	19.6	18.4
2	25.3	14.9	19.1	17.6
3	25.3	14.8	19.2	17.5
Average	25.7	15.1	19.3	17.9

Paticle Size Distribution Trains

Test No.	Actual Flowrate	Dry Reference Flowrate	Dry Adjusted Flowrate	Wet Reference Flowrate
	m³/s	Rm ³ /s *	Rm³/s **	Rm³/s*
1	25.6	15.3	19.3	18.0
2	25.6	15.3	19.8	18.0
3	26.6	15.8	20.1	18.7
Average	26.0	15.5	19.7	18.3

Acid Gases Trains ***

Test No.	Actual Flowrate	Dry Reference Flowrate	Dry Adjusted Flowrate	Wet Reference Flowrate
	m³/s	Rm³/s *	Rm³/s **	Rm ³ /s*
1	25.5	14.9	19.1	17.6
2	27.1	15.7	19.3	18.7
3 / 5	25.4	14.8	19.0	17.6
Average	26.0	15.1	19.1	17.9

Semi-Volatile Organics Trains

Test No.	Actual Flowrate m³/s	Dry Reference Flowrate Rm³/s *	Dry Adjusted Flowrate Rm ³ /s **	Wet Reference Flowrate Rm³/s*
1	25.8	15.0	19.6	18.0
2	24.6	14.5	19.1	17.3
3	24.8	14.8	19.1	17.6
Average	25.1	14.8	19.3	17.6

^{*} 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	Partic	ulate Colle	cted	Dry Gas	**************************************	Particulate	Concentration	OCCUPANT OF THE PROPERTY OF TH	Particulate
No.	Probe	Main	Total	Volume	Actual	Dry	Dry	Wet	Emission
	Rinse	Filter		Sampled	2	Reference	Adjusted	Reference	Rate
	mg	mg	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
1	1.8	<0.30	<2.10	3.714	<0.33	<0.57	<0.45	<0.48	<8.80
2	2.1	<0.30	<2.40	3.523	<0.40	<0.68	<0.53	<0.58	<10.1
3	1.8	<0.30	<2.10	3.559	<0.35	<0.59	<0.46	<0.50	<8.75
Average					<0.36	<0.61	<0.48	<0.52	<9.23

^{*} 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 PM₁₀ Emission Data

PM_{2.5}

	Total	Dry Volume	PM _{2.5} Concentration Emission				Emission
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate
No.	mg	Rm³*	mg/m³	mg/Rm ³ *	mg/Rm ³ **	mg/Rm³*	mg/s
1	<1.2	1.263	<0.57	<0.95	<0.75	<0.81	<14.6
2	0.6	1.194	0.30	0.50	0.39	0.43	7.68
3	<1.3	1.133	<0.68	<1.15	<0.90	<0.97	<18.1
Average			<0.52	<0.87	<0.68	<0.73	<13.4
Blank							

PM₁₀

	Total	Dry Volume	PM ₁₀ Concentration				Emission
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate
No.	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s

1	<8.3	1.263	<3.93	<6.57	<5.21	<5.59	<101
2	1.8	1.194	0.90	1.51	1.17	1.28	23.1
3	<4.7	1.133	<2.46	<4.15	<3.26	<3.50	<65.5
Average			<2.43	<4.08	<3.21	<3.46	<63.1
Blank							
Jiank							

^{*} At 25 °C and 1 atmosphere

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

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

Inorganic Condensable Particulate

	Total	Dry Volume	Inorganic Condensable Particulate Concentration Emission				
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate
No.	mg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
1	19	1.263	9.00	15.0	11.9	12.8	230
2	6.8	1.194	3.40	5.70	4.41	4.83	87.1
3	16	1.133	8.36	14.1	11.1	11.9	223
Average			6.92	11.6	9.14	9.85	180
Blank	7.5						

Organic Condensable Particulate

	Total	Dry Volume	Organic Condensable Particulate Concentration Emission				
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Rate
No.	mg	Rm ³ *	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
1	2.1	1.263	0.99	1.66	1.32	1.41	25.5
2	1.4	1.194	0.70	1.17	0.91	0.99	17.9
3	1.2	1.133	0.63	1.06	0.83	0.89	16.7
Average			0.77	1.30	1.02	1.10	20.0
Blank	<1.0						

^{*} 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

	HCl	Dry Volume		Hydrogen Chl	oride Concentrati	on	HCl
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	mg/m³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
1	6300	1.184	3.12	5.32	4.24	4.51	83.0
2	6500	1.256	3.04	5.18	4.12	4.39	80.7
3	5500	1.191	2.72	4.62	3.60	3.91	68.8
Average			2.96	5.04	3.99	4.27	77.5
Blank	<200						

Hydrogen Fluoride

	HF	Dry Volume		Hydrogen Flu	oride Concentrati	on	HF
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	mg/m³	mg/Rm ³ *	mg/Rm ³ **	mg/Rm³*	mg/s
1	<200	1.184	<0.099	<0.17	<0.13	<0.14	<2.64
2	<200	1.256	<0.093	<0.16	<0.13	<0.14	<2.48
3	<200	1.191	<0.099	<0.17	<0.13	<0.14	<2.50
Average			<0.097	<0.17	<0.13	<0.14	<2.54
Blank	<200						

Ammonia

	Ammonia	Dry Volume			Ammonia		
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	mg/m ³	mg/Rm³*	mg/Rm³**	mg/Rm³*	mg/s
					111		
1	3399	1.184	1.68	2.87	2.28	2.43	44.8
2	3777	1.256	1.76	3.01	2.39	2.55	46.9
3	2927	1.191	1.45	2.46	1.92	2.08	36.6
Average			1.63	2.78	2.20	2.35	42.8
Blank	<23.6						

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit), 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 May 2 to May 5, 2016 and May 9 to May 10, 2016

Sampling Location	Parameter	Minimum	Average	Maximum
BH Outlet	Oxygen (%, 1 hr Avg)	7.08	8.08	9.06
BH Outlet	Carbon Dioxide (kg/Rm³, 1 hr Avg) *	0.18	0.20	0.22
BH Outlet	Carbon Monoxide (mg/Rm³, 1 hr Avg) *	6	17	65
BH Outlet	Carbon Monoxide (mg/Rm³, 4 hr Avg) *	9.8	16.9	29.8
BH Outlet	Sulphur Dioxide (mg/Rm³, 1 hr Avg) *	0	0	0
BH Outlet	Sulphur Dioxide (mg/Rm³, 24 hr Avg) *	0	0	0
BH Outlet	Nitrogen Oxides (mg/Rm³, 1 hr Avg) *	92	107	134
BH Outlet	Nitrogen Oxides (mg/Rm³, 24 hr Avg) *	104	107	111
BH Outlet	Hydrogen Chloride (mg/Rm³, 1 hr Avg) *	2	4	8
BH Outlet	Hydrogen Chloride (mg/Rm³, 24 hr Avg) *	3.6	4.2	5.4
BH Outlet	Total Hydrocarbons (mg/Rm³, 1 hr Avg) *	0	0	1
Scrubber Inlet	Oxygen (%, 1 hr Avg)	7	7	8

Data measured by the ORTECH CEMS on April 19, 2016

Sampling Location	Test No.	Parameter	Minimum	Average	Maximum
DII O i - t	4	T-1-111 du	1.0	2.3	0.1
BH Outlet	1	Total Hydrocarbons (ppm dry) **	1.8	3.3	8.1
BH Outlet	2	Total Hydrocarbons (ppm dry) **	0.2	0.8	1.8
BH Outlet	3	Total Hydrocarbons (ppm dry) **	0	0	0.1
BH Outlet	4	Total Hydrocarbons (ppm dry) **	0	0	0
BH Outlet	5	Total Hydrocarbons (ppm dry) **	0.2	0.5	1.3
BH Outlet	6	Total Hydrocarbons (ppm dry) **	0.5	0.8	1.1
Average		Total Hydrocarbons (ppm dry) **		0.9	

^{*} Reference conditions, dry basis adjusted to 11% oxygen

^{**} Half hour tests reported on a dry basis as equivalent methane

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

Metal	Probe & Filter	Impingers	Total
	Hydrofluoric Acid Digest	& Rinses	Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	<6.0	2.4	2.40
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	8.0	0.81	8.81
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	5.5	5.50
Lead	0.56	0.48	1.04
Manganese	2.3	2.68	4.98
Mercury *	<0.015	1.53	1.53
Molybdenum	45.1	<0.25	45.1
Nickel	18.0	1.52	1 9 .5
Selenium	<2.0	<0.50	<0.50
Silver	<0.40	<0.10	< 0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	2.9	2.90
.			
Total			95.4

^{*} Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit, "<MDL").

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	Impingers	Total
	Hydrofluoric Acid Digest	& Rinses	Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	6.1	3.0	9.10
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	7.79	1.03	8.82
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	6.1	6.10
Lead	0.56	0.49	1.05
Manganese	2.6	3.06	5.66
Mercury *	0.016	1.05	1.07
Molybdenum	45.8	<0.25	45.8
Nickel	17.5	0.63	18.1
Selenium	2.2	0.72	2.92
Silver	<0.40	<0.10	<0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	3.7	3.70
Total			105

^{*} Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit, "<MDL").

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	Impingers	Total
	Hydrofluoric Acid Digest	& Rinses	Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	6.6	1.9	8.50
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	7.00	1.70	8.70
Cobalt	<0.20	<0.050	<0.20
Copper	6.7	4.3	11.0
Lead	0.58	0.37	0.95
Manganese	2.4	2.40	4.80
Mercury *	<0.015	1.16	1.16
Molybdenum	46.7	<0.25	46.7
Nickel	18.4	1.74	20.1
Selenium	<2.0	<0.50	<0.50
Silver	<0.40	<0.10	<0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	3.7	3.70
Total			109

^{*} Includes the permanganate impingers

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit, "<MDL").

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	<0.80	<0.13	<0.22	< 0.17	< 0.18	<0.0034
Arsenic	<0.20	<0.032	<0.054	< 0.043	<0.046	<0.00084
Barium	2.40	0.38	0.65	0.51	0.55	0.010
Beryllium	<0.20	<0.032	<0.054	< 0.043	<0.046	<0.00084
Cadmium	<0.20	<0.032	<0.054	<0.043	<0.046	< 0.00084
Chromium	8.81	1.39	2.37	1.89	2.01	0.037
Cobalt	<0.20	<0.032	< 0.054	< 0.043	<0.046	< 0.00084
Copper	5.50	0.87	1.48	1.18	1.26	0.023
Lead	1.04	0.16	0.28	0.22	0.24	0.0044
Manganese	4.98	0.79	1.34	1.07	1.14	0.021
Mercury	1.53	0.24	0.41	0.33	0.35	0.0064
Molybdenum	45.1	7.12	12.1	9.67	10.3	0.19
Nickel	19.5	3.08	5.26	4.18	4.46	0.082
Selenium	<0.50	< 0.079	< 0.13	< 0.11	<0.11	< 0.0021
Silver	< 0.40	< 0.063	<0.11	<0.086	<0.091	<0.0017
Thallium	<1.00	<0.16	<0.27	<0.21	<0.23	< 0.0042
Vanadium	<0.15	<0.024	<0.040	<0.032	< 0.034	<0.00063
Zinc	2.90	0.46	0.78	0.62	0.66	0.012
Total	95.4	15.1	25.7	20.4	21.8	0.40

Dry Gas Volume Sampled (Rm³*):	3.714
Actual Flowrate (m³/s) :	26.6
Dry Reference Flowrate (Rm³/s*) :	15.6
Dry Adjusted Flowrate (Rm³/s**) :	19.6
Wet Reference Flowrate (Rm³/s*):	18.4

^{*} 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	<0.80	<0.13	<0.23	<0.18	<0.19	<0.0034
Arsenic	<0.20	< 0.033	<0.057	<0.044	<0.048	<0.00085
Barium	9.10	1.52	2.58	2.02	2.19	0.038
Beryllium	<0.20	< 0.033	<0.057	< 0.044	<0.048	<0.00085
Cadmium	<0.20	< 0.033	<0.057	<0.044	<0.048	<0.00085
Chromium	8.82	1.47	2.50	1.95	2.12	0.037
Cobalt	<0.20	< 0.033	<0.057	<0.044	<0.048	<0.00085
Copper	6.10	1.02	1.73	1.35	1.47	0.026
Lead	1.05	0.18	0.30	0.23	0.25	0.0044
Manganese	5.66	0.95	1.61	1.25	1.36	0.024
Mercury	1.07	0.18	0.30	0.24	0.26	0.0045
Molybdenum	45.8	7.66	13.0	10.1	11.0	0.19
Nickel	18.1	3.03	5.15	4.01	4.36	0.077
Selenium	2.92	0.49	0.83	0.65	0.70	0.012
Silver	< 0.40	< 0.067	<0.11	<0.089	< 0.096	< 0.0017
Thallium	<1.00	< 0.17	<0.28	<0.22	<0.24	< 0.0042
Vanadium	< 0.15	<0.025	<0.043	<0.033	<0.036	< 0.00063
Zinc	3.70	0.62	1.05	0.82	0.89	0.016
Total	105	17.6	29.9	23.4	25.4	0.45

Dry Gas Volume Sampled (Rm ³ *):	3.523
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.9
Dry Adjusted Flowrate (Rm³/s**) :	19.1
Wet Reference Flowrate (Rm³/s*) :	17.6

^{*} 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	<0.80	< 0.13	<0.22	<0.17	<0.19	<0.0033
Arsenic	<0.20	< 0.033	< 0.056	< 0.043	<0.048	<0.00083
Barium	8.50	1.40	2.39	1.84	2.02	0.035
Beryllium	< 0.20	< 0.033	< 0.056	< 0.043	<0.048	<0.00083
Cadmium	<0.20	< 0.033	< 0.056	< 0.043	<0.048	<0.00083
Chromium	8.70	1.43	2.44	1.88	2.07	0.036
Cobalt	<0.20	< 0.033	< 0.056	< 0.043	<0.048	<0.00083
Copper	11.0	1.81	3.09	2.38	2.61	0.046
Lead	0.95	0.16	0.27	0.21	0.23	0.0040
Manganese	4.80	0.79	1.35	1.04	1.14	0.020
Mercury	1.16	0.19	0.33	0.25	0.28	0.0048
Molybdenum	46.7	7.68	13.1	10.1	11.1	0.19
Nickel	20.1	3.31	5.66	4.36	4.79	0.084
Selenium	<0.50	<0.082	<0.14	<0.11	<0.12	< 0.0021
Silver	< 0.40	< 0.066	< 0.11	<0.087	<0.095	< 0.0017
Thallium	<1.00	<0.16	<0.28	<0.22	<0.24	< 0.0042
Vanadium	<0.15	<0.025	< 0.042	<0.032	<0.036	< 0.00062
Zinc	3.70	0.61	1.04	0.80	0.88	0.015
Total	109	18.0	30.7	23.7	26.0	0.45

Dry Gas Volume Sampled (Rm ³ *):	3.559
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.2
Wet Reference Flowrate (Rm³/s*) :	17.5

^{*} 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	retiren erregio esca escandiferendo erregio escande escandiferen escandiferen escandiferen escandiferen escand	Actual Concentration					
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	μg/m³	μg/m³	μg/m³	μg/m³	%		
Antimony	< 0.13	< 0.13	<0.13	<0.13	2.9		
Arsenic	<0.032	<0.033	<0.033	<0.033	2.9		
Barium	0.38	1.52	1.40	1.10	57.0		
Beryllium	< 0.032	<0.033	<0.033	<0.033	2.9		
Cadmium	<0.032	<0.033	<0.033	<0.033	2.9		
Chromium	1.39	1.47	1.43	1.43	2.9		
Cobalt	<0.032	< 0.033	<0.033	<0.033	2.9		
Copper	0.87	1.02	1.81	1.23	40.9		
Lead	0.16	0.18	0.16	0.17	5.9		
Manganese	0.79	0.95	0.79	0.84	10.9		
Mercury	0.24	0.18	0.19	0.20	16.3		
Molybdenum	7.12	7.66	7.68	7.48	4.2		
Nickel	3.08	3.03	3.31	3.14	4.7		
Selenium	< 0.079	0.49	<0.082	<0.22	109		
Silver	< 0.063	< 0.067	<0.066	< 0.065	2.9		
Thallium	< 0.16	<0.17	<0.16	<0.16	2.9		
Vanadium	< 0.024	<0.025	< 0.025	< 0.024	2.9		
Zinc	0.46	0.62	0.61	0.56	16.0		
Total	15.1	17.6	18.0	16.9	9.4		

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

Metal		Dry Reference C			Coefficient		
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*	%		
Antimony	<0.22	<0.23	<0.22	<0.22	2.8		
Arsenic	<0.054	<0.057	<0.056	<0.056	2.8		
Barium	0.65	2.58	2.39	1.87	57.0		
Beryllium	< 0.054	<0.057	<0.056	<0.056	2.8		
Cadmium	<0.054	<0.057	<0.056	<0.056	2.8		
Chromium	2.37	2.50	2.44	2.44	2.7		
Cobalt	< 0.054	<0.057	<0.056	<0.056	2.8		
Copper	1.48	1.73	3.09	2.10	41.2		
Lead	0.28	0.30	0.27	0.28	5.5		
Manganese	1.34	1.61	1.35	1.43	10.6		
Mercury	0.41	0.30	0.33	0.35	16.4		
Molybdenum	12.1	13.0	13.1	12.8	4.2		
Nickel	5.26	5.15	5.66	5.35	5.0		
Selenium	< 0.13	0.83	< 0.14	<0.37	108		
Silver	<0.11	<0.11	<0.11	< 0.11	2.8		
Thallium	<0.27	<0.28	<0.28	<0.28	2.8		
Vanadium	<0.040	< 0.043	< 0.042	< 0.042	2.8		
Zinc	0.78	1.05	1.04	0.96	15.9		
Total	25.7	29.9	30.7	28.8	9.4		

^{*} 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 C	oncentration	·	Coefficient
	Test No. 1 μg/Rm³**	Test No. 2 μg/Rm³**	Test No. 3 μg/Rm³**	Average μg/Rm³**	of Variation %
A	-0.17	10.10	10.47	-0.47	4 7
Antimony	<0.17	<0.18	<0.17	<0.17	1.7
Arsenic	<0.043	<0.044	<0.043	<0.043	1.7
Barium	0.51	2.02	1.84	1.46	56.3
Beryllium	< 0.043	<0.044	<0.043	<0.043	1.7
Cadmium	<0.043	<0.044	<0.043	<0.043	1.7
Chromium	1.89	1.95	1.88	1.91	2.0
Cobalt	< 0.043	< 0.044	< 0.043	<0.043	1.7
Copper	1.18	1.35	2.38	1.64	39.8
Lead	0.22	0.23	0.21	0.22	6.1
Manganese	1.07	1.25	1.04	1.12	10.4
Mercury	0.33	0.24	0.25	0.27	17.9
Molybdenum	9.67	10.1	10.1	9.97	2.7
Nickel	4.18	4.01	4.36	4.19	4.2
Selenium	< 0.11	0.65	<0.11	<0.29	108
Silver	< 0.086	< 0.089	<0.087	<0.087	1.7
Thallium	<0.21	<0.22	<0.22	<0.22	1.7
Vanadium	< 0.032	< 0.033	<0.032	<0.033	1.7
Zinc	0.62	0.82	0.80	0.75	14.6
Total	20.4	23.4	23.7	22.5	7.9

^{**} 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	anna anna ann ann ann ann an amh-chuir in an Chillian Bhillian Achtaile Chillian ann an Aireann ann an Aireann	Wet Reference Concentration					
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*	%		
		U U					
Antimony	<0.18	<0.19	<0.19	<0.19	2.7		
Arsenic	<0.046	<0.048	<0.048	< 0.047	2.7		
Barium	0.55	2.19	2.02	1.58	56.9		
Beryllium	< 0.046	<0.048	<0.048	<0.047	2.7		
Cadmium	< 0.046	<0.048	<0.048	<0.047	2.7		
Chromium	2.01	2.12	2.07	2.07	2.6		
Cobalt	< 0.046	<0.048	<0.048	< 0.047	2.7		
Copper	1.26	1.47	2.61	1.78	41.1		
Lead	0.24	0.25	0.23	0.24	5.6		
Manganese	1.14	1.36	1.14	1.21	10.5		
Mercury	0.35	0.26	0.28	0.29	16.5		
Molybdenum	10.3	11.0	11.1	10.8	4.1		
Nickel	4.46	4.36	4.79	4.53	5.0		
Selenium	< 0.11	0.70	<0.12	< 0.31	108		
Silver	<0.091	<0.096	<0.095	< 0.094	2.7		
Thallium	<0.23	<0.24	< 0.24	< 0.24	2.7		
Vanadium	< 0.034	<0.036	< 0.036	<0.035	2.7		
Zinc	0.66	0.89	0.88	0.81	15.8		
Total	21.8	25.4	26.0	24.4	9.3		

^{*} At 25°C and 1 atmosphere

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

Metal	,	Coefficient			
	Test No. 1 mg/s	Test No. 2 mg/s	Test No. 3 mg/s	Average mg/s	of Variation %
Antimony	<0.0034	<0.0034	<0.0033	<0.0034	0.8
Arsenic	<0.00084	<0.00085	<0.00083	<0.00084	0.8
Barium	0.010	0.038	0.035	0.028	55.7
Beryllium	<0.00084	<0.00085	<0.00083	<0.00084	0.8
Cadmium	< 0.00084	<0.00085	<0.00083	<0.00084	0.8
Chromium	0.037	0.037	0.036	0.037	1.6
Cobalt	<0.00084	<0.00085	<0.00083	< 0.00084	0.8
Copper	0.023	0.026	0.046	0.032	39.2
Lead	0.0044	0.0044	0.0040	0.0043	6.2
Manganese	0.021	0.024	0.020	0.022	9.6
Mercury	0.0064	0.0045	0.0048	0.0052	19.3
Molybdenum	0.19	0.19	0.19	0.19	1.4
Nickel	0.082	0.077	0.084	0.081	4.6
Selenium	<0.0021	0.012	< 0.0021	< 0.0055	108
Silver	< 0.0017	< 0.0017	< 0.0017	< 0.0017	0.8
Thallium	< 0.0042	< 0.0042	< 0.0042	< 0.0042	0.8
Vanadium	< 0.00063	< 0.00063	<0.00062	< 0.00063	0.8
Zinc	0.012	0.016	0.015	0.014	13.4
Total	0.40	0.45	0.45	0.43	6.7

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	< 0.13	<0.22	<0.17	<0.19	<0.0034
Arsenic	<0.033	<0.056	< 0.043	< 0.047	<0.00084
Barium	1.10	1.87	1.46	1.58	0.028
Beryllium	< 0.033	<0.056	<0.043	< 0.047	<0.00084
Cadmium	<0.033	<0.056	<0.043	< 0.047	<0.00084
Chromium	1.43	2.44	1.91	2.07	0.037
Cobalt	<0.033	<0.056	< 0.043	< 0.047	<0.00084
Copper	1.23	2.10	1.64	1.78	0.032
Lead	0.17	0.28	0.22	0.24	0.0043
Manganese	0.84	1.43	1.12	1.21	0.022
Mercury	0.20	0.35	0.27	0.29	0.0052
Molybdenum	7.48	12.8	9.97	10.8	0.19
Nickel	3.14	5.35	4.19	4.53	0.081
Selenium	<0.22	<0.37	< 0.29	< 0.31	<0.0055
Silver	< 0.065	< 0.11	<0.087	<0.094	<0.0017
Thallium	< 0.16	<0.28	<0.22	<0.24	< 0.0042
Vanadium	< 0.024	< 0.042	< 0.033	< 0.035	< 0.00063
Zinc	0.56	0.96	0.75	0.81	0.014
Total	16.9	28.8	22.5	24.4	0.43

^{*} 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	Impingers & Rinses	Total Collected
	μg	μg	μg
Antimony	<0.80	<0.20	<0.80
Arsenic	<0.80	<0.20	<0.20
Barium	8.5	2.5	11.0
Beryllium	<0.20	<0.050	<0.20
Cadmium	<0.20	<0.050	<0.20
Chromium	5.83	0.65	6.48
Cobalt	<0.20	<0.050	<0.20
Copper	<4.0	3.0	3.00
Lead	<0.40	0.41	0.41
Manganese	1.8	2.31	4.11
Mercury *	<0.015	<0.15	<0.15
Molybdenum	48.1	<0.25	48.1
Nickel	18.2	0.34	18.5
Selenium	<2.0	<0.50	<0.50
Silver	<0.40	< 0.10	<0.40
Thallium	<1.0	<0.25	<1.00
Vanadium	<0.60	<0.15	<0.15
Zinc	<10	<2.5	<10.0
Total			105

^{*} Hydrofluoric acid digest not included in the total.

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). 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.

^{**} Includes the permanganate impingers.

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

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	426	0.034	0.058	0.045	0.049	0.88
Pentachlorodibenzo-p-dioxins	1170	0.093	0.16	0.12	0.13	2.41
Hexachlorodibenzo-p-dioxins	1900	0.15	0.26	0.20	0.22	3.91
Heptachlorodibenzo-p-dioxins	1290	0.10	0.18	0.14	0.15	2.66
Octachlorodibenzo-p-dioxin	845	0.067	0.12	0.089	0.097	1.74
Total	5631	0.45	0.77	0.59	0.64	11.6

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	816	0.065	0.11	0.086	0.093	1.68
Pentachlorodibenzofurans	762	0.061	0.10	0.080	0.087	1.57
Hexachlorodibenzofurans	544	0.043	0.075	0.057	0.062	1.12
Heptachlorodibenzofurans	307	0.024	0.042	0.032	0.035	0.63
Octachlorodibenzofuran	<140	<0.011	<0.019	<0.015	<0.016	<0.29
Total	<2569	<0.20	<0.35	<0.27	<0.29	<5.29

Dry Gas Volume Sampled (Rm³*) :	7.287
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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 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
	270	0.022	0.054	0.044	0.045	0.70
Tetrachlorodibenzo-p-dioxins	379	0.032	0.054	0.041	0.046	0.79
Pentachlorodibenzo-p-dioxins	874	0.074	0.13	0.095	0.11	1.82
Hexachlorodibenzo-p-dioxins	1200	0.10	0.17	0.13	0.14	2.50
Heptachlorodibenzo-p-dioxins	782	0.066	0.11	0.085	0.094	1.63
Octachlorodibenzo-p-dioxin	593	0.050	0.085	0.065	0.071	1.24
Total	3828	0.32	0.55	0.42	0.46	7.97

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	660	0.056	0.095	0.072	0.079	1.37
Pentachlorodibenzofurans	561	0.048	0.081	0.061	0.068	1.17
Hexachlorodibenzofurans	399	0.034	0.057	0.044	0.048	0.83
Heptachlorodibenzofurans	214	0.018	0.031	0.023	0.026	0.45
Octachlorodibenzofuran	<95	<0.0080	<0.014	<0.010	<0.011	<0.20
Total	<1929	<0.16	<0.28	<0.21	<0.23	<4.02

Dry Gas Volume Sampled (Rm ³ *):	6.961
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.3

^{*} At 25°C and 1 atmosphere

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

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
	250	0.000	0.054	0.000	0.042	0.75
Tetrachlorodibenzo-p-dioxins	359	0.030	0.051	0.039	0.043	0.75
Pentachlorodibenzo-p-dioxins	931	0.079	0.13	0.10	0.11	1.95
Hexachlorodibenzo-p-dioxins	1550	0.13	0.22	0.17	0.18	3.25
Heptachlorodibenzo-p-dioxins	1210	0.10	0.17	0.13	0.14	2.54
Octachlorodibenzo-p-dioxin	824	0.070	0.12	0.091	0.098	1.73
Total	4874	0.41	0.69	0.54	0.58	10.2

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	710	0.060	0.10	0.078	0.085	1.49
Pentachlorodibenzofurans	689	0.058	0.098	0.076	0.082	1.45
Hexachlorodibenzofurans	504	0.043	0.072	0.055	0.060	1.06
Heptachlorodibenzofurans	382	0.032	0.054	0.042	0.046	0.80
Octachlorodibenzofuran	<140	<0.012	<0.020	<0.015	<0.017	<0.29
Total	<2425	<0.21	<0.34	<0.27	<0.29	<5.09

Dry Gas Volume Sampled (Rm³*) :	7.048
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.6

^{*} At 25°C and 1 atmosphere

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

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Congener Group Actual Concentrations

Congener	MELANDESCHAAM MUSI-403 EINST-COMMUNICOME MUMARIO PROCESSANTAL FO-RE EIN VARONE	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.034	0.032	0.030	0.032	5.6
Pentachlorodibenzo-p-dioxins	0.093	0.074	0.079	0.082	12.3
Hexachlorodibenzo-p-dioxins	0.15	0.10	0.13	0.13	19.6
Heptachlorodibenzo-p-dioxins	0.10	0.066	0.10	0.091	23.3
Octachlorodibenzo-p-dioxin	0.067	0.050	0.070	0.062	17.1
Total	0.45	0.32	0.41	0.40	16.3

	Actual Con	centration	······································	Coefficient	
Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
ng/m³	ng/m³	ng/m³	ng/m³	%	
0.065	0.056	0.060	0.060	7.6	
0.061	0.048	0.058	0.056	12.7	
0.043	0.034	0.043	0.040	13.4	
0.024	0.018	0.032	0.025	28.5	
<0.011	<0.0080	<0.012	<0.010	19.6	
<0.20	<0.16	<0.21	<0.19	12.6	
	0.065 0.061 0.043 0.024 <0.011	Test No. 1 Test No. 2 ng/m³ ng/m³ 0.065 0.056 0.061 0.048 0.043 0.034 0.024 0.018 <0.011	ng/m³ ng/m³ ng/m³ 0.065 0.056 0.060 0.061 0.048 0.058 0.043 0.034 0.043 0.024 0.018 0.032 <0.011	Test No. 1 Test No. 2 Test No. 3 Average ng/m³ ng/m³ ng/m³ ng/m³ 0.065 0.056 0.060 0.060 0.061 0.048 0.058 0.056 0.043 0.034 0.043 0.040 0.024 0.018 0.032 0.025 <0.011	

TABLE 28

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Congener Group Dry Reference Concentrations

Congener	Dry Reference Concentration				Coefficient
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.058	0.054	0.051	0.055	6.9
Pentachlorodibenzo-p-dioxins	0.16	0.13	0.13	0.14	13.4
Hexachlorodibenzo-p-dioxins	0.26	0.17	0.22	0.22	20.3
Heptachlorodibenzo-p-dioxins	0.18	0.11	0.17	0.15	23.4
Octachlorodibenzo-p-dioxin	0.12	0.085	0.12	0.11	17.0
Total	0.77	0.55	0.69	0.67	16.8

Congener	Chiad kisha melda kisha hikumuntur yake a demia mke masah kepunikan dan yikumin demia.	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.11	0.095	0.10	0.10	8.5
Pentachlorodibenzofurans	0.10	0.081	0.098	0.094	13.1
Hexachlorodibenzofurans	0.075	0.057	0.072	0.068	13.6
Heptachlorodibenzofurans	0.042	0.031	0.054	0.042	27.7
Octachlorodibenzofuran	<0.019	<0.014	<0.020	<0.018	19.4
Total	<0.35	<0.28	<0.34	<0.32	12.7

^{*} 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

Congener		Coefficient			
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.045	0.044	0.020	0.040	<i>C A</i>
Tetrachlorodibenzo-p-dioxins	0.045	0.041	0.039	0.042	6.4
Pentachlorodibenzo-p-dioxins	0.12	0.095	0.10	0.11	13.4
Hexachlorodibenzo-p-dioxins	0.20	0.13	0.17	0.17	20.6
Heptachlorodibenzo-p-dioxins	0.14	0.085	0.13	0.12	24.0
Octachlorodibenzo-p-dioxin	0.089	0.065	0.091	0.081	17.8
Total	0.59	0.42	0.54	0.51	17.3

Congener		Dry Adjusted Concentration				
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %	
Tetrachlorodibenzofurans	0.086	0.072	0.078	0.079	8.7	
Pentachlorodibenzofurans	0.080	0.061	0.076	0.072	13.7	
Hexachlorodibenzofurans	0.057	0.044	0.055	0.052	14.3	
Heptachlorodibenzofurans	0.032	0.023	0.042	0.033	28.7	
Octachlorodibenzofuran	<0.015	<0.010	<0.015	<0.013	20.2	
Total	<0.27	<0.21	<0.27	<0.25	13.4	

^{*} 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

Congener	Wet Reference Concentration				Coefficient
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.049	0.046	0.043	0.046	6.4
Pentachlorodibenzo-p-dioxins	0.13	0.11	0.11	0.12	12.9
Hexachlorodibenzo-p-dioxins	0.22	0.14	0.18	0.18	20.0
Heptachlorodibenzo-p-dioxins	0.15	0.094	0.14	0.13	23.3
Octachlorodibenzo-p-dioxin	0.097	0.071	0.098	0.089	17.0
Total	0.64	0.46	0.58	0.56	16.6

Congener	to de Carlo de La Branchia de la Carlo de Carlo	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.093	0.079	0.085	0.086	8.1
Pentachlorodibenzofurans	0.087	0.068	0.082	0.079	12.9
Hexachlorodibenzofurans	0.062	0.048	0.060	0.057	13.5
Heptachlorodibenzofurans	0.035	0.026	0.046	0.035	27.9
Octachlorodibenzofuran	<0.016	<0.011	<0.017	<0.015	19.4
Total	<0.29	<0.23	<0.29	<0.27	12.6

^{*} 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

Congener	Emission Rate				Coefficient
Group	Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	of Variation %
Tetrachlorodibenzo-p-dioxins	0.88	0.79	0.75	0.81	7.8
Pentachlorodibenzo-p-dioxins	2.41	1.82	1.95	2.06	14.9
Hexachlorodibenzo-p-dioxins	3.91	2.50	3.25	3.22	21.9
Heptachlorodibenzo-p-dioxins	2.66	1.63	2.54	2.28	24.7
Octachlorodibenzo-p-dioxin	1.74	1.24	1.73	1.57	18.4
Total	11.6	7.97	10.2	9.93	18.4

Congener		Emission Rate				
Group	Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	of Variation %	
				Principal Activities		
Tetrachlorodibenzofurans	1.68	1.37	1.49	1.52	10.2	
Pentachlorodibenzofurans	1.57	1.17	1.45	1.39	14.7	
Hexachlorodibenzofurans	1.12	0.83	1.06	1.00	15.2	
Heptachlorodibenzofurans	0.63	0.45	0.80	0.63	28.4	
Octachlorodibenzofuran	<0.29	<0.20	<0.29	<0.26	20.7	
Total	<5.29	<4.02	<5.09	<4.80	14.2	

TABLE 32

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Summary of Dioxin and Furan Congener Group Emission Data

Congener Group	Actual Concentration	Dry Reference Concentration		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	0.032	0.055	0.042	0.046	0.81
Pentachlorodibenzo-p-dioxins	0.082	0.14	0.11	0.12	2.06
Hexachlorodibenzo-p-dioxins	0.13	0.22	0.17	0.18	3.22
Heptachlorodibenzo-p-dioxins	0.091	0.15	0.12	0.13	2.28
Octachlorodibenzo-p-dioxin	0.062	0.11	0.081	0.089	1.57
Total	0.40	0.67	0.51	0.56	9.93

Congener Group	Actual Concentration	-		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.060	0.10	0.079	0.086	1.52
Pentachlorodibenzofurans	0.056	0.094	0.072	0.079	1.39
Hexachlorodibenzofurans	0.040	0.068	0.052	0.057	1.00
Heptachlorodibenzofurans	0.025	0.042	0.033	0.035	0.63
Octachlorodibenzofuran	<0.010	<0.018	<0.013	<0.015	<0.26
Total	<0.19	<0.32	<0.25	<0.27	<4.80

^{*} 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	Laboratory Blank
	pg	pg
Tetrachlorodibenzo-p-dioxins	<8.4	<7.8
Pentachlorodibenzo-p-dioxins	<6.9	<7.2
Hexachlorodibenzo-p-dioxins	<12	<9.1
Heptachlorodibenzo-p-dioxins	14.6	<5.9
Octachlorodibenzo-p-dioxin	29.4	25.4
Total	<71.3	<55.4

Congener Group	Blank Train	Laboratory Blank
	pg	pg
	ALC: NO.	
Tetrachlorodibenzofurans	<6.8	<3.9
Pentachlorodibenzofurans	<7.8	<5.8
Hexachlorodibenzofurans	<6.2	<6.0
Heptachlorodibenzofurans	<5.3	<6.1
Octachlorodibenzofuran	<6.4	<6.0
Total	<32.5	<27.8

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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	<10	<0.80	<1.37	<1.05	<1.14	<0.021
12378-pentachlorodibenzo-p-dioxin	28.0	2.23	3.84	2.94	3.20	0.058
123478-hexachlorodibenzo-p-dioxin	39.9	3.18	5.48	4.19	4.56	0.082
123678-hexachlorodibenzo-p-dioxin	101	8.06	13.9	10.6	11.6	0.21
123789-hexachlorodibenzo-p-dioxin	129	10.3	17.7	13.5	14.8	0.27
1234678-heptachlorodibenzo-p-dioxin	548	43.7	75.2	57.6	62.7	1.13
Octachlorodibenzo-p-dioxin	845	67.4	116	88.7	96.6	1.74
2378-tetrachlorodibenzofuran	62	4.95	8.51	6.51	7.09	0.13
12378-pentachlorodibenzofuran	49	3.91	6.72	5.15	5.60	0.10
23478-pentachlorodibenzofuran	75	5.98	10.3	7.88	8.58	0.15
123478-hexachlorodibenzofuran	126	10.1	17.3	13.2	14.4	0.26
123678-hexachlorodibenzofuran	<59	<4.71	<8.10	<6.20	<6.75	< 0.12
234678-hexachlorodibenzofuran	77.4	6.18	10.6	8.13	8.85	0.16
123789-hexachlorodibenzofuran	<9.1	<0.73	<1.25	<0.96	<1.04	< 0.019
1234678-heptachlorodibenzofuran	214	17.1	29.4	22.5	24.5	0.44
1234789-heptachlorodibenzofuran	29.1	2.32	3.99	3.06	3.33	0.060
Octachlorodibenzofuran	<140	<11.2	<19.2	<14.7	<16.0	<0.29
PCB 81	<76	<6.06	<10.4	<7.98	<8.69	<0.16
PCB 77	110	8.78	15.1	11.6	12.6	0.23
PCB 123	<66	<5.27	<9.06	<6.93	<7.55	< 0.14
PCB 118	1200	95.7	165	126	137	2.47
PCB 114	<57	<4.55	<7.82	<5.99	<6.52	<0.12
PCB 105	490	39.1	67.2	51.5	56.0	1.01
PCB 126	<59	<4.71	<8.10	<6.20	<6.75	<0.12
PCB 167	<90	<7.18	<12.4	<9.45	<10.3	<0.19
PCB 156 + PCB 157	<84	<6.70	<11.5	<8.82	<9.6	<0.17
PCB 169	<89	<7.10	<12.2	<9.35	<10.2	<0.18
PCB 189	<71	<5.66	<9.74	<7.46	<8.12	<0.15
Total Dioxins & Furans Only	<2542	<203	<349	<267	<291	<5.23
Total PCBs Only	<2392	<191	<328	<251	<274	<4.92
Total Dioxins & Furans and PCBs	<4934	<394	<677	<518	<564	<10.2

Dry Gas Volume Sampled (Rm ³ *):	7.287
Actual Flowrate (m³/s):	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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 35

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Specific Isomer Emission Data

Test No. 2

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<7.0	<0.59	<1.01	<0.76	<0.84	<0.015
12378-pentachlorodibenzo-p-dioxin	18.3	1.55	2.63	2.00	2.20	0.038
123478-hexachlorodibenzo-p-dioxin	23.3	1.97	3.35	2.54	2.81	0.049
123678-hexachlorodibenzo-p-dioxin	65.1	5.51	9.35	7.10	7.84	0.14
123789-hexachlorodibenzo-p-dioxin	78.7	6.66	11.3	8.58	9.48	0.16
1234678-heptachlorodibenzo-p-dioxin	333	28.2	47.8	36.3	40.1	0.69
Octachlorodibenzo-p-dioxin	593	50.2	85.2	64.7	71.4	1.24
2378-tetrachlorodibenzofuran	21.2	1.80	3.05	2.31	2.55	0.044
12378-pentachlorodibenzofuran	30.8	2.61	4.42	3.36	3.71	0.064
23478-pentachlorodibenzofuran	54.6	4.62	7.84	5.95	6.57	0.11
123478-hexachlorodibenzofuran	86.5	7.32	12.4	9.43	10.4	0.18
123678-hexachlorodibenzofuran	43.3	3.67	6.22	4.72	5.21	0.090
234678-hexachlorodibenzofuran	53 <i>.</i> 7	4.55	7.71	5.86	6.47	0.11
123789-hexachlorodibenzofuran	<6.5	<0.55	< 0.93	<0.71	<0.78	< 0.014
1234678-heptachlorodibenzofuran	125	10.6	18.0	13.6	15.1	0.26
1234789-heptachlorodibenzofuran	17.7	1.50	2.54	1.93	2.13	0.037
Octachlorodibenzofuran	<95	<8.04	<13.6	<10.4	<11.4	<0.20
PCB 81	<77	<6.52	<11.1	<8.40	<9.27	<0.16
PCB 77	120	10.2	17.2	13.1	14.4	0.25
PCB 123	<90	<7.62	<12.9	<9.82	<10.8	< 0.19
PCB 118	2500	212	359	273	301	5.21
PCB 114	<78	<6.60	<11.2	<8.51	<9.39	< 0.16
PCB 105	690	58.4	99.1	75.3	83.1	1.44
PCB 126	<81	<6.86	<11.6	<8.83	<9.75	< 0.17
PCB 167	<100	<8.47	<14.4	<10.9	<12.0	< 0.21
PCB 156 + PCB 157	<97	<8.21	<13.9	<10.6	<11.7	<0.20
PCB 169	<100	<8.47	<14.4	<10.9	<12.0	< 0.21
PCB 189	<59	<5.00	<8.48	<6.43	<7.10	<0.12
Total Dioxins & Furans Only	<1653	<140	<237	<180	<199	<3.44
Total PCBs Only	<3992	<338	<573	<435	<481	<8.32
Total Dioxins & Furans and PCBs	<5645	<478	<811	<616	<680	<11.8

Dry Gas Volume Sampled (Rm ³ *):	6.961
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*) :	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*) :	17.3

^{*} At 25°C and 1 atmosphere

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

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	<8.7	<0.74	<1.23	<0.96	<1.04	<0.018
12378-pentachlorodibenzo-p-dioxin	23	1.95	3.26	2.53	2.74	0.048
123478-hexachlorodibenzo-p-dioxin	27.2	2.30	3.86	2.99	3.25	0.057
123678-hexachlorodibenzo-p-dioxin	84.0	7.11	11.9	9.24	10.0	0.18
123789-hexachlorodibenzo-p-dioxin	102	8.64	14.5	11.2	12.2	0.21
1234678-heptachlorodibenzo-p-dioxin	530	44.9	75.2	58.3	63.2	1.11
Octachlorodibenzo-p-dioxin	824	69.8	117	90.6	98.3	1.73
2378-tetrachlorodibenzofuran	25.3	2.14	3.59	2.78	3.02	0.053
12378-pentachlorodibenzofuran	48.4	4.10	6.87	5.32	5.77	0.10
23478-pentachlorodibenzofuran	68.6	5.81	9.73	7.54	8.18	0.14
123478-hexachlorodibenzofuran	116	9.82	16.5	12.8	13.8	0.24
123678-hexachlorodibenzofuran	58.6	4.96	8.31	6.44	6.99	0.12
234678-hexachlorodibenzofuran	62.4	5.28	8.85	6.86	7.45	0.13
123789-hexachlorodibenzofuran	<10	<0.85	<1.42	<1.10	<1.19	< 0.021
1234678-heptachlorodibenzofuran	223	18.9	31.6	24.5	26.6	0.47
1234789-heptachlorodibenzofuran	29.9	2.53	4.24	3.29	3.57	0.063
Octachlorodibenzofuran	<140	<11.9	<19.9	<15.4	<16.7	<0.29
PCB 81	<100	<8.47	<14.2	<11.0	<11.9	<0.21
PCB 77	120	10.2	17.0	13.2	14.3	0.25
PCB 123	<76	<6.44	<10.8	<8.36	<9.07	<0.16
PCB 118	2600	220	369	286	310	5.46
PCB 114	<67	<5.67	<9.51	<7 <i>.</i> 37	<7.99	< 0.14
PCB 105	870	73.7	123	95.6	104	1.83
PCB 126	<69	<5.84	<9.79	<7.59	<8.23	<0.14
PCB 167	<100	<8.47	<14.2	<11.0	<11.9	<0.21
PCB 156 + PCB 157	200	16.9	28.4	22.0	23.9	0.42
PCB 169	<100	<8.47	<14.2	<11.0	<11.9	<0.21
PCB 189	<82	<6.94	<11.6	<9.02	<9.78	<0.17
Total Dioxins & Furans Only	<2381	<202	<338	<262	<284	<5.00
Total PCBs Only	<4384	<371	<622	<482	<523	<9.21
Total Dioxins & Furans and PCBs	<6765	<573	<960	<744	<807	<14.2

Dry Gas Volume Sampled (Rm ³ *):	7.048
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*):	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*) :	17.6

^{*} At 25°C and 1 atmosphere

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

TABLE 37

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Specific Isomer Actual Concentrations

Specific		Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	<0.80	<0.59	<0.74	<0.71	14.9
12378-pentachlorodibenzo-p-dioxin	2.23	1.55	1.95	1.91	18.0
123478-hexachlorodibenzo-p-dioxin	3.18	1.97	2.30	2.49	25.2
123678-hexachlorodibenzo-p-dioxin	8.06	5.51	7.11	6.89	18.7
123789-hexachlorodibenzo-p-dioxin	10.3	6.66	8.64	8.53	21.3
1234678-heptachlorodibenzo-p-dioxin	43.7	28.2	44.9	38.9	23.9
Octachlorodibenzo-p-dioxin	67.4	50.2	69.8	62.5	17.1
2378-tetrachlorodibenzofuran	4.95	1.80	2.14	2.96	58.4
12378-pentachlorodibenzofuran	3.91	2.61	4.10	3.54	22.9
23478-pentachlorodibenzofuran	5.98	4.62	5.81	5.47	13.5
123478-hexachlorodibenzofuran	10.1	7.32	9.82	9.07	16.7
123678-hexachlorodibenzofuran	<4.71	3.67	4.96	<4.45	15.4
234678-hexachlorodibenzofuran	6.18	4.55	5.28	5.34	15.3
123789-hexachlorodibenzofuran	<0.73	<0.55	<0.85	<0.71	21.1
1234678-heptachlorodibenzofuran	17.1	10.6	18.9	15.5	28.1
1234789-heptachlorodibenzofuran	2.32	1.50	2.53	2.12	25.8
Octachlorodibenzofuran	<11.2	<8.04	<11.9	<10.4	19.6
PCB 81	<6.06	<6.52	<8.47	<7.02	18.2
PCB 77	8.78	10.2	10.2	9.70	8.2
PCB 123	<5.27	<7.62	<6.44	<6.44	18.3
PCB 118	95.7	212	220	176	39,5
PCB 114	<4.55	<6.60	<5.67	<5.61	18.4
PCB 105	39.1	58.4	73.7	57.1	30.4
PCB 126	<4.71	<6.86	<5.84	<5.80	18.5
PCB 167	<7.18	<8.47	<8.47	<8.04	9.2
PCB 156 + PCB 157	<6.70	<8.21	16.9	<10.6	52.0
PCB 169	<7.10	<8.47	<8.47	<8.01	9.8
PCB 189	<5.66	<5.00	<6.94	<5.87	16.9
Total Dioxins & Furans Only	<203	<140	<202	<181	19.8
Total PCBs Only	<191	<338	<371	<300	32.0
Total Dioxins & Furans and PCBs	<394	<478	<573	<481	18.6

TABLE 38

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific	C	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.37	<1.01	<1.23	<1.20	15.4
12378-pentachlorodibenzo-p-dioxin	3.84	2.63	3.26	3.24	18.7
123478-hexachlorodibenzo-p-dioxin	5.48	3.35	3.86	4.23	26.3
123678-hexachlorodibenzo-p-dioxin	13.9	9.35	11.9	11.7	19.3
123789-hexachlorodibenzo-p-dioxin	17.7	11.3	14.5	14.5	22.1
1234678-heptachlorodibenzo-p-dioxin	75.2	47.8	75.2	66.1	23.9
Octachlorodibenzo-p-dioxin	116	85.2	117	106	17.0
2378-tetrachlorodibenzofuran	8.51	3.05	3.59	5.05	59.6
12378-pentachlorodibenzofuran	6.72	4.42	6.87	6.01	22.8
23478-pentachlorodibenzofuran	10.3	7.84	9.73	9.29	13.8
123478-hexachlorodibenzofuran	17.3	12.4	16.5	15.4	16.9
123678-hexachlorodibenzofuran	<8.10	6.22	8.31	<7.54	15.3
234678-hexachlorodibenzofuran	10.6	7.71	8.85	9.06	16.2
123789-hexachlorodibenzofuran	<1.25	<0.93	<1.42	<1.20	20.5
1234678-heptachlorodibenzofuran	29.4	18.0	31.6	26.3	27.9
1234789-heptachlorodibenzofuran	3.99	2.54	4.24	3.59	25.5
Octachlorodibenzofuran	<19.2	<13.6	<19.9	<17.6	19.4
PCB 81	<10.4	<11.1	<14.2	<11.9	16.9
PCB 77	15.1	17.2	17.0	16.5	7.2
PCB 123	<9.06	<12.9	<10.8	<10.9	17.8
PCB 118	165	359	369	298	38.7
PCB 114	<7.82	<11.2	<9.51	<9.51	17.8
PCB 105	67.2	99.1	123	96.6	29.2
PCB 126	<8.10	<11.6	<9.79	<9.84	18.0
PCB 167	<12.4	<14.4	<14.2	<13.6	8.2
PCB 156 + PCB 157	<11.5	<13.9	28.4	<17.9	50.8
PCB 169	<12.2	<14.4	<14.2	<13.6	8.8
PCB 189	<9.74	<8.48	<11.6	<9.95	16.0
Total Dioxins & Furans Only	<349	<237	<338	<308	19.9
Total PCBs Only	<328	<573	<622	<508	31.0
Total Dioxins & Furans and PCBs	<677	<811	<960	<816	17.3

^{*} At 25°C and 1 atmosphere

TABLE 39

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific		Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.05	<0.76	<0.96	<0.92	15.8
12378-pentachlorodibenzo-p-dioxin	2.94	2.00	2.53	2.49	19.0
123478-hexachlorodibenzo-p-dioxin	4.19	2.54	2.99	3.24	26.3
123678-hexachlorodibenzo-p-dioxin	10.6	7.10	9.24	8.98	19.7
123789-hexachlorodibenzo-p-dioxin	13.5	8.58	11.2	11.1	22.3
1234678-heptachlorodibenzo-p-dioxin	57.6	36.3	58.3	50.7	24.6
Octachlorodibenzo-p-dioxin	88.7	64.7	90.6	81.3	17.8
2378-tetrachlorodibenzofuran	6.51	2.31	2.78	3.87	59.5
12378-pentachlorodibenzofuran	5.15	3.36	5.32	4.61	23.6
23478-pentachlorodibenzofuran	7.88	5.95	7.54	7.12	14.4
123478-hexachlorodibenzofuran	13.2	9.43	12.8	11.8	17.5
123678-hexachlorodibenzofuran	<6.20	4.72	6.44	<5.79	16.1
234678-hexachlorodibenzofuran	8.13	5.86	6.86	6.95	16.4
123789-hexachlorodibenzofuran	<0.96	< 0.71	<1.10	< 0.92	21.4
1234678-heptachlorodibenzofuran	22.5	13.6	24.5	20.2	28.6
1234789-heptachlorodibenzofuran	3.06	1.93	3.29	2.76	26.3
Octachlorodibenzofuran	<14.7	<10.4	<15.4	<13.5	20.2
PCB 81	<7.98	<8.40	<11.0	<9.12	17.9
PCB 77	11.6	13.1	13.2	12.6	7.3
PCB 123	<6.93	<9.82	<8.36	<8.37	17.2
PCB 118	126	273	286	228	38.9
PCB 114	<5.99	<8.51	<7.37	<7.29	17.3
PCB 105	51.5	75.3	95.6	74.1	29.8
PCB 126	<6.20	<8.83	<7.59	<7.54	17.5
PCB 167	<9.45	<10.9	<11.0	<10.5	8.3
PCB 156 + PCB 157	<8.82	<10.6	22.0	<13.8	51.8
PCB 169	<9.35	<10.9	<11.0	<10.4	8.9
PCB 189	<7.46	<6.43	<9.02	<7.64	17.0
Total Dioxins & Furans Only	<267	<180	<262	<236	20.6
Total PCBs Only	<251	<435	<482	<390	31.3
Total Dioxins & Furans and PCBs	<518	<616	<744	<626	18.1

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

TABLE 40

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific	M	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<1.14	<0.84	<1.04	<1.01	15.1
12378-pentachlorodibenzo-p-dioxin	3.20	2.20	2.74	2.72	18.4
123478-hexachlorodibenzo-p-dioxin	4.56	2.81	3.25	3.54	25.8
123678-hexachlorodibenzo-p-dioxin	11.6	7.84	10.0	9.80	19.0
123789-hexachlorodibenzo-p-dioxin	14.8	9.48	12.2	12.1	21.7
1234678-heptachlorodibenzo-p-dioxin	62.7	40.1	63.2	55.3	23.9
Octachlorodibenzo-p-dioxin	96.6	71.4	98.3	88.8	17.0
2378-tetrachlorodibenzofuran	7.09	2.55	3.02	4.22	59.1
12378-pentachlorodibenzofuran	5.60	3.71	5.77	5.03	22.8
23478-pentachlorodibenzofuran	8.58	6.57	8.18	7.78	13.6
123478-hexachlorodibenzofuran	14.4	10.4	13.8	12.9	16.8
123678-hexachlorodibenzofuran	<6.75	5.21	6.99	<6.32	15.3
234678-hexachlorodibenzofuran	8.85	6.47	7.45	7.59	15.8
123789-hexachlorodibenzofuran	<1.04	<0.78	<1.19	<1.01	20.6
1234678-heptachlorodibenzofuran	24.5	15.1	26.6	22.0	27.9
1234789-heptachlorodibenzofuran	3.33	2.13	3.57	3.01	25.6
Octachlorodibenzofuran	<16.0	<11.4	<16.7	<14.7	19.4
PCB 81	<8.69	<9.27	<11.9	<9.96	17.3
PCB 77	12.6	14.4	14.3	13.8	7.6
PCB 123	<7.55	<10.8	<9.07	<9.15	18.0
PCB 118	137	301	310	249	39.0
PCB 114	<6.52	<9.39	<7.99	<7.97	18.0
PCB 105	56.0	83.1	104	81.0	29.6
PCB 126	<6.75	<9.75	<8.23	<8.24	18.2
PCB 167	<10.3	<12.0	<11.9	<11.4	8.6
PCB 156 + PCB 157	<9.6	<11.7	23.9	<15.0	51.2
PCB 169	<10.2	<12.0	<11.9	<11.4	9.2
PCB 189	<8.12	<7.10	<9.78	<8.34	16.2
Total Dioxins & Furans Only	<291	<199	<284	<258	19.8
Total PCBs Only	<274	<481	<523	<426	31.4
Total Dioxins & Furans and PCBs	<564	<680	<807	<684	17.8

^{*} At 25°C and 1 atmosphere

TABLE 41
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dioxin and Furan Specific Isomer Emission Rates

Specific		Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	<0.021	<0.015	<0.018	<0.018	17.0
12378-pentachlorodibenzo-p-dioxin	0.058	0.038	0.048	0.048	20.3
123478-hexachlorodibenzo-p-dioxin	0.082	0.049	0.057	0.063	27.9
123678-hexachlorodibenzo-p-dioxin	0.21	0.14	0.18	0.17	20.9
123789-hexachlorodibenzo-p-dioxin	0.27	0.16	0.21	0.21	23.7
1234678-heptachlorodibenzo-p-dioxin	1.13	0.69	1.11	0.98	25.2
Octachlorodibenzo-p-dioxin	1.74	1.24	1.73	1.57	18.4
2378-tetrachlorodibenzofuran	0.13	0.044	0.053	0.075	61.1
12378-pentachlorodibenzofuran	0.10	0.064	0.10	0.089	24.1
23478-pentachlorodibenzofuran	0.15	0.11	0.14	0.14	15.4
123478-hexachlorodibenzofuran	0.26	0.18	0.24	0.23	18.4
123678-hexachlorodibenzofuran	<0.12	0.090	0.12	< 0.11	16.6
234678-hexachlorodibenzofuran	0.16	0.11	0.13	0.13	17.8
123789-hexachlorodibenzofuran	< 0.019	< 0.014	< 0.021	< 0.018	21.5
1234678-heptachlorodibenzofuran	0.44	0.26	0.47	0.39	29.0
1234789-heptachlorodibenzofuran	0.060	0.037	0.063	0.053	26.7
Octachlorodibenzofuran	<0.29	<0.20	< 0.29	< 0.26	20.7
PCB 81	< 0.16	<0.16	< 0.21	< 0.18	17.0
PCB 77	0.23	0.25	0.25	0.24	5.9
PCB 123	< 0.14	< 0.19	< 0.16	< 0.16	16.0
PCB 118	2.47	5.21	5.46	4.38	37.9
PCB 114	< 0.12	< 0.16	< 0.14	< 0.14	16.1
PCB 105	1.01	1.44	1.83	1.42	28.7
PCB 126	<0.12	<0.17	< 0.14	< 0.15	16.3
PCB 167	< 0.19	< 0.21	< 0.21	< 0.20	6.9
PCB 156 + PCB 157	<0.17	<0.20	0.42	<0.26	51.0
PCB 169	<0.18	< 0.21	< 0.21	<0.20	7.5
PCB 189	<0.15	< 0.12	< 0.17	<0.15	16.8
Total Dioxins & Furans Only	<5.23	<3.44	<5.00	<4.56	21.3
Total PCBs Only	<4.92	<8.32	<9.21	<7.48	30.2
Total Dioxins & Furans and PCBs	<10.2	<11.8	<14.2	<12.0	16.9

TABLE 42
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Summary of Dioxin and Furan Specific Isomer Emission Data

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<0.71	<1.20	<0.92	<1.01	<0.018
12378-pentachlorodibenzo-p-dioxin	1.91	3.24	2.49	2.72	0.048
123478-hexachlorodibenzo-p-dioxin	2.49	4.23	3.24	3.54	0.063
123678-hexachlorodibenzo-p-dioxin	6.89	11.7	8.98	9.80	0.17
123789-hexachlorodibenzo-p-dioxin	8.53	14.5	11.1	12.1	0.21
1234678-heptachlorodibenzo-p-dioxin	38.9	66.1	50.7	55.3	0.98
Octachlorodibenzo-p-dioxin	62.5	106	81.3	88.8	1.57
2378-tetrachlorodibenzofuran	2.96	5.05	3.87	4.22	0.075
12378-pentachlorodibenzofuran	3.54	6.01	4.61	5.03	0.089
23478-pentachlorodibenzofuran	5.47	9.29	7.12	7.78	0.14
123478-hexachlorodibenzofuran	9.07	15.4	11.8	12.9	0.23
123678-hexachlorodibenzofuran	<4.45	<7.54	<5.79	<6.32	< 0.11
234678-hexachlorodibenzofuran	5.34	9.06	6.95	7.59	0.13
123789-hexachlorodibenzofuran	<0.71	<1.20	<0.92	<1.01	<0.018
1234678-heptachlorodibenzofuran	15.5	26.3	20.2	22.0	0.39
1234789-heptachlorodibenzofuran	2.12	3.59	2.76	3.01	0.053
Octachlorodibenzofuran	<10.4	<17.6	<13.5	<14.7	<0.26
PCB 81	<7.02	<11.9	<9.12	<9.96	<0.18
PCB 77	9.70	16.5	12.6	13.8	0.24
PCB 123	<6.44	<10.9	<8.37	<9.15	<0.16
PCB 118	176	298	228	249	4.38
PCB 114	<5.61	<9.51	<7.29	<7.97	<0.14
PCB 105	57.1	96.6	74.1	81.0	1.42
PCB 126	<5.80	<9.84	<7.54	<8.24	<0.15
PCB 167	<8.04	<13.6	<10.5	<11.4	<0.20
PCB 156 + PCB 157	<10.6	<17.9	<13.8	<15.0	<0.26
PCB 169	<8.01	<13.6	<10.4	<11.4	<0.20
PCB 189	<5.87	<9.95	<7.64	`<8.34	<0.15
Total Dioxins & Furans Only	<181	<308	<236	<258	<4.56
Total PCBs Only	<300	<508	<390	<426	<7.48
Total Dioxins & Furans and PCBs	<481	<816	<626	<684	<12.0

^{*} At 25°C and 1 atmosphere

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

TABLE 43
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Blank Dioxin and Furan Specific Isomer Analyses

Specific	Blank	Laboratory
Isomer	Train	Blank
	pg	pg
2378-tetrachlorodibenzo-p-dioxin	<5.4	<5.6
12378-pentachlorodibenzo-p-dioxin	<6.9	<7.2
123478-hexachlorodibenzo-p-dioxin	<6.1	<6.4
123678-hexachlorodibenzo-p-dioxin	<6.1	<6.5
123789-hexachlorodibenzo-p-dioxin	<5.4	<5.8
1234678-heptachlorodibenzo-p-dioxin	7.1	<5.9
Octachlorodibenzo-p-dioxin	29.4	25.4
2378-tetrachlorodibenzofuran	<6.8	<3.9
12378-pentachlorodibenzofuran	<7.8	<5.8
23478-pentachlorodibenzofuran	<7.8	<5.8
123478-hexachlorodibenzofuran	<6.2	<6.0
123678-hexachlorodibenzofuran	<5.7	<5.5
234678-hexachlorodibenzofuran	<6.2	<6.0
123789-hexachlorodibenzofuran	<6.8	<6.6
1234678-heptachlorodibenzofuran	<4.9	<5.6
1234789-heptachlorodibenzofuran	<5.9	<6.8
Octachlorodibenzofuran	<6.4	<6.0
PCB 81	<74	<120
PCB 77	<72	<120
PCB 123	<66	<110
PCB 118	590	<98
PCB 114	<57	<95
PCB 105	<190	<99
PCB 126	<60	<99
PCB 167	<43	<57
PCB 156 + PCB 157	<40	<53
PCB 169	<42	<56
PCB 189	<72	<100
Total Dioxins & Furans Only	<131	<121
Total PCBs Only	<1306	<1007
Total Dioxins & Furans and PCBs	<1437	<1128

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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	Toxicity		Actual Con	centration	
lsomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.80	<0.59	<0.74	<0.71
12378-pentachlorodibenzo-p-dioxin	1.000	2.23	1.55	1.95	1.91
123478-hexachlorodibenzo-p-dioxin	0.100	0.32	0.20	0.23	0.25
123678-hexachlorodibenzo-p-dioxin	0.100	0.81	0.55	0.71	0.69
123789-hexachlorodibenzo-p-dioxin	0.100	1.03	0.67	0.86	0.85
1234678-heptachlorodibenzo-p-dioxin	0.010	0.44	0.28	0.45	0.39
Octachlorodibenzo-p-dioxin	0.0003	0.020	0.015	0.021	0.019
2378-tetrachlorodibenzofuran	0.100	0.49	0.18	0.21	0.30
12378-pentachlorodibenzofuran	0.030	0.12	0.078	0.12	0.11
23478-pentachlorodibenzofuran	0.300	1.80	1.39	1.74	1.64
123478-hexachlorodibenzofuran	0.100	1.01	0.73	0.98	0.91
123678-hexachlorodibenzofuran	0.100	< 0.47	0.37	0.50	< 0.44
234678-hexachlorodibenzofuran	0.100	0.62	0.45	0.53	0.53
123789-hexachlorodibenzofuran	0.100	< 0.073	< 0.055	<0.085	< 0.071
1234678-heptachlorodibenzofuran	0.010	0.17	0.11	0.19	0.16
1234789-heptachlorodibenzofuran	0.010	0.023	0.015	0.025	0.021
Octachlorodibenzofuran	0.0003	<0.0034	<0.0024	<0.0036	<0.0031
PCB 81	0.0003	<0.0018	<0.0020	<0.0025	<0.0021
PCB 77	0.0001	0.00088	0.0010	0.0010	0.00097
PCB 123	0.00003	<0.00016	<0.00023	< 0.00019	< 0.00019
PCB 118	0.00003	0.0029	0.0064	0.0066	0.0053
PCB 114	0.00003	<0.00014	<0.00020	<0.00017	<0.00017
PCB 105	0.00003	0.0012	0.0018	0.0022	0.0017
PCB 126	0.100	<0.47	< 0.69	<0.58	<0.58
PCB 167	0.00003	<0.00022	<0.00025	<0.00025	< 0.00024
PCB 156 + PCB 157	0.00003	<0.00020	<0.00025	0.00051	<0.00032
PCB 169	0.030	<0.21	<0.25	<0.25	<0.24
PCB 189	0.00003	<0.00017	<0.00015	<0.00021	<0.00018
Total Dioxins & Furans Only		<10.4	<7.23	<9.35	<9.00
Total PCBs Only		<0.69	<0.95	<0.85	<0.83
Total Dioxins & Furans and PCBs		<11.1	<8.18	<10.2	<9.83

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

TABLE 45

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific	Toxicity	NAME OF THE OWNER OWNER OF THE OWNER OWNE	Dry Reference	Concentration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.37	<1.01	<1.23	<1.20
12378-pentachlorodibenzo-p-dioxin	1.000	3.84	2.63	3.26	3.24
123478-hexachlorodibenzo-p-dioxin	0.100	0.55	0.33	0.39	0.42
123678-hexachlorodibenzo-p-dioxin	0.100	1.39	0.94	1.19	1.17
123789-hexachlorodibenzo-p-dioxin	0.100	1.77	1.13	1.45	1.45
1234678-heptachlorodibenzo-p-dioxin	0.010	0.75	0.48	0.75	0.66
Octachlorodibenzo-p-dioxin	0.0003	0.035	0.026	0.035	0.032
2378-tetrachlorodibenzofuran	0.100	0.85	0.30	0.36	0.50
12378-pentachlorodibenzofuran	0.030	0.20	0.13	0.21	0.18
23478-pentachlorodibenzofuran	0.300	3.09	2.35	2.92	2.79
123478-hexachlorodibenzofuran	0.100	1.73	1.24	1.65	1.54
123678-hexachlorodibenzofuran	0.100	< 0.81	0.62	0.83	<0.75
234678-hexachlorodibenzofuran	0.100	1.06	0.77	0.89	0.91
123789-hexachlorodibenzofuran	0.100	<0.12	< 0.093	< 0.14	<0.12
1234678-heptachlorodibenzofuran	0.010	0.29	0.18	0.32	0.26
1234789-heptachlorodibenzofuran	0.010	0.040	0.025	0.042	0.036
Octachlorodibenzofuran	0.0003	<0.0058	<0.0041	<0.0060	<0.0053
PCB 81	0.0003	<0.0031	<0.0033	<0.0043	<0.0036
PCB 77	0.0001	0.0015	0.0017	0.0017	0.0016
PCB 123	0.00003	<0.00027	<0.00039	<0.00032	<0.00033
PCB 118	0.00003	0.0049	0.011	0.011	0.0089
PCB 114	0.00003	<0.00023	<0.00034	<0.00029	<0.00029
PCB 105	0.00003	0.0020	0.0030	0.0037	0.0029
PCB 126	0.100	<0.81	<1.16	<0.98	<0.98
PCB 167	0.00003	<0.00037	<0.00043	<0.00043	<0.00041
PCB 156 + PCB 157	0.00003	<0.00035	<0.00042	0.00085	<0.00054
PCB 169	0.030	<0.37	<0.43	< 0.43	< 0.41
PCB 189	0.00003	<0.00029	<0.00025	<0.00035	<0.00030
Total Dioxins & Furans Only		<17.9	<12.3	<15.7	<15.3
Total PCBs Only		<1.19	<1.62	<1.43	<1.41
Total Dioxins & Furans and PCBs		<19.1	<13.9	<17.1	<16.7

^{*} At 25°C and 1 atmosphere

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

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	Toxicity		Dry Adjusted	Concentration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.05	<0.76	<0.96	<0.92
12378-pentachlorodibenzo-p-dioxin	1.000	2.94	2.00	2.53	2.49
123478-hexachlorodibenzo-p-dioxin	0.100	0.42	0.25	0.30	0.32
123678-hexachlorodibenzo-p-dioxin	0.100	1.06	0.71	0.92	0.90
123789-hexachlorodibenzo-p-dioxin	0.100	1.35	0.86	1.12	1.11
1234678-heptachlorodibenzo-p-dioxin	0.010	0.58	0.36	0.58	0.51
Octachlorodibenzo-p-dioxin	0.0003	0.027	0.019	0.027	0.024
2378-tetrachlorodibenzofuran	0.100	0.65	0.23	0.28	0.39
12378-pentachlorodibenzofuran	0.030	0.15	0.10	0.16	0.14
23478-pentachlorodibenzofuran	0.300	2.36	1.79	2.26	2.14
123478-hexachlorodibenzofuran	0.100	1.32	0.94	1.28	1.18
123678-hexachlorodibenzofuran	0.100	<0.62	0.47	0.64	<0.58
234678-hexachlorodibenzofuran	0.100	0.81	0.59	0.69	0.69
123789-hexachlorodibenzofuran	0.100	<0.096	<0.071	<0.11	<0.092
1234678-heptachlorodibenzofuran	0.010	0.22	0.14	0.25	0.20
1234789-heptachlorodibenzofuran	0.010	0.031	0.019	0.033	0.028
Octachlorodibenzofuran	0.0003	<0.0044	<0.0031	<0.0046	<0.0040
PCB 81	0.0003	<0.0024	<0.0025	<0.0033	<0.0027
PCB 77	0.0001	0.0012	0.0013	0.0013	0.0013
PCB 123	0.00003	<0.00021	<0.00029	<0.00025	<0.00025
PCB 118	0.00003	0.0038	0.0082	0.0086	0.0068
PCB 114	0.00003	<0.0018	<0.00026	<0.00022	<0.00022
PCB 105	0.00003	0.0015	0.0023	0.0029	0.0022
PCB 126	0.100	<0.62	<0.88	<0.76	<0.75
PCB 167	0.00003	<0.00028	<0.00033	<0.00033	< 0.00031
PCB 156 + PCB 157	0.00003	<0.00026	<0.00032	0.00066	<0.00041
PCB 169	0.030	<0.28	<0.33	<0.33	<0.31
PCB 189	0.00003	<0.00022	<0.00019	<0.00027	<0.00023
Total Dioxins & Furans Only		<13.7	<9.31	<12.1	<11.7
Total PCBs Only		<0.91	<1.23	<1.11	<1.08
Total Dioxins & Furans and PCBs		<14.6	<10.5	<13.2	<12.8

^{*} 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.

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	Toxicity		Dry Adjusted (Concentration		
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm³*	
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.05	<0.76	<0.96	<0.92	
12378-pentachlorodibenzo-p-dioxin	0.500	1.47	1.00	1.26	1.24	
123478-hexachlorodibenzo-p-dioxin	0.100	0.42	0.25	0.30	0.32	
123678-hexachlorodibenzo-p-dioxin	0.100	1.06	0.71	0.92	0.90	
123789-hexachlorodibenzo-p-dioxin	0.100	1.35	0.86	1.12	1.11	
1234678-heptachlorodibenzo-p-dioxin	0.010	0.58	0.36	0.58	0.51	
Octachlorodibenzo-p-dioxin	0.001	0.089	0.065	0.091	0.081	
2378-tetrachlorodibenzofuran	0.100	0.65	0.23	0.28	0.39	
12378-pentachlorodibenzofuran	0.050	0.26	0.17	0.27	0.23	
23478-pentachlorodibenzofuran	0.500	3.94	2.98	3.77	3.56	
123478-hexachlorodibenzofuran	0.100	1.32	0.94	1.28	1.18	
123678-hexachlorodibenzofuran	0.100	<0.62	0.47	0.64	<0.58	
234678-hexachlorodibenzofuran	0.100	0.81	0.59	0.69	0.69	
123789-hexachlorodibenzofuran	0.100	< 0.096	< 0.071	<0.11	< 0.092	
1234678-heptachlorodibenzofuran	0.010	0.22	0.14	0.25	0.20	
1234789-heptachlorodibenzofuran	0.010	0.031	0.019	0.033	0.028	
Octachlorodibenzofuran	0.001	<0.015	<0.010	<0.015	<0.013	
Total Dioxins & Furans		<14.0	<9.63	<12.6	<12.1	
In-Stack Emission Limit					60	

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

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 47

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific	Toxicity		Wet Reference	Concentration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm ^{3*}	pg TEQ/Rm³*	pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	<1.14	<0.84	<1.04	<1.01
12378-pentachlorodibenzo-p-dioxin	1.000	3.20	2.20	2.74	2.72
123478-hexachlorodibenzo-p-dioxin	0.100	0.46	0.28	0.32	0.35
123678-hexachlorodibenzo-p-dioxin	0.100	1.16	0.78	1.00	0.98
123789-hexachlorodibenzo-p-dioxin	0.100	1.48	0.95	1.22	1.21
1234678-heptachlorodibenzo-p-dioxin	0.010	0.63	0.40	0.63	0.55
Octachlorodibenzo-p-dioxin	0.0003	0.029	0.021	0.029	0.027
2378-tetrachlorodibenzofuran	0.100	0.71	0.26	0.30	0.42
12378-pentachlorodibenzofuran	0.030	0.17	0.11	0.17	0.15
23478-pentachlorodibenzofuran	0.300	2.57	1.97	2.46	2.33
123478-hexachlorodibenzofuran	0.100	1.44	1.04	1.38	1.29
123678-hexachlorodibenzofuran	0.100	< 0.67	0.52	0.70	< 0.63
234678-hexachlorodibenzofuran	0.100	0.89	0.65	0.74	0.76
123789-hexachlorodibenzofuran	0.100	<0.10	<0.078	< 0.12	< 0.10
1234678-heptachlorodibenzofuran	0.010	0.24	0.15	0.27	0.22
1234789-heptachlorodibenzofuran	0.010	0.033	0.021	0.036	0.030
Octachlorodibenzofuran	0.0003	<0.0048	<0.0034	<0.0050	<0.0044
PCB 81	0.0003	<0.0026	<0.0028	<0.0036	<0.0030
PCB 77	0.0001	0.0013	0.0014	0.0014	0.0014
PCB 123	0.00003	< 0.00023	<0.00033	<0.00027	<0.00027
PCB 118	0.00003	0.0041	0.0090	0.0093	0.0075
PCB 114	0.00003	<0.00020	<0.00028	<0.00024	<0.00024
PCB 105	0.00003	0.0017	0.0025	0.0031	0.0024
PCB 126	0.100	< 0.67	<0.98	<0.82	<0.82
PCB 167	0.00003	< 0.00031	< 0.00036	<0.00036	< 0.00034
PCB 156 + PCB 157	0.00003	< 0.00029	< 0.00035	0.00072	< 0.00045
PCB 169	0.030	<0.31	<0.36	<0.36	< 0.34
PCB 189	0.00003	<0.00024	<0.00021	<0.00029	<0.00025
Total Dioxins & Furans Only		<14.9	<10.3	<13.2	<12.8
Total PCBs Only		<0.99	<1.35	<1.20	<1.18
Total Dioxins & Furans and PCBs		<15.9	<11.6	<14.4	<14.0

^{*} At 25°C and 1 atmosphere

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

TABLE 48

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dioxin and Furan Toxicity Equivalent Emission Rates

Specific	Toxicity		Emissio	n Rate	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	ng TEQ/s	ng TEQ/s	ng TEQ/s	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.021	<0.015	<0.018	<0.018
12378-pentachlorodibenzo-p-dioxin	1.000	0.058	0.038	0.048	0.048
123478-hexachlorodibenzo-p-dioxin	0.100	0.0082	0.0049	0.0057	0.0063
123678-hexachlorodibenzo-p-dioxin	0.100	0.021	0.014	0.018	0.017
123789-hexachlorodibenzo-p-dioxin	0.100	0.027	0.016	0.021	0.021
1234678-heptachlorodibenzo-p-dioxin	0.010	0.011	0.0069	0.011	0.0098
Octachlorodibenzo-p-dioxin	0.0003	0.00052	0.00037	0.00052	0.00047
2378-tetrachlorodibenzofuran	0.100	0.013	0.0044	0.0053	0.0075
12378-pentachlorodibenzofuran	0.030	0.0030	0.0019	0.0030	0.0027
23478-pentachlorodibenzofuran	0.300	0.046	0.034	0.043	0.041
123478-hexachlorodibenzofuran	0.100	0.026	0.018	0.024	0.023
123678-hexachlorodibenzofuran	0.100	<0.012	0.0090	0.012	< 0.011
234678-hexachlorodibenzofuran	0.100	0.016	0.011	0.013	0.013
123789-hexachlorodibenzofuran	0.100	< 0.0019	<0.0014	<0.0021	<0.0018
1234678-heptachlorodibenzofuran	0.010	0.0044	0.0026	0.0047	0.0039
1234789-heptachlorodibenzofuran	0.010	0.00060	0.00037	0.00063	0.00053
Octachlorodibenzofuran	0.0003	<0.00086	<0.00059	<0.00088	<0.000078
	:				
PCB 81	0.0003	<0.000047	<0.00048	<0.00063	<0.000053
PCB 77	0.0001	0.000023	0.000025	0.000025	0.000024
PCB 123	0.00003	<0.0000041	<0.0000056	<0.000048	<0.000048
PCB 118	0.00003	0.000074	0.00016	0.00016	0.00013
PCB 114	0.00003	<0.0000035	<0.0000049	<0.0000042	<0.0000042
PCB 105	0.00003	0.000030	0.000043	0.000055	0.000043
PCB 126	0.100	<0.012	<0.017	<0.014	<0.015
PCB 167	0.00003	<0.000056	<0.0000062	<0.000063	<0.0000060
PCB 156 + PCB 157	0.00003	<0.000052	<0.0000061	0.000013	<0.0000079
PCB 169	0.030	<0.0055	<0.0062	<0.0063	<0.0060
PCB 189	0.00003	<0.000044	<0.0000037	<0.0000052	<0.000044
Total Dioxins & Furans Only		<0.27	<0.18	<0.23	<0.23
Total PCBs Only		<0.018	<0.023	<0.021	<0.021
Total Dioxins & Furans and PCBs		<0.29	<0.20	<0.25	<0.25

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

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	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm ³ **	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<0.71	<1.20	<0.92	<1.01	<0.018
12378-pentachlorodibenzo-p-dioxin	1.91	3.24	2.49	2.72	0.048
123478-hexachlorodibenzo-p-dioxin	0.25	0.42	0.32	0.35	0.0063
123678-hexachlorodibenzo-p-dioxin	0.69	1.17	0.90	0.98	0.017
123789-hexachlorodibenzo-p-dioxin	0.85	1.45	1.11	1.21	0.021
1234678-heptachlorodibenzo-p-dioxin	0.39	0.66	0.51	0.55	0.0098
Octachlorodibenzo-p-dioxin	0.019	0.032	0.024	0.027	0.00047
2378-tetrachlorodibenzofuran	0.30	0.50	0.39	0.42	0.0075
12378-pentachlorodibenzofuran	0.11	0.18	0.14	0.15	0.0027
23478-pentachlorodibenzofuran	1.64	2.79	2.14	2.33	0.041
123478-hexachlorodibenzofuran	0.91	1.54	1.18	1.29	0.023
123678-hexachlorodibenzofuran	<0.44	<0.75	<0.58	< 0.63	< 0.011
234678-hexachlorodibenzofuran	0.53	0.91	0.69	0.76	0.013
123789-hexachlorodibenzofuran	<0.071	<0.12	<0.092	<0.10	<0.0018
1234678-heptachlorodibenzofuran	0.16	0.26	0.20	0.22	0.0039
1234789-heptachlorodibenzofuran	0.021	0.036	0.028	0.030	0.00053
Octachlorodibenzofuran	<0.0031	<0.0053	<0.0040	<0.0044	<0.000078
PCB 81	<0.0021	<0.0036	<0.0027	<0.0030	<0.000053
PCB 77	0.00097	0.0016	0.0013	0.0014	0.000024
PCB 123	<0.00019	<0.00033	<0.00025	< 0.00027	<0.000048
PCB 118	0.0053	0.0089	0.0068	0.0075	0.00013
PCB 114	<0.00017	<0.00029	<0.00022	<0.00024	<0.0000042
PCB 105	0.0017	0.0029	0.0022	0.0024	0.000043
PCB 126	<0.58	<0.98	< 0.75	<0.82	< 0.015
PCB 167	<0.00024	<0.00041	<0.00031	< 0.00034	<0.0000060
PCB 156 + PCB 157	<0.00032	<0.00054	<0.00041	<0.00045	<0.0000079
PCB 169	<0.24	<0.41	<0.31	<0.34	<0.0060
PCB 189	<0.00018	<0.00030	<0.00023	<0.00025	<0.000044
Total Dioxins & Furans Only	<9.00	<15.3	<11.7	<12.8	<0.23
Total PCBs Only	<0.83	<1.41	<1.08	<1.18	<0.021
Total Dioxins & Furans and PCBs	<9.83	<16.7	<12.8	<14.0	<0.25

^{*} At 25°C and 1 atmosphere

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

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

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	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm ³ **	pg TEQ/Rm ³ *	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.35	0.60	0.46	0.50	0.0089
12378-pentachlorodibenzo-p-dioxin	1.91	3.24	2.49	2.72	0.048
123478-hexachlorodibenzo-p-dioxin	0.25	0.42	0.32	0.35	0.0063
123678-hexachlorodibenzo-p-dioxin	0.69	1.17	0.90	0.98	0.017
123789-hexachlorodibenzo-p-dioxin	0.85	1.45	1.11	1.21	0.021
1234678-heptachlorodibenzo-p-dioxin	0.39	0.66	0.51	0.55	0.0098
Octachlorodibenzo-p-dioxin	0.019	0.032	0.024	0.027	0.00047
2378-tetrachlorodibenzofuran	0.30	0.50	0.39	0.42	0.0075
12378-pentachlorodibenzofuran	0.11	0.18	0.14	0.15	0.0027
23478-pentachlorodibenzofuran	1.64	2.79	2.14	2.33	0.041
123478-hexachlorodibenzofuran	0.91	1.54	1.18	1.29	0.023
123678-hexachlorodibenzofuran	0.37	0.62	0.48	0.52	0.0091
234678-hexachlorodibenzofuran	0.53	0.91	0.69	0.76	0.013
123789-hexachlorodibenzofuran	0.035	0.060	0.046	0.050	0.00089
1234678-heptachlorodibenzofuran	0.16	0.26	0.20	0.22	0.0039
1234789-heptachlorodibenzofuran	0.021	0.036	0.028	0.030	0.00053
Octachlorodibenzofuran	0.0016	0.0026	0.0020	0.0022	0.000039
PCB 81	0.0011	0.0018	0.0014	0.0015	0.000026
PCB 77	0.00097	0.0016	0.0013	0.0014	0.000024
PCB 123	0.000097	0.00016	0.00013	0.00014	0.0000024
PCB 118	0.0053	0.0089	0.0068	0.0075	0.00013
PCB 114	0.000084	0.00014	0.00011	0.00012	0.0000021
PCB 105	0.0017	0.0029	0.0022	0.0024	0.000043
PCB 126	0.29	0.49	0.38	0.41	0.0073
PCB 167	0.00012	0.00020	0.00016	0.00017	0.0000030
PCB 156 + PCB 157	0.00016	0.00027	0.00021	0.00023	0.0000040
PCB 169	0.12	0.20	0.16	0.17	0.0030
PCB 189	0.000088	0.00015	0.00011	0.00013	0.0000022
Total Dioxins & Furans Only	8.53	14.5	11.1	12.1	0.21
Total PCBs Only	0.42	0.71	0.55	0.60	0.010
Total Dioxins & Furans and PCBs	8.95	15.2	11.7	12.7	0.22

^{*} At 25°C and 1 atmosphere

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.

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

TABLE 51

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

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
1,4-Dichlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
1,2-Dichlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Total Dichlorobenzene	<0.90	<71.8	<124	<94.5	<103	<1.85
1,3,5-trichlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
1,2,4-trichlorobenzene	< 0.30	<23.9	<41.2	<31.5	<34.3	<0.62
1,2,3-trichlorobenzene	< 0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
Total Trichlorobenzene	<0.90	<71.8	<124	<94.5	<103	<1.85
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
1,2,3,4-tetrachlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Total Tetrachlorobenzene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
Pentachlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Hexachlorobenzene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Total Chlorobenzenes	<3.00	<239	<412	<315	<343	<6.18

Dry Gas Volume Sampled (Rm³*) :	7.287
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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 52
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 2

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
1,4-Dichlorobenzene	< 0.30	<25.4	<43.1	<32.7	<36.1	<0.62
1,2-Dichlorobenzene	< 0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Total Dichlorobenzene	<0.90	<76.2	<129	<98.2	<108	<1.87
1,3,5-trichlorobenzene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
1,2,4-trichlorobenzene	< 0.30	<25.4	<43.1	<32.7	<36.1	<0.62
1,2,3-trichlorobenzene	< 0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Total Trichlorobenzene	<0.90	<76.2	<129	<98.2	<108	<1.87
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
1,2,3,4-tetrachlorobenzene	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Total Tetrachlorobenzene	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
Pentachiorobenzene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Hexachlorobenzene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Total Chlorobenzenes	<3.00	<254	<431	<327	<361	<6.25

Dry Gas Volume Sampled (Rm³*) :	6.961
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.3

^{*} At 25°C and 1 atmosphere

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

TABLE 53

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Data for Chlorobenzenes
Test No. 3

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
1,4-Dichlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
1,2-Dichlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Total Dichlorobenzene	<0.90	<76.2	<128	<98.9	<107	<1.89
1,3,5-trichlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
1,2,4-trichlorobenzene	< 0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
1,2,3-trichlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Total Trichlorobenzene	<0.90	<76.2	<128	<98.9	<107	<1.89
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
1,2,3,4-tetrachlorobenzene	< 0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Total Tetrachlorobenzene	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
Pentachlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Hexachlorobenzene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Total Chlorobenzenes	<3.00	<254	<426	<330	<358	<6.30

Dry Gas Volume Sampled (Rm³*) :	7.048
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*):	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.6

^{*} At 25°C and 1 atmosphere

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

TABLE 54

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Actual Concentrations for Chlorobenzenes

Specific	Actual Concentration Coefficient				
lsomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
1,3-Dichlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
1,4-Dichlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
1,2-Dichlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
Total Dichlorobenzene	<71.8	<76.2	<76.2	<74.7	3.4
1,3,5-trichlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
1,2,4-trichlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
1,2,3-trichlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
Total Trichlorobenzene	<71.8	<76.2	<76.2	<74.7	3.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<23.9	<25.4	<25.4	<24.9	3.4
1,2,3,4-tetrachlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
Total Tetrachlorobenzene	<47.9	<50.8	<50.8	<49.8	3.4
Pentachlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
Hexachlorobenzene	<23.9	<25.4	<25.4	<24.9	3.4
Total Chlorobenzenes	<239	<254	<254	<249	3.4

TABLE 55

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Dry Reference Concentrations for Chlorobenzenes

Specific	Dry Reference Concentration				Coefficient
lsomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
1,3-Dichlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
1,4-Dichlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
1,2-Dichlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
Total Dichlorobenzene	<124	<129	<128	<127	2.4
1,3,5-trichlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
1,2,4-trichlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
1,2,3-trichlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
Total Trichlorobenzene	<124	<129	<128	<127	2.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<41.2	<43.1	<42.6	<42.3	2.4
1,2,3,4-tetrachlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
Total Tetrachlorobenzene	<82.3	<86.2	<85.1	<84.6	2.4
Pentachlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
Hexachlorobenzene	<41.2	<43.1	<42.6	<42.3	2.4
Total Chlorobenzenes	<412	<431	<426	<423	2.4

^{*} At 25°C and 1 atmosphere

TABLE 56
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Dry Adjusted Concentrations for Chlorobenzenes

Specific		Ory Adjusted (Concentration	ŀ	Coefficient
Isomer	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
1,3-Dichlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
1,4-Dichlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
1,2-Dichlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
Total Dichlorobenzene	<94.5	<98.2	<98.9	<97.2	2.4
1,3,5-trichlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
1,2,4-trichlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
1,2,3-trichlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
Total Trichlorobenzene	<94.5	<98.2	<98.9	<97.2	2.4
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<31.5	<32.7	<33.0	<32.4	2.4
1,2,3,4-tetrachlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
Total Tetrachlorobenzene	<63.0	<65.4	<66.0	<64.8	2.4
Pentachlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
Hexachlorobenzene	<31.5	<32.7	<33.0	<32.4	2.4
Total Chlorobenzenes	<315	<327	<330	<324	2.4

^{*} 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	Wet Reference Concentration				Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
1,3-Dichlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
1,4-Dichlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
1,2-Dichlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
Total Dichlorobenzene	<103	<108	<107	<106	2.7
1,3,5-trichlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
1,2,4-trichlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
1,2,3-trichlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
Total Trichlorobenzene	<103	<108	<107	<106	2.7
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<34.3	<36.1	<35.8	<35.4	2.7
1,2,3,4-tetrachlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
Total Tetrachlorobenzene	<68.6	<72.2	<71.6	<70.8	2.7
Pentachlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
Hexachlorobenzene	<34.3	<36.1	<35.8	<35.4	2.7
Total Chlorobenzenes	<343	<361	<358	<354	2.7

^{*} At 25°C and 1 atmosphere

TABLE 58

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Emission Rates for Chlorobenzenes

Specific	Emission Rate			***************************************	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/s	μg/s	μg/s	μg/s	%
1,3-Dichlorobenzene	<0.62	<0.62	< 0.63	< 0.62	1.0
1,4-Dichlorobenzene	< 0.62	<0.62	< 0.63	< 0.62	1.0
1,2-Dichlorobenzene	< 0.62	< 0.62	< 0.63	< 0.62	1.0
Total Dichlorobenzene	<1.85	<1.87	<1.89	<1.87	1.0
1,3,5-trichlorobenzene	<0.62	<0.62	< 0.63	<0.62	1.0
1,2,4-trichlorobenzene	< 0.62	< 0.62	< 0.63	< 0.62	1.0
1,2,3-trichlorobenzene	< 0.62	< 0.62	< 0.63	< 0.62	1.0
Total Trichlorobenzene	<1.85	<1.87	<1.89	<1.87	1.0
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.62	<0.62	< 0.63	<0.62	1.0
1,2,3,4-tetrachlorobenzene	< 0.62	< 0.62	< 0.63	< 0.62	1.0
Total Tetrachlorobenzene	<1.24	<1.25	<1.26	<1.25	1.0
Pentachlorobenzene	<0.62	<0.62	<0.63	<0.62	1.0
Hexachlorobenzene	<0.62	<0.62	<0.63	<0.62	1.0
Total Chlorobenzenes	<6.18	<6.25	<6.30	<6.24	1.0

TABLE 59

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Summary of Emission Data for Chlorobenzenes

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
1,3-Dichlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
1,4-Dichlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
1,2-Dichlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
Total Dichlorobenzene	<74.7	<127	<97.2	<106	<1.87
1,3,5-trichlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
1,2,4-trichlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
1,2,3-trichlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
Total Trichlorobenzene	<74.7	<127	<97.2	<106	<1.87
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<24.9	<42.3	<32.4	<35.4	<0.62
1,2,3,4-tetrachlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
Total Tetrachlorobenzene	<49.8	<84.6	<64.8	<70.8	<1.25
Pentachlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
Hexachlorobenzene	<24.9	<42.3	<32.4	<35.4	<0.62
Total Chlorobenzenes	<249	<423	<324	<354	<6.24

^{*} 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	Blank Train	Laboratory Blank
and Congener Group Totals	Total μg	Total μg
1,3-Dichlorobenzene	<0.30	<0.30
1,4-Dichlorobenzene	<0.30	<0.30
1,2-Dichlorobenzene	<0.30	<0.30
Total Dichlorobenzene	<0.90	<0.90
1,3,5-trichlorobenzene	<0.30	<0.30
1,2,4-trichlorobenzene	<0.30	<0.30
1,2,3-trichlorobenzene	<0.30	<0.30
Total Trichlorobenzene	<0.90	<0.90
1,2,3,5- & 1,2,4,5-tetrachlorobenzenes	<0.30	<0.30
1,2,3,4-tetrachlorobenzene	<0.30	<0.30
Total Tetrachlorobenzene	< 0.60	<0.60
Pentachlorobenzene	<0.30	<0.30
Hexachlorobenzene	<0.30	<0.30
Total Chlorobenzenes	<3.00	<3.00

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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	Dry Reference Concentration		Wet Reference	Emission Rate
isomer	Conected					
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
2-monochlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
3-monochlorophenol	<0.30	<23.9	<41.2 <41.2	<31.5 <31.5	<34.3	<0.62
4-monochlorophenol	<0.30	<23.9	<41.2 <41.2	<31.5 <31.5	<34.3	<0.62
•					<103	
Total Monochlorophenols	<0.90	<71.8	<124	<94.5	<103	<1.85
2,6-dichlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
2,4 & 2,5-dichlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	<0.62
3,5-dichlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
2,3-dichlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
3,4-dichlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
Total Dichlorophenols	<1.50	<120	<206	<158	<172	<3.09
2,4,6-trichlorophenol	0.71	56.6	97.4	74.6	81.2	1.46
2,3,6-trichlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
2,3,5-trichlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
2,4,5-trichlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
2,3,4-trichlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
3,4,5-trichlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
Total Trichlorophenols	<2.21	<176	<303	<232	<253	<4.55
2,3,5,6-tetrachlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
2,3,4,6-tetrachlorophenol	< 0.30	<23.9	<41.2	<31.5	<34.3	<0.62
2,3,4,5-tetrachlorophenol	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
Total Tetrachlorophenols	<0.90	<71.8	<124	<94.5	<103	<1.85
Pentachlorophenol	0.41	32.7	56.3	43.1	46.9	0.84
Total Chlorophenols	<5.92	<472	<812	<622	<677	<12.2

Dry Gas Volume Sampled (Rm ³ *) :	7.287
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*) :	15.0
Dry Adjusted Flowrate (Rm³/s**) :	19.6
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 62
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Analysis and Emission Data
Test No. 2

Specific	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
2-monochlorophenol	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
3-monochlorophenol	<0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
4-monochlorophenol	<0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Total Monochlorophenols	<0.90	<76.2	<129	<98.2	<108	<1.87
2,6-dichlorophenol	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
2,4 & 2,5-dichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
3,5-dichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
2,3-dichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
3,4-dichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Total Dichlorophenols	<1.50	<127	<215	<164	<181	<3.12
2,4,6-trichlorophenol	0.54	45.7	77.6	58.9	65.0	1.12
2,3,6-trichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
2,3,5-trichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
2,4,5-trichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
2,3,4-trichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
3,4,5-trichlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Total Trichlorophenols	<2.04	<173	<293	<222	<246	<4.25
2,3,5,6-tetrachlorophenol	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
2,3,4,6-tetrachlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
2,3,4,5-tetrachlorophenol	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Total Tetrachlorophenols	<0.90	<76.2	<129	<98.2	<108	<1.87
Pentachlorophenol	0.36	30.5	51.7	39.3	43.3	0.75
Total Chlorophenols	<5.70	<483	<819	<622	<686	<11.9

Dry Gas Volume Sampled (Rm ³ *) :	6.961
Actual Flowrate (m³/s):	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*) :	17.3

^{*} At 25°C and 1 atmosphere

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

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	Total	Actual	Dry Reference	Dry Adjusted		
Isomer	Collected	Concentration	Concentration	Concentration	Concentration	Rate
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
2-monochlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
3-monochlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
4-monochlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Total Monochlorophenols	<0.90	<76.2	<128	<98.9	<107	<1.89
2,6-dichlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
2,4 & 2,5-dichlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
3,5-dichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	<0.63
2,3-dichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	<0.63
3,4-dichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Total Dichlorophenols	<1.50	<127	<213	<165	<179	<3.15
2,4,6-trichlorophenol	0.57	48.3	80.9	62.7	68.0	1.20
2,3,6-trichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
2,3,5-trichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
2,4,5-trichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	<0.63
2,3,4-trichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	<0.63
3,4,5-trichlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Total Trichlorophenols	<2.07	<175	<294	<228	<247	<4.35
2,3,5,6-tetrachlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
2,3,4,6-tetrachlorophenol	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
2,3,4,5-tetrachlorophenol	< 0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Total Tetrachlorophenols	<0.90	<76.2	<128	<98.9	<107	<1.89
Pentachlorophenol	0.44	37.3	62.4	48.4	52.5	0.92
Total Chlorophenols	<5.81	<492	<824	<639	<693	<12.2

Dry Gas Volume Sampled (Rm³*):	7.048
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*):	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.6

^{*} At 25°C and 1 atmosphere

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

TABLE 64
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet
Chlorophenol Isomer and Congener Group Actual Concentrations

Specific		Actual Concentration				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
	ng/m³	ng/m³	ng/m³	ng/m³	%	
2-monochlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
3-monochlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
4-monochlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
Total Monochlorophenols	<71.8	<76.2	<76.2	<74.7	3.4	
2,6-dichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,4 & 2,5-dichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
3,5-dichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,3-dichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
3,4-dichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
Total Dichlorophenols	<120	<127	<127	<125	3.4	
2,4,6-trichlorophenol	56.6	45.7	48.3	50.2	11.4	
2,3,6-trichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,3,5-trichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,4,5-trichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,3,4-trichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
3,4,5-trichlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
Total Trichlorophenols	<176	<173	<175	<175	1.1	
2,3,5,6-tetrachlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,3,4,6-tetrachlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
2,3,4,5-tetrachlorophenol	<23.9	<25.4	<25.4	<24.9	3.4	
Total Tetrachlorophenols	<71.8	<76.2	<76.2	<74.7	3.4	
Pentachlorophenol	32.7	30.5	37.3	33.5	10.3	
Total Chlorophenols	<472	<483	<492	<482	2.0	

TABLE 65

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Chlorophenol Isomer and Congener Group Dry Reference Concentrations

Specific		Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
2-monochlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
3-monochlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
4-monochlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
Total Monochlorophenols	<124	<129	<128	<127	2.4
2,6-dichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,4 & 2,5-dichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
3,5-dichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,3-dichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
3,4-dichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
Total Dichlorophenols	<206	<215	<213	<211	2.4
2,4,6-trichlorophenol	97.4	77.6	80.9	85.3	12.5
2,3,6-trichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,3,5-trichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,4,5-trichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,3,4-trichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
3,4,5-trichlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
Total Trichlorophenols	<303	<293	<294	<297	1.9
2,3,5,6-tetrachlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,3,4,6-tetrachlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
2,3,4,5-tetrachlorophenol	<41.2	<43.1	<42.6	<42.3	2.4
Total Tetrachlorophenols	<124	<129	<128	<127	2.4
Pentachlorophenol	56.3	51.7	62.4	56.8	9.5
Total Chlorophenols	<812	<819	<824	<819	0.7

^{*} 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	2000-201-201-201-201-201-201-201-201-201	Dry Adjusted Concentration Coef				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%	
 2-monochlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
3-monochlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
4-monochlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
Total Monochlorophenols	<94.5	<98.2	<98.9	<97.2	2.4	
2,6-dichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,4 & 2,5-dichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
3,5-dichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,3-dichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
3,4-dichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
Total Dichlorophenols	<158	<164	<165	<162	2.4	
2,4,6-trichlorophenol	74.6	58.9	62.7	65.4	12.5	
2,3,6-trichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,3,5-trichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,4,5-trichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,3,4-trichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
3,4,5-trichlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
Total Trichlorophenols	<232	<222	<228	<227	2.1	
2,3,5,6-tetrachlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,3,4,6-tetrachlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
2,3,4,5-tetrachlorophenol	<31.5	<32.7	<33.0	<32.4	2.4	
Total Tetrachlorophenois	<94.5	<98.2	<98.9	<97.2	2.4	
Pentachlorophenol	43.1	39.3	48.4	43.6	10.5	
Total Chlorophenols	<622	<622	<639	<627	1.6	

^{*} 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	V	Vet Reference	: Concentratio	n	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%%
2-monochlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
3-monochlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
4-monochlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
Total Monochlorophenols	<103	<108	<107	<106	2.7
2,6-dichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
2,4 & 2,5-dichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
3,5-dichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
2,3-dichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
3,4-dichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
Total Dichlorophenols	<172	<181	<179	<177	2.7
2,4,6-trichlorophenol	81.2	65.0	68.0	71.4	12.1
2,3,6-trichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
2,3,5-trichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
2,4,5-trichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
2,3,4-trichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
3,4,5-trichlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
Total Trichlorophenols	<253	<246	<247	<248	1.5
2,3,5,6-tetrachlorophenol	<34.3	<36.1	<35.8	<35,4	2.7
2,3,4,6-tetrachlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
2,3,4,5-tetrachlorophenol	<34.3	<36.1	<35.8	<35.4	2.7
Total Tetrachlorophenols	<103	<108	<107	<106	2.7
Pentachlorophenol	46.9	43.3	52.5	47.6	9.7
Total Chlorophenols	<677	<686	<693	<686	1.2

^{*} 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	1477	Emissio	on Rate		Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	μg/s	μg/s	μg/s	μg/s	%
2	0.50	0.60	0.52	0.60	1.0
2-monochlorophenol	<0.62	<0.62	<0.63	<0.62	1.0
3-monochlorophenol	<0.62	< 0.62	<0.63	<0.62	1.0
4-monochlorophenol	<0.62	<0.62	<0.63	<0.62	1.0
Total Monochlorophenols	<1.85	<1.87	<1.89	<1.87	1.0
2,6-dichlorophenol	<0.62	<0.62	<0.63	<0.62	1.0
2,4 & 2,5-dichlorophenol	<0.62	< 0.62	< 0.63	< 0.62	1.0
3,5-dichlorophenol	< 0.62	< 0.62	< 0.63	< 0.62	1.0
2,3-dichlorophenol	< 0.62	< 0.62	< 0.63	< 0.62	1.0
3,4-dichlorophenol	<0.62	< 0.62	< 0.63	<0.62	1.0
Total Dichlorophenols	<3.09	<3.12	<3.15	<3.12	1.0
2,4,6-trichlorophenol	1.46	1.12	1.20	1.26	14.1
2,3,6-trichlorophenol	< 0.62	< 0.62	< 0.63	< 0.62	1.0
2,3,5-trichlorophenol	< 0.62	< 0.62	<0.63	<0.62	1.0
2,4,5-trichlorophenol	<0.62	< 0.62	< 0.63	< 0.62	1.0
2,3,4-trichlorophenol	< 0.62	< 0.62	<0.63	< 0.62	1.0
3,4,5-trichlorophenol	<0.62	< 0.62	<0.63	< 0.62	1.0
Total Trichlorophenols	<4.55	<4.25	<4.35	<4.38	3.5
2,3,5,6-tetrachlorophenol	<0.62	<0.62	<0.63	<0.62	1.0
2,3,4,6-tetrachlorophenol	<0.62	<0.62	< 0.63	<0.62	1.0
2,3,4,5-tetrachlorophenol	<0.62	< 0.62	< 0.63	<0.62	1.0
Total Tetrachlorophenols	<1.85	<1.87	<1.89	<1.87	1.0
Pentachlorophenol	0.84	0.75	0.92	0.84	10.4
Total Chlorophenols	<12.2	<11.9	<12.2	<12.1	1.5

TABLE 69

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Summary of Emission Data for Chlorophenol Isomer and Congener Groups

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission	
Isomer	Concentration	Concentration	Concentration	Concentration	Rate	
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s	
2-monochlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
3-monochlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
4-monochlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
Total Monochlorophenols	<74.7	<127	<97.2	<106	<1.87	
2,6-dichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
2,4 & 2,5-dichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
3,5-dichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
2,3-dichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
3,4-dichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
Total Dichlorophenols	<125	<211	<162	<177	<3.12	
2,4,6-trichlorophenol	50.2	85.3	65.4	71.4	1.26	
2,3,6-trichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
2,3,5-trichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
2,4,5-trichlorophenol	<24.9	<42.3	<32.4	<35.4	< 0.62	
2,3,4-trichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
3,4,5-trichlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
Total Trichlorophenols	<175	<297	<227	<248	<4.38	
2,3,5,6-tetrachlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
2,3,4,6-tetrachlorophenol	<24.9	<42.3	<32.4	<35.4	< 0.62	
2,3,4,5-tetrachlorophenol	<24.9	<42.3	<32.4	<35.4	<0.62	
Total Tetrachlorophenols	<74.7	<127	<97.2	<106	<1.87	
Pentachlorophenol	33.5	56.8	43.6	47.6	0.84	
Total Chlorophenols	<482	<819	<627	<686	<12.1	

^{*} 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	Lab Blank	Blank Train
Group	Total μg	Total μg
2-monochlorophenol	<0.30	<0.30
3-monochlorophenol	<0.30	<0.30
4-monochlorophenol	<0.30	<0.30
Total Monochlorophenols	<0.90	<0.90
2,6-dichlorophenol	<0.30	<0.30
2,4 & 2,5-dichlorophenol	<0.30	<0.30
3,5-dichlorophenol	<0.30	<0.30
2,3-dichlorophenol	<0.30	<0.30
3,4-dichlorophenol	<0.30	<0.30
Total Dichlorophenols	<1.50	<1.50
2,4,6-trichlorophenol	<0.30	<0.30
2,3,6-trichlorophenol	<0.30	<0.30
2,3,5-trichlorophenol	<0.30	<0.30
2,4,5-trichlorophenol	<0.30	<0.30
2,3,4-trichlorophenol	<0.30	< 0.30
3,4,5-trichlorophenol	<0.30	<0.30
Total Trichlorophenols	<1.80	<1.80
2,3,5,6-tetrachlorophenol	<0.30	<0.30
2,3,4,6-tetrachlorophenol	<0.30	<0.30
2,3,4,5-tetrachlorophenol	<0.30	<0.30
Total Tetrachlorophenols	<0.90	<0.90
Pentachlorophenol	<0.30	<0.30
Total Chlorophenols	<5.40	<5.40

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
Acenaphthene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Acenaphthylene	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
Anthracene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Benzo(a)anthracene	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
Benzo(b)fluoranthene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Benzo(k)fluoranthene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Benzo(a)fluorene	<1.2	<95.7	<165	<126	<137	<2.47
Benzo(b)fluorene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
Benzo(g,h,i)perylene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Benzo(a)pyrene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Benzo(e)pyrene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
Biphenyl	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
2-Chloronaphthalene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
Chrysene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Coronene	<1.2	<95.7	<165	<126	<137	<2.47
Dibenzo(a,c) anthracene + Picene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Dibenz(a,h)anthracene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Dibenzo(a,e)pyrene	<1.2	<95.7	<165	<126	<137	<2.47
9,10-Dimethylanthracene	<1.2	<95.7	<165	<126	<137	<2.47
7,12-Dimethylbenzo(a)anthracene	<1.2	<95.7	<165	<126	<137	<2.47
Fluoranthene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Fluorene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Indeno(1,2,3-cd)pyrene	<0.30	<23.9	<41.2	<31.5	<34.3	< 0.62
2-Methylanthracene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
3-Methylcholanthrene	<1.2	<95.7	<165	<126	<137	<2.47
1-Methylnaphthalene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
2-Methylnaphthalene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
1-Methylphenanthrene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
9-Methylphenanthrene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Naphthalene	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
Perylene	<1.2	<95.7	<165	<126	<137	<2.47
Phenanthrene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Pyrene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Quinoline	<1.2	<95.7	<165	<126	<137	<2.47
Tetralin	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
m-Terphenyl	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
o-Terphenyl	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
p-Terphenyl	<0.60	<47.9	<82.3	<63.0	<68.6	<1.24
Triphenylene	<0.30	<23.9	<41.2	<31.5	<34.3	<0.62
Total	<22.5	<1795	<3088	<2363	<2573	<46.3

Dry Gas Volume Sampled (Rm³*) :	7.287
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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 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
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
Acenaphthene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Acenaphthylene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Anthracene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Benzo(a)anthracene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Benzo(b)fluoranthene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Benzo(k)fluoranthene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Benzo(a)fluorene	<1.2	<102	<172	<131	<144	<2.50
Benzo(b)fluorene	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
Benzo(g,h,i)perylene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Benzo(a)pyrene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Benzo(e)pyrene	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
Biphenyl	< 0.60	<50.8	<86.2	<65.4	<72.2	<1.25
2-Chloronaphthalene	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
Chrysene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Coronene	<1.2	<102	<172	<131	<144	<2.50
Dibenzo(a,c) anthracene + Picene	<0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Dibenz(a,h)anthracene	<0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Dibenzo(a,e)pyrene	<1.2	<102	<172	<131	<144	<2.50
9,10-Dimethylanthracene	<1.2	<102	<172	<131	<144	<2.50
7,12-Dimethylbenzo(a)anthracene	<1.2	<102	<172	<131	<144	<2.50
Fluoranthene	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Fluorene	<0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Indeno(1,2,3-cd)pyrene	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
2-Methylanthracene	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
3-Methylcholanthrene	<1.2	<102	<172	<131	<144	<2.50
1-Methylnaphthalene	< 0.60	<50.8	<86.2	<65.4	<72.2	<1.25
2-Methylnaphthalene	< 0.30	<25.4	<43.1	<32.7	<36.1	<0.62
1-Methylphenanthrene	< 0.60	<50.8	<86.2	<65.4	<72.2	<1.25
9-Methylphenanthrene	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Naphthalene	< 0.60	<50.8	<86.2	<65.4	<72.2	<1.25
Pervlene	<1.2	<102	<172	<131	<144	<2.50
Phenanthrene	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Pyrene	< 0.30	<25.4	<43.1	<32.7	<36.1	< 0.62
Quinoline	<1.2	<102	<172	<131	<144	<2.50
Tetralin	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
m-Terphenyl	<0.60	<50.8	<86.2	<65.4	<72.2	<1.25
o-Terphenyl	< 0.60	<50.8	<86.2	<65.4	<72.2	<1.25
p-Terphenyl	< 0.60	<50.8	<86.2	<65.4	<72.2	<1.25
Triphenylene	<0.30	<25.4	<43.1	<32.7	<36.1	<0.62
Total	<22.5	<1905	<3232	<2454	<2709	<46.9

Dry Gas Volume Sampled (Rm³*) :	6.961
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*) :	14.5
Dry Adjusted Flowrate (Rm³/s**) :	19.1
Wet Reference Flowrate (Rm³/s*) :	17.3

^{*} At 25°C and 1 atmosphere

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

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
	μg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	μg/s
Acenaphthene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Acenaphthylene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Anthracene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Benzo(a)anthracene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Benzo(b)fluoranthene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Benzo(k)fluoranthene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Benzo(a)fluorene	<1.2	<102	<170	<132	<143	<2.52
Benzo(b)fluorene	< 0.60	<50.8	<85.1	<66.0	<71.6	<1.26
Benzo(g,h,i)perylene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Benzo(a)pyrene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Benzo(e)pyrene	< 0.60	<50.8	<85.1	<66.0	<71.6	<1.26
Biphenyl	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
2-Chloronaphthalene	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
Chrysene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Coronene	<1.2	<102	<170	<132	<143	<2.52
Dibenzo(a,c) anthracene + Picene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Dibenz(a,h)anthracene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Dibenzo(a,e)pyrene	<1.2	<102	<170	<132	<143	<2.52
9,10-Dimethylanthracene	<1.2	<102	<170	<132	<143	<2.52
7,12-Dimethylbenzo(a)anthracene	<1.2	<102	<170	<132	<143	<2.52
Fluoranthene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Fluorene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Indeno(1,2,3-cd)pyrene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
2-Methylanthracene	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
3-Methylcholanthrene	<1.2	<102	<170	<132	<143	<2.52
1-Methylnaphthalene	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
2-Methylnaphthalene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
1-Methylphenanthrene	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
9-Methylphenanthrene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Naphthalene	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
Perylene	<1.2	<102	<170	<132	<143	<2.52
Phenanthrene	<0.30	<25.4	<42.6	<33.0	<35.8	< 0.63
Pyrene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
Quinoline	<1.2	<102	<170	<132	<143	<2.52
Tetralin	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
m-Terphenyl	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
lo-Terphenyl	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
p-Terphenyl	<0.60	<50.8	<85.1	<66.0	<71.6	<1.26
Triphenylene	<0.30	<25.4	<42.6	<33.0	<35.8	<0.63
inpirentialene			\42.0	\ 33.0	\33.0	\0.03
Total	<22.5	<1905	<3192	<2474	<2685	<47.2

Dry Gas Volume Sampled (Rm³*) :	7.048
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*):	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.6

^{*} At 25°C and 1 atmosphere

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

TABLE 74

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Polycyclic Aromatic Hydrocarbon Actual Concentrations

Compound	**************************************	Actual Concentration				
·	Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
	ng/m³	ng/m³	ng/m³	ng/m³	%	
Acenaphthene	<23.9	<25.4	<25.4	<24.9	3.4	
Acenaphthylene	<23.9	<25.4	<25.4	<24.9	3.4	
Anthracene	<23.9	<25.4	<25.4	<24.9	3.4	
Benzo(a)anthracene	<23.9	<25.4	<25.4	<24.9	3.4	
Benzo(b)fluoranthene	<23.9	<25.4	<25.4	<24.9	3.4	
Benzo(k)fluoranthene	<23.9	<25.4	<25.4	<24.9	3.4	
Benzo(a)fluorene	<95.7	<102	<102	<99.7	3.4	
Benzo(b)fluorene	<47.9	<50.8	<50.8	<49.8	3.4	
Benzo(g,h,i)perylene	<23.9	<25.4	<25.4	<24.9	3.4	
Benzo(a)pyrene	<23.9	<25.4	<25.4	<24.9	3.4	
Benzo(e)pyrene	<47.9	<50.8	<50.8	<49.8	3.4	
Biphenyl	<47.9	<50.8	<50.8	<49.8	3.4	
2-Chloronaphthalene	<47.9	<50.8	<50.8	<49.8	3.4	
Chrysene	<23.9	<25.4	<25.4	<24.9	3.4	
Coronene	<95.7	<102	<102	<99.7	3.4	
Dibenzo(a,c) anthracene + Picene	<23.9	<25.4	<25.4	<24.9	3.4	
Dibenz(a,h)anthracene	<23.9	<25.4	<25.4	<24.9	3.4	
Dibenzo(a,e)pyrene	<95.7	<102	<102	<99.7	3.4	
9,10-Dimethylanthracene	<95.7	<102	<102	<99.7	3.4	
7,12-Dimethylbenzo(a)anthracene	<95.7	<102	<102	<99.7	3.4	
Fluoranthene	<23.9	<25.4	<25.4	<24.9	3.4	
Fluorene	<23.9	<25.4	<25.4	<24.9	3.4	
Indeno(1,2,3-cd)pyrene	<23.9	<25.4	<25.4	<24.9	3.4	
2-Methylanthracene	<47.9	<50.8	<50.8	<49.8	3.4	
3-Methylcholanthrene	<95.7	<102	<102	<99.7	3.4	
1-Methylnaphthalene	<47.9	<50.8	<50.8	<49.8	3.4	
2-Methylnaphthalene	<23.9	<25.4	<25.4	<24.9	3.4	
1-Methylphenanthrene	<47.9	<50.8	<50.8	<49.8	3.4	
9-Methylphenanthrene	<23.9	<25.4	<25.4	<24.9	3.4	
Naphthalene	<47.9	<50.8	<50.8	<49.8	3.4	
Perylene	<95.7	<102	<102	<99.7	3.4	
Phenanthrene	<23.9	<25.4	<25.4	<24.9	3.4	
Pyrene	<23.9	<25.4	<25.4	<24.9	3.4	
Quinoline	<95.7	<102	<102	<99.7	3.4	
Tetralin	<47.9	<50.8	<50.8	<49.8	3.4	
m-Terphenyl	<47.9	<50.8	<50.8	<49.8	3.4	
o-Terphenyl	<47.9	<50.8	<50.8	<49.8	3.4	
p-Terphenyl	<47.9	<50.8	<50.8	<49.8	3.4	
Triphenylene	<23.9	<25.4	<25.4	<24.9	3.4	
Total	<1795	<1905	<1905	<1869	3.4	

TABLE 75

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Polycyclic Aromatic Hydrocarbon Dry Reference Concentrations

Compound	er general de la companya de la comp	Dry Reference	Concentration		Coefficient
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<41.2	<43.1	<42.6	<42.3	2.4
Acenaphthylene	<41.2	<43.1	<42.6	<42.3	2.4
Anthracene	<41.2	<43.1	<42.6	<42.3	2.4
Benzo(a)anthracene	<41.2	<43.1	<42.6	<42.3	2.4
Benzo(b)fluoranthene	<41.2	<43.1	<42.6	<42.3	2.4
Benzo(k)fluoranthene	<41.2	<43.1	<42.6	<42.3	2.4
Benzo(a)fluorene	<165	<172	<170	<169	2.4
Benzo(b)fluorene	<82.3	<86.2	<85.1	<84.6	2.4
Benzo(g,h,i)perylene	<41.2	<43.1	<42.6	<42.3	2.4
Benzo(a)pyrene	<41.2	<43.1	<42.6	<42.3	2.4
Benzo(e)pyrene	<82.3	<86.2	<85.1	<84.6	2.4
Biphenyl	<82.3	<86.2	<85.1	<84.6	2.4
2-Chloronaphthalene	<82.3	<86.2	<85.1	<84.6	2.4
Chrysene	<41.2	<43.1	<42.6	<42.3	2.4
Coronene	<165	<172	<170	<169	2.4
Dibenzo(a,c) anthracene + Picene	<41.2	<43.1	<42.6	<42.3	2.4
Dibenz(a,h)anthracene	<41.2	<43.1	<42.6	<42.3	2.4
Dibenzo(a,e)pyrene	<165	<172	<170	<169	2.4
9,10-Dimethylanthracene	<165	<172	<170	<169	2.4
7,12-Dimethylbenzo(a)anthracene	<165	<172	<170	<169	2.4
Fluoranthene	<41.2	<43.1	<42.6	<42.3	2.4
Fluorene	<41.2	<43.1	<42.6	<42.3	2.4
Indeno(1,2,3-cd)pyrene	<41.2	<43.1	<42.6	<42.3	2.4
2-Methylanthracene	<82.3	<86.2	<85.1	<84.6	2.4
3-Methylcholanthrene	<165	<172	<170	<169	2.4
1-Methylnaphthalene	<82.3	<86.2	<85.1	<84.6	2.4
2-Methylnaphthalene	<41.2	<43.1	<42.6	<42.3	2.4
1-Methylphenanthrene	<82.3	<86.2	<85.1	<84.6	2.4
9-Methylphenanthrene	<41.2	<43.1	<42.6	<42.3	2.4
Naphthalene	<82.3	<86.2	<85.1	<84.6	2.4
Perylene	<165	<172	<170	<169	2.4
Phenanthrene	<41.2	<43.1	<42.6	<42.3	2.4
Pyrene	<41.2	<43.1	<42.6	<42.3	2.4
Quinoline	<165	<172	<170	<169	2.4
Tetralin	<82.3	<86.2	<85.1	<84.6	2.4
m-Terphenyl	<82.3	<86.2	<85.1	<84.6	2.4
o-Terphenyl	<82.3	<86.2	<85.1	<84.6	2.4
p-Terphenyl	<82.3	<86.2	<85.1	<84.6	2.4
Triphenylene	<41.2	<43.1	<42.6	<42.3	2.4
Total	<3088	<3232	<3192	<3171	2.4

^{*} 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
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<31.5	<32.7	<33.0	<32.4	2.4
Acenaphthylene	<31.5	<32.7	<33.0	<32.4	2.4
Anthracene	<31.5	<32.7	<33.0	<32.4	2.4
Benzo(a)anthracene	<31.5	<32.7	<33.0	<32.4	2.4
Benzo(b)fluoranthene	<31.5	<32.7	<33.0	<32.4	2.4
Benzo(k)fluoranthene	<31.5	<32.7	<33.0	<32.4	2.4
Benzo(a)fluorene	<126	<131	<132	<130	2.4
Benzo(b)fluorene	<63.0	<65.4	<66.0	<64.8	2.4
Benzo(g,h,i)perylene	<31.5	<32.7	<33.0	<32.4	2.4
Benzo(a)pyrene	<31.5	<32.7	<33.0	<32.4	2.4
Benzo(e)pyrene	<63.0	<65.4	<66.0	<64.8	2.4
Biphenyl	<63.0	<65.4	<66.0	<64.8	2.4
2-Chloronaphthalene	<63.0	<65.4	<66.0	<64.8	2.4
Chrysene	<31.5	<32.7	<33.0	<32.4	2.4
Coronene	<126	<131	<132	<130	2.4
Dibenzo(a,c) anthracene + Picene	<31.5	<32.7	<33.0	<32.4	2.4
Dibenz(a,h)anthracene	<31.5	<32.7	<33.0	<32.4	2.4
Dibenzo(a,e)pyrene	<126	<131	<132	<130	2.4
9,10-Dimethylanthracene	<126	<131	<132	<130	2.4
7,12-Dimethylbenzo(a)anthracene	<126	<131	<132	<130	2.4
Fluoranthene	<31.5	<32.7	<33.0	<32.4	2.4
Fluorene	<31.5	<32.7	<33.0	<32.4	2.4
Indeno(1,2,3-cd)pyrene	<31.5	<32.7	<33.0	<32.4	2.4
2-Methylanthracene	<63.0	<65.4	<66.0	<64.8	2.4
3-Methylcholanthrene	<126	<131	<132	<130	2.4
1-Methylnaphthalene	<63.0	<65.4	<66.0	<64.8	2.4
2-Methylnaphthalene	<31.5	<32.7	<33.0	<32.4	2.4
1-Methylphenanthrene	<63.0	<65.4	<66.0	<64.8	2.4
9-Methylphenanthrene	<31.5	<32.7	<33.0	<32.4	2.4
Naphthalene	<63.0	<65.4	<66.0	<64.8	2.4
Perylene	<126	<131	<132	<130	2.4
Phenanthrene	<31.5	<32.7	<33.0	<32.4	2.4
Pyrene	<31.5	<32.7	<33.0	<32.4	2.4
Quinoline	<126	<131	<132	<130	2.4
Tetralin	<63.0	<65.4	<66.0	<64.8	2.4
m-Terphenyl	<63.0	<65.4	<66.0	<64.8	2.4
o-Terphenyl	<63.0	<65.4	<66.0	<64.8	2.4
p-Terphenyl	<63.0	<65.4	<66.0	<64.8	2.4
Triphenylene	<31.5	<32.7	<33.0	<32.4	2.4
Total	<2363	<2454	<2474	<2430	2.4

^{*} 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			Coefficient		
	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Acenaphthene	<34.3	<36.1	<35.8	<35.4	2.7
Acenaphthylene	<34.3	<36.1	<35.8	<35.4	2.7
Anthracene	<34.3	<36.1	<35.8	<35 <i>.</i> 4	2.7
Benzo(a)anthracene	<34.3	<36.1	<35.8	<35.4	2.7
Benzo(b)fluoranthene	<34.3	<36.1	<35.8	<35.4	2.7
Benzo(k)fluoranthene	<34.3	<36.1	<35.8	<35.4	2.7
Benzo(a)fluorene	<137	<144	<143	<142	2.7
Benzo(b)fluorene	<68.6	<72.2	<71.6	<70.8	2.7
Benzo(g,h,i)perylene	<34.3	<36.1	<35.8	<35.4	2.7
Benzo(a)pyrene	<34.3	<36.1	<35.8	<35.4	2.7
Benzo(e)pyrene	<68.6	<72.2	<71.6	<70.8	2.7
Biphenyl	<68.6	<72.2	<71.6	<70.8	2.7
2-Chloronaphthalene	<68.6	<72.2	<71.6	<70.8	2.7
Chrysene	<34.3	<36.1	<35.8	<35.4	2.7
Coronene	<137	<144	<143	<142	2.7
Dibenzo(a,c) anthracene + Picene	<34.3	<36.1	<35.8	<35.4	2.7
Dibenz(a,h)anthracene	<34.3	<36.1	<35.8	<35.4	2.7
Dibenzo(a,e)pyrene	<137	<144	<143	<142	2.7
9,10-Dimethylanthracene	<137	<144	<143	<142	2.7
7,12-Dimethylbenzo(a)anthracene	<137	<144	<143	<142	2.7
Fluoranthene	<34.3	<36.1	<35.8	<35.4	2.7
Fluorene	<34.3	<36.1	<35.8	<35.4	2.7
Indeno(1,2,3-cd)pyrene	<34.3	<36.1	<35.8	<35.4	2.7
2-Methylanthracene	<68.6	<72.2	<71.6	<70.8	2.7
3-Methylcholanthrene	<137	<144	<143	<142	2.7
1-Methylnaphthalene	<68.6	<72.2	<71.6	<70.8	2.7
2-Methylnaphthalene	<34.3	<36.1	<35.8	<35.4	2.7
1-Methylphenanthrene	<68.6	<72.2	<71.6	<70.8	2.7
9-Methylphenanthrene	<34.3	<36.1	<35.8	<35.4	2.7
Naphthalene	<68.6	<72.2	<71.6	<70.8	2.7
Perylene	<137	<144	<143	<142	2.7
Phenanthrene	<34.3	<36.1	<35.8	<35.4	2.7
Pyrene	<34.3	<36.1	<35.8	<35.4	2.7
Quinoline	<137	<144	<143	<142	2.7
Tetralin	<68.6	<72.2	<71.6	<70.8	2.7
m-Terphenyl	<68.6	<72.2	<71.6	<70.8	2.7
o-Terphenyl	<68.6	<72.2	<71.6	<70.8	2.7
p-Terphenyl	<68.6	<72.2	<71.6	<70.8	2.7
Triphenylene	<34.3	<36.1	<35.8	<35.4	2.7
Total	<2573	<2709	<2685	<2656	2.7

^{*} At 25°C and 1 atmosphere

TABLE 78

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Polycyclic Aromatic Hydrocarbon Emission Rates

Compound		Emissio	on Rate		Coefficient
	Test No. 1 μg/s	Test No. 2 μg/s	Test No. 3 µg/s	Average μg/s	of Variation %
Acenaphthene	<0.62	<0.62	<0.63	<0.62	1.0
Acenaphthylene	<0.62	<0.62	<0.63	<0.62	1.0
Anthracene	<0.62	<0.62	<0.63	<0.62	1.0
Benzo(a)anthracene	<0.62	<0.62	<0.63	<0.62	1.0
Benzo(b)fluoranthene	<0.62	<0.62	<0.63	<0.62	1.0
Benzo(k)fluoranthene	<0.62	<0.62	<0.63	<0.62	1.0
Benzo(a)fluorene	<2.47	<2.50	<2.52	<2.50	1.0
Benzo(b)fluorene	<1.24	<1.25	<1.26	<1.25	1.0
Benzo(g,h,i)perylene	<0.62	<0.62	<0.63	<0.62	1.0
Benzo(a)pyrene	<0.62	<0.62	<0.63	<0.62	1.0
Benzo(e)pyrene	<1.24	<1.25	<1.26	<1.25	1.0
Biphenyl	<1.24	<1.25	<1.26	<1.25	1.0
2-Chloronaphthalene	<1.24	<1.25	<1.26	<1.25	1.0
Chrysene	<0.62	<0.62	<0.63	<0.62	1.0
Coronene	<2.47	<2.50	<2.52	<2.50	1.0
		<2.50 <0.62	<0.63	<0.62	1.0
Dibenzo(a,c) anthracene + Picene	<0.62			<0.62	1.0
Dibenz(a,h)anthracene	< 0.62	<0.62	< 0.63		
Dibenzo(a,e)pyrene	<2.47	<2.50	<2.52	<2.50 <2.50	1.0
9,10-Dimethylanthracene	<2.47	<2.50	<2.52 <2.52		1.0
7,12-Dimethylbenzo(a)anthracene	<2.47	<2.50		<2.50	1.0
Fluoranthene	<0.62	<0.62	<0.63	< 0.62	1.0
Fluorene	<0.62	<0.62	< 0.63	< 0.62	1.0
Indeno(1,2,3-cd)pyrene	<0.62	<0.62	<0.63	< 0.62	1.0
2-Methylanthracene	<1.24	<1.25	<1.26	<1.25	1.0
3-Methylcholanthrene	<2.47	<2.50	<2.52	<2.50	1.0
1-Methylnaphthalene	<1.24	<1.25	<1.26	<1.25	1.0
2-Methylnaphthalene	<0.62	<0.62	<0.63	<0.62	1.0
1-Methylphenanthrene	<1.24	<1.25	<1.26	<1.25	1.0
9-Methylphenanthrene	<0.62	<0.62	<0.63	<0.62	1.0
Naphthalene	<1.24	<1.25	<1.26	<1.25	1.0
Perylene	<2.47	<2.50	<2.52	<2.50	1.0
Phenanthrene	<0.62	<0.62	<0.63	<0.62	1.0
Pyrene	<0.62	<0.62	<0.63	<0.62	1.0
Quinoline	<2.47	<2.50	<2.52	<2.50	1.0
Tetralin	<1.24	<1.25	<1.26	<1.25	1.0
m-Terphenyl	<1.24	<1.25	<1.26	<1.25	1.0
o-Terphenyl	<1.24	<1.25	<1.26	<1.25	1.0
p-Terphenyl	<1.24	<1.25	<1.26	<1.25	1.0
Triphenylene	<0.62	<0.62	<0.63	<0.62	1.0
Total	<46.3	<46.9	<47.2	<46.8	1.0

TABLE 79

Covanta - Durham York Energy Centre

Boiler No. 2 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	<24.9	<42.3	<32.4	<35.4	<0.62
Acenaphthylene	<24.9	<42.3	<32.4	<35.4	<0.62
Anthracene	<24.9	<42.3	<32.4	<35.4	<0.62
Benzo(a)anthracene	<24.9	<42.3	<32.4	<35.4	<0.62
Benzo(b)fluoranthene	<24.9	<42.3	<32.4	<35.4	<0.62
Benzo(k)fluoranthene	<24.9	<42.3	<32.4	<35.4	<0.62
Benzo(a)fluorene	<99.7	<169	<130	<142	<2.50
Benzo(b)fluorene	<49.8	<84.6	<64.8	<70.8	<1.25
Benzo(g,h,i)perylene	<24.9	<42.3	<32.4	<35.4	< 0.62
Benzo(a)pyrene	<24.9	<42.3	<32.4	<35.4	<0.62
Benzo(e)pyrene	<49.8	<84.6	<64.8	<70.8	<1.25
Biphenyl	<49.8	<84.6	<64.8	<70.8	<1.25
2-Chloronaphthalene	<49.8	<84.6	<64.8	<70.8	<1.25
Chrysene	<24.9	<42.3	<32.4	<35.4	< 0.62
Coronene	<99.7	<169	<130	<142	<2.50
Dibenzo(a,c) anthracene + Picene	<24.9	<42.3	<32.4	<35.4	< 0.62
Dibenz(a,h)anthracene	<24.9	<42.3	<32.4	<35.4	< 0.62
Dibenzo(a,e)pyrene	<99.7	<169	<130	<142	<2.50
9,10-Dimethylanthracene	<99.7	<169	<130	<142	<2.50
7,12-Dimethylbenzo(a)anthracene	<99.7	<169	<130	<142	<2.50
Fluoranthene	<24.9	<42.3	<32.4	<35.4	< 0.62
Fluorene	<24.9	<42.3	<32.4	<35.4	< 0.62
Indeno(1,2,3-cd)pyrene	<24.9	<42.3	<32.4	<35.4	< 0.62
2-Methylanthracene	<49.8	<84.6	<64.8	<70.8	<1.25
3-Methylcholanthrene	<99.7	<169	<130	<142	<2.50
1-Methylnaphthalene	<49.8	<84.6	<64.8	<70.8	<1.25
2-Methylnaphthalene	<24.9	<42.3	<32.4	<35.4	<0.62
1-Methylphenanthrene	<49.8	<84.6	<64.8	<70.8	<1.25
9-Methylphenanthrene	<24.9	<42.3	<32.4	<35.4	< 0.62
Naphthalene	<49.8	<84.6	<64.8	<70.8	<1.25
Perylene	<99.7	<169	<130	<142	<2.50
Phenanthrene	<24.9	<42.3	<32.4	<35.4	< 0.62
Pyrene	<24.9	<42.3	<32.4	<35.4	<0.62
Quinoline	<99.7	<169	<130	<142	<2.50
Tetralin	<49.8	<84.6	<64.8	<70.8	<1.25
m-Terphenyl	<49.8	<84.6	<64.8	<70.8	<1.25
o-Terphenyl	<49.8	<84.6	<64.8	<70.8	<1.25
p-Terphenyl	<49.8	<84.6	<64.8	<70.8	<1.25
Triphenylene	<24.9	<42.3	<32.4	<35.4	<0.62
Total	<1869	<3171	<2430	<2656	<46.8

^{*} 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	Laboratory Blank
	μg	μg
Acenaphthene	<0.30	<0.30
Acenaphthylene	<0.30	<0.30
Anthracene	<0.30	<0.30
Benzo(a)anthracene	<0.30	<0.30
Benzo(b)fluoranthene	<0.30	<0.30
Benzo(k)fluoranthene	<0.30	<0.30
Benzo(a)fluorene	<1.2	<1.2
Benzo(b)fluorene	<0.60	<0.60
Benzo(g,h,i)perylene	<0.30	<0.30
Benzo(a)pyrene	<0.30	<0.30
Benzo(e)pyrene	<0.60	<0.60
Biphenyl	<0.60	<0.60
2-Chloronaphthalene	< 0.60	<0.60
Chrysene	<0.30	<0.30
Coronene	<1.2	<1.2
Dibenzo(a,c) anthracene + Picene	<0.30	<0.30
Dibenz(a,h)anthracene	<0.30	<0.30
Dibenzo(a,e)pyrene	<1.2	<1.2
9,10-Dimethylanthracene	<1.2	<1.2
7,12-Dimethylbenzo(a)anthracene	<1.2	<1.2
Fluoranthene	<0.30	<0.30
Fluorene	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	<0.30	<0.30
2-Methylanthracene	< 0.60	<0.60
3-Methylcholanthrene	<1.2	<1.2
1-Methylnaphthalene	<0.60	<0.60
2-Methylnaphthalene	<0.30	<0.30
1-Methylphenanthrene	<0.60	<0.60
9-Methylphenanthrene	<0.30	<0.30
Naphthalene	<0.60	<0.60
Perylene	<1.2	<1.2
Phenanthrene	<0.30	<0.30
Pyrene	<0.30	<0.30
Quinoline	<1.2	<1.2
Tetralin	<0.60	<0.60
m-Terphenyl	<0.60	<0.60
o-Terphenyl	<0.60	<0.60
p-Terphenyl	<0.60	<0.60
Triphenylene	<0.30	<0.30
Total	<22.5	<22.5

[&]quot;<" indicates that the amount detected is less than the analytical detection limit (<MDL). 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

	Total	Dry Volume		Acetaldehy	de Concentration		Acetaldehyde
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm ³ *	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
	_						
1	<2	0.0278	<41.6	<71.9	<55.0	<60.0	<1.07
2	<2	0.0297	<39.1	<67.4	<51.6	<56.3	<1.00
3	<2	0.0288	<40.2	<69.4	<53.0	<58.0	<1.03
Average			<40.3	<69.6	<53.2	<58.1	<1.03
Blank	<2						

Formaldehyde

	Total	Dry Volume		Formaldehy	de Concentration		Formaldehyde
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
		0.0070	407	22.2	24.7	27.0	0.40
1	0.9	0.0278	18.7	32.3	24.7	27.0	0.48
2	0.8	0.0297	15.6	27.0	20.6	22.5	0.40
3	0.7	0.0288	14.1	24.3	18.6	20.3	0.36
Average			16.1	27.9	21.3	23.3	0.41
Blank	0.3						

Acrolein

	Total	Dry Volume	(c	Acrolein	Concentration		Acrolein
Test	Collected	Sampled	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission Rate
No.	μg	Rm³*	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
					1 1-11		
1	<2	0.0278	<41.6	<71.9	<55.0	<60.0	<1.07
2	<2	0.0297	<39.1	<67.4	<51.6	<56.3	<1.00
3	<2	0.0288	<40.2	<69.4	<53.0	<58.0	<1.03
Average			<40.3	<69.6	<53.2	<58.1	<1.03
Blank	<2						

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit), 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				Total
	Run No. 1 Tube 16A/16B	Run No. 2 Tube 17A/17B	Run No. 3 Tube 18A/18B	Average	of Variation	Collected
	μg	μg	μg	μg	%	μg
Acetone	0.46	0.14	0.14	0.25	74.9	0.74
Benzene	0.025	0.022	0.023	0.024	6.0	0.071
Bromodichloromethane	0.024	0.024	0.029	0.026	11.2	0.077
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Bromomethane	< 0.015	<0.015	< 0.015	< 0.015	_	<0.045
1,3-Butadiene	<0.025	<0.025	<0.025	< 0.025		<0.075
2-Butanone	<0.036	<0.036	<0.036	< 0.036	=	< 0.11
Carbon Tetrachloride	< 0.016	<0.016	< 0.016	< 0.016	-	<0.048
Chlorobenzene	< 0.011	<0.011	< 0.011	< 0.011	_	<0.033
Chloroform	0.025	0.026	0.031	0.027	11.8	0.082
Cumene (Isopropylbenzene)	<0.025	<0.025	<0.025	<0.025	_	<0.075
Dibromochloromethane	0.011	0.011	0.012	0.011	4.9	0.034
Dichlorodifluoromethane	<0.020	<0.020	0.030	<0.023	24.7	<0.070
1,2-Dichloroethane	<0.0070	<0.0070	<0.0070	<0.0070	_	<0.021
trans,1,2-Dichloroethene	<0.010	<0.010	<0.010	<0.010	-	<0.030
1,1-Dichloroethene	<0.011	<0.011	< 0.011	< 0.011	_	< 0.033
1,2-Dichloropropane	< 0.011	< 0.011	<0.011	< 0.011	-	< 0.033
Ethylbenzene	0.022	< 0.014	< 0.014	< 0.017	27.7	<0.050
Ethylene Dibromide	< 0.010	<0.010	< 0.010	<0.010	_	< 0.030
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	<0.025		<0.075
Methylene Chloride	< 0.019	<0.019	0.027	<0.022	21.3	<0.065
Styrene	0.014	<0.012	< 0.012	<0.013	9.1	<0.038
Tetrachloroethene	0.072	0.030	0.020	0.041	67.8	0.12
Toluene	0.044	0.16	0.17	0.12	56.1	0.37
1,1,1-Trichloroethane	< 0.014	< 0.014	< 0.014	<0.014	_	< 0.042
Trichloroethene	<0.011	<0.011	< 0.011	<0.011	-	<0.033
1,1,2-Trichloroethane	< 0.016	< 0.016	<0.016	<0.016	_	<0.048
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	-	<0.075
Trichlorofluoromethane	<0.010	< 0.010	<0.010	<0.010	_	<0.030
M&P-Xylene	0.026	< 0.015	<0.015	<0.019	34.0	<0.056
O-Xylene	<0.015	< 0.015	< 0.015	< 0.015		<0.045
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	-	<0.039
Total	<1.08	<0.81	<0.85	<0.91	16.3	<2.73

Dry Gas Volume Sampled (Rm³*):

Run No. 1	0.0192
Run No. 2	0.0195
Run No. 3	0.0203

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining average and total analytical results for each compound, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

^{*} At 25°C and 1 atmosphere.

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 22A/22B	Run No. 2 Tube 23A/23B	Run No. 3 Tube 24A/24B	Average	of Variation	Collected
	μg	μg	μg	μg	%	μg
Acetone	0.108	0.068	0.074	0.083	25.9	0.25
Benzene	0.030	0.039	0.032	0.034	13.3	0.10
Bromodichloromethane	0.025	0.026	0.024	0.025	4.0	0.075
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Bromomethane	< 0.015	< 0.015	<0.015	< 0.015	-	< 0.045
1,3-Butadiene	<0.025	<0.025	<0.025	<0.025	**	< 0.075
2-Butanone	< 0.036	<0.036	<0.036	< 0.036	_	< 0.11
Carbon Tetrachloride	< 0.016	<0.016	<0.016	< 0.016	-	<0.048
Chlorobenzene	< 0.011	<0.011	< 0.011	< 0.011	-	<0.033
Chloroform	0.027	0.029	0.026	0.027	5.6	0.082
Cumene (Isopropylbenzene)	<0.025	<0.025	<0.025	<0.025	-	<0.075
Dibromochloromethane	0.011	0.011	0.010	0.011	7.0	0.032
Dichlorodifluoromethane	0.023	<0.020	0.033	<0.025	26.9	<0.076
1,2-Dichloroethane	<0.0070	< 0.0070	<0.0070	<0.0070	~	<0.021
trans,1,2-Dichloroethene	< 0.010	< 0.010	< 0.010	< 0.010	-	<0.030
1,1-Dichloroethene	< 0.011	< 0.011	< 0.011	< 0.011	-	<0.033
1,2-Dichloropropane	< 0.011	< 0.011	< 0.011	< 0.011	-	<0.033
Ethylbenzene	< 0.014	< 0.014	< 0.014	< 0.014	-	<0.042
Ethylene Dibromide	< 0.010	< 0.010	< 0.010	< 0.010	-	<0.030
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	<0.025	-	<0.075
Methylene Chloride	0.026	< 0.019	< 0.019	< 0.021	18.9	<0.064
Styrene	< 0.012	< 0.012	< 0.012	< 0.012	-	<0.036
Tetrachloroethene	<0.018	< 0.018	<0.018	< 0.018	-	<0.054
Toluene	0.027	0.037	0.039	0.034	18.7	0.10
1,1,1-Trichloroethane	< 0.014	< 0.014	< 0.014	< 0.014	-	<0.042
Trichloroethene	< 0.011	< 0.011	< 0.011	< 0.011	-	<0.033
1,1,2-Trichloroethane	< 0.016	< 0.016	<0.016	< 0.016	-	<0.048
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	-	<0.075
Trichlorofluoromethane	<0.010	< 0.010	<0.010	< 0.010	<u></u>	<0.030
M&P-Xylene	<0.015	< 0.015	< 0.015	< 0.015	-	<0.045
O-Xylene	<0.015	< 0.015	<0.015	< 0.015	-	<0.045
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	-	<0.039
Total	<0.66	<0.63	<0.64	<0.64	2.3	<1.92

Dry Gas Volume Sampled (Rm³*):

Run No. 1	0.0201
Run No. 2	0.0204
Run No. 3	0.0205

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining average and total analytical results for each compound, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

^{*} At 25°C and 1 atmosphere.

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	Run No. 2	Run No. 3	Average	of Variation	Collected
	Tube 26A/26B	Tube 27A/27B	Tube 28A/28B			
	μg	μg	μg	μg	%	μg
Acetone	0.061	0.062	0.046	0.056	15.9	0.17
Benzene	0.024	0.022	0.024	0.023	3.7	0.070
Bromodichloromethane	0.023	0.024	0.021	0.023	6.7	0.068
Bromoform	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Bromomethane	< 0.015	< 0.015	<0.015	< 0.015	•	<0.045
1,3-Butadiene	<0.025	<0.025	<0.025	<0.025	-	<0.075
2-Butanone	< 0.036	< 0.036	<0.036	< 0.036	-	< 0.11
Carbon Tetrachloride	< 0.016	<0.016	<0.016	< 0.016	-	<0.048
Chlorobenzene	< 0.011	< 0.011	< 0.011	< 0.011	-	< 0.033
Chloroform	0.025	0.028	0.023	0.025	9.9	0.076
Cumene (isopropylbenzene)	<0.025	<0.025	<0.025	<0.025	-	<0.075
Dibromochloromethane	0.010	0.012	<0.0090	< 0.010	12.6	<0.031
Dichlorodifluoromethane	<0.020	<0.020	<0.020	<0.020	_	< 0.060
1,2-Dichloroethane	<0.0070	<0.0070	<0.0070	<0.0070	-	<0.021
trans,1,2-Dichloroethene	<0.010	< 0.010	<0.010	<0.010	-	<0.030
1,1-Dichloroethene	<0.011	< 0.011	<0.011	<0.011	-	< 0.033
1,2-Dichloropropane	<0.011	<0.011	<0.011	< 0.011	-	<0.033
Ethylbenzene	< 0.014	< 0.014	< 0.014	< 0.014	-	< 0.042
Ethylene Dibromide	<0.010	<0.010	<0.010	< 0.010	-	<0.030
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	<0.025	-	<0.075
Methylene Chloride	< 0.019	< 0.019	< 0.019	< 0.019	-	<0.057
Styrene	<0.012	< 0.012	<0.012	<0.012	_	< 0.036
Tetrachloroethene	0.026	0.018	<0.018	<0.021	_	<0.062
Toluene	0.026	0.028	0.026	0.027	4.3	0.080
1,1,1-Trichloroethane	< 0.014	< 0.014	< 0.014	< 0.014	_	< 0.042
Trichloroethene	<0.011	<0.011	< 0.011	<0.011	-	< 0.033
1,1,2-Trichloroethane	<0.016	< 0.016	<0.016	<0.016	-	<0.048
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	-	<0.075
Trichlorofluoromethane	<0.010	<0.010	<0.010	<0.010	-	<0.030
M&P-Xylene	<0.015	<0.015	<0.015	<0.015	-	<0.045
O-Xylene	<0.015	<0.015	<0.015	<0.015	_	<0.045
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	-	<0.039
Total	<0.59	<0.59	<0.57	<0.59	2.7	<1.76

Dry Gas Volume Sampled (Rm³*):

Run No. 1	0.0182
Run No. 2	0.0194
Run No. 3	0.0182

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit). For the purpose of determining average and total analytical results for each compound, any analyte that was not detected was assigned a value equal to the detection limit for calculation purposes.

^{*} At 25°C and 1 atmosphere.

TABLE 85

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet

Volatile Organic Emission Data

Test No. 1

Compound	Total	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
	Collected		Concentration		Concentration	Rate
	μg	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
Acetone	0.74	7.35	12.6	9.68	10.6	0.19
Benzene	0.071	0.70	1.20	0.93	1.02	0.018
Bromodichloromethane	0.077	0.76	1.31	1.01	1.11	0.019
Bromoform	< 0.042	<0.42	<0.71	<0.55	<0.60	<0.011
Bromomethane	<0.045	< 0.45	<0.76	<0.59	<0.65	< 0.011
1,3-Butadiene	<0.075	< 0.74	<1.27	<0.98	<1.08	<0.019
2-Butanone	< 0.11	<1.07	<1.83	<1.41	<1.55	<0.027
Carbon Tetrachloride	<0.048	< 0.48	< 0.81	< 0.63	<0.69	< 0.012
Chlorobenzene	< 0.033	<0.33	<0.56	< 0.43	<0.47	<0.0083
Chloroform	0.082	0.81	1.39	1.07	1.18	0.021
Cumene (Isopropylbenzene)	<0.075	< 0.74	<1.27	<0.98	<1.08	< 0.019
Dibromochloromethane	0.034	0.34	0.57	0.44	0.49	0.0085
Dichlorodifluoromethane	<0.070	<0.70	<1.19	< 0.92	<1.00	<0.018
1,2-Dichloroethane	< 0.021	<0.21	< 0.36	<0.27	< 0.30	< 0.0053
trans,1,2-Dichloroethene	< 0.030	< 0.30	<0.51	< 0.39	< 0.43	< 0.0075
1,1-Dichloroethene	<0.033	< 0.33	<0.56	< 0.43	<0.47	< 0.0083
1,2-Dichloropropane	< 0.033	< 0.33	<0.56	< 0.43	<0.47	<0.0083
Ethylbenzene	<0.050	<0.50	<0.85	<0.65	<0.72	< 0.013
Ethylene Dibromide	<0.030	<0.30	<0.51	< 0.39	< 0.43	<0.0075
Mesitylene (1,3,5-Trimethylbenzene)	<0.075	< 0.74	<1.27	<0.98	<1.08	< 0.019
Methylene Chloride	< 0.065	< 0.65	<1.10	<0.85	<0.93	< 0.016
Styrene	<0.038	<0.38	< 0.65	<0.50	<0.55	<0.0095
Tetrachloroethene	0.12	1.21	2.07	1.60	1.75	0.031
Toluene	0.37	3.67	6.28	4.84	5.31	0.093
1,1,1-Trichloroethane	<0.042	<0.42	< 0.71	<0.55	< 0.60	< 0.011
Trichloroethene	< 0.033	<0.33	<0.56	< 0.43	< 0.47	<0.0083
1,1,2-Trichloroethane	<0.048	< 0.48	< 0.81	< 0.63	< 0.69	< 0.012
Trichlorotrifluoroethane	<0.075	<0.74	<1.27	<0.98	<1.08	< 0.019
Trichlorofluoromethane	<0.030	<0.30	<0.51	<0.39	<0.43	<0.0075
M&P-Xylene	<0.056	<0.56	<0.95	<0.73	<0.80	< 0.014
O-Xylene	<0.045	<0.45	<0.76	<0.59	<0.65	<0.011
Vinyl Chloride	<0.039	<0.39	<0.66	<0.51	<0.56	<0.0098
Total	<2.73	<27.2	<46.4	<35.8	<39.3	<0.69

Dry Gas Volume Sampled (Rm ³ *):	0.0589
Actual Flowrate (m³/s) :	25.3
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**) :	19.2
Wet Reference Flowrate (Rm³/s*):	17.5

^{*} 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	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
	Collected	Concentration	Concentration		Concentration	Rate
	μg	μg/m³	μg/Rm³*	μg/Rm ³ **	μg/Rm³*	mg/s
Acetone	0.25	2.38	4.09	3.13	3.41	0.061
Benzene	0.10	0.96	1.65	1.26	1.37	0.025
Bromodichloromethane	0.075	0.71	1.23	0.94	1.02	0.018
Bromoform	<0.042	<0.40	<0.69	<0.53	<0.57	<0.010
Bromomethane	<0.045	<0.43	<0.74	<0.56	<0.61	< 0.011
1,3-Butadiene	<0.075	<0.71	<1.23	<0.94	<1.02	<0.018
2-Butanone	<0.11	<1.03	<1.77	<1.35	<1.47	<0.027
Carbon Tetrachloride	<0.048	<0.46	<0.79	<0.60	<0.66	< 0.012
Chlorobenzene	<0.033	<0.31	<0.54	< 0.41	< 0.45	<0.0081
Chloroform	0.082	0.78	1.34	1.03	1.12	0.020
Cumene (Isopropylbenzene)	<0.075	<0.71	<1.23	< 0.94	<1.02	<0.018
Dibromochloromethane	0.032	0.31	0.53	0.40	0.44	0.0079
Dichlorodifluoromethane	<0.076	<0.72	<1.24	<0.95	<1.04	< 0.019
1,2-Dichloroethane	< 0.021	<0.20	< 0.34	<0.26	<0.29	<0.0052
trans,1,2-Dichloroethene	< 0.030	<0.29	<0.49	<0.38	< 0.41	< 0.0074
1,1-Dichloroethene	< 0.033	< 0.31	<0.54	< 0.41	< 0.45	< 0.0081
1,2-Dichloropropane	< 0.033	< 0.31	<0.54	< 0.41	<0.45	<0.0081
Ethylbenzene	< 0.042	< 0.40	<0.69	<0.53	<0.57	<0.010
Ethylene Dibromide	< 0.030	<0.29	< 0.49	<0.38	< 0.41	< 0.0074
Mesitylene (1,3,5-Trimethylbenzene)	<0.075	<0.71	<1.23	<0.94	<1.02	<0.018
Methylene Chloride	< 0.064	<0.61	<1.05	<0.80	<0.87	<0.016
Styrene	< 0.036	< 0.34	<0.59	<0.45	< 0.49	<0.0088
Tetrachloroethene	< 0.054	<0.51	<0.88	<0.68	<0.74	< 0.013
Toluene	0.10	0.98	1.69	1.29	1.41	0.025
1,1,1-Trichloroethane	< 0.042	<0.40	<0.69	< 0.53	<0.57	< 0.010
Trichloroethene	< 0.033	<0.31	<0.54	< 0.41	<0.45	<0.0081
1,1,2-Trichloroethane	<0.048	<0.46	<0.79	< 0.60	<0.66	< 0.012
Trichlorotrifluoroethane	<0.075	<0.71	<1.23	<0.94	<1.02	<0.018
Trichlorofluoromethane	< 0.030	<0.29	< 0.49	<0.38	<0.41	< 0.0074
M&P-Xylene	<0.045	<0.43	<0.74	<0.56	<0.61	<0.011
O-Xylene	<0.045	<0.43	<0.74	<0.56	<0.61	<0.011
Vinyl Chloride	<0.039	<0.37	<0.64	<0.49	<0.53	<0.0096
Total	<1.92	<18.3	<31.4	<24.1	<26.2	<0.47

Dry Gas Volume Sampled (Rm ³ *):	0.0611
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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 87

Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet

Volatile Organic Emission Data

Test No. 3

Compound	Total Collected	Actual	Dry Reference Concentration		Wet Reference	Emission Rate
	conected					
	μg	μg/m³	μg/Rm³*	μg/Rm³**	μg/Rm³*	mg/s
					2.52	
Acetone	0.17	1.76	3.03	2.32	2.52	0.045
Benzene	0.070	0.73	1.25	0.96	1.04	0.019
Bromodichloromethane	0.068	0.71	1.22	0.93	1.01	0.018
Bromoform	<0.042	<0.44	<0.75	<0.58	<0.63	<0.011
Bromomethane	<0.045	<0.47	<0.81	<0.62	<0.67	<0.012
1,3-Butadiene	<0.075	<0.78	<1.34	<1.03	<1.12	<0.020
2-Butanone	< 0.11	<1.12	<1.93	<1.48	<1.61	<0.029
Carbon Tetrachloride	<0.048	<0.50	<0.86	<0.66	<0.72	<0.013
Chlorobenzene	< 0.033	< 0.34	<0.59	<0.45	<0.49	<0.0089
Chloroform	0.076	0.79	1.36	1.04	1.13	0.020
Cumene (Isopropylbenzene)	<0.075	<0.78	<1.34	<1.03	<1.12	<0.020
Dibromochloromethane	< 0.031	<0.32	<0.55	<0.42	<0.46	<0.0083
Dichlorodifluoromethane	<0.060	<0.62	<1.07	<0.82	<0.90	<0.016
1,2-Dichloroethane	< 0.021	<0.22	<0.38	<0.29	<0.31	<0.0056
trans,1,2-Dichloroethene	<0.030	< 0.31	<0.54	< 0.41	<0.45	<0.0081
1,1-Dichloroethene	<0.033	< 0.34	<0.59	< 0.45	< 0.49	<0.0089
1,2-Dichloropropane	< 0.033	< 0.34	<0.59	<0.45	< 0.49	<0.0089
Ethylbenzene	< 0.042	< 0.44	<0.75	<0.58	< 0.63	< 0.011
Ethylene Dibromide	< 0.030	< 0.31	<0.54	< 0.41	<0.45	<0.0081
Mesitylene (1,3,5-Trimethylbenzene)	< 0.075	<0.78	<1.34	<1.03	<1.12	<0.020
Methylene Chloride	< 0.057	< 0.59	<1.02	<0.78	< 0.85	< 0.015
Styrene	< 0.036	< 0.37	< 0.64	< 0.49	<0.54	<0.0097
Tetrachloroethene	< 0.062	< 0.65	<1.11	<0.85	< 0.93	< 0.017
Toluene	0.080	0.83	1.43	1.10	1.19	0.021
1,1,1-Trichloroethane	< 0.042	< 0.44	<0.75	<0.58	< 0.63	< 0.011
Trichloroethene	< 0.033	< 0.34	< 0.59	< 0.45	< 0.49	<0.0089
1,1,2-Trichloroethane	<0.048	< 0.50	<0.86	< 0.66	< 0.72	< 0.013
Trichlorotrifluoroethane	<0.075	<0.78	<1.34	<1.03	<1.12	<0.020
Trichlorofluoromethane	< 0.030	<0.31	<0.54	< 0.41	< 0.45	<0.0081
M&P-Xylene	< 0.045	<0.47	< 0.81	< 0.62	<0.67	< 0.012
O-Xylene	<0.045	<0.47	<0.81	< 0.62	< 0.67	< 0.012
Vinyl Chloride	<0.039	<0.41	<0.70	<0.53	<0.58	<0.010
Total	<1.76	<18.3	<31.4	<24.1	<26.2	<0.47

Dry Gas Volume Sampled (Rm³*) :	0.0558
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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 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/m³	μg/m³	μg/m³	μg/m³		
Acetone	7.35	2.38	1.76	3.83		
Benzene	0.70	0.96	0.73	0.80		
Bromodichloromethane	0.76	0.71	0.71	0.73		
Bromoform	< 0.42	<0.40	<0.44	< 0.42		
Bromomethane	<0.45	< 0.43	<0.47	< 0.45		
1,3-Butadiene	< 0.74	<0.71	<0.78	<0.75		
2-Butanone	<1.07	<1.03	<1.12	<1.08		
Carbon Tetrachloride	<0.48	<0.46	<0.50	<0.48		
Chlorobenzene	<0.33	<0.31	< 0.34	<0.33		
Chloroform	0.81	0.78	0.79	0.80		
Cumene (Isopropylbenzene)	< 0.74	<0.71	<0.78	<0.75		
Dibromochloromethane	0.34	0.31	< 0.32	< 0.32		
Dichlorodifluoromethane	<0.70	<0.72	<0.62	< 0.68		
1,2-Dichloroethane	<0.21	<0.20	<0.22	<0.21		
trans,1,2-Dichloroethene	<0.30	<0.29	<0.31	< 0.30		
1,1-Dichloroethene	<0.33	< 0.31	< 0.34	< 0.33		
1,2-Dichloropropane	<0.33	< 0.31	< 0.34	< 0.33		
Ethylbenzene	< 0.50	<0.40	< 0.44	< 0.44		
Ethylene Dibromide	< 0.30	<0.29	< 0.31	< 0.30		
Mesitylene (1,3,5-Trimethylbenzene)	< 0.74	<0.71	<0.78	< 0.75		
Methylene Chloride	<0.65	<0.61	<0.59	<0.62		
Styrene	<0.38	< 0.34	<0.37	< 0.36		
Tetrachloroethene	1.21	<0.51	< 0.65	<0.79		
Toluene	3.67	0.98	0.83	1.83		
1,1,1-Trichloroethane	< 0.42	< 0.40	< 0.44	< 0.42		
Trichloroethene	<0.33	< 0.31	< 0.34	<0.33		
1,1,2-Trichloroethane	<0.48	< 0.46	<0.50	< 0.48		
Trichlorotrifluoroethane	<0.74	<0.71	<0.78	<0.75		
Trichlorofluoromethane	< 0.30	<0.29	<0.31	<0.30		
M&P-Xylene	<0.56	< 0.43	< 0.47	<0.48		
O-Xylene	<0.45	<0.43	<0.47	<0.45		
Vinyl Chloride	<0.39	<0.37	<0.41	<0.39		
Total	<27.2	<18.3	<18.3	<21.2		

TABLE 89

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Volatile Organic Dry Reference Concentrations

Compound	100 mm	Dry Referenc	e Concentration	
	Test No. 1	Test No. 2	Test No. 3	Average
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*
Acetone	12.6	4.09	3.03	6.56
Benzene	1.20	1.65	1.25	1.37
Bromodichloromethane	1.31	1.23	1.22	1.25
Bromoform	<0.71	<0.69	<0.75	<0.72
Bromomethane	<0.76	<0.74	<0.81	<0.77
1,3-Butadiene	<1.27	<1.23	<1.34	<1.28
2-Butanone	<1.83	<1.77	<1.93	<1.85
Carbon Tetrachloride	<0.81	<0.79	<0.86	<0.82
Chlorobenzene	<0.56	<0.54	<0.59	<0.56
Chloroform	1.39	1.34	1.36	1.37
Cumene (Isopropylbenzene)	<1.27	<1.23	<1.34	<1.28
Dibromochloromethane	0.57	0.53	<0.55	<0.55
Dichlorodifluoromethane	<1.19	<1.24	<1.07	<1.17
1,2-Dichloroethane	<0.36	< 0.34	<0.38	< 0.36
trans,1,2-Dichloroethene	<0.51	< 0.49	<0.54	<0.51
1,1-Dichloroethene	<0.56	<0.54	<0.59	<0.56
1,2-Dichloropropane	<0.56	<0.54	< 0.59	<0.56
Ethylbenzene	<0.85	<0.69	<0.75	< 0.76
Ethylene Dibromide	<0.51	< 0.49	<0.54	<0.51
Mesitylene (1,3,5-Trimethylbenzene)	<1.27	<1.23	<1.34	<1.28
Methylene Chloride	<1.10	<1.05	<1.02	<1.06
Styrene	< 0.65	<0.59	< 0.64	< 0.63
Tetrachloroethene	2.07	<0.88	<1.11	<1.36
Toluene	6.28	1.69	1.43	3.13
1,1,1-Trichloroethane	<0.71	< 0.69	<0.75	< 0.72
Trichloroethene	<0.56	<0.54	<0.59	<0.56
1,1,2-Trichloroethane	<0.81	<0.79	<0.86	<0.82
Trichlorotrifluoroethane	<1.27	<1.23	<1.34	<1.28
Trichlorofluoromethane	<0.51	<0.49	<0.54	<0.51
M&P-Xylene	<0.95	<0.74	<0.81	<0.83
O-Xylene	<0.76	<0.74	<0.81	<0.77
Vinyl Chloride	<0.66	<0.64	<0.70	<0.67
Total	<46.4	<31.4	<31.4	<36.4

^{*} 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/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*		
Acetone	9.68	3.13	2.32	5.04		
Benzene	0.93	1.26	0.96	1.05		
Bromodichloromethane	1.01	0.94	0.93	0.96		
Bromoform	<0.55	<0.53	<0.58	<0.55		
Bromomethane	< 0.59	<0.56	<0.62	< 0.59		
1,3-Butadiene	<0.98	<0.94	<1.03	<0.98		
2-Butanone	<1.41	<1.35	<1.48	<1.42		
Carbon Tetrachloride	< 0.63	<0.60	<0.66	< 0.63		
Chlorobenzene	< 0.43	< 0.41	<0.45	< 0.43		
Chloroform	1.07	1.03	1.04	1.05		
Cumene (Isopropylbenzene)	<0.98	< 0.94	<1.03	<0.98		
Dibromochloromethane	0.44	0.40	< 0.42	< 0.42		
Dichlorodifluoromethane	< 0.92	< 0.95	<0.82	< 0.90		
1,2-Dichloroethane	<0.27	<0.26	<0.29	<0.28		
trans,1,2-Dichloroethene	< 0.39	<0.38	< 0.41	< 0.39		
1,1-Dichloroethene	< 0.43	< 0.41	< 0.45	< 0.43		
1,2-Dichloropropane	< 0.43	< 0.41	<0.45	< 0.43		
Ethylbenzene	< 0.65	<0.53	<0.58	<0.59		
Ethylene Dibromide	<0.39	<0.38	< 0.41	< 0.39		
Mesitylene (1,3,5-Trimethylbenzene)	<0.98	<0.94	<1.03	<0.98		
Methylene Chloride	<0.85	<0.80	<0.78	<0.81		
Styrene	<0.50	< 0.45	< 0.49	< 0.48		
Tetrachloroethene	1.60	<0.68	<0.85	<1.04		
Toluene	4.84	1.29	1.10	2.41		
1,1,1-Trichloroethane	<0.55	<0.53	<0.58	< 0.55		
Trichloroethene	< 0.43	< 0.41	< 0.45	< 0.43		
1,1,2-Trichloroethane	<0.63	<0.60	<0.66	< 0.63		
Trichlorotrifluoroethane	<0.98	< 0.94	<1.03	< 0.98		
Trichlorofluoromethane	< 0.39	<0.38	< 0.41	< 0.39		
M&P-Xylene	< 0.73	<0.56	< 0.62	< 0.64		
O-Xylene	< 0.59	<0.56	< 0.62	< 0.59		
Vinyl Chloride	<0.51	<0.49	<0.53	<0.51		
Total	<35.8	<24.1	<24.1	<28.0		

^{*} 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 Referen	ce Concentration	AAA (SO) ja ja ja ja marka ka k
	Test No. 1	Test No. 2	Test No. 3	Average
	μg/Rm³*	μg/Rm³*	μg/Rm³*	μg/Rm³*
Acetone	10.6	3.41	2.52	5.52
Benzene	1.02	1.37	1.04	1.14
Bromodichloromethane	1.11	1.02	1.01	1.05
Bromoform	<0.60	<0.57	<0.63	<0.60
Bromomethane	<0.65	<0.61	< 0.67	< 0.64
1,3-Butadiene	<1.08	<1.02	<1.12	<1.07
2-Butanone	<1.55	<1.47	<1.61	<1.55
Carbon Tetrachloride	< 0.69	<0.66	< 0.72	< 0.69
Chlorobenzene	<0.47	<0.45	< 0.49	<0.47
Chloroform	1.18	1.12	1.13	1.14
Cumene (Isopropylbenzene)	<1.08	<1.02	<1.12	<1.07
Dibromochloromethane	0.49	0.44	< 0.46	<0.46
Dichlorodifluoromethane	<1.00	<1.04	<0.90	<0.98
1,2-Dichloroethane	<0.30	< 0.29	<0.31	<0.30
trans,1,2-Dichloroethene	< 0.43	< 0.41	< 0.45	< 0.43
1,1-Dichloroethene	< 0.47	< 0.45	< 0.49	< 0.47
1,2-Dichloropropane	< 0.47	< 0.45	< 0.49	<0.47
Ethylbenzene	<0.72	<0.57	<0.63	<0.64
Ethylene Dibromide	< 0.43	< 0.41	<0.45	< 0.43
Mesitylene (1,3,5-Trimethylbenzene)	<1.08	<1.02	<1.12	<1.07
Methylene Chloride	<0.93	< 0.87	<0.85	<0.89
Styrene	<0.55	< 0.49	<0.54	<0.52
Tetrachloroethene	1.75	< 0.74	< 0.93	<1.14
Toluene	5.31	1.41	1.19	2.64
1,1,1-Trichloroethane	<0.60	<0.57	< 0.63	<0.60
Trichloroethene	< 0.47	< 0.45	< 0.49	<0.47
1,1,2-Trichloroethane	< 0.69	<0.66	<0.72	< 0.69
Trichlorotrifluoroethane	<1.08	<1.02	<1.12	<1.07
Trichlorofluoromethane	< 0.43	< 0.41	< 0.45	< 0.43
M&P-Xylene	<0.80	< 0.61	<0.67	<0.70
O-Xylene	< 0.65	< 0.61	<0.67	<0.64
Vinyl Chloride	<0.56	<0.53	<0.58	<0.56
Total	<39.3	<26.2	<26.2	<30.6

^{*} 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 Test No. 2		Test No. 3	Average		
	mg/s	mg/s	mg/s	mg/s		
Acetone	0.19	0.061	0.045	0.098		
Benzene	0.018	0.025	0.019	0.020		
Bromodichloromethane	0.019	0.018	0.018	0.019		
Bromoform	<0.011	<0.010	<0.011	<0.011		
Bromomethane	<0.011	<0.011	<0.012	< 0.011		
1,3-Butadiene	<0.019	<0.018	<0.020	< 0.019		
2-Butanone	<0.027	<0.027	<0.029	<0.028		
Carbon Tetrachloride	<0.012	<0.012	<0.013	< 0.012		
Chlorobenzene	<0.0083	<0.0081	<0.0089	<0.0084		
Chloroform	0.021	0.020	0.020	0.020		
Cumene (Isopropylbenzene)	< 0.019	<0.018	<0.020	<0.019		
Dibromochloromethane	0.0085	0.0079	<0.0083	< 0.0082		
Dichlorodifluoromethane	< 0.018	< 0.019	< 0.016	< 0.017		
1,2-Dichloroethane	<0.0053	<0.0052	<0.0056	< 0.0054		
trans,1,2-Dichloroethene	<0.0075	< 0.0074	<0.0081	< 0.0077		
1,1-Dichloroethene	<0.0083	<0.0081	<0.0089	<0.0084		
1,2-Dichloropropane	<0.0083	<0.0081	<0.0089	<0.0084		
Ethylbenzene	< 0.013	< 0.010	<0.011	< 0.011		
Ethylene Dibromide	<0.0075	< 0.0074	<0.0081	<0.0077		
Mesitylene (1,3,5-Trimethylbenzene)	< 0.019	<0.018	<0.020	< 0.019		
Methylene Chloride	< 0.016	< 0.016	<0.015	<0.016		
Styrene	<0.0095	<0.0088	<0.0097	<0.0094		
Tetrachloroethene	0.031	<0.013	< 0.017	<0.020		
Toluene	0.093	0.025	0.021	0.047		
1,1,1-Trichloroethane	< 0.011	<0.010	< 0.011	<0.011		
Trichloroethene	<0.0083	<0.0081	<0.0089	<0.0084		
1,1,2-Trichloroethane	<0.012	<0.012	<0.013	<0.012		
Trichlorotrifluoroethane	<0.019	<0.018	<0.020	< 0.019		
Trichlorofluoromethane	<0.0075	< 0.0074	<0.0081	<0.0077		
M&P-Xylene	< 0.014	<0.011	<0.012	<0.012		
O-Xylene	<0.011	<0.011	<0.012	<0.011		
Vinyl Chloride	<0.0098	<0.0096	<0.010	<0.010		
Total	<0.69	<0.47	<0.47	<0.54		

TABLE 93

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet

Summary of Volatile Organic Emission Data

Compound	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	μg/m³	μg/Rm³*	μg/Rm³*	μg/Rm³*	mg/s

Acetone	3.83	6.56	5.04	5.52	0.098
Benzene	0.80	1.37	1.05	1.14	0.020
Bromodichloromethane	0.73	1.25	0.96	1.05	0.019
Bromoform	< 0.42	<0.72	<0.55	<0.60	<0.011
Bromomethane	< 0.45	<0.77	<0.59	< 0.64	< 0.011
1,3-Butadiene	<0.75	<1.28	<0.98	<1.07	< 0.019
2-Butanone	<1.08	<1.85	<1.42	<1.55	<0.028
Carbon Tetrachloride	<0.48	<0.82	<0.63	< 0.69	< 0.012
Chlorobenzene	<0.33	<0.56	< 0.43	<0.47	<0.0084
Chloroform	0.80	1.37	1.05	1.14	0.020
Cumene (Isopropylbenzene)	<0.75	<1.28	<0.98	<1.07	< 0.019
Dibromochloromethane	<0.32	<0.55	< 0.42	<0.46	<0.0082
Dichlorodifluoromethane	<0.68	<1.17	<0.90	<0.98	< 0.017
1,2-Dichloroethane	<0.21	<0.36	<0.28	<0.30	<0.0054
trans,1,2-Dichloroethene	<0.30	< 0.51	< 0.39	<0.43	<0.0077
1,1-Dichloroethene	<0.33	<0.56	<0.43	<0.47	<0.0084
1,2-Dichloropropane	< 0.33	<0.56	< 0.43	< 0.47	<0.0084
Ethylbenzene	< 0.44	<0.76	< 0.59	< 0.64	< 0.011
Ethylene Dibromide	< 0.30	<0.51	< 0.39	< 0.43	<0.0077
Mesitylene (1,3,5-Trimethylbenzene)	<0.75	<1.28	<0.98	<1.07	< 0.019
Methylene Chloride	< 0.62	<1.06	<0.81	<0.89	< 0.016
Styrene	< 0.36	< 0.63	<0.48	< 0.52	< 0.0094
Tetrachloroethene	<0.79	<1.36	<1.04	<1.14	<0.020
Toluene	1.83	3.13	2.41	2.64	0.047
1,1,1-Trichloroethane	< 0.42	<0.72	<0.55	< 0.60	< 0.011
Trichloroethene	<0.33	<0.56	< 0.43	< 0.47	< 0.0084
1,1,2-Trichloroethane	<0.48	<0.82	<0.63	< 0.69	< 0.012
Trichlorotrifluoroethane	<0.75	<1.28	<0.98	<1.07	< 0.019
Trichlorofluoromethane	<0.30	<0.51	<0.39	<0.43	<0.0077
M&P-Xylene	<0.48	<0.83	<0.64	<0.70	<0.012
O-Xylene	<0.45	<0.77	<0.59	<0.64	<0.011
Vinyl Chloride	<0.39	<0.67	<0.51	<0.56	<0.010
Total	<21.2	<36.4	<28.0	<30.6	<0.54

^{*} 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	Field Blank	Field Blank	Trip Blank	Method
	Tube 10A/10B	Tube 15A/15B	Tube 21A/21B	Tube 30A/30B	Blank
	μg	μg	μg	μg	μg
Acetone	<0.045	<0.045	<0.045	<0.045	< 0.045
Benzene	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090
Bromodichloromethane	< 0.011	< 0.011	<0.011	<0.011	< 0.011
Bromoform	<0.014	< 0.014	< 0.014	< 0.014	< 0.014
Bromomethane	<0.015	<0.015	< 0.015	< 0.015	< 0.015
1,3-Butadiene	<0.025	< 0.025	<0.025	< 0.025	<0.025
2-Butanone	<0.036	< 0.036	<0.036	< 0.036	< 0.036
Carbon Tetrachloride	<0.016	<0.016	<0.016	< 0.016	< 0.016
Chlorobenzene	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Chloroform	< 0.011	< 0.011	<0.011	< 0.011	<0.011
Cumene (Isopropylbenzene)	<0.025	<0.025	<0.025	<0.025	<0.025
Dibromochloromethane	<0.0090	<0.0090	< 0.0090	<0.0090	<0.0090
Dichlorodifluoromethane	<0.020	<0.020	<0.020	<0.020	<0.020
1,2-Dichloroethane	< 0.0070	<0.0070	<0.0070	<0.0070	< 0.0070
trans, 1, 2-Dichloroethene	< 0.010	<0.010	< 0.010	<0.010	< 0.010
1,1-Dichloroethene	<0.011	<0.011	< 0.011	<0.011	< 0.011
1,2-Dichloropropane	<0.011	< 0.011	< 0.011	<0.011	< 0.011
Ethylbenzene	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014
Ethylene Dibromide	<0.010	< 0.010	< 0.010	< 0.010	< 0.010
Mesitylene (1,3,5-Trimethylbenzene)	<0.025	<0.025	<0.025	<0.025	<0.025
Methylene Chloride	<0.019	< 0.019	< 0.019	< 0.019	< 0.019
Styrene	<0.012	< 0.012	<0.012	< 0.012	< 0.012
Tetrachloroethene	<0.018	< 0.018	<0.018	<0.018	< 0.018
Toluene	<0.014	<0.014	< 0.014	<0.014	< 0.014
1,1,1-Trichloroethane	< 0.014	< 0.014	< 0.014	<0.014	< 0.014
Trichloroethene	< 0.011	<0.011	<0.011	<0.011	< 0.011
1,1,2-Trichloroethane	< 0.016	<0.016	< 0.016	< 0.016	< 0.016
Trichlorotrifluoroethane	<0.025	<0.025	<0.025	<0.025	<0.025
Trichlorofluoromethane	<0.010	<0.010	< 0.010	<0.010	<0.010
M&P-Xylene	<0.015	<0.015	<0.015	<0.015	< 0.015
O-Xylene	<0.015	< 0.015	< 0.015	<0.015	< 0.015
Vinyl Chloride	<0.013	<0.013	<0.013	<0.013	<0.013
Total	<0.52	<0.52	<0.52	<0.52	<0.52

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit).

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



APPENDIX 3

Particulate and Metals Field Data Sheets (30 pages)

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particulate/Metals
Test Date	M/QW 2 2010
Test Location	APC Outlet No
Operator Signature	

IEHN

Impinger Box No.:

Meter Box No.:

Probe No.:

Project No.:

Pitot Factor	灵		No.
DGMCF	236		
Barometric Pressure	てかられ	"Hg	
Static Pressure	-9.3	"H20	
Nozzle Size	12539	inches	À
Stack Diameter	とナ	feet	
Length	0	feet	
Width	0	feet	
Port length:		inches	

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Reading Interval Number of Ports Number of Points/Port		2.5	2	12
		Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass / Metal / Teflon / Other_

None / Metal / Mellon / Other_ Union

Glass / Metal / Other

Nozzle

Pitot Leak Checked? (Yes)

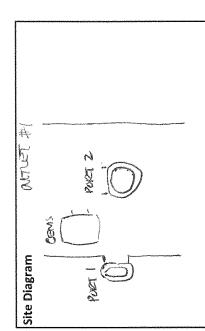
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	2	
Particulate Gain	Filter	Probe

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Probe	Ñ	mg
Moisture Gain		-
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WCBDA	1.4	හා

Barometer

Calipers

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~ ~	Carbon Dioxide	5.7	%
	Carbon Monoxide	16,2	mdd



	Measuring Device	MII Numbers
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	Comb.Gas.Analyzer	
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Time	Point	Clock	Meter	ΔР	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	net	Pressure	Vacuum
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Rev: April 28, 2005

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Rev. November 27, 2014

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Rev: April 28, 2005

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Project No.: Operator :

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120, 574	***************	Time	m	"H20	cfm	Ľ.	Ļ	<u>u</u>	<u>u</u>	Ľ,	<u>L</u>	;	I Š	"Hg Gauge
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Rev: April 28, 2005

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Deart Location Counties Ontain Stack Probe Counting Impliged Temp Mater Temp Ma	Date: 0K//		Plant:	Covanta DYEC	WEC			Test No.:	<u></u>	Particulate/Metals	Metals		Page 4	of 5
Clock Weeker Project			Plant Location:	Courtice, O	Intario		4	Test Locatio		APC Outlet N	10.			1 1
Clock Profess Plot Gas Flot of Gas Profess		*	***	*		*			*		*	*	*	*
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Time	Point	Clock	Meter	ΔР	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	met	Pressure	Vacuum
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17.5	m	15	34.98	89	149	237	248	222	ታ	326	83	28	<u>ه</u> :	8,5
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27.5 (746.36 .80 .48 .340 .248 .356 .49 .347 .818 .83 .341 .348 .348 .348 .348 .348 .348 .348 .348	2	22.5		ō.	80	288	K	286	4	54	Š	178	2.1	0 T
176. 36		25	のえる	08.	H.	2007	で名	R	F	Z	あ	8	1.10	ر ج
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37.5 184. 36 .75 .74 293 2.48 35.7 57 2.40 84 83 1.45 40 18b.05 .44 .16 .293 2.48 .25 51 .234 84 83 1.46 42.5 184.05 .45 .72 .292 .248 .256 .51 .237 .84 .83 1.46 47.5 193.04 .47 .291 .248 .254 .51 .239 .84 .83 1.47 50 193.14 .04 .41 .240 .248 .256 .50 .239 .84 .83 1.43 250 193.14 .04 .41 .240 .248 .256 .84 .83 1.43 250 193.14 .04 .24 .24 .259 .84 .83 1.43 250 193.16 .44 .240 .248 .256 .269 .84 .83 1.43 18.4 .44 .44 .44 .240 .248 .256		35	86.58	7	えん	5/4	5/2	X	67	给其	Ž	B	8-1	Ø: 5
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42.5 187.87 1.65 1.70 293 248 256 51 235 84 83 1.6 4 45 47.5 191.44 1.07 1.71 2.90 2.46 55 2.50 2.59 84 83 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7		40	1816.05	\bar{z}_{-}	. W?	293	248	X	5	える	癸	$\tilde{\omega}$	ō	500
45 \$\text{45} \ \$\text{40} \ \$\text{12} \ \$		42.5	七名:七8)	18	0,61	293	248	256	S	239	之	Q	٥	3.5
47.5 項 ・ 以 ・ 以 ・ 以 ・ 以 ・ 以 ・ 以 ・ 以 ・ 以 ・ 以 ・	7	45	59:183	8	1.35	292	3/7%	256	5	238	さ	2	<i>\</i>	SN
50 行る, 1억 1分 2억 2万 50 259 84 83 1. 子 20 254 84 83 1. 子 20 254 84 83 1. 子 20 254 84 85 1. 子 20 254 84 85 1. 子 20 254 85 1. 子 20 254 254 254 254 254 254 254 254 254 24 2	À	47.5	<u>5</u>	\$	Ŧ	162	マス	S	5	239	ž	X	Ć.	3.5
Initial Leak Check: 1005 ofm@ "Hg		20	193,19	ち ニ	亦	240	788	256	0.5	239	چ	8	Λ. :	2.5
Initial Leak Check: (4) cfm@ "Hg						Roses	AVAIGNE AL CANADA AND AND ALL CONTRACTOR AND A PARTY.			Constitution of the Consti			•	
Final Leak Check: —— cfm@ —— "Hg Project No.: Project No.: Operator:	Start Time:		Initial Leak Check:		cfm@									NEW COLUMN STATE OF THE STATE O
	Finish Time:		Final Leak Check:					operation of the statement of the statem	RATE OF THE PARTY		en e			AND THE RESIDENCE OF THE PROPERTY OF THE PROPE
							ing.				Project No.:	p)	21656	
				wite polyment was a supply for more than the supply of the	Name at 1900 party or a design registration and the property of the		Nadarakan darakan karangan kanan				Operator:		Ž	



3.5

Field Data Sheet

Gauge Vacuum bump 8.8 50 500 S 3,5 N (N) 0 3 55 10 (A) 100 Ŋ ਰੱ 21656 Pressure Meter Page 5 ΔH "H₂O 4 j (د > Inlet 8 S \otimes 8 \approx 00 Meter Temp Project No.: Operator: Outlet 义 高高 太 'n. 2 2. Particulate/Metals 20 成成 石 2 己 APC Outlet No. Inlet/Frap 23.0 330 T B 28 230 239 23 が変 £27 234 Impinger Temp る 783 Outlet 8 इ 李 ų. 9 3 4 3 9 Test Location: Test No.: 22 Temp 280 Oven R N 22 N 22 S 282 R B SS 2001 <u>|</u> Temp Probe 2 なら から 去 まる 28 哭 248 SS 248 器 24% il. 함 Hg B Temp 2228 Stack 888 888 285 288 183 Desired сŧ 8 8 8 13 È cfm@ cfm@ 哥 9 9 Ā F F Courtice, Ontario Covanta DYEC Pitot A P "H₂O 3 8 8 200 \$ 3 8 0 C 2 8 5 Initial Leak Check: Final Leak Check: 2000 のよう 203.97 から 25.80 のナド 26,817 スタグ 98,53 Dry Gas 260,38 285 KB Plant Location: 702.17 20.87 いいい Meter £3 Plant: Clock Time 52.5 57.5 62.5 67.5 72.5 77.5 82.5 87.5 65 72 Finish Time: | 《 : j 나 ry N 9 70 8 S 8 Traverse: NOCT Date: OS/OL/**()** Start Time: Point 2 9 00 ത 얼

Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particulate/Metals
Test Date	May 4 2016
Test Location	APC Outlet No.
Operator Signature	

Pitot Factor	7000	-
DGMCF	, 200 200 200 200	OME SHEET
Barometric Pressure	として	82
Static Pressure	12 . Z	"H20
Nozzle Size	, 2,531	inches
Stack Diameter	45	feet
Length	, L _{appe} depriorite .	feet
Width		feet
Port length:		inches

2.5	2	12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass / Metal /Teflon / Other

Glass / Metal / Other_ Nozzle

None / Metal / Teflon / Other_ Union

Pitot Leak Checked? (Yes)

	gm	Bu
	(d.)	
ate Gain	0	
Particulate Gain	Filter	Probe

Mil Numbers

Measuring Device

Probe / Pitot S2

8/25.0

1 of 5

1 cam

Impinger Box No.:

Meter Box No.:

Probe No.: Page

21656

Project No.:

45001 JOJ COE 20084 203762

300

Incline Manometer Comb.Gas.Analyzer

Control Box

Trendicator

FAC.

Barometer

Calipers

Micromanometer

Ţ	0.0y	mg
Probe	to O	mg
Moisture Gain	nici	
CWTR	9.70 7.70 7.70	8
WCBDA	ず	ρû

Oxygen	かけ	%
Carbon Dioxide	841	%
Carbon Monoxide	J.	mdd

, 2530
/*top
100

Site Diagram

Notes:

# * * * * * * * * * * * * * * * * * * *		## ### Dry Gas Meter ### Meter ### ### ### ### ### ### ###	Courtice, Ont A P Pitot A P P Pitot A P P P P P P P P P P P P P P P P P P	ario cfm cfm	* Stack Temp	Probe	Test Location:		APC Outlet No. *	*	k * * * Moter Temn	*	* Bumo
Clock Meter APP Desired Temp Time ft		* Dry Gas Meter ft³ \$85,76 \$1,37 \$1,24 \$2,10 \$75,10 \$75,10	* Pitot A P * * * * * * * * * * * * * * * * * *	Desired cfm cfm cfm st.	* Stack Temp	Probe	Oven		TON TOWN		Tomp.	*	* Pumb
Clock Meter AP Desired Temp Time ft ³ "H ₂ O cfm "F Time ft ³ "H ₂ O cfm "F T ₂ S ₃ 2.5 83.53 7.5 7.5 100.76 0.75 1.75 1.75 1.75 1.75 1.75 1.75 1.75 1]	85,76 81,37 81,37 81,37 91,14 93,17	Pitot A P P Pitot A P P P P P P P P P P P P P P P P P P	Desired cfm cfm + +++++++++++++++++++++++++++++	Stack Temp	Probe	Oven		Tomp		Tomn		Pump
Clock Meter AP Desired Temp Time ft ³ "H ₂ O cfm "F 2.5 \$\frac{87}{3}\text{.6} \tau \text{.77} \tau \text{.77} \tau \text{.88} \tau \text{.77}		85,76 81,37 81,37 91,14 95,10 97,04	PHOT D P - 1 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	Desired cfm cfm + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 +	Stack Temp	Prope	Oven			26.41		B. B. A. A.	
12.5 84.53 74. 16.7 28.8 17. 17. 18.8 25.5 84.53 74. 17. 18.8 24.2 10. 10. 10. 10. 10. 10. 10. 10. 10. 10.			"H." 24. 44. 44. 44. 44. 44. 44. 44. 44. 44.	इत्रम्	L&	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
2.5 83.53 7.7 7.7 288 388 30.55 84.53 7.7 7.5 7.1 2.88 2.5 84.53 7.7 7.5 7.1 2.92 2.5 81.54 7.5 7.5 7.5 2.0 2.0 47. 7.5 7.5 2.0 2.0 2.5 2.5 102, 60 4.4 7.5 7.5 2.0 2.5 2.5 103, 60 4.6 7.5 7.5 2.0 2.5 2.5 104, 44 7.6 7.5 2.5 2.5 104, 44 7.6 7.5 2.5 2.5 104, 44 7.6 7.5 2.5 2.5 104, 44 7.6 7.5 2.5 2.5 104, 44 7.6 7.5 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6 2.6			で かん かい さい さい こう	はなんなない			L	!	. #	Ľ.	ŗ.	¥	DO T
2.5 84.53 74. 14. 288 2.5 84.53 74. 14. 14. 29. 29. 29. 29. 29. 29. 29. 29. 29. 29			いたがず	44.44								.H20	Gauge
2.5 84.53			はおおれ	र र में स	288	252	2.53	2-8	6	30	83	53	3
5 88.37 . 35 . 37 . 242 10 93, 17 . 34 . 342 115 97, 64 . 37 . 34 . 243 115 97, 64 . 31 . 32 . 243 20 100, 60 . 42 . 42 . 242 215 104, 44 . 64 . 69 . 242 215 106, 18 . 64 . 69 . 240 325 106, 18 . 64 . 69 . 240 325 106, 18 . 64 . 69 . 240 325 106, 18 . 64 . 69 . 240 325 106, 18 . 64 . 69 . 240 325 106, 26 . 64 . 36 . 240 337.5 106, 26 . 68 . 31 . 241 340 115, 26 . 68 . 31 . 241			ジャ・チャ・	3,433	Burn	Ē	402	S	209	82	\$4	J.	3.5
7.5 91.24 , 74 , 12.2 10 93, 17 , 74 , 143			**;	东流	22.7	25.7°	852	55	0/2	85	84	Š	3.5
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Project No.: 21656 Operator: ORTECH Environmental

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		riant:	COVAINE UTEC	וניר			1631 180		רמו נורמומוב/ וו	Victors			-
	••	Plant Location:	Courtice, Ontario	ntario			Test Location:		APC Outlet No.	lo.		***************************************	
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Point	Clock	Meter	Δ	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
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cfm@ Initial Leak Check: Final Leak Check: 98,91 Traverse: Start Time: Finish Time:

21656

Project No.: Operator :

ORTECH Environmental

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21656

Operator:

ORTECH Environmental

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1	2002	Plant Location:	Courtice, Ontario	itario			Test Location:	n:	APC Outlet No.	10.			1
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60	09	200	g	+3	425	228	257	7.5	50	~ ×	A 8	1.53	es
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start lime:		initial Leak Check:		1	1								**************************************
Finish lime:	(0.8)	Final Leak Check:		cım@	E H			- Andrews - Andr			- Interestation of the second	HOT LIMBOURD DOWN PROPERTY OF THE PERSON OF	Pieteralianessocialistica establistica estab

21656 Project No.: Operator :

Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particulate/Metals
Test Date	9102 E NOW
Test Location	APÇ Öutlet No. 🔑
Operator Signature	e Amila Andra

2 PERSON FOR SOLUTION OF THE S

Probe No.:

Meter Box No.: Impinger Box No.:

Project No.:

Pitot Factor DGMCF Barometric Pressure Static Pressure Nozzle Size	984 98.65 "Hg -10.0 "H20
Stack Diameter Length	(中) teet (中)
Width	Ø feet
Port length:	(2) inches

ANTHER REPERDICTION OF THE PROPERTY OF THE PRO	2.5	2	12
COLUMN CONTROL	Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass / Metal /Teflon / Other

Union None/Metal / refloh / Other_

Glass / Metal / Other_

Nozzle

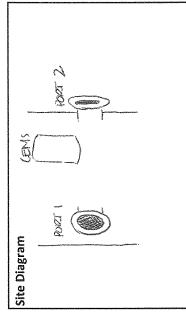
Pitot Leak Checked? (Yes)

2

	The second
	mg
Gain	8.07
Particulate	Filter

Probe	be I.B mg	
Moisture Gain		
CWTR	482.74	
WCBDA	6	

Combustion Gas Concentration	ncentration	
Oxygen	<i>J</i> .	%
Carbon Dioxide	まるの	%
Carbon Monoxide	でで	m d d



	MI Numbers
Probe / Pitot S2	603762
Trendicator $ \mathcal{C} $	OFFICIAL
Control Box 尼州小中(0,500,50
Incline Manometer	いたないら
Comb.Gas.Analyzer	
Micromanometer	szaknas irmnyaktó est paskaládzissettő külümn.
Barometer E	
Calipers	24~22/3L

Nozzle Measurements	1 0,2835	2 0,2545	3 0,25540	4 0,2535	age: 0,2539
	런	2	m	4	Average:

Rev. November 27, 2014

Notes:

Date: 07/	72/1v	Plant:	Covanta DYEC	YEC			Test No.:		Particulate/Metals	Metals	AND PROPERTY OF THE PROPERTY OF THE PARTY OF	Page 2	of 5
	+	Plant Location:	Courtice, Ontario	ntario		and the second s	Test Location:];	APC Outlet No.	10. Z			
	*	*	*		*			*		*	*	*	*
	nd and a second an	Dry Gas	Pitot		Stack	Probe	Oven	Imping	Impinger Temp	Mete	Meter Temp	Meter	Pump
Point	Clock	Meter	ΔЬ	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
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	Ŋ	£118	195	283	813	243	2 2 3	8	211	2	76	2,4	6.0
2	7.5	£2,58	8	283	182	23	25%	33	27	2	H	2.3	6.0
outer outer outer and the contract of the cont	10	25.52	9	28'	727	表	ただ	8	ナベ	36	Ł.	2.2	2.5
CARLOTTE CONTRACTOR CO	12.5		\$	28	482	去	220	36	728	4	Œ	1:7	SS
m	15	3,5	12.6	8	3	孟	Z	あ	87	A	东	2.1	5.5
	17.5	0 10	6	ō.	293	ま	とよく	75	70	4	8£	2.0	0.5
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4	22.5	68.39	2	44	293	まる	き	54	220	Ŧ	7	<u>0:</u>	2,0
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	cfm@ 🐚 "Hg	cfm@	re
	Initial Leak Check: 1004	Final Leak Check:	THE RESIDENCE OF THE PROPERTY
Traverse: POLT 2	Start Time: (8:43	Finish Time:	Approximation and the season is the season and the

Project No.: Operator :

21656 An

ORTECH Environmental

Sheet
Data
Tie.

Plant Location: Courties Oriento Courties Ori			<u>0</u>	County DVEC	VEC			Toct No.		Dartirulato/Allatale	Motole		0000	T.
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Time R ² "H ₂ O "H ₂	Point	Clock	Meter	A	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
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Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator : > △ △ A △ Field Data Sheet

- 1					100	Field Data Sheet	heet	-		-	kesiksebapida kaspina pelopia Gilanja papaanaka kelab		
Date: 07/(2815	Plant:	Covanta DYEC	YEC	***************************************		lest No.:		Particulate/Metals	Metals	ALD CANCEL STATE OF THE STATE O	Page 5	Of 5
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Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	${\mathcal Z}$ Particulate/Metals
Test Date	1/101 3,2016
Test Location	APC Outlet No. 2
Operator Signature	ire (Jinoila MaRan-

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Impinger Box No.:

Meter Box No.:

Probe No.: Page

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Project No.:

MII Numbers

Measuring Device

Probe / Pitot

Trendicator Control Box

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Pitot Factor	Z	
DGMCF	H&b'	neer manage
Barometric Pressure	29:53	"Hg
Static Pressure	0.0	"H20
Nozzle Size	, 2539 in	inches
Stack Diameter	いか	feet
Length	Ø	feet
Width	9	feet
Port length:		inches

2.5	2	12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass// Metal /Teflon / Other_

Site Diagram

Glass / Metal / Other_ Nozzle

None / Metal / Teffor / Other_ Union

Pitot Leak Checked? (Yes)

lter	8.03	mg
Probe	N	E

Moisture Gain	ain	
CWTR	ブ. OT.	90
WCBDA	T. 98	90

Incline Manometer Comb.Gas.Analyzer Micromanometer

Barometer

Calipers

Combustion Gas Concentration	oncentration	
Oxygen	77.2	%
Carbon Dioxide	02:	%
Carbon Monoxide	Q Q	mdd

Average:

Nozzle Measurements	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
Nozzle	2 2 3 4 4 4	A 10 10 10 10 10 10 10 10 10 10 10 10 10

Notes:

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												"H20	Gauge
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	'n	S ±	8	<u></u>	38	243	SS	29	020	K	78	1.7	5,0
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Rev: April 28, 2005

<u></u>	Field Data Sheet
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Date: /K//	KILL	Plant:	Covanta	DYEC	Market of the second se		Test No.:	<u> </u>	Particulate/Metals	Aetals		Page 3	5
		Plant Location:	Courtice, Ontario	ntario			Test Location:	::	APC Outlet No.	lo. 🗸	ene peneral de la companya del la companya de la co		1 1
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Project No.: Operator :

21656

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Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	3 Particulate/Metals
Test Date	2007 y 2016
Test Location	APC Outlet No. 2
Operator Signature	re Walla Molan

Pitot Factor DGMCF Barometric Pressure Static Pressure	X	
tric Pressure ressure	1 000	
	چۆ ئىرى	
	ゴチの	"Hg
	0.0	"H20
Nozzle Size	225	inches
Stack Diameter	いさ	feet
Length	O.	feet
Width	0	feet
Port length:		inches

2.5	2	12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner (Glass)/ Metal /Teflon / Other_

Glass/ Metal / Other_ Nozzle

None/Metal (Tellon / Other_ Union

Pitot Leak Checked? (Yes)

	mg) Bm
Jain	200	Ø:
Particulate Gain	Filter	Probe

MII Numbers

Measuring Device

Probe / Pitot ${\Bbb S}_{oldsymbol{arphi}}$

Trendicator

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Impinger Box No.:

Meter Box No.:

Probe No.: Page

Project No.:

Control BoxTenA4 (DE2009)

Incline Manometer (のも)のの

Comb. Gas. Analyzer Micromanometer

Barometer

Calipers

	¢.0	6.0
	ナー	62
e Gain	ブ: でブ	8
Moisture Gain	CWTR	WCBDA

Combustion Gas Concentration	oncentration	
Oxygen	30.00	%
Carbon Dioxide	11.13	%
Carbon Monoxide	R	mdd

1 1 2 3 4 4 Average:

SEL22080 てきるるの

Site Diagram		
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Notes:

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		Dry Gas	Pitot		Stack	Probe	Oven	Imping	Impinger Temp	Meter	Meter Temp	Meter	Pump
Point	Clock	Meter	ΔP	Desired	Temp	Temp	Lemp	Outlet	Inlet/Frap	Outlet	Inlet	Pressure	Vacuum
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			/ Project No.: 21656
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Traverse: Mar 2	Start Time: 나 도의	Finish Time:	

Rev: April 28, 2005

ORTECH Environmental

Operator:

ORTECH Environmental Rev: April 28, 2005

Sheet		
Data		
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Date: ON THE		Plant:	Covanta DYFC	VEC			Test No.:	2	Particulate/Metals	Aetals	ANTERNAL PROPERTY OF THE PROPE	Page 3	of 5
		Plant Location:	Courtice, Ontario	ıtario	TOWATSON COMPANY TO ANALYSIS OF THE CONTRACTOR O		Test Location:		APC Outlet No.	lo. 2			1 1
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		Dry Gas	Pitot		Stack	Probe	Oven	Imping	Impinger Temp	Meter	Meter Temp	Meter	Pump
Point	Clock	Meter	ΔD	Desired	Temp	Temp	Temp	Outlet	Inlet/Frap	Outlet	Inlet	Pressure	Vacuum
edone no casa azunonom	Time	£	"H20	£	<u>г</u>	ll.	L.	ŭ.	<u>11</u>	ņ	Li-	Δ H,	"Hg Gauge
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Finish Time:	10.29	Final Leak Check:	8	ctm@	BH		-	A THE STATE OF THE	A CONTRACTOR OF THE PROPERTY O			Menacenters	
							_			Project No.:	*	21656	
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Acceptance of the second secon		WHO IN THE PROPERTY OF THE PRO	A STATE OF THE STA										

Date: M. M.	W TIN	Plant:	Covanta	DYFC	AND THE PROPERTY OF THE PROPERTY AND THE	A STATE OF THE STA	Test No.:	2	Particulate/Metals	Aetals	The said to be a s	Page 4	5.
Marie and Marie	The second secon	Plant Location:		ntario	AND MATERIAL PROPERTY OF THE P	delegosseron conserventes and resistance in the service of the ser	Test Location:		APC Outlet No.	0. 2.	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE		1 1
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Ē	Clock	Meter ff ³	→ <u>F</u>	Desired	dwa.	e E T	e u	outlet #	met/ i-rap	ar ar	nlet °F	Pressure	Macuum.
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Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator :

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APPENDIX 4

Particle Size Distribution Field Data Sheets (12 pages)

Discription Countion Ontain Ontai	Decision Courtice, Ontario	Plant	Covanta DYEC	- April and April 200 and Apri					Project No.:	21656
Trendicator Control Box No: Teston Motosture Glass (Metal Tellon / Other Nord Metal Tellon / Other Nord Metal Tellon / Other Site Diagram Fig. 1 Particulate Gain Impinger Box No: Teston Motosture Gain Impinger Bo	Trendicator Combustion Gas of Port Control Box Nozie Meter Box Nozie Meter Box Nozie Gain Filter Milk Gain Feri Pressure Confusion Gas Concentration Gas Control Box Control B	Plant Location	Courtice, Ontario	antidarioramicolares (colored) antidarioramica (colored) antidariorami				Τ ο	age	of
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Galipers	Combustion Gas Concentration Gas Concentra	Length	feet				ρū		Micromanomete	
Combustion Gas Concentration Calipers CAM	Combustion Gas Concentration Calipers CAPA	Width	<i>Ö</i> feet						Barometer	ンまつ。うの
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Rev. November 27, 2014

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Rev: April 28, 2005

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Project No.:

Plant	-,	Covanta DYEC
Plant Location		Courtice, Ontario
Test No.:	2	Particule Size
Test Date		3 may 6
Test Location		APC Outlet No
Operator Signature	ure	

Pitot Factor	948.0	
DGMCF	586 0	
Barometric Pressure		"Hg
Static Pressure	\72)*	"H20
Nozzle Size	0.1713	inches
Stack Diameter	5 h	feet
Length	0	feet
Width	O.	feet
Port length:		inches

	2	25
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass (Metal /Teflon)/ Other_

Site Diagram

Glass / Metal / Other Nozzle

None/Metal | Teflon / Other Union

Pitot Leak Checked? (Yes)

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MII Numbers

Measuring Device

Probe / Pitot

Trendicator Control Box

TEAM

Meter Box No.:

Probe No.: Page

Impinger Box No.:

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Moisture Gain

CWTR	1.0V
WCBDA	7.7

Comb.Gas.Analyzer

Micromanometer

No. 1

Barometer

Calipers

Incline Manometer

Combustion Gas Concentration

ALL THE PROPERTY OF THE PROPER		-
Oxygen	70 .9	%
Carbon Dioxide	0	%
Carbon Monoxide	ブバ	mdd

Nozzle Measurements	Simos persons	Same Control of the same of th			
Z	(-1	' ~	m	4	Average:

Notes:

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Clock Neter Time ft³ 10.5 73.00 20.75 84.30 20.5 84.30 10.05 99.44 20.5 84.30 10.05 99.44 20.5 99.44 20.5 99.44 20.5 99.44 20.5 99.44 20.5 99.44 20.5 99.44		Temp 288 288 288 288 288 288 288 288 288 28	AL SOUNDER TA	Temp % % % % % % % % % % % % % % % % % % %		nlet/Trap	Outlet	Inlet	Drorelled	
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: 143 Final Leak Check:	cfm@		Finish Time:		E F	Final Leak Check:	neck: , O	-	cfm @ /	4. S"Hg
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Rev: April 28, 2005

Plant	Covanta DYEC	- Contract	AND THE PROPERTY OF THE PROPER				Project No.:	акоминичност	21656
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Test No.:	> Particule Size						Probe No.:	Market State Control of the St	namentalisen en e
Test Date	SOME IS				•		Meter Box No.:	12	- Takk
Test Location	APC Outlet No.						Impinger Box No.:	No.:	
Operator Signature							, en el mante de la companya del la companya de la		energenetrietenetrietenetrietenetrietenetrietenetrietenetrietenetrietenetrietenetrietenetrietenetrietenetriete
			***************************************				Measu	Measuring Device	MII Numbers
Pitot Factor	0.940			Particulate Gain					
DGMCF	6 95%			Filter		mg	Probe / Pitot	Pitot	ん変む
Barometric Pressure	20.02	"Hg		Probe		mg	Trendicator	ator	
Static Pressure	1.2.	"H20					Control Box	Вох	1381
Nozzle Size	0.50	inches	*	Moisture Gain			Incline	Incline Manometer	
Stack Diameter	ンナ	feet		CWTR	1.009	5.0	Comb.G	Comb.Gas.Analyzer	,
Length	0	feet		WCBDA	(J. Q	0.0	Microm	Micromanometer	
Width	9	feet					Barometer	iter	
Port length:		inches		Combustion Gas Concentration	Concentration		Calipers		
				Oxygen	CC \ _	%			
Reading Interval	dospołaty przedziała w wykonia przedziała w wykonia w wykonia w wykonia w wykonia w wykonia w wykonia w wykoni			Carbon Dioxide	78.1	%		Nozzle Measurements	urements
Number of Ports	2			Carbon Monoxide	le 23.8	mdd		NON NON	
Number of Points/Port	ort 12	***************************************		**************************************				198	7
	The Continue of the Continue o						m	nessess	
Probe Liner Glass /	Glass /(Metal /Teflon)/ Other_			Site Diagram			4	genera.	
				· · · · · · · · · · · · · · · · · · ·			Average:	::	
Nozzle Glass ∕/	Glass // Metal // Other	-							
,	The same of the sa			www.ata.co					
Union None	None/Metal/ Teflon / Other	_		de CONTRACTOR (ACCOUNTS)					
		- The state of the	***********	*Switz West			······································		
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Pitot Leak Checked?	Ves No						www.cewicz		
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Rev. November 27, 2014

se 2 of 2		*	Meter Pump	Pressure Vacuum	AH "Hg" "H ₂ O Gauge	\$ 3 ^t	50 <u>0</u> 0	50 W	<u>S</u>	1	18 18		N V	N. W.	る。	10-10-10-10-10-10-10-10-10-10-10-10-10-1	2 2	1 N					@ HR
S Page		*		Inlet Pre	ц.	128	7	W W	28	. 1 88	200		7.00	- - - - - - - - - -	25.0	2000	シジ	2 28					cfm @
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h	APC Outlet No.		Impinger Temp	Inlet/Trap	Ļ																		Initial Leak Check:
h		*	Imping	Outlet	÷.		2	Q	3		R		Con	18	V	N	175	K					
Test No.:	Test Location:		Oven	Temp	<u>L</u>	222	20.0	200	N	N N	-255		Sec.		N.	100	7.87	282					<u> </u>
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	histopionistana strongados (construction)	**************************************	Stack	Temp	<u>.</u>	2	R	000		38	286		000	100	12/2	186	28.7.	1200		STATE OF THE PROPERTY OF THE P			gH ~
	tario	Control of the Contro		Desired	cfm	35		-											>	· · · · · · · · · · · · · · · · · · ·			cfm@
Covanta DYEC	Courtice, Ontario	*	Pitot	۵۵	"H20	74	S	2	9	3	R				N.		Ś	K					Ď
lant:	Plant Location:	A A CONTRACTOR OF THE PROPERTY	Dry Gas	Meter	ft ³	12.43	. A.	ので	XX 52	18 9x	いている	36.00	18		ならなった。	ががある	21:11	4.6	12.72				Initial Leak Check:
2 20/6		*		Clock	Time	0	アクニ	15	21.0	18.0	2.0	S. CS					2.C	8.5	10.3				Ē
Date: MAY				Point			0	7	75	W	2		***		1 60	2	V	e				-	Iraverse: Start Time:

Rev: April 28, 2005

21656 1 of

Project No.:

CENTA

Meter Box No.:

Page Probe No.: Impinger Box No.:

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Particule Size
Test Date	Mg 2, 2016
Test Location	APC Outlet No.
Operator Signature	J. C. J. Sirver

Pitot Factor	9th 1	
DGMCF	からら	4
Barometric Pressure	たたらで	"Hg
Static Pressure	5	"H20
Nozzle Size	5(1)0	inches
Stack Diameter	54	feet
Length	0	feet
Width	0	feet
Port length:	Contract of the Contract of th	inches

Locatestanden	7	THE STATE OF THE S
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass (Metal /Teflon) Other____

Nozzle Glass // Metal / Other_

Union None(/Metal/Teflon / Other_

Pitot Leak Checked? / Yes

<u>°</u>

Particulate Gain	
<u>م</u>	L

mg	mg
	And the state of t
Filter	Probe

Moisture Gain

ρŷ	89
~	5
(52)	7
CWTR	WCBDA

Ŋ

Combustion Gas Concentration

Oxygen	S	%
Carbon Dioxide	2	%
Carbon Monoxide	0.C	mdd

Site Diagram

Ken 24

Measuring Device MII Numbers
Probe / Pitot ANDS COE 2000

Control Box
Incline Manometer COE 2003

Micromanometer COE 2003

Barometer COE 2003

Calipers CAN 22/26

Nozzle Measurements	0.1715	0.7.0	080	からら	Enland ?
Ž	H	2	l m	4	Average:

Notes:

Clock Plant Location: Courties, Order Temp	Date: MAY	11/10	Plant:	Covanta DYEC	္ဌ			Test No.:	Test No.: アイバン < ~ 5 VOC	SVOC	** Thinking the state of the st		Page 🦠	of S
Cock Neter Properties P	. 1	1		Courtice, Or	tario			Test Location	n:	APC Outlet I	1 11			
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Time R ⁴ "H,O dfm "F	Point	Clock	Meter	۵۵	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
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Page 1 Probe No. Probe Petro No.	Page 1 Page 1	Plant	Covanta DYEC	uzzkinysiaciestičikokiskakoniestokusepasiau	AND THE PROPERTY OF THE PROPER			rioject 140	OCOTY
Protein Size Protein Size Protein Size Protein Size	Proble No. Particule Size Proble No. Proble	Plant Location	Courtice, Ontario	-			,	Раде	ō
Mater Box No. Particulate Gain Probe Pitot Probe	Meter Box No. Control No.		Particule Size				leanonnus.	Probe No.:	
reston APC Outlet No. Z. Actor Combustion Gas Concentration Carbon Monokide (12, 2) ppm Site Diagram Average: Average: Originate Box No.: Impliger Box No.: Measuring Device Measuring Device Particulate Gain Filter Measuring Device Combusting Device Combusting Device Combustion Gas Concentration Combustion Gas Concentration Carbon Monokide (12, 2) ppm Site Diagram Site Diagram Average: Ave	Impliger Box No.: Impliger Box No.: Impliger Box No.: Inchestation APC Outlet No.						-	Meter Box No.:	Mr. Y
Average: Or Signature Or Sig	reformer Composition Gas Concentration Combosition of Potes Editer Combosition Gas Concentration Combosition Carbon Dioxide Carbon Monoxide Carbon Dioxide Carbon Dioxid	Test Location	APC Outlet No. 7	MANAGON CONTROL MANAGON PROPERTY CONTROL MANAG				mpinger Box No.:	7)
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Combission Composition Combission Co	Cowrre Cowrre Cowrre Combos C	Nozzle Size	l		Moisture Ga	Zus Para		Incline Manomet	er
### Site Diagram Combustion Gas Concentration	WCBDA	Stack Diameter	S S	et	CWTR	(N) 32		Comb.Gas.Analyz	er (1), (7)
Combustion Gas Concentration Galipers	Combustion Gas Concentration Galipers	Length	- Leave Leav	et	WCBDA	9:1	86	Micromanomete	
Combustion Gas Concentration Calipers	Combustion Gas Concentration Calipers	Width	O	et				Barometer	
g interval r of Ports	g interval r of Ports r of Points/Port r	Port length:	5.	es	Combustion	Gas Concentration		Calipers	
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r of Ports r of Points/Port r of Points/	r of Ports 2 Carbon Monoxide (2, 3) ppm 1 iner Glass (Metal /Teflon / Other Glass / Metal / Teflon / Other Nobe / Metal / Meta	Reading Interval			Carbon Diox	ide \\ \\Z	%	Nozzle M	easurements
iner Glass (Metal /Teflon / Other Glass / Metal / Teflon / Other None / Metal	iner Glass (Metal / Teflon / Other	Number of Ports	7		Carbon Mon	(.2	maa		
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Glass / Metal / Other	Glass / Metal / Other		(Metal /Teflon / Other	-	Site Diagram			**************************************	AASSTRIVANSPRINGŠĀNIKĀRIPSTĀNĀ ARĀDĀSĀNIPSTĒVĀSĀN
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Point Good Particle Particl	Plant Location: Courties, Ontario Stade Probe Over Implied Temp Nater T	Date:	1.00	D 3 n + ·	Covanta DYFC	J:			Test No.		NO SVOR	(m) (m)	A sections.	Page 7	Of O
Point Clock Water April Stack Probe Over Water Finish Probe Over Water Finish Probe Over Water Finish Probe Over Water Finish Fini	Point Clock Mere A P Desired Temp Tem			-	Courtice, On	itario		- Charles Concentration Contentration Conten	Test Location	3:	APC Outlet I	No.		0	
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Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	3 Particule Size
Test Date	MAY 2,2016
Test Location	APC Outlet No.
Operator Signature	ture () () () ()

Pitot Factor	7500 0	
DGMCF	えんりつ	
Barometric Pressure	らする	"Hg
Static Pressure	てで	"H20
Nozzle Size	N F	inches
Stack Diameter		feet
Length	0	feet
Width	0	feet
Port length:		inches

T. C.	ts 2	nts/Port 12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass/Metal /Teflon / Other

Glass/Metal/Other_ Nozzle

None/Metal /Teflon / Other_ Union

Ž Pitot Leak Checked?

MII Numbers

Measuring Device

Probe / Pitot

Control Box

Trendicator

とを見

Impinger Box No.:

Meter Box No.:

Probe No.: Page

21656 10

Project No.:

mg	mg
and the second second	
Filter	Probe

~	ナスス	-
Moisture Gain	CWTR	

Comb.Gas.Analyzer Incline Manometer

Micromanometer

Barometer

Calipers

WCBDA ハラ B Combustion Gas Concentration Oxygen S・29 % Carbon Dioxide (1.52) % Carbon Monoxide さいろ ppm		a symmetry of the	,
Oncentration S.29 II.32	WCBDA		ÞΩ
8.29 11.32 31.9 pp	Combustion Gas C	oncentration	
11.52 31.9	Oxygen	57.8	%
6.18	Carbon Dioxide	(1, Z.Z.	%
	Carbon Monoxide	6.18	pm

Nozzle Measurement	Comment of the control of the contro	Des Standard	and the second		
Z	gen)	8	m	4	Average:
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Site Diagram

Rev. November 27, 2014

Notes:

Clock Dry Gas Pitot Probe Over Impinger Temp Weter Temp			500000000000000000000000000000000000000	C 00:4::00	0:104			Torre Longitude		A POLITICA COV	2	1		
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Rev: April 28, 2005



APPENDIX 5

SVOC Data Sheets (30 pages)

Project No .:

Page

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds
Test Date	0102 P KOM
Test Location	APC Outlet No.
Operator Signature	

Pitot Factor	115.8	
DGMCF	(8),	
Barometric Pressure	TOS	"Hg
Static Pressure	C101 m	"H20
Nozzle Size	, 2531	inches
Stack Diameter	スプ	feet
Length	амень	feet
Width	e de la composition della comp	feet
Port length:		inches

ഗ	2	12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass / Metal /Teflon / Other____

Nozzle Glass / Metal / Other_

None /Metal / Teflon / Other_

Union

Pitot Leak Checked? Yes

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Particulate Gain

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Moisture Gain

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WCBDA	Section Sectio	g

Combustion Gas Concentration

Calipers

Oxygen		%
Carbon Dioxide	年二	%
Carbon Monoxide	(Q)	mdd

Site Diagram

4.5 diagram

2.20

2.20

Month side of back side of back

Probe No.:		6 - Series
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Imping	Impinger Box No.:	÷.
L	Measuring Device	e MII Numbers
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	Control Box	500 2006 C
	Incline Manometer	7002 200 le
	Comb.Gas.Analyzer	e
	Micromanometer	
L	Rarometer	Carlo Carlo

	Nozzie Measurements
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4	0.2830
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Project No.: Operator:

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Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator :

Plaint Location:	Date: 14	9146 9	Plant:	Covanta DYEC	35			Test No.:	******	SVOC	***************************************	**************************************	Page 🎶	of 5
Clock Meter AP Desired Temp Temp Outlet IntegrTremp Time R ² "H,O cfm "F "F" "F" "F" "F" "F" "F" "F" "F" "F"		1	Plant Location:	Courtice, On	itario		THE CHARGE WATER STREET, THE CHARGE STREET, THE CHA	Test Location		APC Outlet N	<u>o</u>	NAME OF THE PROPERTY OF THE PR		
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Project No.: Operator :

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Rev: April 28, 2005

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Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator :

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Plant Location	Courtice, Ontario	- Company of the Comp	on social management of the social management	Marien		Page		1 of 5
Test No.:	75	ic Compc	nnds			Prob	Probe No.:	6 series
Test Date	May 10, 2010					Met	Meter Box No.:	
Test Location	APC Outlet No.	and the second s				idul	Impinger Box No.:	cons.
Operator Signature							9 8	L
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Static Pressure	- 1113	"H2O					Control Box	COR 2009 U
Nozzle Size	<u>-625.</u>	inches	Moisture Gain	e Gain		!	Incline Manometer	ar (OE 2009Y
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Length	enien	feet	WCBDA	7:27	8	b 0	Micromanometer	
Width	· · · · · · · · · · · · · · · · · · ·	feet				ı	Barometer	EN, CONER,
Port length:	imas referencia de la composito	inches	Combus	Combustion Gas Concentration			Calipers	
Restruction and the second			Oxygen	Colombian I have	%	\0		
Reading Interval	ഗ		Carbon Dioxide	Dioxide N. 82	%	\ 0	Nozzle M	Nozzle Measurements
Number of Ports	7		Carbon	Carbon Monoxide トレス	ppm			
Number of Points/Port	r 12						7	
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Y			· · · · · · · · · · · · · · · · · · ·			протисивалла	Average:	A GOOGLES AND THE STATE OF THE
Nozzle Glass / N	Glass / Metal / Other	none de principal de la constante de la consta						
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Pitot Leak Checked?	Yes No							
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Rev. November 27, 2014

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Plant Location: curities, Ordario Probe Coven Institute	מוני.	5 5 5 5	7.0	COVAINED DI	ار			1631 140	Carrie	2000			rage 4	- 1
Clock Meter Apple of the Frobe oven implies Temp Meter Temp Time R ² "H ₂ O cfm "F" properation outlet interfree interfre	-		Plant Location:	Courtice, Or	ntario			Test Location	::	APC Outlet N	- -			
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Clock Meter AP Desired Temp Temp Outlet Inlet/Trap Outlet Inlet/Trap Outlet Inlet/Trap Outlet Inlet/Trap Outlet Inlet 10			Dry Gas	Pitot		Stack	Probe	Oven	Impini	ger Temp	Meter	Temp	Meter	Dump
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Date: May (3)	0,000	Plant:	Covanta DYEC	EC	-		lest No.:	7	2000	HACADINA KANDANINI MENENDENDANI MENINGALA HATAMANANA	***************************************	rage 3	0T 5
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Project No.:

21656

Operator:

Rev: April 28, 2005

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Rev: April 28, 2005

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	125	287,04	39	3	5	2	254	2	j	30	7	2	9
	130	25,43	1000	+3.	757	255	457	かか	35	8	Ş	(3)	255
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Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator :

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds
Test Date	305 = 20
Test Location 3	APC Outlet No. 1
Operator Signature	

Pitot Factor	J %	
DGMCF	983	
Barometric Pressure	00.TS	"Hg
Static Pressure	731	"H20
Nozzle Size	1897	inches
Stack Diameter		feet
Length	الم	feet
Width	epithelis:	feet
Port length:		inches

Reading Interval	2
Number of Ports	2
Number of Points/Port	12

Probe Liner Glass Metal /Teflon / Other_

Glass/ Metal / Other__

Nozzle

Site Diagram

None/Metal / Teflon / Other_ Union

Pitot Leak Checked? (Yes)

Gain
rticulate
Pa

MII Numbers

Measuring Device

Impinger Box No.:

Meter Box No.:

Probe No.: Page

6 series

Project No.:

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Probe	ACQUIDED SECTION:	mg
-	OTHER PROPERTY OF THE PROPERTY	

Moisture Gain

7.7		•	
CWTR	7. Ott	b.0	
WCBDA	0.08	86	

Combustion Gas Concentration

Oxygen		%
Carbon Dioxide	26.1	%
Carbon Monoxide	0	mdd

Ceneda B03762 45000 CO COE 20094 元三元 Comb.Gas.Analyzer Incline Manometer Micromanometer Probe / Pitot \lesssim \gtrsim Control Box Trendicator Barometer Calipers

Nozzle Measurements				Name of the contract of the co	enconstruction are electrical contractions and the contraction of the
Z	-	7	m	4	Average.

Rev. November 27, 2014

Notes:

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Sec.		right.	Covalita						2000		MACHINE STREET, STREET		-1
iter.		Plant Location:	Courtice, Ontario	tario			Test Location:	::	APC Outlet No.	· .	***************************************		THE PERSON NAMED IN THE PE
	*	***************************************	*		*			*		*	*	*	*
		Dry Gas	Pitot		Stack	Probe	Oven	Impinge	Impinger Temp	Meter Temp	Temp	Meter	Pump
Point	Clock	Meter	ФΦ	Desired	Temp	Temp	Temp	Outlet	t rike ¢/Trap	Outlet	Inlet	Pressure	Vacuum
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	02	5 3 3	99,	Z	82	1552	252	50	23	28	18	1.63.1	5
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Project No.: Operator:

21656

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Date: 🧖 ೬೭೪	11 2016	Plant:	Covanta DYEC	EC			lest No.:	2)	SVOC	* Company of the Comp	teden estimicamo esa estado de internaciona estado en orden de estado	Page 3	OT 5
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	125	NO ± 19	3	3.	200	NA	4	1	F	H	á	<u>y</u>	V
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10	135	87.8		5	289	150	22.5	<u>ئے</u>	45	83	8	\(\frac{1}{2}\)	0 5
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	155	\(\sigma \)	8	501	282	23	22	3	38	⊘	28	1	0
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	170	88	2	99	7887	22	202	2	\ \ \ \ \	~\ \{\rangle}	28	3	の子
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Finish Time:	11:20	Final Leak Check:	. 003		Hg.	Finish Time:			Final Leak Check:	eck:		cfm @	Hg.
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Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator :

Interpretation Countries Original Countries	D. 50	6	08-2-4-	Courants DVE	J.		Tact	Tact No .	~	SVOC			Dage 4	7
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Clock Dry Gas Pitot Stack Probe Oven Impinger Termp Meter Temp Inter Temp Temp Temp Temp Outlier Inter Temp Inter Temp Temp Temp Outlier Inter Temp T		*	*	*		*			*		*	*	#	*
Clock Mater AP Desired Temp Temp Temp Outlet Inlet/Trap			Dry Gas	Pitot		Stack	Probe	Oven	Imping	er Temp	Meter	Temp	Meter	Pump
Time ft	Point	Clock	Meter	ΔP	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
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Project No.: Operator :

21656

ORTECH Environmental

Rev: April 28, 2005

Plant Location	Date:	11 2016	Plant:	Covanta DYEC	EC	NATIONAL PARTICIPATION OF THE PROPERTY OF THE PARTICIPATION OF THE PARTI		Test No.:	3	SVOC	NAMES OF THE PROPERTY OF THE P		Page 5	of 5
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Rev: April 28, 2005

Project No.:

Page Probe No.: Meter Box No.: Impinger Box No.:

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds
Test Date	May 5, 2016
Test Location	APC Outlet No. 2
Operator Signature	angle Nolar-

Pitot Factor	848		Name of Street, or other Persons
DGMCF	180.		Section.
Barometric Pressure	40.02	"Hg	
Static Pressure	-10.3	"H2O	
Nozzle Size	SHSZ.	inches	604
Stack Diameter	レチ	feet	
Length	0	feet	
Width	Ø	feet	
Port length:	9	inches	

ស	2	12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass Metal /Teflon / Other

Nozzle Glass/ Metal / Other_

None/Metal / Teffor/ Other_

Union

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Pitot Leak Checked? (Yes

Particulate Gain

Filter	Ø	mg
Probe	Ø	mg

Moisture Gain

- W	30
@. 13	v: る
CWTR	WCBDA

Combustion Gas Concentration

Oxygen	J.	%
Carbon Dioxide	1	%
Carbon Monoxide		mdd

Site Diagram

CEMS

PORT 1

PORT 2

Measuring Device	Mil Numbers
Probe / Pitot ≲	E037107
Trendicator	CIRCLOSTO
Control Box	CNEZZONO
Incline Manometer	COELLOSTO
Comb.Gas.Analyzer	
Micromanometer	Wasting of the Hamma Delicated different reference
Barometer	でき、 である。
Calipers	(AN 22135

Nozzle Measurements	ments
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3 2530	nación de la constante de la c
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e con	•	Plant Location:	Courtice, Ontario	ntario			Test Location:	::	APC Outlet No	lo.			
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Point	Clock	Meter	ФΔ	Desired	Temp	Temp	Temp	Outlet	-Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
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Time: Final Leak Check: cfm@ "Hg Finish Time: / Final Leak Check: /	Itial Leak Check: ハハレ cfm@ し	Start Time:	Initial Leak Check:	9	SS H
	Time: Final Leak Check:	Finish Time:	Leak Ch	/ @ ctm @ /	"Hg

Project No.: 21656 Operator: ⊕∨

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Point	Clock	Meter	ΔV	Desired	Temp	Temp	Temp	Outlet	Jmlet/Trap	Outlet	Inlet	Pressure	Vacuum
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Rev: April 28, 2005

ORTECH Environmental

Operator:

Plant Location: Curring Dutation Color Plant Location:	Clock Day Gas Peter Cover Institution Accounter No. 2. Peter P		1	Diene	Courses Di	727	21		Toot No .	**************************************	20//3		ecutional complete and control of the control of th	D200 /	, n
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190, 638 Pirot P	Clock Dry Gas Pirot From the problem Pirot Pirot <th></th> <th></th> <th>Plant Location:</th> <th>Courtice, O</th> <th>ntario</th> <th></th> <th></th> <th>Test Locatio</th> <th>Ë</th> <th>APC Outlet I</th> <th>4o.</th> <th></th> <th>***************************************</th> <th></th>			Plant Location:	Courtice, O	ntario			Test Locatio	Ë	APC Outlet I	4o.		***************************************	
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65 187, 34 . lb. 234 234 253 4lb 4lb 83 8lb 1.lb 3.lb 70 191.25 . lb . lb <td>65 187,74 . lb . 22 . 244 . 253 . lb <</td> <td>. 5</td> <td>09</td> <td>40.2%</td> <td>S .</td> <td>143</td> <td>282</td> <td>古</td> <td>28</td> <td>2</td> <td>チ</td> <td>5%</td> <td>93</td> <td></td> <td>0,8</td>	65 187,74 . lb . 22 . 244 . 253 . lb <	. 5	09	40.2%	S .	143	282	古	28	2	チ	5%	93		0,8
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80 198,2+ i、5S i vS 28S 244 247 48 43 83 84 1.4 3-3 8.5 1.2 3-3 85 1.2 3-3 85 1.2 3-3 85 1.2 3-3 80 2vS, oq i po i pq 28S 244 244 44 83 88 1.4K 3-3 3-3 85 1.4K 3-3 3-3 8-3 8-3 8-3 8-3 8-3 8-3 8-3 8-3	85 201.34 いち 148、34 244 48 43 83 84 1.4 3.4 3.4 3.4 3.4 4.8 4.3 8.3 8.4 1.4 3.4 3.4 3.4 3.4 4.8 4.9 4.4 8.3 8.4 1.3 3.4 3.4 3.4 4.9 4.4 8.3 8.8 1.4 3.4 3.4 3.4 3.4 3.4 4.9 4.4 8.3 8.8 1.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3	9	75	45,13	22	\$	7.82	8h7	282	\$P	<u></u>	\$	8		0
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②: 2巻 Initial Leak Check: 、(ひ)	2: 2多 Initial Leak Check: ・〇〇(cfm@ S, 「Hg Start Time: / Initial Leak Check: / cfm@ / cfm@ / Final Leak Check: / cfm@ /	raverse:	10/21 12 12				-	Traverse:					1		
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Rev: April 28, 2005

21656

Project No.: Operator :

Plant Location: Courtice, Ontario	200	Plant:	Covanta DYEC	EC			Test No.:		SVOC	CARCOLANDO CONTRACACIONA CONTR		Page 5	of 5
## * * * * * Dry Gas	-	Plant Location:	Courtice, O	ntario			Test Location:		APC Outlet No.	lo. 2			DECEMBER SEASON DESCRIPTION OF THE PROPERTY OF
Dry Gas	*	*	*		*			*		*	*	*	¥
Meter AP Desired Temp Ft		Dry Gas	Pitot		Stack	Probe	Oven	Imping	Impinger Temp	Meter	Meter Temp	Meter	bumb
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Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	Semi-Volatile Organic Compounds
Test Date	May 9, 2016
Test Location	APC Outlet No. 2
Operator Signature	Mose Mokan

Impinger Box No.:

Meter Box No.:

Page Probe No.:

Project No.:

Pitot Factor	<u>~</u>	
DGMCF	3	
Barometric Pressure	ある	"Hg
Static Pressure	N OT	"H20
Nozzle Size	でたろ	inches
Stack Diameter	とよ	feet
Length	Ø	feet
Width	0	feet
Port length:		inches

	7	t 12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass/ Metal /Teflon / Other___

Nozzle Glass/ Metal / Other____

Union None/Metal (Tellon) Other

Pitot Leak Checked? Yes No

MII Numbers		8	X	V
Measuring Device	Probe / Pitot	Trendicator	Control Box	Incline Manometer
	mg	mg		

Particulate Gain		
Filter	0	mg
Probe	Ø	mg
Moisture Gain		
CWTR	0.30 0.00	ρŷ
WCBDA	(2) (1)	рŊ

Comb.Gas.Analyzer

Barometer

Calipers

Combustion Gas Concentration	ncentration	
Oxygen	90.0	%
Carbon Dioxide	200	%
Carbon Monoxide	0.0	mdd

Nozzle Measurements		
Noz	W	Average:

Site Diagram

Rev. November 27, 2014

Notes:

Stack Probe Oven	Covanta DYFC			Test No.:	6	SVOC			Page 2	of 5
Clock Meter AP Pitot Stack Probe Oven Time If " "H,O cfm "F "F "F "F "F "F " "F " "F " "F "F " " " "F "				Test Location		APC Outlet No	0, 7			Activities of the control of the con
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Finish Time: Final Leak Check: cfm@ "Hg	Finish Time:	Final Leak Check:	cfm @
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21656

Project No.: Operator :

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Rev: April 28, 2005

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Project No.: 21656 Operator: AN ORTECH Environmental

Rev: April 28, 2005

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Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	3 Semi-Volatile Organic Compounds
Test Date	Med 10, 2016
Test Location	APC Outlet No. 2
Operator Signature	(Angle- Nolar
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Meter Box No.: Impinger Box No.:

Project No.:

Page Probe No.:

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Static Pressure	000	"H20
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Length	Ø	feet
Width	Ø	feet
Port length:	=. ور	inches

	2	12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass/ Metal /Teflon / Other____

Nozzle Glass / Metal / Other

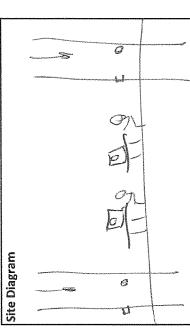
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Pitot Leak Checked? (Yes)

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	WCBDA		0.0
	Combustion Gas Cor	ncentration	
5 S	Oxygen	21.8	%
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- ANGLE ANGLES A	Carbon Monoxide	00	ppm



Measuring Device	MII Numbers
Probe / Pitot	
Trendicator	3
Control Box	\ \ \
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Nozzle Measurements 1 2 3 4 4 Avorage
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Notes:

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Project No.: Operator :

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Rev: April 28, 2005

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APPENDIX 6

Acid Gas Field Data Sheets (12 pages)

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						Measuring Device	Device MII Numbers	
Pitot Factor	**************************************		Particulate Gain		Вительной положений полож			T
DGMCF	· 88		Filter		B	Probe / Pitot	: S3 33763	П
Barometric Pressure 2	29. Hg		Probe		mg	Trendicator	100 300	$\overline{}$
Static Pressure	~ 9,5 "H20					Control Box	Teal COE 20092	1
Nozzle Size	255 inches		Moisture Gain			Incline Manometer	ometer <u> </u>	٦, ١
Stack Diameter	45 feet		CWTR	1	DO	Comb.Gas.Analyzer	nalyzer	П
Length	feet		WCBDA		60	Micromanometer	neter	
Width	feet					Barometer	Care Cener	
Port length:	inches		Combustion Gas Concentration	Concentration		Calipers		\neg
			Oxygen		%		на выполня продости в пределения	
Reading Interval	5		Carbon Dioxide	100 Z	%	Noz	Nozzle Measurements	
Number of Ports	1		Carbon Monoxide	N I	mdd	e-4	12556	-
Number of Points/Port	4					2	2545	
Probe Liner (Glass) Metal /Teflon / Other	Teflon / Other		Site Diagram			e 4	\$2,525	
_		I)			Average:	0000	
Nozzle Glass / Metal / Other	Other					The state of the s		1
Union None / Metal / Teflon / Other_	Teflon / Other	ı						
Pitot Leak Checked? (Yes)	No					nejvejivoji administra		
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Piper Location: Courtice, Ontario Piper	Date: Man	96	Plant:	Covanta DYEC	ပ္			Test No.:	Cin to	Particulate/Metals		< 0 €	rage z	OT .2
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Miles Dry Gas		*	***************************************	*		*			*		*	*	*	*
Clock Mater AP Desired Temp Temp Temp Outlet Inlet Proportion		M26A	Dry Gas	Pitot		Stack	Probe	Oven	Imping	ger Temp	Meter	Temp	Meter	Pump
Time ff	Point	Clock	Meter	ΔР	Desired	Temp	Temp	Temp	Outlet	Inlet/Frap	Outlet	mlet	Pressure	Vacuum
0		Time	*	"H20	cţw	<u></u>		<u></u>	۳	Ļ.	u.	<u>u</u>	ΔH ''H,0	"Mg Gauge
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Rev: April 28, 2005

ORTECH Environmental

Plant Covanta DYEC			<u>a</u>	Project No.:	21656
Plant Location Courtice, Ontario	ario		6.	Page	1 of 2
Test No.:			<u>~ 1</u>	Probe No.:	50,505
Test Date May 2 20/6			2	Meter Box No.:	leg me
ion APC Outt			ense ense	Impinger Box No.:	F 6
Operator Signature	An action of the second of the				
				Measuring Device	se MII Numbers
Pitot Factor \$4		Particulate Gain			
DGMCF		Filter	mg	Probe / Pitot <>>	
Barometric Pressure 29.74	BH. Int	Probe	æ	Trendicator	COE 20092
Static Pressure	∂ "H20			Control Box	25002 200
Nozzle Size	>>> inches	Moisture Gain		Incline Manometer	er COE 10091
Stack Diameter	feet	CWTR 155.3	80	Comb.Gas.Analyzer	er
Length	feet	WCBDA 9.1	80	Micromanometer	
Width	feet			Barometer	Env. Cemada
Port length:	inches	Combustion Gas Concentration		Calipers	
		Oxygen 7.53	%	вадунной принципальной профактирующей выправлений принципальной принцип	
Reading Interval 5		Carbon Dioxide ハ. い	%	Nozzle N	Nozzle Measurements
Number of Ports		Carbon Monoxide 12	mdd ~		medical control property of the control property of th
Number of Points/Port 12				2 2 2	
				m	
Probe Liner Glass / Metal /Teflon / Other_	Other	Site Diagram		4	Bijleren i kalender den der
Nozzle GJass / Metal / Other	The state of the s			Average:	pundi da pamanan munda mendamen kerikan kerikan kerikan kerikan da majaman da mendamen kerikan kerikan da keri
Union None / Metal / Tellon / Other_	Other				
Pitot Leak Checked? (Yes) No					
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Rev. November 27, 2014

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Project No.: Operator :

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ORTECH Environmental

Rev: April 28, 2005

MII Numbers

Page 1 of 2	Page 1	Plant	Covanta DYEC	***************************************	Harreston of the state of the s				Project No.:	21656
Probe No.:	Probe No.:	Plant Location	Courtice, Ontario						Раде	1 of 2
APC Outlet No. Inches In	Land		M26A							
APC Outlet No. Implinger Box No.: 13 APC Outlet No. Measuring Device Rilter mg Probe / Pitot S 3 2 A. A. 3 "H2O Moisture Gain Trendicator 4,5 3 inches Control Box Concentration Combustion Gas Concentration Combustion Gas Concentration 5 Carbon Dioxide 1, A. 2, 4 % 5 Carbon Monoxide 1, A. 2, 4 % 6 carbon Monoxide 1, A. 2, 4 % 7 Carbon Monoxide 1, A. 2, 4 % 8 Carbon Monoxide 1, A. 2, 4 % 12 I Average:	Particulate Gain Probe P									- 1
Measuring Device Particulate Gain Probe Pitot S 3 Probe Pr	Particulate Gain Probe P		APC Outlet No.						Impinger Box No.:	2
Particulate Gain Probe Probe Probe Probe Protocolor	Particulate Gain Filter Probe A S "H2O Noisture Gain Freet CWTR CWTR Combustion Gas Concentration S Carbon Monoxide Average: Average: A Merage: Average: Average: A Merage: A Mera	Operator Signature								
Particulate Gain Particulate Gain Probe Pitot 53	Filter mg Filter mg Frobe Probe Probe Protot S3 2 A. A.S. "H2O Moisture Gain CWTR 136.4 g Comtrol Box Teet Combustion Gas Concentration 5 Carbon Monoxide 11.9 ppm 1 Carbon Monoxide 11.9 ppm 1 Average:								Measuring De	
Filter mg Probe / Pitot 53	Filter mg Probe Pitot 53	Pitot Factor	1587			Particulate Gai	'n			
Probe Moisture Gain Control Box Probe Moisture Gain Control Box Probe Prob	Probe Moisture Gain Control Box Feet WCBDA N.O. B Control Box Feet WCBDA N.O. B Comb.Gas.Analyzer Micromanometer Barometer Barometer Combustion Gas Concentration Calipers Carbon Monoxide N.O. S Carbon Monoxide S	DGMCF	5 5 5 8		********	Filter		mg	Probe / Pitot	M
Moisture Gain Control Box Page	Moisture Gain Moisture Gain Control Box (e.g., 1975) Incline Manometer Combustion Gas Concentration Combustion Gas Concentration Carbon Dioxide 11.2 Ppm Carbon Monoxide 11.3 Ppm Ppm Carbon Monoxide 11.3 Ppm Carbon	Barometric Pressure		<u>=</u>		Probe		mg	Trendicator	COE
Moisture Gain CWTR CWTR Comb. Gas. Analyzer Comb. Gas. Analyzer Comb. Gas. Analyzer Comb. Gas. Concentration Calipers Carbon Dioxide 11.3 Ppm Carbon Monoxide 11.3 Ppm Pp	CWTR CWTR Comb.Gas.Analyzer Comb.Gas.Analyzer Comb.Gas.Analyzer Comb.Gas.Analyzer Combustion Gas Concentration Carbon Dioxide Carbon Monoxide	Static Pressure		H20					Control Box	1
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WCBDA O	WCBDA O	Stack Diameter		feet		CWTR	ブ. お		Comb.Gas.Ana	yzer
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Combustion Gas Concentration S Carbon Dioxide 11.7 ppm 12 22 24 % Carbon Dioxide 11.7 ppm 12 2 2 2 2 2 2 2 2 2	Combustion Gas Concentration Calipers	Width	data.W.	feet					Barometer	
Carbon Dioxide 1.75 % Carbon Monoxide 1.75 % 2 2 Site Diagram Average	Carbon Dioxide 11.9 % 12.1 % Carbon Monoxide 11.9 ppm 1 2 2 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Port length:	Ü	ches		Combustion Ga	as Concentration	Видеодилинованичную применента и поставления поставле	Calipers	
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12 2 2 2 2 2 2 2 2 2 3 3 4	12 2 2 2 2 2 2 2 2 2	Number of Ports	*			Carbon Monox	, seement	mad	grand)	4
Glass / Metal /Teflon / Other Site Diagram	Glass / Metal /Teflon / Other Site Diagram	Number of Points/Por							7~	1627 g
Glass / Metal /Teflon / Other Site Diagram	Glass / Metal / Teflon / Other Site Diagram	S. Marson					es, es se esta de la companya de la	а ақуының басқара ұнарефексіріна арарының жережені қазалының жереже	m	1
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Notes:

None /Metal / Teflon / Other_

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Pitot Leak Checked? Yes

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30 02, 40	8	25		1 .	79	757	\$ \$	270	25	246	\$ 2	82.	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	3
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ORTECH Environmental

Rev: April 28, 2005

					THE CONTRACT OF THE PROPERTY O	Accompany of the Control of the Cont
Plant Location	Courtice, Ontario				Page	1 of 2
Test No.:	M26A				Probe No.:	S 562/25
Test Date Max	3 2010				Meter Box No.:	lea m. hom
ion	APC Outlet No. 2-				Impinger Box No.:	~
Operator Signature						
					Measuring Device	ice MII Numbe
Pitot Factor	18	Par	Particulate Gain	Nessenvogspolongio-pio-sid-Standardun-		
DGMCF	086	Filter	ēr	88	Probe / Pitot S 3	
Barometric Pressure	BH. イツでで	Probe	pe	æ	Trendicator	202 200
Static Pressure	0.0 "H20				Control Box	COF 200'
Nozzle Size	inches /	Mo	Moisture Gain	Recommendation common property and acceptance of the common property a	Incline Manometer	ter 205 100%
Stack Diameter	feet feet	3	CWTR 146.3	D.O	Comb.Gas.Analyzer	
Length	feet	× ×	WCBDA 10.0	bo	Micromanometer	er
Width	feet				Barometer	Thu. Casac
Port length:	sedoui	ō	Combustion Gas Concentration		Calipers	
		ő	Oxygen	%		
Reading Interval	5	टि	Carbon Dioxide (\\ \)	%	Nozzle	Nozzle Measurements
Number of Ports	X	<u>[a</u>	Carbon Monoxide 그은음	mdd		N NO
Number of Points/Port	7.7				> >	5.451
· Salar				очення веренення в предоставлення в предоставлення в предоставлення в предоставления в предоставления в предост	9 m s	722
Probe Liner (Glass / Me	Glass / Ivietal / Lerion / Otner	200	site Diagram		O 45	
Nozzle Glass / Metal / Other_	tal / Other	***************************************			Average:	222
Union None / Met	None/Metal / (effor) Other	Parallel				
Section Charles		West,				
	<u> </u>				· ·	
Noto:			bilityis in middelianda kalasan arraika kalasa kayan genaja ugan paka kata kata kata kayan paka kayan kata kata	meters seed disposement representations of the second contract of th	1	

Date:	3, 2016	Plant:	Covanta DYEC	/EC			Test No.:		Particulate/Metals		260	Page 2	of 2
		Plant Location:	Courtice, Ontario	ntario			Test Location:	n:	APC Outlet No.	2	21656	1 1	
	*			O. A. TOTAL CONTRACTOR	OPPOPARATION AND AND AND AND AND AND AND AND AND AN	ALTON EXPONENT CHARACTER CONTRACTOR CONTRACT		*		*	*	*	* .
MANOGEMENT AND	M26A	Dry Gas	Pitot		Stack	Probe	Oven	Imping	Impinger Temp	Meter	Meter Temp	Meter	Pump
Point	Clock	Meter	4 V	Desired	Temp	Temp	Temp	Outlet	Inlet/Frap	Outlet	= =	Pressure	Vacuum
	Time	<u></u>	"H20	ctm	¥.	쁘	!	u_	L	LL.	LL o	Ħ V	- - -
												"H20	Gauge
1	0	24, 28	to !	7	291	269	998	25	+1	78	the	9	20,
y	S	とは	* 64	24	252	£97	72	56	43	<i>\</i> ≪	80	1,00	2.51
ý	10	36.18	2,	7,	25%	29%	7	200	さる	<u>~</u>	0%	7.0	2,5
A	13	1 .	J. J.	27.0		265	Ĩ	8	72	100 100	00	<u>, , , , , , , , , , , , , , , , , , , </u>	0
150	20	36, 63	E	14.	29%	592	3	8	752/	200	>	4	6
8	25	42.24	40.	Ā	245	892	3	<u>့</u>	<i>S</i> ħ2	3500	-incident SX	3	7:7
K	30		3	て,	18%	897.	き	00	243	75	5%	59:1	25
pp	35	五 五	000	7	13	33	ā	20	ナガス	t œ	\$	1,65,1	25/
8	40	22.60	3	Ā	290	597	表	2	£ h 2	150	べる	1.65	2.5
10	45	3 %	39.	7,	Z	22 23	\$	25	23/2	\$ 8	25		2.5
-	20	74 3	89 .	7	80	597	F-7	S	543	8	78	+1	2,5
77.	ន្ត		9	À,	0.5%	592	みる	23	S43	58	78	1.65	7.5
NO CONTRACTOR CONTRACT	09	かのよう											

					The second secon								
			Taranta de la companya del companya de la companya della companya										
		National Administration of the Company of the Compa			- Anna Parken (Anna Anna Anna Anna Anna Anna Anna An								
Annual Control of Cont		Valadaria de la composição de la composi			Angermeionist Affektionistativismist				1/1				
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			THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF TH		amidokretisan kakeera da kakeera d								
			The same of the sa		THE BATTER STATE OF THE STATE O	The second secon							
Traverse:					No.	Traverse:						***************************************	RENALONIAN CONTRACTOR AND
				The second secon									

s: の の中 Initial Leak Check: , ooy cfm@	Transference					Ш	ravor	And the state of t
Final Leak Check: Row chw@ High Finish Time:	Time: \(\times \)	Initial Leak Check:	7,00	cfm@	-	- S	tart Time:	Initial Leak Check:
	Time:	Final Leak Check:	N	cfm@	9	122	inish Time:	Final Leak Check

			The second secon	CONTRACTOR OF STREET			
<u>p0</u>	Start Time:		Initial Leak Check:	K:		cfm @	@
50	Finish Time:	4 <u>1</u> 2	Final Leak Check:	`		cfm	ල
1					11,000		

Project No.: Operator :

21656

ORTECH Environmental

Rev: April 28, 2005

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	2 M26A 2
Test Date	May 3
Test Location	APC Outlet No.
Operator Signature	re

Pitot Factor	*		TO SHE
DGMCF	286.		-
Barometric Pressure	29.62	"Hg	
Static Pressure	0.0	"H20	-
Nozzle Size	, 2557 I	inches	Same
Stack Diameter	, ,	feet	
Length	ų patemotii.	feet	
Width	and the second s	feet	
Port length:		inches	

2	*	is/Port 12
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass / Metal /Teflon / Other_

Site Diagram

None/Metal/Jenoh/Other_ Union

Glass / Metal / Other_

Nozzle

Pitot Leak Checked? (Yes

Moisture Gain		
CWTR	157.2	90
WCBDA	17 × K	90

COL 1.0092

COE 20092

Incline Manometer

Comb. Gas. Analyzer

(Mari

Micromanometer

54

Barometer

Calipers

COL 2009 2

MII Numbers

Measuring Device

Probe / Pitot 53

Frendicator Control Box

21.12

C. C. M.

Impinger Box No.:

Meter Box No.:

Probe No.:

Project No.:

Combustion Gas Concentration	
Oxygen	%
Carbon Dioxide ハント	%
Carbon Monoxide	mdd

Notes:

1000		D. A. A.	Courses DVEC	J2			Tact No .	C.	Dontientata/Attatalc		Las Commence	C aged [of 2
Zara i		Plant Location:	Courtice, Ontario	ntario			Test Location:		APC Outlet No.		21656	295	1
	*	*	*	Amazini de la companya de la company	*		And the second s	*		*	*	*	*
Name when the party of the part	M26A	Dry Gas	Pitot		Stack	Probe	Oven	guidml	Impinger Temp	Meter	Meter Temp	Meter	Pump
Point	Clock	Meter	ФФ	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	Inlet	Pressure	Vacuum
eroneron oraș	Time	£ 14.3	"H20	cţu	<u>u</u>	ij.	ų.	¥	바	<u>.</u>	Ļ	H	E E
-acusador							3					"H20	Gauge
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	5	1	13.	K	12	<i>198</i>	チス	0	をひ	80	2%	188	r)
-E	10	なが	2	77.	25	282	な	25	525	∞	85	1,75	3
Becan .	15	£ 22	12	NA.	28%	268	OEX	85	£42	83	.28	183	~)
k	20		 x	13	28%	37	Ş	25	543	53	7%	(8)	5
	25	%, 82	1	4.5	7,0%	597	270	S,	282	58	78	1.85	8
k	30	49 06	X.	3	252	2002	天石	9	27.2	2	85	1,831	3
%	35	25	*	4	183	2,6%	え	6.9	243	<i>20</i>	83	(,8,5	8
Bro	40	48, 22	7.	ţ	292	292	142	63	7.65	50	83	1.25	3.2
R	45	2 Lo	-SO	X	294	197	た	19	244	8	\$\langle \sqrt{\sq}}}}}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \end{\sqrt{\sqrt{\sq}	ري ن ن	2,2
À	20	3	\$	*	294	297	み	0g	243	2	83	2.0	25
ZZ.	55	0	78	4	794	292	74	09	ただ	(S)	82	5	3.5
	09	5.0	Charge of the Control		Any of the following the follo								
Printed Company of the Company of th		THE PROPERTY OF THE PROPERTY O			**************************************	-	warman and the state of the sta						
		manyan kanana kanan			- Name of the state of the stat	And the second s		Name and the state of the state		Management of the state of the			
		The same of the sa			Charles of the Control of the Contro	The state of the s							
					история при								
	Delinatoria da cananta de cananta	DENINDEN CONTRACTOR DESPRESSOR DES SENTINDEN DE SENTINDEN	And the second control of the second control							-			
					in de la constanta de la const								and the second s
					KAMADONOMASAMAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA			ALL AND					
Traverse:	The state of the s				`	Traverse:		***************************************	The state of the s				N
Start Time:		Initial Leak Check:	200	cfm@	gH" ₹	Start Time:	- AND CONTRACTOR AND		Initial Leak Check:	Sheck:		cfm @	"Hg
Finish Time:		Final Leak Check:)00°.	cfm@		Finish Time:			Final Leak Check:	heck: 🗸		cfm @	"Hg
	-		-	telegramonerous management of the second	-	- Company and the company of the com		- Commence of the Commence of		- CONTRACTOR OF THE PROPERTY O			

Rev: April 28, 2005

ORTECH Environmental

/21656

Project No.: Operator:

Plant	Covanta DYEC
Plant Location	Courtice, Ontario
Test No.:	M26A
Test Date	Mey 3 2016
Test Location	APC Outlet No.
Operator Signature	

	CONTRACTOR DESCRIPTION OF THE PERSON OF THE	THE RESERVE THE PERSON NAMED IN COLUMN NAMED I	9
Pitot Factor	Ž,		· ·
DGMCF	085"		- Part
Barometric Pressure	29.59	"Hg	
Static Pressure	Q1 ····	"H20	
Nozzle Size	(252)	inches	~
Stack Diameter	どい	feet	
Length	Antogogy	feet	
Width	والمتحاليس	feet	
Port length:		inches	

5	1 2	72
Reading Interval	Number of Ports	Number of Points/Port

Probe Liner Glass / Metal /Teflon / Other_

Glass / Metal / Other___ Nozzle

None/Metal / Mellon / Other Union

Pitot Leak Checked? (Yes)

	SANTONIAN PROPERTY OF THE PROP
late Gain	STORESTON STREET, STRE
Particu	-

ter	Probe	Moisture Gain	CWTR 154.4	WCBDA CLUB
Filter	Prol		8	WC

Combustion Gas Concentration	oncentration	
Oxygen	00.00	%
Carbon Dioxide	11.22	%
Carbon Monoxide	9.6	mdd

Site Diagram

Project No.:	21656
Page	1 of 2
Probe No.:	36-50-50
Meter Box No.:	Care Care Shirting Commen
Impinger Box No.:	2

Measuring Device	MII Numbers
Probe / Pitot S>	
Trendicator	23002.700
Control Box	23,002 700
Incline Manometer	76002 302
Comb.Gas.Analyzer	
Micromanometer	
Barometer	Kud Canade
Calipers	

Notes:

		Dine	Courses DVEC	J 3,		Tock	Tact No .	6	Dontien James (A fetale		0362	Dage 3	0.f.)
Dale:	0 8 6 0	Т	Covalita Di	ָּרָ רָּ	-		Total 180:	1	ADC Outlot B		24050	~~	
		Plant Location:	Courtice, Ontario	ntario			lest Location:	n:	APC Outlet No.	NO.	QCQT7	**************************************	-
	*		*		*			*		*	*	*	*
	M26A	Dry Gas	Pitot		Stack	Probe	Oven	Imping	Impinger Temp	Mete	Meter Temp	Meter	dund
Point	Clock	Meter	ΔV	Desired	Temp	Temp	Temp	Outlet	Inlet/Trap	Outlet	nlet	Pressure	Vacuum
	Time	£	"H ₂ 0	ctm	ŗ.		ų.	<u>.</u>	Ľ.	뉴	L	ΗV	# H
												"H20	Gauge
1	0	デ さ	×9.	24	272	A92	592	X	10.5	7.8	/8	67	2,5
4	2	78 80	70.	4	290	792	25.2	2	247	28	8 2,	+"	5-2
ķņ	10	21,8	Ŝ	4	282	192	Ž	C	125	28	\$	+	502
4	15	1 100	39.	7	7.0%	2,68	Ş	2	55%	25	% 0	1.62.1	502
ۇم	20	60.97	89 *	12	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	368	7	Z	242	% %	80	+	5.2
B	25		53	3	78%	268	2,2	2	25%	^^ ⊗3	80	7.1	5-5
7	30	36, 32	50	4	7.0%	268	35	23	832	83	18	47	<i>_0</i> ~2
8	35	2	5	3	7.89	7,6%	え	54	543	<i></i> カ&	18	30°	755/
o	40	表 次	93°	ā	289	89%	77	25	243	\$4	22	1.60	ر ک
10	45	% · tr	790	P,	281	268	33	2	24%	5%	\ \ \	3.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
#	20	50, 84	39.	ana marine	289	8972	271	ナ	242	\$C	7	1.20	1
12	55	27.72	9	4.	Z2/	897	たか	8	243	58	85	7	رة ا
	09	C) 85			destruction of the first participation of the fi			-					
					Activities and control of the contro								
- Contract of the Contract of													
-	National Control of the Control of t							The second control of		in a series de la companya del la companya de la co			
												Participan de la constitución de	
			- Announce of the Control of the Con										
			MANUFACTURE OF THE PROPERTY OF	- Carachaga da Car	DOSCORPORANT TO VOCATION CONTINUES C							de la constitución de la constit	
			NA		ned described two deals were an extended or produced o	- Andrews - Andr				Variability of the Control of the Co		And the second s	
	Andrewin Company of the Company of t				ANNINTERNATURAL PROPERTY CONTRACTOR OF THE PROPERTY OF THE PRO						CALCOLOR DE CALCOL		
Traverse:					-	Traverse:	Vantaga mili sibajim sustin mili mili moda nasani eti						
1	2 mg/m 2	· · · · · · · · · · · · · · · · · · ·		(- 1 all 1	-						100	

Rev: April 28, 2005

ORTECH Environmental

21656

Project No.: Operator:

cfm @

Initial Leak Check: Final Leak Check:

> Start Time: Finish Time:

> > 1

cfm@

000

Initial Leak Check: Final Leak Check:

120.50

Start Time:

Finish Time: 14,02



APPENDIX 7

VOST Field Data Sheets (8 pages)

Vost Data Sheet

H	7.2.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.						
Plant:	Covanta DYEC	<u></u>	Test Condition:	***************************************			
Plant Location	Courtice, ON		Test No:	**		Control Box ID:	<u></u>
Test location:	APC Outlet No		DGMCF: (1,988		Operator: 🕖	DUC
Date:	MAY 10. 5	2016	Barometric Pressui		"Hg	Project No:	21656
~ 1 LPM for 2		NDL - No Dectect	able Leak		Field Blank Pair ID):	
						16-21656	- V057-
Tube Pair 1 St	tart Timo:	854	Initial Leak Check	NDL@	/9 "Ha	Sample ID: 1A	
		0 14	<u> </u>	NDL @		Lab ID: CHW10	
Tube Pair 1 Er Clock	Dry Gas	4 1 4	Final Leak Check Temper	A A DESCRIPTION AND AND AND AND AND AND AND AND AND AN	L) ng	Meter	Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	℃	°C	°C	"H₂O	"Hg
0	26.24	/ 13/1	146	19	26	1.1	5
5	31.5	135	147	1/)	29	1.1	
10	369	1311	100	10	<u> </u>	1 1	C
15	1 27:41		122	- 1 Z	28	1.1	7
	11/2 33	133	1367		295	/ /	73
20	40,14			Q = Q	<u> </u>	£ - \ _	d ~www
			Transaction to	. 8	i i i i i	Samuela ID: 37 /	-13
Tube Pair 2 S		<u>ひ</u> 43	Initial Leak Check	<u> </u>		Sample ID: 2/	1
Tube Pair 2 E	nd Time: 🦷 🗍		Final Leak Check Temper	<u> </u>	/ Hg	Lab ID:と什心ル Meter	19 24,28 Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	°C	°C	°C	"H ₂ O	"Hg
0	46.86	136	1.63	11	77	1.1	
5	524	13/	103	10	30	10 (
10	57.9	- 199	16/13	3	31	1 1	
		12/1	11/0		31	1 1	$-\gamma$
15	63.2	105	143	<u> </u>		$L < \mathbb{L}$	
20	1 60 7	152	ML		31	l. l	· · · · · · · · · · · · · · · · · · ·
		and the same of th	1		63 6 FE. x	La	
Tube Pair 3 S		· waster §	Initial Leak Check	<u> </u>		Sample ID: 3/	1,36
Tube Pair 3 E	2 762	A Company	Final Leak Check	<u> </u>	<u>/ ろ "Hg</u>	Lab ID: 34:	<u> 3B C什Ы//</u> Pump
Clock Time	Dry Gas Meter	Probe	Temper Stack	Condensor	Meter Avg	Meter / Pressure	Vacuum
	L	°C	°C	°C	°C	"H₂O	"Hg
0	68.37	133	11.//	10	90	1 1	Lefe
5	1000	(3)	13	- 4	31	1.	<u> </u>
	122	133	110	8	32	1 1	~~~
10	10.0	134	146-		- S. Green.	1/1	
15	34.	155	191	<u> </u>	35	1:1	
20	139,27	155	14/	<u>`</u>		<u> </u>	Common
<u></u>							- A - A - A - A - A - A - A - A - A - A
Tube Pair 4 S	Start Time: /८	19	Initial Leak Check	<u> NN</u> @	/3 "Hg	Sample ID:	2A, 12B
Tube Pair 4 E		39	Final Leak Check	NOL @	<u>/5</u> "Hg	Lab IDCEJo3	7 7 7 700 200
Clock	Dry Gas		Tempe		NA-4 0	Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
		<u> </u>				1 1	1 15
0	- 1914 -	13/	139	-49		111,	
5	174.4	34	139	9-	194	1-1-1	
10	141.0	134	140	<u> </u>	25	1 = 1	133
15	1104.2	<u> </u>	147	<u> </u>	33	1. (-	<u>L</u>
20	1109164	(33	1 141	8	33	1-1	6

ORTECH Environmental Vost Data Sheet

Plant:	Covanta DYEC		Test Condition:	7			<i>5.</i> /
Plant Location	r Courtice, ON		Test No:	of the second se	/	Control Box ID:	<u>lof</u>
Test location:	APC Outlet No	_{	DGMCF: 0 -	998 J		Operator:	1/1/2
Date: MA	r 10, 2010	·	Barometric Pressu	re: <u>30.01</u>	"Hg	Project No:	21656
~ 1 LPM for 2		NDL - No Dectect	able Leak		Field Blank Pair IC):	
<u> </u>					4	16-216	56-1051
Tube Pair 1 St	tart Time: 10	149	Initial Leak Check	<i>∨</i> /∩ <i>L</i> _@	15 "He	Sample ID:	0 1/0
Tube Pair 1 E		79	Final Leak Check	1/// @		Lab ID:CHW11	1 4A 48
Clock	Dry Gas		Temper	A S. S. Marian	() 116	Meter	Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	°C	°C	°C	"H₂O	"Hg
0	9,79	124	143	9	29	1, (
5	treat	- 2	140	<u> </u>	32	7,1	7.5
	21.2	120		*	33	1, 1	4
10	15/15	<u> </u>	 		32	1 1	
15	40.6		/44			l: (
20	131,171	<u> 435 </u>	199		32_	(-)	<u> </u>
		-		ž potin-	* ama		
Tube Pair 2 S	4.4	15	Initial Leak Check	NDC @			A 5B
Tube Pair 2 E		55	Final Leak Check	NIDL @	18 . Z "Hg	Lab ID: CHW	114
Clock	Dry Gas		Temper			Meter	Pump
Time	Meter	Probe	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
	<u> </u>	°C	<u> </u>	<u> </u>		1120	178
0	36.25	134	142		30	le (<u> </u>
5	30.22	133	142	13	39-	0.1	9.6
10	41.32	136	142	14	34	0.1	4.2
15	46.46	134	142	(2	33	1.0	9-3
20	5145	134	142	12	39-	(0 9)	9.3
<u> </u>							
Tube Pair 3 S	Start Time: 114	5	Initial Leak Check	NDL @	19-5Hg	Sample ID:	A, 68
Tube Pair 3 E			Final Leak Check	M)L @		Lab ID: CHW	
Clock	Dry Gas		Temper		192	Meter	Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	°C	°C	°C	"H ₂ O	"Hg
0	54 :7	134	143	16	30	1.1	6.5
5	60.2	134	10/1	14	33	1.(77
10	TE.U	134	1/1/25	17	33	11	7.5
15	140 01	134	Non	17	34	1.7	7.5
	+445		1131	11			
20	17240	134	171		34	1 60	7.5
		\$.00%				Ta : := / **	20 :00
Tube Pair 4 S	Start Time: /Z	-1'4-	Initial Leak Check			Sample ID:	
Tube Pair 4 E	e	34_	Final Leak Check		Hg"	Lab ID: CEJ	
Clock	Dry Gas	Duaka		ratures Condensor	Meter Avg	Meter Pressure	Pump' Vacuum
Time	Meter L	Probe °C	Stack °C	°C	°C	"H ₂ O	"Hg
				47	+ 24	1 7 7	5
0	1755	<u> </u>	143	- 49 -	1-34	1 / / /	
5	310	134	142	12	34	1.	6
10	96.(134	142	17_	13	1 /- 1	162
15	191.0	133	142	H	34	1.(65
20	9579	133	152	1	34	1/1	65

Vost Data Sheet

			Vost Da	ta Sheet		TRIP B	CANY
T			T			30A7	
	Covanta DYEC		Test Condition:			*	<u> </u>
Plant Location	Courtice, ON		Test No:			Control Box ID:	4
Test location:	APC Outlet No		DGMCF: 0	<u>.989 </u>	J	Operator: 🏿 🎾	105
Date: M	MY 10. 2	016	Barometric Pressu	re: 39.98	ු "Hg	Project No:	21656
~ 1 LPM for 20	0 minutes	NDL - No Dectect	able Leak		Field Blank Pair IC	: CHW127	10A,10B
b						16-216	056-W57
Tube Pair 1 St	art Time:	244	Initial Leak Check	NOL @	/-5 "Hg	Sample ID: 7%	F. 78
Tube Pair 1 Er	- 0	364	Final Leak Check	10 e		Lab ID:CHW1	24 74,78
Clock	Dry Gas		Temper	/	1 - 18	Meter	Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	°C	°C	°C	"H₂O	"Hg
0	96.10	135	140	17	Z()	1.(5.5
5	101.9	136	147	W	32	1.1	5.5
10	107.7	135	147_	17	-33	1.1	7.5
15	117 7	135	142	17	37	1.(Ŕ
20	111.75	124	143	17	33	1. (9
L				7		<u> </u>	
Tube Pair 2 St	tart Time:	/3/3	Initial Leak Check	NDL@	/5 "Hø	Sample ID:	A, 83
Tube Pair 2 E		333	Final Leak Check	\(\lambda\)\(\lambda\)\(\lambda\)\(\lambda\)		Lab ID:	
Clock	Dry Gas	and the second	Temper	A CONTRACTOR OF THE PROPERTY O	7 (118	Meter	Pump
Time	Meter	, Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	°C	°C	°C	"H ₂ O	"Hg
0	17.4	135	143	18	.50	1.7	5
5	12.3	133	140	12	34	1.1	6.5
10	79.3	133	143	/-3	34	101	57
15	122 (1)	134	143	17_	34	1.1	7
20	38 UT	123	1700	17_	301	1.0	44
				7		1 7 5	
Tube Pair 3 S	tart Time	1344	Initial Leak Check	NDL @	17) "Hø	Sample ID:	94,98
Tube Pair 3 E		TUNU	Final Leak Check	NOL @		Lab ID:Cけいに	
Clock	Dry Gas		Tempe	ratures		Meter	Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	°C	°C	°C	°C	"H ₂ O	"Hg
0	38.66	133	145	15	31	6,0	5
5	44.7	134	142	16	34	1.0	55
10	49.5	134	144	14	34	1.1	6.5
15	5410	133	145	15	34	1.1	- Sur-7
20	50 00	134	145	TIG	34	77	Commond
	1 - 1 70					1 1 1	
Tube Pair 4 S	tart Time:	1430	Initial Leak Check	//// @	/ l- "Ho	Sample ID: 14/	4 1413
Tube Pair 4 E		11/20	Final Leak Check	VOL @		Lab ID: CEJ	
Clock	Dry Gas	1421		ratures	Seem Community	Meter	Pump
Time	Meter	Probe	Stack	Condensor	Meter Avg	Pressure	Vacuum
	L	<u>°</u> C	°C	°C	°C	"H₂O	"Hg
0	160.13	(35	146	20	30	1,(4
5	165.7	13/5	145	15	34	1.1	4,5
10	71.0	134	144	15-1	34	1.0	4.5
15	76.(河边	144	13	34	1 1	Carrier Carrier
20	12/11		1 141	ŀÍ	74	1 7.7	- Common - C
	1 ()1,,,		1 1 1 1	I I I	<u> </u>		<u> </u>

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Vost Data Sheet

				a Sheet			
Plant:	Covanta DYEC		Test Condition:	######################################		1.5	
Plant Location:	Courtice, ON		Test No:	one-section of the section of the se		Control Box ID:	1097 H
Test location:	APC Outlet No	Z-	DGMCF: 0.988 J		8A I	Operator: 10-111-	
Date: Mp	4,20	16	Barometric:	99:43	1 Ha	Project No:	21656
~ 1 LPM for 20 r	• • • • • • • • • • • • • • • • • • • •	NDL - No Dected	table Leak		Field Blank Pair		113 4
				considerate de la considerate del considerate de la considerate de la considerate de la considerate del considerate del considerate de la considerate del co	dan iwayaa aa	7 /	=1112
Tube Pair 1 Star	t Time:	13	Initial Leak Check	W) @ 16	"Hg	Sample ID: /	6A 16B
Tube Pair 1 End		33	Final Leak Check		Hg		6/4 16/3
Clock	Dry Gas		Temper			Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
0	59.38	130	139	26	Z	1.1	4.5
5	04.3	131	139	19	29		4.5
10	49.3	132	139	17	31	7.7	~
15	74.3	137	139	17	30	1 1	6
20	79:22	- 132	139	17	30	1./	. 6
			de maria de la companya de la compa		-		'€J043
Tube Pair 2 Star	t Time: 94	41	Initial Leak Check	ML@ 12.5	5"Hg	Sample ID: /	74 18
Tube Pair 2 End	7 4 6	1	Final Leak Check	A	<u> </u>	Lab ID:	74 1713
Clock	Dry Gas		Temper		•••	Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H ₂ O	Vacuum "Hg
0	14.65	120	170	90	29	1 / 1	6.5
5	QUE	13	139	<u> </u>	32_		4
***************************************	1833	12-	122	17	37_		75
10	一首山本	12/	 	1/2	32		75
15	1/00/09	104	130	- 19	33	1 /: \	1-4-
20	1700,03	121	<u> </u>		<u> </u>	1 / (<u> </u>
Tubo Dein 2 Ce	et Time	1008	Initial Lank Chart	AIN A 1E		Cample ID	1044 4 a 10 r
Tube Pair 3 Star			Initial Leak Check		"Hg / ",,_	Sample ID: /	10 10 15
Tube Pair 3 End Clock	Time: /	025	Final Leak Check Temper	M	[/] "Hg	Lab ID: / 5	<u>が牛」(7)/5</u> - ^ Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg	Pressure "H₂O	Vacuum "Hg
0	100.65	132	179	19	32	1.	455
5	1/05 5	131	139	16	34	1 7.7	6.0
10	1/10	131	139	17.	34	7 7	71.()
15	116.5	139	138	11.	35	1/1	7.0
20	177.05	139	139	16	34	1 /. 1	710
		5 65 6				CE.	2 4
Tube Pair 4 Star	rt Time:	39	Initial Leak Check	NIX @ IS	"Hg	Sample ID: /	7A 19R
Tube Pair 4 End		'Ed	Final Leak Check		"Hg	Lab ID: /4	3A 19B
Clock	Dry Gas		Tempe			Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
0	22.44	175	139	-22	32	1.1	5.0
5	77.4	130	139	17	36		55
10	23.4	131	138	16	35	1 7.7	45
15	139 n	130	I nã	Ti G	135	1 1 7	175

Rev: Oct 22, 2014

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Vost Data Sheet

Plant:	Covanta DYEC		Test Condition:	MATERIAL DE LA COLUMN DE LA COL		
Plant Location:	Courtice, ON		Test No:	2	Control Box II	o: 4
Test location:	APC Outlet No	Z	DGMCF: O.C	188 /	Operator:	DIVOR
Date: ► N	NAY 5 2	016	Barometric: ්ර	1,57	Ha Project No:	21656
~ 1 LPM for 20	minutes	NDL - No De	ctectable Leak	Field Bla	nk Pair ID: 15A	. 153

Tube Pair 1 Star	t Time: 💍	120	Initial Leak Chec	WDL@ 21	"Hg	Sample ID: 2	2A, 22B
Tube Pair 1 End	be Pair 1 End Time:		Final Leak Check	Lab ID: Z	2A, 22B		
Clock	Dry Gas			ratures		Meter	Pump
Time	Meter L	Probe °C	Stack %	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
0	62.48	132	243	29	29	1.1	4
5	67-19	132	283	195	37_	l (c)	4,5
10	71.7	137_	2-63	16	33	1.(6
15	1 77.7	131	282	40	34	/.	6.5
20	43,52	131	261	W	34	1.	6.5

Tube Pair 2 Star	rt Time: 09	48	Initial Leak Check	Sample ID: 23	3A, 23B		
Tube Pair 2 End Time: (0 (28	Final Leak Check	NQ @ 14	≶"Hg	Lab ID: Z	3A Z3P
Clock			Temper	atures		Meter	Pump
Time	Meter L	Probe °C	Stack %F	Condensor °C	Meter Avg °C	Pressure "H ₂ O	Vacuum "Hg
0	(63.60)	137_	282	21	32	1.1	4
5	89.4	132	794	195	34	1.1	4.5
10	194.9	152	281		35	1.1	4-5
15	100.2	132	282	16	36	1 1.1	4,5
20	105,40	131	292	15	36	/,)	5

Tube Pair 3 Sta	art Time: /(218	Initial Leak Check	WN @ 14:	9Hg	Sample ID: 24	A-24B	
Tube Pair 3 En	d Time:	188 :	Final Leak Check	(@ 1/2 5"Hg		Lab ID: 24	41, 2413	
Clock	Dry Gas		Temper	ratures (Meter	['] Pump	
Time	Meter L	Probe °C	Stack %	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg	
0	5.63	132	293	21	32		4.5	
5	10.6	132	293	lh	34	1,1	5	
10	16.7	131	299	<u> 16</u>	36_	1 (. (5.5	
15	12.6	132	294	16	36		B	
20	27.30	133	2504	i S	36	1.1	6	

Tube Pair 4 Sta	rt Time: 10ら	く	Initial Leak Check	MX-e 19	"Hg	Sample ID: 25	54 2513	
ube Pair 4 End Time: $1/\mathcal{O}$		5	Final Leak Check	NIX e 16	"Hg	Lab ID: 75	11:2513	
Clock	Dry Gas		Tempe			Meter	/Pump	
Time	Meter L	Probe °C	Stack %/	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg	
0	27.52	132	7982	20	35		Lanfa	
5	33.0	132	264	76	37		B	
10	34,4	135	285	16	37		6	
15	いらう	135	295	16	39		6	
20	114.64	135	285	16	37		Va	

Rev: Oct 22, 2014

				ita Sheet			
Plant:	Covanta DYEC	344500433400,03404139,107	Test Condition:				
Plant Location	: Courtice, ON		Test No:	"Tan	alidek Militariko arria musumonyen popungan yang ang ang ang ang ang anjara musul	Control Box ID:	ч
Test location:	APC Outlet No		DGMCF:	0966	7	Operator:	· all
Date: ∧	MAY 5, 20	16	Barometric:	139.da	7 T T T T T T T T T T T T T T T T T T T	Project No:	21656
~ 1 LPM for 20		NDL - No Dect	ectable Leak		Field Blank Pair	· ID:	
Tube Pair 1 St	art Time:	1306	Initial Leak Chec	:kWDC@14	"Hg	Sample ID: 26	A. 26B
Tube Pair 1 En	d Time:	1320	Final Leak Check	NOL@15	"Hg	Lab ID: 26	DA, 2613
Clock	Dry Gas			eratures		Meter	Pump
Time	Meter L	Probe °C	Stack	Condensor °C	Meter Avg °C	Pressure "H ₂ O	Vacuum "Hg
0	43.60	132	781	22	30	1.(5
5	53.7	132	250	146	33	1.1	5.5
10	1 59:0	132	261	\Box	33	1. (6
15	63.0	130	287	1	30	1.7	6
20	67,70	132	251	176	134	1.1	6,5
Tube Pair 2 St	art Time: 135	34	Initial Leak Chec	ck/OL@ 14) "Hg	Sample ID: 2	27 4 270
Tube Pair 2 En	nd Time: 13°	5 4	Final Leak Checl	5m 1	o "Hg	Lab ID: Z	74 216
Clock	Dry Gas		Tempe	eratures		Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg	Pressure "H₂O	Vacuum "Hg
0	1 68,04	13.1	1993	2.7	T 57	1.1	

Tube Pair 2 Start	Time: 105	<u> 54 </u>	Initial Leak Chec	<u>ku/l@ (7)</u>	"Hg	Sample ID: Z	-115 C113	
Tube Pair 2 End Time: 1354		34	Final Leak Check	ML @ 15	"Hg	Lab ID: 27A 21B		
Clock	Clock Dry Gas		Tempe	ratures		Meter	Pump	
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg	
0	68.04	131	1283	27	52	1.1	6	
5	73.01	131	253	18	33	1./	(1)	
10	79.0	131	780	16	35		7,5	
15	43,9	132	283	16	35	7.1	_ K \	
20	88.51	132	1282	15	35	(1)	3.5	

Tube Pair 3 Star	Tube Pair 3 Start Time: 140 (Initial Leak Chec	WDLe 14.5	Sample ID: 28A, 28B		
Tube Pair 3 End Time: 142		21	Final Leak Check	eri elementa en el martinología el el 🕏 🔊 el 🛩	O"Hg	Lab ID: 25A, 25	
Clock	The second secon		Tempe	ratures		Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
0	88.77	132	1 193	20	33		4
5	93.50	132	2957	18	. 36	7. (45
10	96.0	132	783	17	37	7. (5.5
15	103.5	137	263	17	36		6
20	IOA.U	135	462	10	37		6.5

Tube Pair 4 Start	Time: 142			k/102@ Z(Sample ID: 29A, 29B		
ube Pair 4 End Time: /(//		7	Final Leak Check	ND @ 20	"Hg	Lab ID: 2	94,291
Clock	Clock Dry Gas			ratures		Meter	Pump
Time	Meter L	Probe °C	Stack °C	Condensor °C	Meter Avg °C	Pressure "H₂O	Vacuum "Hg
0	8, 33	130	284	70	35	1.(5
5	13.3	132	293	216	37	(.)	6.5
10	17.9	133	254	15	37	1.(8
15	23.0	133	29	[5	37		8
20	20.5	123	244	15	37	1.,	8

Rev: Oct 22, 2014

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	0.988	26.22	46.72	20.50	30,01	1.10	28.0	20.17	0.0202
1.2	0.988	46.86	68.20	21.34	30.01	1.10	30.0	20.85	0.0209
1-3	0.988	68.32	89.27	20,95	30.01	1.10	31.2	20.39	0.0204
1-4	0.988	89,40	109.64	20.24	30.01	1.10	31.6	19.68	0.0197
,	((T	,	(000	7	ţ	7	9000
2-1	0.988	8/.6	31,1/	21.39	30.0I	T.TO	37.6	67.07	0.0208
2-2	0.988	31.25	51.45	20.20	30.01	1.02	32.2	19.59	0.0196
2-3	0.988	54.70	75.42	20.72	30,01	1.10	32.8	20.06	0.0201
2-4	0.988	75.53	95.78	20.25	30.01	1.10	33.0	19.60	0.0196
3-1	0.988	96.10	117.25	21.15	29.98	1.10	32.2	20.50	0.0205
3-2	0.988	17.40	38.41	21.01	29.98	1.10	33.2	20.30	0.0203
3-3	0.988	38.66	59.90	21.24	29.98	1.10	33.4	20.51	0.0205
3-4	0.988	60.13	81.17	21.04	29.98	1.10	33.2	20.33	0.0203
								A CONTRACTOR DE LA CONT	

* 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./	DGMCF	Initial DGM	Final DGM	Actual Vol.	Barometric	Average DGM	Average DGM	Corrected	Corrected
Pair No.		Reading	Reading	Sampled	Pressure	Pressure	Temperature	Volume	Volume
		(1)	(1)	(1)	(in Hg)	del H (in H2O)	(၁,)	(1)*	(Rm3)*
1-1	0.988	59.38	79.32	19.94	29.47	1.10	29.4	19.17	0.0192
1-2	0.988	79.65	100.03	20.38	29.47	1.10	31.6	19.46	0.0195
1-3	0.988	100.65	122.05	21.40	29.47	1.10	33.8	20.28	0.0203
1-4	0.988	22.44	44.08	21.64	29.47	1.10	34.6	20.46	0.0205
· Eucotae									
2-1	0.988	62.48	83.52	21.04	29.57	1,10	32.4	20,10	0.0201
2-2	0.988	83.87	105.40	21.53	29.57	1.10	34.6	20,42	0.0204
2-3	0.988	5.63	27.30	21.67	29.57	1,10	34.8	20.54	0.0205
2-4	0.988	27.52	48.41	20.89	29.57	1.10	36.6	19.69	0.0197
**************************************									•
3-1	0.988	48.60	67.70	19.10	29.56	1.10	32.8	18.22	0.0182
3-2	0.988	68.04	88,51	20.47	29.56	1.10	34.0	19.45	0.0194
3-3	0.988	88.77	108.00	19.23	29.56	1,10	35.8	18.16	0.0182
3-4	0.988	8,33	30.50	22.17	29.56	1.10	36.6	20.89	0.0209
· ·									

* Dry at 25°C and 1 atmosphere



APPENDIX 8

Aldehydes Field Data Sheets (8 pages)

The state of the s	
Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	
Test location:	APC Outlet No.
Date:	MAY 01. 2016
Project No.:	,21656

Measuring Device	MII Number
Control Module	+ + SON
NOVA	
Barometer	ママリードへの

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Δ	Bar Bar
	A CHARLES AND A

Pump	Vacuum	EH.	Gauge		Zasseren .		7	2	2			Comment of the second		No.	Same		
Meter	Pressure	ΥV	"H20	ブ ! 〇	15.0	100	50	7.0	<i>か:0</i>	 	オーロ	から	50	ナーの	7.0		
Meter Temperature	Inet		ပ		g g of the second second	The state of the s	and public spaces	Contact to the Contac		CONTRACT SALES	9224cb ++++			w-246			
Meter T	Outlet	まし	ပ္စ	92	Security Sec	(m) 2m	(I) East	R	<u>-</u>	N	7	60 00	N	3	7		
Impinger	Outlet	- Mariana	ွင	S Charles	Dis les	Con Con	7	N	72	ろ	V	3	7	727	7		
Oven	Temp		သ	R	787	50.60	50 K		120	8	(V)	Ŋ	/S/	3	9		
Stack	Lemb		ႇင	121	りた	F	3	3	5		N 2	5		らき	100		
Probe	Temp		ွ	552	0.00	0	V V	N	X	りて	182	139	1351	T	100 m		
Dry Gas	Meter		H	らた	7.2	45.50	7	2000	27.0	かった	1. 1. 1.	10:05	200	- T	1000 V	No Solve	
Clock				0	'n	02	15	20	25	30	35	40	45	50	55	09	

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Sec. Sec.	11	۵	
	1	ck:	K:
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ne:	ime:	Leak Chec	Final Leak Check
Start Time:	Finish Time:	al L	l Le
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0	Sample Volume:	Average DGM Temp:	Average DGM ∆ H:
1 1 1 1	21.0	30%	7:0

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Comments:

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Operator:

ORTECH Environmental CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	
Test location:	APC Outlet No.
Date:	9102 6 ABW
Project No.:	, 21656

Measuring Device	MII Number
Control Module	JO2 CF
NOVA	•
Barometer	NOW IND

P. S. S.

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Dump	Vacuum	Hz.	Gauge	Same	Č	las.	Lake	C	12	Sanda Sanda	Comp	2	Committee Committee	2	Section of the sectio	0	
Meter	Pressure	ΗV	"H2O	9.4	j	J O	+ 0	<i>y</i>	て。の	から	J 0	3.0	2.0	から	J. C.	て、つ	
Meter Temperature	Inlet		၁့	Physiology	araneereen yn i			and the same of th	e en som en		anouse receive		nt-50-55-10-40	age and facility	aerre (453) (18		
Meter To	Quttlet	かると	°C	~	M	ナい	さ	よ	1750	70	7	3	I So	25	X	34	
Impinger	Outlet		၁့	2(7	2	00	00	0	7	10	£	5	22	100		
Oven	Temp		၁	188	1	ると	5	法	S	VV	727	100	20	28/	727	131	
Stack	Temp		၁	186	3	3	3	ジュ	15	13		いさ	22	25	Ĩ	55	
Probe	Temp		ပ	Q	さ	120		283	70	735	1337	133	755	782	X	7	
Dry Gas	Meter			12/05/07	7	120	70.00	1 .		7413	18.8	7 5	るころ	100 m	200	り、なが	
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Sample Volume:	32.39
Average DGM Temp:	(23.0)
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Comments:

ORTECH Environmental

Operator:

ORTECH Environmental CARB 430

THE RESIDENCE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAME		
Plant:	Covanta DYEC	
Plant Location:	Courtice, Ontario	
Test No.:	2	
Test location:	APC Outlet No.	
Date:	MAG 9 20 Rs	
Project No.:	21656	

Measuring Device	MII Number
Control Module	7 1507
NOVA	
Barometer	のと、ことと

P_{Bar} Sys

Clock	Dry Gas	Probe	Stack	Oven	Impinger	Meter Te	Meter Temperature	Meter	Pump
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Average DGM Temp:	<i>3</i> .78
Average DGM A H:	20

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Comments:

ORTECH Environmental

Operator:

Operator:

Sample Volume: Average DGM Temp: Average DGM ∆ H:

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Col Lpm @

Initial Leak Check: Final Leak Check:

Comments:

Start Time: Finish Time:

## ORTECH Environmental CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	
Test location:	APC Outlet No. 7
Date:	MAY & 2010
Project No.:	21656

Measuring Device	MII Number
Control Module	1007 th
NOVA	
Barometer	

Par S.c.2.

Clock	Dry Gas	Probe	Stack	Oven	Impinger.	Meter Te	Meter Temperature	Meter	Pump
Time	Meter	Temp	Emp	Temp	Outlet	Outlet	met	Pressure	Vacuum
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# ORTECH Environmental CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	
Test location:	APC Outlet No.
Date:	MAY 50 2016
Project No.:	21656

Measuring Device	MII Number
Control Module	5 700
NOVA	
Barometer	240 - 1240 - 1

Pump	Vacuum
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emperature	*alul
Meter To	Anthr
Impinger	Ontlot
Oven	Tomo.
Stack	Toma
Probe	Tomp
Dry Gas	Motor
Clock	Time

Pump	Vacuum	oH.	Gauge	2	2	~	2	Cost	Z	2	2	2	2	2	V		
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Name of the last o	Carlo Europe				
Start Time: / /	\ \				
Finish Time: //	33				1
nitial Leak Check:		27		Lpm @	-/ "Hg
Final Leak Check:		7.0	( Lp	Lpm @ 6	/ " Hg
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Comments:

Operator:

## ORTECH Environmental CARB 430

Plant:	Covanta DYEC
Plant Location:	Courtice, Ontario
Test No.:	6
Test location:	APC Outlet No. 2000
Date:	MAY 6,2016
Project No.:	21656

Measuring Device	MII Number
Control Module	U057 4
NOVA	
Barometer	TAN, CAN

Clock	Dry Gas	Probe	Stack	Oven	Impinger	Meter To	Meter Temperature	Meter	Dump
	Meter	Temp	den de	em	Outlet	製	Inlet	Pressure A H	Vacuum "Hg
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Sample Volume:	20.77
Average DGM Temp:	2.16
Average DGM A H:	びら

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	sample @ ~0.5 lpm for 60	
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Comments:

ا ORTECH Environmental

Operator:

### Covanta - Durham York Energy Centre Boiler No. 1 BH Outlet Aldehydes Sample Volume Corrections

Test	DGMCF	Initial DGM	Final DGM	Actual Vol.	Barometric	Average DGM	Average DGM	Corrected	Corrected
Š.		Reading	Reading	Sampled	Pressure	Pressure	Temperature	Volume	Volume
		(1)	(1)	(r)	(in Hg)	del H (in H ₂ O)	(0,)	*(n)	(Rm²)*
Т	0.985	24.92	55.95	31.03	29.85	0.40	30.8	29.94	0.0299
2	0.985	56.21	88.60	32.39	29.86	0.40	33.7	30.97	0.0310
m	0.985	88.79	119.00	30.21	29.85	0.40	32.8	28.96	0.0290

* Dry at 25°C and 1 atmosphere.

### Covanta - Durham York Energy Centre Boiler No. 2 BH Outlet Aldehydes Sample Volume Corrections

Test	DGMCF	Initial DGM	Final DGM	Actual Vol.	Barometric	Average DGM	Average DGM	Corrected	Corrected
Š		Reading	Reading	Sampled	Pressure	Pressure	Temperature	Volume	Volume
		(1)	(ר)	(1)	(in Hg)	del H (in H ₂ O)	(°C)	*(1)	(Rm²)*
₩	0.985	31.88	61.20	29.32	29.62	0.40	33.5	27.83	0.0278
7	0.985	62.00	93.61	31.61	29.62	0.40	37.1	29.65	0.0297
m	0.985	93.85	124.34	30.49	29.61	0.40	34.6	28.82	0.0288
									portional designation of the second s

* Dry at 25°C and 1 atmosphere.



### **APPENDIX 9**

ORTECH Sample Log/Chain of Custody Forms (13 pages)

# ORTECH Environmental Sample Log Particulate and Metals Samples

### Covanta

Client: Covanta Job/Report Number: 21656 Received By: Dan Turton

How Received: Train recovery Job Assigned To: Maxxam

QUOTE #: 1601007PO Ortech PO# : 21656 - J2227

ORTECH Sample ID	Sample	Sample		Sample	Sample
16-21656-PM-	Date	Description	Location	Media	Analysis
1	02-May-16	Test 1	#1 APC Outlet	Acetone	Particulate & Metals
	·· · • <b>,</b>	Probe Rinse Acetone			
2		Test 1		0.1N Nitric	Metals
		Probe Rinse Nitric			
3		Test 1	ay a quantida gi manganan a "anny matanan mandalah manan dibihan manan mahalah	Particulate	Particulate & Metals
		Filter			
4		Test 1		Nitric/Peroxide	Metals
		Impinger 1,2,3 Solution			
5		Test 1		Acid. KMnO4	Mercury
		Impinger 4, 5 Solution			
6		Test 1		8N HCI	Mercury
		Impinger 4, 5 Rinse			
7	02-May-16	Test 2	#1 APC Outlet	Acetone	Particulate & Metals
	,	Probe Rinse Acetone			
8		Test 2		0.1N Nitric	Metals
		Probe Rinse Nitric			
9		Test 2		Particulate	Particulate & Metals
		Filter			
10		Test 2		Nitric/Peroxide	Metals
		Impinger 1,2,3 Solution			
11		Test 2		Acid. KMnO4	Mercury
		Impinger 4, 5 Solution			
12		Test 2		8N HCl	Mercury
		Impinger 4, 5 Rinse			

### ORTECH Environmental Sample Log Particulate and Metals Samples Covanta

Client: Covanta Job/Report Number: 21656 Received By: Dan Turton

How Received: Train recovery Job Assigned To: Maxxam

QUOTE #: 1601007PO Ortech PO# :-21656 - J2227

ORTECH Sample ID	Sample	Sample		Sample	Sample
16-21656-PM-	Date	Description	Location	Media	Analysis
			112 ABC 0 15 1	<b>A t</b>	Particulate & Metals
25	03-May-16	Test 1	#2 APC Outlet	Acetone	Particulate & Metais
		Probe Rinse Acetone		O dat bite	Metals
26		Test 1		0.1N Nitric	ivietais
		Probe Rinse Nitric		D 11 5 1	Particulate & Metals
27	indifferent histories annualises annualises annualises annualises que como annualismo impari per	Test 1	THE THE STATE OF T	Particulate	Par liculate & Wetais
		Filter			N 6 - 4 - 1 -
28		Test 1		Nitric/Peroxide	Metals
		Impinger 1,2,3 Solution			
29		Test 1		Acid. KMnO4	Mercury
		Impinger 4, 5 Solution			
30		Test 1		8N HCl	Mercury
		Impinger 4, 5 Rinse			
31	03-May-16	Test 2	#2 APC Outlet	Acetone	Particulate & Metal:
		Probe Rinse Acetone			
32		Test 2		0.1N Nitric	Metals
		Probe Rinse Nitric			
33		Test 2		Particulate	Particulate & Metal
		Filter			
34		Test 2		Nitric/Peroxide	Metals
		Impinger 1,2,3 Solution			
35		Test 2		Acid. KMnO4	Mercury
		Impinger 4, 5 Solution			
36		Test 2		8N HCl	Mercury
		Impinger 4, 5 Rinse			
43	03-May-16	Blank # 2	#2 APC Outlet	Acetone	Particulate & Metal
		Probe Rinse Acetone			
44		Blank # 2		0.1N Nitric	Metals
		Probe Rinse Nitric			
45		Blank # 2		Particulate	Particulate & Metal
		Filter			
46		Blank # 2		Nitric/Peroxide	Metals
		Impinger 1,2,3 Solution			•
47		Blank # 2		Acid. KMnO4	Mercury
		Impinger 4, 5 Solution			
48		Blank # 2		8N HCI	Mercury
		Impinger 4, 5 Rinse			

Relinquished By:

Relinquished To:

A

JOSEPH UMAY

Date: 1844 4, 16

Date: 2016/05/04

12.03

# ORTECH Environmental Sample Log Region All SamplesCovanta

Client: Covanta
Job/Report Number: 21656
Received by: Dan Turton
How Received, Train-recovery
Job Assigned To: Mauxam
QUOTE 8: 1661007P0 Ortech PGR: 21656 -12227

ORTECH Sample IO 16-21656-PM-	Sample Date	5ample Description	Location	Sample Media	Sample Analysis
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13		Test 3	#1 APC Outlet	Acetone	Particulate & Meta
		Probe Rinse Acetons			
14		Test 3		0.1N Music	Metals
***		Probe Rinse Nitric			
15		Test 3		Particulate	Particulate & Meta
		Figur			
16		Test 3		Nitric/Peroxide	Metals
		impinger 1,2,3 Solution		• •	
.17		Test 3		Acid. KMm04	Marcury
		tropinger 4, 5 Solution			
18		Test 3		8N HCI	Mercury
		Impinger 4, 5 Riose			
19		Stank	Blank	Acetone	Particulate & Met
		Probe Riese Agetone			
20		Bank		0.1N Nitric	Metals
		Probe Binse Nitric			
21		Mark		Particulate	Particulate & Met
		Filer			
22		Blank		Mitric/Peroxide	Metals
		Impinger 1,2,3 Solution			
23		Rlack		Acid, KMnO4	Mercury
		Impirager 4, 5 Solution			
24 - 1		Black		BN HC	Stercury
. €		Impinger 4, 5 Rinse			
37		Test 3	#2 APC Outlet	Acetone	Particulate & Mat
		Probe Rinse Acetone			
38		Test 3		0.1N Music	Metals
yê.		Probe Rinse Nitric			
39		Test 3		Particulate	Particulate & Mei
		Filter			
40 🛊		Test 3		Nitric/Peroxide	Metals
à		Impinger 1,2,3 Solution			
41		Test 3		Atid. XMnG4	Mercury
		Implinger 4, 5 Substion			
42		Test 3		8N HCI	Mercury
		Impinger 4, 5 Rinse			

Relinquished To:

Date:

9/2/7 81919

ORTECH

# ORTECH Environmental Sample Log Method 201A & Method 202

Covanta

Client: Covanta
Job/Report Number: 21656
Received By: Dan Turton
How Received: Train recovery
Job Assigned To: Maxxam

Quote/ PO: 1601007PO - Ortech PO#: 21656 - J2227

ORTECH Sample ID			Sample	Sample	Sample
16-21656-M201A-	Date	Location	Description	Media	Analysis
1	03-May-16	# 1 APC Outlet	Test 1	Acetone	Particulate
-	,		Nozzle & PM10 cyclone rinse		
2			Test 1	Acetone	Particulate
_			PM 2.5 cyclone Rinse		
3			Test 1	Acetone	Particulate
	**************************************		PM 2.5 exit & connectors		
4			Test 1	filter	Particulate
·			Back up filter		
5			Test 1	water	Particulate
•			Impinger Soln & rinse		
6			Test 1	filter	Particulate
ŭ			Secondary Filter		
7			Test 1	Acetone	Particulate
•			Impinger Rinse		
8	03-May-16	# 1 APC Outlet	Test 2	Acetone	Particulate
•	,		Nozzie & PM10 cyclone rinse		
9			Test 2	Acetone	Particulate
ū			PM 2.5 cyclone Rinse		
10			Test 2	Acetone	Particulate
			PM 2.5 exit & connectors		
11			Test 2	filter	Particulate
			Back up filter		
12			Test 2	water	Particulate
- <b>-</b>			Impinger Soln & rinse		
13			Test 2	filter	Particulate
			Secondary Filter		
14			Test 2	Acetone	Particulate
Δ.			Impinger Rinse		

### ORTECH Environmental Sample Log Method 201A & Method 202 Covanta

Client: Covanta

Job/Report Number: 21656

Received By: Dan Turton How Received: Train recovery Job Assigned To: Maxxam

Quote/PO: 1601007PO Ortech PO#: 21656 - J2227

. ORTECH Sample ID			Sample	Sample	Sample
16-21656-M201A-	Date	Location	Description	Media	Analysis
22	02-May-16	# 2 APC Outlet	Test 1	Acetone	Particulate
	•		Nozzle & PM10 cyclone rinse		
23			Test 1	Acetone	Particulate
			PM 2.5 cyclone Rinse		
24			Test 1	Acetone	Particulate
		THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TWO	PM 2.5 exit & connectors		
25			Test 1	filter	Particulate
			Back up filter		
26			Test 1	water	Particulate
2.5			Impinger Soln & rinse		
27			Test 1	filter	Particulate
<b>-</b> ,			Secondary Filter		
28			Test 1	Acetone	Particulate
20			Impinger Rinse		
29	02-May-16	# 2 APC Outlet	Test 2	Acetone	Particulate
23	02 may 10	,	Nozzle & PM10 cyclone rinse		
30			Test 2	Acetone	Particulate
30			PM 2,5 cyclone Rinse		
31			Test 2	Acetone	Particulate
31			PM 2.5 exit & connectors		
32			Test 2	filter	Particulate
32			Back up filter		
33			Test 2	water	Particulate
55			Impinger Soln & rinse		
34			Test 2	filter	Particulate
54			Secondary Filter		
25			Test 2	Acetone	Particulate
35			Impinger Rinse	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	· · <del>-</del> · -
36	02.145.4.16	#2 APC Outlet	Test 3	Acetone	Particulate
30	02-May-16	#2 Arc Outlet	Nozzle & PM10 cyclone rinse	,	
3→			Test 3	Acetone	Particulate
37			PM 2.5 cyclone Rinse		
20			Test 3	Acetone	Particulate
38			PM 2.5 exit & connectors		
20			Test 3	filter	Particulate
39			Back up filter	,,,,,,,	
10			Test 3	water	Particulate
40			Impinger Soln & rinse	Water	, a, a, a, a, a
4.4			Test 3	filter	Particulate
41			Secondary Filter	INTE	, ar createte
			Secondary Fifter Test 3	Acetone	Particulate
42				Acetone	, ar ticulate
			Impinger Rinse		

# ORTECH Environmental Sample Log Method 201A & Method 202

Covanta

Client: Covanta Job/Report Number: 21656

> Received By: Dan Turton How Received: Train recovery Job Assigned To: Maxxam

Quote/ PO: 1601007PO Ortech PO#: 21656 = J2227

ORTECH Sample ID			Sample	Sample	Sample
16-21656-M201A-	Date	Location	Description	Media	Analysis
50	03-May-16	APC#1	Blank # 1	Acetone	Particulate
	,		Nozzle & PM10 cyclone rinse		
51			Blank # 1	Acetone	Particulate
			PM 2.5 cyclone Rinse		
52			Blank #1	Acetone	Particulate
	and the second section of the second section of the second section section section section section section sec	To the second of	PM 2.5 exit & connectors		
53			Blank # 1	filter	Particulate
			Back up filter		
54			Blank # 1	water	Particulate
			Impinger Soln & rinse		
55			Blank # 1	filter	Particulate
			Secondary Filter		
56			Blank # 1	Acetone	Particulate
			Impinger Rinse		
43	02-May-16	APC#2	Blank # 2	Acetone	Particulate
	•		Nozzle & PM10 cyclone rinse		
44			Blank #2	Acetone	Particulate
			PM 2.5 cyclone Rinse		
45			Blank # 2	Acetone	Particulate
			PM 2.5 exit & connectors		
46			Blank # 2	filter	Particulate
			Back up filter		
47			Blank # 2	water	Particulate
			Impinger Soln & rinse		
48			Blank # 2	filter	Particulate
			Secondary Filter		
49			Blank #2	Acetone	Particulate
			Impinger Rinse		

ORTECH has all filters & will determine weights for those.	
Relinquished By:	Date: MAY 4, 16,
Relinquished To: Manual JOJEVIA UNAVI	Date: 2016/05/04
Mary	173.03

### ORTECH Environmental Sample Log Method 201A & Method 202 Covanta

Client: Covanta
Job/Report Number: 21656
Received By: Dan Turton
How Received: Train recovery
Job Assigned To: Macaon
Quote/ PO: 1601907PO Ontech POR: 21656-12227

ORTECH Sample ID			Sample	Sample	Sample
16-21655-M201A-	Date	Location	Description	Media	Analysis
15	(4-May-16	#1 APC Outlet	Test 3	Acetone	Particulate
			Notice & PM10 cyclone since		
:16			Test 3	Acetore	Particulate
			PM 2.5 cyclone Rinse		
17			Test 3	Acetone	Particulate
			PAR 2.5 exit & connectors		
19			Test3	water	Particulate
			Impinger Soin & nase		
1			7AS\$ 3	Acetone	Particulate
ART CONTRACTOR			Empioges Rose		
6	1000	# 1 APC Collet	Test 1	filter	Particulate
			Sacondary Filter		
13			Test ≥	Gter	Particulate
			Secondary Flaer		
20			Test 2	Mer	Particulate
			Secondary Filter		
55			Blank 1	1821	Particulate
			Secondary Filter		
27		# 1 APC Outlin	Test 1	िक्ष	Particulate
			Secondary Filter		
34			Test 2	fater	Particulate
			Secondary Filter		
41			Test 3	filter	Particulati
3			Secondary Filter		
48 6			Efank 2	fiter	Particulate
			Secondary Filter		

Relinquished By 34	D Date: May 5, 16
& Relinquished To	Date
	TL ICIDIA
	Mr. 1. 10''''
	TIME NEWS
	15/17/19 mm/ horse 1060sig 13/18
	7 7 7 7 7 7
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•• ***********************************	

### ORTECH Environmental Sample Log Semi-Volatile Organics Samples Covanta

Client: Covanta

Job/Report Number: 21656

Received By: Angela Nolan How Received: Train Recovery Job Assigned To: Maxxam

Quote / PO: 1601007PO Ortech PO#: 21656 - J2227

	Sample		Sample	Sample
Date	Description	Location	Media	Analysis
9-May-16	Test 1	# 1 APC Outlet	Hexane/Acetone	svoc
	Probe Rinse			
9-May-16	Test 1		Particulate	SVOC
	Filter			
9-May-16	Test 1		N.A.	SVOC
	XAD-II Trap			
9-May-16	Test 1		Ethylene Glycol	SVOC
	Impinger Solution			
9-May-16	Test 1		Hexane/Acetone	SVOC
	Impinger Rinse			
10-May-16	Test 2	# 1 APC Outlet	Hexane/Acetone	SVOC
	Probe Rinse			
10-May-16	Test 2		Particulate	svoc
	Filter			
10-May-16	Test 2		N.A.	svoc
	XAD-II Trap			
10-May-16	Test 2		Ethylene Glycol	svoc
•	Impinger Solution		•	
10-May-16	Test 2		Hexane/Acetone	svoc
,	Impinger Rinse		·	
11-May-16	Test 3	#1 APC Outlet	Hexane/Acetone	SVOC
,	Probe Rinse		·	
11-May-16	Test 3		Particulate	svoc
,	Filter			
11-May-16	Test 3		N.A.	svoc
,				
11-May-16	Test 3		Ethylene Glycol	svoc
,	Impinger Solution		, ,	
11-Mav-16			Hexane/Acetone	svoc
,			•	
11-Mav-16	Blank	Blank	Hexane/Acetone	SVOC
, ,	Probe Rinse			
11-May-16			Particulate	SVOC
,				
11-May-16			N.A.	SVOC
11 11107 10			170.0	3,30
11-May-16			Ethylene Glycol	svoc
11-141dy 110			Ethyletic Glycol	3,00
11_May-16	· =		Heyane/Acetone	SVOC
11-1419A-10	Impinger Rinse		Hexalle/ Accione	3,000
	9-May-16 9-May-16 9-May-16 9-May-16 9-May-16 10-May-16 10-May-16 10-May-16	Date   Description	Date         Description         Location           9-May-16         Test 1         # 1 APC Outlet           Probe Rinse         Probe Rinse           9-May-16         Test 1           Filter         Filter           9-May-16         Test 1           Impinger Solution         Probe Rinse           10-May-16         Test 2         # 1 APC Outlet           Probe Rinse         Probe Rinse           10-May-16         Test 2         Filter           10-May-16         Test 2         Impinger Solution           10-May-16         Test 2         Impinger Solution           10-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Outlet           Probe Rinse         11-May-16         Test 3         # 1 APC Ou	Date   Description   Location   Media

16/10/9 11/9/8 24/16/18

5/6/7

2016/05/12

# ORTECH Environmental Sample Log Semi-Volatile Organics Samples

### Covanta

Client: Covanta Job/Report Number: 21656

Received By: Angela Nolan How Received: Train Recovery Job Assigned To: Maxxam

Quote / PO: 1601007PO Ortech PO#: 21656 - J2227

ORTECH Sample ID		Sample		Sample	Sample
16 - 21656 -SVOC-	Date	Description	Location	Media	Analysis
21	5-May-16	Test 1	# 2 APC Outlet	Hexane/Acetone	SVOC
		Probe Rinse			
22	5-May-16	Test 1		Particulate	SVOC
		Filter			
23	5-May-16	Test 1		N.A.	SVOC
	•	XAD-II Trap			
24	5-May-16	Test 1		Ethylene Glycol	SVOC
	,	Impinger Solution		, ,	
25	5-May-16	Test 1		Hexane/Acetone	SVOC
	<b>,</b>	Impinger Rinse			
26	9-May-16	Test 2	# 2 APC Outlet	Hexane/Acetone	SVOC
	.,	Probe Rinse			
27	9-May-16	Test 2		Particulate	SVOC
	5 ma, 25	Filter		7 31 4.04.14.2	3.55
28	9-May-15	Test 2		N.A.	SVOC
	5 May 20	XAD-II Trap		140 0	3,00
29	9-May-16	Test 2		Ethylene Glycol	SVOC
23	5 Ividy 10	Impinger Solution		Edityiche diyeor	3400
30	9-May-16	Test 2		Hexane/Acetone	SVOC
30	3-1VIay-10	Impinger Rinse		nexane/Acetone	3400
31	10-May-16	Test 3	# 2 APC Outlet	Hexane/Acetone	SVOC
Ji	10-10189-10	Probe Rinse	# 2 Ar C Oddiet	riexarie/Acetorie	3400
32	10-May-16	Test 3		Particulate	SVOC
32	10-101ay-10	Filter		Particulate	3000
33	10-May-16	Test 3		N.A.	SVOC
33	10-1viay-10			N.A.	3000
34	10 May 10	XAD-II Trap		Falsodona Choral	SMOC
54	10-May-16	Test 3		Ethylene Glycol	SVOC
25	40.44 46	Impinger Solution			21.10.0
35	10-May-16	Test 3		Hexane/Acetone	SVOC
2.5		Impinger Rinse			
36	6-May-16	Blank 2	Blank	Hexane/Acetone	SVOC
		Probe Rinse			
37	6-May-16	Blank 2		Particulate	SVOC
		Filter			
38	6-May-16	Blank 2		N.A.	SVOC
		XAD-II Trap			
39	6-May-16	Blank 2		Ethylene Glycol	SVOC
		Impinger Solution			
40	6-May-16	Blank 2		Hexane/Acetone	SVOC
		Impinger Rinse			

Refer to request letter dated April 13, 2016 for lists of analytes.

Relinquished To:

Date:

Date:

yll Molan

2016/05/12

wow low 12:30

# ORTECH Environmental Sample Log AMESA Dioxin & Furan Samples

### Covanta

Client: Covanta Job/Report Number: 21656 Received By: Angela Nolan How Received: Train Recovery Job Assigned To: Maxxam

Quote / PO: 1601007PO Ortech PO#: 21656 - J2227

Sample ID		Sample		Sample	Sample
	Date	Description	Location	Media	Analysis
AMESA-PR-U1-160509-T1	9-May-16	Test 1	# 1 APC Outlet	Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
Unit 1 160509-18	9-May-16	Test 1		N.A	Dioxins/Furans & 12 Dioxin-Like PCBs
		XAD-II Trap			
AMESA-PR-U1-160510-T2	10-May-16	Test 2		Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
Unit 1 160510-19	10-May-16	Test 2		N.A.	Dioxins/Furans & 12 Dioxin-Like PCBs
		XAD-II Trap			
AMESA-PR-U1-160511-T3	11-May-16	Test 3		Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
Unit 1 160511-20	11-May-16	Test 3		N.A	Dioxins/Furans & 12 Dioxin-Like PCBs
		XAD-II Trap			
AMESA-PR-U2-160505-T1	5-May-16	Test 1	# 2 APC Outlet	Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
Unit 2 160505-17	5-May-16	Test 1		N.A.	Dioxins/Furans & 12 Dioxin-Like PCBs
		XAD-II Trap			
AMESA-PR-U2-160509-T2	9-May-16	Test 2		Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
Unit 2 160509-19	9-May-16	Test 2		N.A.	Dioxins/Furans & 12 Dioxin-Like PCBs
		XAD-II Trap			
AMESA-PR-U2-160510-T3	10-May-16	Test 3		Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
Unit 2 160510-20	10-May-16	Test 3		N.A.	Dioxins/Furans & 12 Dioxin-Like PCBs
		XAD-II Trap			
AMESA-PR-PRETEST-U1-160503	3-May-16	Pre-Test	# 1 APC Outlet	Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			
AMESA-PR-PRETEST-U2-160503	3-May-16	Pre-Test	# 2 APC Outlet	Hexane/Acetone	Dioxins/Furans & 12 Dioxin-Like PCBs
		Probe Rinse			

	Probe Rinse		
Please analyze and report AMES	A XAD-II Traps and AMESA Probe Rinses seperately.		
Relinquished To:		Date:	
Relinquished By:	Amgela Molan	Date: OS/ID/IV	

July John Town 2016/05/12 12:30

# ORTECH Environmental Sample Log Acid Gases Covanta

	alagya aadda				Quote / PO #: 1601007PO Ortech PO# : 21656 - J2227
Client: Covanta	21656	Dan Turton	How Received: Train Recovery	Maxxam	1601007PO Ort
Client:	Job/Report Number: 21656	Received By: Dan Turton	How Received:	Job Assigned To: Maxxam	Quote / PO #:

ORTECH Sample ID 16-21656-M26A-	Sample Date	Location	Sample Description	Media	Initial Volume(ml)	Initial Final Volume(ml) Volume(ml)	Sample Analysis
-	02-Mav-16	APC Outlet # 1	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	404.6	HCl, HF & Ammonia
٠ ,	02-Mav-16	APC Outlet # 1	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	391.6	HCI, HF & Ammonia
ı m	02-Mav-16	APC Outlet # 1	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	396	HCl, HF & Ammonia
0 4	03-Mav-16	APC Outlet # 2	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	3878	HCl, HF & Ammonia
· Lr	03-Mav-16	APC Outlet # 2	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	399.3	HCl, HF & Ammonia
n ve	03-Mav-16	APC Outlet # 2	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	407.9	HCl, HF & Ammonia
B! ANK #1	02-Mav-16	APC#1	Impinger Soln & rinse	$0.1N H_2SO_4 + DH_2O$	200	250.7	HCl, HF & Ammonia
BI ANK #7	03-Mav-16	APC # 2	Impinger Soln & rinse	0.1N H ₂ SO ₄ + DH ₂ O	200	253.9	HCl, HF & Ammonia

Analyze for HCl, HF and Ammonta

Relinquished By:

Relinquished To: More JOJEM UMALI

80.21

# ORTECH Sample Log VOCs

Client: Covanta
Project Number: 21656
Received By: David Utley
Job Assigned To: Maxxam

Quote / PO: 1601007PO ORTECH P.O.: 21656 - J2227

Location	Test Number	Pair Number	ORTECH Sample ID 16-21656-VOST-	Sample Date	Sample Description	Sample Analysis	Maxxam Sample Number
#1 APC Outlet	1	1	1A,1B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW108
# I APC Outlet	1	2	2A,2B	May 10, 2016 May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW108
		3	3A,3B	May 10, 2016 May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW103
			•		•	VOCS	CEJ038
		4	12A,12B	May 10, 2016	Archived @ ORTECH	1/06-	
		Field Blank	10A,10B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW127
	2	1	4A,4B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW111
		2	5A,5B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW112
		3	6A,6B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW113
		4	13A,13B	May 10, 2016	Archived @ ORTECH		CEJ039
	3	1	7A,7B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW124
		2	8A,8B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW125
		3	9A,9B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CHW126
		4	14A,14B	May 10, 2016	Archived @ ORTECH		CEJ040
		Trip Blank	30A,30B	May 10, 2016	Tenax and Tenax/Charcoal	VOCs	CEJ056
	Combined	d Condesate		May 10, 2016	Archived @ ORTECH		
gaganggagang ang ang ang ang ang ang ang							-
# 2 APC Outlet	1	1	16A,16B	May 4, 2016	Tenax and Tenax/Charcoal	VOCs	CEJ042
# 2 APC Outlet	1	1 2	16A,16B 17A,17B	May 4, 2016 May 4, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs	CEJ042 CEJ043
# 2 APC Outlet	1			, .			
# 2 APC Outlet	1	2	17A,17B	May 4, 2016	Tenax and Tenax/Charcoal	VOCs	CEJ043
# 2 APC Outlet	1	2 3	17A,17B 18A,18B	May 4, 2016 May 4, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs	CEJ043 CEJ044
# 2 APC Outlet	1	2 3 4	17A,17B 18A,18B 19A,19B	May 4, 2016 May 4, 2016 May 4, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH	VOCs VOCs	CEJ043 CEJ044 CEJ045
# 2 APC Outlet		2 3 4 Field Blank	17A,17B 18A,18B 19A,19B 21A,21B	May 4, 2016 May 4, 2016 May 4, 2016 May 4, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal	VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ047
# 2 APC Outlet		2 3 4 Field Blank 1 2	17A,17B 18A,18B 19A,19B 21A,21B 22A,22B 23A,23B	May 4, 2016 May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ047
# 2 APC Outlet		2 3 4 Field Blank	17A,17B 18A,18B 19A,19B 21A,21B	May 4, 2016 May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ047 CEJ048 CEJ049
# 2 APC Outlet		2 3 4 Field Blank 1 2 3	17A,17B 18A,18B 19A,19B 21A,21B 22A,22B 23A,23B 24A,24B 25A,25B	May 4, 2016 May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016 May 5, 2016 May 5, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs VOCs VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ047 CEJ048 CEJ050
# 2 APC Outlet	2	2 3 4 Field Blank 1 2 3 4	17A,17B 18A,18B 19A,19B 21A,21B 22A,22B 23A,23B 24A,24B 25A,25B	May 4, 2016 May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016 May 5, 2016 May 5, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal	VOCs VOCs VOCs VOCs VOCs VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ047 CEJ049 CEJ050 CEJ051
# 2 APC Outlet	2	2 3 4 Field Blank 1 2 3 4	17A,17B 18A,18B 19A,19B 21A,21B 22A,22B 23A,23B 24A,24B 25A,25B 26A,26B 27A,27B	May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	CEJ043 CEJ044 CEJ047 CEJ048 CEJ049 CEJ050 CEJ051 CEJ052
# 2 APC Outlet	2	2 3 4 Field Blank 1 2 3 4	17A,17B 18A,18B 19A,19B 21A,21B 22A,22B 23A,23B 24A,24B 25A,25B 26A,26B 27A,27B 28A,28B	May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH  Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ048 CEJ049 CEJ050 CEJ051 CEJ052 CEJ053 CEJ054
# 2 APC Outlet	2	2 3 4 Field Blank 1 2 3 4	17A,17B 18A,18B 19A,19B 21A,21B 22A,22B 23A,23B 24A,24B 25A,25B 26A,26B 27A,27B	May 4, 2016 May 4, 2016 May 4, 2016 May 5, 2016	Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal Archived @ ORTECH Tenax and Tenax/Charcoal Tenax and Tenax/Charcoal	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	CEJ043 CEJ044 CEJ045 CEJ047 CEJ049 CEJ050 CEJ051

Refer to request letter dated April 13, 2016 for lists of analytes.

Custody Relinquished by:

angele- Maa

Date: 05/12/1

Custody Received by:

& Juon Town

Date: 26/6 (05/12

10/10/9

1/9/8

3/2/7

5/49

## ORTECH Sample Log Method 430 Samples Covanta

Client: Covanta
Project Number: 21656
Received By: David Utley
How Received: Train recovery

Job Assigned To: Maxxam

QUOTE/P.O.: 1601007PO Ortech P.O.: 21656 - J2227

Test	Test	ORTECH Sample IC	Sample	Sample
Location	Number	16-21656-M430-	Date	Media
#1 APC Outlet	1	1	May 9, 2016	DNPH & Hexane
	2	2	May 9, 2016	DNPH & Hexane
	3	3	May 9, 2016	DNPH & Hexane
	Blank	Blank	May 9, 2016	DNPH & Hexane
#2 APC Outlet	1	4	May 6, 2016	DNPH & Hexane
	2	5	May 6, 2016	DNPH & Hexane
	3	6	May 6, 2016	DNPH & Hexane
	Blank	7	May 6, 2016	DNPH & Hexane
	Trip Spike	8	NA	

			_
Δ	no	MCD	for

Formaldehyde

Acetaldehyde

Acrolein

Relinquished To: _		Date:	
Relinquished By:	angle Nolar	Date: 05/12/16	
_	73	•	



### **APPENDIX 10**

Particulate and Metals Train Recovery Data Sheets (8 pages)

	Impinger 8		Impinger#8 Silica Gel Initial Wt: 950 ( Final Wt: 0000 1					60x 7		ORTECH Enivronmental
	Impinger 6 & 7	CONTAINER TS5-A & TS5-B	CONTAINER TSS-A Empty Wt: -4/5.0 With Imp. 6&7 Solne+16.0 Simp. 6&7 Solne+16.1 After KMnO, Rinse: 355.0 After KMnO, Rinse: 355.0 Total TSS-A: -451.7	MARK FLUID LEVEL SEAL & LABEL TSS-A	CONTAINER TSS-B Empty Wt: イマーム With 156 mL DI H ₂ O: S コーム・ After HCI Rinse: S コーム・ After DI H ₂ O Rinse: と思うして Total TSS-B: コーム・フ	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			ر ا
	Impinger 6 & 7		Impinger#6 KMnO ₄ /H ₂ SO ₄ Empty Wt: トラミ   Imital Wt: テキュート   Final Wt: モーニ・トゥート   Gain: ーニ・トゥート   Colour: エーロート	Impinger #7 KMnO ₄ /H ₂ SO ₄ Empty Wt: $b \cup c_5$ , $\beta$ Initial Wt: $\beta \ni \beta$ , $\beta$	Kinal Wt. 15 Colour: O. 4 P. Colour: C			7.7	CWTR=1 to 7: 4 65 7	WCBDA= 8: 20.1
, , , , , , , , , , , , , , , , , , , ,	Impingers 1, 2, 3, 4 and 5	CONTAINER IS4	Impinger #1 Empty Empty Wt: 0/6 : 6 Final Wt: CAC Clour: CCAL Colour: CCAL Impinger #2 Empty (Knock-out)	3/7/I I I	Impinger #3 HNO ₃ /H ₂ O ₂ Empty Wr: 673 . 1 Initial Wr: 682 . S Final Wr: 838 . S 3 Gain: 41.3	Impinger#4 HNO3/H2O2 Empty Wt: \$\insert{\text{Ch} \in \text{Ch} \in \tex	Impinger#SEmpty Empty Wt: USX f Final Wt: UOC &	AINE! Wt: 1-5 So 0 5 Vo NO, R	MARK FLUID LEVEL	SEAL AND LABEL TS4
	Filter D: 1-5-3-50	CONTAINER TS3	Initial Wt: & & & & & & & & & & & & & & & & & & &				C 44			K
Client: Covanta DYEC Project No.: 21656 Date: SINCALIC Test No.: Test Location: CADC #	Nozzle, Probe Liner Cyclone Bypass & F.H. Filter Housing	CONTAINER TSI	Container TSI Weights Empty Wt. 27-1. After Act. Rinse: 352. 2 Total TSI: 159.2 MARK FLUID LEVEL	CONTAINER TS2	Container TS2 Weights Empty Wt: OCO .C After 0.1N HNO, Rinse: SO   .S Total TS2:       S MARK FLUID LEVEL	SEAL AND LABELAIS		TSS-B (Impinger 6, 7 Rinse-HCl)	Train Loaded By: 1-17  Train Recovered By: The Becovered By: The Becovered Witnessed By: The Becovered By: The By: T	No.

Project No.: 21656

Test No.:

Project No.: 21656

Client:

Project No.: 21656 ZAZ

Date:

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Client:

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Project No.: 21656

Client:

Project No.: 21656



### **APPENDIX 11**

Inorganics Analytical Reports (26 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site Location: COVANTA

### Attention:Chris Belore

ORTECH Environmental 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/05/13

Report #: R3991755 Version: 1 - Final

### **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B689319 Received: 2016/05/04, 12:03

Sample Matrix: Stack Sampling Train

# Samples Received: 24

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Mercury 3C in HCl Rinse	8	2016/05/09	2016/05/10	BRL SOP-00104	EPA M29/M0060 m
Mercury 2B in HNO3/H2O2 Imp.	8	2016/05/06	2016/05/08	BRL SOP-00104	EPA M29/M0060 m
Mercury 3B in KMnO4/H2SO4 Imp.	8	2016/05/06	2016/05/08	BRL SOP-00104	EPA M29/M0060 m
Mercury 1B in Filter + Rinse (M29)	8	2016/05/10	2016/05/10	BRL SOP-00104	EPA 29 m
Hydrogen Halides in H2SO4 Imp.	8	2016/05/09	2016/05/09	BRL SOP-00108	EPA 26A m
Metals B.H. in H2O2/HNO3 Imp.(6020A)	8	2016/05/09	2016/05/09	BRL SOP-00103 / BRL SOP- 00102	- EPA M29/CARB 436 m
Metals F.H. in Filter + Rinses (6020A)	8	2016/05/10	2016/05/10	BRL SOP-00103/ BRL SOP- 00102	EPA M29/CARB 436 m
Ammonium in H2SO4 Impingers (CTM-027)	8	2016/05/10	2016/05/10	BRL SOP-00107	EPA CTM-027 m
>10um Particulates in Rinse	8	2016/05/07	2016/05/09	BRL SOP-00109	EPA M201A/OTM-027 m
2.5-10um Particulates in Rinse	8	2016/05/07	2016/05/09	BRL SOP-00109	EPA M201A/OTM-027 m
<2.5um Particulates in Rinse	8	2016/05/07	2016/05/09	BRL SOP-00109	EPA M201A/OTM-027 m
Particulates/Acetone Rinse (M5/315/M201)	8	2016/05/06	2016/05/09	BRL SOP-00109	EPA 5/315 m
Particulates/Filter (M5/315/NJATM1/M201)	8	N/A	2016/05/07	BRL SOP-00109	EPA 5/315/NJATM1 m
Final Volume of Acetone Probe Rinse	16	N/A	2016/05/07	BRL SOP-00109	
Volume of Sulfuric Acid Impinger	8	N/A	2016/05/09		

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: Clohnson@maxxam.ca

Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

^{*} RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M201A - PARTICULATES (STACK SAMPLING TRAIN)**

Maxxam ID		CHP111	CHP118	CHP119			
Sampling Date		2016/05/03	2016/05/02	2016/05/03			
	UNITS	16-21656-M201A 50-52	16-21656-M201A 43-45	16-21656-M201A 1-3	RDL	MDL	QC Batch
> 10 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	<0.5	0.5	0.1	4489369
< 2.5 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	<0.5	0.5	0.5	4489367
2.5 - 10 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	0.5	0.5	0.5	4489368
Acetone Rinse Volume (10)	ml	65	65	36	1	N/A	4489370
Acetone Rinse Volume (2.5 - 10)	ml	65	67	42	1	N/A	4489370
Acetone Rinse Volume (2.5)	ml	27	27	16	1	N/A	4489370

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CHP120	CHP121	CHP122			
Sampling Date		2016/05/03	2016/05/04	2016/05/02			
	UNITS	16-21656-M201A 8-10	16-21656-M201A 15-17	16-21656-M201A 22-24	RDL	MDL	QC Batch
> 10 Particulate Weight in Acetone Rinse	mg	0.6	<0.5	<0.5	0.5	0.1	4489369
< 2.5 Particulate Weight in Acetone Rinse	mg	<0.5	<0.5	<0.5	0.5	0.5	4489367
2.5 - 10 Particulate Weight in Acetone Rinse	mg	<0.5	0.8	7.1	0.5	0.5	4489368
Acetone Rinse Volume (10)	ml	51	56	30	1	N/A	4489370
Acetone Rinse Volume (2.5 - 10)	ml	28	64	79	1	N/A	4489370
Acetone Rinse Volume (2.5)	ml	13	23	27	1	N/A	4489370

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CHP123	CHP124			
Sampling Date		2016/05/02	2016/05/02			
	UNITS	16-21656-M201A 29-31	16-21656-M201A 36-38	RDL	MDL	QC Batch
> 10 Particulate Weight in Acetone Rinse	mg	0.9	0.8	0.5	0.1	4489369
< 2.5 Particulate Weight in Acetone Rinse	mg	0.6	<0.5	0.5	0.5	4489367
2.5 - 10 Particulate Weight in Acetone Rinse	mg	1.2	3.4	0.5	0.5	4489368
Acetone Rinse Volume (10)	ml	110	58	1	N/A	4489370
Acetone Rinse Volume (2.5 - 10)	ml	95	61	1	N/A	4489370
Acetone Rinse Volume (2.5)	ml	23	14	1	N/A	4489370

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPA M26A HYDROGEN HALIDES AND HALOGENS (STACK SAMPLING TRAIN)

Maxxam ID		CHK596	CHK610	CHK611			
Sampling Date		2016/05/03	2016/05/03	2016/05/02			
	UNITS	16-21656-M26A BLANK#1	16-21656-M26A BLANK#2	16-21656-M26A 1	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	251	254	405	1	1	4490734
Hydrochloric Acid	ug	<200	<200	4400	200	60	4490738
Hydrofluoric Acid	ug	<200	<200	<200	200	110	4490738

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

Maxxam ID		CHK611	CHK612	CHK613	CHK614			
Sampling Date		2016/05/02	2016/05/02	2016/05/02	2016/05/03			
	UNITS	16-21656-M26A 1 Lab-Dup	16-21656-M26A 2	16-21656-M26A 3	16-21656-M26A 4	RDL	MDL	QC Batch
Sulfuric Acid Volume	ml	N/A	392	396	388	1	1	4490734
Hydrochloric Acid	ug	4400	7500	6800	6300	200	60	4490738
Hydrofluoric Acid	ug	<200	<200	<200	<200	200	110	4490738

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

	CHK615	CHK616			
	2016/05/03	2016/05/03			
UNITS	16-21656-M26A 5	16-21656-M26A 6	RDL	MDL	QC Batch
ml	399	408	1	1	4490734
ug	6500	5500	200	60	4490738
ug	<200	<200	200	110	4490738
	ml ug	2016/05/03 UNITS 16-21656-M26A 5 ml 399 ug 6500	2016/05/03   2016/05/03   UNITS   16-21656-M26A 5   16-21656-M26A 6   ml   399   408   ug   6500   5500	2016/05/03   2016/05/03   UNITS   16-21656-M26A 5   16-21656-M26A 6   RDL	2016/05/03   2016/05/03

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA CTM 027 AMMONIA (STACK SAMPLING TRAIN)**

Maxxam ID		CHK596	CHK610	CHK611			
Sampling Date		2016/05/03	2016/05/03	2016/05/02			
	UNITS	16-21656-M26A BLANK#1	16-21656-M26A BLANK#2	16-21656-M26A 1	RDL	MDL	QC Batch
Ammonium (NH4)	ug	<25	<25	240	25	4.8	4491405

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

Maxxam ID		CHK611	CHK612	CHK613			CHK614			
Sampling Date		2016/05/02	2016/05/02	2016/05/02			2016/05/03			
	UNITS	16-21656-M26A 1 Lab-Dup	16-21656-M26A 2	16-21656-M26A 3	RDL	MDL	16-21656-M26A 4	RDL	MDL	QC Batch
Ammonium (NH4)	ug	250	560	730	25	4.8	3600	50	9.6	4491405

RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		CHK615	CHK616			
Sampling Date		2016/05/03	2016/05/03			
	UNITS	16-21656-M26A 5	16-21656-M26A 6	RDL	MDL	QC Batch
Ammonium (NH4)	ug	4000	3100	50	9.6	4491405

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M29 METALS (FRONT & BACK SEPARATE)**

Maxxam ID		CHK450	CHK589	CHK589	CHK590			
Sampling Date		2016/05/03	2016/05/02	2016/05/02	2016/05/02			
	UNITS	16-21656-PM 43-48	16-21656-PM 1-6	16-21656-PM 1-6 Lab-Dup	16-21656-PM 7-12	RDL	MDL	QC Batch
Front Half Antimony (Sb)	ug	<0.80	<0.80	<0.80	<0.80	0.80	0.16	4492000
Front Half Arsenic (As)	ug	<0.80	<0.80	<0.80	<0.80	0.80	0.16	4492000
Front Half Barium (Ba)	ug	8.5	6.4	6.2	<6.0	6.0	1.6	4492000
Front Half Beryllium (Be)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.080	4492000
Front Half Cadmium (Cd)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.080	4492000
Front Half Chromium (Cr)	ug	5.83	30.6	32.0	2.32	0.60	0.20	4492000
Front Half Cobalt (Co)	ug	<0.20	<0.20	0.21	<0.20	0.20	0.040	4492000
Front Half Copper (Cu)	ug	<4.0	<4.0	<4.0	<4.0	4.0	0.40	4492000
Front Half Lead (Pb)	ug	<0.40	0.88	0.92	0.48	0.40	0.080	4492000
Front Half Manganese (Mn)	ug	1.8	3.1	3.2	1.5	1.5	0.20	4492000
Front Half Molybdenum (Mo)	ug	48.1	44.4	45.7	20.3	1.0	0.20	4492000
Front Half Nickel (Ni)	ug	18.2	25.8	26.5	1.4	1.0	0.40	4492000
Front Half Selenium (Se)	ug	<2.0	<2.0	<2.0	<2.0	2.0	1.0	4492000
Front Half Silver (Ag)	ug	<0.40	<0.40	<0.40	<0.40	0.40	0.080	4492000
Front Half Thallium (TI)	ug	<1.0	<1.0	<1.0	<1.0	1.0	0.20	4492000
Front Half Vanadium (V)	ug	<0.60	<0.60	<0.60	<0.60	0.60	0.16	4492000
Front Half Zinc (Zn)	ug	<10	12	12	<10	10	2.0	4492000
Back Half Antimony (Sb)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.040	4490445
Back Half Arsenic (As)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.040	4490445
Back Half Barium (Ba)	ug	2.5	3.2	3.0	3.5	1.5	0.040	4490445
Back Half Beryllium (Be)	ug	<0.050	<0.050	<0.050	<0.050	0.050	0.050	4490445
Back Half Cadmium (Cd)	ug	<0.050	<0.050	<0.050	<0.050	0.050	0.030	4490445
Back Half Chromium (Cr)	ug	0.65	1.36	1.26	2.31	0.15	0.070	4490445
Back Half Cobalt (Co)	ug	<0.050	<0.050	<0.050	<0.050	0.050	0.010	4490445
Back Half Copper (Cu)	ug	3.0	6.3	6.1	8.0	2.0	1.6	4490445
Back Half Lead (Pb)	ug	0.41	0.65	0.63	0.58	0.10	0.040	4490445
Back Half Manganese (Mn)	ug	2.31	3.79	N/A	3.39	0.25	0.060	4490445
Back Half Molybdenum (Mo)	ug	<0.25	<0.25	<0.25	<0.25	0.25	0.050	4490445
Back Half Nickel (Ni)	ug	0.34	1.25	1.19	1.31	0.25	0.060	4490445
Back Half Selenium (Se)	ug	<0.50	<0.50	<0.50	1.15	0.50	0.20	4490445
Back Half Silver (Ag)	ug	<0.10	<0.10	<0.10	<0.10	0.10	0.020	4490445
Back Half Thallium (TI)	ug	<0.25	<0.25	<0.25	<0.25	0.25	0.050	4490445
Back Half Vanadium (V)	ug	<0.15	<0.15	<0.15	<0.15	0.15	0.030	4490445
Back Half Zinc (Zn)	ug	<2.5	5.6	5.4	4.0	2.5	0.60	4490445

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M29 METALS (FRONT & BACK SEPARATE)**

Maxxam ID		CHK591	CHK592	CHP049	CHP053			
Sampling Date		2016/05/03	2016/05/03	2016/05/03	2016/05/02			
	UNITS	16-21656-PM 25-30	16-21656-PM 31-36	16-21656-PM 19-24	16-21656-PM 13-18	RDL	MDL	QC Batch
Front Half Antimony (Sb)	ug	<0.80	<0.80	<0.80	<0.80	0.80	0.16	4492000
Front Half Arsenic (As)	ug	<0.80	<0.80	<0.80	<0.80	0.80	0.16	4492000
Front Half Barium (Ba)	ug	<6.0	6.1	17.9	7.1	6.0	1.6	4492000
Front Half Beryllium (Be)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.080	4492000
Front Half Cadmium (Cd)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.080	4492000
Front Half Chromium (Cr)	ug	8.00	7.79	2.06	7.15	0.60	0.20	4492000
Front Half Cobalt (Co)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.040	4492000
Front Half Copper (Cu)	ug	<4.0	<4.0	<4.0	<4.0	4.0	0.40	4492000
Front Half Lead (Pb)	ug	0.56	0.56	<0.40	0.66	0.40	0.080	4492000
Front Half Manganese (Mn)	ug	2.3	2.6	<1.5	2.3	1.5	0.20	4492000
Front Half Molybdenum (Mo)	ug	45.1	45.8	32.6	44.1	1.0	0.20	4492000
Front Half Nickel (Ni)	ug	18.0	17.5	<1.0	17.2	1.0	0.40	4492000
Front Half Selenium (Se)	ug	<2.0	2.2	<2.0	<2.0	2.0	1.0	4492000
Front Half Silver (Ag)	ug	<0.40	<0.40	<0.40	<0.40	0.40	0.080	4492000
Front Half Thallium (TI)	ug	<1.0	<1.0	<1.0	<1.0	1.0	0.20	4492000
Front Half Vanadium (V)	ug	<0.60	<0.60	<0.60	<0.60	0.60	0.16	4492000
Front Half Zinc (Zn)	ug	<10	<10	<10	<10	10	2.0	4492000
Back Half Antimony (Sb)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.040	4490445
Back Half Arsenic (As)	ug	<0.20	<0.20	<0.20	<0.20	0.20	0.040	4490445
Back Half Barium (Ba)	ug	2.4	3.0	2.0	2.4	1.5	0.040	4490445
Back Half Beryllium (Be)	ug	<0.050	<0.050	<0.050	<0.050	0.050	0.050	4490445
Back Half Cadmium (Cd)	ug	<0.050	<0.050	<0.050	<0.050	0.050	0.030	4490445
Back Half Chromium (Cr)	ug	0.81	1.03	0.81	1.46	0.15	0.070	4490445
Back Half Cobalt (Co)	ug	<0.050	<0.050	<0.050	<0.050	0.050	0.010	4490445
Back Half Copper (Cu)	ug	5.5	6.1	3.7	7.6	2.0	1.6	4490445
Back Half Lead (Pb)	ug	0.48	0.49	0.31	0.46	0.10	0.040	4490445
Back Half Manganese (Mn)	ug	2.68	3.06	1.94	2.86	0.25	0.060	4490445
Back Half Molybdenum (Mo)	ug	<0.25	<0.25	<0.25	<0.25	0.25	0.050	4490445
Back Half Nickel (Ni)	ug	1.52	0.63	1.55	1.13	0.25	0.060	4490445
Back Half Selenium (Se)	ug	<0.50	0.72	<0.50	1.08	0.50	0.20	4490445
Back Half Silver (Ag)	ug	<0.10	<0.10	<0.10	<0.10	0.10	0.020	4490445
Back Half Thallium (TI)	ug	<0.25	<0.25	<0.25	<0.25	0.25	0.050	4490445
Back Half Vanadium (V)	ug	<0.15	<0.15	<0.15	<0.15	0.15	0.030	4490445
Back Half Zinc (Zn)	ug	2.9	3.7	<2.5	6.0	2.5	0.60	4490445

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M29 METALS (FRONT & BACK SEPARATE)**

Maxxam ID		CHP054			:
Sampling Date		2016/05/02			
	UNITS	16-21656-PM 37-42	RDL	MDL	QC Batch
Front Half Antimony (Sb)	ug	<0.80	0.80	0.16	4492000
Front Half Arsenic (As)	ug	<0.80	0.80	0.16	4492000
Front Half Barium (Ba)	ug	6.6	6.0	1.6	4492000
Front Half Beryllium (Be)	ug	<0.20	0.20	0.080	4492000
Front Half Cadmium (Cd)	ug	<0.20	0.20	0.080	4492000
Front Half Chromium (Cr)	ug	7.00	0.60	0.20	4492000
Front Half Cobalt (Co)	ug	<0.20	0.20	0.040	4492000
Front Half Copper (Cu)	ug	6.7	4.0	0.40	4492000
Front Half Lead (Pb)	ug	0.58	0.40	0.080	4492000
Front Half Manganese (Mn)	ug	2.4	1.5	0.20	4492000
Front Half Molybdenum (Mo)	ug	46.7	1.0	0.20	4492000
Front Half Nickel (Ni)	ug	18.4	1.0	0.40	4492000
Front Half Selenium (Se)	ug	<2.0	2.0	1.0	4492000
Front Half Silver (Ag)	ug	<0.40	0.40	0.080	4492000
Front Half Thallium (TI)	ug	<1.0	1.0	0.20	4492000
Front Half Vanadium (V)	ug	<0.60	0.60	0.16	4492000
Front Half Zinc (Zn)	ug	<10	10	2.0	4492000
Back Half Antimony (Sb)	ug	<0.20	0.20	0.040	4490445
Back Half Arsenic (As)	ug	<0.20	0.20	0.040	4490445
Back Half Barium (Ba)	ug	1.9	1.5	0.040	4490445
Back Half Beryllium (Be)	ug	<0.050	0.050	0.050	4490445
Back Half Cadmium (Cd)	ug	<0.050	0.050	0.030	4490445
Back Half Chromium (Cr)	ug	1.70	0.15	0.070	4490445
Back Half Cobalt (Co)	ug	<0.050	0.050	0.010	4490445
Back Half Copper (Cu)	ug	4.3	2.0	1.6	4490445
Back Half Lead (Pb)	ug	0.37	0.10	0.040	4490445
Back Half Manganese (Mn)	ug	2.40	0.25	0.060	4490445
Back Half Molybdenum (Mo)	ug	<0.25	0.25	0.050	4490445
Back Half Nickel (Ni)	ug	1.74	0.25	0.060	4490445
Back Half Selenium (Se)	ug	<0.50	0.50	0.20	4490445
Back Half Silver (Ag)	ug	<0.10	0.10	0.020	4490445
Back Half Thallium (TI)	ug	<0.25	0.25	0.050	4490445
Back Half Vanadium (V)	ug	<0.15	0.15	0.030	4490445
Back Half Zinc (Zn)	ug	3.7	2.5	0.60	4490445
RDL = Reportable Detection Li	mit				
1					



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M29 MERCURY (STACK SAMPLING TRAIN)**

Maxxam ID		CHK450			СНК589	CHK590			·
Sampling Date		2016/05/03			2016/05/02	2016/05/02			
	UNITS	16-21656-PM 43-48	RDL	MDL	16-21656-PM 1-6	16-21656-PM 7-12	RDL	MDL	QC Batch
1B Mercury (Hg)	ug	<0.015	0.015	0.015	0.018	<0.015	0.015	0.015	4492010
2B Mercury (Hg)	ug	<0.15	0.15	0.03	2.49	1.80	0.39	0.078	4487644
3B Mercury (Hg)	ug	<0.05	0.05	0.01	0.13	0.15	0.05	0.01	4487639
3C Mercury (Hg)	ug	<0.018	0.018	0.0036	0.292	0.178	0.018	0.0036	4490131

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Maxxam ID		CHK590			CHK591			
Sampling Date		2016/05/02			2016/05/03			
	UNITS	16-21656-PM 7-12 Lab-Dup	RDL	MDL	16-21656-PM 25-30	RDL	MDL	QC Batch
1B Mercury (Hg)	ug	N/A	0.015	0.015	<0.015	0.015	0.015	4492010
2B Mercury (Hg)	ug	N/A	0.39	0.078	1.3	0.4	0.08	4487644
3B Mercury (Hg)	ug	N/A	0.05	0.01	<0.05	0.05	0.01	4487639
3C Mercury (Hg)	ug	0.178	0.018	0.0036	0.225	0.018	0.0036	4490131

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

Maxxam ID		CHK592			CHP049			
Sampling Date		2016/05/03			2016/05/03			
	UNITS	16-21656-PM 31-36	RDL	MDL	16-21656-PM 19-24	RDL	MDL	QC Batch
1B Mercury (Hg)	ug	0.016	0.015	0.015	<0.015	0.015	0.015	4492010
2B Mercury (Hg)	ug	0.77	0.38	0.076	<0.15	0.15	0.03	4487644
3B Mercury (Hg)	ug	0.13	0.05	0.01	0.07	0.05	0.01	4487639
3C Mercury (Hg)	ug	0.151	0.018	0.0036	0.645	0.018	0.0036	4490131

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M29 MERCURY (STACK SAMPLING TRAIN)**

Maxxam ID		CHP053	CHP053			CHP054			
Sampling Date		2016/05/02	2016/05/02			2016/05/02			
	UNITS	16-21656-PM 13-18	16-21656-PM 13-18 Lab-Dup	RDL	MDL	16-21656-PM 37-42	RDL	MDL	QC Batch
1B Mercury (Hg)	ug	<0.015	<0.015	0.015	0.015	<0.015	0.015	0.015	4492010
2B Mercury (Hg)	ug	0.93	0.96	0.45	0.09	0.79	0.46	0.092	4487644
3B Mercury (Hg)	ug	0.10	N/A	0.05	0.01	0.20	0.05	0.01	4487639
3C Mercury (Hg)	ug	0.104	N/A	0.023	0.0046	0.17	0.02	0.004	4490131

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

Maxxam ID		CHP054			
Sampling Date		2016/05/02			
	UNITS	16-21656-PM 37-42 Lab-Dup	RDL	MDL	QC Batch
3B Mercury (Hg)	ug	0.20	0.05	0.01	4487639

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPA M5 PARTICULATE MATTER (PM)**

	CHK450	CHK589	CHK590			
	2016/05/03	2016/05/02	2016/05/02			
UNITS	16-21656-PM 43-48	16-21656-PM 1-6	16-21656-PM 7-12	RDL	MDL	QC Batch
mg	0.5	3.1	1.9	0.5	0.1	4488042
mg	1.50	1.30	1.20	0.30	0.060	4488041
ml	130	140	160	1	1	4488043
	mg mg	2016/05/03 UNITS 16-21656-PM 43-48 mg 0.5 mg 1.50	2016/05/03         2016/05/02           UNITS         16-21656-PM 43-48         16-21656-PM 1-6           mg         0.5         3.1           mg         1.50         1.30	UNITS         16-21656-PM 43-48         16-21656-PM 1-6         16-21656-PM 7-12           mg         0.5         3.1         1.9           mg         1.50         1.30         1.20	UNITS         16-21656-PM 43-48         16-21656-PM 1-6         16-21656-PM 7-12         RDL           mg         0.5         3.1         1.9         0.5           mg         1.50         1.30         1.20         0.30	UNITS         16-21656-PM 43-48         16-21656-PM 1-6         16-21656-PM 7-12         RDL         MDL           mg         0.5         3.1         1.9         0.5         0.1           mg         1.50         1.30         1.20         0.30         0.060

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

Maxxam ID		CHK591	CHK592	CHP049			
Sampling Date		2016/05/03	2016/05/03	2016/05/03			
	UNITS	16-21656-PM 25-30	16-21656-PM 31-36	16-21656-PM 19-24	RDL	MDL	QC Batch
Acetone Rinse Particulate Weight in Acetone Rinse	mg	1.8	2.1	0.7	0.5	0.1	4488042
Front Half Particulate Weight on Filter	mg	<0.30	<0.30	1.80	0.30	0.060	4488041
Acetone Rinse Volume	ml	140	170	250	1	1	4488043

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

Maxxam ID		CHP053	CHP054			
Sampling Date		2016/05/02	2016/05/02			
	UNITS	16-21656-PM 13-18	16-21656-PM 37-42	RDL	MDL	QC Batch
Acetone Rinse Particulate Weight in Acetone Rinse	mg	0.9	1.8	0.5	0.1	4488042
Front Half Particulate Weight on Filter	mg	<0.30	<0.30	0.30	0.060	4488041
Acetone Rinse Volume	ml	140	120	1	1	4488043

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHK450

**Sample ID:** 16-21656-PM 43-48 Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHK589

Sample ID: 16-21656-PM 1-6 Matrix: Stack Sampling Train

2016/05/02 Collected:

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHK589 Dup

Sample ID: 16-21656-PM 1-6 Matrix: Stack Sampling Train Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst	
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha	
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha	

Maxxam ID: CHK590

Sample ID: 16-21656-PM 7-12
Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHK590

Sample ID: 16-21656-PM 7-12

Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHK590 Dup

Sample ID: 16-21656-PM 7-12

Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison

Maxxam ID: CHK591

16-21656-PM 25-30 Sample ID:

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped: Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHK592

Sample ID: 16-21656-PM 31-36

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHK596

Sample ID: 16-21656-M26A BLANK#1

Matrix: Stack Sampling Train

Collected:

2016/05/03

Shipped: Received:

2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK610

Sample ID: 16-21656-M26A BLANK#2 Matrix: Stack Sampling Train

Collected:

2016/05/03

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK611

Sample ID: 16-21656-M26A 1 Matrix: Stack Sampling Train Collected: Shipped:

2016/05/02

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK611 Dup Sample ID: 16-21656-M26A 1

Matrix: Stack Sampling Train

Collected:

2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera

Maxxam ID: CHK612

Sample ID:

16-21656-M26A 2

Matrix: Stack Sampling Train Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK613

16-21656-M26A 3 Sample ID:

Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHK613

Sample ID: 16-21656-M26A 3
Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped: Received:

2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK614

Sample ID: 16-21656-M26A 4 Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped: Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK615

Sample ID: 16-21656-M26A 5

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHK616

**Sample ID:** 16-21656-M26A 6

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Halides in H2SO4 Imp.	IC/SPEC	4490738	2016/05/09	2016/05/09	Ann-Marie Stern
Ammonium in H2SO4 Impingers (CTM-027)	IC/SPEC	4491405	2016/05/10	2016/05/10	Manoj Gera
Volume of Sulfuric Acid Impinger		4490734	N/A	2016/05/09	Frank Mo

Maxxam ID: CHP049

Sample ID:

16-21656-PM 19-24

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHP053

Sample ID: 16-21656-PM 13-18

Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped: Received:

2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP053 Dup

Sample ID:

16-21656-PM 13-18

Matrix: Stack Sampling Train

2016/05/02 Collected:

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison

Maxxam ID: CHP054

Sample ID: 16-21656-PM 37-42

Matrix: Stack Sampling Train

Collected:

2016/05/02

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3C in HCl Rinse	CV/AA	4490131	2016/05/09	2016/05/10	Ron Morrison
Mercury 2B in HNO3/H2O2 Imp.	CV/AA	4487644	2016/05/06	2016/05/08	Ron Morrison
Mercury 3B in KMnO4/H2SO4 imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison
Mercury 1B in Filter + Rinse (M29)	CV/AA	4492010	2016/05/10	2016/05/10	Ron Morrison
Metals B.H. in H2O2/HNO3 Imp.(6020A)	ICP1/MS	4490445	2016/05/09	2016/05/09	Nan Raykha
Metals F.H. in Filter + Rinses (6020A)	ICP1/MS	4492000	2016/05/10	2016/05/10	Nan Raykha
Particulates/Acetone Rinse (M5/315/M201)	BAL	4488042	2016/05/06	2016/05/09	Brenda Moore
Particulates/Filter (M5/315/NJATM1/M201)	BAL	4488041	N/A	2016/05/07	Brenda Moore
Final Volume of Acetone Probe Rinse		4488043	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP054 Dup

Sample ID:

16-21656-PM 37-42

Matrix: Stack Sampling Train

Collected:

2016/05/02

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury 3B in KMnO4/H2SO4 Imp.	CV/AA	4487639	2016/05/06	2016/05/08	Ron Morrison



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHP111

**Sample ID:** 16-21656-M201A 50-52

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP118

**Sample ID:** 16-21656-M201A 43-45

Matrix: Stack Sampling Train

**Collected:** 2016/05/02

Shipped:

Collected:

Received: 2016/05/04

2016/05/03

2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP119

**Sample ID:** 16-21656-M201A 1-3

Matrix: Stack Sampling Train

201A 1-3 Shipped: ing Train Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP120

Sample ID: 16-21656-M201A 8-10

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP121

Sample ID: 16-21656-M201A 15-17 Matrix: Stack Sampling Train

1201A 15-17

Collected: 2016/05/04 Shipped: Received: 2016/05/04

Tact Description Strumontation Ratch Extracted Date Analyzed Analyst

lest Description	instrumentation	Batch	Extracted	Date Analyzeo	Anaiyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHP122 Sample ID: 16-21656-M201A 22-24 Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP123
Sample ID: 16-21656-M201A 29-31
Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore

Maxxam ID: CHP124

Sample ID: 16-21656-M201A 36-38 Matrix: Stack Sampling Train

Shipped:

Collected: 2016/05/02

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
>10um Particulates in Rinse	BAL	4489369	2016/05/07	2016/05/09	Brenda Moore
2.5-10um Particulates in Rinse	BAL	4489368	2016/05/07	2016/05/09	Brenda Moore
<2.5um Particulates in Rinse	BAL	4489367	2016/05/07	2016/05/09	Brenda Moore
Final Volume of Acetone Probe Rinse		4489370	N/A	2016/05/07	Brenda Moore



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **GENERAL COMMENTS**

Sample CHP054-01: Digestion repeated for Ni only for this sample on 2016-05-11

### **EPA M29 METALS (FRONT & BACK SEPARATE)**

Metals F.H. in Filter + Rinses (6020A): Post digestion duplicate and spike were done on sample CHK589.

Some Ba (6.9 ug) was observed in the Processed Blank.

Metals B.H. in H2O2/HNO3 Imp.(6020A): Post digestion duplicate and spike were done on sample CHK589.

Results relate only to the items tested.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **QUALITY ASSURANCE REPORT**

QA/QC		**************************************		Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4487639	RON	Reagent Blank	3B Mercury (Hg)	2016/05/08	<0.013	recovery		QC LIIIILS
4487639	RON	Matrix Spike(CHP054)	3B Mercury (Hg)	2016/05/08	<b>\0.013</b>	95	ug %	85 - 115
4487639	RON	Matrix Spike DUP(CHP054)		2016/05/08		100	%	85 - 115
4487639	RON	MS/MSD RPD	3B Mercury (Hg)	2016/05/08	4.9	100	%	20
4487639	RON	Spiked Blank	3B Mercury (Hg)	2016/05/08	4.5	100	%	90 - 110
4487639	RON	Spiked Blank DUP	3B Mercury (Hg)	2016/05/08		98	%	90 - 110
4487639	RON	RPD	3B Mercury (Hg)	2016/05/08	2.2	30	%	20
4487639	RON	Method Blank	3B Mercury (Hg)	2016/05/08	<0.05		ug	20
4487639	RON	RPD - Sample/Sample Dup		2016/05/08	NC		%	20
4487644	RON	Matrix Spike(CHP053)	2B Mercury (Hg)	2016/05/08		103	%	85 - 115
4487644	RON	Matrix Spike DUP(CHP053)		2016/05/08		104	%	85 - 115
4487644	RON	MS/MSD RPD	2B Mercury (Hg)	2016/05/08	0.77	101	%	20
4487644	RON	Spiked Blank	2B Mercury (Hg)	2016/05/08	0.,,	104	%	90 - 110
4487644	RON	Spiked Blank DUP	2B Mercury (Hg)	2016/05/08		105	%	90 - 110
4487644	RON	RPD	2B Mercury (Hg)	2016/05/08	0.58	103	%	20
4487644	RON	Method Blank	2B Mercury (Hg)	2016/05/08	<0.015		ug	20
4487644	RON	RPD - Sample/Sample Dup		2016/05/08	NC		%	20
4488042	BLM	Method Blank	Acetone Rinse Particulate Weight in Acetone		0.5,		mg	20
1400042	DEIVI	Wiction Brank	Rinse	2010/05/05	RDL=0.5		1118	
4489367	BLM	Method Blank	< 2.5 Particulate Weight in Acetone Rinse	2016/05/09	<0.5		ma	
4489368	BLM	Method Blank	2.5 - 10 Particulate Weight in Acetone Rinse	2016/05/09	<0.5		mg mg	
4489369	BLM	Method Blank	> 10 Particulate Weight in Acetone Rinse	2016/05/09	<0.5		mg mg	
4490131	RON	Reagent Blank	3C Mercury (Hg)	2016/05/05	<0.013		mg	
4490131	RON	Matrix Spike(CHK590)	3C Mercury (Hg)	2016/05/10	<0.013	94	ug %	85 - 115
4490131	RON	Matrix Spike DUP(CHK590)		2016/05/10		94	% %	85 - 115
4490131	RON	MS/MSD RPD	3C Mercury (Hg)	2016/05/10	0.21	54	%	20
4490131	RON	Spiked Blank	3C Mercury (Hg)	2016/05/10	0.21	100	%	90 - 110
4490131	RON	Spiked Blank DUP	3C Mercury (Hg)	2016/05/10		99	%	90 - 110
4490131	RON	RPD	3C Mercury (Hg)	2016/05/10	1.5	33	%	20
4490131	RON	Method Blank	3C Mercury (Hg)	2016/05/10	<0.013		ug	20
4490131	RON	RPD - Sample/Sample Dup		2016/05/10	0.22		%	20
4490445	N R	Matrix Spike(CHK589)	Back Half Antimony (Sb)	2016/05/09	0.22	94	%	70 - 130
1430443		maan spinc(critisos)	Back Half Arsenic (As)	2016/05/09		95	%	70 - 130
			Back Half Barium (Ba)	2016/05/09		97	%	70 - 130
			Back Half Beryllium (Be)	2016/05/09		91	%	70 - 130
			Back Half Cadmium (Cd)	2016/05/09		91	%	70 - 130
			Back Half Chromium (Cr)	2016/05/09		97	%	70 - 130
			Back Half Cobalt (Co)	2016/05/09		96	%	70 - 130
			Back Half Copper (Cu)	2016/05/09		99	%	70 - 130
			Back Half Lead (Pb)	2016/05/09		96	%	70 - 130
			Back Half Manganese (Mn)	2016/05/09		96	%	70 - 130
			Back Half Molybdenum (Mo)	2016/05/09		97	%	70 - 130
			Back Half Nickel (Ni)	2016/05/09		95	%	70 - 130
			Back Half Selenium (Se)	2016/05/09		89	%	70 - 130
			Back Half Silver (Ag)	2016/05/09		100	%	70 - 130
			Back Half Thallium (TI)	2016/05/09		99	%	70 - 130
			Back Half Vanadium (V)	2016/05/09		95	%	70 - 130
			Back Half Zinc (Zn)	2016/05/09		90	%	70 - 130
4490445	ΝR	Matrix Spike DUP(CHK589)	• •	2016/05/09		95	%	70 - 130
			Back Half Arsenic (As)	2016/05/09		94	%	70 - 130
			Back Half Barium (Ba)	2016/05/09		97	%	70 - 130
			Back Half Beryllium (Be)	2016/05/09		92	%	70 - 130
L				,,			,,,	



ORTECH Environmental
Client Project #: 21656
Site Location: COVANTA
Your P.O. #: 21656-J2227

QA/QC				Date		%	***************************************	
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
****			Back Half Cadmium (Cd)	2016/05/09		93	%	70 - 130
			Back Half Chromium (Cr)	2016/05/09		95	%	70 - 130
			Back Half Cobalt (Co)	2016/05/09		97	%	70 - 130
			Back Half Copper (Cu)	2016/05/09		96	%	70 - 130
			Back Half Lead (Pb)	2016/05/09		97	%	70 - 130
			Back Half Manganese (Mn)	2016/05/09		94	%	70 - 130
			Back Half Molybdenum (Mo)	2016/05/09		97	%	70 - 130
			Back Half Nickel (Ni)	2016/05/09		97	%	70 - 130
			Back Half Selenium (Se)	2016/05/09		86	%	70 - 130
			Back Half Silver (Ag)	2016/05/09		100	%	70 - 130
			Back Half Thallium (TI)	2016/05/09		100	%	70 - 130
			Back Half Vanadium (V)	2016/05/09		95	%	70 - 130
			Back Half Zinc (Zn)	2016/05/09		88	%	70 - 130
4490445	ΝR	MS/MSD RPD	Back Half Antimony (Sb)	2016/05/09	1.1		%	20
,		,	Back Half Arsenic (As)	2016/05/09	1.1		%	20
			Back Half Barium (Ba)	2016/05/09	0		%	20
			Back Half Beryllium (Be)	2016/05/09	1.1		%	20
			Back Half Cadmium (Cd)	2016/05/09	2.2		%	20
			Back Half Chromium (Cr)	2016/05/09	2.1		%	20
			Back Half Cobalt (Co)	2016/05/09	1.0		%	20
			Back Half Copper (Cu)	2016/05/09	3.1		%	20
			Back Half Lead (Pb)	2016/05/09	1.0		%	20
			Back Half Manganese (Mn)	2016/05/09	2.1		%	20
			Back Half Molybdenum (Mo)	2016/05/09	0		%	20
			Back Half Nickel (Ni)	2016/05/09	2.1		%	20
			Back Half Selenium (Se)	2016/05/09	3.4		%	20
			Back Half Silver (Ag)	2016/05/09	0		%	20
			Back Half Thallium (TI)	2016/05/09	1.0		% %	20
			Back Half Vanadium (V)	2016/05/09	0		% %	20
			Back Haif Zinc (Zn)	2016/05/09	2.2		% %	20
4490445	AL D	Cailead Blank		1.5 1.15	2.2	105		
4490445	IV_K	Spiked Blank	Back Half Arrania (As)	2016/05/09		105	%	85 - 115
			Back Half Arsenic (As)	2016/05/09		101	%	85 - 115
			Back Half Barium (Ba)	2016/05/09		103	%	85 - 115
			Back Half Beryllium (Be)	2016/05/09		99	%	85 - 115
			Back Half Cadmium (Cd)	2016/05/09		104	%	85 - 115
			Back Half Chromium (Cr)	2016/05/09		106	%	85 - 115
			Back Half Cobalt (Co)	2016/05/09		103	%	85 - 115
			Back Half Copper (Cu)	2016/05/09		104	%	85 - 115
			Back Half Lead (Pb)	2016/05/09		103	%	85 - 115
			Back Half Manganese (Mn)	2016/05/09		104	%	85 - 115
			Back Half Molybdenum (Mo)	2016/05/09		104	%	85 - 115
			Back Half Nickel (Ni)	2016/05/09		106	%	85 - 115
			Back Half Selenium (Se)	2016/05/09		97	%	85 - 115
			Back Half Silver (Ag)	2016/05/09		112	%	85 - 115
			Back Half Thallium (TI)	2016/05/09		104	%	85 - 115
			Back Half Vanadium (V)	2016/05/09		104	%	85 - 115
			Back Half Zinc (Zn)	2016/05/09		95	%	85 - 115
4490445	N_R	Spiked Blank DUP	Back Half Antimony (Sb)	2016/05/09		98	%	85 - 115
			Back Half Arsenic (As)	2016/05/09		100	%	85 - 115
			Back Half Barium (Ba)	2016/05/09		99	%	85 - 115
			Back Half Beryllium (Be)	2016/05/09		98	%	85 - 115
			Back Half Cadmium (Cd)	2016/05/09		97	%	85 - 115



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC		THE RESIDENCE OF THE PROPERTY		Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
		·····	Back Half Chromium (Cr)	2016/05/09		98	%	85 - 115
			Back Half Cobalt (Co)	2016/05/09		97	%	85 - 115
			Back Half Copper (Cu)	2016/05/09		100	%	85 - 115
			Back Half Lead (Pb)	2016/05/09		100	%	85 - 115
			Back Half Manganese (Mn)	2016/05/09		100	%	85 - 115
			Back Half Molybdenum (Mo)	2016/05/09		100	%	85 - 115
			Back Half Nickel (Ni)	2016/05/09		100	%	85 - 115
			Back Half Selenium (Se)	2016/05/09		94	%	85 - 115
			Back Half Silver (Ag)	2016/05/09		111	%	85 - 115
			Back Half Thallium (TI)	2016/05/09		102	%	85 - 115
			Back Half Vanadium (V)	2016/05/09		99	%	85 - 115
			Back Half Zinc (Zn)	2016/05/09		93	%	85 - 115
4490445	N R	RPD	Back Half Antimony (Sb)	2016/05/09	7.6	23	%	20
CPPOCPF	14_14	NI D	Back Half Arsenic (As)	2016/05/09	1.1		% %	20
			Back Half Barium (Ba)	2016/05/09	3.5		% %	20
			Back Half Beryllium (Be)	• •	1.1		% %	
				2016/05/09 2016/05/09	6.4		% %	20
			Back Half Cadmium (Cd) Back Half Chromium (Cr)	• •				20
			, ,	2016/05/09	7.4		%	20
			Back Half Cobalt (Co)	2016/05/09	6.0		%	20
			Back Half Copper (Cu)	2016/05/09	4.4		%	20
			Back Half Lead (Pb)	2016/05/09	2.7		%	20
			Back Half Manganese (Mn)	2016/05/09	3.5		%	20
			Back Half Molybdenum (Mo)	2016/05/09	4.0		%	20
			Back Half Nickel (Ni)	2016/05/09	5.9		%	20
			Back Half Selenium (Se)	2016/05/09	3.1		%	20
			Back Half Silver (Ag)	2016/05/09	1.4		%	20
			Back Half Thallium (TI)	2016/05/09	2.2		%	20
			Back Half Vanadium (V)	2016/05/09	4.2		%	20
			Back Half Zinc (Zn)	2016/05/09	2.3		%	20
4490445	N_R	Method Blank	Back Half Antimony (Sb)	2016/05/09	<0.20		ug	
			Back Half Arsenic (As)	2016/05/09	<0.20		ug	
			Back Half Barium (Ba)	2016/05/09	<1.5		ug	
			Back Half Beryllium (Be)	2016/05/09	<0.050		ug	
			Back Half Cadmium (Cd)	2016/05/09	<0.050		ug	
		•	Back Half Chromium (Cr)	2016/05/09	<0.15		ug	
			Back Half Cobalt (Co)	2016/05/09	<0.050		ug	
			Back Half Copper (Cu)	2016/05/09	<2.0		ug	
			Back Half Lead (Pb)	2016/05/09	< 0.10		ug	
			Back Half Manganese (Mn)	2016/05/09	<0.25		ug	
			Back Half Molybdenum (Mo)	2016/05/09	<0.25		ug	
			Back Half Nickel (Ni)	2016/05/09	<0.25		ug	
			Back Half Selenium (Se)	2016/05/09	<0.50		ug	
			Back Half Silver (Ag)	2016/05/09	<0.10		ug	
			Back Half Thallium (TI)	2016/05/09	<0.25		ug	
			Back Half Vanadium (V)	2016/05/09	<0.15		ug	
			Back Half Zinc (Zn)	2016/05/09	<2.5		ug	
4490445	N. R	RPD - Sample/Sample Dup	, ,	2016/05/09	NC		-3 %	20
		. , , ,	Back Half Arsenic (As)	2016/05/09	NC		%	20
			Back Half Barium (Ba)	2016/05/09	NC		%	20
			Back Half Beryllium (Be)	2016/05/09	NC		%	20
			Back Half Cadmium (Cd)	2016/05/09	NC		%	20
			Back Half Chromium (Cr)	2016/05/09	7.7		%	20



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
<del></del>			Back Half Cobalt (Co)	2016/05/09	NC		%	20
			Back Half Copper (Cu)	2016/05/09	NC		%	20
			Back Half Lead (Pb)	2016/05/09	3.8		%	20
			Back Half Molybdenum (Mo)	2016/05/09	NC		%	20
			Back Half Nickel (Ni)	2016/05/09	NC		%	20
			Back Half Selenium (Se)	2016/05/09	NC		%	20
			Back Half Silver (Ag)	2016/05/09	NC		%	20
			Back Half Thallium (TI)	2016/05/09	NC		%	20
			Back Half Vanadium (V)	2016/05/09	NC		%	20
			Back Half Zinc (Zn)	2016/05/09	NC		%	20
4490738	ΑS	Matrix Spike(CHK611)	Hydrochloric Acid	2016/05/09		97	%	80 - 120
	_	,	Hydrofluoric Acid	2016/05/09		91	%	80 - 120
4490738	A_S	Spiked Blank	Hydrochloric Acid	2016/05/09		102	%	90 - 110
7.007.00			Hydrofluoric Acid	2016/05/09		96	%	90 - 110
4490738	A S	Method Blank	Hydrochloric Acid	2016/05/09	<200		ug	
			Hydrofluoric Acid	2016/05/09	<200		ug	
4490738	A S	RPD - Sample/Sample Dup	Hydrochloric Acid	2016/05/09	0.12		%	20
		5 50p.c, 50p.c 50p	Hydrofluoric Acid	2016/05/09	NC		%	20
4491405	MGF	Matrix Spike(CHK611)	Ammonium (NH4)	2016/05/10		102	%	75 - 125
4491405		Spiked Blank	Ammonium (NH4)	2016/05/10		102	%	90 - 110
4491405		Method Blank	Ammonium (NH4)	2016/05/10	<25		ug	
4491405				2016/05/10	3.6		%	20
4492000	N R	Matrix Spike(CHK589)	Front Half Antimony (Sb)	2016/05/10	0.0	96	%	70 - 130
1 132000		maam spine(erinses)	Front Half Arsenic (As)	2016/05/10		92	%	70 - 130
			Front Half Barium (Ba)	2016/05/10		92	%	70 - 130
			Front Half Beryllium (Be)	2016/05/10		91	%	70 - 130
			Front Half Cadmium (Cd)	2016/05/10		94	%	70 - 130
			Front Half Chromium (Cr)	2016/05/10		97	%	70 - 130
			Front Half Cobalt (Co)	2016/05/10		93	%	70 - 130
			Front Half Copper (Cu)	2016/05/10		92	%	70 - 130
			Front Half Lead (Pb)	2016/05/10		98	%	70 - 130
			Front Half Manganese (Mn)	2016/05/10		96	%	70 - 130
			Front Half Molybdenum (Mo)	2016/05/10		95	%	70 - 130
			Front Half Nickel (Ni)	2016/05/10		93	%	70 - 130
			Front Half Selenium (Se)	2016/05/10		95	%	70 - 130
			Front Half Silver (Ag)	2016/05/10		95	%	70 - 130
			Front Half Thallium (TI)	2016/05/10		97	%	70 - 130
			Front Half Vanadium (V)	2016/05/10		97	%	70 - 130
			Front Half Zinc (Zn)	2016/05/10		94	%	70 - 130
4492000	N R	Matrix Spike DUP(CHK589)		2016/05/10		98	%	70 - 130
			Front Half Arsenic (As)	2016/05/10		95	%	70 - 130
			Front Half Barium (Ba)	2016/05/10		96	%	70 - 130
			Front Half Beryllium (Be)	2016/05/10		92	%	70 - 130
			Front Half Cadmium (Cd)	2016/05/10		98	%	70 - 130
			Front Half Chromium (Cr)	2016/05/10		102	%	70 - 130
			Front Half Cobalt (Co)	2016/05/10		98	%	70 - 130
			Front Half Copper (Cu)	2016/05/10		96	%	70 - 130
			Front Half Lead (Pb)	2016/05/10		99	%	70 - 130
			Front Half Manganese (Mn)	2016/05/10		104	%	70 - 130
			Front Half Molybdenum (Mo)	2016/05/10		99	%	70 - 130
			Front Half Nickel (Ni)	2016/05/10		98	%	70 - 130
1			Front Half Selenium (Se)	2016/05/10		97	%	70 - 130



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

04/00				Data	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	%		
QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
Datell	HIIL	QC 19pe	Front Half Silver (Ag)	2016/05/10	value	99	%	70 - 130
			Front Half Thallium (TI)	2016/05/10		98	%	70 - 130
			Front Half Vanadium (V)	2016/05/10		104	% %	70 - 130
						97	%	70 - 130
4402000	N D	NAC/RACD DDD	Front Half Antimony (Sh)	2016/05/10 2016/05/10	2.1	31	% %	20
4492000	14 L	MS/MSD RPD	Front Half Antimony (Sb) Front Half Arsenic (As)	2016/05/10	3.2		%	20
					4.3		%	20
			Front Half Barium (Ba) Front Half Beryllium (Be)	2016/05/10 2016/05/10	4.5 1.1		% %	20
			Front Half Cadmium (Cd)	2016/05/10	4.2		%	20
			Front Half Chromium (Cr)	2016/05/10	5.0		%	20
			Front Half Cobalt (Co)	2016/05/10	5.2		%	20
			• •		4.3		% %	20
			Front Half Copper (Cu)	2016/05/10	1.0		% %	20
			Front Half Lead (Pb)	2016/05/10	8.0		% %	20
			Front Half Manganese (Mn)	2016/05/10 2016/05/10	4.1		% %	20
			Front Half Molybdenum (Mo)	• •	5.2		% %	20
			Front Half Nickel (Ni)	2016/05/10	2.1		% %	20
			Front Half Selenium (Se)	2016/05/10	4.1		%	20
			Front Half Silver (Ag)	2016/05/10	1.0		% %	20
			Front Half Thallium (TI)	2016/05/10	7.0		% %	20
			Front Half Vanadium (V)	2016/05/10	7.0 3.1		% %	20
4400000	N D	Cartina d Diagram	Front Half Zinc (Zn)	2016/05/10	5.1	99	% %	
4492000	N_R	Spiked Blank	Front Half Antimony (Sb)	2016/05/10 2016/05/10		100	% %	85 - 115 85 - 115
			Front Half Arsenic (As)	*****		99	% %	85 - 115 85 - 115
			Front Half Barium (Ba)	2016/05/10		98	% %	85 - 115
			Front Half Beryllium (Be)	2016/05/10		97	% %	85 - 115
			Front Half Cadmium (Cd)	2016/05/10		96	%	85 - 115 85 - 115
			Front Half Chromium (Cr)	2016/05/10		94	% %	85 - 115
			Front Half Cobait (Co)	2016/05/10		100	% %	85 - 115
			Front Half Copper (Cu) Front Half Lead (Pb)	2016/05/10 2016/05/10		99	%	85 - 115
						97	%	85 - 115 85 - 115
			Front Half Manganese (Mn)	2016/05/10 2016/05/10		97	%	85 - 115
			Front Half Molybdenum (Mo) Front Half Nickel (Ni)	2016/05/10		97	%	85 - 115
			Front Half Selenium (Se)	2016/05/10		100	%	85 - 115
				2016/05/10		103	%	85 - 115
			Front Half Silver (Ag) Front Half Thallium (TI)	2016/05/10		97	%	85 - 115 85 - 115
			Front Half Vanadium (V)	2016/05/10		97	%	85 - 115
			Front Half Zinc (Zn)	2016/05/10		96	%	85 - 115 85 - 115
4492000	ΝR	Spiked Blank DUP	Front Half Antimony (Sb)			96	%	85 - 115
4492000	14_1/	Spiked blank DOP	Front Half Arsenic (As)	2016/05/10 2016/05/10		99	%	85 - 115
			Front Half Barium (Ba)	2016/05/10		99	%	85 - 115 85 - 115
			Front Half Beryllium (Be)	2016/05/10		97	%	85 - 115
			Front Half Cadmium (Cd)	2016/05/10		96	%	85 - 115 85 - 115
			Front Half Chromium (Cr)	2016/05/10		94	%	85 - 115 85 - 115
			Front Half Cobalt (Co)	2016/05/10		93	%	85 - 115 85 - 115
			Front Half Copper (Cu)	2016/05/10		96	% %	85 - 115
			Front Half Copper (Cu)	2016/05/10		99	%	85 - 115 85 - 115
			Front Half Manganese (Mn)	2016/05/10		94	%	85 - 115
			Front Half Molybdenum (Mo)	2016/05/10		97	% %	85 - 115
						96	% %	85 - 115
			Front Half Nickel (Ni) Front Half Selenium (Se)	2016/05/10 2016/05/10		99	% %	85 - 115
				2016/05/10		100	% %	85 - 115 85 - 115
			Front Half Silver (Ag)	<b>₹010/02/10</b>		TOO	/0	0.7 - TT2



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Front Half Thallium (TI)	2016/05/10	C	96	%	85 - 115
			Front Half Vanadium (V)	2016/05/10		94	%	85 - 115
			Front Half Zinc (Zn)	2016/05/10		96	%	85 - 115
4492000	N R	RPD	Front Half Antimony (Sb)	2016/05/10	3.0		%	20
			Front Half Arsenic (As)	2016/05/10	0.28		%	20
			Front Half Barium (Ba)	2016/05/10	0.11		%	20
			Front Half Beryllium (Be)	2016/05/10	1.4		%	20
			Front Half Cadmium (Cd)	2016/05/10	1.1		%	20
			Front Half Chromium (Cr)	2016/05/10	1.7		%	20
			Front Half Cobalt (Co)	2016/05/10	0.97		%	20
			Front Half Copper (Cu)	2016/05/10	3.5		%	20
			Front Half Lead (Pb)	2016/05/10	0.41		%	20
			Front Half Manganese (Mn)	2016/05/10	3.4		%	20
			Front Half Molybdenum (Mo)	2016/05/10	0.050		%	20
			Front Half Nickel (Ni)	2016/05/10	0.62		%	20
			Front Half Selenium (Se)	2016/05/10	0.95		%	20
			Front Half Silver (Ag)	2016/05/10	2.7		%	20
			Front Half Thallium (TI)	2016/05/10	0.85		%	20
			Front Half Vanadium (V)	2016/05/10	2.5		%	20
			Front Half Zinc (Zn)	2016/05/10	0.96		%	20
4492000	N_R	Method Blank	Front Half Antimony (Sb)	2016/05/10	<0.80		ug	
1132000		Wicklind Blank	Front Half Arsenic (As)	2016/05/10	<0.80		ug	
			Front Half Barium (Ba)	2016/05/10	6.9,		ug	
			Trong nan Banam (Ba)	2010/03/10	RDL=6.0		-5	
			Front Half Beryllium (Be)	2016/05/10	<0.20		ug	
			Front Half Cadmium (Cd)	2016/05/10	<0.20		ug	
			Front Half Chromium (Cr)	2016/05/10	<0.60		ug	
			Front Half Cobalt (Co)	2016/05/10	<0.20		ug	
			Front Half Copper (Cu)	2016/05/10	<4.0		ug	
			Front Half Lead (Pb)	2016/05/10	<0.40		ug	
			Front Half Manganese (Mn)	2016/05/10	<1.5		ug	
			Front Half Molybdenum (Mo)	2016/05/10	<1.0		ug	
			Front Half Nickel (Ni)	2016/05/10	<1.0		ug	
			Front Half Selenium (Se)	2016/05/10	<2.0		ug	
			Front Half Silver (Ag)	2016/05/10	<0.40		ug	
			Front Half Thallium (TI)	2016/05/10	<1.0		ug	
			Front Half Vanadium (V)	2016/05/10	<0.60		ug	
			Front Half Zinc (Zn)	2016/05/10	<10		ug	
4492000	N R	RPD - Sample/Sample Dup	the first field of the telephone for the first section of the first sect	2016/05/10	NC		%	20
7752000	'_''	M D Sumple/Sumple Dup	Front Half Arsenic (As)	2016/05/10	NC		%	20
			Front Half Barium (Ba)	2016/05/10	NC		%	20
			Front Half Beryllium (Be)	2016/05/10	NC		%	20
			Front Half Cadmium (Cd)	2016/05/10	NC		%	20
			Front Half Chromium (Cr)	2016/05/10	4.5		%	20
*			Front Half Cobalt (Co)	2016/05/10	NC		%	20
			Front Half Copper (Cu)	2016/05/10	NC		%	20
			Front Half Lead (Pb)	2016/05/10	NC		%	20
			Front Half Manganese (Mn)	2016/05/10	NC		%	20
			Front Half Molybdenum (Mo)	2016/05/10	2.8		%	20
			Front Half Nickel (Ni)	2016/05/10	2.5		%	20
			Front Half Selenium (Se)	2016/05/10	NC		%	20
			Front Half Silver (Ag)	2016/05/10	NC		%	20



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Front Half Thallium (Tl)	2016/05/10	NC		%	20
			Front Half Vanadium (V)	2016/05/10	NC		%	20
			Front Half Zinc (Zn)	2016/05/10	NC		%	20
4492010	RON	Reagent Blank	1B Mercury (Hg)	2016/05/10	< 0.015		ug	
4492010	RON	Matrix Spike(CHP053)	1B Mercury (Hg)	2016/05/10		101	%	85 - 115
4492010	RON	Matrix Spike DUP(CHP053)	1B Mercury (Hg)	2016/05/10		103	%	85 - 115
4492010	RON	MS/MSD RPD	1B Mercury (Hg)	2016/05/10	1.4		%	20
4492010	RON	Spiked Blank	18 Mercury (Hg)	2016/05/10		102	%	90 - 110
4492010	RON	Spiked Blank DUP	1B Mercury (Hg)	2016/05/10		103	%	90 - 110
4492010	RON	RPD	18 Mercury (Hg)	2016/05/10	0.58		%	20
4492010	RON	Method Blank	1B Mercury (Hg)	2016/05/10	< 0.015		ug	
4492010	RON	RPD - Sample/Sample Dup	1B Mercury (Hg)	2016/05/10	NC		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Reagent Blank: A blank matrix containing all reagents used in the analytical procedure. Used to determine any analytical contamination.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Frank Mo, B.Sc., Inorganic Lab. Manager

Ralph Siebert, Operations Manager - Inorganic Analyses

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



### **APPENDIX 12**

Particle Size Distribution Train Recovery Data Sheets (8 pages)

300016

Project No.: 21656 Date: ろいつ

Client: Covanta

Test Location: トロンサー

Empty Wt: 280.4 After Acetone Rinse: 310.1 After Hexane Rinse: 340.8 Mark Fluid Level and Acetone & Hexane into TS7 Rinse all glassware from filter to 2nd u-tube with Acetone/Hexane Rinse Seal and Label Container CONTAINER TS7 stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction Filter ID: No 一名<MNN~ Perform nitrogen purge of After H₂O Rinse: 나온동. Total Volume TS5: 기사 의 CONTAINER TS5 & TS6 glassware from filter めずか to 2nd u-tube with Empty Wt: ⊃⊖O CONTAINER TS6 CONTAINER TS5 Secondary Filter di H2O into TS3 Colour: Colour Rinse all purge is not required. * if there is no gain With Imp 2: Purge On: Purge Off: Final Wt: TS6 Gain: Initial Wt: Impinger #1 Knock Out Impinger #4 Silica Gel Initial Wt: 어구요.으 Impinger #2 Empty Empty Wt: しろうこ Initial Wt: コーピー 35.00 Final Wt: しつつ.C Gain: 一〇.C Impingers 1, 2, 3, 4 300 Impinger #3 H₂O 北京 2000 Empty Wt: こうこと Secondary Filter Empty Wt: トーイント CWTR=1+2+3: WCBDA=4: Final Wt: Final Wt: Final Wt: 2 Gain: Colour: Colour: % Spent: Colour: 3 Gain: Seal and label container TS4 Filter ID: (년 ~ 낙극에까 - 그 Colour: Reign Initial Wt: 중 Final Wt: 〇 고식은 0.633 CONTAINER TS4 CONTAINER TS4 Back-Up Filter Seal and label container TS3 Container TS3 Weights
Empty Wt: 275 Ct
After Act. Rinse: 788Ct
Total TS3: Exit Stem, and Connecting Tubing to Filter, CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Final Wt: Gain: Seal and label container TS2 cup, and outside of exit stem Container TS2 Weights
Empty Wt: 282.6
After Act. Rinse: 316.6
Total TS2: 25.8 to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Cyclone walls, collection PM 10 Turnaround cup, exit stem, connecting 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 Beaker Initial Wt: Final Wt: 9 0 3 200 6 Gain: Nozzle, PM 10 Cyclone walls, Seal and label container TS1 Container TS1 Weights
Empty Wt: 250 C SAMPLE IDENTIFICATION TS6 (Secondary Filter)
TS7 (Acetone / Hexane rinse) outside of exit stem CONTAINER TS1 TS5 (Imp 2 H₂® and rinse) CONTAINER TS1 collection cup, TS4 (Back Up Filter, <2.5) Recovery Witnessed By: Date: Train Recovered By: Beaker Initial Wt: Train Loaded By: TS3 (Part. < 2.5) S2 (Part. > 2.5) 'S1 (Part. > 10) Total TS1: Final Wt:

Project No.: 21656 Date: ⊃, NN

Client: Covanta

# 000

Test Location:

Test No.:

After Hexane Rinse: 3년주... Mark Fluid Level and filter to 2nd u-tube with Acetone & Hexane into TS7 Seal and Label Container Rinse all glassware from Acetone/Hexane Rinse After Acetone Rinse: 355 CONTAINER TS7 C.427 Empty Wt: Filter ID: No. 6 SMM D 沙洲 stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction Perform nitrogen purge of CONTAINER TS5 & TS6 glassware from filter to 2nd u-tube with CONTAINER TS6 Purge On: トライク Purge Off: これこ Secondary Filter CONTAINER TSS di H2O into TS3 Total Volume TS5: T 0 Rinse all Colour: SALAL purge is not required. * if there is no gain After H₂O Rinse: With Imp 2: Empty Wt: Final Wt: TS6 Gain: Impinger #1 Knock Out Impinger #4 Silica Gel ial Wt: 역으곡 기 Impinger #2 Empty Impingers 1, 2, 3, 4 CERT Secondary Filter Impinger #3 H₂O empty Wt: 👈 පිහ Empty Wt: S신너. 0.50 CATORIO CA Final Wt: Stol S 2 Gain: _________CO Colour: (1254)2 7 CWTR=1+2+3: WCBDA=4: Empty Wt: Initial Wt: Colour: Initial Wt: Final Wt: Final Wt: % Spent: Final Wt: Colour: Gain: 3 Gain: Gain: Filter ID: 112-47-11 Seal and label container TS4 Initial Wt: 0.031Final Wt: 0.028CONTAINER TS4 CONTAINER TS4 Back-Up Filter Gain: ートン ス Colour: ハインド Seal and label container TS3 Exit Stem, and Connecting Empty Wt: 공구역 . 구 After Act. Rinse: 의용유 . 의 Total TS3: 즉 . S Container TS3 Weights **Tubing to Filter,** CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Final Wt: Gain! Seal and label container TS2 cup, and outside of exit stem After Act. Rinse: ろつふ. し Total TS2: to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Container TS2 Weights y Wt: Cyclone walls, collection PM 10 Turnaround cup, exit stem, connecting 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 Beaker Initial Wt: Final Wt: 0 j 0 Empty Wt: 3 mont 16 12/2 Gain Nozzle, PM 10 Cyclone walls, Seal and label container TS1 SAMPLE IDENTIFICATION After Act. Rinse: 3/16. C Total TS1: 35. S TS6 (Secondary Filter)
TS7 (Acetone / Hexane rinse) Container TS1 Weights by Wt: outside of exit stem CONTAINER TS1 CONTAINER TS1 TS5 (Imp 2 H₂0 and rinse) collection cup, TS4 (Back Up Filter, <2.5) Recovery Witnessed By: Date: Train Recovered By: Beaker Initial Wt: Train Loaded By: TS3 (Part, < 2.5) TS2 (Part. > 2.5) TS1 (Part. > 10) Empty Wt: Final Wt: Gain:

Client: Covanta

After Acetone Rinse: 4677
After Hexane Rinse: 526
Mark Fluid Level and Acetone & Hexane into TS7 filter to 2nd u-tube with Seal and Label Container Rinse all glassware from Acetone/Hexane Rinse CONTAINER TS7 Empty Wt: Test Location: Control stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction Filter ID: IC - SSONIN - 7 Perform nitrogen purge of CONTAINER TS5 & TS6 10255 P glassware from filter to 2nd u-tube with CONTAINER TS6 CONTAINER TS5 Secondary Filter 0000 di H2O into TS3 WHITE Rinse all purge is not required. d After H₂O Rinse: Total Volume TS5: * if there is no gain With Imp 2: Empty Wt: Purge On: Purge Off: Initial Wt: TS6 Gain: Final Wt: Colour: Impinger #4 Silica Gel Initial Wt: Gマイ・B Final Wt: ハのシュ・ Impinger #1 Knock Out Impinger #2 Empty CLEAR Impingers 1, 2, 3, 4 CCEAR 7.887 Empty Wt: (ムンライ) Initial Wt: トンタル Empty Wt: (67-1.2 Impinger #3 H₂O 1661. Final Wt: GACIC Secondary Filter S. C. 0 Colour: 0 CWTR=1+2+3: WCBDA=4: Empty Wt: Gain: % Spent: Final Wt: 2 Gain: Colour: Final Wt: Colour: Gain: Gain: Filter ID: K - M 22/101 - 1/5/ Seal and label container TS4 Colour: 135166/CALTE Initial Wt: O(1233)Final Wt: O(1245)CONTAINER TS4 CONTAINER TS4 Back-Up Filter Gain: Seal and label container TS3 Container TS3 Weights
Empty Wt:
After Act. Rinse: DC(C.)
Total TS3: Exit Stem, and Connecting Tubing to Filter, CONTAINER TS3 **CONTAINER TS3** and Filter Top Beaker Initial Wt: Final Wt: Gain: After Act. Rinse: 329, U Seal and label container TS2 cup, and outside of exit stem to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Cyclone walls, collection PIM 10 Turnaround cup, exit stem, connecting Container TS2 Weights 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 Beaker Initial Wt: Final Wt: Q 202 2 VAIN Gain: Seal and label container TS1 SAMPLE IDENTIFICATION Nozzle, PM 10 Cyclone walls, After Act. Rinse: 3256.C Total TS1: TS6 (Secondary Filter)
TS7 (Acetone / Hexane rinse) Container TS1 Weights y Wt: 782.4 outside of exit stem CONTAINER TS1 CONTAINER TS1 TS4 (Back Up Filter, <2.5) TS5 (Imp 2 H₂0 and rinse) collection cup, Recovery Witnessed By: Date: Project No.: 21656 Date: アルン Train Recovered By: Beaker Initial Wt: Train Loaded By: TS2 (Part. > 2.5) TS3 (Part. < 2.5) TS1 (Part. > 10) Empty Wt: Final Wt: Gain:

Project No.: 21656 Date: S MOCH NO

Client: Covanta

Test Location:

Acetone & Hexane into TS7 Rinse all glassware from filter to 2nd u-tube with Acetone/Hexane Rinse Empty Wt: OBL.S After Hexane Rinse: SSS
Mark Fluid Level and Seal and Label Container CONTAINER TS7 Filter ID: No-RAMM-29 initial Wt: C. 28559 Final Wt: C. 28559 TS6 Gain: Colour: Colour stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction Empty Wt: コート・ろ With Imp 2: コート・ろ After H₂O Rinse: スラス・( Perform nitrogen purge of 十・のナ :Stal Nolume TSS: イのナ CONTAINER TS5 & TS6 glassware from filter to 2nd u-tube with CONTAINER TS6 CONTAINER TS5 Secondary Filter di H2O into TS3 Rinse all purge is not required. * if there is no gain Purge On: Purge Off: Impinger #1 Knock Out Empty Wt: C70.S Initial Wt: 798.3 Final Wt: 798.3 Impinger #4 Silica Gel Impinger #2 Empty Impingers 1, 2, 3, 4 Initial Wt: のようの Final Wt: のくこう Impinger #3 H₂O Secondary Filter Final Wt: (0(0). Empty Wt: しんし Empty Wt: ー CWTR=1+2+3: WCBDA=4: Final Wt: % Spent: 2 Gain: Colour: Colour: Colour: Gain: 3 Gain: Filter ID:(し - イナかい- 15) Seal and label container TS4 Initial Wt: C. C. 3C. Final Wt: C. (2.3C. CONTAINER TS4 CONTAINER TS4 Back-Up Filter Colour: CARITE Ò Gain: Container TS3 Weights
Empty Wt: ASS...
After Act. Rinse: ASS...
Total TS3: Seal and label container TS3 Exit Stem, and Connecting Tubing to Filter, CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Final Wt: Gain: Container TS2 Weights
Empty Wt: AAA. S
After Act. Rinse: AB | H
Total TS2: Seal and label container TS2 cup, and outside of exit stem to PM 2.5 cyclone, PM 2.5 tubing from, PM 10 head Cyclone walls, collection PM 10 Turnaround cup, exit stem, connecting 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 Beaker Initial Wt: WASHAS NO. Final Wt: Gain Nozzle, PM 10 Cyclone walls, Seal and label container TS1 SAMPLE IDENTIFICATION After Act. Rinse: 공경공·닉 Total TS1: 중\·S Container TS1 Weights TS6 (Secondary Filter)
TS7 (Acetone / Hexane rinse) outside of exit stem Empty Wt: 88. CONTAINER TS1 CONTAINER TS1 collection cup, TS4 (Back Up Filter, <2.5) TS5 (Imp 2 H₂0 and rinse) Recovery Witnessed By: Date: Train Recovered By: Beaker Initial Wt: Train Loaded By: TS3 (Part. < 2.5) TS2 (Part. > 2.5) (S1 (Part. > 10) Final Wt: Gain?

S MOLLING

Date:

Project No.: 21656

Client: Covanta

Acetone/Hexane Rinse
Empty Wt는 장에 중 After Acetone Rinse: 일을 용 After Hexane Rinse: 공동식 중 Mark Fluid Level and Filter ID: 16 - 음송때까 - 1층 stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction Empty Wt: コウス・/ With Imp 2: イムン・O After H₂O Rinse: - / しっこ 〜 Perform nitrogen purge of CONTAINER TS5 & TS6 100 B Total Volume TS5: 、行いた Purge On: 13: 3구 Purge Off: 1식: 3구 glassware from filter to 2nd u-tube with CONTAINER TS5 CONTAINER TS6 Secondary Filter di H2O into TS3 N Rinse all purge is not required. tif there is no gain Initial Wt: Final Wt: TS6 Gain: Empty Wt: 680・7 Initial Wt: 780・S Final Wt: デースト Impinger #1 Knock Out Impinger #4 Silica Gel Initial Wt: 986 3 31.16.3 01000 Impinger #2 Empty Impingers 1, 2, 3, 4 Empty Wt: 56 /- 6 Final Wt: SCI.し 1000 Secondary Filter 0.0 Impinger #3 H₂O Final Wt: Empty Wt: Final Wt: Gain: % Spent: Gain: Colour: Gain: Colour: Gain: Colour: Seal and label container TS4 Initial Wt: 4778 CONTAINER TS4 CONTAINER TS4 Back-Up Filter 4 Colour: Gain: Seal and label container TS3 Empty Wt: 3+8.9 After Act. Rinse: 3<0.8 Total 153: 21.9 Exit Stem, and Connecting Container TS3 Weights Tubing to Filter, CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Final Wt: Gairtí: Container TS2 Weights
Empty Wt: 378. S
After Act. Rinse: 344.C
Total TS2: 65.2 Seal and label container TS2 cup, and outside of exit stem to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Cyclone walls, collection PM 10 Turnaround cup, exit stem, connecting 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 NY. Beaker Initial Wt: Final Wt: Gam: Seal and label container TS1 SAMPLE IDENTIFICATION Nozzle, PM 10 Cyclone walls, After Act. Rinse: ろのの (と) Total TS1: Container TS1 Weights y Wt: コネお 의 outside of exit stem CONTAINER TS1 CONTAINER TS1 collection cup, Beaker Initial Wt: TS2 (Part. > 2.5) TS3 (Part. < 2.5) TS1 (Part. > 10) Empty Wt: Final Wt:

Acetone & Hexane into TS7 Rinse all glassware from

filter to 2nd u-tube with

CONTAINER TS7

きなす。

Test Location:

Seal and Label Container

> CWTR=1+2+3: (S2 WCBDA=4: (C)

Colour: White

2

TS6 (Secondary Filter)
TS7 (Acetone / Hexane rinse)

TS5 (Imp 2 H₂0 and rinse) TS4 (Back Up Filter, <2.5)

200

5

No.

3 most le

Recovery Witnessed By: Date:

Train Recovered By:

Train Loaded By:

21656

Client: Covanta

(本)公子

Test Location:

Test No.:

Acetone & Hexane into TS7 After Hexane Rinse: ふうう Mark Fluid Level and Rinse all glassware from Seal and Label Container filter to 2nd u-tube with Acetone/Hexane Rinse Empty Wt: コテロ・〇 After Acetone Rinse: 🝣 CONTAINER TS7 Filter 10: Ot - Bank - 1B stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction with Imp 2: ムのろ・6 After H₂O Rinse: ビーチザー Total Volume TS5: 、(へ) 🛴 Perform nitrogen purge of CONTAINER TS5 & TS6 glassware from filter to 2nd u-tube with B B B B B CONTAINER TS6 97.0 CONTAINER TS5 Empty Wt: Secondary Filter di H20 into TS3 Colour: Rinse all C purge is not required. ' if there is no gain TS6 Gain: Purge On: Initial Wt: Purge Off: Final Wt:  $\mathbf{\hat{}}$ のシニ Impinger #1 Knock Out Impinger #4 Silica Gel Initial Wt: 946. 🗈 Impinger #2 Empty Impingers 1, 2, 3, 4 Final Wt: こうまた Gain: ドイス・A بن برخ بر WEST. CLSAR Impinger #3 H₂O Colour: CARA Empty Wt: 670. Secondary Filter Empty Wt: 659: Initial Wt: 760: 9 CWTR=1+2+3: WCBDA=4: Empty Wt: Final Wt: Final Wt: Final Wt: Gain: % Spent: Colour: Colour: Gain: Gain: Seal and label container TS4 一一一 Filter ID: 🔗 🐔 😤 亡 CONTAINER TS4 CONTAINER TS4 Back-Up Filter nitial Wt: 🧢 🗀 0.0 Final Wt: 0.12 Colour: Gain: Seal and label container TS3 After Act. Rinse: ろっこ. し Total TS3: (合, 나 Exit Stem, and Connecting Container TS3 Weights y Wt: 284.2 Tubing to Filter, CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Empty Wt: Final Wt: Gain: Seal and label container TS2 cup, and outside of exit stem Container TS2 Weights
Empty Wt: 255.7
After Act. Rinse: 3(6.1.4)
Total TS2: to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Cyclone walls, collection PM 10 Turnaround cup, exit stem, connecting CONTAINER TS2 16-21656-M201A-CONTAINER TS2 7 Beaker Initial Wt: Final Wt: Gain: Seal and label container TS1 SAMPLE IDENTIFICATION Nozzie, PM 10 Cyclone walls, Container TS1 Weights y Wt: 285 C TS7 (Acetone / Hexane rinse) outside of exit stem CONTAINER TS1 CONTAINER TS1 TS5 (Imp 2 H₂0 and rinse) TS4 (Back Up Filter, <2.5) collection cup, Recovery Witnessed By: Date: TS6 (Secondary Filter) Train Recovered By: Beaker Initial Wt: After Act. Rinse: Total TS1: Train Loaded By: TS2 (Part. > 2.5) TS3 (Part. < 2.5) TS1 (Part. > 10) Project No.: Date: Empty Wt: Final Wt: Gain:

# $\text{PM}_{10}$ , $\text{PM}_{2.5}$ & Condensate Recovery Data Sheet

Project No.: 21656 Date: 기술에

Client: Covanta

Test Location: CALT *12

After Hexane Rinse: 국옥은... Mark Fluid Level and filter to 2nd u-tube with Acetone & Hexane into TS7 After Acetone Rinse: 교식 Rinse all glassware from Acetone/Hexane Rinse npty Wt: ユーモー Seal and Label Container CONTAINER TS7 Empty Wt: stem impinger (14 lpm for 1 hr) 16-033Pr-1 imp 1 transfered to Impaction After H₂O Rinse: 〜〜〜〜〜〜 Total Volume TS5: 〜〜〜〜〜 Perform nitrogen purge of CONTAINER TS5 & TS6 0170 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 -1000 glassware from filter to 2nd u-tube with CONTAINER TS6 CONTAINER TS5 Secondary Filter 20202 di H2O into TS3 Rinse all Colour: 1-1/1purge is not required. * if there is no gain Empty Wt: Purge On: Purge Off: With Imp 2: Filter ID: Initial Wt: Final Wt: TS6 Gain: Impinger #1 Knock Out CLEAR Golour: CLEMA Impinger #4 Silica Gel Initial Wt: 1000 C CWTR=1+2+3: いんの と (WCBDA=4: (いつ) Impinger #2 Empty Impingers 1, 2, 3, 4 Empty Wt: 686 Final Wt: の(ちょ) Gain: (1(名 % Spent: 2名 Secondary Filter Impinger #3 H₂O 436. 3 Final Wt: 56(S Gain: Colour: CLEMR Empty Wt: ട്യൂട്ട Empty Wt: Final Wt: Final Wt: % Spent: Colour: Gain: Gain: 3 Gain: Seal and label container TS4 Filter ID: No ーインmm ー Initial Wt: 0.122 + Final Wt: 0.08CONTAINER TS4 CONTAINER TS4 Back-Up Filter 0 Colour: White Gain: Seal and label container TS3 After Act. Rinse: 의독의 옷 Total TS3: Exit Stem, and Connecting Container TS3 Weights ty Wt: コート Tubing to Filter, CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Final Wt: Empty Wt: Gaint: Seal and label container TS2 After Act. Rinse: スプス (い Total TS2: イセ・さ cup, and outside of exit stem 0.70.0 to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Cyclone walls, collection Container TS2 Weights PM 10 Turnaround cup, exit stem, connecting 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 Beaker Initial Wt: Final Wt: 60 Empty Wt: 2 ROW 16 50/12 Gain Container TS1 Weights
Empty Wt: ストーン
After Act. Rinse: スコーン
Total TS1: Nozzle, PM 10 Cyclone walls, SAMPLE IDENTIFICATION Seal and label container TS1 TS7 (Acetone / Hexane rinse) outside of exit stem CONTAINER TS1 CONTAINER TS1 TS5 (Imp 2 H₂0 and rinse) collection cup, TS4 (Back Up Filter, <2.5) Recovery Witnessed By: Date: TS6 (Secondary Filter) Train Recovered By: Beaker Initial Wt: Train Loaded By: TS2 (Part. > 2.5) TS3 (Part. < 2.5) IS1 (Part. > 10) Final Wt:

2 2800

Date:

Client: Covanta Project No.: 21656

Test No.: BICAL # 2
Test Location: ADC # 2

Acetone & Hexane into TS7 filter to 2nd u-tube with After Acetone Rinse: 2005 After Hexane Rinse: 3≲ \ Seal and Label Container Rinse all glassware from Acetone/Hexane Rinse Mark Fluid Level and Empty Wt: 200 CONTAINER TS7 Filter ID: 110 - BSmm - Colour: 0.38411
Final Wt: 0.38412
TS6 Gain: - 0.38 stem impinger (14 lpm for 1 hr) imp 1 transfered to Impaction After H₂O Rinse: 322. ○ Perform nitrogen purge of 5 080 5 080 CONTAINER TS5 & TS6 glassware from filter Total Volume TS5: to 2nd u-tube with CONTAINER TS6 CONTAINER TS5 Secondary Filter di H2O into TS3 Rinse all purge is not required. * if there is no gain Filter ID: 110 Empty Wt: With Imp 2: Purge On: Purge Off: Empty Wt: 670.0 Initial Wt: 795.0 Final Wt: 795.1 Impinger #1 Knock Out の説 Impinger #4 Silica Gel Impinger #2 Empty Impingers 1, 2, 3, 4 Clepy ニダブ Secondary Filter Impinger #3 H₂O CWTR=1+2+3: ~_0.1 WCBDA=4: ____1 Lolol. 0 Empty Wt: しんしょ Initial Wt: Empty Wt: Final Wt: Gain: % Spent: Final Wt: Colour: Colour: Gain: Colour: Gain: Gain: Filter ID: 16 - LT MM - IT Seal and label container TS4 Initial Wt: 〇 . (2도) . Final Wt: 〇 . (2도) CONTAINER 1S4 CONTAINER TS4 Back-Up Filter Gain: -O. | Colour: \-\rangle\rangle\rangle Seal and label container TS3 Exit Stem, and Connecting Container TS3 Weights y Wt: コート After Act. Rinse: 3cs |... Tubing to Filter, CONTAINER TS3 CONTAINER TS3 and Filter Top Beaker Initial Wt: Final Wt: Empty Wt: Gain: Seal and label container TS2 cup, and outside of exit stem Empty Wt: ころろ こ After Act. Rinse: 333 子 Total TS2: ころ こ to PM 2.5 cyclone. PM 2.5 tubing from, PM 10 head Cyclone walls, collection Container TS2 Weights PM 10 Turnaround cup, exit stem, connecting 16-21656-M201A-CONTAINER TS2 CONTAINER TS2 绵 Beaker Initial Wt: Final Wt: 7 J Gain: Empty Wt: ふるら イ After Act. Rinse: ふろ2. ら Total TS1: ち2・4 Nozzle, PM 10 Cyclone walls, Seal and label container TS1 SAMPLE IDENTIFICATION Container TS1 Weights TS6 (Secondary Filter)
TS7 (Acetone / Hexane rinse) outside of exit stem CONTAINER TS1 CONTAINER TS1 TS4 (Back Up Filter, <2.5) TS5 (Imp 2 H₂0 and rinse) Recovery Witnessed By: Date: collection cup, Train Recovered By: Beaker Initial Wt: Train Loaded By: TS2 (Part. > 2.5) TS3 (Part. < 2.5) TS1 (Part. > 10) Final Wt:



### **APPENDIX 13**

Condensable Particulate Analytical Report (7 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site Location: COVANTA

### Attention:Chris Belore

ORTECH Environmental 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/05/12

Report #: R3990285 Version: 1 - Final

### **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: 8690460 Received: 2016/05/04, 12:03

Sample Matrix: Stack Sampling Train

# Samples Received: 8

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Extractable Condensables (M202)	8	2016/05/06	2016/05/09	BRL SOP-00118	EPA 202 m
Non Extractable Condensibles (M202)	8	2016/05/06	2016/05/12	BRL SOP-00118 / BRL SOP- 00109	EPA 202 m
Weight of Solvent from Impingers	8	N/A	2016/05/09		
Weight of Water from Impingers	8	N/A	2016/05/09		

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: Clohnson@maxxam.ca Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

EPA M202 CONDENSIBLE PM (STACK SAMPLING TRAIN)

			( A Z X ) *	March 1 1 1			
Maxxam ID		CHP297	CHP343	CHP344			
Sampling Date		2016/05/03	2016/05/02	2016/05/03			
	UNITS	16-21656-M201A 54-56	16-21656-M201A 47-49	16-21656-M201A 5-7	RDL	MDL	QC Batch
Weight	g	45	40	200	0.1	0.1	4487517
Weight of Solvent	g	73	69	59	0.1	N/A	4487513
Inorganic Condensibles	mg	6.5	7.5	15	0.5	0.1	4487515
Organic Condensibles	mg	<1.0	<1.0	1.2	1.0	0.20	4487512

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

ATT2	UIT3	UZ.
41 1 Lum	The second secon	Marie & Marie

Maxxam ID		CHP345	CHP346	CHP347			
Sampling Date		2016/05/03	2016/05/04	2016/05/02			
	UNITS	16-21656-M201A 12-14	16-21656-M201A 19,1,20	16-21656-M201A 26-28	RDL	MDL	QC Batch
Weight	g	210	260	180	0.1	0.1	4487517
Weight of Solvent	g	61	110	72	0.1	N/A	4487513
Inorganic Condensibles	mg	16	12	19	0.5	0.1	4487515
Organic Condensibles	mg	<1.0	1.5	2.1	1.0	0.20	4487512

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

N/A = Not Applicable

(2	72	UZ.	72
& Some	Section 1	South Acres	

Maxxam ID		CHP348	CHP349			
Sampling Date		2016/05/02	2016/05/02			
	UNITS	16-21656-M201A 33-35	16-21656-M201A 40-42	RDL	MDL	QC Batch
Weight	g	190	170	0.1	0.1	4487517
Weight of Solvent	g	58	58	0.1	N/A	4487513
Inorganic Condensibles	mg	6.8	16	0.5	0.1	4487515
Organic Condensibles	mg	1.4	1.2	1.0	0.20	4487512

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHP297

Sample ID: 16-21656-M201A 54-56

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag

Maxxam ID: CHP343

Sample ID: 16-21656-M201A 47-49 Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag

Maxxam ID:

**CHP344** 

Sample ID: 16-21656-M201A 5-7

Matrix: Stack Sampling Train

Collected:

2016/05/03

Shipped:

2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag

Maxxam ID: CHP345

Sample ID: 16-21656-M201A 12-14

Matrix: Stack Sampling Train

Collected:

2016/05/03

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag

Maxxam ID: CHP346

Sample ID:

16-21656-M201A 19,1,20

Matrix: Stack Sampling Train

Collected:

2016/05/04

Shipped: 2016/05/04 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CHP347

Sample ID: 16-21656-M201A 26-28 Matrix: Stack Sampling Train

Collected: 2016/05/02

Shipped:

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag

Maxxam ID: CHP348

Sample ID: 16-21656-M201A 33-35

Matrix: Stack Sampling Train Shipped:

Collected: 2016/05/02

Received: 2016/05/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Extractable Condensables (M202)	BAL	4487512	2016/05/06	2016/05/09	Farag Farag
Non Extractable Condensibles (M202)	BAL	4487515	2016/05/06	2016/05/12	Farag Farag
Weight of Solvent from Impingers		4487513	N/A	2016/05/09	Farag Farag
Weight of Water from Impingers		4487517	N/A	2016/05/09	Farag Farag

Maxxam ID: **CHP349** 

Sample ID: 16-21656-M201A 40-42

Matrix: Stack Sampling Train

Shipped:

Collected: 2016/05/02

2016/05/04 Received:

Test Description Instrumentation Batch Extracted Date Analyzed Analyst Extractable Condensables (M202) 4487512 2016/05/06 2016/05/09 BAL Farag Farag Non Extractable Condensibles (M202) BAL 4487515 2016/05/06 2016/05/12 Farag Farag Weight of Solvent from Impingers 4487513 N/A 2016/05/09 Farag Farag 4487517 Weight of Water from Impingers N/A 2016/05/09 Farag Farag



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **GENERAL COMMENTS**

Untatred filters were received

Sample CHP297-01: ORGANIC EXTRACTION: Whitish residue found in vial.

INORGANIC EXTRACTION: Whitish residue found in Teflon dish.

Sample CHP343-01: ORGANIC EXTRACTION: Whitish residue found in vial.

INORGANIC EXTRACTION: Whitish residue found in Teflon dish.

Sample CHP344-01: ORGANIC EXTRACTION: Whitish residue found in vial.

INORGANIC EXTRACTION: Yellowish residue found in Teflon dish

Sample CHP345-01: ORGANIC EXTRACTION: Whitish residue found in vial.

INORGANIC EXTRACTION: Yellowish residue found in Teflon dish

Sample CHP346-01: ORGANIC EXTRACTION: Oily material found in vial. INORGANIC EXTRACTION: Yellowish residue found in Teflon dish

Sample CHP347-01: Filter received torn

ORGANIC EXTRACTION: Oily material found in vial.

INORGANIC EXTRACTION: Whitish residue found in Teflon dish.

Sample CHP348-01: ORGANIC EXTRACTION: Oily material found in vial. INORGANIC EXTRACTION: Yellowish residue found in Teflon dish

Sample CHP349-01: Filter received torn

ORGANIC EXTRACTION: Whitish residue found in vial.

INORGANIC EXTRACTION: Whitish residue found in Teflon dish.

Results relate only to the items tested.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **QUALITY ASSURANCE REPORT**

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4487512	FF	Spiked Blank	Organic Condensibles	2016/05/09		91	%	70 - 130
4487512	FF	Method Blank	Organic Condensibles	2016/05/09	<1.0		mg	
4487515	FF	Method Blank	Inorganic Condensibles	2016/05/12	<0.5		mg	

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brenda	Moore	
Brenda Moore, Te	eam Lead	

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



### **APPENDIX 14**

SVOC Train Recovery Data Sheets (8 pages)

### ORTECH Environmental

### Semi-Volatile Organics Train Recovery Data Sheet

Test No.:   Test Date: MAJ 9/16 Test Location: MN, 7/1	Sample ID S Impinger 4  XAD-II Trap Impingers 1, 2 & 3  Imp. Inlet Stem, U-Tubes and Impingers	CONTAINER CONTAINER CONTAINER TS3 TS4 TS6 (Impinger)	Initial Wt: 394.3   Empty Wt: 193.0   Final Wt: 204.5   Final Wt: 193.0   Final Wt
Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-	3 ( B A	CONTAINER CONTAINER TS3 T53	Final V Gain: Colour

### ORTECH Environmental

### Semi-Volatile Organics Train Recovery Data Sheet

Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-				Test No.: Z Test Date: MAY 10/11C Test Location: UNIT 1 ANTLET	1000
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
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: 41b, 2 After Acetone/ 723, 4 Hexane Rinse: 207, 2	Colour: WHITE FOLD IN FOIL SEAL AND LABEL CONTAINER 152	Initial Wt: \$54, 4 Final Wt: \$60, 0 Gain: \$16 Colour: \text{Y(H)TE}	Impinger #1 Empty Empty Wt: 700.5 Final Wt: 1507.3 Gain: 801.8 Colour: (UEMA)	After Acetone Rinse: MA-1 Acetone Rinse Gain: 13.2 After Hexane Rinse: 770.4 Hexane Rinse Gain: 101.8 Total TSS: 554.5	Initial Wt: \$0 7.4 Final Wt: \$0 7.0 5 Gain: \$23.10
MARK FLUID LEVEL  SEAL AND LABEL  CONTAINER TS1		WRAP IN FOIL LABEL AS CONTAINER TS3	Empty Wt: 65 % 2 Initial Wt: 760 5 Final Wt: 805, L Gain: 45	Use 100 - 150g acetone total & 100-150g of hexane total for rinses	
Glassware Train & Proofing Identification Glassware Train ID: Classware Glassware Classware Batch No.: Classware Batch No.: Classware Batch No.:	Maxxam (A) Maxxam (A)		Impinger #3 Empty  Empty Wt: 65% 9 Final Wt: 65% 4 Gain: -0.2 Colour: (LEMC)  Colour: (LEMC)  Container TS4 Weights  Empty Wt: 342.5	Impinger Box ID: 2	
Acetone Batch No.:  Train Loaded By: Recovery Witnessed By: Date:	8 6 8		Imp Volume:  After ~100g H ₂ O Rinse: 26 8 6  Total TS4: 726 6  CWTR = 1+2+3+4: 7 7 7	TS1, TS4, TS5 - 1L Amber Glass Bottle TS2 - Glass Petri Dish TS3 - Glass Trap	

### Semi-Volatile Organics Train Recovery Data Sheet

Client : Covanta DYEC				Test No.: 3	
Project No.: 21656	and the form management of the second control of the second contro			Test Location:	
Sample Batch No.: 16-21656-5VOC-				Test Education: Water   World (E.)	
Sample ID (	Sample ID	Sample ID   3	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
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TSS	CONTAINER TS6 (Impinger)
Empty Wt: $412.8$ After Acetone/ $643.8$ Hexane Rinse: $281.0$	Colour: WHLTE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 391.2 Final Wt: 396.0 Gain: U.8 Colour: WHITE	Impinger #1 Empty  Empty Wt: 103.5 S  Final Wt: 103.2 S  Gain: 92.6 S  Colour: (UE) A.Z	After Acetone Rinse: ちん, マーAcetone Rinse Gain: いか、テームのは、 はいいとして After Hexane Rinse Gain: しか、アーロtal TS5: 2 コーク・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	Initial Wt: 902.3 Final Wt: 782.2 5 Gain: 20.0 % Spent: 70
MARK FLUID LEVEL SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL LABEL AS CONTAINER TS3	Empty Wt: 1644,5 Initial Wt: 169,5 Final Wt: 812,8 3 Gain: 43,3	Use 100 - 150g acetone total & 100- 150g of hexane total for rinses	
Train & Proofing Identification Glassware Train Proofing Provided By: Glassware Train ID: Trap ID:	nntification Maxxam U		Impinger #3 Empty  Empty Wt: by 8,3 Final Wt: by 8,1 4 Gain: 0,2 Colour: A PAR	Impinger Box ID:	
HPLC Batch No.: Ethylene Gylcol Batch No.: Hexane Batch No.: Acetone Batch No.:	60A724-01 153313 92567 31813		Container TS4 Weights Empty Wt:   ふいん、S With Imp Soln: ・スペヨ・レ Imp Volume:   いみ・  After ~100g H ₂ O Rinse: ンしち + い Total TS4:   ス움タ・S		
Train Loaded By: Train Recovered By: Recovery Witnessed By: Date:	Daile		CWTR=1+2+3+4: イネ3、2、、 WCBDA=5: 20,0	TS1, TS4, TS5 - 1L Amber Glass Bottle   TS2 - Glass Petri Dish   TS3 - Glass Trap	

ORTECH Environmental

### Semi-Volatile Organics Train Recovery Data Sheet

Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-				Test No.: (APN K # 2 Test Date: MAY     U	
Sample ID	Sample ID (7-	Sample ID (§	Sample ID	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 TS.1	CONTAINER TS2	CONTAINER TS3	CONTAINER TS4	CONTAINER TS5	CONTAINER TS6 (Impinger)
Empty Wt: けん・チ After Acetone/ イイ・チ Hexane Rinse: ススト・ウ	COIOUN: WHITE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 372, 9 Final Wt: 372, 9 Gain: Colour: WHITE	Impinger #1 Empty  Empty Wt: A 0, 2  Final Wt: A 0, 2  Gain: Colour:	Empty Wt: レース・ナー After Acetone Rinse: スサ・サー Acetone Rinse Gain: スト・オー After Hexane Rinse: レース・ドード Hexane Rinse Gain: ロス・ドー Total TSS:	Initial Wt: 38.5 Final Wt: 38.5 Gain: 8.5 Spent: 0
SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL  LABEL AS  CONTAINER TS3	Empty Wt: bess. 0 Initial Wt: 761.6 Final Wt: 701.6 Gain: Colour: Cont.	Use 100 - 150g acetone total & 100- 150g of hexane total for rinses	
Train & Proofing Identification Glassware Train Proofing Provided By: Glassware Train ID: Trap ID:	ntification Maxxam		Impinger #3 Empty Empty Wt: bSS. 4 Final Wt: CSS. 4 Gain:	Impinger Box ID:	
HPLC Batch No.: Ethylene Gylcol Batch No.: Hexane Batch No.: Acetone Batch No.:	(08224-01 15327 92507 81613		Container TS4 Weights Empty Wt: With Imp Soln: SOH, Y Imp Volume: After ~100g H ₂ O Rinse: JUb.   Total TS4:		
Train Loaded By: Train Recovered By: Recovery Witnessed By: Date:			CWTR = 1+2+3+4: (Ú WCBDA=5:	TS1, TS4, TS5 - 1L Amber Glass Bottle TS2 - Glass Petri Dish TS3 - Glass Trap	

ORTECH Environmental

### Semi-Volatile Organics Train Recovery Data Sheet

Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-				Test Date: MAY 5 201 Test Location: UNIT 7	910
Sample ID 2	Sample ID 22	Sample ID 23	Sample ID 2 C.(	Sample ID 7	
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: 4/5.5 After Acetone/ 706.7 Hexane Rinse: 291.2	Colour: LATITE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 324 P. Final Wt: 324 P. Colour: WHITE	Empty Wt: A S S Final Wt: Colour: Colo	Empty Wt: 40.89 After Acetone Rinse: 59.7 Acetone Rinse Gain: 66.9 Hexane Rinse Gain: 257.9 Total TSS: 75.9	Final Wt: 378.7 Final Wt: 808.4 Gain: 24.5 % Spent: 50
MARK FLUID LEVEL SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL  LABEL AS  CONTAINER TS3	Empty Wt: C57.5 Initial Wt: 746.2 Final Wt: 745.7 3 Gain: 46.5	Use 100 - 150g acetone total & 100- 150g of hexane total for rinses	
Glassware Train & Proofing Identification Glassware Train ID: Trap ID: HPLC Batch No.:	Maxxam Maxxam V		Empty Wt: 656.5 Final Wt: 677.5 Gain: 677.5 Colour: 6.60.7 Container TS4 Weights	Impinger Box ID: 4	
Hexane Batch No.:  Acetone Batch No.:  Train Loaded By:  Train Recovered By:	57063		oln: 090-0 e: 049.2 g H,0 Rinse: 2.626.5 12.73.4	7451-88  TS1, TS4, TS5 - 1L Amber Glass Bottle	
Recovery Witnessed By:  Date: MAY 5	2016		WCBDA=5: 24, S	√ TS2 - Glass Petri Dish	

ORTECH Environmental

### Semi-Volatile Organics Train Recovery Data Sheet

Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-				Test No.: 2 Test Location: [MM 9   1/6 Test Location: [MM 7 2	
Sample ID $2 \& $	Sample ID	Sample ID 🔏	Sample ID	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: HH, 8 After Acetone/ ACA, 4 Hexane Rinse: 342.6	Colour: CATHITE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Initial Wt: 343. A. Gain: 5.3. Colour: WALTE	Empty Wt: 699 - Final Wt: 690 - Colour: 600 - Ethylene Glycol	After Acetone Rinse: Col. Col. Col. Col. Col. Col. Col. Col.	Initial Wt: 768-4 Final Wt: 769-4 Gain: 715-6 % Spent:
MARK FLUID LEVEL  SEAL AND LABEL  CONTAINER TS1		WRAP IN FOIL  LABEL AS  CONTAINER TS3	Empty Wr: 653.5 Initial Wr: 754.0 Final Wr: 794.3 Gain: 40.2	Use 100 - 150g acetone total & 100- 150g of hexane total far rinses	
Glassware Train Proofing Provided By: Glassware Train ID: Trap ID:	Maxxam  Maxxam  S  (5.3.71/3.		Impinger #3 Empty Empty Wt: 647.7 Final Wt: 67.7 Gain: Colour: Container TS4 Weights	Impinger Box ID: /O	
Ethylene Gylcol Batch No.: Hexane Batch No.: Acetone Batch No.: Train Loaded By:			With Imp Soln: CLOS House: Color Total TS4: COVTR = 1 + 2 + 3 + 4: Color With Imp Wi	10++, (	
Recovery Witnessed By:  Date:    March	112		WCBDA=5: 21.5	TS2 - Glass Petri Dish TS3 - Glass Trap	

# Semi-Volatile Organics Train Recovery Data Sheet

Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-				Test No.: S Test Date: Mey 10 S Test Location: Unit S	DIG PATIET
Sample ID 😁 🔇 🗎	Sample ID 🔤 🖒 🕭	Sample ID ~ 35	Sample ID S	Sample ID	
Nozzle, Probe Liner, Cyclone Bypass, F.H. & B.H. Filter Housing, Frit & Connecting Glassware to Top of Condenser	Filter	XAD-ll 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: HIS of After Acetone/ Hexane Rinse: 304,7	Colour: VARICE FOLD IN FOIL SEAL AND LABEL CONTAINER TS2	Final Wt: つりせん じ Final Wt: 上でかり 1 Gain:	Empty Wt: 772 - 6 Final Wt: 664 - 5 Gain: 89 v 9 Colour: ASS	After Acetone Rinse: 575 7 7 7 7 Acetone Rinse Gain: 163 8 4 8 After Hexane Rinse: 109 1 10tal TSS:	Final Wt: 747.4 Final Wt: 768.1 5 Gain: 20.7
MARK FLUID LEVEL SEAL AND LABEL CONTAINER TS1		WRAP IN FOIL  LABEL AS  CONTAINER TS3	Empty Wt: 662-7 Initial Wt: 768-6 Final Wt: 26.8	Use 100 - 150g acetone total & 100- 150g of hexane total for rinses	
Train & Proofing Identification Glassware Train Proofing Provided By: Glassware Train ID: Trap ID:	ntification Maxxam A		Impinger #3 Empty Empty Wt: 66/6 Final Wt: 66/6 Gain: 60our: CACA	Impinger Box ID:	
HPLC Batch No.: Ethylene Gylcol Batch No.: Hexane Batch No.: Acetone Batch No.:	(0,00,00) (5,3713 (0,5567 SIV13		Container TS4 Weights Empty Wt: SS6 is S With Imp Soln: CON is Imp Volume: CON is After "100g H ₂ O Rinse: CON is Total TS4:		
Train Loaded By:  Train Recovered By:  Recovery Witnessed By:  Date:	Selare Sollo		CWTR=1+2+3+4: (441) (8) WCBDA=5: 70,7	TS1, TS4, TS5 - 1L Amber Glass Bottle TS2 - Glass Petri Dish TS3 - Glass Trap	

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## Semi-Volatile Organics Train Recovery Data Sheet

Client: Covanta DYEC Project No.: 21656 Sample Batch No.: 16-21656-SVOC-				Test No.: BANK Test Date: MAY 6,20(6.	
Sample ID 3G -	Sample ID ST	Sample ID	Sample ID "3CC	Sample ID YC	
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)
Finpty Wt: Clour.  After Acetone/ Hexane Rinse: COS.?  Total TS1: (89.2  Seal AND LEVEL  SEAL AND LABEL  CONTAINER TS1  Glassware Train Proofing Provided By: Glassware Train ID: Trap ID: Trap ID: Fethylene Gylcol Batch No.: Ethylene Gylcol Batch No.: Hexane Batch No.: Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.:  Acetone Batch No.	Colour:  FOLD IN FOIL  SEAL AND LABEL  CONTAINER TS2  Maxxam  Maxxam	Initial Wt: 393.8 Final Wt: 393.8 Gain: Colour: WAYTHE SEAL TRAP  SEAL TRAP  LABEL AS CONTAINER TS3	に	Empty Wt: 416.3  After Actione Rinse: 499.4  Acetone Rinse Gain: 84.1  After Hexane Rinse: 626.6  Hexane Rinse Gain: 72.2  Total TSS: 21.3  Use 100-150g of hexane tatal for rinses  Impinger Box ID: 3	Final Wr: 805.3 Final Wr: 65.4 Gain: 0.1 % Spent:
Train Loaded By: JGn Train Recovered By: JGn Recovery Witnessed By: MAY G.	2 2006		Total T54:	TS1, TS4, TS5 - 1t Amber Glass Bottle TS2 - Glass Petri Dish TS3 - Glass Trap	



### **APPENDIX 15**

SVOC Analytical Report (48 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site Location: COVANTA

Attention: CHRIS BELORE

ORTECH Environmental 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/05/26

Report #: R4004506 Version: 1 - Final

### **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B695926 Received: 2016/05/12, 12:30

Sample Matrix: Stack Sampling Train

# Samples Received: 8

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Chlorobenzenes in MM5 Trains (EPA M0010)	8	2016/05/12	2016/05/17	BRL SOP-00202	In house (M0010)
Chlorophenols in MM5 Trains (EPA M0010)	8	2016/05/12	2016/05/17	BRL SOP-00204	In house (M0010)
2,3,7,8-TCDF Confirmation (M23)	6	N/A	2016/05/17	BRL SOP-00404	EPA M23/23A m
Dioxins/Furans in Air (Method 23)	8	2016/05/13	2016/05/16	BRL SOP-00404	EPA M23/23A m
PAH's in MM5 SamplingTrains (CARB429mod)	6	2016/05/12	2016/05/14	BRL SOP-00201	CARB429(ARBM1,M2)mod
PAH's in MM5 SamplingTrains (CARB429mod)	1	2016/05/12	2016/05/15	BRL SOP-00201	CARB429(ARBM1,M2)mod
PAH's in MM5 SamplingTrains (CARB429mod)	1	2016/05/12	2016/05/16	BRL SOP-00201	CARB429(ARBM1,M2)mod
PCBs in a Sampling Train (1668Amod)	8	2016/05/12	2016/05/16	BRL SOP-00408	EPA 1668A m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

**Encryption Key** 

 ${\it Please \ direct \ all \ questions \ regarding \ this \ Certificate \ of \ Analysis \ to \ your \ Project \ Manager.}$ 

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

^{*} RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

UI Blank

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP574							
Sampling Date		2016/05/11				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 16-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<5.7	5.7	60	12	1.00	5.70	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	<8.7	8.7	60	12	1.00	8.70	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	<6.0	6.0	60	12	0.100	0.600	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	<6.0	6.0	60	12	0.100	0.600	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	<5.4	5.4	60	12	0.100	0.540	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	10.6	5.7	60	18	0.0100	0.106	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	28.2	6.1	600	18	0.000300	0.00846	N/A	4499555
Total Tetra CDD *	pg	<7.0 (1)	7.0	60	N/A	N/A	N/A	0	4499555
Total Penta CDD *	pg	<8.7	8.7	60	N/A	N/A	N/A	0	4499555
Total Hexa CDD *	pg	<11 (1)	11	60	N/A	N/A	N/A	0	4499555
Total Hepta CDD *	pg	10.6	5.7	60	N/A	N/A	N/A	1	4499555
2,3,7,8-Tetra CDF **	pg	<3.8	3.8	60	12	0.100	0.380	N/A	4499555
1,2,3,7,8-Penta CDF **	pg	<8.0	8.0	60	12	0.0300	0.240	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	<8.0	8.0	60	12	0.300	2.40	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	<6.0	6.0	60	12	0.100	0.600	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	<5.5	5.5	60	12	0.100	0.550	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	<6.0	6.0	60	12	0.100	0.600	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<6.6	6.6	60	12	0.100	0.660	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	<4.4	4.4	60	18	0.0100	0.0440	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	<5.3	5.3	60	12	0.0100	0.0530	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<6.3	6.3	600	30	0.000300	0.00189	N/A	4499555
Total Tetra CDF **	pg	<6.2 (1)	6.2	60	N/A	N/A	N/A	0	4499555
Total Penta CDF **	pg	<8.0	8.0	60	N/A	N/A	N/A	0	4499555
Total Hexa CDF **	pg	<6.0	6.0	60	N/A	N/A	N/A	0	4499555
Total Hepta CDF **	pg	<4.8	4.8	60	N/A	N/A	N/A	0	4499555
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	21.8	N/A	N/A
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	83	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP574							
Sampling Date		2016/05/11				TOXIC EQL	IVALENCY	# of	
	UNITS	16-21656-SVOC 16-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	67	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	67	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	63	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	68	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

WE Black

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP575							
Sampling Date		2016/05/06				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 36-40	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<5.4	5.4	60	12	1.00	5.40	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	<6.9	6.9	60	12	1.00	6.90	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	<6.1	6.1	60	12	0.100	0.610	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	<6.1	6.1	60	12	0.100	0.610	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	<5.4	5.4	60	12	0.100	0.540	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	7.1 (1)	4.1	60	18	0.0100	0.0710	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	29.4	5.8	600	18	0.000300	0.00882	N/A	4499555
Total Tetra CDD *	pg	<8.4 (2)	8.4	60	N/A	N/A	N/A	0	4499555
Total Penta CDD *	pg	<6.9	6.9	60	N/A	N/A	N/A	0	4499555
Total Hexa CDD *	pg	<12 (2)	12	60	N/A	N/A	N/A	0	4499555
Total Hepta CDD *	pg	14.6	4.1	60	N/A	N/A	N/A	2	4499555
2,3,7,8-Tetra CDF **	pg	<6.8	6.8	60	12	0.100	0.680	N/A	4499555
1,2,3,7,8-Penta CDF **	pg	<7.8	7.8	60	12	0.0300	0.234	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	<7.8	7.8	60	12	0.300	2.34	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	<6.2	6.2	60	12	0.100	0.620	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	<5.7	5.7	60	12	0.100	0.570	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	<6.2	6.2	60	12	0.100	0.620	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<6.8	6.8	60	12	0.100	0.680	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	<4.9	4.9	60	18	0.0100	0.0490	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	<5.9	5.9	60	12	0.0100	0.0590	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<6.4	6.4	600	30	0.000300	0.00192	N/A	4499555
Total Tetra CDF **	pg	<6.8	6.8	60	N/A	N/A	N/A	0	4499555
Total Penta CDF **	pg	<7.8	7.8	60	N/A	N/A	N/A	0	4499555
Total Hexa CDF **	pg	<6.2	6.2	60	N/A	N/A	N/A	0	4499555
Total Hepta CDF **	pg	<5.3	5.3	60	N/A	N/A	N/A	0	4499555
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	20.0	N/A	N/A
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Ratio - Isotopic ratio adjusted to meet theoretical

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP575							
Sampling Date		2016/05/06				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 36-40	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-1234678 HeptaCDF **	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	69	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	64	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

U1 T1

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP576							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 1-5	EDŁ	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	54.7 (1)	7.6	60	12	1.00	54.7	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	1180	11	60	12	1.00	1180	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	4510 (2)	390	600	12	0.100	451	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	14700 (2)	390	600	12	0.100	1470	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	22900 (2)	350	600	12	0.100	2290	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	62100 (2)	490	600	18	0.0100	621	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	35800	7.9	600	18	0.000300	10.7	N/A	4499555
Total Tetra CDD *	pg	5900	7.6	60	N/A	N/A	N/A	14	4499555
Total Penta CDD *	pg	52200	11	60	N/A	N/A	N/A	12	4499555
Total Hexa CDD *	pg	173000 (2)	380	600	N/A	N/A	N/A	7	4499555
Total Hepta CDD *	pg	125000 (2)	490	600	N/A	N/A	N/A	2	4499555
1,2,3,7,8-Penta CDF **	pg	978	6.8	60	12	0.0300	29.3	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	<3400 (3)	3400	60	12	0.300	1020	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	11200 (4)	16	60	12	0.100	1120	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	5630	15	60	12	0.100	563	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	10100	16	60	12	0.100	1010	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<750 (3)	750	60	12	0.100	75.0	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	20200 (2)	270	600	18	0.0100	202	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	4670 (2)	330	600	12	0.0100	46.7	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<9500 (3)	9500	600	30	0.000300	2.85	N/A	4499555
Total Tetra CDF **	pg	9090	7.0	60	N/A	N/A	N/A	15	4499555
Total Penta CDF **	pg	22100	6.8	60	N/A	N/A	N/A	14	4499555
Total Hexa CDF **	pg	47800	16	60	N/A	N/A	N/A	11	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Ratio - Isotopic ratio adjusted to meet theoretical

(2) ** From 10X Dilution **

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(4) EMPC / Merged Peak



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP576							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 1-5	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	40100 (1)	300	600	N/A	N/A	N/A	4	4499555
Confirmation 2,3,7,8-Tetra CDF **	pg	309	19	60	N/A	0.100	30.9	N/A	4501249
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	10200	N/A	N/A
Surrogate Recovery (%)	***************************************			<del> </del>		<u> </u>			
Confirmation C13-2378 TetraCDF **	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4501249
C13-1234678 HeptaCDD *	%	89 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234678 HeptaCDF **	%	80 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	70 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	61	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	110	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

WITZ

Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP577							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 6-10	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	26.0 (1)	7.2	60	12	1.00	26.0	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	703	16	60	12	1.00	703	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	2960 (2)	290	600	12	0.100	296	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	8490 (2)	290	600	12	0.100	849	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	9870 (2)	260	600	12	0.100	987	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	46300 (2)	580	600	18	0.0100	463	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	28400	8.6	600	18	0.000300	8.52	N/A	4499555
Total Tetra CDD *	pg	4680	7.2	60	N/A	N/A	N/A	14	4499555
Total Penta CDD *	pg	33400	16	60	N/A	N/A	N/A	12	4499555
Total Hexa CDD *	pg	118000 (2)	280	600	N/A	N/A	N/A	7	4499555
Total Hepta CDD *	pg	93200 (2)	580	600	N/A	N/A	N/A	2	4499555
1,2,3,7,8-Penta CDF **	pg	575	12	60	12	0.0300	17.3	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	<2000 (3)	2000	60	12	0.300	600	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	7670 (4)	8.7	60	12	0.100	767	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	3690	8.0	60	12	0.100	369	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	6200	8.8	60	12	0.100	620	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<460 (3)	460	60	12	0.100	46.0	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	14100 (2)	800	600	18	0.0100	141	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	3250 (2)	970	600	12	0.0100	32.5	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<7700 (3)	7700	600	30	0.000300	2.31	N/A	4499555
Total Tetra CDF **	pg	6560	8.0	60	N/A	N/A	N/A	15	4499555
Total Penta CDF **	pg	15100	12	60	N/A	N/A	N/A	14	4499555
Total Hexa CDF **	pg	31700	8.7	60	N/A	N/A	N/A	12	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

- ** CDF = Chloro Dibenzo-p-Furan
- (1) EMPC / Ratio Isotopic ratio adjusted to meet theoretical
- (2) ** From 10X Dilution **
- (3) EMPC / DPE Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.
- (4) EMPC / Merged Peak



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP577							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 6-10	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	27900 (1)	880	600	N/A	N/A	N/A	4	4499555
Confirmation 2,3,7,8-Tetra CDF **	pg	243	41	60	N/A	0.100	24.3	N/A	4501249
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	5950	N/A	N/A
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	110	N/A	N/A	N/A	N/A	N/A	N/A	4501249
C13-1234678 HeptaCDD *	%	107 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234678 HeptaCDF **	%	101 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	115	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	92 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	65	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	109	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	88	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	. %	108	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

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### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP578							
Sampling Date		2016/05/11				TOXIC EQU	IIVALENCY	# of	
	UNITS	16-21656-SVOC 11-15	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	24.5 (1)	8.2	60	12	1.00	24.5	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	545	12	60	12	1.00	545	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	2730	9.9	60	12	0.100	273	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	7400	10	60	12	0.100	740	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	9470	8.9	60	12	0.100	947	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	90100 (2)	860	600	18	0.0100	901	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	27200	7.1	600	18	0.000300	8.16	N/A	4499555
Total Tetra CDD *	pg	3280	8.2	60	N/A	N/A	N/A	14	4499555
Total Penta CDD *	pg	27000	12	60	N/A	N/A	N/A	12	4499555
Total Hexa CDD *	pg	104000	9.6	60	N/A	N/A	N/A	7	4499555
Total Hepta CDD *	pg	126000 (2)	860	600	N/A	N/A	N/A	2	4499555
1,2,3,7,8-Penta CDF **	pg	445	7.2	60	12	0.0300	13.4	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	<1500 (3)	1500	60	12	0.300	450	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	6160 (4)	11	60	12	0.100	616	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	2920	10	60	12	0.100	292	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	5710	11	60	12	0.100	571	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<330 (3)	330	60	12	0.100	33.0	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	12000	25	60	18	0.0100	120	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	2820	31	60	12	0.0100	28.2	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<7500 (3)	7500	600	30	0.000300	2.25	N/A	4499555
Total Tetra CDF **	pg	5090	5.9	60	N/A	N/A	N/A	15	4499555
Total Penta CDF **	pg	11200	7.2	60	N/A	N/A	N/A	15	4499555
Total Hexa CDF **	pg	27700	11	60	N/A	N/A	N/A	12	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

- ** CDF = Chloro Dibenzo-p-Furan
- (1) EMPC / Ratio Isotopic ratio adjusted to meet theoretical
- (2) ** From 10X Dilution **
- (3) EMPC / DPE Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".
  Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.
- (4) EMPC / Merged Peak



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP578							
Sampling Date		2016/05/11				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 11-15	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	23700	28	60	N/A	N/A	N/A	4	4499555
Confirmation 2,3,7,8-Tetra CDF **	pg	181	26	60	N/A	0.100	18.1	N/A	4501249
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	5580	N/A	N/A
Surrogate Recovery (%)		37							
Confirmation C13-2378 TetraCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4501249
C13-1234678 HeptaCDD *	%	127 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234678 HeptaCDF **	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	105	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	111	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	71	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	65	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

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### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP579							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 21-25	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<10	10	60	12	1.00	10.0	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	28	11	60	12	1.00	28.0	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	39.9	7.0	60	12	0.100	3.99	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	101	7.0	60	12	0.100	10.1	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	129	6.2	60	12	0.100	12.9	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	548	4.2	60	18	0.0100	5.48	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	845	8.3	600	18	0.000300	0.254	N/A	4499555
Total Tetra CDD *	pg	426	10	60	N/A	N/A	N/A	7	4499555
Total Penta CDD *	pg	1170	11	60	N/A	N/A	N/A	8	4499555
Total Hexa CDD *	pg	1900	6.7	60	N/A	N/A	N/A	7	4499555
Total Hepta CDD *	pg	1290	4.2	60	N/A	N/A	N/A	2	4499555
1,2,3,7,8-Penta CDF **	pg	49	14	60	12	0.0300	1.47	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	75	14	60	12	0.300	22.5	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	126	7.6	60	12	0.100	12.6	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	<59 (1)	59	60	12	0.100	5.90	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	77.4	7.7	60	12	0.100	7.74	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<9.1 (1)	9.1	60	12	0.100	0.910	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	214	3.8	60	18	0.0100	2.14	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	29.1	4.7	60	12	0.0100	0.291	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<140 (1)	140	600	30	0.000300	0.0420	N/A	4499555
Total Tetra CDF **	pg	816	12	60	N/A	N/A	N/A	14	4499555
Total Penta CDF **	pg	762	14	60	N/A	N/A	N/A	9	4499555
Total Hexa CDF **	pg	544	7.6	60	N/A	N/A	N/A	11	4499555
Total Hepta CDF **	pg	307	4.2	60	N/A	N/A	N/A	3	4499555
Confirmation 2,3,7,8-Tetra CDF **	pg	62	34	60	N/A	0.100	6.20	N/A	4501249
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	131	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".
Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP579							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 21-25	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	75	N/A	N/A	N/A	N/A	N/A	N/A	4501249
C13-1234678 HeptaCDD *	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234678 HeptaCDF **	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	65	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	61	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	70	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	%	75	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

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### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP580							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 26-30	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<7.0	7.0	60	12	1.00	7.00	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	18.3	7.8	60	12	1.00	18.3	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	23.3	6.0	60	12	0.100	2.33	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	65.1	6.0	60	12	0.100	6.51	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	78.7	5.3	60	12	0.100	7.87	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	333	6.3	60	18	0.0100	3.33	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	593	8.6	600	18	0.000300	0.178	N/A	4499555
Total Tetra CDD *	pg	379	7.0	60	N/A	N/A	N/A	8	4499555
Total Penta CDD *	pg	874	7.8	60	N/A	N/A	N/A	10	4499555
Total Hexa CDD *	pg	1200	5.8	60	N/A	N/A	N/A	7	4499555
Total Hepta CDD *	pg	782	6.3	60	N/A	N/A	N/A	2	4499555
1,2,3,7,8-Penta CDF **	pg	30.8 (1)	5.4	60	12	0.0300	0.924	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	54.6	5.4	60	12	0.300	16.4	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	86.5	6.0	60	12	0.100	8.65	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	43.3	5.5	60	12	0.100	4.33	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	53.7	6.0	60	12	0.100	5.37	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<6.5	6.5	60	12	0.100	0.650	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	125	3.3	60	18	0.0100	1.25	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	17.7	4.0	60	12	0.0100	0.177	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<95 (2)	95	600	30	0.000300	0.0285	N/A	4499555
Total Tetra CDF **	pg	660	6.4	60	N/A	N/A	N/A	14	4499555
Total Penta CDF **	pg	561	5.4	60	N/A	N/A	N/A	11	4499555
Total Hexa CDF **	pg	399	6.0	60	N/A	N/A	N/A	10	4499555
Total Hepta CDF **	pg	214	3.7	60	N/A	N/A	N/A	4	4499555
Confirmation 2,3,7,8-Tetra CDF **	pg	21.2	5.9	60	N/A	0.100	2.12	N/A	4501249

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Ratio - Isotopic ratio adjusted to meet theoretical

(2) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".
Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP580								
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of		
	UNITS	16-21656-SVOC 26-30	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch	
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	85.4	N/A	N/A	
Surrogate Recovery (%)										
Confirmation C13-2378 TetraCDF **	%	113	N/A	N/A	N/A	N/A	N/A	N/A	4501249	
C13-1234678 HeptaCDD *	%	123	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-1234678 HeptaCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-123478 HexaCDD *	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-123478 HexaCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-1234789 HeptaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-123678 HexaCDD *	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-123678 HexaCDF **	%	79	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-12378 PentaCDD *	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-12378 PentaCDF **	%	109	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-123789 HexaCDF **	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-23478 PentaCDF **	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-2378 TetraCDD *	%	113	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-2378 TetraCDF **	%	117	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
C13-Octachlorodibenzo-p-Dioxin	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4499555	
Cl37-2378 TetraCDD *	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4499555	

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

* CDD = Chloro Dibenzo-p-Dioxin



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ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP581							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 31-35	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<8.7	8.7	60	12	1.00	8.70	N/A	4499555
1,2,3,7,8-Penta CDD *	pg	23	10	60	12	1.00	23.0	N/A	4499555
1,2,3,4,7,8-Hexa CDD *	pg	27.2	5.2	60	12	0.100	2.72	N/A	4499555
1,2,3,6,7,8-Hexa CDD *	pg	84.0	5.3	60	12	0.100	8.40	N/A	4499555
1,2,3,7,8,9-Hexa CDD *	pg	102	4.7	60	12	0.100	10.2	N/A	4499555
1,2,3,4,6,7,8-Hepta CDD *	pg	530	4.8	60	18	0.0100	5.30	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDD *	pg	824	6.0	600	18	0.000300	0.247	N/A	4499555
Total Tetra CDD *	pg	359	8.7	60	N/A	N/A	N/A	7	4499555
Total Penta CDD *	pg	931	10	60	N/A	N/A	N/A	7	4499555
Total Hexa CDD *	pg	1550	5.1	60	N/A	N/A	N/A	7	4499555
Total Hepta CDD *	pg	1210	4.8	60	N/A	N/A	N/A	2	4499555
1,2,3,7,8-Penta CDF **	pg	48.4	6.0	60	12	0.0300	1.45	N/A	4499555
2,3,4,7,8-Penta CDF **	pg	68.6	6.0	60	12	0.300	20.6	N/A	4499555
1,2,3,4,7,8-Hexa CDF **	pg	116	6.8	60	12	0.100	11.6	N/A	4499555
1,2,3,6,7,8-Hexa CDF **	pg	58.6	6.3	60	12	0.100	5.86	N/A	4499555
2,3,4,6,7,8-Hexa CDF **	pg	62.4	6.8	60	12	0.100	6.24	N/A	4499555
1,2,3,7,8,9-Hexa CDF **	pg	<10 (1)	10	60	12	0.100	1.00	N/A	4499555
1,2,3,4,6,7,8-Hepta CDF **	pg	223	5.6	60	18	0.0100	2.23	N/A	4499555
1,2,3,4,7,8,9-Hepta CDF **	pg	29.9	6.8	60	12	0.0100	0.299	N/A	4499555
1,2,3,4,6,7,8,9-Octa CDF **	pg	<140 (1)	140	600	30	0.000300	0.0420	N/A	4499555
Total Tetra CDF **	pg	710	8.8	60	N/A	N/A	N/A	12	4499555
Total Penta CDF **	pg	689	6.0	60	N/A	N/A	N/A	13	4499555
Total Hexa CDF **	pg	504	6.8	60	N/A	N/A	N/A	11	4499555
Total Hepta CDF **	pg	382	6.1	60	N/A	N/A	N/A	4	4499555
Confirmation 2,3,7,8-Tetra CDF **	pg	25.3	6.1	60	N/A	0.100	2.53	N/A	4501249
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	110	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".
Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS, FURANS AND PCBS (STACK SAMPLING TRAIN)

Maxxam ID		CIP581							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 31-35	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4501249
C13-1234678 HeptaCDD *	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234678 HeptaCDF **	%	68	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDD *	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123478 HexaCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-1234789 HeptaCDF **	%	108	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDD *	%	67	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123678 HexaCDF **	%	63	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDD *	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-12378 PentaCDF **	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-123789 HexaCDF **	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-23478 PentaCDF **	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDD *	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-2378 TetraCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555
C13-Octachlorodibenzo-p-Dioxin	%	<b>7</b> 5	N/A	N/A	N/A	N/A	N/A	N/A	4499555
Cl37-2378 TetraCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4499555

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP574	CIP575	CIP576			
Sampling Date		2016/05/11	2016/05/06	2016/05/09			
	UNITS	16-21656-SVOC 16-20	16-21656-SVOC 36-40	16-21656-SVOC 1-5	RDL	MDL	QC Batch
1-Methylnaphthalene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
1-Methylphenanthrene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
2-Chloronaphthalene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
2-Methylanthracene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
2-Methylnaphthalene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
3-Methylcholanthrene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
7,12-Dimethylbenzo(a)anthracene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
9,10-Dimethylanthracene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
9-Methylphenanthrene	ug	<0.30	<0.30	<0.30	0.30	N/A	4495754
Acenaphthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Acenaphthylene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Anthracene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(a) anthracene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(a)fluorene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Benzo(a)pyrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(b)fluoranthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(b)fluorene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Benzo(e)pyrene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Benzo(g,h,i)perylene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(k)fluoranthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Biphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Chrysene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Coronene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Dibenz(a,h)anthracene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Dibenzo(a,c) anthracene + Picene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Dibenzo(a,e)pyrene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Fluoranthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Fluorene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Indeno(1,2,3-cd)pyrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
m-Terphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Naphthalene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
o-Terphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Perylene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Phenanthrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
p-Terphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP574	CIP575	CIP576			
Sampling Date		2016/05/11	2016/05/06	2016/05/09			
	UNITS	16-21656-SVOC 16-20	16-21656-SVOC 36-40	16-21656-SVOC 1-5	RDL	MDL	QC Batch
Pyrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Quinoline	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Tetralin	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Triphenylene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
1,2,3,4-Tetrachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2,3,5+1,2,4,5-Tetrachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2,3-Trichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2,4-Trichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2-Dichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,3,5-Trichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,3-Dichlorobenzene	ug	<0.30	<0.30	0.31	0.30	0.060	4495745
1,4-Dichlorobenzene	ug	<0.30	<0.30	0.31	0.30	0.060	4495745
Hexachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
Pentachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
2,3,4,5-Tetrachlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,4,6-Tetrachlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,4-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,5,6-Tetrachlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,5-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,6-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,4 + 2,5-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,4,5-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,4,6-Trichlorophenol	ug	<0.30	<0.30	1.17	0.30	0.24	4495752
2,6-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2-Chlorophenol	ug	<0.30	<0.30	0.32	0.30	0.24	4495752
3,4,5-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3,4-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3,5-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3-Chlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
4-Chlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
Pentachlorophenol	ug	<0.30	<0.30	0.57	0.30	0.24	4495752
Surrogate Recovery (%)	***	**************************************					
13C6-Hexachlorobenzene	%	89	108	89	N/A	N/A	4495745

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP574	CIP575	CIP576			
Sampling Date		2016/05/11	2016/05/06	2016/05/09			
	UNITS	16-21656-SVOC 16-20	16-21656-SVOC 36-40	16-21656-SVOC 1-5	RDL	MDL	QC Batch
2H3-1,2,4-Trichlorobenzene	%	75	90	74	N/A	N/A	4495745
2H4-1,3-Dichlorobenzene	%	74	84	72	N/A	N/A	4495745
2H4-1,4-Dichlorobenzene (FS)	%	66	77	63	N/A	N/A	4495745
2,6-Dibromo-4-fluorophenol (FS)	%	93	95	87	N/A	N/A	4495752
D3-2,4-Dichlorophenol	%	97	84	96	N/A	N/A	4495752
D6-Pentachlorophenol	%	85	88	87	N/A	N/A	4495752
D10-2-Methylnaphthalene	%	90	84	70	N/A	N/A	4495754
D10-Anthracene	%	74	70	64	N/A	N/A	4495754
D10-Fluoranthene	%	92	92	84	N/A	N/A	4495754
D10-Fluorene (FS)	%	96	90	79	N/A	N/A	4495754
D10-Phenanthrene	%	98	94	82	N/A	N/A	4495754
D12-Benzo(a)anthracene	%	94	92	86	N/A	N/A	4495754
D12-Benzo(a)pyrene	%	78	78	78	N/A	N/A	4495754
D12-Benzo(b)fluoranthene	%	96	98	88	N/A	N/A	4495754
D12-Benzo(ghi)perylene	%	98	96	90	N/A	N/A	4495754
D12-Benzo(k)fluoranthene	%	98	94	86	N/A	N/A	4495754
D12-Chrysene	%	100	96	88	N/A	N/A	4495754
D12-Indeno(1,2,3-cd)pyrene	%	94	92	86	N/A	N/A	4495754
D12-Perylene	%	82	82	78	N/A	N/A	4495754
D14-Dibenzo(a,h)anthracene	%	94	94	86	N/A	N/A	4495754
D14-Terphenyl (FS)	%	91	92	85	N/A	N/A	4495754
D8-Acenaphthylene	%	92	82	76	N/A	N/A	4495754
D8-Naphthalene	%	94	88	72	N/A	N/A	4495754

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP577	CIP578	CIP579			
Sampling Date		2016/05/10	2016/05/11	2016/05/05			
	UNITS	16-21656-SVOC 6-10	16-21656-SVOC 11-15	16-21656-SVOC 21-25	RDL	MDL	QC Batch
1-Methylnaphthalene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
1-Methylphenanthrene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
2-Chloronaphthalene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
2-Methylanthracene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
2-Methylnaphthalene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
3-Methylcholanthrene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
7,12-Dimethylbenzo(a)anthracene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
9,10-Dimethylanthracene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
9-Methylphenanthrene	ug	<0.30	<0.30	<0.30	0.30	N/A	4495754
Acenaphthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Acenaphthylene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Anthracene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(a)anthracene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(a)fluorene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Benzo(a)pyrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(b)fluoranthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Benzo(b)fluorene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Benzo(e)pyrene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Benzo(g,h,i)perylene	ug	<0,30	<0.30	<0.30	0.30	0.060	4495754
Benzo(k)fluoranthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Biphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Chrysene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Coronene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Dibenz(a,h)anthracene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Dibenzo(a,c) anthracene + Picene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Dibenzo (a, e) pyrene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Fluoranthene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Fluorene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Indeno(1,2,3-cd)pyrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
m-Terphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Naphthalene	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
o-Terphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Perylene	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Phenanthrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
p-Terphenyl	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP577	CIP578	CIP579			
Sampling Date		2016/05/10	2016/05/11	2016/05/05			
	UNITS	16-21656-SVOC 6-10		16-21656-SVOC 21-25	RDL	MDL	QC Batch
Pyrene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
Quinoline	ug	<1.2	<1.2	<1.2	1.2	0.30	4495754
Tetralin	ug	<0.60	<0.60	<0.60	0.60	0.30	4495754
Triphenylene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495754
1,2,3,4-Tetrachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2,3,5+1,2,4,5-Tetrachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2,3-Trichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2,4-Trichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,2-Dichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,3,5-Trichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,3-Dichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
1,4-Dichlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
Hexachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
Pentachlorobenzene	ug	<0.30	<0.30	<0.30	0.30	0.060	4495745
2,3,4,5-Tetrachlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,4,6-Tetrachlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,4-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,5,6-Tetrachlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,5-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3,6-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,3-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,4 + 2,5-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,4,5-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2,4,6-Trichlorophenol	ug	1.05	1.12	0.71	0.30	0.24	4495752
2,6-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
2-Chlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3,4,5-Trichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3,4-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3,5-Dichlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
3-Chlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
4-Chlorophenol	ug	<0.30	<0.30	<0.30	0.30	0.24	4495752
Pentachlorophenol	ug	0.55	0.56	0.41	0.30	0.24	4495752
Surrogate Recovery (%)		£10-00-					•
13C6-Hexachlorobenzene	%	93	96	92	N/A	N/A	4495745
2H3-1,2,3-Trichlorobenzene (FS)	%	81	77	72	N/A	N/A	4495745

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP577	CIP578	CIP579			
Sampling Date		2016/05/10	2016/05/11	2016/05/05			
	UNITS	16-21656-SVOC 6-10	16-21656-SVOC 11-15	16-21656-SVOC 21-25	RDL	MDL	QC Batch
2H3-1,2,4-Trichlorobenzene	%	82	79	81	N/A	N/A	4495745
2H4-1,3-Dichlorobenzene	%	70	67	74	N/A	N/A	4495745
2H4-1,4-Dichlorobenzene (FS)	%	66	70	49	N/A	N/A	4495745
2,6-Dibromo-4-fluorophenol (FS)	%	97	101	91	N/A	N/A	4495752
D3-2,4-Dichlorophenol	%	95	104	92	N/A	N/A	4495752
D6-Pentachlorophenol	%	85	88	95	N/A	N/A	4495752
D10-2-Methylnaphthalene	%	78	78	84	N/A	N/A	4495754
D10-Anthracene	%	66	46 (1)	58	N/A	N/A	4495754
D10-Fluoranthene	%	88	90	92	N/A	N/A	4495754
D10-Fluorene (FS)	%	84	85	91	N/A	N/A	4495754
D10-Phenanthrene	%	88	90	94	N/A	N/A	4495754
D12-Benzo(a)anthracene	%	90	90	94	N/A	N/A	4495754
D12-Benzo(a)pyrene	%	80	84	90	N/A	N/A	4495754
D12-Benzo(b)fluoranthene	%	92	92	92	N/A	N/A	4495754
D12-Benzo(ghi)perylene	%	94	90	96	N/A	N/A	4495754
D12-Benzo(k)fluoranthene	%	92	90	94	N/A	N/A	4495754
D12-Chrysene	%	90	90	96	N/A	N/A	4495754
D12-Indeno(1,2,3-cd)pyrene	%	90	86	92	N/A	N/A	4495754
D12-Perylene	%	84	86	88	N/A	N/A	4495754
D14-Dibenzo(a,h)anthracene	%	90	88	92	N/A	N/A	4495754
D14-Terphenyl (FS)	%	87	88	88	N/A	N/A	4495754
D8-Acenaphthylene	%	82	82	92	N/A	N/A	4495754
D8-Naphthalene	%	80	78	86	N/A	N/A	4495754

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP580	CIP581			
Sampling Date		2016/05/09	2016/05/10			
	UNITS	16-21656-SVOC 26-30	16-21656-SVOC 31-35	RDL	MDL	QC Batch
1-Methylnaphthalene	ug	<0.60	<0.60	0.60	0.30	4495754
1-Methylphenanthrene	ug	<0.60	<0.60	0.60	0.30	4495754
2-Chloronaphthalene	ug	<0.60	<0.60	0.60	0.30	4495754
2-Methylanthracene	ug	<0.60	<0.60	0.60	0.30	4495754
2-Methylnaphthalene	ug	<0.30	<0.30	0.30	0.060	4495754
3-Methylcholanthrene	ug	<1.2	<1.2	1.2	0.30	4495754
7,12-Dimethylbenzo(a)anthracene	ug	<1.2	<1.2	1.2	0.30	4495754
9,10-Dimethylanthracene	ug	<1.2	<1.2	1.2	0.30	4495754
9-Methylphenanthrene	ug	<0.30	<0.30	0.30	N/A	4495754
Acenaphthene	ug	<0.30	<0.30	0.30	0.060	4495754
Acenaphthylene	ug	<0.30	<0.30	0.30	0.060	4495754
Anthracene	ug	<0.30	<0.30	0.30	0.060	4495754
Benzo(a)anthracene	ug	<0.30	<0.30	0.30	0.060	4495754
Benzo(a)fluorene	ug	<1.2	<1.2	1.2	0.30	4495754
Benzo(a)pyrene	ug	<0.30	<0.30	0.30	0.060	4495754
Benzo(b)fluoranthene	ug	<0.30	<0.30	0.30	0.060	4495754
Benzo(b)fluorene	ug	<0.60	<0.60	0.60	0.30	4495754
Benzo(e)pyrene	ug	<0.60	<0.60	0.60	0.30	4495754
Benzo(g,h,i)perylene	ug	<0.30	<0.30	0.30	0.060	4495754
Benzo(k)fluoranthene	ug	<0.30	<0.30	0.30	0.060	4495754
Biphenyl	ug	<0.60	<0.60	0.60	0.30	4495754
Chrysene	ug	<0.30	<0.30	0.30	0.060	4495754
Coronene	ug	<1.2	<1.2	1.2	0.30	4495754
Dibenz(a,h)anthracene	ug	<0.30	<0.30	0.30	0.060	4495754
Dibenzo(a,c) anthracene + Picene	ug	<0.30	<0.30	0.30	0.060	4495754
Dibenzo(a,e)pyrene	ug	<1.2	<1.2	1.2	0.30	4495754
Fluoranthene	ug	<0.30	<0.30	0.30	0.060	4495754
Fluorene	ug	<0.30	<0.30	0.30	0.060	4495754
Indeno(1,2,3-cd)pyrene	ug	<0.30	<0.30	0.30	0.060	4495754
m-Terphenyl	ug	<0.60	<0.60	0.60	<del> </del>	4495754
Naphthalene	ug	<0.60	<0.60	0.60	0.30	4495754
o-Terphenyl	ug	<0.60	<0.60	0.60	0.30	4495754
Perylene	ug	<1.2	<1.2	1.2	0.30	4495754
Phenanthrene	ug	<0.30	<0.30	0.30	0.060	4495754
p-Terphenyl	ug	<0.60	<0.60	0.60	<del> </del>	4495754

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP580	CIP581			
Sampling Date		2016/05/09	2016/05/10			
	UNITS	16-21656-SVOC 26-30	16-21656-SVOC 31-35	RDL	MDL	QC Batch
Pyrene	ug	<0.30	<0.30	0.30	0.060	4495754
Quinoline	ug	<1.2	<1.2	1.2	0.30	4495754
Tetralin	ug	<0.60	<0.60	0.60	0.30	4495754
Triphenylene	ug	<0.30	<0.30	0.30	0.060	4495754
1,2,3,4-Tetrachlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,2,3,5+1,2,4,5-Tetrachlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,2,3-Trichlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,2,4-Trichlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,2-Dichlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,3,5-Trichlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,3-Dichlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
1,4-Dichlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
Hexachlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
Pentachlorobenzene	ug	<0.30	<0.30	0.30	0.060	4495745
2,3,4,5-Tetrachlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,3,4,6-Tetrachlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,3,4-Trichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,3,5,6-Tetrachlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,3,5-Trichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,3,6-Trichlorophenol	ug	<0.30	<0.30	0.30	0.24	449575
2,3-Dichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,4 + 2,5-Dichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,4,5-Trichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2,4,6-Trichlorophenol	ug	0.54	0.57	0.30	0.24	4495752
2,6-Dichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
2-Chlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
3,4,5-Trichlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
3,4-Dichlorophenol	ug	<0.30	<0.30	0.30	0.24	449575
3,5-Dichlorophenol	ug	<0.30	<0.30	0.30	0.24	449575
3-Chlorophenol	ug	<0.30	<0.30	0.30	0.24	4495752
4-Chlorophenol	ug	<0.30	<0.30	0.30	0.24	449575
Pentachlorophenol	ug	0.36	0.44	0.30	0.24	4495752
Surrogate Recovery (%)						
13C6-Hexachlorobenzene	%	103	90	N/A	N/A	449574
2H3-1,2,3-Trichlorobenzene (FS)	%	88	77	N/A	N/A	449574
RDL = Reportable Detection Limit		and the second s				
QC Batch = Quality Control Batch						



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **EPS 1/RM/2 SEMIVOLATILES**

### (STACK SAMPLING TRAIN)

Maxxam ID		CIP580	CIP581			
Sampling Date		2016/05/09	2016/05/10			
	UNITS	16-21656-SVOC 26-30	16-21656-SVOC 31-35	RDL	MDL	QC Batch
2H3-1,2,4-Trichlorobenzene	%	94	78	N/A	N/A	4495745
2H4-1,3-Dichlorobenzene	%	81	71	N/A	N/A	4495745
2H4-1,4-Dichlorobenzene (FS)	%	82	73	N/A	N/A	4495745
2,6-Dibromo-4-fluorophenol (FS)	%	79	86	N/A	N/A	4495752
D3-2,4-Dichlorophenol	%	98	88	N/A	N/A	4495752
D6-Pentachlorophenol	%	95	116	N/A	N/A	4495752
D10-2-Methylnaphthalene	%	78	70	N/A	N/A	4495754
D10-Anthracene	%	46 (1)	52	N/A	N/A	4495754
D10-Fluoranthene	%	88	82	N/A	N/A	4495754
D10-Fluorene (FS)	%	86	79	N/A	N/A	4495754
D10-Phenanthrene	%	88	82	N/A	N/A	4495754
D12-Benzo(a) anthracene	%	88	82	N/A	N/A	4495754
D12-Benzo(a)pyrene	%	64	72	N/A	N/A	4495754
D12-Benzo(b)fluoranthene	%	90	84	N/A	N/A	4495754
D12-Benzo(ghi)perylene	%	92	86	N/A	N/A	4495754
D12-Benzo(k)fluoranthene	%	92	84	N/A	N/A	4495754
D12-Chrysene	%	92	82	N/A	N/A	4495754
D12-Indeno(1,2,3-cd)pyrene	%	90	82	N/A	N/A	4495754
D12-Perylene	%	60	74	N/A	N/A	4495754
D14-Dibenzo(a,h)anthracene	%	90	82	N/A	N/A	4495754
D14-Terphenyl (FS)	%	87	82	N/A	N/A	4495754
D8-Acenaphthylene	%	82	74	N/A	N/A	4495754
D8-Naphthalene	%	80	72	N/A	N/A	4495754

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP574							
Sampling Date		2016/05/11				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 16-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	<63	63	600	N/A	0.00010	0.0063	N/A	4495763
344'5-TetraCB-(81)	pg	<64	64	600	N/A	0.00030	0.019	N/A	4495763
233'44'-PentaCB-(105)	pg	<150 (1)	150	600	N/A	0.000030	0.0045	N/A	4495763
2344'5-PentaCB-(114)	pg	<49	49	600	N/A	0.000030	0.0015	N/A	4495763
23'44'5-PentaCB-(118)	pg	440	51	600	N/A	0.000030	0.013	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<57	57	600	N/A	0.000030	0.0017	N/A	4495763
33'44'5-PentaCB-(126)	pg	<51	51	600	N/A	0.10	5.1	N/A	4495763
HexaCB-(156)+(157)	pg	<84	84	1200	N/A	0.000030	0.0025	N/A	4495763
23'44'55'-HexaCB-(167)	pg	<90	90	600	N/A	0.000030	0.0027	N/A	4495763
33'44'55'-HexaCB-(169)	pg	<90	90	600	N/A	0.030	2.7	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	<80	80	600	N/A	0.000030	0.0024	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	7.9	N/A	N/A
Surrogate Recovery (%)									
C13-233'44'55'-HeptaCB-(189)	%	118	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	71	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	71	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	40	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	79	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP575							
Sampling Date		2016/05/06				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 36-40	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	<72	72	600	N/A	0.00010	0.0072	N/A	4495763
344'5-TetraCB-(81)	pg	<74	74	600	N/A	0.00030	0.022	N/A	4495763
233'44'-PentaCB-(105)	pg	<190 (1)	190	600	N/A	0.000030	0.0057	N/A	4495763
2344'5-PentaCB-(114)	pg	<57	57	600	N/A	0.000030	0.0017	N/A	4495763
23'44'5-PentaCB-(118)	pg	590	59	600	N/A	0.000030	0.018	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<66	66	600	N/A	0.000030	0.0020	N/A	4495763
33'44'5-PentaCB-(126)	pg	<60	60	600	N/A	0.10	6.0	N/A	4495763
HexaCB-(156)+(157)	pg	<40	40	1200	N/A	0.000030	0.0012	N/A	4495763
23'44'55'-HexaCB-(167)	pg	<43	43	600	N/A	0.000030	0.0013	N/A	4495763
33'44'55'-HexaCB-(169)	pg	<42	42	600	N/A	0.030	1.3	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	<72	72	600	N/A	0.000030	0.0022	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	7.4	N/A	N/A
Surrogate Recovery (%)	·!············		<u> </u>				_		
C13-233'44'55'-HeptaCB-(189)	%	120	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	64	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	64	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	68	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	40	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	67	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP576							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 1-5	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	540	88	600	N/A	0.00010	0.054	N/A	4495763
344'5-TetraCB-(81)	pg	240	91	600	N/A	0.00030	0.072	N/A	4495763
233'44'-PentaCB-(105)	pg	1300	100	600	N/A	0.000030	0.039	N/A	4495763
2344'5-PentaCB-(114)	pg	<97	97	600	N/A	0.000030	0.0029	N/A	4495763
23'44'5-PentaCB-(118)	pg	3200	99	600	N/A	0.000030	0.096	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<110	110	600	N/A	0.000030	0.0033	N/A	4495763
33'44'5-PentaCB-(126)	pg	920	100	600	N/A	0.10	92	N/A	4495763
HexaCB-(156)+(157)	pg	1300	85	1200	N/A	0.000030	0.039	N/A	4495763
23'44'55'-HexaCB-(167)	pg	230	91	600	N/A	0.000030	0.0069	N/A	4495763
33'44'55'-HexaCB-(169)	pg	840	91	600	N/A	0.030	25	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	1400	92	600	N/A	0.000030	0.042	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	120	N/A	N/A
Surrogate Recovery (%)	***************************************								
C13-233'44'55'-HeptaCB-(189)	%	127	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	75	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	83	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	43	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP577							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 6-10	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	390	76	600	N/A	0.00010	0.039	N/A	4495763
344'5-TetraCB-(81)	pg	160	79	600	N/A	0.00030	0.048	N/A	4495763
233'44'-PentaCB-(105)	pg	810	61	600	N/A	0.000030	0.024	N/A	4495763
2344'5-PentaCB-(114)	pg	<120 (1)	120	600	N/A	0.000030	0.0036	N/A	4495763
23'44'5-PentaCB-(118)	pg	2100	61	600	N/A	0.000030	0.063	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<67	67	600	N/A	0.000030	0.0020	N/A	4495763
33'44'5-PentaCB-(126)	pg	520	61	600	N/A	0.10	52	N/A	4495763
HexaCB-(156)+(157)	pg	920	81	1200	N/A	0.000030	0.028	N/A	4495763
23'44'55'-HexaCB-(167)	pg	<180 (1)	180	600	N/A	0.000030	0.0054	N/A	4495763
33'44'55'-HexaCB-(169)	pg	600	86	600	N/A	0.030	18	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	1100	140	600	N/A	0.000030	0.033	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	70	N/A	N/A
Surrogate Recovery (%)									
C13-233'44'55'-HeptaCB-(189)	%	123	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	46	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP578							
Sampling Date		2016/05/11				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 11-15	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	330	89	600	N/A	0.00010	0.033	N/A	4495763
344'5-TetraCB-(81)	pg	120	92	600	N/A	0.00030	0.036	N/A	4495763
233'44'-PentaCB-(105)	pg	500	68	600	N/A	0.000030	0.015	N/A	4495763
2344'5-PentaCB-(114)	pg	84	65	600	N/A	0.000030	0.0025	N/A	4495763
23'44'5-PentaCB-(118)	pg	1100	67	600	N/A	0.000030	0.033	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<74	74	600	N/A	0.000030	0.0022	N/A	4495763
33'44'5-PentaCB-(126)	pg	370	68	600	N/A	0.10	37	N/A	4495763
HexaCB-(156)+(157)	pg	<520 (1)	520	1200	N/A	0.000030	0.016	N/A	4495763
23'44'55'-HexaCB-(167)	pg	130	85	600	N/A	0.000030	0.0039	N/A	4495763
33'44'55'-HexaCB-(169)	pg	430	85	600	N/A	0.030	13	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	<680	680	600	N/A	0.000030	0.020	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	50	N/A	N/A
Surrogate Recovery (%)		-							
C13-233'44'55'-HeptaCB-(189)	%	121	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	58	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP579							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 21-25	EDŁ	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	110	73	600	N/A	0.00010	0.011	N/A	4495763
344'5-TetraCB-(81)	pg	<76	76	600	N/A	0.00030	0.023	N/A	4495763
233'44'-PentaCB-(105)	pg	490	60	600	N/A	0.000030	0.015	N/A	4495763
2344'5-PentaCB-(114)	pg	<57	57	600	N/A	0.000030	0.0017	N/A	4495763
23'44'5-PentaCB-(118)	pg	1200	59	600	N/A	0.000030	0.036	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<66	66	600	N/A	0.000030	0.0020	N/A	4495763
33'44'5-PentaCB-(126)	pg	<59	59	600	N/A	0.10	5.9	N/A	4495763
HexaCB-(156)+(157)	pg	<84	84	1200	N/A	0.000030	0.0025	N/A	4495763
23'44'55'-HexaCB-(167)	pg	<90	90	600	N/A	0.000030	0.0027	N/A	4495763
33'44'55'-HexaCB-(169)	pg	<89	89	600	N/A	0.030	2.7	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	<71	71	600	N/A	0.000030	0.0021	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	8.7	N/A	N/A
Surrogate Recovery (%)			^			***************************************			
C13-233'44'55'-HeptaCB-(189)	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	79	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	79	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	64	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	79	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP580							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 26-30	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	120	75	600	N/A	0.00010	0.012	N/A	4495763
344'5-TetraCB-(81)	pg	<77	77	600	N/A	0.00030	0.023	N/A	4495763
233'44'-PentaCB-(105)	pg	690	82	600	N/A	0.000030	0.021	N/A	4495763
2344'5-PentaCB-(114)	pg	<78	78	600	N/A	0.000030	0.0023	N/A	4495763
23'44'5-PentaCB-(118)	pg	2500	81	600	N/A	0.000030	0.075	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<90	90	600	N/A	0.000030	0.0027	N/A	4495763
33'44'5-PentaCB-(126)	pg	<81	81	600	N/A	0.10	8.1	N/A	4495763
HexaCB-(156)+(157)	pg	<97	97	1200	N/A	0.000030	0.0029	N/A	4495763
23'44'55'-HexaCB-(167)	pg	<100	100	600	N/A	0.000030	0.0030	N/A	4495763
33'44'55'-HexaCB-(169)	pg	<100	100	600	N/A	0.030	3.0	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	<59	59	600	N/A	0.000030	0.0018	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	11	N/A	N/A
Surrogate Recovery (%)			<del></del>	A	<del> </del>				
C13-233'44'55'-HeptaCB-(189)	%	118	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	- %	83	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	82	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	48	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77) %		86	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CIP581							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-SVOC 31-35	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	pg	120	97	600	N/A	0.00010	0.012	N/A	4495763
344'5-TetraCB-(81)	pg	<100	100	600	N/A	0.00030	0.030	N/A	4495763
233'44'-PentaCB-(105)	pg	870	69	600	N/A	0.000030	0.026	N/A	4495763
2344'5-PentaCB-(114)	pg	<67	67	600	N/A	0.000030	0.0020	N/A	4495763
23'44'5-PentaCB-(118)	pg	2600	68	600	N/A	0.000030	0.078	N/A	4495763
23'44'5'-PentaCB-(123)	pg	<76	76	600	N/A	0.000030	0.0023	N/A	4495763
33'44'5-PentaCB-(126)	pg	<69	69	600	N/A	0.10	6.9	N/A	4495763
HexaCB-(156)+(157)	pg	200	95	1200	N/A	0.000030	0.0060	N/A	4495763
23'44'55'-HexaCB-(167)	pg	<100	100	600	N/A	0.000030	0.0030	N/A	4495763
33'44'55'-HexaCB-(169)	pg	<100	100	600	N/A	0.030	3.0	N/A	4495763
233'44'55'-HeptaCB-(189)	pg	<82	82	600	N/A	0.000030	0.0025	N/A	4495763
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	10	N/A	N/A
Surrogate Recovery (%)	***************************************								
C13-233'44'55'-HeptaCB-(189)	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5-HexaCB-(156)	%	66	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'5'-HexaCB-(157)	%	66	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-233'44'-PentaCB-(105)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'55'-HexaCB-(167)	%	71	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2344'5-PentaCB-(114)	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-23'44'5-PentaCB-(118)	%	75	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-2'344'5-PentaCB-(123)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'55'-HexaCB-(169)	%	46	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'5-PentaCB-(126)	%	67	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-33'44'-TetraCB-(77)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4495763
C13-344'5-TetraCB-(81)	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4495763

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

#### **TEST SUMMARY**

Maxxam ID: CIP574

16-21656-SVOC 16-20

Sample ID: Matrix: Stack Sampling Train Collected: 2016/05/11 Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/16	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu

Maxxam ID: CIP575

Sample ID:

16-21656-SVOC 36-40

Matrix: Stack Sampling Train

Collected: 2016/05/06

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/14	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu

Maxxam ID: CIP576

Sample ID:

16-21656-SVOC 1-5 Matrix: Stack Sampling Train Collected: 2016/05/09

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4501249	N/A	2016/05/17	Branko Vrzic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/14	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu

Maxxam ID: CIP577

Sample ID: 16-21656-SVOC 6-10

Matrix: Stack Sampling Train

2016/05/10 Collected:

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4501249	N/A	2016/05/17	Branko Vrzic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/14	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

#### **TEST SUMMARY**

Maxxam ID: CIP578

Sample ID: 16-21656-SVOC 11-15

Matrix: Stack Sampling Train

Shipped:

Collected: 2016/05/11

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4501249	N/A	2016/05/17	Branko Vrzic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/14	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu

Maxxam ID: CIP579

Sample ID: 16-21656-SVOC 21-25 Matrix: Stack Sampling Train

Collected: Shipped:

2016/05/05

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4501249	N/A	2016/05/17	Branko Vrzic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/14	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu

Maxxam ID: CIP580

Sample ID: 16-21656-SVOC 26-30

Matrix: Stack Sampling Train

2016/05/09 Collected:

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4501249	N/A	2016/05/17	Branko Vrzic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/14	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu

Maxxam ID: CIP581

Sample ID: 16-21656-SVOC 31-35

Matrix: Stack Sampling Train

2016/05/10 Collected:

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4495745	2016/05/12	2016/05/17	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4495752	2016/05/12	2016/05/17	Lidija Tomic
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4501249	N/A	2016/05/17	Branko Vrzic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4499555	2016/05/13	2016/05/16	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4495754	2016/05/12	2016/05/15	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4495763	2016/05/12	2016/05/16	Cathy Xu



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **GENERAL COMMENTS**

7,12-dimethylbenzo(a)anthracene is above 25% RSD in initial calibration. No positives found for this compound. 3-Methylcholanthrene is above 25% RSD in continuing calibration. No positives found for this compound.

Sample CIP578-01: Low recovery for D10-Anthracene

Sample CIP580-01: Low recovery for D10-Anthracene

Results relate only to the items tested.



ORTECH Environmental
Client Project #: 21656
Site Location: COVANTA
Your P.O. #: 21656-J2227

### **QUALITY ASSURANCE REPORT**

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4495745	LTO	Spiked Blank	1,2,3,4-Tetrachlorobenzene	2016/05/17		98	%	40 - 130
			1,2,3,5+1,2,4,5-Tetrachlorobenzene	2016/05/17		97	%	40 - 130
			1,2,3-Trichlorobenzene	2016/05/17		92	%	40 - 130
			1,2,4-Trichlorobenzene	2016/05/17		85	%	40 - 130
			1,2-Dichlorobenzene	2016/05/17		79	%	40 - 130
			1,3,5-Trichlorobenzene	2016/05/17		109	%	40 - 130
			1,3-Dichlorobenzene	2016/05/17		76	%	40 - 130
			1,4-Dichlorobenzene	2016/05/17		123	%	40 - 130
			13C6-Hexachlorobenzene	2016/05/17		109	%	30 - 130
			2H3-1,2,4-Trichlorobenzene	2016/05/17		97	%	30 - 130
			2H4-1,3-Dichlorobenzene	2016/05/17		95	%	30 - 130
			Hexachlorobenzene	2016/05/17		100	%	40 - 130
			Pentachlorobenzene	2016/05/17		96	%	40 - 130
4495745	LTO	Spiked Blank DUP	1,2,3,4-Tetrachlorobenzene	2016/05/17		87	%	40 - 130
		- F	1,2,3,5+1,2,4,5-Tetrachlorobenzene	2016/05/17		83	%	40 - 130
		1,2,3-Trichlorobenzene	2016/05/17		77	%	40 - 130	
			1,2,4-Trichlorobenzene	2016/05/17		72	%	40 - 130
			1,2-Dichlorobenzene	2016/05/17		67	%	40 - 130
			1,3,5-Trichlorobenzene	2016/05/17		87	%	40 - 130
			1,3-Dichlorobenzene	2016/05/17		63	%	40 - 130
			1,4-Dichlorobenzene	2016/05/17		93	%	40 - 130
		13C6-Hexachlorobenzene	2016/05/17		96	%	30 - 130	
	,	2H3-1,2,4-Trichlorobenzene	2016/05/17		82	%	30 - 130	
			2H4-1,3-Dichlorobenzene	2016/05/17		68	%	30 - 130
			Hexachlorobenzene	2016/05/17		87	%	40 - 130
			Pentachlorobenzene	2016/05/17		81	%	40 - 130
4495745	LTO	RPD	1,2,3,4-Tetrachlorobenzene	2016/05/17	12	01	%	50
7733773	210	M D	1,2,3,5+1,2,4,5-Tetrachlorobenzene	2016/05/17	16		%	50
			1,2,3-Trichlorobenzene	2016/05/17	18		%	50
			1,2,4-Trichlorobenzene	2016/05/17	17		%	50
			1,2-Dichlorobenzene	2016/05/17	17		%	50
			1,3,5-Trichlorobenzene	2016/05/17	23		%	50
			1,3-Dichlorobenzene	2016/05/17	19		%	50
			1,4-Dichlorobenzene	2016/05/17	27		% %	50 50
			Hexachlorobenzene	2016/05/17	15		% %	50
			Pentachlorobenzene	2016/05/17	13 17		% %	50
4495745	LTO	Method Blank	1,2,3,4-Tetrachlorobenzene	2016/05/17	<0.30			30
4493743	LIO	Method plank	1,2,3,5+1,2,4,5-Tetrachlorobenzene	2016/05/17	<0.30		ug	
			1,2,3,5+1,2,4,5-Tetrachiorobenzene 1,2,3-Trichlorobenzene		<0.30		ug	
				2016/05/17			ug	
			1,2,4-Trichlorobenzene 1,2-Dichlorobenzene	2016/05/17	<0.30		ug	
				2016/05/17	<0.30		ug	
			1,3,5-Trichlorobenzene	2016/05/17	<0.30		ug	
			1,3-Dichlorobenzene	2016/05/17	<0.30		ug	
			1,4-Dichlorobenzene	2016/05/17	<0.30	0.0	ug	20 120
			13C6-Hexachlorobenzene	2016/05/17		86	%	30 - 130
			2H3-1,2,4-Trichlorobenzene	2016/05/17		75 66	%	30 - 130
			2H4-1,3-Dichlorobenzene	2016/05/17		66	%	30 - 130
			Hexachlorobenzene	2016/05/17	<0.30		ug	
		- 4 1-1 1	Pentachlorobenzene	2016/05/17	<0.30		ug	00
4495752	LTO	Spiked Blank	2,3,4,5-Tetrachlorophenol	2016/05/17		112	%	22 - 134
			2,3,4-Trichlorophenol	2016/05/17		91	%	22 - 13
			2,3,5-Trichlorophenol	2016/05/17		103	%	22 - 13



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			2,4 + 2,5-Dichlorophenol	2016/05/17		85	%	22 - 134
			2,4,6-Trichlorophenol	2016/05/17		97	%	22 - 134
			2,6-Dichlorophenol	2016/05/17		80	%	22 - 134
			2-Chlorophenol	2016/05/17		75	%	22 - 134
			3,4,5-Trichlorophenol	2016/05/17		95	%	22 - 134
			3,4-Dichlorophenol	2016/05/17		87	%	22 - 134
			3,5-Dichlorophenol	2016/05/17		87	%	22 - 134
			4-Chlorophenol	2016/05/17		81	%	22 - 134
			D3-2,4-Dichlorophenol	2016/05/17		87	%	20 - 130
			D6-Pentachlorophenol	2016/05/17		113	%	20 - 130
			Pentachlorophenol	2016/05/17		107	%	22 - 134
			2,3,4,6-Tetrachlorophenol	2016/05/17		93	%	22 - 134
			2,3,5,6-Tetrachlorophenol	2016/05/17		108	%	22 - 134
			2,3,6-Trichlorophenol	2016/05/17		92	%	22 - 134
			2,3-Dichlorophenol	2016/05/17		85	%	22 - 134
			2,4,5-Trichlorophenol	2016/05/17		92	%	22 - 134
			3-Chlorophenol	2016/05/17		81	%	22 - 134
4495752	LTO	Spiked Blank DUP	2,3,4,5-Tetrachlorophenol	2016/05/17		73	%	22 - 134
		•	2,3,4-Trichlorophenol	2016/05/17		78	%	22 - 134
			2,3,5-Trichlorophenol	2016/05/17		84	%	22 - 134
			2,4 + 2,5-Dichlorophenol	2016/05/17		101	%	22 - 134
			2,4,6-Trichlorophenol	2016/05/17		96	%	22 - 134
			2,6-Dichlorophenol	2016/05/17		105	%	22 - 134
			2-Chlorophenol	2016/05/17		122	%	22 - 134
			3,4,5-Trichlorophenol	2016/05/17		78	%	22 - 134
			3,4-Dichlorophenol	2016/05/17		93	%	22 - 134
			3,5-Dichlorophenol	2016/05/17		104	%	22 - 134
			4-Chlorophenol	2016/05/17		115	%	22 - 134
			D3-2,4-Dichlorophenol	2016/05/17		112	%	20 - 130
			D6-Pentachlorophenol	2016/05/17		96	%	20 - 130
			Pentachlorophenol	2016/05/17		58	%	22 - 134
			2,3,4,6-Tetrachlorophenol	2016/05/17		75	%	22 - 134
			2,3,5,6-Tetrachlorophenol	2016/05/17		76	%	22 - 134
			2,3,6-Trichlorophenol	2016/05/17		85	%	22 - 134
			2,3-Dichlorophenol	2016/05/17		92	%	22 - 134
			2,4,5-Trichlorophenol	2016/05/17		84	%	22 - 134
			3-Chlorophenol	2016/05/17		125	%	22 - 134
4495752	LTO	RPD	2,3,4,5-Tetrachlorophenol	2016/05/17	42		%	50
			2,3,4-Trichlorophenol	2016/05/17	16		%	50
			2,3,5-Trichlorophenol	2016/05/17	20		%	50
			2,4 + 2,5-Dichlorophenol	2016/05/17	17		%	50
			2,4,6-Trichlorophenol	2016/05/17	1.2		%	50
			2,6-Dichlorophenol	2016/05/17	27		%	50
			2-Chlorophenol	2016/05/17	48		%	50
			3,4,5-Trichlorophenol	2016/05/17	20		%	50
			3,4-Dichlorophenol	2016/05/17	6.6		%	50
			3,5-Dichlorophenol	2016/05/17	19		%	50
			4-Chlorophenol	2016/05/17	35		%	50
			Pentachlorophenol	2016/05/17	59 (1)		%	50
			2,3,4,6-Tetrachlorophenol	2016/05/17	22		%	50
			2,3,5,6-Tetrachlorophenol	2016/05/17	34		%	50
			2,3,6-Trichlorophenol	2016/05/17	8.3		%	50



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			2,3-Dichlorophenol	2016/05/17	7.9		%	50
			2,4,5-Trichlorophenol	2016/05/17	8.9		%	50
			3-Chlorophenol	2016/05/17	43		%	50
4495752	LTO	Method Blank	2,3,4,5-Tetrachlorophenol	2016/05/17	< 0.30		ug	
			2,3,4-Trichlorophenol	2016/05/17	< 0.30		ug	
			2,3,5-Trichlorophenol	2016/05/17	< 0.30		ug	
			2,4 + 2,5-Dichlorophenol	2016/05/17	< 0.30		ug	
			2,4,6-Trichlorophenol	2016/05/17	<0.30		ug	
			2,6-Dichlorophenol	2016/05/17	< 0.30		ug	
			2-Chlorophenol	2016/05/17	< 0.30		ug	
			3,4,5-Trichlorophenol	2016/05/17	< 0.30		ug	
			3,4-Dichlorophenol	2016/05/17	<0.30		ug	
			3,5-Dichlorophenol	2016/05/17	<0.30		ug	
			4-Chlorophenol	2016/05/17	<0.30		ug	
			D3-2,4-Dichlorophenol	2016/05/17		104	%	20 - 130
			D6-Pentachlorophenol	2016/05/17		93	%	20 - 130
			Pentachlorophenol	2016/05/17	< 0.30		ug	
			2,3,4,6-Tetrachlorophenol	2016/05/17	<0.30		ug	
			2,3,5,6-Tetrachlorophenol	2016/05/17	<0.30		ug	
			2,3,6-Trichlorophenol	2016/05/17	<0.30		ug	
			2,3-Dichlorophenol	2016/05/17	<0.30		ug	
			2,4,5-Trichlorophenol	2016/05/17	<0.30		ug	
			3-Chlorophenol	2016/05/17	<0.30		ug	
4495754	LTO	Spiked Blank	Acenaphthene	2016/05/14	10.50	92	%	60 - 130
1133731	210	Spined Didin	Acenaphthylene	2016/05/14		84	%	60 - 130
			Anthracene	2016/05/14		83	%	60 - 130
			Benzo(a)anthracene	2016/05/14		96	%	60 - 130
			Benzo(a)pyrene	2016/05/14		88	%	60 - 130
			Benzo(b)fluoranthene	2016/05/14		92	%	60 - 130
			Benzo(g,h,i)perylene	2016/05/14		89	%	60 - 130
			Benzo(k)fluoranthene	2016/05/14		101	%	60 - 130
			Chrysene	2016/05/14		99	%	60 - 130
			D10-2-Methylnaphthalene	2016/05/14		96	%	50 - 150
			D10-Fluoranthene	2016/05/14		96	%	50 - 150
			D10-Phenanthrene	2016/05/14		102	%	50 - 150
			D12-Benzo(a)anthracene	2016/05/14		98	%	50 - 150
			D12-Benzo(a)pyrene	2016/05/14		88	%	50 - 150
			D12-Benzo(b)fluoranthene	2016/05/14		100	%	50 - 150
			D12-Benzo(ghi)perylene	2016/05/14		102	%	50 - 150
			D12-Benzo(k)fluoranthene	2016/05/14		102	%	50 - 150
			D12-Chrysene	2016/05/14		106	%	50 - 150
			D12-indeno(1,2,3-cd)pyrene	2016/05/14		98	%	50 - 150
			D12-Parylene	2016/05/14		94	%	50 - 150
			D14-Dibenzo(a,h)anthracene	2016/05/14		98	%	50 - 150 50 - 150
			D8-Acenaphthylene	2016/05/14		94	% %	50 - 150 50 - 150
			D8-Naphthalene	2016/05/14		98	% %	50 - 150 50 - 150
			Dibenz(a,h)anthracene	2016/05/14		98	% %	60 - 130
			Fluoranthene	2016/05/14		98 94	% %	60 - 130
			Fluorene	2016/05/14		94	%	60 - 130
						94 97	% %	60 - 130
		Indeno(1,2,3-cd)pyrene	2016/05/14		3/	70	00 - 130	
			Naphthalene	2016/05/14		99	%	60 - 130



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Pyrene	2016/05/14		92	%	60 - 130
4495754	LTO	Spiked Blank DUP	Acenaphthene	2016/05/14		84	%	60 - 130
		•	Acenaphthylene	2016/05/14		73	%	60 - 130
			Anthracene	2016/05/14		73	%	60 - 130
			Benzo(a)anthracene	2016/05/14		89	%	60 - 130
		ş.	Benzo(a)pyrene	2016/05/14		76	%	60 - 130
			Benzo(b)fluoranthene	2016/05/14		87	%	60 - 130
			Benzo(g,h,i)perylene	2016/05/14		82	%	60 - 130
			Benzo(k)fluoranthene	2016/05/14		89	%	60 - 130
			Chrysene	2016/05/14		91	%	60 - 130
			D10-2-Methylnaphthalene	2016/05/14		88	%	50 - 150
			D10-Fluoranthene	2016/05/14		92	%	50 - 150
			D10-Phenanthrene	2016/05/14		96	%	50 - 150
			D12-Benzo(a)anthracene	2016/05/14		90	%	50 - 150
			D12-Benzo(a)pyrene	2016/05/14		76	%	50 - 150
			D12-Benzo(b)fluoranthene	2016/05/14		94	%	50 - 150
			D12-Benzo(ghi)perylene	2016/05/14		94	%	50 - 150
			D12-Benzo(k)fluoranthene	2016/05/14		94	%	50 - 150
			D12-Chrysene	2016/05/14		96	%	50 - 150
			D12-Indeno(1,2,3-cd)pyrene	2016/05/14		90	%	50 - 150
			D12-Perylene	2016/05/14		80	%	50 - 150
			D14-Dibenzo(a,h)anthracene	2016/05/14		90	%	50 - 150
			D8-Acenaphthylene	2016/05/14		82	%	50 - 150
			D8-Naphthalene	2016/05/14		90	%	50 - 150
			Dibenz(a,h)anthracene	2016/05/14		91	%	60 - 130
			Fluoranthene	2016/05/14		90	%	60 - 130
			Fluorene	2016/05/14		88	%	60 - 130
			Indeno(1,2,3-cd)pyrene	2016/05/14		89	%	60 - 130
			Naphthalene	2016/05/14		91	%	60 - 130
			Phenanthrene	2016/05/14		90	%	60 - 130
			Pyrene	2016/05/14		88	%	60 - 130
4495754	LTO	RPD	Acenaphthene	2016/05/14	8.3		%	50
.,,			Acenaphthylene	2016/05/14	13		%	50
			Anthracene	2016/05/14	13		%	50
			Benzo(a)anthracene	2016/05/14	8.1		%	50
			Benzo(a)pyrene	2016/05/14	14		%	50
			Benzo(b)fluoranthene	2016/05/14	5.9		%	50
			Benzo(g,h,i)perylene	2016/05/14	7.9		%	50
			Benzo(k)fluoranthene	2016/05/14	12		%	50
			Chrysene	2016/05/14	8.4		%	50
			Dibenz(a,h)anthracene	2016/05/14	8.2		%	50
			Fluoranthene	2016/05/14	4.9		%	50
			Fluorene	2016/05/14	6.6		%	50
			Indeno(1,2,3-cd)pyrene	2016/05/14	8.3		%	50
			Naphthalene	2016/05/14	8.4		%	50
			Phenanthrene	2016/05/14	4.9		%	50
			Pyrene	2016/05/14	4.2		%	50
4495754	LTO	Method Blank	1-Methylnaphthalene	2016/05/14	<0.60		ug	50
777777	110	Wichiou Dialik	1-Methyliphenanthrene	2016/05/14	<0.60		ug	
			2-Chloronaphthalene	2016/05/14	<0.60		ug	
			2-Methylanthracene	2016/05/14	<0.60			
			•		<0.30		ug	
			2-Methylnaphthalene	2016/05/14	<b>\U.5U</b>		ug	



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			3-Methylcholanthrene	2016/05/14	<1.2		ug	
			7,12-Dimethylbenzo(a)anthracene	2016/05/14	<1.2		ug	
			9,10-Dimethylanthracene	2016/05/14	<1.2		ug	
			9-Methylphenanthrene	2016/05/14	0		ug	
			Acenaphthene	2016/05/14	< 0.30		ug	
			Acenaphthylene	2016/05/14	< 0.30		ug	
			Anthracene	2016/05/14	< 0.30		ug	
			Benzo(a)anthracene	2016/05/14	< 0.30		ug	
			Benzo(a)fluorene	2016/05/14	<1.2		ug	
			Benzo(a)pyrene	2016/05/14	< 0.30		ug	
			Benzo(b)fluoranthene	2016/05/14	< 0.30		ug	
			Benzo(b)fluorene	2016/05/14	< 0.60		ug	
			Benzo(e)pyrene	2016/05/14	< 0.60		ug	
			Benzo(g,h,i)perylene	2016/05/14	< 0.30		ug	
			Benzo(k)fluoranthene	2016/05/14	< 0.30		ug	
			Biphenyl	2016/05/14	<0.60		ug	
			Chrysene	2016/05/14	< 0.30		ug	
			Coronene	2016/05/14	<1.2		ug	
			D10-2-Methylnaphthalene	2016/05/14		94	%	50 - 150
			D10-Fluoranthene	2016/05/14		98	%	50 - 150
			D10-Phenanthrene	2016/05/14		102	%	50 - 150
			D12-Benzo(a)anthracene	2016/05/14		98	%	50 - 150
			D12-Benzo(a)pyrene	2016/05/14		84	%	50 - 150
			D12-Benzo(b)fluoranthene	2016/05/14		98	%	50 - 150
			D12-Benzo(ghi)perylene	2016/05/14		102	%	50 - 150
			D12-Benzo(k)fluoranthene	2016/05/14		102	%	50 - 150
			D12-Chrysene	2016/05/14		100	%	50 - 150
			D12-Indeno(1,2,3-cd)pyrene	2016/05/14		98	%	50 - 150
			D12-Perylene	2016/05/14		90	%	50 - 150
			D14-Dibenzo(a,h)anthracene	2016/05/14		98	%	50 - 150
			D8-Acenaphthylene	2016/05/14		96	%	50 - 150
			D8-Naphthalene	2016/05/14		96	%	50 - 150
			Dibenz(a,h)anthracene	2016/05/14	< 0.30		ug	
			Dibenzo(a,c) anthracene + Picene	2016/05/14	< 0.30		ug	
			Dibenzo(a,e)pyrene	2016/05/14	<1.2		ug	
			Fluoranthene	2016/05/14	< 0.30		ug	
			Fluorene	2016/05/14	<0.30		ug	
			Indeno(1,2,3-cd)pyrene	2016/05/14	<0.30		ug	
			m-Terphenyl	2016/05/14	<0.60		ug	
			Naphthalene	2016/05/14	<0.60		ug	
			o-Terphenyl	2016/05/14	<0.60		ug	
			Perylene	2016/05/14	<1.2		ug	
			Phenanthrene	2016/05/14	<0.30		ug	
			p-Terphenyl	2016/05/14	<0.60		ug	
			Pyrene	2016/05/14	<0.30		ug	
			Quinoline	2016/05/14	<1.2		ug	
			Tetralin	2016/05/14	<0.60		ug	
l			Triphenylene	2016/05/14	<0.30		ug	
4495763	CXU	Spiked Blank	C13-233'44'55'-HeptaCB-(189)	2016/05/16		100	%	30 - 140
			C13-233'44'5-HexaCB-(156)	2016/05/16		80	%	30 - 140
			C13-233'44'5'-HexaCB-(157)	2016/05/16		80	%	30 - 140
			C13-233'44'-PentaCB-(105)	2016/05/16		86	%	30 - 140



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			C13-23'44'55'-HexaCB-(167)	2016/05/16		80	%	30 - 140
			C13-2344'5-PentaCB-(114)	2016/05/16		83	%	30 - 140
			C13-23'44'5-PentaCB-(118)	2016/05/16		84	%	30 - 140
			C13-2'344'5-PentaCB-(123)	2016/05/16		82	%	30 - 140
			C13-33'44'55'-HexaCB-(169)	2016/05/16		65	%	30 - 140
			C13-33'44'5-PentaCB-(126)	2016/05/16		84	%	30 - 140
			C13-33'44'-TetraCB-(77)	2016/05/16		78	%	30 - 140
			C13-344'5-TetraCB-(81)	2016/05/16		76	%	30 - 140
			33'44'-TetraCB-(77)	2016/05/16		101	%	50 - 150
			344'5-TetraCB-(81)	2016/05/16		100	%	50 - 150
			233'44'-PentaCB-(105)	2016/05/16		105	%	50 - 150
			2344'5-PentaCB-(114)	2016/05/16		99	%	50 - 150
			23'44'5-PentaCB-(118)	2016/05/16		101	%	50 - 150
			23'44'5'-PentaCB-(123)	2016/05/16		102	%	50 - 150
			33'44'5-PentaCB-(126)	2016/05/16		103	%	50 - 150
			HexaCB-(156)+(157)	2016/05/16		103	%	N/A
			23'44'55'-HexaCB-(167)	2016/05/16		100	%	50 - 150
			33'44'55'-HexaCB-(169)	2016/05/16		100	%	50 - 150
			233'44'55'-HeptaCB-(189)	2016/05/16		95	%	50 - 150
4495763	CXU	Spiked Blank DUP	C13-233'44'55'-HeptaCB-(189)	2016/05/16		119	%	30 - 140
		-,	C13-233'44'5-HexaCB-(156)	2016/05/16		73	%	30 - 140
			C13-233'44'5'-HexaCB-(157)	2016/05/16		73	%	30 - 140
			C13-233'44'-PentaCB-(105)	2016/05/16		85	%	30 - 140
			C13-23'44'55'-HexaCB-(167)	2016/05/16		75	%	30 - 140
			C13-2344'5-PentaCB-(114)	2016/05/16		84	%	30 - 140
			C13-23'44'5-PentaCB-(118)	2016/05/16		84	%	30 - 140
			C13-2'344'5-PentaCB-(123)	2016/05/16		86	%	30 - 140
			C13-33'44'55'-HexaCB-(169)	2016/05/16		50	%	30 - 140
			C13-33'44'5-PentaCB-(126)	2016/05/16		74	%	30 - 140
			C13-33'44'-TetraCB-(77)	2016/05/16		84	%	30 - 140
			C13-344'5-TetraCB-(81)	2016/05/16		83	%	30 - 140
			33'44'-TetraCB-(77)	2016/05/16		102	%	50 - 150
			344'5-TetraCB-(81)	2016/05/16		101	%	50 - 150
			233'44'-PentaCB-(105)	2016/05/16		104	%	50 - 150
			2344'5-PentaCB-(114)	2016/05/16		100	%	50 - 150
			23'44'5-PentaCB-(118)	2016/05/16		106	%	50 - 150
			23'44'5'-PentaCB-(123)	2016/05/16		105	%	50 - 150
			33'44'5-PentaCB-(126)	2016/05/16		100	%	50 - 150
			HexaCB-(156)+(157)	2016/05/16		104	%	N/A
			23'44'55'-HexaCB-(167)	2016/05/16		104	%	50 - 150
			33'44'55'-HexaCB-(169)	2016/05/16		99	%	50 - 150
			233'44'55'-HeptaCB-(189)	2016/05/16		98	%	50 - 150
4495763	CYLL	RPD	33'44'-TetraCB-(77)	2016/05/16	0.99	30	%	30
4433703	CAU	M D	344'5-TetraCB-(81)	2016/05/16	1.0		%	30
			233'44'-PentaCB-(105)	2016/05/16	0.96		%	30
			2344'5-PentaCB-(114)	2016/05/16	1.0		%	30
			23'44'5-PentaCB-(114)	2016/05/16	4.8		%	30
			23'44'5'-PentaCB-(123)	2016/05/16	2.9		%	30
			33'44'5-PentaCB-(126)	2016/05/16	3.0		% %	30
			HexaCB-(156)+(157)	2016/05/16			%	30
				2016/05/16	0.97		%	30
			23'44'55'-HexaCB-(167)	• •	3.9			
			33'44'55'-HexaCB-(169)	2016/05/16	1.0		%	30



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			233'44'55'-HeptaCB-(189)	2016/05/16	3.1		%	30
4495763	CXU	Method Blank	C13-233'44'55'-HeptaCB-(189)	2016/05/16		117	%	30 - 140
			C13-233'44'5-HexaCB-(156)	2016/05/16		69	%	30 - 140
			C13-233'44'5'-HexaCB-(157)	2016/05/16		69	%	30 - 140
			C13-233'44'-PentaCB-(105)	2016/05/16		78	%	30 - 140
			C13-23'44'55'-HexaCB-(167)	2016/05/16		75	%	30 - 140
			C13-2344'5-PentaCB-(114)	2016/05/16		73	%	30 - 140
			C13-23'44'5-PentaCB-(118)	2016/05/16		79	%	30 - 140
			C13-2'344'5-PentaCB-(123)	2016/05/16		79	%	30 - 140
			C13-33'44'55'-HexaCB-(169)	2016/05/16		36	%	30 - 140
			C13-33'44'5-PentaCB-(126)	2016/05/16		67	%	30 - 140
			C13-33'44'-TetraCB-(77)	2016/05/16		83	%	30 - 140
			C13-344'5-TetraCB-(81)	2016/05/16		84	%	30 - 140
			33'44'-TetraCB-(77)	2016/05/16	<120		pg	
			344'5-TetraCB-(81)	2016/05/16	<120		pg	
			233'44'-PentaCB-(105)	2016/05/16	<99		pg	
			2344'5-PentaCB-(114)	2016/05/16	<95		рg	
			23'44'5-PentaCB-(118)	2016/05/16	<98		pg	
			23'44'5'-PentaCB-(123)	2016/05/16	<110		pg	
			33'44'5-PentaCB-(126)	2016/05/16	<99		pg	
			HexaCB-(156)+(157)	2016/05/16	<53		рg	
			23'44'55'-HexaCB-(167)	2016/05/16	<57		рg	
			33'44'55'-HexaCB-(169)	2016/05/16	<56		pg	
			233'44'55'-HeptaCB-(189)	2016/05/16	<100		pg pg	
4499555	ORC	Spiked Blank	C13-1234678 HeptaCDD	2016/05/16	100	79	% %	25 - 130
4455555	OBC	Spiked blank	C13-1234678 HeptaCDF	2016/05/16		64	%	25 - 130
			C13-1234078 HeptaCDI	2016/05/16		58	%	40 - 130
			C13-123078 HexaCDF	2016/05/16		50	%	40 - 130
			C13-12378 PentaCDD	2016/05/16		85	%	40 - 130
			C13-12378 PentaCDF	2016/05/16		88	%	40 - 130
			C13-12378 PentaCDF	2016/05/16		70	%	40 - 130
			C13-23783 TetraCDD	2016/05/16		88	%	40 - 130
			C13-2378 TetraCDF	2016/05/16		95	%	40 - 130
			C13-Octachlorodibenzo-p-Dioxin	2016/05/16		67	%	25 - 130
			2,3,7,8-Tetra CDD	2016/05/16		98	%	80 - 140
			1,2,3,7,8-Penta CDD	2016/05/16		90	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2016/05/16		99	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2016/05/16		99	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2016/05/16		123	%	80 - 140
			1,2,3,7,8,3-Nexa CDD 1,2,3,4,6,7,8-Hepta CDD	2016/05/16		95	%	80 - 140
				2016/05/16		94	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDD	2016/05/16		93	% %	80 - 140
			2,3,7,8-Tetra CDF	2016/05/16		97	%	80 - 140
			1,2,3,7,8-Penta CDF	17.14		94	% %	80 - 140 80 - 140
			2,3,4,7,8-Penta CDF	2016/05/16			% %	
			1,2,3,4,7,8-Hexa CDF	2016/05/16		101 92	% %	80 - 140
			1,2,3,6,7,8-Hexa CDF	2016/05/16		110	% %	80 - 140 80 - 140
			2,3,4,6,7,8-Hexa CDF	2016/05/16				
			1,2,3,7,8,9-Hexa CDF	2016/05/16		110	% «	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2016/05/16		96 07	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2016/05/16		97	%	80 - 140
4400555	000	Called District	1,2,3,4,6,7,8,9-Octa CDF	2016/05/16		95 67	% «	80 - 140
4499555	ORC	Spiked Blank DUP	C13-1234678 HeptaCDD	2016/05/16		67	%	25 - 130



ORTECH Environmental
Client Project #: 21656
Site Location: COVANTA
Your P.O. #: 21656-J2227

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			C13-1234678 HeptaCDF	2016/05/16		65	%	25 - 130
			C13-123678 HexaCDD	2016/05/16		63	%	40 - 130
			C13-123678 HexaCDF	2016/05/16		58	%	40 - 130
			C13-12378 PentaCDD	2016/05/16		84	%	40 - 130
			C13-12378 PentaCDF	2016/05/16		87	%	40 - 130
			C13-123789 HexaCDF	2016/05/16		71	%	40 - 130
			C13-2378 TetraCDD	2016/05/16		92	%	40 - 130
			C13-2378 TetraCDF	2016/05/16		97	%	40 - 130
			C13-Octachlorodibenzo-p-Dioxin	2016/05/16		68	%	25 - 130
			2,3,7,8-Tetra CDD	2016/05/16		100	%	80 - 140
			1,2,3,7,8-Penta CDD	2016/05/16		99	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2016/05/16		101	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2016/05/16		102	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2016/05/16		123	%	80 - 140
				2016/05/16		100	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2016/05/16		99	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDD 2,3,7,8-Tetra CDF			99 97	% %	80 - 140
			• • •	2016/05/16			% %	80 - 140
			1,2,3,7,8-Penta CDF	2016/05/16		101		
			2,3,4,7,8-Penta CDF	2016/05/16		99	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2016/05/16		100	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2016/05/16		91	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2016/05/16		98	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2016/05/16		105	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2016/05/16		101	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2016/05/16		96	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDF	2016/05/16		98	%	80 - 140
4499555	OBC	RPD	2,3,7,8-Tetra CDD	2016/05/16	NC		%	20
			1,2,3,7,8-Penta CDD	2016/05/16	NC		%	20
			1,2,3,4,7,8-Hexa CDD	2016/05/16	NC		%	20
			1,2,3,6,7,8-Hexa CDD	2016/05/16	NC		%	20
			1,2,3,7,8,9-Hexa CDD	2016/05/16	NC		%	20
			1,2,3,4,6,7,8-Hepta CDD	2016/05/16	NC		%	20
			1,2,3,4,6,7,8,9-Octa CDD	2016/05/16	NC		%	20
			2,3,7,8-Tetra CDF	2016/05/16	NC		%	20
			1,2,3,7,8-Penta CDF	2016/05/16	NC		%	20
			2,3,4,7,8-Penta CDF	2016/05/16	NC		%	20
			1,2,3,4,7,8-Hexa CDF	2016/05/16	NC		%	20
			1,2,3,6,7,8-Hexa CDF	2016/05/16	NC		%	20
			2,3,4,6,7,8-Hexa CDF	2016/05/16	NC		%	20
			1,2,3,7,8,9-Hexa CDF	2016/05/16	NC		%	20
			1,2,3,4,6,7,8-Hepta CDF	2016/05/16	NC		%	20
			1,2,3,4,7,8,9-Hepta CDF	2016/05/16	NC		%	20
			1,2,3,4,6,7,8,9-Octa CDF	2016/05/16	NC		%	20
4499555	OBC	Method Blank	C13-1234678 HeptaCDD	2016/05/16		65	%	25 - 130
1-2223	200	medioa biank	C13-1234678 HeptaCDF	2016/05/16		63	%	25 - 130 25 - 130
			C13-1234078 HexaCDD	2016/05/16		60	%	40 - 130
			C13-123678 HexaCDF	2016/05/16		53	%	40 - 130
			C13-123678 NextaCDF C13-12378 PentaCDD	2016/05/16		79	%	40 - 130
				·		79 81	% %	40 - 130
			C13-12378 PentaCDF	2016/05/16			% %	40 - 130
			C13-123789 HexaCDF	2016/05/16		72 94		
			C13-2378 TetraCDD	2016/05/16		84	% «	40 - 130
			C13-2378 TetraCDF	2016/05/16		89	%	40 - 130



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

QA/QC			Date		%
Batch	Init QC Type	Parameter	Analyzed	Value	Recovery UNITS QC Limits
		C13-Octachlorodibenzo-p-Dioxin	2016/05/16		66 % 25 - 130
		2,3,7,8-Tetra CDD	2016/05/16	<5.6, EDL=5.6	pg
		1,2,3,7,8-Penta CDD	2016/05/16	<7.2, EDL=7.2	pg
		1,2,3,4,7,8-Hexa CDD	2016/05/16	<6.4, EDL=6.4	pg
		1,2,3,6,7,8-Hexa CDD	2016/05/16	<6.5, EDL=6.5	pg
		1,2,3,7,8,9-Hexa CDD	2016/05/16	<5.8, EDL=5.8	pg
		1,2,3,4,6,7,8-Hepta CDD	2016/05/16	<5.9, EDL=5.9	pg
		1,2,3,4,6,7,8,9-Octa CDD	2016/05/16	25.4, EDL=5.9	pg
		Total Tetra CDD	2016/05/16	<7.8, EDL=7.8 (2)	pg
		Total Penta CDD	2016/05/16	<7.2, EDL=7.2	pg
		Total Hexa CDD	2016/05/16	<9.1, EDL=9.1 (2)	pg
		Total Hepta CDD	2016/05/16	<5.9, EDL=5.9	pg
		2,3,7,8-Tetra CDF	2016/05/16	<3.9, EDL=3.9	pg
		1,2,3,7,8-Penta CDF	2016/05/16	<5.8, EDL=5.8	pg
		2,3,4,7,8-Penta CDF	2016/05/16	<5.8, EDL=5.8	pg
		1,2,3,4,7,8-Hexa CDF	2016/05/16	<6.0, EDL=6.0	pg
		1,2,3,6,7,8-Hexa CDF	2016/05/16	<5.5, EDL=5.5	pg
		2,3,4,6,7,8-Hexa CDF	2016/05/16	<6.0, EDL=6.0	pg
		1,2,3,7,8,9-Hexa CDF	2016/05/16	<6.6, EDL=6.6	pg
		1,2,3,4,6,7,8-Hepta CDF	2016/05/16	<5.6, EDL=5.6	pg
		1,2,3,4,7,8,9-Hepta CDF	2016/05/16	<6.8, EDL=6.8	pg
		1,2,3,4,6,7,8,9-Octa CDF	2016/05/16	<6.0, EDL=6.0	pg
		Total Tetra CDF	2016/05/16	<3.9, EDL=3.9	pg
		Total Penta CDF	2016/05/16	<5.8, EDL=5.8	pg
		Total Hexa CDF	2016/05/16	<6.0, EDL=6.0	pg



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Total Hepta CDF	2016/05/16	<6.1, EDL=6.1		pg	
4501249	BY	Method Blank	Confirmation 2,3,7,8-Tetra CDF	2016/05/17	<12, EDL=12		pg	
			Confirmation C13-2378 TetraCDF	2016/05/17		80	%	40 - 135

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

- (1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
- (2) EMPC / NDR Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

#### **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Karen Nicol, Supervisor, Semi-Volatiles

Kay Shaw, C. Chem, Sr Scientific Specialist, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



# **APPENDIX 16**

Acid Gas Recovery Data Sheets (8 page)

Project No.: 21656					
A					
Date: 12 7 9019				•	
fest No.:					
Test Location: WALT #					
		and the same	ekkenin elikain elikai		Maria di principality (1917), de la comp
Nozzle, Probe Liner	Filter	Impi	ngers 1, 2, 3		Impinger 4
Cyclone Bypass & F.H.					
Filter Housing	Filter ID: 16 GFF - 42				
	1			7	
CONTAINER TS1	CONTAINER TS2	CON	TAINER TS3	_	
Container TS1 Weights	Initial Wt: C. 6811	Imninger	r#1 0.1 N H ₂ SO4	Impi	nger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt:	657.6	Initial Wt:	992.0
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt:	7-55.8	Final Wt:	1001.5
Total-TS1:	Post-Test Wt (3):	Final Wt:	589.5	4 Gain:	9.5
	Final Wtr	1 Gain:	133.2	· J	
MARK FLUID LEVEL	Gaip.	Colour:	rien		
	Colour:				
Seal and label container TS1		Impinge	r#2 0.1 N H ₂ SO4		
	SEAL CONTAINER TS2	Empty Wt:	669.8		•
CONTAINER TS1a		Initial Wt:	769.2		
Probe Rinse Residue		Final Wt:	795.5	<u>.</u>	
		2 Gain:	<u> 36.8</u>	4	
Initial Wt:	1	Colour:	<u>clear</u>		
Post-Test Wt (1):			Control of the Control of March Control	•	
Post-Test Wt (2):		Description of the last of the	ger #3 EMPTY		
Post-Test Wt (3):		Empty Wt:	6/66		
Final Wt:		Final Wt:	<u> </u>		
Gain:		3 Gain:	2.3		The state of the s
Cofour:		Colour:	<u>clear</u>		
		CONTAIN	ER TS3 WEIGHTS		
SAMPLE IDENTIFICATION	116-216-01A	Empty Wt:	U19.2		
TS1(Probe Rinse-Acetone)	110-31620 IIBOH		3 Soln: 772.7		
TS2(Filter)		Imp. 1,2,3 Volu		1,	
TS3(Impinger 1,2,3 Sol'n)		After Rinse:	832.8		
[160(timprage: 1,2,0 50(a)		Total TS3:	J. POP	7/	
	and the second s				
					•
				<u> </u>	
Train Loaded By:	Laloh			CWTR = 1+2+3	F.101:
Train Recovered By:	SANDERSON !	_			
Recovery Witnessed By:		_	•	WCBDA= 4:	9.5
Date: MAN					The second secon

Box 13

Project No.: 21656					
31100110		•			
Test No.:	•				
Test Location: PPC#1					
Nozzle, Probe Liner	Filter	Imp	ingers 1, 2, 3		mpinger 4
Cyclone Bypass & F.H.		il leavenment		and Linear months and	
Filter Housing	Filter ID: 16-67-12		1. 的复数A. A. A.		
CONTAINER TSI	CONTAINER TS2	CON	ITAINER TS3		
Container TS1 Weights	Initial Wt: 0.6802		r#1 0.1 N H ₂ SO4	THE REAL PROPERTY AND ADDRESS OF THE PERSON NAMED AND ADDRESS	ger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt:	661.5	Initial Wt:	774.7
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt:	258° <del>9</del>	Final Wt:	7-29.8
Total-TS1:	Post-Test Wt (3)t	Final Wt:	<u>8,90,8</u>	4 Gain:	-9.1
	Final Wt:	1 Gain:	131.9	_	
MARK FLUID LEVEL	Gain:	Colour:	<u>Clear</u>		
	Colour:	J	US OF NITE COA		•
Seal and label container TS1			r#2 0.1 N H ₂ SO4		
	SEAL CONTAINER TS2	Empty Wt:	<u> </u>		
CONTAINER TS1a		Initial Wt:	750:2		
Probe Rinse Residue		Final Wt: 2 Gain:	<u> </u>	<del></del>	
Initial Wt:	7	2   Gain:   Colour:	31.9 Clear		
Post-Test Wt (1):		Colour.	<u> </u>	4	
Post-Test Wt (2):		Imnin	ger #3 EMPTY		
Post-Test Wt (3):		Empty Wt:	639.9		
Final Wt:		Final Wt:	<u> </u>		
Gain:		3 Gain:	- 9.9	0.1.6 1 1.0 	
Colour:		Colour:	clear		
[ Person		1990	<u> </u>		
고 발활 홍영 (1) 전기 시간 그 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		CONTAIN	ER TS3 WEIGHTS	<b>1</b>	
SAMPLE IDENTIFICATION	16-21656-MBA	Empty Wt:	UNE, E		
TS1(Probe Rinse-Acetone)			3 Soln: コレリ、リ	<del></del>	
TS2(Filter)		Imp. 1,2,3 Volu	Contaction of the contact of the con	* 7.20 *-	
TS3(Impinger 1,2,3 Sol'n)	a	After Rinse:	P. 018		
The Control of the Co		Total TS3:	391.6		•
	Mayor -				-
			4 1		
	•				
Turin I anded Day				CWTR = 1+2+3:	155.3
Train Loaded By:  Train Recovered By:				CW 1R - 17273:	199.0
Recovery Witnessed By:				WCBDA= 4:	9.1
	naylo	_		Literation in	

Box 6

Project No.: 21656			
3116010		•	
est No.: 3	• •		
est Location: 1700 #1			
Nozzle, Probe Liner	Filter	Impingers 1, 2, 3	Impinger 4
Cyclone Bypass & F.H.			
Filter Housing	Filter ID:		
CONTAINER TSI	CONTAINER TS2	CONTAINER TS3	]
	] [ <i>[</i>	Testescal ATNU SOA	Tensis con #4 Silion Col
Container TS1 Weights	Initial Wt:	Impinger #1 0.1 N H ₂ SO4 Empty Wt:	Impinger #4 Silica Gel
Empty Wt: After Acetone Rinse:	Post-Test Wt (1):	Empty Wt: USA.   Initial Wt: 7594	Final Wt: 1012.4
Cotal TS1:	Post-Test Wt (2); Post-Test Wt (3):	Final Wt: 879.3	4 Gain: 11.0
alat 1915		1 Gain: 114.9	T Gam.
MARK FLUID LEVEL	Gain:	Colour: Clear	1
MARK POID EEVED	Colour:	Colours	<b>.</b>
Seal and label container TS1	Colour	Impinger #2 0.1 N H₂SO4	
Starting laber container 151	SEAL CONTAINER TS2	Empty Wt: (3-1.)	
CONTAINER TS1a		Initial Wt: 114	•
Probe Rinse Residue		Final Wt: 790.6	
		2 Gain: 19.2	
nitial Wt:	<b>1</b>	Colour: Clear	
Post-Test Wt (1):			
Post-Test Wt (2):		Impinger #3 EMPTY	
Post-Test Wt (3):		Empty Wt: 614.3	
Final Wt: /		Final Wt: 616.6	
Gain: 🗸		3 Gain:	9
Colour:		Colour: C.C.C.	
		CONTAINER TS3 WEIGHTS	
SAMPLE IDENTIFICATION	16-21656-M26A-	Empty Wt: 410.7	
rS1(Probe Rinse-Acetone)		With Imp. 1,2,3 Soln: +55.7+	
rS2(Filter)		Imp. 1,2,3 Volume: 3360	`
FS3(Impinger 1,2,3 Sol'n)	3	After Rinse: 8157	
		Total TS3: 3960	1
	NACES .		Por 13
	•	,	
Train Loaded By:			CWTR = 1+2+3: 136.4
Train Recovered By:			· ·
Recovery Witnessed By:	1	·	WCBDA=4:

Project No.: 21656			
	<del></del>		
Date: 3 May 16	·		
rest No.: Blank #1	·		
Test Location: YAPC # \			
	Andreas Company of the Company of th	and the second of the second s	
Nozzle, Probe Liner	Filter	Impingers 1, 2, 3	Impinger 4
Cyclone Bypass & F.H.		and the state of the	
Filter Housing	Filter ID:		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	1
		1	
Container TS1 Weights	Initial Wt:	Impinger#1 0.1 N H₂SO4	Impinger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt: ししろ 〇	Initial Wt: 779.8
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt: 763.9	Final Wt: +79.8
Fotal TSI:	Post-Test Wt (3):	Final Wt: 7639	4 Gain:
	Final Wt:	1 Gain:	
MARK FLUID LEVEL	Gains	Colour: Clear	
	Colour:		
Seal and label container TS1		Impinger #2 0.1 N H ₂ SO4	source of the state of the stat
	SEAL CONTAINER TS2	Empty Wt: 653.0	
CONTAINER TS1a Probe Rinse Residue	<del></del>	Initial Wt: 5 754.0	
Prope Rinse Residue		Final Wt: 354.0	·
Initial Wt:	<b>1</b>	2 Gain: CACO	
Post-Test Wt (1):		Coon.	
Post-Test Wt (2):		Impinger #3 EMPTY	
Post-Test Wt (3):		Empty Wt: (a4a)	
Final Wt:		Final Wt: (a4a l	AND THE STATE OF T
Gain:		3 Gain:	
Colour:		Cólour:	
		CONTAINER TS3 WEIGHTS	
SAMPLE IDENTIFICATION	16-21656-malaA	Empty Wt: 418.7	
TS1(Probe Rinse-Acetone)		With Imp. 1,2,3 Soln: 600.6	
TS2(Filter)		Imp. 1,2,3 Volume: 001.9	े हैं। <del>बहुत्री</del>
TS3(Impinger 1,2,3 Sol'n)	1 Blanky	After Rinse: US9.4	
		Total TS3: 556. 7	
	•		en de la companya de La companya de la co
Train Loaded By:			CWTR = 1+2+3:
Train Recovered By:		<del>-</del>	
Recovery Witnessed By:		-	WCBDA= 4:
	aulo	<del>-</del>	

Project No.: 21656			
Date: 3 1 1 10416	***************************************	•	
Test No.:	<del></del>		
Test Location: Apc #2			
			graterization control and cont
Nozzle, Probe Liner	Filter	Impingers 1, 2, 3	Impinger 4
Cyclone Bypass & F.H.			
Filter Housing	Filter ID:		
	CONTRACTOR TOO	CONTRATED 7503	· ·
CONTAINER TSI	CONTAINER TS2	CONTAINER TS3	J
Container TS1 Weights	Initial Wt:	Impinger #1 0.1 N H ₂ SO4	Impinger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt: 663.0	Initial Wt: 779.7
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt: 762.9	Final Wt: 789.9
Total TS1:	Post-Test Wt (3):	Final Wt: 889.9	4 Gain: 10.0
	Final Wt:	1 Gain: 120.0	
MARK FLUID LEVEL	Gain:	Colour: Clear	
	Colour:		
Seal and label container TS1	1	Impinger #2 0.1 N H ₂ SO4	
	SEAL CONTAINER TS2	Empty Wt: しち3.つ	
CONTAINER TS1a		Initial Wt: するん	
Probe Rinse Residue		Final Wt: 7767	
		2 Gain: つろ.\	
Initial Wt:		Colour: C/CO-C	
Post-Test Wt (1):			
Post-Test Wt (2):		Impinger #3 EMPTY	
Post-Test Wt (3):		Empty Wt: 6400	
Final Wt:		Final Wt: 645.4	
Gain:		3 Gain: 3.2	
Colour:		Colour: Clear	
으로 보통하는 것이 되었다. 그는 경기 가장 보고 있다. 기계 (1985년 - 1985년 - 1987년 - 1		CONTAINER TS3 WEIGHTS	
SAMPLE IDENTIFICATION	16-31656-M36A	Empty Wt: 418.9	
TS1(Probe Rinse-Acetone)	16-01006-11-01011	With Imp. 1,2,3 Soln: 763.4	
TS2(Filter)		Imp. 1,2,3 Volume: 344.5	
TS3(Impinger 1,2,3 Sol'n)	1 4	After Rinse: 806.9	
135(mpmger 1,25 55.11)	- Control of the Cont	Total TS3: 388.0	T (5)
	And the second s		604
			age and the second
		•	
Train Loaded By:			CWTR = 1+2+3: 146.3
Train Recovered By: \(\tag{5}\)		-	
Recovery Witnessed By:	Y .	<del>-</del> -	WCBDA=4: 10.3
	0416	<del>-</del>	

Project No.: 21656					
	ALLECTION	•			
Test No.:					
Test Location: # OFFC W	Het				
				and branchamonomer	n na new galago a new para
Nozzle, Probe Liner	Filter	<u>l</u>	pingers 1, 2, 3		Impinger 4
Cyclone Bypass & F.H.					
Filter Housing	Filter ID:				
CONTAINER TSI	CONTAINER TS2	CO	NTAINER TS3	٦	
CONTAINER 131	J CONTAINER 132		ATTAINER 100		
Container TS1 Weights	Initial Wt:	Imping	ger#1 0.1 N H ₂ SO4	Impin	ger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt:	660.2	Initial Wt:	919.9
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt:	700.7	Final Wt:	4:689
Total TS1:	Post-Test Wt (3):	Final Wt:	888.3	4 Gain:	8.61
	Final Wt:	1 Gain:	197.6		
MARK FLUID LEVEL	Gain:	Colour:	clear		
	Colour:			station of the state of the sta	•
Seal and label container TS1			ger #2 0.1 N H ₂ SO4	•	
	SEAL CONTAINER TS2	Empty Wt:	<u>672.9</u>		
CONTAINER TS1a	_	Initial Wt:			
Probe Rinse Residue	_	Final Wt:	798.8		
	<b>7</b>	2 Gain:	0.05		
Initial Wt:		Colour:	dear		
Post-Test Wt (1): Post-Test Wt (2):		Imn	inger#3 EMPTY		
Post-Test Wt (3):		Empty Wt:	<u></u>	All Control	
Final Wt:		Final Wt:	618.9		
Gain:		3 Gain:	3.6		
Colour:		Colour:	dear		
		-			
		CONTA	INER TS3 WEIGHTS		
SAMPLE IDENTIFICATION	16-21656-MS6A	Empty Wt:	419.5		
TS1(Probe Rinse-Acetone)			2,3 Soln: フラし. O		
TS2(Filter)		Imp. 1,2,3 Vo	and the second s		
TS3(Impinger 1,2,3 Sol'n)		After Rinse:			2
		Total TS3:	399.3		*
	* Marcolana			· vys	<u> </u>
				R. C.	
Train Loaded By:				CWTR = 1+2+3:	157·2
Train Recovered By:		-		CHILL III.	1 1 2 2 2 2 2 2
Recovery Witnessed By:	1	-		WCBDA= 4:	19:61
Date: 3 Was	: 11 0	-		L.,	325

Client: Covanta DYEC	,		
Project No.: 21656			
Date: 3 May 16			
Test No.: 3			
Test Location: (ACC # 2	<del></del>		
rest Location:			skirt in the control of the control
Nozzle, Probe Liner	Filter	Impingers 1, 2, 3	Impinger 4
Cyclone Bypass & F.H.			and the second s
Filter Housing	Filter ID:		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	
		-	
Container TS1 Weights	Initial Wt:	Impinger #1 0.1 N H ₂ SO4	Impinger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt: しらろ・\	Initial Wt: 7898
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt: 766.3	Final Wt: 7995
Total TS1:	Post-Test Wt (3):	Final Wt: 894.5	4 Gain: 9.74
	Final Wt	1 Gain: 1 이징· 3	-
MARK FLUID LEVEL	Gaina	Colour: CC	_
	Colour:	1	·
Seal and label container TS1	GEAL CONTAINED BOX	Impinger #2 0.1 N H ₂ SO4	
	SEAL CONTAINER TS2	Initial Wt: \$7524	-
CONTAINER TS1a		Initial Wt: R 752 4 Final Wt: 775 3	<del>-</del>
Probe Rinse Residue			
Initial Wt:	<u> </u>	2 Gain: SSSS	
TO A CONTROL OF THE PARTY OF TH		colour.	
Post-Test Wt (1): Post-Test Wt (2):		Impinger #3 EMPTY	
Post-Test Wt (3):		Empty Wt: (91.4	
Final Wt:		Final Wt: (a 44.7	
Gain:		3 Gain: 3.3	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Colour:		Colour: CACCAC	
		CONTAINER TS3 WEIGHTS	
SAMPLE IDENTIFICATION	16-21630-MaloA	Empty Wt: リローち	
TS1(Probe Rinse-Acetone)		With Imp. 1,2,3 Soln: 771.5	
TS2(Filter)		Imp. 1,2,3 Volume: 353 7	
TS3(Impinger 1,2,3 Sol'n)		After Rinse: 825.7	
		Total TS3: Чの子.つ	
	at one '		•
			•
		·	
Train Loaded By:			CWTR = 1+2+3: \SU.
Train Recovered By:	-		
Recovery Witnessed By:	· · · · · · · · · · · · · · · · · · ·		WCBDA=4: °; ¬₹
Date: 3 W	2116		

Client: Covanta DYEC			
Project No.: 21656			
Date: 3 May 16	· .	ere to the contract of	
Test No.: Blank#2			
Test Location: PXX # 2_			
	<del>androna.</del> Ang Pangal Bartan and a sanah mengangkan pandah sanah sanah sanah sa	and the state of t	ti i i i i i i i i i i i i i i i i i i
Nozzle, Probe Liner	Filter	Impingers 1, 2, 3	Impinger 4
Cyclone Bypass & F.H.			
Filter Housing	Filter ID:		
CONTAINER TS1	CONTAINER TS2	CONTAINER TS3	·
CONTAINER ISI	CONTAINER 152	CONTAINER 153	
Container TS1 Weights	Initial Wt:	1mpinger #1 0.1 N H ₂ SO4	Impinger #4 Silica Gel
Empty Wt:	Post-Test Wt (1):	Empty Wt: 69.2	Initial Wt: 789.9
After Acetone Rinse:	Post-Test Wt (2):	Initial Wt: 766.9	Final Wt: 789.8
Total TS1:	Post-Test Wt (3):	Final Wt: コレビリ	4 Gain:
	Final Wt:	1 Gain:	
MARK FLUID LEVEL	Gain:	Colour: Class	
	Colour:		·
Seal and label container TS1	Particular section of the section of	Impinger #2 0.1 N H ₂ SO4	
	SEAL CONTAINER TS2	Empty Wt: 653.6	
CONTAINER TS1a		Initial Wt: 7570	
Probe Rinse Residue		Final Wt: 757 O	
Initial Wt:	The state of the s	2 Gain: Colour: Clean	**************************************
Post-Test Wt (1):		Colouis	
Post-Test Wt (2):		Impinger #3 EMPTY	a tawa wa sana a sa A sana a san
Post-Test Wt (3):	불리 그 그 그리고 그리다면서	Empty Wt: 643.8	
Final Wt:		Final Wt: LAUS 8	
Gain:		3 Gain:	
Colour:		Colour:	지하다 하면 나라는 15명
			november 1996 1997 - De la Carlo de la Car
		CONTAINER TS3 WEIGHTS	
SAMPLE IDENTIFICATION	16-21656-M36A	Empty Wt: 49.0	and the same of th
TS1(Probe Rinse-Acetone)	· · · · · · · · · · · · · · · · · · ·	With Imp. 1,2,3 Soln: 634.	
TS2(Filter)	- Annual Control of the Control of t	Imp. 1,2,3 Volume: 205 S	
TS3(Impinger 1,2,3 Sol'n)	Blankz	After Rinse: 6709	
		Total TS3: 253.5	
	•		
Train Loaded By:			CWTR = 1+2+3:
Train Recovered By:		-	L= 1-7- 5 - 1-3-1
Recovery Witnessed By:	· · · · · · · · · · · · · · · · · · ·	<del>-</del>	WCBDA=4:
Date: 3 M	allo	····	**************************************



# **APPENDIX 17**

VOST Analytical Reports (43 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site Location: COVANTA

Attention:Chris Belore

ORTECH Environmental 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/05/24

Report #: R4002138 Version: 2 - Revision

#### **CERTIFICATE OF ANALYSIS - REVISED REPORT**

MAXXAM JOB #: B696111 Received: 2016/05/12, 12:30

Sample Matrix: Stack Sampling Train

# Samples Received: 22

Analyses	Date Quantity Extracted	Date Analyzed Laboratory Method	Reference
VOST EPA5041A, 8260C for 0030, 0031	9 <b>N/</b> A	2016/05/13 BRL SOP-00302	EPA5041A, 8260C
VOST EPA5041A, 8260C for 0030, 0031	8 N/A	2016/05/16 BRL SOP-00302	EPA5041A, 8260C
VOST EPA5041A, 8260C for 0030, 0031	5 N/A	2016/05/17 BRL SOP-00302	EPA5041A, 8260C

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: Clohnson@maxxam.ca

Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

^{*} RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Маххат ID		CIQ445	CIQ464	CIQ465			
Sampling Date		2016/05/10	2016/05/10	2016/05/10			
	UNITS	16-21656-VOST 10A/B FB	16-21656-VOST 30A/B TB	16-21656-VOST 1A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	<0.020	<0.020	0.020	0.020	4499696
Vinyl Chloride	ug	<0.013	<0.013	<0.013	0.013	0.013	4499696
Bromomethane	ug	<0.015	<0.015	<0.015	0.015	0.015	4499696
Trichlorofluoromethane (FREON 11)	ug	<0.010	<0.010	<0.010	0.010	0.010	4499696
Acetone (2-Propanone)	ug	<0.045	<0.045	0.098	0.045	0.025	4499696
1,1-Dichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4499696
Methylene Chloride(Dichloromethane)	ug	<0.019	<0.019	<0.019	0.019	0.020	4499696
trans-1,2-Dichloroethylene	ug	<0.010	<0.010	<0.010	0.010	0.010	4499696
Chloroform	ug	<0.011	<0.011	0.036	0.011	0.011	4499696
1,2-Dichloroethane	ug	<0.0070	<0.0070	<0.0070	0.0070	0.0070	4499696
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	<0.036	<0.036	0.036	0.036	4499696
1,1,1-Trichloroethane	ug	<0.014	<0.014	<0.014	0.014	0.014	4499696
Carbon Tetrachloride	ug	<0.016	<0.016	<0.016	0.016	0.016	4499696
Benzene	ug	<0.0090	<0.0090	0.0430	0.0090	0.0090	4499696
1,1,2-Trichloroethane	ug	<0.016	<0.016	<0.016	0.016	0.016	4499696
1,2-Dichloropropane	ug	<0.011	<0.011	<0.011	0.011	0.011	4499696
Trichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4499696
Bromodichloromethane	ug	<0.011	<0.011	0.037	0.011	0.011	4499696
Dibromochloromethane	ug	<0.0090	<0.0090	0.0185	0.0090	0.0090	4499696
Toluene	ug	<0.014	<0.014	0.057	0.014	0.014	4499696
Ethylene Dibromide	ug	<0.010	<0.010	<0.010	0.010	0.010	4499696
Tetrachloroethylene	ug	<0.018	<0.018	<0.018	0.018	0.018	4499696
Chlorobenzene	ug	<0.011	<0.011	0.012	0.011	0.011	4499696
Ethylbenzene	ug	<0.014	<0.014	<0.014	0.014	0.014	4499696
m / p-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4499696
Styrene	ug	<0.012	<0.012	<0.012	0.012	0.012	4499696
o-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4499696
Bromoform	ug	<0.014	<0.014	<0.014	0.014	0.014	4499 <b>6</b> 96
Surrogate Recovery (%)	***************************************						
Bromofluorobenzene	%	100	100	101	N/A	N/A	4499696
D10-Ethylbenzene (FS)	%	107	118	90	N/A	N/A	4499696
D4-1,2-Dichloroethane	%	109	112	111	N/A	N/A	4499696
D8-Toluene	%	104	102	103	N/A	N/A	4499696

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ466	CIQ467	CIQ468			
Sampling Date		2016/05/10	2016/05/10	2016/05/10			
	UNITS	16-21656-VOST 2A/B	16-21656-VOST 3A/B	16-21656-VOST 4A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	<0.020	<0.020	0.020	0.020	4501300
Vinyl Chloride	ug	<0.013	<0.013	<0.013	0.013	0.013	4501300
Bromomethane	ug	0.015	0.015	<0.015	0.015	0.015	4501300
Trichlorofluoromethane (FREON 11)	ug	<0.010	<0.010	<0.010	0.010	0.010	4501300
Acetone (2-Propanone)	ug	0.060	0.051	0.061	0.045	0.025	4501300
1,1-Dichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4501300
Methylene Chloride(Dichloromethane)	ug	<0.019	<0.019	<0.019	0.019	0.020	4501300
trans-1,2-Dichloroethylene	ug	<0.010	<0.010	<0.010	0.010	0.010	4501300
Chloroform	ug	0.039	0.039	0.039	0.011	0.011	4501300
1,2-Dichloroethane	ug	<0.0070	<0.0070	<0.0070	0.0070	0.0070	4501300
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	<0.036	<0.036	0.036	0.036	4501300
1,1,1-Trichloroethane	ug	<0.014	<0.014	<0.014	0.014	0.014	4501300
Carbon Tetrachloride	ug	<0.016	<0.016	<0.016	0.016	0.016	4501300
Benzene	ug	0.0369	0.0338	0.0324	0.0090	0.0090	4501300
1,1,2-Trichloroethane	ug	<0.016	<0.016	<0.016	0.016	0.016	4501300
1,2-Dichloropropane	ug	<0.011	<0.011	<0.011	0.011	0.011	4501300
Trichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4501300
Bromodichloromethane	ug	0.040	0.041	0.040	0.011	0.011	4501300
Dibromochloromethane	ug	0.0201	0.0202	0.0209	0.0090	0.0090	4501300
Toluene	ug	0.044	0.038	0.038	0.014	0.014	4501300
Ethylene Dibromide	ug	<0.010	<0.010	<0.010	0.010	0.010	4501300
Tetrachloroethylene	ug	<0.018	<0.018	<0.018	0.018	0.018	4501300
Chlorobenzene	ug	0.012	0.012	0.014	0.011	0.011	4501300
Ethylbenzene	ug	<0.014	<0.014	<0.014	0.014	0.014	4501300
m / p-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4501300
Styrene	ug	<0.012	<0.012	<0.012	0.012	0.012	4501300
o-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4501300
Bromoform	ug	<0.014	<0.014	<0.014	0.014	0.014	4501300
Surrogate Recovery (%)	in value	to the control of the second stage to the seco				e yn Eddeld C	Negativa see
Bromofluorobenzene	%	98	99	99	N/A	N/A	4501300
D10-Ethylbenzene (FS)	%	103	111	101	N/A	N/A	4501300
D4-1,2-Dichloroethane	%	109	108	110	N/A	N/A	4501300
D8-Toluene	%	104	102	103	N/A	N/A	4501300

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ469	CIQ470		***************************************	·
Sampling Date		2016/05/10	2016/05/10			
	UNITS	16-21656-VOST 5A/B	16-21656-VOST 6A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	0.152	0.020	0.020	4501300
Vinyl Chloride	ug	<0.013	<0.013	0.013	0.013	4501300
Bromomethane	ug	<0.015	<0.015	0.015	0.015	4501300
Trichlorofluoromethane (FREON 11)	ug	<0.010	<0.010	0.010	0.010	4501300
Acetone (2-Propanone)	ug	0.057	0.054	0.045	0.025	4501300
1,1-Dichloroethylene	ug	<0.011	<0.011	0.011	0.011	4501300
Methylene Chloride(Dichloromethane)	ug	<0.019	<0.019	0.019	0.020	4501300
trans-1,2-Dichloroethylene	ug	<0.010	<0.010	0.010	0.010	4501300
Chloroform	ug	0.042	0.034	0.011	0.011	4501300
1,2-Dichloroethane	ug	<0.0070	<0.0070	0.0070	0.0070	4501300
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	<0.036	0.036	0.036	4501300
1,1,1-Trichloroethane	ug	<0.014	<0.014	0.014	0.014	4501300
Carbon Tetrachloride	ug	<0.016	<0.016	0.016	0.016	4501300
Benzene	ug	0.0320	0.0274	0.0090	0.0090	4501300
1,1,2-Trichloroethane	ug	<0.016	<0.016	0.016	0.016	4501300
1,2-Dichloropropane	ug	<0.011	<0.011	0.011	0.011	4501300
Trichloroethylene	ug	<0.011	<0.011	0.011	0.011	4501300
Bromodichloromethane	ug	0.044	0.037	0.011	0.011	4501300
Dibromochloromethane	ug	0.0226	0.0183	0.0090	0.0090	4501300
Toluene	ug	0.037	0.031	0.014	0.014	4501300
Ethylene Dibromide	ug	<0.010	<0.010	0.010	0.010	4501300
Tetrachloroethylene	ug	<0.018	<0.018	0.018	0.018	4501300
Chlorobenzene	ug	0.013	0.012	0.011	0.011	4501300
Ethylbenzene	ug	<0.014	<0.014	0.014	0.014	4501300
m / p-Xylene	ug	<0.015	<0.015	0.015	0.015	4501300
Styrene	ug	<0.012	<0.012	0.012	0.012	4501300
o-Xylene	ug	<0.015	<0.015	0.015	0.015	4501300
Bromoform	ug	<0.014	<0.014	0.014	0.014	4501300
Surrogate Recovery (%)	<del>'</del>		A CONTRACTOR OF THE CONTRACTOR	100000000000000000000000000000000000000	A CONTRACT	
Bromofluorobenzene	%	97	97	N/A	N/A	4501300
D10-Ethylbenzene (FS)	%	89	109	N/A	N/A	4501300
D4-1,2-Dichloroethane	%	109	110	N/A	N/A	4501300
D8-Toluene	%	102	102	N/A	N/A	4501300

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ472		CIQ473			
Sampling Date		2016/05/10		2016/05/10			
	UNITS	16-21656-VOST 7A/B	QC Batch	16-21656-VOST 8A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	0.021	4497101	<0.020	0.020	0.020	4499696
Vinyl Chloride	ug	<0.013	4497101	<0.013	0.013	0.013	4499696
Bromomethane	ug	<0.015	4497101	<0.015	0.015	0.015	4499696
Trichlorofluoromethane (FREON 11)	ug	<0.010	4497101	<0.010	0.010	0.010	4499696
Acetone (2-Propanone)	ug	0.071	4497101	0.063	0.045	0.025	4499696
1,1-Dichloroethylene	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Methylene Chloride(Dichloromethane)	ug	0.093	4497101	0.031	0.019	0.020	4499696
trans-1,2-Dichloroethylene	ug	<0.010	4497101	<0.010	0.010	0.010	4499696
Chloroform	ug	0.041	4497101	0.036	0.011	0.011	4499696
1,2-Dichloroethane	ug	<0.0070	4497101	<0.0070	0.0070	0.0070	4499696
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	4497101	<0.036	0.036	0.036	4499696
1,1,1-Trichloroethane	ug	<0.014	4497101	<0.014	0.014	0.014	4499696
Carbon Tetrachloride	ug	<0.016	4497101	<0.016	0.016	0.016	4499696
Benzene	ug	0.0410	4497101	0.0395	0.0090	0.0090	4499696
1,1,2-Trichloroethane	ug	<0.016	4497101	<0.016	0.016	0.016	4499696
1,2-Dichloropropane	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Trichloroethylene	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Bromodichloromethane	ug	0.040	4497101	0.036	0.011	0.011	4499696
Dibromochloromethane	ug	0.0202	4497101	0.0191	0.0090	0.0090	4499696
Toluene	ug	0.030	4497101	0.038	0.014	0.014	4499696
Ethylene Dibromide	ug	<0.010	4497101	<0.010	0.010	0.010	4499696
Tetrachloroethylene	ug	<0.018	4497101	<0.018	0.018	0.018	4499696
Chlorobenzene	ug	0.013	4497101	0.012	0.011	0.011	4499696
Ethylbenzene	ug	<0.014	4497101	<0.014	0.014	0.014	4499696
m / p-Xylene	ug	<0.015	4497101	<0.015	0.015	0.015	4499696
Styrene	ug	<0.012	4497101	<0.012	0.012	0.012	4499696
o-Xylene	ug	<0.015	4497101	<0.015	0.015	0.015	4499696
Bromoform	ug	<0.014	4497101	<0.014	0.014	0.014	4499696
Surrogate Recovery (%)		*		<del></del>	* *** ********	N7288,3888	
Bromofluorobenzene	%	99	4497101	98	N/A	N/A	4499696
D10-Ethylbenzene (FS)	%	108	4497101	101	N/A	N/A	4499696
D4-1,2-Dichloroethane	%	109	4497101	109	N/A	N/A	4499696
D8-Toluene	%	103	4497101	103	N/A	N/A	4499696

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ474		CIQ475			
Sampling Date		2016/05/10		2016/05/04			
	UNITS	16-21656-VOST 9A/B	QC Batch	16-21656-VOST 21A/B FB	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	4499696	<0.020	0.020	0.020	4497101
Vinyl Chloride	ug	<0.013	4499696	<0.013	0.013	0.013	4497101
Bromomethane	ug	<0.015	4499696	<0.015	0.015	0.015	4497101
Trichlorofluoromethane (FREON 11)	ug	0.014	4499696	<0.010	0.010	0.010	4497101
Acetone (2-Propanone)	ug	0.073	4499696	<0.045	0.045	0.025	4497101
1,1-Dichloroethylene	ug	<0.011	4499696	<0.011	0.011	0.011	4497101
Methylene Chloride(Dichloromethane)	ug	<0.019	4499696	<0.019	0.019	0.020	4497101
trans-1,2-Dichloroethylene	ug	<0.010	4499696	<0.010	0.010	0.010	4497101
Chloroform	ug	0.037	4499696	<0.011	0.011	0.011	4497101
1,2-Dichloroethane	ug	<0.0070	4499696	<0.0070	0.0070	0.0070	4497101
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	4499696	<0.036	0.036	0.036	4497101
1,1,1-Trichloroethane	ug	<0.014	4499696	<0.014	0.014	0.014	4497101
Carbon Tetrachloride	ug	<0.016	4499696	<0.016	0.016	0.016	4497101
Benzene	ug	0.0524	4499696	<0.0090	0.0090	0.0090	4497101
1,1,2-Trichloroethane	ug	<0.016	4499696	<0.016	0.016	0.016	4497101
1,2-Dichloropropane	ug	<0.011	4499696	<0.011	0.011	0.011	4497101
Trichloroethylene	ug	<0.011	4499696	<0.011	0.011	0.011	4497101
Bromodichloromethane	ug	0.035	4499696	<0.011	0.011	0.011	4497101
Dibromochloromethane	ug	0.0184	4499696	<0.0090	0.0090	0.0090	4497101
Toluene	ug	0.073	4499696	<0.014	0.014	0.014	4497101
Ethylene Dibromide	ug	<0.010	4499696	<0.010	0.010	0.010	4497101
Tetrachloroethylene	ug	<0.018	4499696	<0.018	0.018	0.018	4497101
Chlorobenzene	ug	0.014	4499696	<0.011	0.011	0.011	4497101
Ethylbenzene	ug	<0.014	4499696	<0.014	0.014	0.014	4497101
m / p-Xylene	ug	<0.015	4499696	<0.015	0.015	0.015	4497101
Styrene	ug	<0.012	4499696	<0.012	0.012	0.012	4497101
o-Xylene	ug	<0.015	4499696	<0.015	0.015	0.015	4497101
Bromoform	ug	<0.014	4499696	<0.014	0.014	0.014	4497101
Surrogate Recovery (%)		·	4466				
Bromofluorobenzene	%	98	4499696	99	N/A	N/A	4497101
D10-Ethylbenzene (FS)	%	105	4499696	98	N/A	N/A	4497101
D4-1,2-Dichloroethane	%	111	4499696	109	N/A	N/A	4497101
D8-Toluene	%	103	4499696	103	N/A	N/A	4497101

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ476	CIQ477	CIQ485			
Sampling Date		2016/05/05	2016/05/04	2016/05/04			
	UNITS	16-21656-VOST 15A/B FB	16-21656-VOST 16A/B	16-21656-VOST 17A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	<0.020	<0.020	0.020	0.020	4497101
Vinyl Chloride	ug	<0.013	<0.013	<0.013	0.013	0.013	4497101
Bromomethane	ug	<0.015	<0.015	<0.015	0.015	0.015	4497101
Trichlorofluoromethane (FREON 11)	ug	<0.010	<0.010	<0.010	0.010	0.010	4497101
Acetone (2-Propanone)	ug	<0.045	0.460	0.139	0.045	0.025	4497101
1,1-Dichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Methylene Chloride(Dichloromethane)	ug	<0.019	<0.019	<0.019	0.019	0.020	4497101
trans-1,2-Dichloroethylene	ug	<0.010	<0.010	<0.010	0.010	0.010	4497101
Chloroform	ug	<0.011	0.025	0.026	0.011	0.011	4497101
1,2-Dichloroethane	ug	<0.0070	<0.0070	<0.0070	0.0070	0.0070	4497101
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	<0.036	<0.036	0.036	0.036	4497101
1,1,1-Trichloroethane	ug	<0.014	<0.014	<0.014	0.014	0.014	4497101
Carbon Tetrachloride	ug	<0.016	<0.016	<0.016	0.016	0.016	4497101
Benzene	ug	<0.0090	0.0251	0.0223	0.0090	0.0090	4497101
1,1,2-Trichloroethane	ug	<0.016	<0.016	<0.016	0.016	0.016	4497101
1,2-Dichloropropane	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Trichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Bromodichloromethane	ug	<0.011	0.024	0.024	0.011	0.011	4497101
Dibromochloromethane	ug	<0.0090	0.0110	0.0109	0.0090	0.0090	4497101
Toluene	ug	<0.014	0.044	0.155	0.014	0.014	4497101
Ethylene Dibromide	ug	<0.010	<0.010	<0.010	0.010	0.010	4497101
Tetrachloroethylene	ug	<0.018	0.072	0.030	0.018	0.018	4497101
Chlorobenzene	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Ethylbenzene	ug	<0.014	0.022	<0.014	0.014	0.014	4497101
m / p-Xylene	ug	<0.015	0.026	<0.015	0.015	0.015	4497101
Styrene	ug	<0.012	0.014	<0.012	0.012	0.012	4497101
o-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4497101
Bromoform	ug	<0.014	<0.014	<0.014	0.014	0.014	4497101
Surrogate Recovery (%)							
Bromofluorobenzene	%	100	97	100	N/A	N/A	4497101
D10-Ethylbenzene (FS)	%	109	132	106	N/A	N/A	4497101
D4-1,2-Dichloroethane	%	110	107	108	N/A	N/A	4497101
D8-Toluene	%	103	102	104	N/A	N/A	4497101

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ486	CIQ487	CIQ488			
Sampling Date		2016/05/04	2016/05/05	2016/05/05			
	UNITS	16-21656-VOST 18A/B	16-21656-VOST 22A/B	16-21656-VOST 23A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	0.030	0.023	<0.020	0.020	0.020	4497101
Vinyl Chloride	ug	<0.013	<0.013	<0.013	0.013	0.013	4497101
Bromomethane	ug	<0.015	<0.015	<0.015	0.015	0.015	4497101
Trichlorofluoromethane (FREON 11)	ug	<0.010	<0.010	<0.010	0.010	0.010	4497101
Acetone (2-Propanone)	ug	0.141	0.108	0.068	0.045	0.025	4497101
1,1-Dichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Methylene Chloride(Dichloromethane)	ug	0.027	0.026	<0.019	0.019	0.020	4497101
trans-1,2-Dichloroethylene	ug	<0.010	<0.010	<0.010	0.010	0.010	4497101
Chloroform	ug	0.031	0.027	0.029	0.011	0.011	4497101
1,2-Dichloroethane	ug	<0.0070	<0.0070	<0.0070	0.0070	0.0070	4497101
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	<0.036	<0.036	0.036	0.036	4497101
1,1,1-Trichloroethane	ug	<0.014	<0.014	<0.014	0.014	0.014	4497101
Carbon Tetrachloride	ug	<0.016	<0.016	<0.016	0.016	0.016	4497101
Benzene	ug	0.0234	0.0301	0.0386	0.0090	0.0090	4497101
1,1,2-Trichloroethane	ug	<0.016	<0.016	<0.016	0.016	0.016	4497101
1,2-Dichloropropane	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Trichloroethylene	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Bromodichloromethane	ug	0.029	0.025	0.026	0.011	0.011	4497101
Dibromochloromethane	ug	0.0119	0.0111	0.0113	0.0090	0.0090	4497101
Toluene	ug	0.171	0.027	0.037	0.014	0.014	4497101
Ethylene Dibromide	ug	<0.010	<0.010	<0.010	0.010	0.010	4497101
Tetrachloroethylene	ug	0.020	<0.018	<0.018	0.018	0.018	4497101
Chlorobenzene	ug	<0.011	<0.011	<0.011	0.011	0.011	4497101
Ethylbenzene	ug	<0.014	<0.014	<0.014	0.014	0.014	4497101
m / p-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4497101
Styrene	ug	<0.012	<0.012	<0.012	0.012	0.012	4497101
o-Xylene	ug	<0.015	<0.015	<0.015	0.015	0.015	4497101
Bromoform	ug	<0.014	<0.014	<0.014	0.014	0.014	4497101
Surrogate Recovery (%)	A Children				Presidentijs P	North Co.	Maring and the
Bromofluorobenzene	%	98	99	100	N/A	N/A	4497101
D10-Ethylbenzene (FS)	%	123	99	99	N/A	N/A	4497101
D4-1,2-Dichloroethane	%	106	108	107	N/A	N/A	4497101
D8-Toluene	%	103	103	103	N/A	N/A	4497101

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ489		CIQ490			
Sampling Date		2016/05/05		2016/05/05			
	UNITS	16-21656-VOST 24A/B	QC Batch	16-21656-VOST 26A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	0.033	4497101	<0.020	0.020	0.020	4499696
Vinyl Chloride	ug	<0.013	4497101	<0.013	0.013	0.013	4499696
Bromomethane	ug	<0.015	4497101	<0.015	0.015	0.015	4499696
Trichlorofluoromethane (FREON 11)	ug	<0.010	4497101	<0.010	0.010	0.010	4499696
Acetone (2-Propanone)	ug	0.074	4497101	0.061	0.045	0.025	4499696
1,1-Dichloroethylene	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Methylene Chloride(Dichloromethane)	ug	<0.019	4497101	<0.019	0.019	0.020	4499696
trans-1,2-Dichloroethylene	ug	<0.010	4497101	<0.010	0.010	0.010	4499696
Chloroform	ug	0.026	4497101	0.025	0.011	0.011	4499696
1,2-Dichloroethane	ug	<0.0070	4497101	<0.0070	0.0070	0.0070	4499696
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	4497101	<0.036	0.036	0.036	4499696
1,1,1-Trichloroethane	ug	<0.014	4497101	<0.014	0.014	0.014	4499696
Carbon Tetrachloride	ug	<0.016	4497101	<0.016	0.016	0.016	4499696
Benzene	ug	0.0320	4497101	0.0236	0.0090	0.0090	4499696
1,1,2-Trichloroethane	ug	<0.016	4497101	<0.016	0.016	0.016	4499696
1,2-Dichloropropane	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Trichloroethylene	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Bromodichloromethane	ug	0.024	4497101	0.023	0.011	0.011	4499696
Dibromochloromethane	ug	0.0099	4497101	0.0103	0.0090	0.0090	4499696
Toluene	ug	0.039	4497101	0.026	0.014	0.014	4499696
Ethylene Dibromide	ug	<0.010	4497101	<0.010	0.010	0.010	4499696
Tetrachloroethylene	ug	<0.018	4497101	0.026	0.018	0.018	4499696
Chlorobenzene	ug	<0.011	4497101	<0.011	0.011	0.011	4499696
Ethylbenzene	ug	<0.014	4497101	<0.014	0.014	0.014	4499696
m / p-Xylene	ug	<0.015	4497101	<0.015	0.015	0.015	4499696
Styrene	ug	<0.012	4497101	<0.012	0.012	0.012	4499696
o-Xylene	ug	<0.015	4497101	<0.015	0.015	0.015	4499696
Bromoform	ug	<0.014	4497101	<0.014	0.014	0.014	4499696
Surrogate Recovery (%)			1 11 2 3 24 45 45 4 21 1			. ********	entertos transportações
Bromofluorobenzene	%	101	4497101	101	N/A	N/A	4499696
D10-Ethylbenzene (FS)	%	102	4497101	110	N/A	N/A	4499696
D4-1,2-Dichloroethane	%	110	4497101	106	N/A	N/A	4499696
D8-Toluene	%	102	4497101	105	N/A	N/A	4499696

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (STACK SAMPLING TRAIN)**

Maxxam ID		CIQ491	CIQ492			
Sampling Date		2016/05/05	2016/05/05			
	UNITS	16-21656-VOST 27A/B	16-21656-VOST 28A/B	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	<0.020	0.020	0.020	4499696
Vinyl Chloride	ug	<0.013	<0.013	0.013	0.013	4499696
Bromomethane	ug	<0.015	<0.015	0.015	0.015	4499696
Trichlorofluoromethane (FREON 11)	ug	<0.010	<0.010	0.010	0.010	4499696
Acetone (2-Propanone)	ug	0.062	0.046	0.045	0.025	4499696
1,1-Dichloroethylene	ug	<0.011	<0.011	0.011	0.011	4499696
Methylene Chloride(Dichloromethane)	ug	<0.019	<0.019	0.019	0.020	4499696
trans-1,2-Dichloroethylene	ug	<0.010	<0.010	0.010	0.010	4499696
Chloroform	ug	0.028	0.023	0.011	0.011	4499696
1,2-Dichloroethane	ug	<0.0070	<0.0070	0.0070	0.0070	4499696
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	<0.036	0.036	0.036	4499696
1,1,1-Trichloroethane	ug	<0.014	<0.014	0.014	0.014	4499696
Carbon Tetrachloride	ug	<0.016	<0.016	0.016	0.016	4499696
Benzene	ug	0.0223	0.0239	0.0090	0.0090	4499696
1,1,2-Trichloroethane	ug	<0.016	<0.016	0.016	0.016	4499696
1,2-Dichloropropane	ug	<0.011	<0.011	0.011	0.011	4499696
Trichloroethylene	ug	<0.011	<0.011	0.011	0.011	4499696
Bromodichloromethane	ug	0.024	0.021	0.011	0.011	4499696
Dibromochloromethane	ug	0.0116	<0.0090	0.0090	0.0090	4499696
Toluene	ug	0.028	0.026	0.014	0.014	4499696
Ethylene Dibromide	ug	<0.010	<0.010	0.010	0.010	4499696
Tetrachloroethylene	ug	0.018	<0.018	0.018	0.018	4499696
Chlorobenzene	ug	<0.011	<0.011	0.011	0.011	4499696
Ethylbenzene	ug	<0.014	<0.014	0.014	0.014	4499696
m / p-Xylene	ug	<0.015	<0.015	0.015	0.015	4499696
Styrene	ug	<0.012	<0.012	0.012	0.012	4499696
o-Xylene	ug	<0.015	<0.015	0.015	0.015	4499696
Bromoform	ug	<0.014	<0.014	0.014	0.014	4499696
Surrogate Recovery (%)	<del></del>			\$ 1114 (175)		North Colors of
Bromofluorobenzene	%	99	98	N/A	N/A	4499696
D10-Ethylbenzene (FS)	%	112	109	N/A	N/A	4499696
D4-1,2-Dichloroethane	%	109	110	N/A	N/A	4499696
D8-Toluene	%	103	103	N/A	N/A	4499696
RDI = Reportable Detection Limit		<u> </u>		A	*	·

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



**ORTECH Environmental** Client Project #: 21656

Site Location: COVANTA Your P.O. #: 21656-J2227

#### **TEST SUMMARY**

Maxxam ID: CIQ445

Sample ID: 16-21656-VOST 10A/B FB

Stack Sampling Train Matrix:

Collected: 2016/05/10

Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 4499696 2016/05/16 GC/MS N/A Yujie Yan

Maxxam ID: CIQ464

Sample ID: 16-21656-VOST 30A/B TB

Matrix: Stack Sampling Train

2016/05/10 Collected:

Shipped:

2016/05/12 Received:

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4499696 2016/05/16 N/A Yujie Yan

Maxxam ID: CIQ465

Sample ID: 16-21656-VOST 1A/B

Matrix: Stack Sampling Train

Collected: 2016/05/10

Shipped:

Collected:

Received: 2016/05/12

Date Analyzed **Test Description** Instrumentation Batch Extracted Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4499696 N/A 2016/05/16 Yujie Yan

Maxxam ID: CIQ466

16-21656-VOST 2A/B Sample ID:

Matrix: Stack Sampling Train Shipped:

2016/05/10

Received: 2016/05/12

**Test Description** Instrumentation Extracted Date Analyzed Analyst Batch VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4501300 N/A 2016/05/17 Yujie Yan

Maxxam ID: CIQ467

16-21656-VOST 3A/B Sample ID:

Matrix: Stack Sampling Train Collected: 2016/05/10

Shipped:

Received: 2016/05/12

**Test Description** Extracted Date Analyzed Instrumentation Batch Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4501300 N/A 2016/05/17 Yujie Yan

Maxxam ID: CIQ468

16-21656-VOST 4A/B Sample ID: Matrix: Stack Sampling Train Collected: Shipped:

2016/05/10

Received: 2016/05/12

**Test Description** Instrumentation Extracted Batch Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4501300 N/A 2016/05/17 Yujie Yan

Maxxam ID: CIQ469

16-21656-VOST 5A/B Sample ID: Matrix: Stack Sampling Train Collected: 2016/05/10 Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4501300 N/A 2016/05/17 Yujie Yan



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

#### **TEST SUMMARY**

Maxxam ID: CIQ470

Sample ID: 16-21656-VOST 6A/B

Matrix: Stack Sampling Train

Collected: 2016/05/10

Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 2016/05/17 GC/MS 4501300 N/A Yujie Yan

Maxxam ID: CIQ472

Sample ID: 16-21656-VOST 7A/B Matrix: Stack Sampling Train

2016/05/10 Collected:

Shipped:

2016/05/12 Received:

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4497101 2016/05/13 N/A Yujie Yan

Maxxam ID: CIQ473

16-21656-VOST 8A/B Sample ID: Matrix: Stack Sampling Train

Collected:

2016/05/10

Shipped: Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4499696 2016/05/16 N/A Yujie Yan

Maxxam ID: CIQ474

Sample ID: 16-21656-VOST 9A/B Matrix:

Shipped: Stack Sampling Train

Collected: Received: 2016/05/10 2016/05/12

Instrumentation Extracted Date Analyzed **Test Description** Batch Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4499696 N/A 2016/05/16 Yujie Yan

Maxxam ID: CIQ475

Sample ID: 16-21656-VOST 21A/B FB

Matrix: Stack Sampling Train Collected: 2016/05/04

Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4497101 N/A 2016/05/13 Yujie Yan

Maxxam ID: CIO476

16-21656-VOST 15A/B FB Sample ID: Matrix: Stack Sampling Train

Collected: 2016/05/05

Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4497101 N/A 2016/05/13 Yujie Yan

Maxxam ID: CIQ477

Sample ID: 16-21656-VOST 16A/B Matrix: Stack Sampling Train

Collected: 2016/05/04 Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted **Date Analyzed** Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4497101 N/A 2016/05/13 Yujie Yan



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

#### **TEST SUMMARY**

Maxxam ID: CIQ485

Sample ID: 16-21656-VOST 17A/B

Matrix: Stack Sampling Train

2016/05/04 Collected:

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOST EPA5041A, 8260C for 0030, 0031	GC/MS	4497101	N/A	2016/05/13	Yujie Yan

Maxxam ID: CIQ486

Sample ID: 16-21656-VOST 18A/B Matrix: Stack Sampling Train

Collected: 2016/05/04 Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 2016/05/13 GC/MS 4497101 N/A Yujie Yan

Maxxam ID: CIQ487

Sample ID: 16-21656-VOST 22A/B Matrix: Stack Sampling Train

Collected: 2016/05/05

Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 4497101 2016/05/13 GC/MS N/A Yujie Yan

Maxxam ID: CIQ488

Sample ID: 16-21656-VOST 23A/B Matrix: Stack Sampling Train

Collected: 2016/05/05

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOST EPA5041A, 8260C for 0030, 0031	GC/MS	4497101	N/A	2016/05/13	Yujie Yan

Maxxam ID: CIQ489

Sample ID: 16-21656-VOST 24A/B Matrix: Stack Sampling Train

Collected: 2016/05/05 Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4497101 N/A 2016/05/13 Yujie Yan

Maxxam ID: CIQ490

Sample ID: 16-21656-VOST 26A/B Matrix: Stack Sampling Train

2016/05/05 Collected:

Shipped:

Received: 2016/05/12

**Test Description** instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4499696 N/A 2016/05/16 Yujie Yan

Maxxam ID: CIQ491

Sample ID: 16-21656-VOST 27A/B Matrix: Stack Sampling Train

Collected: 2016/05/05

Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4499696 N/A 2016/05/16 Yujie Yan



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CIQ492

Sample ID: 16-21656-VOST 28A/B
Matrix: Stack Sampling Train

Collected: 2016/05/05

Shipped: Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOST EPA5041A, 8260C for 0030, 0031	GC/MS	4499696	N/A	2016/05/16	Yujie Yan



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **GENERAL COMMENTS**

Report revised to include	results for	chlorobenzene	and 1,1,2	2-trichloroethane.
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Results relate only to the items tested.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **QUALITY ASSURANCE REPORT**

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4497101	YYA	Spiked Blank	Bromofluorobenzene	2016/05/13		99	%	43 - 131
		,	D10-Ethylbenzene (FS)	2016/05/13		98	%	47 - 157
			D4-1,2-Dichloroethane	2016/05/13		98	%	64 - 133
			D8-Toluene	2016/05/13		101	%	68 - 121
			Dichlorodifluoromethane (FREON 12)	2016/05/13		134	%	50 - 150
			Vinyl Chloride	2016/05/13		106	%	50 - 150
			Bromomethane	2016/05/13		108	%	50 - 150
			Trichlorofluoromethane (FREON 11)	2016/05/13		104	%	50 - 150
			Acetone (2-Propanone)	2016/05/13		83	%	50 - 150
			1,1-Dichloroethylene	2016/05/13		106	%	50 - 150
			Methylene Chloride(Dichloromethane)	2016/05/13		105	%	50 - 150
			trans-1,2-Dichloroethylene	2016/05/13		112	%	50 - 150
			Chloroform	2016/05/13		101	%	50 - 150
			1,2-Dichloroethane	2016/05/13		102	%	50 - 150
			Methyl Ethyl Ketone (2-Butanone)	2016/05/13		111	%	50 - 150
			1,1,1-Trichloroethane	2016/05/13		100	%	50 - 150
			Carbon Tetrachloride	2016/05/13		101	%	50 - 150
			Benzene	2016/05/13		100	%	50 - 150
			1,1,2-Trichloroethane	2016/05/13		107	%	50 - 150
			1,2-Dichloropropane	2016/05/13		102	%	50 - 150
			Trichloroethylene	2016/05/13		105	%	50 - 150
			Bromodichloromethane	2016/05/13		102	%	50 - 150
			Dibromochloromethane	2016/05/13		105	%	50 - 150
			Toluene	2016/05/13		103	%	50 - 150
			Ethylene Dibromide	2016/05/13		106	%	50 - 150 50 - 150
			Tetrachloroethylene	2016/05/13		106	%	50 - 150
			Chlorobenzene	2016/05/13		102	%	50 - 150 50 - 150
				2016/05/13		102	%	50 - 150 50 - 150
			Ethylbenzene m / p-Xylene	2016/05/13		102	% %	50 - 150
				2016/05/13		102	% %	50 - 150
			Styrene			102	% %	50 - 150
			o-Xylene	2016/05/13				50 - 150
4497101	V/V A	Method Blank	Bromoform	2016/05/13		111 99	% %	43 - 131
449/101	YYA	Method Blank	Bromofluorobenzene	2016/05/13		105	% %	
			D10-Ethylbenzene (FS)	2016/05/13		105	% %	47 - 157
			D4-1,2-Dichloroethane	2016/05/13				64 - 133
			D8-Toluene	2016/05/13	40.020	104	%	68 - 121
			Dichlorodifluoromethane (FREON 12)	2016/05/13	<0.020		ug	
			Vinyl Chloride	2016/05/13	< 0.013		ug	
			Bromomethane	2016/05/13	<0.015		ug	
			Trichlorofluoromethane (FREON 11)	2016/05/13	<0.010		ug	
			Acetone (2-Propanone)	2016/05/13	<0.045		ug	
			1,1-Dichloroethylene	2016/05/13	<0.011		ug	
			Methylene Chloride(Dichloromethane)	2016/05/13	<0.019		ug	
			trans-1,2-Dichloroethylene	2016/05/13	<0.010		ug	
			Chloroform	2016/05/13	<0.011		ug	
			1,2-Dichloroethane	2016/05/13	<0.0070		ug	
			Methyl Ethyl Ketone (2-Butanone)	2016/05/13	< 0.036		ug	
			1,1,1-Trichloroethane	2016/05/13	<0.014		ug	
			Carbon Tetrachloride	2016/05/13	<0.016		ug	
			Benzene	2016/05/13	<0.0090		ug	
1			1,1,2-Trichloroethane	2016/05/13	<0.016		ug	
			1,2-Dichloropropane	2016/05/13	<0.011		ug	



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%	· · · · · · · · · · · · · · · · · · ·	****
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			Trichloroethylene	2016/05/13	<0.011		ug	***************************************
			Bromodichloromethane	2016/05/13	< 0.011		ug	
			Dibromochloromethane	2016/05/13	<0.0090		ug	
			Toluene	2016/05/13	< 0.014		ug	
			Ethylene Dibromide	2016/05/13	<0.010		ug	
			Tetrachloroethylene	2016/05/13	<0.018		ug	
			Chlorobenzene	2016/05/13	<0.011		ug	
			Ethylbenzene	2016/05/13	< 0.014		ug	
			m / p-Xylene	2016/05/13	<0.015		ug	
			Styrene	2016/05/13	<0.012		ug	
			o-Xylene	2016/05/13	<0.015		ug	
			Bromoform	2016/05/13	<0.014		ug	
4499696	ννΔ	Spiked Blank	Bromofluorobenzene	2016/05/16	10.014	99	%	43 - 131
4455050	117	эржей ыйтк	D10-Ethylbenzene (FS)	2016/05/16		93	%	47 - 157
			D4-1,2-Dichloroethane	2016/05/16		100	%	64 - 133
			D8-Toluene	2016/05/16		101	%	68 - 121
			Dichlorodifluoromethane (FREON 12)	2016/05/16		120	%	50 - 150
			Vinyl Chloride	2016/05/16		99	%	50 - 150
			Bromomethane	2016/05/16		102	%	50 - 150
			Trichlorofluoromethane (FREON 11)	2016/05/16		99	%	50 - 150
			Acetone (2-Propanone)	2016/05/16		78	%	50 - 150
			1,1-Dichloroethylene	2016/05/16		100	%	50 - 150
			Methylene Chloride(Dichloromethane)	1,7 * 1, 1		97	%	50 - 150
				2016/05/16		105	%	50 - 150
			trans-1,2-Dichloroethylene Chloroform	2016/05/16		95	% %	50 - 150
				2016/05/16		96	% %	50 - 150
			1,2-Dichloroethane	2016/05/16		105	% %	50 - 150 50 - 150
			Methyl Ethyl Ketone (2-Butanone)	2016/05/16		95	% %	50 - 150 50 - 150
			1,1,1-Trichloroethane	2016/05/16		93 94	% %	50 - 150
			Carbon Tetrachloride	2016/05/16		94	% %	50 - 150 50 - 150
			Benzene	2016/05/16		99		
			1,1,2-Trichloroethane	2016/05/16		96	% %	50 - 150
			1,2-Dichloropropane	2016/05/16		96 97	% %	50 - 150
			Trichloroethylene	2016/05/16		97 97	% %	50 - 150
			Bromodichloromethane	2016/05/16				50 - 150 50 - 150
			Dibromochloromethane	2016/05/16		98 06	%	
			Toluene	2016/05/16		96 100	%	50 - 150
			Ethylene Dibromide	2016/05/16		100	%	50 - 150
			Tetrachloroethylene	2016/05/16		98	%	50 - 150
			Chlorobenzene	2016/05/16		96	%	50 - 150
			Ethylbenzene	2016/05/16		96	%	50 - 150
			m / p-Xylene	2016/05/16		96	%	50 - 150
			Styrene	2016/05/16		95	%	50 - 150
			o-Xylene	2016/05/16		97	%	50 - 150
			Bromoform	2016/05/16		106	%	50 - 150
4499696	YYA	Method Blank	Bromofluorobenzene	2016/05/16		98	- %	43 - 131
			D10-Ethylbenzene (FS)	2016/05/16		94	%	47 - 157
			D4-1,2-Dichloroethane	2016/05/16		106	%	64 - 133
			D8-Toluene	2016/05/16		103	%	68 - 121
			Dichlorodifluoromethane (FREON 12)	2016/05/16	<0.020		ug	
			Vinyl Chloride	2016/05/16	< 0.013		ug	
			Bromomethane	2016/05/16	<0.015		ug	
			Trichlorofluoromethane (FREON 11)	2016/05/16	<0.010		ug	



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%	***************************************	
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
<del></del>		<u></u>	Acetone (2-Propanone)	2016/05/16	<0.045	**************************************	ug	
			1,1-Dichloroethylene	2016/05/16	< 0.011		ug	
			Methylene Chloride(Dichloromethane)	2016/05/16	< 0.019		ug	
			trans-1,2-Dichloroethylene	2016/05/16	< 0.010		ug	
			Chloroform	2016/05/16	< 0.011		ug	
			1,2-Dichloroethane	2016/05/16	<0.0070		ug	
			Methyl Ethyl Ketone (2-Butanone)	2016/05/16	<0.036		ug	
			1,1,1-Trichloroethane	2016/05/16	< 0.014		ug	
			Carbon Tetrachloride	2016/05/16	< 0.016		ug	
			Benzene	2016/05/16	<0.0090		ug	
			1,1,2-Trichloroethane	2016/05/16	<0.016		ug	
			1,2-Dichloropropane	2016/05/16	< 0.011		ug	
			Trichloroethylene	2016/05/16	< 0.011		ug	
			Bromodichloromethane	2016/05/16	<0.011		ug	
			Dibromochloromethane	2016/05/16	< 0.0090		ug	
			Toluene	2016/05/16	<0.014		ug	
			Ethylene Dibromide	2016/05/16	<0.010		ug	
			Tetrachloroethylene	2016/05/16	<0.018		ug	
			Chlorobenzene	2016/05/16	<0.011		ug	
			Ethylbenzene	2016/05/16	< 0.014		ug	
			m / p-Xylene	2016/05/16	<0.014		ug	
			Styrene	2016/05/16	<0.013		ug	
,			o-Xylene	2016/05/16	<0.015		ug	
			Bromoform	2016/05/16	<0.013		ug	
4501300	YYA	Spiked Blank	Bromofluorobenzene	2016/05/17	VO.014	100	%	43 - 131
*201200	117	Spiked bidlik	D10-Ethylbenzene (FS)	2016/05/17		99	%	47 - 157
			D4-1,2-Dichloroethane	2016/05/17		101	%	64 - 133
			D8-Toluene	2016/05/17		100	%	68 - 121
			Dichlorodifluoromethane (FREON 12)	2016/05/17		133	%	50 - 150
			Vinyl Chloride	2016/05/17		108	%	50 - 150
			Bromomethane	2016/05/17		112	%	50 - 150
			Trichlorofluoromethane (FREON 11)	2016/05/17		112	%	50 - 150
			Acetone (2-Propanone)	2016/05/17		93	%	50 - 150
			1,1-Dichloroethylene	2016/05/17		111	%	50 - 150
			Methylene Chloride(Dichloromethane)	2016/05/17		109	%	50 - 150
			trans-1,2-Dichloroethylene	2016/05/17		118	%	50 - 150
			Chloroform	2016/05/17		104	%	50 - 150
			1,2-Dichloroethane	2016/05/17		104	% %	50 - 150
				The state of the s		118	% %	50 - 150
			Methyl Ethyl Ketone (2-Butanone)	2016/05/17		104		
			1,1,1-Trichloroethane	2016/05/17			% «	50 - 150
			Carbon Tetrachloride	2016/05/17		105	%	50 - 150
			Benzene	2016/05/17		101	% «	50 - 150
			1,1,2-Trichloroethane	2016/05/17		106	% ~	50 - 150
			1,2-Dichloropropane	2016/05/17		102	% «	50 - 150
			Trichloroethylene	2016/05/17		103	% «	50 - 150
			Bromodichloromethane	2016/05/17		105	%	50 - 150
			Dibromochloromethane	2016/05/17		107	%	50 - 150
			Toluene	2016/05/17		102	%	50 - 15
			Ethylene Dibromide	2016/05/17		107	%	50 - 15
			Tetrachloroethylene	2016/05/17		104	%	50 - 15
			Chlorobenzene	2016/05/17		103	%	50 - 15
			Ethylbenzene	2016/05/17		103	%	50 - 150



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			m / p-Xylene	2016/05/17		104	%	50 - 150
			Styrene	2016/05/17		102	%	50 - 150
			o-Xylene	2016/05/17		104	%	50 - 150
			Bromoform	2016/05/17		112	%	50 - 150
4501300	YYA	Method Blank	Bromofluorobenzene	2016/05/17		99	%	43 - 131
			D10-Ethylbenzene (FS)	2016/05/17		97	%	47 - 157
			D4-1,2-Dichloroethane	2016/05/17		107	%	64 - 133
			D8-Toluene	2016/05/17		103	%	68 - 121
			Dichlorodifluoromethane (FREON 12)	2016/05/17	<0.020		ug	
			Vinyl Chloride	2016/05/17	< 0.013		ug	
			Bromomethane	2016/05/17	<0.015		ug	
			Trichlorofluoromethane (FREON 11)	2016/05/17	<0.010		ug	
			Acetone (2-Propanone)	2016/05/17	<0.045		ug	
			1,1-Dichloroethylene	2016/05/17	<0.011		ug	
			Methylene Chloride (Dichloromethane)	2016/05/17	<0.019		ug	
			trans-1,2-Dichloroethylene	2016/05/17	<0.010		ug	
			Chloroform	2016/05/17	<0.011		ug	
			1,2-Dichloroethane	2016/05/17	<0.0070		ug	
			Methyl Ethyl Ketone (2-Butanone)	2016/05/17	<0.036		ug	
			1,1,1-Trichloroethane	2016/05/17	<0.014		ug	
			Carbon Tetrachloride	2016/05/17	<0.016		ug	
			Benzene	2016/05/17	<0.0090		ug	
			1,1,2-Trichloroethane	2016/05/17	<0.016		ug	
			1,2-Dichloropropane	2016/05/17	<0.011		ug	
			Trichloroethylene	2016/05/17	<0.011		ug	
			Bromodichloromethane	2016/05/17	<0.011		ug	
			Dibromochloromethane	2016/05/17	<0.0090		ug	
			Toluene	2016/05/17	<0.014		ug	
			Ethylene Dibromide	2016/05/17	<0.010		ug	
			Tetrachloroethylene	2016/05/17	<0.018		ug	
			Chlorobenzene	2016/05/17	<0.011		ug	
			Ethylbenzene	2016/05/17	<0.014		ug	
			m / p-Xylene	2016/05/17	<0.015		ug	
			Styrene	2016/05/17	<0.012		ug	
			o-Xylene	2016/05/17	<0.015		ug	
			Bromoform	2016/05/17	<0.014		ug	

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Maureen Smith, Supervisor, Volatiles

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

SAMPLE#:	Method Blank	and the second s		
Field ID#:	Method Blank			
Number of TICs found	:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1.	1,3-Butadiene < 0.025ug			
2.	Isopropylbenzene < 0.025 ug 1,3,5-Trimethylbenzene < 0.025 ug	and another same		
4.	Trichlorotrifluoroethane < 0.025 ug	ii u aanaa aa	es.	- Bengarawa Anglina

SAMPLE#:	CIQ445			
Field ID#:	16-21656-VOST 10A/B FB	and the same of th		
Number of TICs found	:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1.	1,3-Butadiene < 0.025ug			erry french artistratis Attribute Attribute de Attribute
2.	Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug	BASTORISANDANA	constituents and the constituents are constituents and the constituents and the constituents are constituents and the constituents and the constituents are constituents are constituents are constituents are constituents are constituents and constituents are	
4.	Trichlorotrifluoroethane < 0.025ug	PERMIT	605 CTREATING	N. A. C.

SAMPLE#:	CIQ464	water of		
Field ID#:	16-21656-VOST 30A/B TB			
Number of TICs found	:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	1,3-Butadiene < 0.025ug	and the same of th	an manada manda di Mada Mada da manda m	
3.	Isopropylbenzene < 0.025 ug 1,3,5-Trimethylbenzene < 0.025 ug	41.004 45.613 30.000		Statistics (Victorial)
4.	Trichlorotrifluoroethane < 0.025ug			áry tiến thiết thi

SAMPLE#:	CIQ465	NO. MANAGEMENT		
Field ID#:	16-21656-VOST 1A/B			
Number of TICs found	:0	Concentra ug	ition Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1.	1,3-Butadiene < 0.025ug			
2.	Isopropylbenzene < 0.025 ug		scale de la companya	
4.	1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug		-	Copus diadata piano di Nova di

	SAMPLE#:	CIQ466			
	Field ID#:	16-21656-VOST 2A/B			
Numb	er of TICs found:	0	Concentra ug	ation Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	CONTRACTOR	1,3-Butadiene < 0.025ug			
3.		Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug			
4.		Trichlorotrifluoroethane < 0.025ug			

	SAMPLE#:	CIQ467	week-tools		
	Field ID#:	16-21656-VOST 3A/B			
Numbe	er of TICs found:	00	Concentra ug	ation Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1.		1,3-Butadiene < 0.025ug			
2.		Isopropylbenzene < 0.025ug	NA CONTRACTOR OF THE CONTRACTO	rianul (44	
3.		1,3,5-Trimethylbenzene $< 0.025$ ug	ayanan ayan	electronic de la company de la	
4.		Trichlorotrifluoroethane < 0.025ug	Date of the second of the seco		

	SAMPLE#:	CIQ468			
	Field ID#:	16-21656-VOST 4A/B			
Numb	er of TICs found:	0	Concentra ug	ation Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2. 3. 4.		1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug			

SAMPLE#:	CIQ469			
Field ID#:	16-21656-VOST 5A/B			
Number of TICs found:	0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2. 3. 4.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug			

	SAMPLE#:	CIQ470			
	Field ID#:	16-21656-VOST 6A/B			
Numb	er of TICs found:	0	Concentra ug	tion Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1.		1,3-Butadiene < 0.025ug			
2.		Isopropylbenzene < 0.025ug			
3.		1,3,5-Trimethylbenzene < 0.025 ug		To the state of th	
4.		Trichlorotrifluoroethane < 0.025ug			

	SAMPLE#:	CIQ472	A CONTRACTOR OF THE CONTRACTOR		
	Field ID#:	16-21656-VOST 7A/B			
Numbe	er of TICs found:	0	Concentra ug	tion Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1.	anakan kanakan kunun kentan kanakan kentan kanakan kentan kanakan kanakan kentan kanakan kentan kanakan kentan	1,3-Butadiene < 0.025ug			
2. 3.		Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug	PT-Southern Statement Stat		neppaintement in the second in
4.		Trichlorotrifluoroethane < 0.025ug			

SAM	IPLE#:	CIQ473			
Fie	ld ID#:	16-21656-VOST 8A/B			
Number of TI	Cs found:	0	Concentra ug	tion Units	
CA	AS#	Compound Name	RT	Est. Conc.	Match %
1.		1,3-Butadiene < 0.025ug			
2.		Isopropylbenzene < 0.025ug	1000 A	-	acamatan do
3.		1,3,5-Trimethylbenzene < 0.025 ug	200-1-3-1-3-1		
4.		Trichlorotrifluoroethane < 0.025ug		l	

	SAMPLE#:	CIQ474			
	Field ID#:	16-21656-VOST 9A/B			
Numb	per of TICs found:	0	Concentra ug	tion Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1.	Self-Land Colonia (1994) and the Self-Self-Self-Self-Self-Self-Self-Self-	1,3-Butadiene < 0.025ug			
2.		Isopropylbenzene < 0.025ug		D110001-01001	
3.		1,3,5-Trimethylbenzene $< 0.025$ ug		500 100 100 100 100 100 100 100 100 100	
4.		Trichlorotrifluoroethane < 0.025ug		ACT PROPERTY.	

	SAMPLE#:	CIQ475			
	Field ID#:	16-21656-VOST 21A/B FB			
Numb	er of TICs found:	0	Concentra ug	ation Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.		1,3-Butadiene < 0.025ug		ang pilakanan kanada melangan kalambilah kelakan kelakan kelakan kelakan kelakan kelakan kelakan kelakan kelak Berjan	
2. 3.		Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug			THE PROPERTY OF THE PROPERTY O
4.		Trichlorotrifluoroethane < 0.025ug			

	SAMPLE#:	CIQ476			
	Field ID#:	16-21656-VOST 15A/B FB			
Numb	per of TICs found:	0	Concentra ug	tion Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1.		1,3-Butadiene < 0.025ug			
2.		Isopropylbenzene < 0.025 ug		***************************************	
3. 4.		1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug	ndoc-income in the control of the co	O PORT OF THE PROPERTY OF THE	Walk Education and Control of Con

SAMPLE#:	CIQ477			
Field ID#:	16-21656-VOST 16A/B			
Number of TICs found	:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug			
3. 4.	1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug	Local Association and the Control Association and the Cont	Annie in Anderson George Control of the Control of	

SAMPLE#:	CIQ485			
Field ID#:	16-21656-VOST 17A/B			
Number of TICs found	:0	Concentra ug	tion Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug			
3. 4.	1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug	Ma politicamenta proprieta de la constanta de	Terrario de la companya del companya de la companya del companya de la companya del la companya de la companya	oraciona de la composição de la composiç

SAMPLE#:	CIQ486			
Field ID#:	16-21656-VOST 18A/B	SOCIONES 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Number of TICs foun	d:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug			
3.	1,3,5-Trimethylbenzene < 0.025 ug	dia solo and a solo an	ni-kao kao kao kao kao kao kao kao kao kao	
4.	Trichlorotrifluoroethane < 0.025ug		N. Company	

SAMPLE#:	CIQ487			
Field ID#:	16-21656-VOST 22A/B			
Number of TICs found:	0	Concentra ug	ntion Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2. 3. 4.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug			

	SAMPLE#:	CIQ488			
	Field ID#:	16-21656-VOST 23A/B			
Number	of TICs found:	0	Concentra ug	ition Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2. 3. 4.		1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug 1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug			

SAMPLE#:	CIQ489			
Field ID#:	16-21656-VOST 24A/B			
Number of TICs foun	d:0	Concentra ug	tion Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug		STANDON STA	
3. 4.	1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug	Tennanda a para da par		Vanishing to the state of the s

	SAMPLE#:	CIQ490	National Association of the Control		
	Field ID#:	16-21656-VOST 26A/B	CO AND		
Numb	er of TICs found:	0	Concentra ug	tion Units	
	CAS#	Compound Name	RT	Est. Conc.	Match %
1.	anna an ann an Aireann an Aireann an Aireann an Aireann an Aireann an Aireann an an Aireann an Aireann an Aire	1,3-Butadiene < 0.025ug		namananya maka maka maka maka ana ana ana aka aka aka aka aka aka	
2.		Isopropylbenzene < 0.025ug			Action 1
3.		1,3,5-Trimethylbenzene < 0.025 ug			Non-Attachment of the Control of the
4.		Trichlorotrifluoroethane < 0.025ug			

SAMPLE#:	CIQ491			
Field ID#:	16-21656-VOST 27A/B			
Number of TICs found	:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug	and the second s	A MANAGEM PROGRAMMENT OF THE CHARGE AND A MANAGEMENT OF THE CH	
3. 4.	1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug			Tile and control of the control of t

SAMPLE#:	CIQ492			
Field ID#:	16-21656-VOST 28A/B			
Number of TICs found	1:0	Concentra ug	ation Units	
CAS#	Compound Name	RT	Est. Conc.	Match %
1. 2.	1,3-Butadiene < 0.025ug Isopropylbenzene < 0.025ug			
3. 4.	1,3,5-Trimethylbenzene < 0.025 ug Trichlorotrifluoroethane < 0.025ug	Marginah aman ya maranda gaber		And the state of t



### **APPENDIX 18**

Aldehydes Recovery Data Sheets (8 page)

# Method 430 Train Recovery Data Sheet

Client: Covanta DYEC		
Project No.: 21656		
Test No.:		
Test Location: APC # [		
Test Date: MAY 9, 2016		
,		
	16-21656-M430-	
Impingers 1, 2, 3 & 4	Sample ID:	
CONSTRUCTION OF THE CONSTR	Name of the state	
Impinger 1 (15 ml DNPH)	Imp. 1, 2 and 3 plus rinsings	
Empty Mass: 101.5	Colour: YELOW	
Initial Mass: 115.9	Bottle empty: 127.0	
Final Mass: 119-9	Mass with impingers: 157.	
Gain: 4.0 /	With DNPH rinse: 171.2	
	With Hexane rinse: 183,7	
Impinger 2 (15 ml DNPH)	Total sample: 56.7 /	
Empty Mass: 86.		
Initial Mass: 99.4		
Final Mass: 99.4		
Gain: 0.0		
Impinger 3 (Empty)		
Initial Mass: 92.7		
Final Mass: 92.8		
Gain:		
Impinger 4 (Silica Gel)		
Initial Mass: 113.9		2
Final Mass: 114 (		Box 3
Gain: 0.7 /	Total Moisture Gain: 4.3	
Train Loaded By:		
Train Recovered By:		
Recovery Witnessed By:		
Date: MAY 9, 2016		
		•

Rev: May 6, 2005

# Method 430 Train Recovery Data Sheet

Client:	Covanta DYEC
Project No.:	21656
Test No.:	2
Test Location:	APC (
Test Date:	MAY 9 2016

Sample ID: 16-21656-1430-	Z
---------------------------	---

Impinge	r 1 (15 ml DNPH)	
Empty Mass:	89.1	
Initial Mass:	102.4	
Final Mass:	107.1	
Gain:	4.3	

Impinger 2 (15 ml DNPH)		
Empty Mass:	90.8	
Initial Mass:	103.8	
Final Mass:	103.8	4
Gain:	1.0	

Impinger 3 (Empty)		
Initial Mass:	1037	anu,
Final Mass:	103.7	
Gain:	0.0	p P

Impinger 4 (Silica Gel)		
Initial Mass:	126.6	
Final Mass:	1267	
Gain:	0.(	

Imp. 1, 2 and 3 p	lus rinsings
Colour: YEL	ك و ت
Bottle empty: 126	, S
Mass with impingers:	56.4
With DNPH rinse: /	19.4
With Hexane rinse: jC	19.4
Total sample:	2.6

Total Moisture Gain: 4-4

Train Loaded By:

Train Recovered By:

Recovery Witnessed By:

Date:

MAY 9 2016

Bot 2

Client:	Covanta D	YEC
Project No.:	21656	
Test No.:	3	
Test Location:	APC 1	
Test Date: /	MAY 9	2016

Impingers 1, 2,	3	ď	4	
-----------------	---	---	---	--

Sample ID:	16-21656-1496-3	> >

Imp. 1, 2 and 3 plus rinsings

Impinger	· 1 (15 ml DNPH)
Empty Mass:	101.9
Initial Mass:	116:7
Final Mass:	119.9
Gain:	3-2 /

Bottle empty:	27.4
Mass with impingers:	155.5
With DNPH rinse:	178.5
With Hexane rinse:	196.4
Total sample:	69.0

Impinge	r 2 (15 ml DNPH)
Empty Mass:	86.4
Initial Mass:	98.1
Final Mass:	97.9
Gain:	40.2

r 3 (Empty)	
93.0	
93.0	
$\mathcal{L}_{\mathcal{L}}$	(Jordan
	93.0 93.0

Impinger 4 (Silica Gel)		
Initial Mass:	114.1	
Final Mass:	114.7	
Gain:	06	

Total Moisture Gain: 3.6

Train Loaded By:

Train Recovered By:

Recovery Witnessed By:

Date:

MAY 9 7246

BOX 3

Client: Covanta DYEC	
Project No.: 21656	-
Test No.: BLANK	<del></del>
Test Location: APC #3	<del></del>
Test Date: MAY 169 2016	
	usan.
Impingers 1, 2, 3 & 4	Sample ID:
Impinger 1 (15 ml DNPH)	Imp. 1, 2 and 3 plus rinsings
Empty Mass: /0/, 4	Colour: Year
Initial Mass: 114.4	Bottle empty: 126.3
Final Mass: // Y C	Mass with impingers: 153.7
Gain:	With DNPH rinse:
	With Hexane rinse: 192.2
Impinger 2 (15 ml DNPH)	Total sample: 65.9
Empty Mass: 86.2	•
Initial Mass: 100.	
Final Mass: /OD	
Gain:	
Impinger 3 (Empty)	
Initial Mass: 92.7	
Final Mass: 927	
Gain:	
Impinger 4 (Silica Gel)	
Initial Mass: 113.9	
Final Mass: 113.9	
Gain:	Total Moisture Gain:
	2.1
	Box -
Train Loaded By:	
Train Recovered By:	
Recovery Witnessed By:	
Date: MAN 189701	9

**ORTECH Environmental** Rev: May 6, 2005

Client: Covanta DYEC	ranco.	
Project No.: 21656	NONCORPA	
Test No.:	DARMAN	
Test Location: UNIT 7	ACCIONA	
Test Date: MAY 6, 2016	on the same of the	
,		
T	G I ID 4	
Impingers 1, 2, 3 & 4	Sample ID:	
Impinger 1 (15 ml DNPH)	Imp. 1, 2 and 3 plus rinsings	
Empty Mass: 101.%	Colour: YELLOW	
Initial Mass: //3, &	Bottle empty: 177.7	
Final Mass: 116.9	Mass with impingers: 1540	
Gain: 3.3	With DNPH rinse: 167.6	
	With Hexane rinse: 179.9	
Impinger 2 (15 ml DNPH)	Total sample: 52.7	
Empty Mass: 86.		
Initial Mass: 98.3		
Final Mass: 97. 9		
Gain: -0.4		
· Control of the cont		
Impinger 3 (Empty)		
Initial Mass: 92.7		
Final Mass: 97 - 8		
Gain:		
Impinger 4 (Silica Gel)		4
Initial Mass: 1123		Bot
Final Mass: (13.3		Do.
Gain: 1. U	Total Moisture Gain: 4, 0	
Train Loaded By:		
Train Recovered By:		
Recovery Witnessed By:		

Rev: May 6, 2005

Date:

Client: Covanta DYEC		
Project No.: 21656		
Test No.: Z		
Test Location: UNIT 2	NATIONAL PROPERTY OF THE PROPE	
Test Date: MAY 6, 2016	-	
•		
	- Septemb	
Impingers 1, 2, 3 & 4	Sample ID: 5	
Impinger 1 (15 ml DNPH)	Imp. 1, 2 and 3 plus rinsings	
Empty Mass: 99.7	Colour: YELOW	
Initial Mass: 99.2	Bottle empty: 127.4	
Final Mass: 102.8	Mass with impingers: 100.0	
Gain: 3.6	With DNPH rinse: 160.7	
T	With Hexane rinse: 175.4	
Impinger 2 (15 ml DNPH)	Total sample: 48.0	
Empty Mass:		
Initial Mass: 101.3 Final Mass: 100.8		
Gain: -0.5		
Impinger 3 (Empty)		
Initial Mass: /03.(		
Final Mass: 103.6		
Gain:		
Gair.		
Impinger 4 (Silica Gel)		
Initial Mass: 17.5.4		BOXZ
Final Mass: 126.7		() ⁰
Gain: (-3	Total Moisture Gain: 4.4	
Train Loaded By:		
Train Recovered By:		
Recovery Witnessed By:		
Date: VIAY 6	2016	

Rev: May 6, 2005

Client:	Covanta DYEC
Project No.:	21656
Test No.:	· waste
Test Location:	UNIT Z
Test Date:	MAY 6, 2016

Impingers 1, 2,	5	Œ	4
-----------------	---	---	---

Impinge	r 1 (15 ml DNPH)
Empty Mass:	101.9
Initial Mass:	116.0
Final Mass:	119.5
Gain:	3.5

Impinger	· 2 (15 ml DNPH)
Empty Mass:	86.5
Initial Mass:	97.6
Final Mass:	97.3
Gain:	50.3

Imping	er 3 (Empty)
Initial Mass:	93.1
Final Mass:	92.9
Gain:	-0.2

Impinger	r 4 (Silica Gel)
Initial Mass:	113.3
Final Mass:	114-1
Gain:	0.193
Gain:	0.19

Sample ID: 16-21656-14420-6

Imp. 1, 2 and	3 plus rinsings
Colour: YEC	cow
Bottle empty:	27.5
Mass with impingers:	155.0
With DNPH rinse:	173.5
With Hexane rinse:	189,5
Total sample:	62.0

Total Moisture Gain: 3.8

Train Loaded By:	D-6	11	
Гrain Recovered By:	MIN	12	
Recovery Witnessed By:		7	
Date:	VAY 6 7	016	

Bax

Client: Covanta DYEC	
Project No.: 21656	
Test No.: BLANK	
Test Location: UNIT 2	
Test Date: MAY 6, 2016	
,	
grammessarzzannem solveten by durindust stamberden tot of derivative behavior and derivative by the solven solveten by the so	
Impingers 1, 2, 3 & 4	Sample ID: 16-21656-M470-7
Impinger 1 (15 ml DNPH)	Imp. 1, 2 and 3 plus rinsings
Empty Mass: 89.5	Colour: YELLOW
Initial Mass: 96.8	Bottle empty: 127.6
Final Mass: 988	Mass with impingers: 146.4
Gain:	With DNPH rinse: 163.6
	With Hexane rinse: 180. O
Impinger 2 (15 ml DNPH)	Total sample: 52.4
Empty Mass: 91.3	
Initial Mass: / O.O. 6	
Final Mass: 100.6	
Gain:	
Impinger 3 (Empty)	
Initial Mass: 103.6	
Final Mass: 103.6	
Gain:	
Impinger 4 (Silica Gel)	Bo+ 2
Initial Mass: 125.4	
Final Mass: 15.4	
Gain:	Total Moisture Gain:
Train Loaded By:	
Train Recovered By:	
Recovery Witnessed By:	

Date:



## **APPENDIX 19**

Aldehydes Analytical Reports (7 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site Location: COVANTA

#### Attention:Chris Belore

ORTECH Environmental 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/05/19

Report #: R3997957

Version: 1 - Final

### **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B696182 Received: 2016/05/12, 12:30

Sample Matrix: Stack Sampling Train

# Samples Received: 9

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Aldehydes + Ketones in Air	9	2016/05/13	2016/05/16	BRL SOP-00229	EPA 8315/M0011 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## CARBONYL COMPOUNDS BY HPLC (STACK SAMPLING TRAIN)

Maxxam ID		CIQ742	CIQ743	CIQ744	CIQ745			
Sampling Date		2016/05/09	2016/05/09	2016/05/09	2016/05/09			
	UNITS	16-21656-M430 BLANK	16-21656-M430 -1	16-21656-M430 -2	16-21656-M430 -3	RDL	MDL	QC Batch
Formaldehyde (Methanal)	ug/Tot.	0.6	2.2	1.8	1.3	0.2	0.1	4497045
Acetaldehyde (Ethanal)	ug/Tot.	<2	2	2	<2	2	0.4	4497045
Acrolein	ug/Tot.	<2	<2	<2	<2	2	0.4	4497045

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

Maxxam ID		CIQ746	CIQ747	CIQ748	CIQ749			
Sampling Date		2016/05/06	2016/05/06	2016/05/06	2016/05/06			
	UNITS	16-21656-M430 -7	16-21656-M430 -4	16-21656-M430 -5	16-21656-M430 -6	RDL	MDL	QC Batch
Formaldehyde (Methanal)	ug/Tot.	0.3	0.9	0.8	0.7	0.2	0.1	4497045
Acetaldehyde (Ethanal)	ug/Tot.	<2	<2	<2	<2	2	0.4	4497045
Acrolein	ug/Tot.	<2	<2	<2	<2	2	0.4	4497045

RDL = Reportable Detection Limit QC Batch = Quality Control Batch

Maxxam ID		CIQ750			
Sampling Date					
	UNITS	16-21656-M430 -8	RDL	MDL	QC Batch
Formaldehyde (Methanal)	ug/Tot.	9.6	0.2	0.1	4497045
Acetaldehyde (Ethanal)	ug/Tot.	9	2	0.4	4497045
Acrolein	ug/Tot.	3	2	0.4	4497045

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

#### **TEST SUMMARY**

Maxxam ID: CIQ742

Sample ID: 16-21656-M430 BLANK

Matrix: Stack Sampling Train

Collected: 2016/05/09

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Aldehydes + Ketones in Air	LC/UV	4497045	2016/05/13	2016/05/16	Dennis Boodram

Maxxam ID: CIQ743

Sample ID: 16-21656-M430 -1 Matrix: Stack Sampling Train Collected: 2016/05/09

Shipped: Received: 2016/05/12

Date Analyzed **Test Description** Instrumentation Batch Extracted Analyst Aldehydes + Ketones in Air LC/UV 4497045 2016/05/13 2016/05/16 Dennis Boodram

Maxxam ID: CIQ744

Sample ID: 16-21656-M430 -2 Matrix: Stack Sampling Train Collected: 2016/05/09

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Aldehydes + Ketones in Air	LC/UV	4497045	2016/05/13	2016/05/16	Dennis Boodram

Maxxam ID: CIO745

Sample ID: 16-21656-M430 -3

Stack Sampling Train Matrix:

2016/05/09 Collected:

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Aldehydes + Ketones in Air	LC/UV	4497045	2016/05/13	2016/05/16	Dennis Boodram

Maxxam ID: CIQ746

Sample ID:

16-21656-M430 -7

Stack Sampling Train Matrix:

Collected: 2016/05/06

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Aldehydes + Ketones in Air	LC/UV	4497045	2016/05/13	2016/05/16	Dennis Boodram

Maxxam ID: CIQ747

16-21656-M430 -4 Sample ID:

Collected: Shipped:

2016/05/06

Matrix: Stack Sampling Train Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Aldehydes + Ketones in Air	LC/UV	4497045	2016/05/13	2016/05/16	Dennis Boodram

Maxxam ID: CIQ748

16-21656-M430 -5 Sample ID: Matrix: Stack Sampling Train Collected: 2016/05/06

Shipped: Received: 2016/05/12

**Test Description** Date Analyzed Analyst Instrumentation Batch Extracted

2016/05/16 Dennis Boodram Aldehydes + Ketones in Air LC/UV 4497045 2016/05/13



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CIQ749

Sample ID: 16-21656-M430-6

Matrix: Stack Sampling Train

Collected:

2016/05/06

Shipped:

Collected:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Aldehydes + Ketones in Air	LC/UV	4497045	2016/05/13	2016/05/16	Dennis Boodram

Maxxam ID: CIQ750

Sample ID: 16-21656-M430 -8 Matrix: Stack Sampling Train Shipped:

Received: 2016/05/12

Test DescriptionInstrumentationBatchExtractedDate AnalyzedAnalystAldehydes + Ketones in AirLC/UV44970452016/05/132016/05/16Dennis Boodram



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

#### **GENERAL COMMENTS**

BLANK SPIKE: ACROLEIN RECOVERY

The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

Sample CIQ750-01: Recovery for Trip Spike: Formaldehyde 95.6%; Acetaldehyde 93.0%; Acrolein 28.8% Samples have been corrected for desorption efficiencies if average percent recoveries are less than 80% (does not apply to gravimetric and inorganic analysis).

Results relate only to the items tested.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

#### **QUALITY ASSURANCE REPORT**

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4497045	DEO	Spiked Blank	Formaldehyde (Methanal)	2016/05/16		97	%	N/A
			Acetaldehyde (Ethanal)	2016/05/16		90	%	N/A
			Acrolein	2016/05/16		41	%	N/A
4497045	DEO	Spiked Blank DUP	Formaldehyde (Methanal)	2016/05/16		101	%	N/A
			Acetaldehyde (Ethanal)	2016/05/16		93	%	N/A
			Acrolein	2016/05/16		23	%	N/A
4497045	DEO	RPD	Formaldehyde (Methanal)	2016/05/16	3.1		%	30
			Acetaldehyde (Ethanal)	2016/05/16	2.9		%	30
			Acrolein	2016/05/16	55 (1)		%	30
4497045	DEO	Method Blank	Formaldehyde (Methanal)	2016/05/16	<0.2		ug/Tot	•
			Acetaldehyde (Ethanal)	2016/05/16	<2		ug/Tot	
			Acrolein	2016/05/16	<2		ug/Tot	

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Karen Nicol, Supervisor, Semi-Volatiles

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



## **APPENDIX 20**

SVOC and VOST Proof Data (43 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site#: MEDIA PREP

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Attention:Dan Turton

**ORTECH Environmental** 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/04/26

Report #: R3973234 Version: 1 - Final

#### **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B672731 Received: 2016/04/13, 12:53

Sample Matrix: Air Sampling Media

# Samples Received: 17

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Chlorobenzenes in MM5 Trains (EPA M0010)	3	2016/04/17	2016/04/18	BRL SOP-00202	In house (M0010)
Chlorobenzenes in MM5 Trains (EPA M0010)	1	2016/04/19	2016/04/22	BRL SOP-00202	In house (M0010)
Chlorophenols in MM5 Trains (EPA M0010)	3	2016/04/16	2016/04/18	BRL SOP-00204	In house (M0010)
Chlorophenols in MM5 Trains (EPA M0010)	1	2016/04/19	2016/04/22	BRL SOP-00204	In house (M0010)
Dioxins/Furans in Air (Method 23)	3	2016/04/16	2016/04/18	BRL SOP-00404	EPA M23/23A m
Dioxins/Furans in Air (Method 23)	1	2016/04/16	2016/04/23	BRL SOP-00404	EPA M23/23A m
PAH's in MM5 SamplingTrains (CARB429mod)	3	2016/04/17	2016/04/18	BRL SOP-00201	CARB429(ARBM1,M2)mod
PAH's in MM5 SamplingTrains (CARB429mod)	1	2016/04/19	2016/04/23	BRL SOP-00201	CARB429(ARBM1,M2)mod
Particulates/Filter (M5/315/NJATM1/M201)	12	N/A	2016/04/18	BRL SOP-00109	EPA 5/315/NJATM1 m
PCBs in a Sampling Train (1668Amod)	1	2016/04/20	2016/04/23	BRL SOP-00408	EPA 1668A m
PCBs in a Sampling Train (1668Amod)	3	2016/04/26	2016/04/18	BRL SOP-00408	EPA 1668A m
VOST EPA5041A, 8260C for 0030, 0031	1	N/A	2016/04/26	BRL SOP-00302	EPA5041A, 8260C

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

______

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca

Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CE1796							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	TRAIN PROOF O - R	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	ng	<0.0030	0.0030	0.10	N/A	0.00010	0.0000030	N/A	4465289
344'5-TetraCB-(81)	ng	<0.0031	0.0031	0.10	N/A	0.00030	0.00000093	N/A	4465289
233'44'-PentaCB-(105)	ng	<0.0028	0.0028	0.10	N/A	0.000030	0.000000084	N/A	4465289
2344'5-PentaCB-(114)	ng	<0.0027	0.0027	0.10	N/A	0.000030	0.000000081	N/A	4465289
23'44'5-PentaCB-(118)	ng	<0.0070 (1)	0.0070	0.10	N/A	0.000030	0.00000021	N/A	4465289
23'44'5'-PentaCB-(123)	ng	<0.0031	0.0031	0.10	N/A	0.000030	0.000000093	N/A	4465289
33'44'5-PentaCB-(126)	ng	<0.0028	0.0028	0.10	N/A	0.10	0.00028	N/A	4465289
HexaCB-(156)+(157)	ng	<0.0041	0.0041	0.20	N/A	0.000030	0.00000012	N/A	4465289
23'44'55'-HexaCB-(167)	ng	<0.0044	0.0044	0.10	N/A	0.000030	0.0000013	N/A	4465289
33'44'55'-HexaCB-(169)	ng	<0.0043	0.0043	0.10	N/A	0.030	0.00013	N/A	4465289
233'44'55'-HeptaCB-(189)	ng	<0.0027	0.0027	0.10	N/A	0.000030	0.000000081	N/A	4465289
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	N/A	0.00041	N/A	N/A
Surrogate Recovery (%)			·	***************************************					
C13-233'44'55'-HeptaCB-(189)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5-HexaCB-(156)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5'-HexaCB-(157)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'-PentaCB-(105)	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'55'-HexaCB-(167)	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2344'5-PentaCB-(114)	%	68	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'5-PentaCB-(118)	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2'344'5-PentaCB-(123)	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'55'-HexaCB-(169)	%	50	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'5-PentaCB-(126)	%	70	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'-TetraCB-(77)	%	68	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-344'5-TetraCB-(81)	%	65	N/A	N/A	N/A	N/A	N/A	N/A	4465289

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CE1797							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	TRAIN PROOF S - V	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	ng	<0.0029	0.0029	0.10	N/A	0.00010	0.00000029	N/A	4465289
344'5-TetraCB-(81)	ng	<0.0029	0.0029	0.10	N/A	0.00030	0.00000087	N/A	4465289
233'44'-PentaCB-(105)	ng	<0.0029	0.0029	0.10	N/A	0.000030	0.000000087	N/A	4465289
2344'5-PentaCB-(114)	ng	<0.0028	0.0028	0.10	N/A	0.000030	0.000000084	N/A	4465289
23'44'5-PentaCB-(118)	ng	<0.0094	0.0094	0.10	N/A	0.000030	0.00000028	N/A	4465289
23'44'5'-PentaCB-(123)	ng	<0.0031	0.0031	0.10	N/A	0.000030	0.000000093	N/A	4465289
33'44'5-PentaCB-(126)	ng	<0.0028	0.0028	0.10	N/A	0.10	0.00028	N/A	4465289
HexaCB-(156)+(157)	ng	<0.0022	0.0022	0.20	N/A	0.000030	0.000000066	N/A	4465289
23'44'55'-HexaCB-(167)	ng	<0.0024	0.0024	0.10	N/A	0.000030	0.000000072	N/A	4465289
33'44'55'-HexaCB-(169)	ng	<0.0023	0.0023	0.10	N/A	0.030	0.000069	N/A	4465289
233'44'55'-HeptaCB-(189)	ng	<0.0024	0.0024	0.10	N/A	0.000030	0.000000072	N/A	4465289
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	N/A	0.00035	N/A	N/A
Surrogate Recovery (%)									
C13-233'44'55'-HeptaCB-(189)	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5-HexaCB-(156)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5'-HexaCB-(157)	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'-PentaCB-(105)	%	73	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'55'-HexaCB-(167)	%	75	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2344'5-PentaCB-(114)	%	67	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'5-PentaCB-(118)	%	70	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2'344'5-PentaCB-(123)	%	70	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'55'-HexaCB-(169)	%	44	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'5-PentaCB-(126)	%	68	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'-TetraCB-(77)	%	69	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-344'5-TetraCB-(81)	%	69	N/A	N/A	N/A	N/A	N/A	N/A	4465289

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CE1798							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	TRAIN PROOF W - Z	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	ng	<0.0024	0.0024	0.10	N/A	0.00010	0.00000024	N/A	4465289
344'5-TetraCB-(81)	ng	<0.0025	0.0025	0.10	N/A	0.00030	0.00000075	N/A	4465289
233'44'-PentaCB-(105)	ng	<0.0054 (1)	0.0054	0.10	N/A	0.000030	0.00000016	N/A	4465289
2344'5-PentaCB-(114)	ng	<0.0021	0.0021	0.10	N/A	0.000030	0.000000063	N/A	4465289
23'44'5-PentaCB-(118)	ng	0.017	0.0021	0.10	N/A	0.000030	0.00000051	N/A	4465289
23'44'5'-PentaCB-(123)	ng	<0.0024	0.0024	0.10	N/A	0.000030	0.000000072	N/A	4465289
33'44'5-PentaCB-(126)	ng	<0.0021	0.0021	0.10	N/A	0.10	0.00021	N/A	4465289
HexaCB-(156)+(157)	ng	<0.0018	0.0018	0.20	N/A	0.000030	0.000000054	N/A	4465289
23'44'55'-HexaCB-(167)	ng	<0.0020	0.0020	0.10	N/A	0.000030	0.000000060	N/A	4465289
33'44'55'-HexaCB-(169)	ng	<0.0019	0.0019	0.10	N/A	0.030	0.000057	N/A	4465289
22'33'44'5-HeptaCB-(170)	ng	<0.0040	0.0040	0.10	N/A	N/A	N/A	N/A	4465289
22'344'55'-HeptaCB-(180)	ng	<0.0037	0.0037	0.10	N/A	N/A	N/A	N/A	4465289
233'44'55'-HeptaCB-(189)	ng	<0.0031	0.0031	0.10	N/A	0.000030	0.000000093	N/A	4465289
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	N/A	0.00027	N/A	N/A
Surrogate Recovery (%)									
C13-233'44'55'-HeptaCB-(189)	%	74	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5-HexaCB-(156)	%	71	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5'-HexaCB-(157)	%	71	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'-PentaCB-(105)	%	65	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'55'-HexaCB-(167)	%	70	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2344'5-PentaCB-(114)	%	62	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'5-PentaCB-(118)	%	66	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2'344'5-PentaCB-(123)	%	64	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'55'-HexaCB-(169)	%	42	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'5-PentaCB-(126)	%	62	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'-TetraCB-(77)	%	61	N/A	N/A	N/A	N/A	N/A	N/A	4465289

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CE1798							
Sampling Date		2016/04/13 14:40				TOXIC EQUIVALENCY		# of	
	UNITS	TRAIN PROOF W - Z	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-344'5-TetraCB-(81)	%	61	N/A	N/A	N/A	N/A	N/A	N/A	4465289

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CE1799							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	RESIN PROOF	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	ng	<0.022	0.022	0.10	N/A	0.00010	0.0000022	N/A	4465289
344'5-TetraCB-(81)	ng	<0.022	0.022	0.10	N/A	0.00030	0.0000066	N/A	4465289
233'44'-PentaCB-(105)	ng	<0.0088	0.0088	0.10	N/A	0.000030	0.00000026	N/A	4465289
2344'5-PentaCB-(114)	ng	<0.0085	0.0085	0.10	N/A	0.000030	0.00000026	N/A	4465289
23'44'5-PentaCB-(118)	ng	<0.0087	0.0087	0.10	N/A	0.000030	0.00000026	N/A	4465289
23'44'5'-PentaCB-(123)	ng	<0.0097	0.0097	0.10	N/A	0.000030	0.00000029	N/A	4465289
33'44'5-PentaCB-(126)	ng	<0.0086	0.0086	0.10	N/A	0.10	0.00086	N/A	4465289
HexaCB-(156)+(157)	ng	<0.0032	0.0032	0.20	N/A	0.000030	0.000000096	N/A	4465289
23'44'55'-HexaCB-(167)	ng	<0.0035	0.0035	0.10	N/A	0.000030	0.00000011	N/A	4465289
33'44'55'-HexaCB-(169)	ng	<0.0035	0.0035	0.10	N/A	0.030	0.00011	N/A	4465289
22'33'44'5-HeptaCB-(170)	ng	<0.011	0.011	0.10	N/A	N/A	N/A	N/A	4465289
22'344'55'-HeptaCB-(180)	ng	<0.0093	0.0093	0.10	N/A	N/A	N/A	N/A	4465289
233'44'55'-HeptaCB-(189)	ng	<0.0063	0.0063	0.10	N/A	0.000030	0.00000019	N/A	4465289
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	N/A	0.00098	N/A	N/A
Surrogate Recovery (%)	***************************************		<u> </u>						
C13-233'44'55'-HeptaCB-(189)	%	109	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5-HexaCB-(156)	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'5'-HexaCB-(157)	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-233'44'-PentaCB-(105)	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'55'-HexaCB-(167)	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2344'5-PentaCB-(114)	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-23'44'5-PentaCB-(118)	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-2'344'5-PentaCB-(123)	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'55'-HexaCB-(169)	%	61	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'5-PentaCB-(126)	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-33'44'-TetraCB-(77)	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4465289
C13-344'5-TetraCB-(81)	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4465289

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

#### RESULTS OF ANALYSES OF AIR SAMPLING MEDIA

Maxxam ID		CEJ067						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IVALENCY	# of	
	UNITS	113MM QUARTZ TARED -1	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	727	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CEJ068						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IVALENCY	# of	
	UNITS	113MM QUARTZ TARED -2	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	747	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

## **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CEJ069						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IIVALENCY	# of	
	UNITS	113MM QUARTZ TARED -3	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	760	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CEJ070						
Sampling Date		2016/04/13 <b>1</b> 4:40			TOXIC EQU	IVALENCY	# of	
	UNITS	113MM QUARTZ TARED -4	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	747	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

#### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CEJ071						
Sampling Date		2016/04/13 14:40			TOXIC EQL	IIVALENCY	# of	
	UNITS	113MM QUARTZ TARED -5	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	804	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CEJ072						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IVALENCY	# of	
	UNITS	113MM QUARTZ TARED -6	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	764	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

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Your P.O. #: 21656-J2227

#### **RESULTS OF ANALYSES OF AIR SAMPLING MEDIA**

Maxxam ID		CEJ073						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IIVALENCY	# of	
	UNITS	113MM QUARTZ TARED -7	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	719	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CEJ617						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IVALENCY	# of	
	UNITS	113MM QUARTZ TARED -8	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	785	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

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Your P.O. #: 21656-J2227

#### RESULTS OF ANALYSES OF AIR SAMPLING MEDIA

Maxxam ID		CEJ618						
Sampling Date		2016/04/13 14:40			TOXIC EQU	IIVALENCY	# of	
	UNITS	113MM QUARTZ TARED -9	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	750	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CEJ619	T					
Sampling Date		2016/04/13 14:40			TOXIC EQU	IVALENCY	# of	
	UNITS	113MM QUARTZ TARED -10	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	792	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxinlike Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

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#### RESULTS OF ANALYSES OF AIR SAMPLING MEDIA

Maxxam ID		CEJ620		-				
Sampling Date		2016/04/13 14:40			TOXIC EQU	TOXIC EQUIVALENCY		
	UNITS	113MM QUARTZ TARED -11	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	781	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxinlike Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable

Maxxam ID		CEJ621						
Sampling Date		2016/04/13 14:40			TOXIC EQU	# of		
	UNITS	113MM QUARTZ TARED -12	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Front Half Initial Weight	mg	707	0.30	N/A	N/A	N/A	N/A	4461806
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	0	N/A	N/A

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxinlike Compounds

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

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Your P.O. #: 21656-J2227

## SEMI-VOLATILE ORGANICS BY GC-MS (AIR SAMPLING MEDIA)

Maxxam ID		CE1796	CE1797	CE1798			
Sampling Date		2016/04/13 14:40	2016/04/13 14:40	2016/04/13 14:40			
	UNITS	TRAIN PROOF O	TRAIN PROOF S	TRAIN PROOF W	RDL	MDL	QC Batch
1-Methylnaphthalene	ug	<0.10	<0.10	<0.10	0.10	0.050	4461402
1-Methylphenanthrene	ug	<0.10	<0.10	<0.10	0.10	0.050	4461402
2-Chloronaphthalene	ug	<0.10	<0.10	<0.10	0.10	0.050	4461402
2-Methylanthracene	ug	<0.10	<0.10	<0.10	0.10	0.050	4461402
2-Methylnaphthalene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
3-Methylcholanthrene	ug	<0.20	<0.20	<0.20	0.20	0.050	4461402
7,12-Dimethylbenzo(a)anthracene	ug	<0.20	<0.20	<0.20	0.20	0.050	4461402
9,10-Dimethylanthracene	ug	<0.20	<0.20	<0.20	0.20	0.050	4461402
Acenaphthene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
Acenaphthylene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
Anthracene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
Benzo(a)anthracene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
Benzo(a)fluorene	ug	<0.20	<0.20	<0.20	0.20	0.050	446140
Benzo(a)pyrene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Benzo(b)Anthracene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
Benzo(b)fluoranthene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Benzo(b)fluorene	ug	<0.10	<0.10	<0.10	0.10	0.050	446140
Benzo(e)pyrene	ug	<0.10	<0.10	<0.10	0.10	0.050	446140
Benzo(g,h,i)perylene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Benzo(k)fluoranthene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Biphenyl	ug	<0.10	<0.10	<0.10	0.10	0.050	446140
Chrysene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Coronene	ug	<0.20	<0.20	<0.20	0.20	0.050	446140
Dibenz(a,h)anthracene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Dibenzo(a,c) anthracene + Picene	ug	<0.050	<0.050	<0.050	0.050	0.010	446140
Dibenzo(a,e)pyrene	ug	<0.20	<0.20	<0.20	0.20	0.050	446140
Fluoranthene	ug	<0.050	<0.050	<0.050	0.050	0.010	<del> </del>
Fluorene	ug	<0.050	<0.050	<0.050		0.010	<del> </del>
Indeno(1,2,3-cd)pyrene	ug	<0.050	<0.050	<0.050	0.050	0.010	<del></del>
m-Terphenyl	ug	<0.10	<0.10	<0.10	0.10	0.050	<del>                                     </del>
Naphthalene	ug	<0.10	<0.10	<0.10	0.10	0.050	<del> </del>
o-Terphenyl	ug	<0.10	<0.10	<0.10	0.10	0.050	<del> </del>
Perylene	ug	<0.20	<0.20	<0.20	0.20	0.050	<u> </u>
Phenanthrene	ug	<0.050	<0.050	<0.050	0.050	+	<del> </del>

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

## SEMI-VOLATILE ORGANICS BY GC-MS (AIR SAMPLING MEDIA)

Maxxam ID		CE1796	CE1797	CE1798			
Sampling Date		2016/04/13 14:40	2016/04/13 14:40	2016/04/13 14:40			
	UNITS	TRAIN PROOF O - R	TRAIN PROOF S - V	TRAIN PROOF W - Z	RDL	MDL	QC Batch
p-Terphenyl	ug	<0.10	<0.10	<0.10	0.10	0.050	4461402
Pyrene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
Quinoline	ug	<0.20	<0.20	<0.20	0.20	0.050	4461402
Tetralin	ug	<0.10	<0.10	<0.10	0.10	0.050	4461402
Triphenylene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461402
1,2,3,4-Tetrachlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,2,3,5+1,2,4,5-Tetrachlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,2,3-Trichlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,2,4-Trichlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,2-Dichlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,3,5-Trichlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,3-Dichlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
1,4-Dichlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
Hexachlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
Pentachlorobenzene	ug	<0.050	<0.050	<0.050	0.050	0.010	4461399
2,3,4,5-Tetrachlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,3,4,6-Tetrachlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,3,4-Trichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,3,5,6-Tetrachlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,3,5-Trichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,3,6-Trichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,3-Dichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,4 + 2,5-Dichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,4,5-Trichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,4,6-Trichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2,6-Dichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
2-Chlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
3,4,5-Trichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
3,4-Dichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
3,5-Dichlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
3-Chlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
4-Chlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393
Pentachlorophenol	ug	<0.050	<0.050	<0.050	0.050	0.040	4461393

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

## SEMI-VOLATILE ORGANICS BY GC-MS (AIR SAMPLING MEDIA)

Maxxam ID		CE1796	CE1797	CE1798			
Sampling Date		2016/04/13 14:40	2016/04/13 14:40	2016/04/13 14:40			
	UNITS	TRAIN PROOF O - R	TRAIN PROOF S - V	TRAIN PROOF W - Z	RDL	MDL	QC Batch
Surrogate Recovery (%)							
13C6-Hexachlorobenzene	%	88	87	98	N/A	N/A	4461399
2H3-1,2,4-Trichlorobenzene	%	81	78	92	N/A	N/A	4461399
2H4-1,3-Dichlorobenzene	%	80	78	85	N/A	N/A	4461399
D3-2,4-Dichlorophenol	%	102	102	103	N/A	N/A	4461393
D6-Pentachlorophenol	%	104	101	105	N/A	N/A	4461393
D10-2-Methylnaphthalene	%	94	88	92	N/A	N/A	4461402
D10-Fluoranthene	%	92	90	102	N/A	N/A	4461402
D10-Phenanthrene	%	98	100	104	N/A	N/A	4461402
D12-Benzo(a)anthracene	%	94	92	98	N/A	N/A	4461402
D12-Benzo(a)pyrene	%	100	100	104	N/A	N/A	4461402
D12-Benzo(b)fluoranthene	%	98	98	102	N/A	N/A	4461402
D12-Benzo(ghi)perylene	%	100	102	108	N/A	N/A	4461402
D12-Benzo(k)fluoranthene	%	108	112	112	N/A	N/A	4461402
D12-Chrysene	%	112	114	108	N/A	N/A	4461402
D12-Indeno(1,2,3-cd)pyrene	%	96	94	102	N/A	N/A	4461402
D12-Perylene	%	102	104	104	N/A	N/A	4461402
D14-Dibenzo(a,h)anthracene	%	96	94	104	N/A	N/A	4461402
D8-Acenaphthylene	%	98	98	100	N/A	N/A	4461402
D8-Naphthalene	%	98	98	94	N/A	N/A	4461402

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

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## SEMI-VOLATILE ORGANICS BY GC-MS (AIR SAMPLING MEDIA)

Maxxam ID		CE1799			
Sampling Date		2016/04/13 14:40			
	UNITS	RESIN PROOF	RDL	MDL	QC Batch
1-Methylnaphthalene	ug	<0.10	0.10	0.050	4465263
1-Methylphenanthrene	ug	<0.10	0.10	0.050	4465263
2-Chloronaphthalene	ug	<0.10	0.10	0.050	4465263
2-Methylanthracene	ug	<0.10	0.10	0.050	4465263
2-Methylnaphthalene	ug	<0.050	0.050	0.010	4465263
3-Methylcholanthrene	ug	<0.20	0.20	0.050	4465263
7,12-Dimethylbenzo(a)anthracene	ug	<0.20	0.20	0.050	4465263
9,10-Dimethylanthracene	ug	<0.20	0.20	0.050	4465263
Acenaphthene	ug	<0.050	0.050	0.010	4465263
Acenaphthylene	ug	<0.050	0.050	0.010	4465263
Anthracene	ug	<0.050	0.050	0.010	4465263
Benzo(a)anthracene	ug	<0.050	0.050	0.010	4465263
Benzo(a)fluorene	ug	<0.20	0.20	0.050	4465263
Benzo(a)pyrene	ug	<0.050	0.050	0.010	4465263
Benzo(b)Anthracene	ug	<0.050	0.050	0.010	4465263
Benzo(b)fluoranthene	ug	<0.050	0.050	0.010	4465263
Benzo(b)fluorene	ug	<0.10	0.10	0.050	4465263
Benzo(e)pyrene	ug	<0.10	0.10	0.050	4465263
Benzo(g,h,i)perylene	ug	<0.050	0.050	0.010	4465263
Benzo(k)fluoranthene	ug	<0.050	0.050	0.010	4465263
Biphenyl	ug	<0.10	0.10	0.050	4465263
Chrysene	ug	<0.050	0.050	0.010	4465263
Coronene	ug	<0.20	0.20	0.050	4465263
Dibenz(a,h)anthracene	ug	<0.050	0.050	0.010	4465263
Dibenzo(a,c) anthracene + Picene	ug	<0.050	0.050	0.010	4465263
Dibenzo(a,e)pyrene	ug	<0.20	0.20	0.050	4465263
Fluoranthene	ug	<0.050	0.050	0.010	4465263
Fluorene	ug	<0.050	0.050	0.010	4465263
Indeno(1,2,3-cd)pyrene	ug	<0.050	0.050	0.010	4465263
m-Terphenyl	ug	<0.10	0.10	0.050	4465263
Naphthalene	ug	<0.10	0.10	0.050	4465263
o-Terphenyl	ug	<0.10	0.10	0.050	4465263
Perylene	ug	<0.20	0.20	0.050	4465263
Phenanthrene	ug	<0.050	0.050	0.010	4465263
RDL = Reportable Detection Limit		***************************************		·····	***************************************



ORTECH Environmental Client Project #: 21656

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Your P.O. #: 21656-J2227

## SEMI-VOLATILE ORGANICS BY GC-MS (AIR SAMPLING MEDIA)

JNITS  ug  ug  ug  ug  ug  ug  ug  ug  ug  u	CEI799 2016/04/13 14:40  RESIN PROOF  <0.10 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.20 0.10 0.050 0.050 0.050 0.050 0.050	0.050 0.010 0.050 0.050 0.010 0.010 0.010 0.010 0.010	4465257
ug u	14:40  RESIN PROOF  <0.10 <0.050 <0.20 <0.10 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.10 0.050 0.20 0.10 0.050 0.050 0.050 0.050	0.050 0.010 0.050 0.050 0.010 0.010 0.010 0.010	4465263 4465263 4465263 4465263 4465263 4465257 4465257 4465257
ug u	<pre>&lt;0.10 &lt;0.050 &lt;0.20 &lt;0.10 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050 &lt;0.050</pre>	0.10 0.050 0.20 0.10 0.050 0.050 0.050 0.050	0.050 0.010 0.050 0.050 0.010 0.010 0.010 0.010	4465263 4465263 4465263 4465263 4465257 4465257 4465257
ug	<0.050 <0.20 <0.10 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.050 0.20 0.10 0.050 0.050 0.050 0.050 0.050	0.010 0.050 0.050 0.010 0.010 0.010 0.010	4465263 4465263 4465263 4465257 4465257 4465257
ug	<0.20 <0.10 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.20 0.10 0.050 0.050 0.050 0.050 0.050	0.050 0.050 0.010 0.010 0.010 0.010	4465263 4465263 4465257 4465257 4465257 4465257
ug	<0.10 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.10 0.050 0.050 0.050 0.050 0.050	0.050 0.010 0.010 0.010 0.010	4465263 4465257 4465257 4465257 4465257
ug ug ug ug ug ug ug ug ug	<0.050 <0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.050 0.050 0.050 0.050 0.050	0.010 0.010 0.010 0.010 0.010	4465257 4465257 4465257 4465257
ug ug ug ug ug ug ug ug	<0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.050 0.050 0.050 0.050 0.050	0.010 0.010 0.010 0.010	4465257 4465257 4465257 4465257
ug ug ug ug ug ug ug	<0.050 <0.050 <0.050 <0.050 <0.050 <0.050	0.050 0.050 0.050 0.050	0.010 0.010 0.010	4465257 4465257 4465257
ug ug ug ug ug	<0.050 <0.050 <0.050 <0.050 <0.050	0.050 0.050 0.050	0.010 0.010	4465257 4465257
ug ug ug ug ug	<0.050 <0.050 <0.050 <0.050	0.050 0.050	0.010	4465257
ug ug ug ug	<0.050 <0.050 <0.050	0.050		
ug ug ug	<0.050 <0.050		0.010	
ug ug	<0.050	0.050		4465257
ug			0.010	4465257
***************************************	-0.050	0.050	0.010	4465257
ug	<0.050	0.050	0.010	4465257
	<0.050	0.050	0.010	4465257
ug	<0.050	0.050	0.010	4465257
ug	<0.050	0.050	0.040	4465254
ug	<0.050	0.050	0.040	4465254
ug	<0.050	0.050	0.040	4465254
ug	<0.050	0.050	0.040	4465254
ug	<0.050	0.050	0.040	4465254
	<0.050	0.050	0.040	4465254
	<0.050	0.050	0.040	4465254
	<0.050	0.050	0.040	4465254
	<0.050	0.050	0.040	446525
	<0.050	0.050	0.040	446525
	<0.050	0.050	0.040	4465254
	<0.050	0.050	0.040	446525
ug	<0.050	<del></del>		<del> </del>
ug	<0.050		1	<del> </del>
	<0.050	0.050	0.040	446525
ug	<0.050	<del>                                     </del>	<del> </del>	<del> </del>
	<0.050	<del> </del>		<del>}</del>
	<0.050	<del> </del>	<del> </del>	<del> </del>
	ug	ug <0.050  ug <0.050	ug         <0.050         0.050           ug         <0.050	ug         <0.050         0.050         0.040           ug         <0.050



**ORTECH Environmental** Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

## SEMI-VOLATILE ORGANICS BY GC-MS (AIR SAMPLING MEDIA)

Maxxam ID		CE1799			
Sampling Date		2016/04/13 14:40			
	UNITS	RESIN PROOF	RDL	MDL	QC Batch
Surrogate Recovery (%)					
13C6-Hexachlorobenzene	%	109	N/A	N/A	4465257
2H3-1,2,4-Trichlorobenzene	%	112	N/A	N/A	4465257
2H4-1,3-Dichlorobenzene	%	102	N/A	N/A	4465257
D3-2,4-Dichlorophenol	%	104	N/A	N/A	4465254
D6-Pentachlorophenol	%	109	N/A	N/A	4465254
D10-2-Methylnaphthalene	%	84	N/A	N/A	4465263
D10-Fluoranthene	%	96	N/A	N/A	4465263
D10-Phenanthrene	%	86	N/A	N/A	4465263
D12-Benzo(a) anthracene	%	98	N/A	N/A	4465263
D12-Benzo(a) pyrene	%	94	N/A	N/A	4465263
D12-Benzo(b)fluoranthene	%	94	N/A	N/A	4465263
D12-Benzo(ghi)perylene	%	100	N/A	N/A	4465263
D12-Benzo(k)fluoranthene	%	100	N/A	N/A	4465263
D12-Chrysene	%	94	N/A	N/A	4465263
D12-Indeno(1,2,3-cd)pyrene	%	100	N/A	N/A	4465263
D12-Perylene	%	92	N/A	N/A	4465263
D14-Dibenzo(a,h)anthracene	%	98	N/A	N/A	4465263
D8-Acenaphthylene	%	86	N/A	N/A	4465263
D8-Naphthalene	%	82	N/A	N/A	4465263
RDL = Reportable Detection Limit					

QC Batch = Quality Control Batch



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (AIR SAMPLING MEDIA)**

Maxxam ID		CEJ057			
Sampling Date		2016/04/13 14:40			
	UNITS	VOST PROOF 1 - 15	RDL	MDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ug	<0.020	0.020	0.020	4472740
Chloromethane	ug	<0.015	0.015	0.015	4472740
Vinyl Chloride	ug	<0.013	0.013	0.013	4472740
Bromomethane	ug	<0.015	0.015	0.015	4472740
Chloroethane	ug	<0.0090	0.0090	0.0090	4472740
Trichlorofluoromethane (FREON 11)	ug	<0.010	0.010	0.010	4472740
Acetone (2-Propanone)	ug	<0.045	0.045	0.025	4472740
1,1-Dichloroethylene	ug	<0.011	0.011	0.011	4472740
lodomethane	ug	<0.015	0.015	0.015	4472740
Carbon Disulfide	ug	<0.026	0.026	0.026	4472740
Methylene Chloride(Dichloromethane)	ug	<0.019	0.019	0.020	4472740
1,1-Dichloroethane	ug	<0.012	0.012	0.012	4472740
trans-1,2-Dichloroethylene	ug	<0.010	0.010	0.010	4472740
cis-1,2-Dichloroethylene	ug	<0.010	0.010	0.010	4472740
Chloroform	ug	<0.011	0.011	0.011	4472740
1,2-Dichloroethane	ug	<0.0070	0.0070	0.0070	4472740
Methyl Ethyl Ketone (2-Butanone)	ug	<0.036	0.036	0.036	4472740
1,1,1-Trichloroethane	ug	<0.014	0.014	0.014	4472740
Carbon Tetrachloride	ug	<0.016	0.016	0.016	4472740
Benzene	ug	<0.0090	0.0090	0.0090	4472740
1,1,2-Trichloroethane	ug	<0.016	0.016	0.016	4472740
1,2-Dichloropropane	ug	<0.011	0.011	0.011	4472740
Trichloroethylene	ug	<0.011	0.011	0.011	4472740
Dibromomethane	ug	<0.010	0.010	0.010	4472740
Bromodichloromethane	ug	<0.011	0.011	0.011	4472740
cis-1,3-Dichloropropene	ug	<0.010	0.010	0.010	4472740
trans-1,3-Dichloropropene	ug	<0.0070	0.0070	0.0070	4472740
Dibromochloromethane	ug	<0.0090	0.0090	0.0090	<del></del>
Methyl Isobutyl Ketone	ug	<0.019	0.019	0.019	4472740
Methyl Butyl Ketone (2-Hexanone)	ug	<0.031	0.031	0.031	4472740
Toluene	ug	<0.014	0.014	0.014	4472740
Ethylene Dibromide	ug	<0.010	0.010	0.010	4472740
Tetrachloroethylene	ug	<0.018	0.018	0.018	4472740
Chlorobenzene	ug	<0.011	0.011	0.011	447274
RDL = Reportable Detection Limit QC Batch = Quality Control Batch	wł			· A	



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# **VOLATILE ORGANICS BY GC/MS (AIR SAMPLING MEDIA)**

Maxxam ID		CEJ057			
Sampling Date		2016/04/13			
Jamping Date		14:40			
	UNITS	VOST PROOF 1 - 15	RDL	MDL	QC Batch
1,1,1,2-Tetrachloroethane	ug	<0.010	0.010	0.010	4472740
Ethylbenzene	ug	<0.014	0.014	0.014	4472740
m / p-Xylene	ug	<0.015	0.015	0.015	4472740
Styrene	ug	<0.012	0.012	0.012	4472740
o-Xylene	ug	<0.015	0.015	0.015	4472740
Bromoform	ug	<0.014	0.014	0.014	4472740
1,1,2,2-Tetrachloroethane	ug	<0.014	0.014	0.014	4472740
1,2,3-Trichloropropane	ug	<0.015	0.015	0.015	4472740
1,3-Dichlorobenzene	ug	<0.020	0.020	0.020	4472740
1,4-Dichlorobenzene	ug	<0.020	0.020	0.020	4472740
1,2-Dichlorobenzene	ug	<0.020	0.020	0.020	4472740
Surrogate Recovery (%)		Recorded and the second			***************************************
Bromofluorobenzene	%	100	N/A	N/A	4472740
D10-Ethylbenzene (FS)	%	93	N/A	N/A	4472740
D4-1,2-Dichloroethane	%	109	N/A	N/A	4472740
D8-Toluene	%	105	N/A	N/A	4472740
RDL = Reportable Detection Limit QC Batch = Quality Control Batch					



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1796					· · · · · · · · · · · · · · · · · · ·		
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	TRAIN PROOF O - R	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4461316
1,2,3,7,8-Penta CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4461316
1,2,3,4,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,6,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,7,8,9-Hexa CDD *	pg	<0.98	0.98	10	2.0	0.100	0.0980	N/A	4461316
1,2,3,4,6,7,8-Hepta CDD *	pg	<1.0	1.0	10	3.0	0.0100	0.0100	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDD *	pg	<1.0	1.0	100	3.0	0.000300	0.000300	N/A	4461316
Total Tetra CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Penta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Hexa CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Hepta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
2,3,7,8-Tetra CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,7,8-Penta CDF **	pg	<1.1	1.1	10	2.0	0.0300	0.0330	N/A	4461316
2,3,4,7,8-Penta CDF **	pg	<1.1	1.1	10	2.0	0.300	0.330	N/A	4461316
1,2,3,4,7,8-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,6,7,8-Hexa CDF **	pg	<0.98	0.98	10	2.0	0.100	0.0980	N/A	4461316
2,3,4,6,7,8-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,7,8,9-Hexa CDF **	pg	<1.2	1.2	10	2.0	0.100	0.120	N/A	4461316
1,2,3,4,6,7,8-Hepta CDF **	pg	<0.71	0.71	10	3.0	0.0100	0.00710	N/A	4461316
1,2,3,4,7,8,9-Hepta CDF **	pg	<0.87	0.87	10	2.0	0.0100	0.00870	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDF **	pg	<0.48	0.48	100	5.0	0.000300	0.000144	N/A	4461316
Total Tetra CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Penta CDF **	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Hexa CDF **	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Hepta CDF **	pg	<0.78	0.78	10	N/A	N/A	N/A	0	4461316
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	3.25	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1796							
Sampling Date		2016/04/13 14:40				TOXIC EQUIVALENCY		# of	
	UNITS	TRAIN PROOF O - R	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)							·		
C13-1234678 HeptaCDD *	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-1234678 HeptaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-123678 HexaCDD *	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-123678 HexaCDF **	%	88	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-12378 PentaCDD *	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-12378 PentaCDF **	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-123789 HexaCDF **	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-2378 TetraCDD *	%	88	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-2378 TetraCDF **	%	75	N/A	N/A	N/A	N/A	N/A	N/A	4461316
C13-Octachlorodibenzo-p-Dioxin	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4461316

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

2,3,7,8-Tetra CDD *   pg   <1.0   1.0   10   2.0   1.00   1.00   N/A   446;   1,2,3,7,8-Penta CDD *   pg   <1.1   1.1   10   2.0   0.100   0.110   N/A   446;   1,2,3,7,8-Penta CDD *   pg   <1.1   1.1   10   2.0   0.100   0.110   N/A   446;   1,2,3,7,8-Penta CDD *   pg   <1.1   1.1   10   2.0   0.100   0.110   N/A   446;   1,2,3,7,8-Penta CDD *   pg   <0.97   0.97   10   2.0   0.100   0.0970   N/A   446;   1,2,3,7,8-Penta CDD *   pg   <0.97   0.97   10   2.0   0.100   0.0970   N/A   446;   1,2,3,4,6,7,8-Penta CDD *   pg   <1.1   1.1   10   3.0   0.0100   0.0110   N/A   446;   1,2,3,4,6,7,8-Penta CDD *   pg   <1.1   1.1   100   3.0   0.000300   0.000330   N/A   446;   1,2,3,4,6,7,8-Penta CDD *   pg   <1.1   1.1   10   N/A   N/A   N/A   N/A   0   446;   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100   100	Maxxam ID		CE1797							
CNITS	Sampling Date						TOXIC EQU	IVALENCY	# of	
1,2,3,7,8-Penta CDD*         pg         <1.1         1.1         10         2.0         1.00         1.10         N/A         446:           1,2,3,4,7,8-Hexa CDD*         pg         <1.1         1.1         10         2.0         0.100         0.110         N/A         446:           1,2,3,6,7,8-Hexa CDD*         pg         <1.1         1.1         10         2.0         0.100         0.0110         N/A         446:           1,2,3,4,6,7,8-Hepta CDD*         pg         <1.1         1.1         10         3.0         0.0100         0.0110         N/A         446           1,2,3,4,6,7,8-Hepta CDD*         pg         <1.1         1.1         10         3.0         0.0100         0.0110         N/A         446           1,2,3,4,6,7,8-Hepta CDD*         pg         <1.1         1.1         10         3.0         0.000300         0.00103         N/A         446           1,2,3,4,6,7,8-Penta CDD*         pg         <1.0         1.0         10         N/A         N/A         N/A         0         446           Total Penta CDD*         pg         <1.0         1.0         10         N/A         N/A         N/A         0         446           Total Heya CDD* <th></th> <th>UNITS</th> <th></th> <th>EDL</th> <th>RDL</th> <th>MDL</th> <th>TEF (2005 WHO)</th> <th>TEQ(DL)</th> <th>Isomers</th> <th>QC Batch</th>		UNITS		EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
1,2,3,4,7,8-Hexa CDD *       pg       <1.1	2,3,7,8-Tetra CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4461316
1,2,3,6,7,8-Hexa CDD *       pg       <1.1	1,2,3,7,8-Penta CDD *	pg	<1.1	1.1	10	2.0	1.00	1.10	N/A	4461316
1,2,3,7,8,9-Hexa CDD*         pg         <0.97	1,2,3,4,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,4,6,7,8-Hepta CDD *         pg         <1.1	1,2,3,6,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDD*         pg         <1.1	1,2,3,7,8,9-Hexa CDD *	pg	<0.97	0.97	10	2.0	0.100	0.0970	N/A	4461316
Total Tetra CDD *	1,2,3,4,6,7,8-Hepta CDD *	pg	<1.1	1.1	10	3.0	0.0100	0.0110	N/A	4461316
Total Penta CDD *	1,2,3,4,6,7,8,9-Octa CDD *	pg	<1.1	1.1	100	3.0	0.000300	0.000330	N/A	4461316
Total Hexa CDD * pg < 1.0	Total Tetra CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Hepta CDD *	Total Penta CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
2,3,7,8-Tetra CDF **	Total Hexa CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
1,2,3,7,8-Penta CDF **       pg       <1.0	Total Hepta CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
2,3,4,7,8-Penta CDF **	2,3,7,8-Tetra CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,4,7,8-Hexa CDF **       pg       <1.0	1,2,3,7,8-Penta CDF **	pg	<1.0	1.0	10	2.0	0.0300	0.0300	N/A	4461316
1,2,3,6,7,8-Hexa CDF **       pg       <0.94	2,3,4,7,8-Penta CDF **	pg	<1.0	1.0	10	2.0	0.300	0.300	N/A	4461316
2,3,4,6,7,8-Hexa CDF **       pg       <1.0	1,2,3,4,7,8-Hexa CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,7,8,9-Hexa CDF **       pg       <1.1	1,2,3,6,7,8-Hexa CDF **	pg	<0.94	0.94	10	2.0	0.100	0.0940	N/A	4461316
1,2,3,4,6,7,8-Hepta CDF **       pg       <0.96	2,3,4,6,7,8-Hexa CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,4,7,8,9-Hepta CDF **       pg       <1.2	1,2,3,7,8,9-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDF **         pg         <0.43         0.43         100         5.0         0.000300         0.000129         N/A         446           Total Tetra CDF **         pg         <1.0	1,2,3,4,6,7,8-Hepta CDF **	pg	<0.96	0.96	10	3.0	0.0100	0.00960	N/A	4461316
Total Tetra CDF **         pg         <1.0         1.0         10         N/A         N/A         N/A         0         446           Total Penta CDF **         pg         <1.0	1,2,3,4,7,8,9-Hepta CDF **	pg	<1.2	1.2	10	2.0	0.0100	0.0120	N/A	4461316
Total Penta CDF ** pg <1.0 1.0 10 N/A N/A N/A 0 446 Total Hexa CDF ** pg <1.0 1.0 10 N/A N/A N/A 0 446	1,2,3,4,6,7,8,9-Octa CDF **	pg	<0.43	0.43	100	5.0	0.000300	0.000129	N/A	4461316
Total Hexa CDF ** pg <1.0 1.0 10 N/A N/A N/A 0 446	Total Tetra CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
PB 20 10 10 10 10 10 10 10 10 10 10 10 10 10	Total Penta CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
	Total Hexa CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
lotal Hepta CDF **   pg   <1.0   1.0   10   N/A   N/A   N/A   U   446	Total Hepta CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
	TOTAL TOXIC EQUIVALENCY	1	N/A	N/A	N/A	N/A	N/A	3.28	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1797								
Sampling Date		2016/04/13 14:40				TOXIC EQUIVALENCY		# of		
	UNITS	TRAIN PROOF S - V	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch	
Surrogate Recovery (%)										
C13-1234678 HeptaCDD *	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-1234678 HeptaCDF **	%	130	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123678 HexaCDD *	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123678 HexaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-12378 PentaCDD *	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-12378 PentaCDF **	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123789 HexaCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-2378 TetraCDD *	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-2378 TetraCDF **	%	78	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-Octachlorodibenzo-p-Dioxin	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4461316	

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TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

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QC Batch = Quality Control Batch

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N/A = Not Applicable



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1798							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	TRAIN PROOF W - Z	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4461316
1,2,3,7,8-Penta CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4461316
1,2,3,4,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,6,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,7,8,9-Hexa CDD *	pg	<0.98	0.98	10	2.0	0.100	0.0980	N/A	4461316
1,2,3,4,6,7,8-Hepta CDD *	pg	<1.0	1.0	10	3.0	0.0100	0.0100	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDD *	pg	<1.1	1.1	100	3.0	0.000300	0.000330	N/A	4461316
Total Tetra CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Penta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Hexa CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Hepta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
2,3,7,8-Tetra CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,7,8-Penta CDF **	pg	<1.1	1.1	10	2.0	0.0300	0.0330	N/A	4461316
2,3,4,7,8-Penta CDF **	pg	<1.1	1.1	10	2.0	0.300	0.330	N/A	4461316
1,2,3,4,7,8-Hexa CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,6,7,8-Hexa CDF **	pg	<0.94	0.94	10	2.0	0.100	0.0940	N/A	4461316
2,3,4,6,7,8-Hexa CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4461316
1,2,3,7,8,9-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,4,6,7,8-Hepta CDF **	pg	<0.93	0.93	10	3.0	0.0100	0.00930	N/A	4461316
1,2,3,4,7,8,9-Hepta CDF **	pg	<1.1	1.1	10	2.0	0.0100	0.0110	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDF **	pg	<0.53	0.53	100	5.0	0.000300	0.000159	N/A	4461316
Total Tetra CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Penta CDF **	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Hexa CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Hepta CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	3.22	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

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QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1798								
Sampling Date		2016/04/13 14:40				TOXIC EQUIVALENCY		# of		
	UNITS	TRAIN PROOF W - Z	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch	
Surrogate Recovery (%)										
C13-1234678 HeptaCDD *	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-1234678 HeptaCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123678 HexaCDD *	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123678 HexaCDF **	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-12378 PentaCDD *	%	81	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-12378 PentaCDF **	%	79	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123789 HexaCDF **	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-2378 TetraCDD *	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-2378 TetraCDF **	%	70	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-Octachlorodibenzo-p-Dioxin	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4461316	

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TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

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N/A = Not Applicable



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1798							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	TRAIN PROOF W - Z Lab-Dup	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<1.1	1.1	10	2.0	1.00	1.10	N/A	4461316
1,2,3,7,8-Penta CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4461316
1,2,3,4,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,6,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,7,8,9-Hexa CDD *	pg	<0.95	0.95	10	2.0	0.100	0.0950	N/A	4461316
1,2,3,4,6,7,8-Hepta CDD *	pg	<1.1	1.1	10	3.0	0.0100	0.0110	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDD *	pg	<1.1	1.1	100	3.0	0.000300	0.000330	N/A	4461316
Total Tetra CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Penta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4461316
Total Hexa CDD *	pg	<1.1 (1)	1.1	10	N/A	N/A	N/A	0	4461316
Total Hepta CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
2,3,7,8-Tetra CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,7,8-Penta CDF **	pg	<0.99	0.99	10	2.0	0.0300	0.0297	N/A	4461316
2,3,4,7,8-Penta CDF **	pg	<0.99	0.99	10	2.0	0.300	0.297	N/A	4461316
1,2,3,4,7,8-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,6,7,8-Hexa CDF **	pg	<0.98	0.98	10	2.0	0.100	0.0980	N/A	4461316
2,3,4,6,7,8-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4461316
1,2,3,7,8,9-Hexa CDF **	pg	<1.2	1.2	10	2.0	0.100	0.120	N/A	4461316
1,2,3,4,6,7,8-Hepta CDF **	pg	<0.60	0.60	10	3.0	0.0100	0.00600	N/A	4461316
1,2,3,4,7,8,9-Hepta CDF **	pg	<0.73	0.73	10	2.0	0.0100	0.00730	N/A	4461316
1,2,3,4,6,7,8,9-Octa CDF **	pg	<0.32	0.32	100	5.0	0.000300	0.0000960	N/A	4461316
Total Tetra CDF **	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316
Total Penta CDF **	pg	<0.99	0.99	10	N/A	N/A	N/A	0	4461316
Total Hexa CDF **	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4461316

EDL = Estimated Detection Limit

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TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

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QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1798								
Sampling Date		2016/04/13 14:40				TOXIC EQUIVALENCY		# of		
	UNITS	TRAIN PROOF W - Z Lab-Dup	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch	
Total Hepta CDF **	pg	<0.66	0.66	10	N/A	N/A	N/A	0	4461316	
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	3.31	N/A	N/A	
Surrogate Recovery (%)										
C13-1234678 HeptaCDD *	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-1234678 HeptaCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123678 HexaCDD *	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123678 HexaCDF **	%	83	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-12378 PentaCDD *	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-12378 PentaCDF **	%	76	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-123789 HexaCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-2378 TetraCDD *	%	85	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-2378 TetraCDF **	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4461316	
C13-Octachlorodibenzo-p-Dioxin	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4461316	

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

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Lab-Dup = Laboratory Initiated Duplicate

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1799							
Sampling Date		2016/04/13 14:40				TOXIC EQU	IVALENCY	# of	
	UNITS	RESIN PROOF	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<1.1	1.1	10	2.0	1.00	1.10	N/A	4464946
1,2,3,7,8-Penta CDD *	pg	<1.0	1.0	10	2.0	1.00	1.00	N/A	4464946
1,2,3,4,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4464946
1,2,3,6,7,8-Hexa CDD *	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4464946
1,2,3,7,8,9-Hexa CDD *	pg	<0.94	0.94	10	2.0	0.100	0.0940	N/A	4464946
1,2,3,4,6,7,8-Hepta CDD *	pg	<1.0	1.0	10	3.0	0.0100	0.0100	N/A	4464946
1,2,3,4,6,7,8,9-Octa CDD *	pg	2.2	1.0	100	3.0	0.000300	0.000660	N/A	4464946
Total Tetra CDD *	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4464946
Total Penta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4464946
Total Hexa CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4464946
Total Hepta CDD *	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4464946
2,3,7,8-Tetra CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4464946
1,2,3,7,8-Penta CDF **	pg	<1.0	1.0	10	2.0	0.0300	0.0300	N/A	4464946
2,3,4,7,8-Penta CDF **	pg	<1.0	1.0	10	2.0	0.300	0.300	N/A	4464946
1,2,3,4,7,8-Hexa CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4464946
1,2,3,6,7,8-Hexa CDF **	pg	<0.94	0.94	10	2.0	0.100	0.0940	N/A	4464946
2,3,4,6,7,8-Hexa CDF **	pg	<1.0	1.0	10	2.0	0.100	0.100	N/A	4464946
1,2,3,7,8,9-Hexa CDF **	pg	<1.1	1.1	10	2.0	0.100	0.110	N/A	4464946
1,2,3,4,6,7,8-Hepta CDF **	pg	<0.97	0.97	10	3.0	0.0100	0.00970	N/A	4464946
1,2,3,4,7,8,9-Hepta CDF **	pg	<1.2	1.2	10	2.0	0.0100	0.0120	N/A	4464946
1,2,3,4,6,7,8,9-Octa CDF **	pg	<0.97	0.97	100	5.0	0.000300	0.000291	N/A	4464946
Total Tetra CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4464946
Total Penta CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4464946
Total Hexa CDF **	pg	<1.0	1.0	10	N/A	N/A	N/A	0	4464946
Total Hepta CDF **	pg	<1.1	1.1	10	N/A	N/A	N/A	0	4464946
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	3.28	N/A	N/A

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# DIOXINS AND FURANS BY HRMS (AIR SAMPLING MEDIA)

Maxxam ID		CE1799								
Sampling Date		2016/04/13 14:40				TOXIC EQUIVALENCY		# of		
	UNITS	RESIN PROOF	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch	
Surrogate Recovery (%)										
C13-1234678 HeptaCDD *	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-1234678 HeptaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-123678 HexaCDD *	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-123678 HexaCDF **	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-12378 PentaCDD *	%	65	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-12378 PentaCDF **	%	72	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-123789 HexaCDF **	%	80	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-2378 TetraCDD *	%	88	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-2378 TetraCDF **	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4464946	
C13-Octachlorodibenzo-p-Dioxin	%	77	N/A	N/A	N/A	N/A	N/A	N/A	4464946	

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



**ORTECH Environmental** Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CE1796

2016/04/13 Collected:

TRAIN PROOF O - R Sample ID: Matrix: Air Sampling Media

Shipped: Received: 2016/04/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4461399	2016/04/17	2016/04/18	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4461393	2016/04/16	2016/04/18	Lidija Tomic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4461316	2016/04/16	2016/04/18	Owen Cosb <b>y</b>
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4461402	2016/04/17	2016/04/18	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4465289	2016/04/26	2016/04/18	Cathy Xu

Maxxam ID: CE1797

Collected: 2016/04/13

TRAIN PROOFS - V Sample ID: Matrix: Air Sampling Media Shipped:

Received: 2016/04/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4461399	2016/04/17	2016/04/18	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4461393	2016/04/16	2016/04/18	Lidija Tomic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4461316	2016/04/16	2016/04/18	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4461402	2016/04/17	2016/04/18	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4465289	2016/04/26	2016/04/18	Cathy Xu

Maxxam ID: CE1798 Collected:

2016/04/13

TRAIN PROOF W - Z Sample ID: Matrix: Air Sampling Media

Shipped: 2016/04/13 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4461399	2016/04/17	2016/04/18	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4461393	2016/04/16	2016/04/18	Lidija Tomic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4461316	2016/04/16	2016/04/18	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4461402	2016/04/17	2016/04/18	Lidija Tomic
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4465289	2016/04/26	2016/04/18	Cathy Xu

Maxxam ID: CEI798 Dup TRAIN PROOF W - Z Sample ID: Matrix: Air Sampling Media

Matrix:

Collected: 2016/04/13 Shipped:

Received: 2016/04/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	4461316	2016/04/16	2016/04/18	Owen Cosby

Maxxam ID: CE1799 Sample ID: **RESIN PROOF** 

Air Sampling Media

Collected:

2016/04/13

Shipped:

Received: 2016/04/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chlorobenzenes in MM5 Trains (EPA M0010)	GC/MS	4465257	2016/04/19	2016/04/22	Lidija Tomic
Chlorophenols in MM5 Trains (EPA M0010)	GC/MS	4465254	2016/04/19	2016/04/22	Lidija Tomic
Dioxins/Furans in Air (Method 23)	HRMS/MS	4464946	2016/04/16	2016/04/23	Owen Cosby
PAH's in MM5 SamplingTrains (CARB429mod)	GC/MS	4465263	2016/04/19	2016/04/23	Lidija Tomic



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CE1799

Sample ID: **RESIN PROOF** 

Matrix: Air Sampling Media

Collected: 2016/04/13

Shipped:

Received: 2016/04/13

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst PCBs in a Sampling Train (1668Amod) HRMS/MS 4465289 2016/04/20 2016/04/23 Cathy Xu

Maxxam ID: CEJ057

Sample ID: VOST PROOF 1 - 15

Matrix: Air Sampling Media

2016/04/13 Collected:

Shipped:

Received: 2016/04/13

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst VOST EPA5041A, 8260C for 0030, 0031 GC/MS 4472740 N/A 2016/04/26 Yujie Yan

Maxxam ID: CF 1067

Sample ID: 113MM QUARTZ TARED -1

Matrix: Air Sampling Media Collected: 2016/04/13

Shipped:

Received: 2016/04/13

Extracted Date Analyzed Analyst **Test Description** Instrumentation Batch Particulates/Filter (M5/315/NJATM1/M201) 4461806 N/A 2016/04/18 Brenda Moore BAL

Maxxam ID: CEJ068

Sample ID: 113MM QUARTZ TARED -2

Matrix: Air Sampling Media Collected: 2016/04/13

Shipped:

Received: 2016/04/13

Date Analyzed **Test Description** Extracted Analyst Instrumentation Batch Particulates/Filter (M5/315/NJATM1/M201) 4461806 N/A 2016/04/18 Brenda Moore

Maxxam ID: CEJ069

Sample ID: 113MM QUARTZ TARED -3

Matrix: Air Sampling Media Collected: 2016/04/13

Shipped:

Received: 2016/04/13

Extracted Date Analyzed Analyst **Test Description** Instrumentation Batch Particulates/Filter (M5/315/NJATM1/M201) BAL 4461806 N/A 2016/04/18 Brenda Moore

Maxxam ID: CEJ070

Sample ID: 113MM QUARTZ TARED -4

Matrix: Air Sampling Media Collected: 2016/04/13

Shipped:

Received: 2016/04/13

**Test Description** Extracted Date Analyzed Analyst Instrumentation Batch Particulates/Filter (M5/315/NJATM1/M201) Brenda Moore BAL 4461806 N/A 2016/04/18

Maxxam ID: CEJ071

113MM QUARTZ TARED -5 Sample ID:

Matrix: Air Sampling Media

Collected: 2016/04/13 Shipped:

Received: 2016/04/13

**Test Description** Instrumentation Extracted Date Analyzed Analyst Batch Particulates/Filter (M5/315/NJATM1/M201) BAL 4461806 N/A 2016/04/18 Brenda Moore



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

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Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CEJ072

Collected: 2016/04/13

Sample ID: 113MM QUARTZ TARED -6
Matrix: Air Sampling Media

Shipped: Received: 2016/04/13

Test Description Instrumentation Batch Extracted Date Analyzed Analyst

Particulates/Filter (M5/315/NJATM1/M201) BAL 4461806 N/A 2016/04/18 Brenda Moore

Maxxam ID: CEJ073

**Collected:** 2016/04/13

Sample ID: 113MM QUARTZ TARED -7
Matrix: Air Sampling Media

Shipped: Received: 2016/04/13

Test Description Instrumentation Batch Extracted Date Analyzed Analyst

Particulates/Filter (M5/315/NJATM1/M201) BAL 4461806 N/A 2016/04/18 Brenda Moore

Maxxam ID: CEJ617

**Collected:** 2016/04/13

Sample ID: 113MM QUARTZ TARED -8
Matrix: Air Sampling Media

Shipped: Received: 2016/04/13

Test DescriptionInstrumentationBatchExtractedDate AnalyzedAnalystParticulates/Filter (M5/315/NJATM1/M201)BAL4461806N/A2016/04/18Brenda Moore

Maxxam ID: CEJ618

Collected: 2016/04/13

Sample ID: 113MM QUARTZ TARED -9
Matrix: Air Sampling Media

Shipped:

Received: 2016/04/13

Test DescriptionInstrumentationBatchExtractedDate AnalyzedAnalystParticulates/Filter (M5/315/NJATM1/M201)BAL4461806N/A2016/04/18Brenda Moore

Maxxam ID: CEJ619

Matrix:

Sample ID: 113MM QUARTZ TARED -10

Air Sampling Media

Collected: 2 Shipped:

Received: 2016/04/13

Test DescriptionInstrumentationBatchExtractedDate AnalyzedAnalystParticulates/Filter (M5/315/NJATM1/M201)BAL4461806N/A2016/04/18Brenda Moore

Maxxam ID: CEJ620

Collected: 2016

2016/04/13

2016/04/13

Sample ID: 113MM QUARTZ TARED -11
Matrix: Air Sampling Media

Shipped:

Received: 2016/04/13

 Test Description
 Instrumentation
 Batch
 Extracted
 Date Analyzed
 Analyst

 Particulates/Filter (M5/315/NJATM1/M201)
 BAL
 4461806
 N/A
 2016/04/18
 Brenda Moore

Maxxam ID: CEJ621

Collected: 2

2016/04/13

Sample ID: 113MM QUARTZ TARED -12
Matrix: Air Sampling Media

Shipped: Received:

ceived: 2016/04/13

Test DescriptionInstrumentationBatchExtractedDate AnalyzedAnalystParticulates/Filter (M5/315/NJATM1/M201)BAL4461806N/A2016/04/18Brenda Moore



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

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Your P.O. #: 21656-J2227

# **GENERAL COMMENTS**

Results relate only to the items tested.		



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

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Your P.O. #: 21656-J2227

## **QUALITY ASSURANCE REPORT**

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4461316	OBC	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2016/04/18	NC		%	20
- Control			1,2,3,7,8-Penta CDD	2016/04/18	NC		%	20
			1,2,3,4,7,8-Hexa CDD	2016/04/18	NC		%	20
			1,2,3,6,7,8-Hexa CDD	2016/04/18	NC		%	20
			1,2,3,7,8,9-Hexa CDD	2016/04/18	NC		%	20
			1,2,3,4,6,7,8-Hepta CDD	2016/04/18	NC		%	20
			1,2,3,4,6,7,8,9-Octa CDD	2016/04/18	NC		%	20
			Total Tetra CDD	2016/04/18	NC		%	20
			Total Penta CDD	2016/04/18	NC		%	20
			Total Hexa CDD	2016/04/18	NC (1)		%	20
			Total Hepta CDD	2016/04/18	NC		%	20
			2,3,7,8-Tetra CDF	2016/04/18	NC		%	20
			1,2,3,7,8-Penta CDF	2016/04/18	NC		%	20
			2,3,4,7,8-Penta CDF	2016/04/18	NC		%	20
			1,2,3,4,7,8-Hexa CDF	2016/04/18	NC		%	20
			1,2,3,6,7,8-Hexa CDF	2016/04/18	NC		%	20
			2,3,4,6,7,8-Hexa CDF	2016/04/18	NC		%	20
			1,2,3,7,8,9-Hexa CDF	2016/04/18	NC		%	20
			1,2,3,4,6,7,8-Hepta CDF	2016/04/18	NC		%	20
			1,2,3,4,7,8,9-Hepta CDF	2016/04/18	NC		%	20
			1,2,3,4,6,7,8,9-Octa CDF	2016/04/18	NC		%	20
****		•	Total Tetra CDF	2016/04/18	NC		%	20
			Total Penta CDF	2016/04/18	NC		%	20
-			Total Hexa CDF	2016/04/18	NC		%	20
-			Total Hepta CDF	2016/04/18	NC		%	20

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656

Site Location: COVANTA, DURHAM-YORK ENERGY CENTRE,

COURICE

Your P.O. #: 21656-J2227

# **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

A
Ann-Marie Stern, Senior Analyst
Karen Nicol
Karen Nicol, Supervisor, Semi-Volatiles
Maurem Smith
Maureen Smith, Supervisor, Volatiles
Slady
Owen Cosby, BSc C Chem, Supervisor, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your Project #: COVANTA PROBE PROOF

## Attention: CHRIS BELORE

**ORTECH Environmental** 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/06/10

Report #: R4023699 Version: 1 - Final

# **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B6B1801 Received: 2016/06/02, 12:30

Sample Matrix: Stack Sampling Train # Samples Received: 1

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Dioxins/Furans in Air (Method 23)	1	2016/06/04	2016/06/07	BRL SOP-00404	EPA M23/23A m
PCBs in a Sampling Train (1668Amod)	1	2016/06/04	2016/06/08	BRL SOP-00408	EPA 1668A m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca

Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



ORTECH Environmental
Client Project #: COVANTA PROBE PROOF

# **EPA M23 DIOXINS AND FURANS (STACK SAMPLING TRAIN)**

Maxxam ID		CLQ637							
Sampling Date		2016/05/02				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-PROBE-001	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<3.7	3.7	30	6.0	1.00	3.70	N/A	4525694
1,2,3,7,8-Penta CDD *	pg	<3.5	3.5	30	6.0	1.00	3.50	N/A	4525694
1,2,3,4,7,8-Hexa CDD *	pg	<4.6	4.6	30	6.0	0.100	0.460	N/A	4525694
1,2,3,6,7,8-Hexa CDD *	pg	<4.7	4.7	30	6.0	0.100	0.470	N/A	4525694
1,2,3,7,8,9-Hexa CDD *	pg	<4.2	4.2	30	6.0	0.100	0.420	N/A	4525694
1,2,3,4,6,7,8-Hepta CDD *	pg	14.3	3.2	30	9.0	0.0100	0.143	N/A	4525694
1,2,3,4,6,7,8,9-Octa CDD *	pg	29.5	3.1	300	9.0	0.000300	0.00885	N/A	4525694
Total Tetra CDD *	pg	<3.7	3.7	30	N/A	N/A	N/A	0	4525694
Total Penta CDD *	pg	<3.5	3.5	30	N/A	N/A	N/A	0	4525694
Total Hexa CDD *	pg	<4.5	4.5	30	N/A	N/A	N/A	0	4525694
Total Hepta CDD *	pg	25.3	3.2	30	N/A	N/A	N/A	2	4525694
2,3,7,8-Tetra CDF **	pg	<3.1	3.1	30	6.0	0.100	0.310	N/A	4525694
1,2,3,7,8-Penta CDF **	pg	<2.8	2.8	30	6.0	0.0300	0.0840	N/A	4525694
2,3,4,7,8-Penta CDF **	pg	<2.8	2.8	30	6.0	0.300	0.840	N/A	4525694
1,2,3,4,7,8-Hexa CDF **	pg	<5.0	5.0	30	6.0	0.100	0.500	N/A	4525694
1,2,3,6,7,8-Hexa CDF **	pg	<4.6	4.6	30	6.0	0.100	0.460	N/A	4525694
2,3,4,6,7,8-Hexa CDF **	pg	<5.0	5.0	30	6.0	0.100	0.500	N/A	4525694
1,2,3,7,8,9-Hexa CDF **	pg	<5.4	5.4	30	6.0	0.100	0.540	N/A	4525694
1,2,3,4,6,7,8-Hepta CDF **	pg	<3.0	3.0	30	9.0	0.0100	0.0300	N/A	4525694
1,2,3,4,7,8,9-Hepta CDF **	pg	<3.6	3.6	30	6.0	0.0100	0.0360	N/A	4525694
1,2,3,4,6,7,8,9-Octa CDF **	pg	<4.6	4.6	300	15	0.000300	0.00138	N/A	4525694
Total Tetra CDF **	pg	<3.1	3.1	30	N/A	N/A	N/A	0	4525694
Total Penta CDF **	pg	<2.8	2.8	30	N/A	N/A	N/A	0	4525694
Total Hexa CDF **	pg	<5.0	5.0	30	N/A	N/A	N/A	0	4525694
Total Hepta CDF **	pg	<3.3	3.3	30	N/A	N/A	N/A	0	4525694
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	12.0	N/A	N/A
Surrogate Recovery (%)	<del></del>				inin i				
C13-1234678 HeptaCDD *	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-1234678 HeptaCDF **	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-123678 HexaCDD *	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-123678 HexaCDF **	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4525694

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



ORTECH Environmental Client Project #: COVANTA PROBE PROOF

# **EPA M23 DIOXINS AND FURANS (STACK SAMPLING TRAIN)**

Maxxam ID		CLQ637							
Sampling Date		2016/05/02				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-PROBE-001	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-12378 PentaCDD *	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-12378 PentaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-123789 HexaCDF **	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-2378 TetraCDD *	%	84	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-2378 TetraCDF **	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4525694
C13-Octachlorodibenzo-p-Dioxin	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4525694

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable



ORTECH Environmental
Client Project #: COVANTA PROBE PROOF

## **RESULTS OF ANALYSES OF STACK SAMPLING TRAIN**

Maxxam ID		CLQ637							
Sampling Date		2016/05/02				TOXIC EQU	IVALENCY	# of	
	UNITS	16-21656-PROBE-001	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
33'44'-TetraCB-(77)	ng	<0.010	0.010	0.10	N/A	0.00010	0.0000010	N/A	4525696
344'5-TetraCB-(81)	ng	<0.011	0.011	0.10	N/A	0.00030	0.0000033	N/A	4525696
233'44'-PentaCB-(105)	ng	<0.024	0.024	0.10	N/A	0.000030	0.00000072	N/A	4525696
2344'5-PentaCB-(114)	ng	<0.023	0.023	0.10	N/A	0.000030	0.00000069	N/A	4525696
23'44'5-PentaCB-(118)	ng	0.077	0.024	0.10	N/A	0.000030	0.0000023	N/A	4525696
23'44'5'-PentaCB-(123)	ng	<0.026	0.026	0.10	N/A	0.000030	0.00000078	N/A	4525696
33'44'5-PentaCB-(126)	ng	<0.024	0.024	0.10	N/A	0.10	0.0024	N/A	4525696
HexaCB-(156)+(157)	ng	<0.012	0.012	0.20	N/A	0.000030	0.00000036	N/A	4525696
23'44'55'-HexaCB-(167)	ng	<0.013	0.013	0.10	N/A	0.000030	0.00000039	N/A	4525696
33'44'55'-HexaCB-(169)	ng	<0.013	0.013	0.10	N/A	0.030	0.00039	N/A	4525696
233'44'55'-HeptaCB-(189)	ng	<0.0078	0.0078	0.10	N/A	0.000030	0.00000023	N/A	4525696
TOTAL TOXIC EQUIVALENCY	ng	N/A	N/A	N/A	N/A	N/A	0.0028	N/A	N/A
Surrogate Recovery (%)									
C13-233'44'55'-HeptaCB-(189)	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-233'44'5-HexaCB-(156)	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-233'44'5'-HexaCB-(157)	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-233'44'-PentaCB-(105)	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-23'44'55'-HexaCB-(167)	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-2344'5-PentaCB-(114)	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-23'44'5-PentaCB-(118)	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-2'344'5-PentaCB-(123)	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-33'44'55'-HexaCB-(169)	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-33'44'5-PentaCB-(126)	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-33'44'-TetraCB-(77)	%	83	N/A	N/A	N/A	N/A	N/A	N/A	4525696
C13-344'5-TetraCB-(81)	%	86	N/A	N/A	N/A	N/A	N/A	N/A	4525696

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

N/A = Not Applicable



ORTECH Environmental Client Project #: COVANTA PROBE PROOF

## **TEST SUMMARY**

Maxxam ID: CLQ637
Sample ID: 16-21656-PROBE-001
Matrix: Stack Sampling Train

Collected: 2016/05/02 Shipped:

Received: 2016/06/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	4525694	2016/06/04	2016/06/07	Owen Cosby
PCBs in a Sampling Train (1668Amod)	HRMS/MS	4525696	2016/06/04	2016/06/08	Cathy Xu



ORTECH Environmental
Client Project #: COVANTA PROBE PROOF

# **GENERAL COMMENTS**

Results relate only to the items tested.		



ORTECH Environmental
Client Project #: COVANTA PROBE PROOF

## **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



# **APPENDIX 21**

ORTECH Equipment Calibration Data (15 pages)

# ORTECH Environmental Pitot Tube Calibration

Date	February 8, 2016
Probe/Pitot ID	S2
MII Number	B03762
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Environmental
Calibrated By	Dan Turton
Signature	706
Reviewed/Accepted By	Didus
Reviewed/Accepted By	12200

	Pstd
Cp = Cpstd *	
t t	Ps

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H ₂ O	Velocity Head S-Type Pitot in. H ₂ O	S-Type Pitot Coefficient	Deviation From The Mean
	Pstd	Ps	Cp _s	<u></u>	
With Nozzle	7.88	0.150	0.210	0.845	0.0041
(0.25")	9.43	0.215	0.303	0.842	0.0013
	11.68	0.330	0.475	0.833	0.0075
	14.52	0.510	0.710	0.847	0.0065
	16.14	0.630	0.900	0.836	0.0044
		Mean	0.841	0.0048	

Without Nozzle	7.47	0.135	0.190	0.842	0.0050
	9.32	0.210	0.295	0.843	0.0042
	11.41	0.315	0.440	0.846	0.0018
	14.09	0.480	0,660	0.852	0.0049
	16.01	0.620	0.850	0.854	0.0061
			Mean	0.847	0.0044

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  $0.99 \pm 0.01$ .

For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the MOE 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	February 8, 2016
Probe/Pitot ID	S3
MII Number	B03763
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

ORTECH Environmental
Dan Turton
534
7) 000

	Pstd
Cp = Cpstd *	
\	Ps

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H₂O Pstd	Velocity Head S-Type Pitot in. H ₂ O P _S	S-Type Pitot Coefficient  Cp _s	Deviation From The Mean
With Nozzle	722	0.100			
	7.33	0.130	0.182	0.845	0.0032
(0.25")	9.09	0.200	0.287	0.834	0.0071
	11.32	0.310	0.440	0.839	0.0026
	13.79	0.460	0.650	0.841	0.0007
	16.01	0.620	0.860	0.849	0.0071
		Mean	0.841	0.0041	

		7		***************************************	
Without Nozzle	7.33	0.130	0.180	0.849	0.0021
	9.21	0.205	0.290	0.840	0.0070
	11.32	0.310	0.430	0.849	0.0013
	13.87	0.465	0.650	0.845	0.0020
	15.75	0.600	0.824	0.853	0.0056
			Mean	0.847	0.0036

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  $0.99 \pm 0.01$ .

For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the MOE 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	February 9, 2016
Probe/Pitot ID	\$6
MII Number	B03767
Calibrated Against	B02911
Cp standard	0.99948
Calibration Procedure	93-T62-SP-012

Calibration Facility	ORTECH Environmental
Calibrated By	Dan Turton
Signature	220
Reviewed/Accepted By	1005
Literiorical Factorita by	

		Pstd
Cp = Cpstd	*	
	V	Ps

Configuration	Wind Tunnel Velocity m/s	Velocity Head Standard Pitot in. H ₂ O Pstd	Velocity Head S-Type Pitot in. H ₂ O Ps	S-Type Pitot Coefficient Cp _s	Deviation From The Mean
With Nozzle	7,47	0.135	0.187	0.849	0.0017
(0.25")	9.54	0.220	0.310	0.842	0.0017
	11.68	0.330	0.460	0.847	0.0010
	14.38	0.500	0.690	0.851	0.0033
	15.88	0.610	0.845	0.849	0.0016
			Mean	0.848	0.0026

Without Nozzle	7.61	0.140	0.197	0.843	0.0022
	9.43	0.215	0.305	0.839	0.0056
	11.68	0.330	0.467	0.840	0.0046
	14.09	0.480	0.660	0.852	0.0076
	16.39	0.650	0.900	0.849	0.0047
			Mean	0.845	0.0049

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  $0.99 \pm 0.01$ .

For Stausscheibe (S-Type) Pitots refer to the measurement criteria as specified in Method 2 of the MOE 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).

# Dry Gas Meter Calibration Data ORTECH Environmental

Court Day Day of the Control	
Carlot ation a locumen	ALAND - CA
Meter Number	Team 2
Date	January 4, 2016
Barometric Pressure	29.97
System Leak Check	<.001 cfm @ 26 "Hg

 $ft^3 = cm^* 1.332$  litres per cm/28.3168 litres per  $ft^3$ 

Vstd ft³
Vdgm ft³

DGMCF=

Pbar (in. Hg)	(Pbar in. Hg+DGMPressure/13.6)
Tdgm °F+460	Tstd °F+460
	m

MIINUMBERS	COE 20092	A01463	COE20028	Mike Traynor	STIN STIN	70,0,51	
MIN	DGM	Gasometer	Barometer	Calibrated By	Signature	Reviewed and Accepted By	becommended to the contract of

Gar	Gasometer Reading	ling	Gasometer	Gasometer	DGM	DGM Reading	DGM	DGM Average	DGM	DGM	DGM	Time
	cm	)	Volume	Temperature	ft ³	۳.	Volume	Temperature	Pressure	Outlet	Calibration	
Initial	Final	cm	£	၁့	Initial	Final	ft	H _o	in. H ₂ 0	Å.	Factor	min.
84.20	22.10	62.10	2.921	22.0	413.530	416.500	2.970	70.5	0.75	89	086'0	9
83.70	20.00	63.70	2.996	22.0	416.510	419.530	3.020	70	0.75	69	0.987	9
83.40	19.90	63.50	2.987	22.0	419.530	422.550	3.020	70.5	0.75	70	0.985	9
84.10	21.50	62.60	2.945	22.0	422:690	425.685	2.995	72	1.8	70	0.980	4
84 30	19.90	64.40	3.029	22.0	425.685	428.775	3.090	72	1.9	70	0.977	4
84.70	21.00	63.70	2.996	22.0	428.775	431.850	3.075	72	1.9	70	0.971	4
84.60	19.50	65.10	3.062	22.0	431.972	435.065	3.093	72	3.4	70	0.983	3
85.10	21.20	63.90	3.006	22.0	435.065	438.115	3.050	72	3,4	70	0.978	3
84.40	19.90	64.50	3.034	22.0	438.115	441.185	3.070	72	3.4	70	0.981	3
				-	And the second s	Secure of a state of the secure of the secur	Andrewski production of the control	With control the section of the sect				

# Acceptance Criteria:

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) Individual values of DGM calibration factor must be within  $\pm$  1.5% of the average value. If not the calibration must be repeated. Also, the DGMCF average value must be 1.00  $\pm$  0.05,

0.980 DGMCF AVERAGE

BEFORE

0.985

# ORTECH Environmental Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 2
MII	COE 20092
Date	January 4, 2016
Calibrated By	Mike Traynor
Signature	JULY
Reviewed and Accepted By	15.04c

Fluke Calibrator Output	Tredicator D	lisplay Value	Percent Difference
(COE 20024)	Before Adjustment	After Adjustment	
(°F)	(°F)	(°F)	(%)
32	32	NA	0.0
70	70	1	0.0
100	100		0.0
200	200		0.0
250	250		0.0
300	300		0.0
400	400		0.0
500	499		0.2
600	600		0.0
700	700		0.0
800	799		0.1
900	899		0.1
1000	999		0.1
1100	1099		0.1
1200	1200		0.0
1250	1249	<b>Y</b>	0.1

% Difference = (micromite - after adjustment reading)x 100 micromite

# Acceptance Criteria:

Trendicator display must read within  $\pm$  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	January 4, 2016	Calibrated By	Mike Traynor
Manometer Number	Team 2	Signature	MARINE
Manometer MII Number	COE 20092	Reviewed/Accepted By	1000
Calibrated Against	Omega HHP		V
MII Number	B02679		
Calibration Procedure	03 - J010		

# Front Leg

Manometer Scale		er Reading I ₂ O	Reference Manometer Reading	Percent Difference
"H ₂ 0	Before Adjustment	After Adjustment	"H ₂ O	%
	0.260	NA	0.264	1.5
0-1.0	0.570	1	0.577	1.2
	0.950		0.970	2.1
	1.70		1.71	0.6
1.0-10.0	5.40		5.44	0.7
	8.70	V	8.70	0.0

Percent Difference = (Ref. Manometer - Instrument Reading) x 100 Ref. Manometer

# Acceptance Criteria:

The manometer being calibrated must be within  $\pm$  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 4
Date	February 24, 2016
Barometric Pressure	29.50
System Leak Check	<0.001 cfm @ 29 "Hg

 $ft^3 = cm^* 1.332$  litres per cm/28.3168 litres per  $ft^3$ 

DGMCF= Vstd ft³ Tdgm °F+460 (Pbar

60 Pbar (in. Hg) 50 (Pbar in. Hg+DGMPressure/13.6)

MII NUMBERS	COE 20090	A01463//	COE200428	J/ Grofinan		Comment of Comment
MIIN	DGM	Gasometer	Barometer	Calibrated By	signature	Reviewed and Accepted By

Gas	Gasometer Reading	ling	Gasometer	Gasometer	DGM F	DGM Reading	DCM	DGM Average	DGM	DGM	DGM	Time
	cm		Volume	Temperature	£ 13.	ъ.	Volume	Temperature	Pressure	Outlet	Calibration	
Initial	Final	cm	ft ³	ာ	Initial	Final	dens E-post	PF	in. H ₂ 0	⁰ F	Factor	n.u.
88.10	22.30	65.80	3.095	21.0	968.036	968.036 971.147	3.111	70	8.0	69	0.993	9
86.90	22.50	64.40	3.029	21.0	971.147	974.236	3.089	70	8.0	70	0.979	9
88.10	23.50	64.60	3.039	21.0	974.236	974.236   977.324	3.088	70.5	0.8	70	0.983	9
86.30	14.20	72.10	3.392	21.0	977.324   980.775	980.775	3.451	70.5	1.9	70	0.979	4.5
84.70	21.30	63.40	2.982	21.0	983.245	986.261	3.016	70	1.8	70	0.985	4
88.30	24.00	64.30	3.025	21.0	986.261	989.303	3.042	70	1.8	70	0.990	4
83.00	16.20	08:99	3.142	21.0	989.509	992.675	3.166	29	3.5	29	0.979	3
86.00	20.30	65.70	3.090	21.0	992.675	995.784	3.109	67	3.4	29	0.980	3
87.10	21.90	65.20	3.067	21.0	995.784	995.784 998.863	3.079	68	3.4	89	0.984	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  $1.00\pm0.05$ , 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 0.984

BEFORE 0.989

**ORTECH Environmental** 

# ORTECH Environmental Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	OMEGA OP 116.
MII	CQF/20090
Date	February 24, 2016
Calibrated By	J/Grollman
Signature	
Reviewed and Accepted By	DHOCKS

Fluke Calibrator Output	Tredicator D	isplay Value	Percent Difference
(COE 20024)	Before Adjustment	After Adjustment	
(°F)	(°F)	(°F)	(%)
32	37	32	0.0
70		70	0.0
100		100	0.0
200		200	0.0
250		251	-0.4
300		301	-0.3
400		399	0.3
500		499	0.2
600		600	0.0
700		701	-0.1
800		801	-0.1
900		901	-0.1
1000		1001	-0.1
1100		1102	-0.2
1200	TO AN AREA OF A TOTAL TO SEE PROMITED AND SERVICE AND AREA OF A TOTAL AND	1201	-0.1
1250		1251	-0.1

% Difference = (micromite - after adjustment reading)x 100 micromite

# Acceptance Criteria:

Trendicator display must read within  $\pm$  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

			1 11
Date	February 24, 2016	Calibrated By	J. Groffman
Manometer Number	Team 4	Signature	1111
Manometer MII Number	COE 20090	Reviewed/Accepted By	Milla
Calibrated Against	Omega HHP		7
MII Number	B02679		
Calibration Procedure	03 - J010		

### Front Leg

Manometer Scale		er Reading I ₂ O	Reference Manometer Reading	Percent Difference
"H ₂ 0	Before Adjustment	After Adjustment	"H ₂ O	%
	0.250	NA	0.254	1.6
0-1.0	0.530		0.530	0.0
	0.850		0.850	0.0
	1.80		1.800	0.0
1.0-10.0	5.10		5.110	0.2
	8.20	V	8.220	0.2

Percent Difference = (Ref. Manometer - Instrument Reading) x 100 Ref. Manometer

# Acceptance Criteria:

The manometer being calibrated must be within  $\pm$  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)

# Revision June 5, 2007

# ORTECH Environmental Dry Gas Meter Calibration Data

Calibration Procedure Meter Number Date Barometric Pressure	03-J004 Vost 4 April 14, 2016 30.03 NDI. @ 19" Ho
-------------------------------------------------------------	---------------------------------------------------

MINUMBERS	DGM A11542	Gasometer A01463	Barometer COE 20028		Calibrated By // Abomas Timar	Signature	Reviewed and Accepted By
-----------	------------	------------------	---------------------	--	-------------------------------	-----------	--------------------------

 $ft^3 = cm^* 1.332$  litres per cm/28.3168 litres per  $ft^3$ 

Tdgm °F+460 Tstd °F+460 Vstd ft³ DGMCF=

(Pbar in. Hg+DGMPressure/13.6) Phar (in. Hg)

	Cocomotor Roading	Sing	Casometer	Casometer	DGM 1	DGM Reading	DGM	DGM Average	DGM	DGM	DGM	Time	Flow
<u> </u>	cm avea		Volume	-		،	Volume	Temperature	Pressure	Outlet	Calibration		Rate
Initial	Final	СШ	ft³	၁ _စ	Initial	Final	£ 35	ာ့	in. H ₂ O	ပ္	Factor	min.	lpm
0C YL	42.30	31.90	1 501	22.5	8664.28	8706.90	1.505	26.0	2.6	26.0	1.002	.20	2.1
71.70	38.70	33.00	1.552		8706.90	8751.65	1.580	30.0	2.7	30.0	1.001	20	2.2
06.89		41.40			8796.31		1.992	29.0	2.5	29.0	0.993	26	2.2
00.00	54.10	25.10	1.181	22.5	8886.00	8921.00	1.236	30.0	1.0	30.0	0.977	34	1.0
19:20	01.40	07.00	1054	200	8921.00	8951 97	1.094	32.0	1.0	32.0	0.992	30	1.0
84.80	05.40	22.70		22.5	8984.08	9015:36	1.105	32.0	1.0	32.0	0.995	31	1.0
- 11	67.00			206		9048.90	1.068	30.0	0.5	30.0	0.983	40	0.8
00.67	00 50 67.40 13.10	13.10		22.5		9134.18	0.645	28.0	0.4	28.0	0.972	25	0.7
83.90	67.30					1	0.798	29.0	0.4	29.0	0.998	32	0.7
07:00	00:10		***************************************			The state of the s	***************************************		William Competition of the Compe				

# Acceptance Criteria:

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) If not the calibration must be repeated. Also, the DGMCF average value must be  $1.00\pm0.05$ , Individual values of DGM calibration factor must be within  $\pm$  1.5% of the average value.

ALL BEE	1Lpm 0.988	0.5Lpm 0.985

# ORTECH Environmental Trendicator Calibration

Calibration Procedure	03-J005
Trendicator Type	Nutech
МП	A11542
Date	April 14, 2016
Calibrated By	Thomas Timar
Signature	76
Reviewed and Accepted By	DULG

Fluke Calibrator Output	Tredicator D	Pisplay Value	Percent Difference
(COE 20024)	Before Adjustment	After Adjustment	
(°C)	(°C)	(°C)	(%)
0	0	A/A	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	151		-0.7
200	200		0.0
300	300		0.0
400	400		0,0
500	500		0.0
600	601	V	-0.2

% Difference = (micromite - after adjustment reading)x 100 micromite

# Acceptance Criteria:

Trendicator display must read within  $\pm 1.5\%$  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)

# Dry Gas Meter Calibration Data ORTECH Environmental

Calibration Procedure	03 - J004
Meter Number	Team 1
Date	March 3, 2016
Barometric Pressure	29.80
System Leak Check	<.001 cfm @ 23 "Hg

ft³= cm* 1.332 litres per cm/28.3168 litres per ft³

Tdgm °F+460 Tstd °F+460 Vdgm ft³ Vstd ft³

DGMCF=

Phar (in. Hg)

(Pbar in. Hg+DGMPressure/13.6)

	MII NUMBERS
DGM	COE 20094
Gasometer	A01463
Barometer	COE 20028
Calibrated By	D Turton
Signature	
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Ča	Gasometer Reading	200	Gasometer	Gasometer	DGM Reading	ding	DCM	DGM Average	DCM DCM	PCM	DOM	ıme
-cumous co	cm		Volume	Temperature	2		Volume	Temperature	Pressure	Outlet	Calibration	
Initial	Final	Cm	1	J.	Initial	Final	$\mathbb{H}^3$	<b>T</b>	in. H,0	O Ta	Factor	min.
88.40	23.70	64.70	3,043	21.5	8.000	11.050	3.050	65.5	0.75	64	0.986	9
88 00	1	66.10		21.0	<u> </u>	14.170	3.120	66.5	0.75	. 65	0.989	9
88.00		64.40		21.0	14,170 17,240	7.240	3.070		0.75	99	0.980	6
87.50	1	62.10		21.0	17,430   20,380	0.380	2.950	67.5	1.8	99	0.982	4
87 00	00.90	61.90	2 012	21.0	20.380 2	23.300	2.920	67.5	1.8	99	0.988	4
87.50	25.30	62.20		21.0	23.300 26.260	6.260	2.960	67.5	1,8	99	0.980	4
87.00	25.00	61.10		21.0	26.435   2	29.344	2.909	89	3.2	- 67	0.977	3
88.30	05.50	63.10		21.0		2.525	2.985	68	3.3	- 67	0.983	3
87.80		64.00		21.0	32.882 35.900	5.900	3.018	89	3.4	- 67	0.986	3
								anderstein des				

# Acceptance Criteria:

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) If not the calibration must be repeated. Also, the DGMCF average value must be  $1.00\pm0.05$ , Individual values of DGM calibration factor must be within  $\pm$  1.5% of the average value.

0.983 DGMCF AVERAGE

BEFORE

ORTECH Environmental

# ORTECH Environmental Trendicator Calibration

Calibration Procedure	03 - J005
Trendicator Type	Team 1
MII	COE 20094
Date	3-Mar-16
Calibrated By	D Turton
Signature	99
Reviewed and Accepted By	CHRK REUPE

Fluke Calibrator Output	Tredicator D	Tredicator Display Value	
(COE 20024)	Before Adjustment	After Adjustment	
(°F)	(°F)	(°F)	(%)
32	32	NA	0.0
70	69		1.4
100	99		1.0
200	200		0.0
250	251		-0.4
300	301		-0.3
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	1001		-0.1
1100	1100		0.0
1200	1200		0.0
1250	1250	V	0.0

% Difference = (micromite - after adjustment reading)x 100 micromite

# Acceptance Criteria:

Trendicator display must read within  $\pm 1.5\%$  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	March 3, 2016	Calibrated By	D. Turton
Manometer Number	Team 1	Signature	704
Manometer MII Number	COE 20094	Reviewed/Accepted By	CARK RELOBS
Calibrated Against	Omega HHP	·	
MII Number	B02679		
Calibration Procedure	03 - J010		

### Front Leg

Manometer Scale		ter Reading H ₂ O	Reference Manometer Reading	Percent Difference
"H ₂ 0	Before Adjustment	After Adjustment	"H ₂ O	%
	0.340	ALA	0.352	3.4
0-1.0	0.700		0.710	1.4
	0.925	¥	0.930	0.5
	2.50	NA	2.49	-0.4
1.0-10.0	4.45		4.45	0.0
·	7.75	V	7.71	-0.5

Percent Difference = (Ref. Manometer - Instrument Reading) x 100 Ref. Manometer

### Acceptance Criteria:

The manometer being calibrated must be within  $\pm$  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)



### SUPPLEMENTAL REPORT

### CALIBRATION LAB DATA AS FOUND / AS LEFT

Customer: ORTECH ENVIRONMENTAL

PO Number: 20000-J2219

Certificate/SO Number: 9-Q0C9H-80-1

Manufacturer: Marathon Tool Company

Model Number: CO030150

Description: Digital Caliper

Serial Number: NONE

ID: CAN-22136

Service Type: R5

Calibration Date: Feb 08, 2016

Due Date: Feb 08, 2017

Calibration Procedure: 5-AC42617-0

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	O TUR
Function Check			et de la company	overse manazar va com rocu v savieter d de videli etilitä kalili	nguni, pungunum an ancia ar minimuk kalkonobilak an ekunkun bilanciak beranda bilan bilan bilan kalkonobilan b	tariinidahoonuu aanahaan kan doka yaayoo aay
Parallelism			Р	P	P	
Length Measure	<del>nerioring the next relies of the new to the property specified to the left of the the the teacher of the teach</del>	nerwyddiaeuwelluniae diadda fel o eard en oed ganad an gallada da da da da en y en o en oed oen oedd an en oed			earneanninge kreiner volkste Politike in 1982 Annings Andreas Company of Company of the Company of the Company	econocimiento de la company de
Outside Length	0.0000in	±( 0.0005 in)	-0.0005	0.0005	0.0000 in	
	1.5000in	±( 0.0005 in)	1.4995	1.5005	1.5000 in	
	3.0000in	±( 0.0005 in)	2.9995	3.0005	2.9995 in	
	4.5000in	±( 0.0005 in)	4.4995	4.5005	4.4995 in	
	6.0000in	±( 0.0005 in)	5.9995	6,0005	5.9995 in	
Inside Length	1.0000in	±( 0.0005 in)	0.9995	1.0005	1.0000 in	
Depth	1.0000in	±( 0.0005 in)	0,9995	1.0005	1.0000 in	
And desired to the second second	1.0000in	±( 0.0005 in)	0.9995	1.0005	1.0005 in	

As Found and As Left Data recorded on February 08, 2016

Temperature: 68.8°F / 20.4°C Relative Humidity: 34%

Asset	Manufacturer	Model	Description	Cal Date	Due Date	Traceability Numbers
M004	Coventry Gauge Ltd	C-84	Gage Block Set, 84 pcs.	Aug 27, 2015	Aug 27, 2016	9-&M004-3-1
M457	Starrett Tru-Stone Tech. Div.	80942	Granite Surface Plate	Dec 30, 2015	Dec 31, 2016	9-&M457 <del>-4-</del> 1

Temp/RH Asset LEM-0003

Calibration Lab Data Report - Page 1 of 1

Field not applicable. (P = Pass, F = Fail)

Certificate/SO Number: 9-Q0C9H-80-1

F0178R1 08/03/15



### **APPENDIX 22**

Particulate and Metals Test Emission Calculations at the Boiler No. 1 BH Outlet (12 pages)

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Boiler No. 1 BH Outlet 1 - Metals & Particulate

Test No.: Date:

May 2, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.983
NOZZLE DIAMETER	6.45 mm
DRY REF GAS VOLUME SAMPLED	3.427 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	142.6 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	16.49 m/s
BAROMETRIC PRESSURE (Station)	100.711 Kpa
STATIC PRESSURE	-2.316 Kpa
ABSOLUTE GAS PRESSURE	98.395 Kpa
OXYGEN CONCENTRATION	7.46 %
CARBON DIOXIDE CONCENTRATION	11.69 %
CARBON MONOXIDE CONCENTRATION	16.2 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE	24.36 m³/s
DRY REF GAS FLOWRATE	14.22 Rm³/s
DRY ADJ GAS FLOWRATE	19.31 Rm³/s
WET REF GAS FLOWRATE	16.97 Rm³/s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	3.1 mg
	-FILTER	1.3 mg
	-TOTAL	4.4 mg
DRY REF GAS VOLUME SAMPLED		3.427 m ³
PARTICULATE CONC ACTUAL		0.750 mg/m ³
PARTICULATE CONC DRY REF		1.284 mg/m ³
PARTICULATE CONC DRY ADJ		0.946 mg/m ⁴
PARTICULATE CONC WET REF		1.077 mg/m ³
PARTICULATE EMISSION RATE		0.01826 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

Plant: Test No.: Date:

Covanta - DYEC 1 - Metals & Particulate May 2, 2016

Винализирания принята политирання по принята	1.3 Combustion Gases	3.1 02% 7.46	465.7 CO2% 11.69	20.1 COppm 16.2		0.6 ft Measured H2O	2.5 minutes 16.2 %	2	13
	Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Dort
	0.841	0.983	29.74 "Hg	0 ² H" 005.6-	0.2539 inches	4.500 ft	0.000 ft	0.000 ft	
	Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzie	Stack Diameter	Length	Width	

	ocity   Isokinetic	% ا ا	7.23			3.08 95.5																											7.53 99.3 7.53 103.2 7.28 101.0 7.03 100.8 7.77 103.3 7.17 103.3 5.91 100.9 7.42 101.3 7.42 101.3 7.45 101.3 7.45 101.3 7.45 101.3 7.45 103.3 7.46 103.2 7.46 103.2 7.47 101.3
	Check Velocity	Volume m/s	17.25	18.06	18.5	18.08	17.8	18.57	16.99	17.2	18.00	16.99	16.59	17.7	17.1.	16.7.		17.37	17.37 17.63	17.37 17.6? 16.7!	17.37 17.6? 16.7! 16.7!	17.37 17.65 16.77 17.57 17.57	17.37 17.65 16.77 17.57 17.57 17.07	17.37 17.65 16.75 17.55 17.25 17.05 17.06	17.37 17.65 16.75 17.55 17.05 16.74	17.37 17.65 16.75 17.55 17.05 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70 16.70	17.37 17.65 16.75 17.55 17.02 16.77 16.97 16.97 16.97 17.17.	17.37 17.63 16.75 17.55 17.02 16.70 16.91 17.11	17.37 17.63 16.75 17.55 17.03 16.93 17.17 17.47 11.74 16.83	17.37 16.5 16.75 17.55 17.05 16.95 17.17 17.47 17.47 16.88	17.37 16.57 17.55 17.55 17.05 16.93 17.47 17.47 16.88 16.03 16.03	17.37 16.57 17.57 17.57 17.70 16.71 17.47 11.74 16.83 16.00 16.00	17.37 17.63 16.75 17.28 17.03 16.78 16.91 17.42 17.42 17.42 17.42 16.89 16.89 16.89 16.80
	Vacuum	"Hg	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0 3.0 3.0	3.0 3.0 3.0 3.0	3.0 3.0 3.0 3.0 3.0	3.0 0.8 0.8 0.8 0.8 0.8 0.8	0. 8. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9.	0. 8. 8. 8. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9.	0. w w w w w o. w o. w w w o. w w w w o. w w w o. w	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0						
-,	A	"H20	1.8	1.7	1.8	1.8	1.8	1.9	1.65	1.7	1.8	1.7	1.6	1.8	1.7	1.7		1.7	1.7	1.7 1.7 1.7	1.7 1.7 1.8	1.7 1.7 1.7 1.8	1.7 1.7 1.8 1.75 1.75	1.7 1.7 1.8 1.75 1.75 1.7	1.7 1.7 1.8 1.75 1.75 1.7	1.7 1.7 1.8 1.75 1.75 1.7	1.7 1.7 1.8 1.75 1.75 1.7 1.7	1.7 1.7 1.8 1.75 1.7 1.7 1.7	1.7 1.7 1.8 1.75 1.7 1.7 1.8 1.8	1.7 1.7 1.8 1.75 1.7 1.7 1.7 1.8 1.8	1.7 1.7 1.8 1.75 1.7 1.7 1.8 1.8 1.8	1.7 1.7 1.8 1.75 1.7 1.7 1.8 1.8 1.8 1.8	1.7 1.7 1.8 1.75 1.7 1.7 1.8 1.8 1.8 1.7 1.7
	DGM In	<b>4</b>	78	78	78	79	79	79	79	79	79	79	79	79	79	79	1	٦,	e/ 6/	6/ 80	67 80 80	80 80 80 80 80	67 80 80 80 80 80	67 80 80 80 80 80 80 80 80 80 80 80 80 80	67 88 80 88 80 80 80 80 80 80 80 80 80 80	67 88 88 88 88 88 88 88 88 88 88 88 88 88	2/ 67 88 88 88 88 88 88 88 88 88 88 88 88 88	2/ 65 88 88 88 88 88 88 88 88 88 88 88 88 88	5/ 65 88 88 88 88 88 88 88 88 88 88 88 88 88	5/ 65 88 88 88 88 88 88 88 88 88 88 88 88 88	2/ 6/ 8/ 8/ 8/ 8/ 8/ 8/ 8/ 8/ 8/ 8/ 8/ 8/ 8/	5/ 08 08 08 08 08 08 08 08 08 08 08 08 08 0	2/ 79 88 88 88 88 88 88 88 88 88 88 88 88 88
atures	DGM Out	٩,	78	79	6/	79	79	80	80	80	80	80	80	81	80	81	ç	10	81	81 81	81 81 81	8 8 8 8 8 8 8 8 9 1 8 1 8 1 8 1 8 1 8 1	81 81 82 82	8 8 1 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	81 81 82 82 82 82	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
Temperatures	Imp. Out	<b>4</b>	89	52	49	47	45	44	44	43	43	43	43	43	43	43	43	)	43	43 44	5 4 4 4 43 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4 4 4 4 4	4 4 4 4 4 5 4 5 4 5 4 5 4 5 4 5 6 4 5 6 4 5 6 4 5 6 6 6 6	4 4 4 4 4 5 4 5 4 5 4 5 4 5 4 5 6 4 5 6 4 5 6 4 5 6 6 6 6	5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5	5	5 4 4 4 4 4 4 4 4 5 8 8 8 8 8 8 8 8 8 8	5	5	5	5 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
	Stack	H.	279	287	288	289	289	290	292	292	292	292	291	291	291	291	100	TC7	292	292 293	292 293 294	292 293 294 295	292 293 294 295 295	292 293 294 295 295 296	291 292 294 295 295 296	291 292 294 295 296 296 296	291 292 293 295 296 296 296	291 292 293 295 296 296 296 296	291 292 293 295 296 296 296 295	291 292 293 295 296 296 296 297 293	291 292 293 295 296 296 297 293	291 292 293 295 296 296 297 293 293	291 292 293 295 296 297 297 293
	ΔP	"H20	69.0	0.75	0.79	0.75	0.73	0.79	99'0	0.68	0.74	99.0	0.63	0.72	0.67	0.64		0.04	0.71	0.69 0.71 0.64	0.69 0.71 0.64 0.7	0.64 0.71 0.7 0.7	0.05 0.71 0.64 0.7 0.68 0.66	0.03 0.71 0.7 0.68 0.66 0.66	0.03 0.71 0.64 0.68 0.66 0.66	0.05 0.71 0.7 0.68 0.66 0.64 0.67	0.03 0.71 0.64 0.68 0.66 0.67 0.65	0.03 0.71 0.64 0.68 0.66 0.67 0.65	0.09 0.71 0.68 0.66 0.67 0.69 0.69	0.09 0.71 0.68 0.66 0.67 0.69 0.67 0.65	0.09 0.71 0.68 0.66 0.67 0.69 0.65 0.65 0.65	0.05 0.71 0.68 0.68 0.65 0.67 0.65 0.65 0.65 0.65	0.05 0.71 0.64 0.68 0.65 0.67 0.65 0.65 0.65 0.65 0.65
	DGM	Reading	66.16	68.29	70.10	71.93	73.78	75.63	77.51	79.29	81.05	82.89	84.67	86.42	88.25	90.05	0.70	91.84	91.84 93.62	91.84 93.62 95.40	91.84 93.62 95.40 97.18	91.84 93.62 95.40 97.18	91.84 93.62 95.40 97.18 99.00 100.79	91.84 93.62 95.40 97.18 99.00 100.79	91.84 93.62 95.40 97.18 99.00 100.79 102.58	91.84 93.62 95.40 97.18 99.00 100.79 104.36	91.84 93.62 95.40 97.18 99.00 100.79 102.58 106.14	91.84 93.62 95.40 97.18 99.00 102.58 104.36 106.14 107.90	91.84 93.62 95.40 97.18 99.00 102.58 104.36 106.14 107.90 111.53	91.84 93.62 95.40 97.18 99.00 102.58 104.36 106.14 107.90 109.71 111.53	91.84 93.62 95.40 97.18 100.79 102.58 106.14 107.90 109.71 111.53	91.84 93.62 95.40 97.18 100.79 102.58 106.14 109.71 111.53 113.31	91.84 93.62 95.40 97.18 100.79 102.58 106.14 109.71 111.53 113.31 115.08 116.79
		Time	0	2.5	22	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	CC	33.5	33 37.5 40	33.5 37.5 40 42.5	37.5 40 42.5 45	37.5 40 42.5 45 47.5	37.5 40 42.5 45 47.5 50	37.5 40 42.5 45 47.5 50 52.5	37.5 40 42.5 45 47.5 50 52.5	37.5 40 42.5 45 47.5 50 52.5 57.5	37.5 40 42.5 45 47.5 50 52.5 57.5 60	37.5 40 42.5 45 47.5 50 52.5 55 57.5 60 62.5	37.5 40 42.5 45 47.5 50 52.5 55 57.5 60 62.5	37.5 40 42.5 45.5 47.5 50 52.5 57.5 60 62.5 67.5	37.5 40 42.5 45.5 47.5 50 52.5 57.5 60 62.5 67.5	37.5 40 42.5 45.5 45.5 50 52.5 57.5 60 62.5 67.5 70
		Point	1			2			ო			4			5				9	9	9	9 /	9 2	9 7	9	9 / 8	9 / 8	9 1 8 6	0 ~ 80 0	0	6 7 8 9 10	9 7 8 9 01	6 7 8 9 9

Covanta - DYEC Test No.: Date: Plant:

1 - Metals & Particulate May 2, 2016

DGMCF

Length

Width

Nozzle

Plant Location: Courtice, ON Test Location: Boiler No. 18H Outlet AN Operator: Combustion Gases 7.46 11.69 16.2 Measured H2O 16.2 % 02% CO2% COppm 2.5 minutes 2 12 0.6 ft 1.3 3.1 465.7 20.1 Number of points / Port Leak Check Volume Number of Ports Reading Interval CWTR (g) WCBDA (g) Probe (mg) Filter (mg) 29.74 "Hg -9.300 "H₂O 0.2539 inches 0.000 ft 0.000 ft 4,500 ft 0.841 Barometric Pressure Static Pressure Stack Diameter Pitot Factor

					Temperatures	atures	A. A. C.			kea.	1	:
		DGM	ΔP	Stack	Imp. Out	DGM Out	DGM in	ΔH	Vacuum	Check	Velocity	Isokinetic
Point	Time	Reading	"H2O	<b>1</b>	ц.	<b>ч</b> о	<b>4</b> ,	"H20	"Hg	Volume	m/s	%
	77.5	121.75	0.54	292	44	83	81	1.2	3.0		15.37	102.6
	80	123.28	0.5	292	44	82	81	1.2	3.0		14.79	96.1
12	82.5	124.81	0.5	291	44	82	81	1.2	3.0		14.78	100.0
	85	126.35	0.58	291	44	83	81	1.4	3.0		15.92	100.5
	87.5	128.00	0.55	290	44	83	81	1.3	3.0		15.49	100.0
	90	129.60								9.0		99.5
⊣	0	130.20	0.72	283	63	82	81	1.9	3.5		17.64	
	2.5	132.10	0.77	288	54	82	81	1.9	3.5		18.31	103.0
	5	134.00	0.74	288	48	82	82	1.85	3.5		17.95	6.66
7	7.5	135.88	0.7	287	47	83	82	1.75	3.5		17.44	100.8
	10	137.68	0.68	287	46	83	82	1.75	3.5		17.19	0.66
	12.5	139.51	0.74	286	46	83	82	1.85	3.5		17.92	102.1
m	15	141.40	0.67	286	46	83	82	1.7	3.5		17.05	101.1
	17.5	143.17	0.66	285	46	83	82	1.7	3.5		16.92	99.4
	20	144.95	0.72	285	46	83	82	1.8	3.0		17.67	100.7
4	22.5	146.79	69.0	285	46	83	82	1.8	3.0		17.30	99.7
	25	148.63	0.64	286	46	83	82	1.6	3.0		16.67	101.8
	27.5	150.38	0.68	286	47	83	82	1.7	3.0		17.18	100.6
5	30	152.15	0.65	285	47	84	82	1.7	3.0		16.79	98.7
	32.5	153.92	0.63	285	48	83	82	1.7	3.0		16.53	100.8
	35	155.67	9.0	285	49	84	83	1.6	3.0		16.13	101.3
9	37.5	157.40	0.63	285	48	84	83	1.5	3.0		16.53	102.4
	40	159.10	0.61	286	20	84	83	1.5	3.0		16.27	98.2
	42.5	160.79	0.58	286	20	84	83	1.5	3.0		15.87	99.3
7	45	162.50	0.63	287	20	84	83	1.6	3.0		16.55	103.0
	47.5	164.21	0.59	286	20	84	83	1.6	3.0		16.00	98.9
	50	165.93	0.59	286	49	84	83	1.5	3.0		16.00	102.7
∞	52.5	167,63	0.59	286	48	84	83	1.5	3.0		16.00	101.5
	55	169.30	0.59	286	48	84	83	1.5	3.0		16.00	2.66
	57.5	171.00	0.59	286	48	85	83	1.5	3.0		16.00	101.5
6	09	172.67	0.55	286	47	85	83	1.4	3.0		15.45	9.66

Covanta - DYEC 1 - Metals & Particulate May 2, 2016 Plant: Test No.: Date:

itot Factor	0.841	Filter (mg)	1.3		Combusti	on Gases
DGMCF	0.983	Probe (mg)	3.1		02% 7.46	7.46
ometric Pressure	29.74 "Hg	CWTR (g)	465.7		CO2%	11.69
Static Pressure	-9,300 "H ₂ O	WCBDA (g)	20.1		COppm	16.2
zzle	0.2539 inches					
itack Diameter	4.500 ft	Leak Check Volume		0.6 ft [°]	Measur	ed H2O
Length	0.000 ft	Reading Interval		2.5 minutes	16.2 %	%
Ith	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

	/elocity   Isokinetic		16.66 100.7											99.1
Leak	Check Ve	Volume	1	Η.	1	Н	Н	П	+	1	П	1	1	
	Vacuum	"Hg	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	МД	"H20	1.6	1.4	1	1	1	1.3	1.5	1.4	1.1	1.1	1.1	
	DGM in	4,	83	83	83	83	83	83	83	83	83	83	83	
atures	DGM Out	<mark>т</mark>	85	85	84	84	85	85	85	85	85	85	85	
Temperatures	Imp. Out	<u>L</u>	47	47	47	47	47	47	47	47	48	48	48	
	Stack	<b>,</b>	285	284	285	284	284	285	285	284	284	284	285	
	ΔP	"H20	0.64	0.56	0.42	0.41	0.41	0.54	0.54	0.53	0.45	0.45	0.43	
	DGM	Reading	174.30	176.04	177.69	179.13	180.52	181.91	183.42	185.10	186.75	188.25	189.72	101
		Time	62,5	65	67.5	70	72.5	75	77.5	80	82.5	85	87.5	CC
		Point			10			11			12			

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Boiler No. 1 BH Outlet 2 - Metals & Particulate

Test No.: Date:

May 2, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.983
NOZZLE DIAMETER	6.45 mm
DRY REF GAS VOLUME SAMPLED	3.513 m ³
AVGERGE ISOKINETICITY	100.0 %
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	141.3 °C
AVERAGE GAS MOISTURE BY VOLUME	15.3 %
AVERAGE GAS VELOCITY	16.82 m/s
BAROMETRIC PRESSURE (Station)	100.677 Kpa
STATIC PRESSURE	-2.316 Kpa
ABSOLUTE GAS PRESSURE	98.362 Kpa
OXYGEN CONCENTRATION	7.75 %
CARBON DIOXIDE CONCENTRATION	11.24 %
CARBON MONOXIDE CONCENTRATION	16.9 ppm

### **FLOWRATE**

ACTUAL GAS FLOWRATE	24.86 m ³ /s
DRY REF GAS FLOWRATE	14.71 Rm ³ /s
DRY ADJ GAS FLOWRATE	19.54 Rm ³ /s
WET REF GAS FLOWRATE	17.37 Rm ³ /s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.9 mg
	-FILTER	1.2 mg
	-TOTAL	3.1 mg
DRY REF GAS VOLUME SAMPLED		3.513 m ³
PARTICULATE CONC ACTUAL		0.522 mg/m ³
PARTICULATE CONC DRY REF		0.882 mg/m ³
PARTICULATE CONC DRY ADJ		0.664 mg/m ⁴
PARTICULATE CONC WET REF		0.748 mg/m ³
PARTICULATE EMISSION RATE		0.01298 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

Covanta - DYEC 2 - Metals & Particulate May 2, 2016 Plant: Test No.: Date:

Pitot Factor	0.841	Filter (mg)	1.2		Combustion	n Gases
DGMCF	0.983	Probe (mg)	1.9		02%	7.75
Barometric Pressure	29.73 "Hg	CWTR (g)	446		C02%	11.24
Static Pressure	-9.300 "H ₂ O	WCBDA (g)	19.5		COppm 16.9	16.9
Nozzie	0,2539 inches					
Stack Diameter	4.500 ft	Leak Check Volume		0.75 ft²	Measured	J H20
Length	0.000 ft	Reading Interval		2.5 minutes	15.3 %	
Width	0.000	Number of Ports		2		
		Number of points / Port		12		

	Isokinetic	%		100.4	101.3	98.7	99.5	100.5	98.8	100.2	100.4	100.2	7.76	94.3	103.5	100.1	100.8	101.5	102.4	98.9	101.8	104.1	0.86	102.5	8.66	9.66	97.2	101.5	101.7	99.8	0.66	100.7	98.2
	Velocity	m/s	17.96	18.02	17.54	17.77	17.90	17.90	17.14	17.02	17.14	16.24	16.49	17.14	17.64	17.52	17.17	16.11	16.11	16.26	15.43	15.71	15.57	15.71	16.10	16.10	15.97	15.83	15.97	15.42	14.70	15.14	14.39
Leak	Check	Volume																															
	Vacuum	"Hg	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	МΔ	"H20	2	1.9	1.8	1.9	1.9	1.9	1.75	1.7	1.7	1.5	1.6	1.7	1.9	1.9	1.7	1.6	1.6	1.6	1.45	1.45	1.45	1.5	1.5	1.5	1.6	1.5	1.5	1.4	1.3	1.35	1.3
	DGM In	H _o	83	83	83	83	83	84	83	83	83	83	83	83	83	83	98	84	84	83	83	83	83	83	83	83	83	84	83	83	83	84	84
atures	DGM Out	ir.	84	84	84	84	83	83	84	84	84	83	84	84	84	84	98	85	85	84	84	84	84	84	84	84	85	85	84	85	84	85	85
Temperatures	Imp. Out	T,	75	65	09	59	58	58	59	58	59	09	58	26	54	53	26	53	53	55	53	53	20	20	20	20	49	49	49	49	49	20	20
	Stack	L o	280	285	286	285	285	285	284	284	284	284	283	284	284	284	286	285	285	286	285	285	285	285	284	284	284	284	284	284	284	284	283
	ΔP	"H20	0.75	0.75	0.71	0.73	0.74	0.74	0.68	0.67	0.68	0.61	0.63	0.68	0.72	0.71	0.68	9.0	9.0	0.61	0.55	0.57	0.56	0.57	9.0	9.0	0.59	0.58	0.59	0.55	0.5	0.53	0.48
	DGM	Reading	91.78	93.70	95.63	97.46	99.33	101.23	103.10	104.92	106.73	108.55	110.23	111.88	113.76	115.63	117.50	119.35	121.10	122.79	124.54	126.24	127.87	129.56	131.22	132.92	134.58	136.30	138.01	139.70	141.32	142.89	144.47
		Time	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	20	52.5	55	57.5	09	62.5	65	67.5	70	72.5	75
		Point	1			2			m			4			5			9			7			∞			6			10			11

Covanta - DYEC 2 - Metals & Particulate May 2, 2016 Plant: Test No.: Date:

<u> </u>				į 1				
Combustion Gases	7.75	11.24	16.9		red H2O	%		
Combust	02%	%ZO2	COppm		Measu	15.3 %		
					0.75 ft³	2.5 minutes	2	12
1.2	1.9	446	19.5					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0.983	29.73 "Hg	-9.300 "H ₂ O	0.2539 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%	103.2	102.4	2.66	8.66	99.2	97.5		100.2	100.5	100.2	100.3	100.3	7.66	99.5	98.9	99.2	98.6	103.5	101.6	102.7	101.3	102.0	100.5	102.2	2.66	97.8	99.2	100.8	98.4	98.9	100.0
	Velocity	m/s	14.69	14.39	14.69	14.69	15.12		18.66	19.17	18.95	18.97	17.91	18.03	18.40	19.11	19.22	18.76	18.67	18.67	18,69	18.11	17.99	17.87	16.73	16.86	17.36	17.10	17.09	17.21	17.20	17.20	17.20
Leak	Check	Volume						0.75																									
	Vacuum	"Hg	3.0	3.0	3.0	3.0	3.0		3.5	3.5	3.5	3.5	3,5	3.5	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	3,5	3.5	3.5	3.5	3.5	3.5	3.5
	РΑ	"H20	1.3	1.2	1.3	1.3	1.3		2.1	2.1	2.1	2.1	1.9	1.9	1.9	2.1	2.1	2.1	2.1	2.1	2.1	1.95	1.95	1.95	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
	DGM In	<b>4</b>	84	84	84	84	84		83	83	84	84	84	84	83	83	84	84	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
atures	DGM Out	<b>.</b>	85	85	85	85	85		84	84	84	84	84	84	83	84	84	84	84	83	84	84	84	84	84	84	84	84	84	84	84	84	84
Temperatures	Imp. Out	<b>L</b>	50	51	51	51	51		65	55	49	49	47	47	47	48	47	47	48	49	49	49	49	50	51	51	51	51	20	51	51	51	52
	Stack	7.	283	283	283	283	283		280	284	285	286	286	286	287	288	288	288	290	290	292	293	293	293	293	293	292	291	290	290	289	289	289
	ΔP	"H2O	0.5	0.48	0.5	0.5	0.53		0.81	0.85	0.83	0.83	0.74	0.75	0.78	0.84	0.85	0.81	0.8	0.8	0.8	0.75	0.74	0.73	0.64	0.65	0.69	0.67	0.67	0.68	0.68	0.68	0.68
	DGM	Reading	146.05	147.65	149.17	150.73	152.28	153.85	154.60	156.59	158.63	160.64	162.65	164,55	166.45	168.38	170.37	172.38	174.33	176.36	178.35	180.36	182.28	184.20	186.08	187.87	189.63	191.41	193.19	195.00	196.78	198.57	200.38
		Time	77.5	80	82.5	85	87.5	06	0	2.5	2	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	20	52.5	55	57.5	09
-		Point			12				ᆏ			2			က			4			S			9			7			∞			6

Plant: Test No.: Date:

Covanta - DYEC 2 - Metals & Particulate May 2, 2016

					and a second and a second as a	-
itot Factor	0.841	Filter (mg)	1.2		Combusti	on Gases
DGMCF	0.983	Probe (mg)	1.9		02%	7.75
tric Pressure	29.73 "Hg	CWTR (g)	446		C02%	11.24
essure	-9.300 "H ₂ O	WCBDA (g)	19.5		COppm 16.9	16.9
	0.2539 inches					
Stack Diameter	4.500 ft	Leak Check Volume		0.75 ft²	Measured H2O	ed H2O
Length	0.000 ft	Reading Interval		2.5 minutes	15.3	%
	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

	Isokinetic	%	98.9	666	6.66	98.4	98.5	97.4	98.6	100.5	98.7	98.9	99.4	98.2
	Velocity	s/w	17.19	17.19	16.28	16.29	16.27	16.14	15.45	15.72	15.58	14.71	14.71	
Leak	Check	Volume												
	Vacuum	"Hg	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	
	М	"H20	1.7	1.7	1.5	1.5	1.5	1.5	1,4	1.4	1.4	1.2	1.2	
	DGM In	<b>4</b> 0	83	83	83	83	85	83	83	83	83	83	83	
atures	DGM Out	<u>+</u>	84	84	84	84	98	84	84	84	84	84	84	
Temperatures	Imp. Out		50	49	48	48	51	47	47	48	48	48	49	
	Stack	<b>L</b>	288	288	288	289	287	287	287	286	286	285	285	
	Δb	"H20	0.68	0.68	0.61	0.61	0.61	9.0	0.55	0.57	0.56	0.5	0.5	
	DGM	Reading	202.17	203.97	205.78	207.47	209.16	210.84	212.52	214.16	215.80	217.43	218.98	220.51
		Time	62.5	65	67.5	70	72.5	75	77.5	80	82.5	85	87.5	06
		Point	Ţ		10			11			12			

Plant:Covanta - DYECPlant Location:Courtice, OntarioTest Location:Boiler No. 1 BH OutletTest No.:3 - Metals and Particulate

Date: May 4, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.983
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	3.321 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	142.6 °C
AVERAGE GAS MOISTURE BY VOLUME	15.6 %
AVERAGE GAS VELOCITY	16.30 m/s
BAROMETRIC PRESSURE (Station)	99.695 Kpa
STATIC PRESSURE	-3.038 Kpa
ABSOLUTE GAS PRESSURE	96.657 Kpa
OXYGEN CONCENTRATION	7.09 %
CARBON DIOXIDE CONCENTRATION	11.73 %
CARBON MONOXIDE CONCENTRATION	19.4 ppm

### **FLOWRATE**

ACTUAL GAS FLOWRATE	24.09 m ³ /s
DRY REF GAS FLOWRATE	13.90 Rm ³ /s
DRY ADJ GAS FLOWRATE	19.39 Rm ³ /s
WET REF GAS FLOWRATE	16.48 Rm ³ /s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0.9 mg
	-FILTER	0.3 mg
	-TOTAL	1.2 mg
DRY REF GAS VOLUME SAMPLED		3.321 m ³
PARTICULATE CONC ACTUAL		0.209 mg/m ³
PARTICULATE CONC DRY REF		0.361 mg/m ³
PARTICULATE CONC DRY ADJ		0.259 mg/m ⁴
PARTICULATE CONC WET REF		0.305 mg/m ³
PARTICULATE EMISSION RATE		0.00502 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  $25 \ \text{deg C}$  (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

Covanta - DYEC 3 - Metals and Particulate May 4, 2016 Plant: Test No.: Date:

on Gases	7.09	11.73	19.4		d H2O	9		
Combustion Gases	02%	%ZO2	COppm		Measured H2O	15.6 %		
					0.58 ft²	2.5 minutes	2	12
0.3	6.0	432.6	19.4					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA(g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0.983	29.44 "Hg	-12.200 "H ₂ O	0.2531 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%		105.6	8.66	99.4	100.0	102.0	101.9	101.7	100.2	100.5	101.1	100.0	102.4	100.4	6.66	6.66	100.3	101.4	101.7	100.9	98.1	101.6	9.66	100.2	97.7	6.66	98.6	100.7	102.0	100.8	9.66
	Velocity	m/s	16.12	17.89	18.26	18.74	18.39	18.51	17.78	18.03	17.78	17.64	16.87	17.50	16.84	16.45	17.24	17.37	16.99	16.47	15.91	15.49	15.65	16.76	16.35	16.08	16.48	16.47	17.00	16.45	16.01	16.00	14.71
Leak	Check	Volume																															
	Vacuum	"Hg	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	МΔ	"H20	1.5	1.9	1.95	2.05	2	2	1.85	1.9	1.8	1.75	1.6	1.8	1.6	1.55	1.7	1.7	1.7	1.55	1.4	1.3	1.4	1.6	1.5	1,4	1.5	1.5	1.65	1.6	1.5	1.5	1.2
	DGM In	J _o	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	85	85	85	85	82	85	85	85	85	85
atures	DGM Out	ц,	84	85	85	84	84	84	84	85	85	85	85	85	85	85	85	85	98	86	86	85	98	86	86	98	86	87	87	87	87	87	87
Temperatures	Imp. Out	T.	78	59	55	54	51	51	20	49	20	20	49	49	49	20	50	50	20	20	20	20	20	20	49	49	49	49	20	20	20	20	51
	Stack	ᇿ	285	292	292	292	293	293	293	293	293	292	292	291	290	290	290	291	291	292	291	292	293	294	294	294	293	292	292	290	288	287	287
	ΔР	"H2O	0.59	0.72	0.75	0.79	0.76	0.77	0.71	0.73	0.71	0.7	0.64	69.0	0.64	0.61	0.67	0.68	0.65	0.61	0.57	0.54	0.55	0.63	9.0	0.58	0.61	0.61	0.65	0.61	0.58	0.58	0.49
	DGM	Reading	85.76	87.53	89.37	91.24	93.17	95.10	97.04	98.90	100.76	102.60	104.44	106.18	108.03	109.78	111.48	113.26	115.06	116.84	118.57	120.23	121.80	123.44	125.16	126.85	128.47	130.17	131.85	133.62	135,36	137.04	138.70
		Time	0	2,5	2	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	20	52.5	55	57.5	09	62.5	65	67.5	70	72.5	75
		Point	1			2			m			4			5			9			7			8			6			10			11

Covanta - DYEC Test No.: Plant:

3 - Metals and Particulate

May 4, 2016 Date:

Plant Location: Courtice, Ontario Operator: Combustion Gases 7.09 11.73 19.4 Measured H2O 15.6 % O2% CO2% COppm 2.5 minutes 0.58 ft² 2 0.3 0.9 432.6 19.4 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval CWTR (g) WCBDA (g) Probe (mg) Filter (mg) 0.2531 inches 29.44 "Hg -12.200 "H₂O 0.000 ft 0.000 ft 4.500 ft 0.841 Barometric Pressure Static Pressure Stack Diameter Pitot Factor DGMCF Length Width Nozzle

	Isokinetic	%	101.1	99.5
	ck Velocity	s/m	14.86	15.00
Leak	Check	Volume		
	Vacuum	"Hg	3.0	3.0
	HΩ	"H20	1.25	1.3
	DGM in	<b>4</b> ,	85	85
atures	DGM Out	°F.	86	87
Temperatures	Imp. Out	Ľ.	52	52
	Stack	ŭ.	287	286
	ΔD	"H20	0.5	0.51
	DGM	Reading	140,25	141.79
		Time	77.5	80
		Point		

Plant: Test No.: Date:

Covanta - DYEC 3 - Metals and Particulate May 4, 2016

Combustion Gases	02% 7.09	CO2% 11.73	COppm 19.4		Measured H2O	15.6 %		
					0.58 ft²	2.5 minutes	2	12
0.3	6.0	. 432.6	19.4					<u>_</u>
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0.983	29.44 "Hg	-12.200 "H ₂ O	0.2531 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

				Tempe	Temperatures				Leak	•	:
	۵	۵	Stack	Imp. Out	DGM Out	DGM II	МΔ	Vacuum	Check	Velocity	Isokinetic
	"H20		<b>.</b>	<b>.</b>	ů.	ë.	"H20	"Hg	Volume	m/s	%
62.5 191.00 0.6	0.6	ll	287	51	88	87	1.55	3.0		16.28	100.6
192.70	0.59		287	51	88	87	1.55	3.0		16.14	100.0
194.43	0.59		286	51	88	87	1.5	3.0		16.13	102.6
196.12	0.57		285	51	88	87	1.45	3.0		15.84	100.2
197.79	0.57		285	51	88	87	1.45	3.0		15.84	100.6
199.45	0.53		285	51	88	87	1.3	3.0		15.28	100.0
201.04	0.57		284	52	88	87	1.45	3.0		15.83	99.3
202.70	0.57		285	51	88	87	1.45	3.0		15.84	100.0
204.37	0.51		285	51	88	87	1.3	3.0		14.99	100.6
205.92	0.51		284	52	88	87	1.3	3.0		14.98	98.7
	0.5		285	52	88	87	1.3	3.0		14.84	100.5
											101.6



### **APPENDIX 23**

Particle Size Distribution Test Emission Calculations at the Boiler No. 1 BH Outlet (6 pages)

# EPA Draft Method - PM_{2.5} Calculations

<b>Date:</b> May 3, 2016	Project No.:	21656	Cyclo	<b>Cyclone Sampling Parameters</b>	
Client: Covanta	Operator:	DO	Cyclone Qs _{ST}	0.36 Rft³/min*	10.3 I/mir
Plant: DYEC			Cyclone Qs actual	0.63 ft³/min	17.9 I/mi
Location: Courtice, Ontario			Stack	Stack Gas Sampling Parameters	
Test No.: Test 1			Vms	43.6 Rft ^{3*}	1.234 Rm³
Test Location: Unit No. 1 BH Outlet			Average Cyclone I Cut Diameter	iameter	9.73 µm

Stack Diamotor (m)	137
שומוובוכו (ווו)	, D. H
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m²)	1.47
No. of Traverses	2
No. of Points Per Traverse	9
Data Readings Per Point	. 1
DGMCF	0.983
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.63
Static Pressure ("H ₂ O)	-12.10
Oxygen Content (%)	7.4
Carbon Dioxide Content (%)	11.6
Carbon Monoxide Content (PPM)	12.4
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cycloi	<b>Cyclone Sampling Parameters</b>	ſS
Cyclone Qs _{ST}	0.36 Rft³/min*	10.3 I/min*
Cyclone Qs actual	0.63 ft³/min	17.9 I/min
Stack (	Stack Gas Sampling Parameters	šrs
V _{ms}	43.6 Rft³*	1.234 Rm³*
Average Cyclone I Cut Diameter	ameter	9.73 µm
Average Cyclone IV Cut Diameter	Diameter	2.17 µm
Average Isokineticity		103.3 %
Stack	Stack Gas Physical Parameters	rs
B _{ws}	16.8 % v/v	1//
Average m	213.7 (dimensionless)	sionless)
Ma	30.15 lbs/lbs mole	s mole
Ŋ	28.11 lbs/lbs mole	s mole
Average T _s	286 °F	141 °C
Average U _s	59.6 ft/s	18.17 m/s
Stack Area	15.87 ft²	$1.474  \text{m}^2$
Actual Q	56762 ACFIVI	26.79 m³/s
Wet Reference Q	39248 SCFM*	$18.52  \text{Rm}^3/\text{s}^*$
Dry Reference Q _s	32671 SCFM*	15.42 Rm³/s*
Summary	Summary of Particulate Emission Rates	Rates
	Dry Ref. Conc.	<b>Emission Rate</b>
Total Part. (a)	$2.11  \text{mg/Rm}^{3*}$	0.0325 g/s
Total Part. (b)	$15.2  \text{mg/Rm}^{3*}$	0.2349 g/s
PM _{2.5} Part. (a)	$1.30  \text{mg/Rm}^{3*}$	0.01999 g/s
PM _{2.5} Part. (b)	$14.4 \text{ mg/Rm}^{3*}$	0.2224 g/s
Cond. Part.	13.1 mg/Rm³*	0.2024 g/s
soldiagopa obuladi ton sook (c)	donoibloc	

## (a) does not include condensibles (b) includes condensibles

		Ty .		P	7 1000
Impinger Recovery	Impinger 1	Impinger 2	impinger 3	mpinger 4	e jaguiduji
initial volume or weight (ml or mg)	491.2	672.4	764.5	973.9	
final volume or weight (ml or mg)	663.7	670.4	761.0	989.7	
gain in volume or weight (ml or mg)	172.5	-2.0	-3.5	15.8	
				TOTAL	182.8

Particulate Weight Gains	>10mm	>2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.5	0.5	<0.5	and the company of th	16.2

## **Test Data Page Calculations**

Date:	Date: May 3, 2016	16	And the same of th	Plant: DYEC	DYEC			Ĭ	Test No.:	•	Test 1			Project No.: 21656	21656
Client:	Client: Covanta			Location: Courtice, Onta	Courtice,	Ontario	**Defention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefention-indefe	Test Ic	Test location:		Unit No. 1 BH Outlet	3H Outlet		Operator: DU	nc
¥		erotreecommiscolitorization production production and production a	(AND COLOR OF THE PROPERTY OF	Department research and a second a second and a second and a second and a second and a second an	Windowski and the control of the con	AND THE PROPERTY OF THE PROPER							,		
		Clock	Dwell	Dry Gas	TO THE		Stack	Meter Temp	Temp	Meter	bump	Stack	Cyclone I	Cyclone IV	OSI
Pon	Point	Time	Time	Meter	ž	Desired	Temp	Outlet	Inlet	Pressure	Vacuum	Gas	Cut Diam.	Cut Diam.	
ġ						cfm	**************************************		·	H	Gauge	Velocity		il accommon	
		(min)	(min)	(ft³)	("H ₂ O)		(°F)	(F)	(°F)	("H ₂ O)	("Hg)	(ft/s)	(mm)	(mm)	(%)
	1	0.00	10.50	23.24	0.83	0.35	282	80	79	0.45	3.0	63.0	9.55	2.10	99.5
***************************************	2	10.50	10.25	27.28	08.0	0.35	284	80	79	0.45	3.0	62.0	9.63	2.13	100.3
	3	20.75	10.00	31.18	0.72	0.35	284	80	79	0.45	3.0	58.8	69.6	2.15	104.8
	4	30.75	9.50	34.95	69.0	0.35	288	80	79	0.45	3.0	57.7	9.76	2.18	106.4
	5	40.25	9.00	38.50	0.75	0.35	288	80	79	0.45	3.0	60.2	9.59	2.12	104.7
	9	49.25	9.00	41.95	0.70	0.35	287	80	79	0.45	3.0	58.1	10.44	2.45	0.96
		58.25		45.01											
2	1	00.00	11.25	45.01	0.75	0.35	284	80	79	0.45	3.0	0.09	9.57	2.10	104.6
ACCUMENTATION OF THE PERSON OF	2	11.25	11.25	49.33	0.81	0.35	287	81	80	0.45	3.0	62.5	9.75	2.18	98.3
	3	22.50	10.50	53.55	69.0	0.35	287	80	80	0.45	3.0	57.7	9.70	2.16	107.2
<b>Carles Salarina</b>	4	33.00	10.00	57.51	99.0	0.35	287	81	80	0.45	3.0	57.3	9.73	2.17	107.5
	5	43.00	9.25	61.27	0.70	0.35	287	81	80	0.45	3.0	58.1	9.83	2.21	104.5
	9	52.25	9.00	64.70	0.75	0.35	287	81	80	0.45	3.0	60.1	9.50	2.08	105.9
		61.25		68.20											
Averages	es	- Министический применентий применентий применентий применентий применентий применентий применентий применентий п В применентий применент	Secretaria conjuncia de marcanis francis de missora.	Germanien green aderes and an organism and an	0.74		286	80		0.45		59.6	9.73	2.17	103.3

# EPA Draft Method - PM_{2.5} Calculations

Cyclone Sampling Parameters	Cyclone Qs _{ST} 0.36 Rft³/min* 10.2 l/mir	Cyclone Qs _{actual} 0.62 ft³/min 17.6 l/mi	Stack Gas Sampling Parameters	V _{ms} 43.2 Rft ^{3*} 1.225 Rm ^{3*}	Average Cyclone I Cut Diameter 9.86 µm	
21656	DO					
Project No.:	Operator:					
Date: May 3, 2016	Client: Covanta	Plant: DYEC	Location: Courtice, Ontario	Test No.: Test 2	Test Location: Unit No. 1 BH Outlet	

Stack Diameter (m)	1.37
Stack Width (m)	00:00
Stack Breadth (m)	0.00
Stack Area (m²)	1.47
No. of Traverses	2
No. of Points Per Traverse	9
Data Readings Per Point	.1
DGMCF	0.983
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.58
Static Pressure ("H ₂ O)	-12.10
Oxygen Content (%)	6.8
Carbon Dioxide Content (%)	12.2
Carbon Monoxide Content (PPM)	21.4
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773
	**************************************

Cyclone	<b>Cyclone Sampling Parameters</b>	eters
Cyclone Qs _{ST}	0.36 Rft³/min*	10.2 I/min*
Cyclone Qs actual	0.62 ft³/min	17.6 I/min
Stack Ga	Stack Gas Sampling Parameters	eters
Vms	43.2 Rft ^{3*}	1.225 Rm³*
Average Cyclone I Cut Diameter	Diameter	9.86 µm
Average Cyclone IV Cut Diameter	rt Diameter	2.22 µm
Average Isokineticity		109.1 %
Stack Ga	Stack Gas Physical Parameters	eters
SM CO	15.8	15.8 % v/v
Average m	213.8 (din	213.8 (dimensionless)
M	30.22 lbs	30.22 lbs/lbs mole
N.	28.29 lbs	28.29 lbs/lbs mole
Average T _s	285 °F	140 °C
Average U _s	55.4 ft/s	16.88 m/s
Stack Area	15.87 ft ²	$1.474  \mathrm{m}^2$
Actual Q _s	52729 ACFM	24.89 m³/s
Wet Reference Q _s	36453 SCFM*	17.20 Rm ³ /s*
Dry Reference Q _s	30687 SCFM*	14.48 Rm³/s*
Summary of	Summary of Particulate Emission Rates	ion Rates
	Dry Ref. Conc.	<b>Emission Rate</b>
Total Part. (a)	$1.31  \mathrm{mg/Rm^{3*}}$	0.0189 g/s
Total Part. (b)	$15.2  \text{mg/Rm}^{3*}$	0.2200 g/s
PM _{2.5} Part. (a)	$0.41  \text{mg/Rm}^{3*}$	0.00591 g/s
PM _{2.5} Part. (b)	$14.3  \text{mg/Rm}^{3*}$	0.2070 g/s
Cond. Part.	$13.9  \text{mg/Rm}^{3*}$	0.2011 g/s
(a) does not include condensibles	ondensibles	

(a) does not include condensibles (b) includes condensibles

initial volume or weight (m) or mg) 476.3	-	Impinger 4	Impinger 5
	1 782.0	907.1	
	5 770.0	921.3	
gain in volume or weight (ml or mg) 169.7 -2.6	-12.0	14.2	

Particulate Weight Gains	>10mm	>2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.0	<0.5	<0.5	0.0	17.0

^{*}Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

## Test Data Page Calculations

Date	Date: May 3, 2016	16		Plant:	Plant: DYEC	Washington Company of the Company of			Test No.:		Test 2			Project No.: 21656	21656
Client:	Client: Covanta			Location:	Location: Courtice, Ontario	Ontario	actors the market between the contract of the	Test k	Test location:		Unit No. 1 BH Outlet	3H Outlet		Operator: DU	DO
Christman Carrier and Carrier		Systematic property and a second seco		- 1 - 10 - 1											
		Clock	Dwell	Dry Gas			Stack	Meter Temp	Temp	Meter	Pump	Stack	Cyclone I	Cyclone IV	180
Port	Point	Time	Time	Meter	ద	Desired	Temp	Outlet	Inlet	Pressure	Nacuum	Gas	Cut Diam.	Cut Diam.	
Š						cfm		7247410414		품	Gauge	Velocity			
		(min)	(mim)	(ft³)	("H ₂ O)		(°F)	(°F)	(°F)	("H ₂ O)	("Hg)	(ft/s)	(mm)	(mm)	(%)
1	1	0.00	10.50	96.89	08:0	0.35	280	80	79	0.45	3.0	61.7	9.62	2.12	100.3
	2	10.50	10.50	73.00	0.67	0.35	283	80	79	0.45	3.0	56.6	9.70	2.15	108.7
	3	21.00	9.75	77.00	0.58	0.35	283	80	79	0.45	3.0	52.6	9.92	2.24	113.2
	4	30.75	9.75	80.60	0.57	0.35	281	80	79	0.45	3.0	52.1	9.72	2.16	117.2
	5	40.50	10.00	84.30	0.58	0.35	283	80	79	0.45	3.0	52.6	9.72	2.16	116.5
	9	50.50	9.75	88.10	0.56	0.35	280	80	79	0.45	3.0	51.6	10.52	2.47	105.7
	DATA DE LE CONTRACTOR DE LA CONTRACTOR D	60.25		91.41											
2	1	0.00	10.00	91.41	0.77	0.35	283	08	79	0.45	3.0	9.09	9.44	2.05	105.4
	2	10.00	10.50	95.37	0.72	0.35	289	80	80	0.45	3.0	58.9	10.02	2.28	100.7
	3	20.50	9.75	99.20	0.65	0.35	291	81	80	0.45	3.0	26.0	9.97	2.26	107.0
	4	30.25	9.50	102.79	0.58	0.35	291	81	80	0.45	3.0	52.9	96.6	2.27	113.1
	5	39.75	9.75	106.28	0.62	0.35	287	82	81	0.45	3.0	54.5	10.05	2.29	107.9
	9	49.50	10.00	109.83	0.62	0.35	287	82	81	0.45	3.0	54.5	9.70	2.15	113.5
	The state of the s	59.50		113.66			3								
Averages	res	а. Олизантини применения по			0.64		285	80	0	0.45		55,4	9.86	2.22	109.1

# EPA Draft Method - PM_{2.5} Calculations

Date: May 3, 2016	Project No.:	21656	Cyclone Sampling Parameters	arameters
Client: Covanta	Operator:	na	Cyclone Qs _{ST} 0.36 Rft ³ /min*	nin* 10.1 l/
Plant: DYEC			Cyclone Qs actual 0.62 ft ³ /min	nin 17.6 l/
Location: Courtice, Ontario			Stack Gas Sampling Parameters	Parameters
Test No.: Test 3			V _{ms} 42.8 Rft ³ *	3* 1.213 RI
Test Location: Unit No. 1 BH Outlet			Average Cyclone I Cut Diameter	9.87 µ

STATE OF THE PARTY	
Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m²)	1,47
No. of Traverses	2
No. of Points Per Traverse	9
Data Readings Per Point	1
DGMCF	0.983
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.54
Static Pressure ("H ₂ O)	-12.10
Oxygen Content (%)	7.2
Carbon Dioxide Content (%)	11.8
Carbon Monoxide Content (PPM)	23.3
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclone	Cyclone Sampling Parameters	ters
Cyclone Qs _{ST}	Cyclone Qs _{ST} 0.36 Rft ³ /min*	10.1 I/min*
Cyclone Qs _{actual}	0.62 ft³/min	17.6 I/min
Stack Ga	Stack Gas Sampling Parameters	eters
Vms	42.8 Rft³*	1.213 Rm³*
Average Cyclone I Cut Diameter	Diameter	9.87 µm
Average Cyclone IV Cut Diameter	ut Diameter	2.22 µm
Average Isokineticity		107.5 %
Stack Ga	Stack Gas Physical Parameters	eters
Bws	16.3	16.3 % v/v
Average m	214.1 (dim	214.1 (dimensionless)
M	30.18 lbs	30.18 lbs/lbs mole
Š	28.19 lbs	28.19 lbs/lbs mole
Average T _s	287 °F	141 °C
Average U _s	56.4 ft/s	17.18 m/s
Stack Area	15.87 ft²	$1.474  \mathrm{m}^2$
Actual Q _s	53658 ACFM	25.32 m³/s
Wet Reference Q _s	36953 SCFM*	17.44 Rm³/s*
Dry Reference Q _s	30916 SCFM*	14.59 Rm³/s*
Summary of	Summary of Particulate Emission Rates	on Rates
	Dry Ref. Conc.	<b>Emission Rate</b>
Total Part. (a)	2.47 mg/Rm³*	0.0361 g/s
Total Part. (b)	$13.6  \text{mg/Rm}^{3*}$	0.1984 g/s
PM _{2.5} Part. (a)	$1.40 \mathrm{mg/Rm^{3*}}$	0.02045 g/s
PM _{2.5} Part. (b)	$12.5 \text{ mg/Rm}^{3*}$	0.1828 g/s
Cond. Part.	$11.1  \text{mg/Rm}^{3*}$	0.1624 g/s
(a) does not include condensibles	ondensibles	

(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)	491.3	671.2	759.1	994.8	
final volume or weight (ml or mg)	655.8	670.6	758.6	1005.7	
gain in volume or weight (ml or mg)	164.5	-0.6	-0.5	10.9	
	Library of the supplemental s	- And Administration of the Administration o		TOTAL	174.3

Particulate Weight Gains	>10mm	>2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.5	0.8	<0.5	1.2	13.5

^{*}Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

## **Test Data Page Calculations**

AND THE PROPERTY OF THE PERSON NAMED AND THE PERSON	Date: IVIAY 3, 2010			Plant: DYEC			_	lest No.:		Fest 3			Project No.: 21656	21656	ı
Client: Covanta	anta	HONE STATE OF THE	Location:	Location: Courtice, Ontar	Ontario		Test lc	Test location:		Unit No. 1 BH Outlet	BH Outlet		Operator: DU	DO	
															1
	Clock	Dwell	Dry Gas			Stack	Meter Temp	Temp	Meter	bump	Stack	Cyclone	Cyclone IV	081	
Port P	Point Time	e Time	Meter	క	Desired	Temp	Outlet	Inlet	Pressure	Vacuum	Gas	Cut Diam.	Cut Diam.		
è.		wot ever see to		and the second s	cfm				품	Gauge	Velocity		NA W/2004		
		(mim)	(m³)	("H ₂ O)		(°F)	(ªF)	(°F)	("H ₂ 0)	("Hg)	(ft/s)	(mm)	(mm)	(%)	.1
1	1 0.00	) 11.25	13.83	0.78	0.35	291	83	82	0.45	3.0	61.5	9.91	2.24	98.4	
	2 11.25	5 10.25	18.00	0.67	0.35	291	83	82	0.45	3.0	57.0	9.92	2.25	105.9	
	3 21.50	0 9.50	21.79	89.0	0.35	290	84	83	0.45	3,0	57.4	9.78	2.19	107.1	- 1
	4 31.00	0 9.50	25.38	0.62	0.35	282	84	82	0,45	3.0	54.5	9.84	2.21	110.5	1
	5 40.50	0 9.50	28.93	0.61	0.35	280	85	83	0.45	3.0	54.0	9.90	2.23	110.1	I
indicate the state of the state	6 50,00	0 9,25	32.45	0.56	0,35	282	82	83	0.45	3.0	51.8	99'6	2,14	119.2	- 1
	59.25	5	36,00												1
2	1 0.00	0 11.00	36,00	08.0	0.35	290	85	83	0.45	3.0	62.2	9.95	2.26	96.4	1
	2 11,00	0 10.50	40.06	0.73	0.35	291	85	83	0.45	3.0	59.5	10.00	2.28	100.3	1
	3 21.50	0 10.00	43.91	0.65	0.35	287	85	83	0,45	3.0	26,0	66.6	2.27	106.1	ì
	4 31.50	0 9.50	47.58	09'0	0.35	286	84	83	0.45	3.0	53.8	68'6	2.23	111.9	1
	5 41.00	0 9.75	51.11	0.65	0.35	285	84	83	0.45	3.0	55.9	9.71	2.16	110.3	ı
	6 50.75	5 9.75	54.83	0.58	0.35	285	84	83	0.45	3.0	52.8	9.88	2.23	113.9	- 1
	60.50	0	58.46												1
Averages	режиментика и применения и при	composition with a cree-include present and the contract of th		0,66		287	84	gerja Serja	0.45		56.4	9.87	2.22	107.5	



### **APPENDIX 24**

Acid Gases Test Emission Calculations at the Boiler No. 1 BH Outlet (6 pages)

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Unit No. 1 BH Outlet

Test No.:

1 - Acid Gases (Method 26A)

Date:

May 2, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.98
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	1.181 m ³
AVGERGE ISOKINETICITY	100.3 %
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	145.4 °C
AVERAGE GAS MOISTURE BY VOLUME	16.5 %
AVERAGE GAS VELOCITY	17.14 m/s
BAROMETRIC PRESSURE (Station)	100.711 Kpa
STATIC PRESSURE	-2.316 Kpa
ABSOLUTE GAS PRESSURE	98.395 Kpa
OXYGEN CONCENTRATION	7.17 %
CARBON DIOXIDE CONCENTRATION	11.95 %
CARBON MONOXIDE CONCENTRATION	14.5 ppm

### **FLOWRATE**

ACTUAL GAS FLOWRATE	25.32 m³/s
DRY REF GAS FLOWRATE	14.63 Rm ³ /s
DRY ADJ GAS FLOWRATE	20.29 Rm ³ /s
WET REF GAS FLOWRATE	17.52 Rm ³ /s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.181 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC 1 - Acid Gases (Method 26A) May 2, 2016 Plant: Test No.:

Date:

 Plant Location:
 Courtice, ON

 Test Location:
 Unit No. 1 BH Outlet

 Operator:
 TT

Combustion Gases	02% 7.17	CO2% 11.95	COppm 14.5		Measured H2O	16.5 %		
					0 ft²	5 minutes	₩	7
0	0	161.7	9.5			·	Mariana	Port
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / I
0.841	86.0	29.74 "Hg	-9.300 "H ₂ O	0.2553 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	<b>Barometric Pressure</b>	Static Pressure	Nozzle	Stack Diameter	Length	Width	

				Tempe	Temperatures				Leak		
	DGM	ΔP	Stack	Imp. Out	9d	DGM In	Р	Vacuum	Check	Velocity	Isokinetic
Time	Reading	"H2O	<b>5</b> -			는	"H20	H.	Volume	m/s	%
	96.45	0.66	285	75	78	77	1.65	4.0		16.92	
	100.10	69.0	291	58	78	78	1.6	3.5		17.37	103.1
	103.67	0.68	292	54	78	78	1.6	3.5		17.25	98.9
	107.25	0.67	293	52	79	78	1.6	3.5		17.14	100.0
20	110.73	79.0	296	53	81	78	1.6	3.5		17.17	97.9
25	114.30	99'0	296	23	82	79	1.6	3.5		17.04	100.4
	117.86	0.65	297	53	82	79	1.6	3.5		16.93	100.7
	121.43	0.68	296	52	83	80	1.65	3.5		17.30	101.8
	125.04	99.0	295	51	84	80	1.6	3.5		17.03	100.4
45	128.58	69.0	294	. 51	84	80	1.65	3.5		17.40	8.66
	132.20	99.0	295	51	85	80	1.6	3.5		17.03	7.66
55	135.75	99.0	295	52	84	80	1.6	3.5		17.03	100.0
09	139.31										100.4

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Unit No. 1 BH Outlet

Test No.:

2 - Acid Gases (Method 26A)

Date:

May 2, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.98
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	1.158 m ³
AVGERGE ISOKINETICITY	100.0 %
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	141.8 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	16.65 m/s
BAROMETRIC PRESSURE (Station)	100.711 Kpa
STATIC PRESSURE	-2.316 Kpa
ABSOLUTE GAS PRESSURE	98.395 Kpa
OXYGEN CONCENTRATION	7.53 %
CARBON DIOXIDE CONCENTRATION	11.68 %
CARBON MONOXIDE CONCENTRATION	12.3 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE		24.60 m ³ /s
DRY REF GAS FLOWRATE		14.38 Rm³/s
DRY ADJ GAS FLOWRATE		19.42 Rm ³ /s
WET REF GAS FLOWRATE		17.17 Rm³/s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.158 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE	# NA	0.00000 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

Covanta - DYEC Test No.: Plant: Date:

2 - Acid Gases (Method 26A) May 2, 2016

Plant Location: Courtice, ON
Test Location: Unit No. 1 BH Outlet Operator: Combustion Gases Measured H20 16.2 % CO2% COppm 02% 5 minutes 0 ft² 155.3 9.1 Number of points / Port Leak Check Volume Number of Ports Reading Interval CWTR (g) WCBDA (g) Filter (mg) Probe (mg) 0.841 0.98 29.74 "Hg -9.300 "H₂O 0.2553 inches 0.000 ft 0.000 ft 4.500 ft **Barometric Pressure** Static Pressure Stack Diameter Pitot Factor DGMCF Length Nozzie Width

11.68 12.3 7.53

	Isokinetic	%		102.4	101.9	100.3	0.66	8.66	9.66	6.66	98.4	98.9	99.5	6.66	6.66
	Velocity		17.15	16.30	16.68	16.14	16.93	16.67	16.41	16.93	16.81	16.94	16.68	16.15	
Leak	Check	Volume													
	Vacuum	"Hg	2.5	2.5	2.5	2.5	2.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
	НΔ	"H20	1.65	1.55	1.55	1.45	1.65	1.55	1.5	1.6	1.6	1.65	1.6	1.5	
ALIEN FRENCHEN FRENCHEN FRENCHEN FRENCHEN FRENCHEN FRENCHEN FRENCH FRENCH FRENCH FRENCH FRENCH FRENCH FRENCH F	DGM In	Ľ.	81	81	81	81	82	82	82	83	83	83	83	84	
atures	DGM Out	ሥ	82	82	82	83	84	85	98	98	87	87	87	87	
Temperatures	Imp. Out	<b></b>	80	49	48	48	48	48	49	49	20	20	49	50	
	Stack	<b></b>	294	288	287	286	286	286	286	286	287	287	287	287	
	ΔP	"H20	0.67	0.61	0.64	9.0	99.0	0.64	0.62	99.0	0.65	99.0	0.64	9.0	
	DGM	Reading	39.79	43.46	46.96	50.49	53.87	57.45	60.97	64.45	62.99	71.52	75.10	78.64	82.07
		Time	0	5	10	15	20	25	30	35	40	45	20	55	09
	mages to	oint	5												

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Unit No. 1 BH Outlet

Test No.:

3 - Acid Gases (Method 26A)

Date:

May 2, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.98
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	1.124 m ³
AVGERGE ISOKINETICITY	98.6 %
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	140.7 °C
AVERAGE GAS MOISTURE BY VOLUME	15.1 %
AVERAGE GAS VELOCITY	16.14 m/s
BAROMETRIC PRESSURE (Station)	100.677 Kpa
STATIC PRESSURE	-2.316 Kpa
ABSOLUTE GAS PRESSURE	98.362 Kpa
OXYGEN CONCENTRATION	7.24 %
CARBON DIOXIDE CONCENTRATION	11.75 %
CARBON MONOXIDE CONCENTRATION	11.9 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE		23.85 m ³ /s
DRY REF GAS FLOWRATE		14.15 Rm ³ /s
DRY ADJ GAS FLOWRATE		19.52 Rm³/s
WET REF GAS FLOWRATE	•	16.68 Rm ³ /s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.124 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/m⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC Test No.: Plant:

3 - Acid Gases (Method 26A) May 2, 2016

Date:

Test Location: Unit No. 1 BH Outlet Plant Location: Courtice, ON Operator: Combustion Gases Measured H20 15.1 % CO2% COppm 02% 5 minutes 0 ft³ 136.4 11 Number of points / Port Leak Check Volume Number of Ports Reading Interval CWTR (g) WCBDA (g) Filter (mg) Probe (mg) 0.841 0.98 29.73 "Hg -9.300 "H₂O 0.2553 inches 0.000 ft 0.000 ft 4.500 ft Barometric Pressure Stack Diameter Static Pressure Pitot Factor DGMCF Nozzle Length Width

7.24 11.75 11.9

	Isokinetic	%		99.4	98.3	97.6	98.0	98.4	97.9	98.5	0.66	100.1	98.4	98.4	99.2
	Velocity	s/m	16.76	16.11	16.10	15.82	15.68	16.22	16.75	16.24	16.37	15.97	15.97	15.69	
Leak	Check	Volume													
	Vacuum	я Н	2.5	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	
	Ч	"H20	1.6	1.45	1.45	1.4	1.4	1.5	1.6	1.5	1.55	1.45	1.45	1.4	
	DGM In	<b>L</b>	82	82	82	82	82	82	82	83	83	84	84	84	
atures	DGM Out	<u>.</u>	83	82	82	83	84	85	85	98	87	87	87	87	
Temperatures	Imp. Out	۳	79	57	26	26	57	58	57	58	59	61	62	65	
	Stack	ሥ	286	286	285	285	284	284	285	286	286	286	286	285	
	ΔР	"H20	0.65	0.6	9.0	0.58	0.57	0.61	0.65	0.61	0.62	0.59	0.59	0.57	
	DGM	Reading	82.50	86.07	89.46	92.83	96.16	99.48	102.90	106.45	109.91	113,44	116.83	120.22	123.58
		Time	0	- 10	10	15	20	25	30	35	40	45	20	55	09
		Point	1												



### **APPENDIX 25**

SVOC Test Emission Calculations at the Boiler No. 1 BH Outlet (12 pages)

Plant:

COVANTA - DYEC

Plant Location:

Courtice, Ontario

Test Location:

Unit No. 1 BH Outlet

Test No.:

1 - SVOC

Date:

May 9, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.983
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	6.539 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	142.9 °C
AVERAGE GAS MOISTURE BY VOLUME	16.1 %
AVERAGE GAS VELOCITY	15.88 m/s
BAROMETRIC PRESSURE (Station)	101.050 Kpa
STATIC PRESSURE	-2.565 Kpa
ABSOLUTE GAS PRESSURE	98.485 Kpa
OXYGEN CONCENTRATION	7.51 %
CARBON DIOXIDE CONCENTRATION	11.79 %
CARBON MONOXIDE CONCENTRATION	21.8 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE	23.46 m³/s
DRY REF GAS FLOWRATE	13.70 Rm ³ /s
DRY ADJ GAS FLOWRATE	18.53 Rm ³ /s
WET REF GAS FLOWRATE	16.34 Rm³/s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		6.539 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

COVANTA - DYEC 1 - SVOC Test No.: Plant:

Date:

May 9, 2016

Unit No. 1 BH Outlet Plant Location: Courtice, Ontario Test Location: Operator: Combustion Gases 11.79 21.8 7.51 Measured H20 16.1 % CO2% COppm 02% 5 minutes 0.42 ft² 2 905.3 19.1 00 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval CWTR (g) WCBDA (g) Probe (mg) Filter (mg) 0.2531 inches 29.84 "Hg -10.300 "H₂O 0.000 ft 0.000 ft 4.500 ft 0.841 **Barometric Pressure** Stack Diameter Static Pressure Pitot Factor DGMCF Length Nozzle Width

	Isokinetic	%		99.2	98.8	99.5	100.1	101.1	101.5	101.9	102.6	98.3	98.1	100.4	99.9	8.66	101.2	101.3	100.2	6.66	100.3	100.1	100.4	98.6	8.66	100.2	101.4	100.1	100.6	101.2	102.4	99.2	100.9	6.66
	Velocity	s/w	16.70	17.12	17.12	17.50	17.00	16.74	16.60	16.73	16.73	16.99	16.47	16.87	16.74	16.21	15.92	15.38	15.64	15.94	14.80	14.64	15.22	14,94	15.51	15.80	15.80	16.61	16.21	16.87	16.87	16.08	16.20	15.93
Leak	Check	Volume																																
	Vacuum	"Hg	5.0	5.5	5.5	6.0	0.9	0.9	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.0	2.0	2.0	5.0	2.0	5.0	5.0	2.0	2.0	5.0	5.0	5.5	5,5	5.5	5.5	5.5	5.5	5.5
	ЧΖ	"H20	1.55	1.6	1.65	1.75	1.65	1.6	1.6	1.55	1.55	1.6	1.5	1.6	1.55	1.5	1,45	1.3	1.4	1.4	1.2	1.15	1.25	1.2	1.35	1,4	1.4	1.55	1.5	1.6	1.6	1.45	1.45	1.45
	DGM In	ᆫ	72	74	74	74	74	74	74	74	75	74	75	75	75	75	75	75	75	74	75	75	74	75	75	75	75	75	75	75	75	75	74	74
atures	DGM Out	<b>4</b> 0	73	75	74	75	75	75	75	75	75	75	9/	9/	9/	9/	9/	9/	9/	75	92	9/	75	75	9/	75	9/	9/	9/	75	74	75	74	75
Temperatures	Imp. Out	°F	74	52	20	48	50	51	48	50	50	49	48	51	20	47	49	20	47	45	47	46	45	45	46	46	45	46	45	45	45	45	45	45
	Stack	<b>4</b>	290	293	293	293	294	294	293	293	293	293	293	294	294	294	292	294	292	294	294	293	292	293	293	294	294	294	294	294	294	294	293	293
	Δp	"H20	0.64	0.67	0.67	0.7	99.0	0.64	0.63	0.64	0.64	99.0	0.62	0.65	0.64	0.6	0.58	0.54	0.56	0.58	0.5	0.49	0.53	0.51	0.55	0.57	0.57	0.63	9.0	0.65	0.65	0.59	9.0	0.58
	DGM	Reading	44.56	47.91	51.33	54.77	58.31	61.78	65.21	68.63	72.10	75.43	78.80	82.15	85.56	88.94	92.26	95.53	98.65	101.82	105.05	108.05	111.03	114.07	117.09	120.24	123.48	126.68	130.06	133.38	136.87	140.25	143.53	146.80
		T.	0	5	10	15	20	25	30	35	40	45	20	55	09	65	70	75	80	85	06	95	100	105	110	115	120	125	130	135	140	145	150	155
		Point	-			2			ю			4			5			9			7			8			თ			10			11	

Plant: Test No.: Date:

COVANTA - DYEC 1 - SVOC May 9, 2016

Plant Location: Courtice, Ontario
Test Location: Unit No. 1 BH Outlet
Operator: TT

Pitot Factor	0.841	Filter (mg)	0		Combusti	on Gases
DGMCF	0.983	Probe (mg)	0		02% 7.51	7.51
Barometric Pressure	29.84 "Hg	CWTR (g)	905.3		CO2%	11.79
Static Pressure	-10.300 "H ₂ O	WCBDA (g)	19.1		СОррт	21.8
Nozzle	0.2531 inches					The state of the s
Stack Diameter	4.500 ft	Leak Check Volume		0.42 ft³	Measured H20	ed H20
Length	0.000	Reading Interval		5 minutes	16.1 %	%
Width	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

	Isokinetic	%	101.5	102.7	99.4	100.4	100.1		100.5	100.9	100.3	101.6	100.8	100.7	100.3	8.66	100.1	100.1	101.1	101.3	100.3	101.1	101.7	98.3	101.0	100.5	103.1	102.1	100.5	100.6	100.6	102.2	99.1
	Velocity	s/w	15.51	15.23	15.09	15.37		16.15	17.57	17.43	17.31	16.80	16.54	16.54	16.39	16.12	15.57	15.71	15.70	15.14	15.28	15.14	14.85	14.84	14.99	14.69	14.69	15.27	15.55	15.42	15.28	15.43	15.86
Leak	Check	Volume					0.42																										
	Vacuum	"Hg	5.5	5.0	5.0	5.0		5.0	6.0	6.0	6.0	6.0	6.0	6.0	5.5	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Р	"H20	1.4	1.25	1.25	1.3		1.45	1.8	1.75	1.75	1.6	1.55	1.55	1.5	1.45	1.4	1.4	1.4	1.3	1.35	1.3	1.2	1.25	1.3	1.25	1.25	1.35	1.4	1.4	1.4	1.4	1.4
	DGM In	J,	74	74	74	74		74	74	73	73	73	72	73	73	72	72	72	72	73	72	72	73	72	73	73	73	73	73	73	73	73	73
atures		<u>ہ</u>	74	74	74	74		74	74	73	73	73	73	73	73	72	72	72	72	73	73	73	73	73	74	74	74	74	74	74	74	74	74
Temperatures	Imp. Out	u.	45	45	45	46		57	45	45	45	46	46	46	46	46	46	47	47	47	47	48	48	48	49	49	49	49	49	50	20	20	50
	Stack	ų.	293	293	294	293		288	288	287	287	287	287	287	286	285	285	285	284	284	284	284	284	283	284	283	283	283	283	284	284	285	286
	ΔÞ	"H20	0.55	0.53	0.52	0.54		9.0	0.71	0.7	0.69	0.65	0.63	0.63	0.62	9.0	0.56	0.57	0.57	0.53	0.54	0.53	0.51	0.51	0.52	0.5	0.5	0.54	0.56	0.55	0.54	0.55	0.58
	DGM	Reading	150.07	153.29	156.35	159.41	162.52	162.94	166.24	169.84	173.39	176.96	180.40	183.78	187.15	190,48	193.76	196.93	200.16	203.40	206.50	209.65	212.79	215.77	218.83	221.91	225.01	228.08	231.22	234.42	237.59	240.78	243.90
		Time	160	165	170	175	180	0	5	10	15	20	25	30	35	40	45	20	55	09	65	20	75	80	85	06	95	100	105	110	115	120	125
		Point		12				н			2			ო			4			ιΩ	,		9			7			_∞			6	

Plant: COVANTA - DYEC

**Test No.:** 1 - SVOC **Date:** May 9, 2016

Operator: 11

Plant Location: Courtice, Ontario

Test Location: Unit No. 1 BH Outlet
Operator: TT

Combustion Gases

O2% 7.51

CO2% 11.79

COppm 21.8 Measured H2O 16.1 % 5 minutes 2 12 0.42 ft³ 905.3 19.1 0 0 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval Filter (mg) Probe (mg) CWTR (g) WCBDA (g) 0.841 0.983 29.84 "Hg -10.300 "H₂O 0.2531 inches 0.000 ft 0.000 ft 4.500 ft Barometric Pressure Static Pressure Stack Diameter Pitot Factor DGMCF Length Width Nozzle

	Isokinetic	%	100.9	9.66	98.8	99.3	99.7	100.1	106.5	100.3	8.66	6.66	100.9
	Velocity	s/m	15.72	15.87	15.84	15.72	15.30	15.01	15.01	14.42	14.42	14.42	
Leak	Check	Volume											
	Vacuum	"Hg	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
	Ч∇	"H20	1.4	1.4	1.4	1.4	1.4	1.4	1.25	1.1	1.1	1.1	
	DGM In	ታ	73	73	73	74	73	73	73	73	74	74	
atures	DGM Out	٥ <b>۴</b>	74	74	74	75	74	75	74	74	74	74	
Temperatures	Imp. Out	u. o	51	51	52	51	48	48	. 46	46	46	46	
	Stack	ሥ	286	287	285	286	286	286	286	286	286	286	
	ΔР	"H20	0.57	0.58	0.58	0.57	0.54	0.52	0.52	0.48	0.48	0.48	
	DGM	Reading	247.16	250.35	253.54	256.75	259.95	263.07	266.33	269.40	272.32	275.26	278.23
THE PROPERTY OF THE THE PROPERTY OF THE PROPER		Time	130	135	140	145	150	155	160	165	170	175	180
		Point		10			11			12			

Plant:

Covanta - DYEC

Plant Location:

Courtice, Ontario

Test Location:

Unit No. 1 BH Outlet

Test No.: Date: 2 - SVOC May 10, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.983
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	6.656 m ³
AVGERGE ISOKINETICITY	100.7 %
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

143.2 °C
16.1 %
16.09 m/s
101.558 Kpa
-2.814 Kpa
98.744 Kpa
7.67 %
11.82 %
14.9 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE	23.77 m ³ /s
DRY REF GAS FLOWRATE	13.92 Rm ³ /s
DRY ADJ GAS FLOWRATE	18.61 Rm ³ /s
WET REF GAS FLOWRATE	16.59 Rm³/s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		6.656 m ³
PARTICULATE CONC ACTUAL		0.000 mg/m ³
PARTICULATE CONC DRY REF		$0.000 \text{ mg/m}^3$
PARTICULATE CONC DRY ADJ		0.000 mg/m ⁴
PARTICULATE CONC WET REF		$0.000 \text{ mg/m}^3$
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC 2 - SVOC May 10, 2016 Plant: Test No.: Date:

Plant Location: Courtice, Ontario
Test Location: Unit No. 1 BH Outlet
Operator: TT

Combustion Gases	02% 7.67	CO2% 11.82	COppm 14.9		Measured H2O	16.1 %		
					0.37 ft ³	5 minutes	2	12
0	0	912.3	23.6					ort
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / P.
0.841	0.983	29.99 "Hg	$-11.300 \text{ "H}_2^{-}$	0,2531 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzie	Stack Diameter	Length	Width	

And the state of t	Isokinetic	%		100.8	100.2	98.9	101.3	100.1	101.1	101.1	6.66	101.1	101.2	100.9	101.5	100.5	6.66	100.3	101.7	99.5	102.1	100.8	97.3	99.2	101.9	100.6	98.6	101.8	100.6	101.8	101.6	101.0	101.2
	Velocity	s/w	16.96	16.96	17.22	17.32	17.32	16.94	16.66	16.80	16.66	16.26	16.39	16.64	16.24	15.85	15.70	15.27	15.27	15.55	14.25	14.25	13.95	14.27	14.58	15.73	15.61	15.88	15.61	15.61	16.13	15.85	15.29
Leak	Check	Volume																															
	Vacuum	"Hg	5.0	5.0	5.0	5.5	5.5	5.5	5.5	5.5	5.5	2.0	2.0	5.3	5.3	5.0	5.0	5.0	5.0	5.0	4.5	4.5	4.5	4.5	4.5	5.0	5.0	5.0	2.0	2.0	5.0	5.0	5.0
	НΔ	"H20	1.65	1.65	1.7	1.75	1.75	1.65	1.6	1.6	1.6	1.55	1.55	1.6	1.55	1.4	1,4	1.35	1.3	1.4	1.1	1.1	1.1	1.2	1.2	1,4	1.4	1.45	1.4	1.4	1.5	1.45	1.35
and the second s	DGM In	± ₀	76	9/	9/	9/	9/	76	9/	77	76	77	77	77	77	77	78	78	78	78	78	78	78	78	78	78	78	78	78	79	78	79	79
atures	DGM Out	<b>4</b> 0	76	9/	77	76	77	77	77	78	77	78	78	79	78	79	79	79	79	79	78	79	79	79	79	79	79	79	79	80	79	80	79
Temperatures	Imp. Out	٥,	75	26	53	20	49	52	52	20	49	51	54	53	52	54	99	26	53	53	53	52	51	49	49	49	48	48	48	48	48	48	49
	Stack	or.	293	293	293	291	291	291	289	290	289	288	288	287	287	288	287	286	286	286	286	286	287	288	289	290	291	291	291	291	289	288	288
	ΔP	"H2O	0.66	99.0	0.68	69.0	69.0	99.0	0.64	0.65	0.64	0.61	0.62	0.64	0.61	0.58	0.57	0.54	0.54	0.56	0.47	0.47	0.45	0.47	0.49	0.57	0.56	0.58	0.56	0.56	9.0	0.58	0.54
	DGM	Reading	79.24	82.70	86.14	89.59	93.15	29.96	100.15	103.58	107.00	110.43	113.79	117.17	120.63	123,97	127.21	130.44	133.63	136.75	140.01	142.96	145.81	148.65	151.63	154.63	157.80	161.04	164.30	167.54	170.78	174.11	177.40
		Time	0	5	10	15	20	25	30	35	40	45	20	55	09	65	70	75	80	85	06	95	100	105	110	115	120	125	130	135	140	145	150
		Point	1			2			m			4			5			9			7			8	ı		6	ı		10			11

Covanta - DYEC 2 - SVOC May 10, 2016 Plant: Test No.: Date:

Plant Location: Courtice, Ontario
Test Location: Unit No. 1 BH Outlet
Operator: TT

0 0 912.3 23.6 0.37 ft² 5 minutes 2							Total Control of the
0.983         Probe (mg)         0           29.99 "Hg         CWTR (g)         912.3           -11.300 "H ₂ O         WCBDA (g)         23.6           0.2531 inches         Leak Check Volume         0.37 ft²           4.500 ft         Reading Interval         5 minutes           0.000 ft         Number of Ports         2           Number of points / Port         12	Pitot Factor	0.841	Filter (mg)	0		Combusti	on Gases
29.99 "Hg CWTR (g) 912.3 -11.300 "H ₂ O WCBDA (g) 23.6 0.2531 inches 4.500 ft Leak Check Volume 0.000 ft Reading Interval 0.000 ft Number of Ports 0.000 ft Number of points / Port	DGMCF	0,983	Probe (mg)	0		02%	7.67
-11.300 "H ₂ O WCBDA(g) 23.6 0.2531 inches 4.500 ft Leak Check Volume 0.000 ft Reading Interval 0.000 ft Number of Ports 1.2	Barometric Pressure	29.99 "Hg	CWTR (g)	912.3		CO2%	11.82
0.2531 inches 4.500 ft Leak Check Volume 0.000 ft Reading Interval 0.000 ft Number of Ports 1.2	Static Pressure	-11.300 "H ₂ O	WCBDA (g)	23.6		COppm 14.9	14.9
4.500 ft Leak Check Volume 0.300 ft Reading Interval 0.000 ft Number of Ports	Nozzie	0.2531 inches					
0.000 ft Reading Interval 0.000 ft Number of Ports	Stack Diameter	4.500 ft	Leak Check Volume		0.37 ft ²	Measured H20	ed H2O
0.000 ft N	Length	0.000 ft	Reading Interval		5 minutes	16.1 %	%
Number of noints / Port	Width	0.000 ft	Number of Ports		2		
			Number of points / Port		12		

	Isokinetic	%	101.1	100.9	100.6	100.0	102.0	101.3		100.7	100.6	2.66	99.4	98.5	0.86	100.3	100.6	101.1	101.3	101.4	101.7	100.3	101.1	100.4	103.2	99,5	100.6	100.1	101.1	100.8	100.6	100.7	100.1
	Velocity	s/m	14.85	14.85	15.01	14.86	15.29		16.91	17.20	16.94	17.17	17.17	17.19	16.80	17.42	17.16	16.92	16.27	16.67	15.74	15.88	16.16	14.59	15.31	15.60	16.53	16.66	16.93	16.93	17.58	17.35	17.62
Leak	Check	Volume						0.37																									
	Vacuum	"Hg	5.0	5.0	5.0	5.0	5.0		5.3	5.5	5.5	5.8	5.8	5.8	5,5	6.0	6.0	0.9	5.7	5.5	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.5	5.5	6.0	6.0	0.9	6.0
	МΩ	"H20	1.25	1.25	1.25	1.3	1.3		1.65	1.7	1.65	1.65	1.65	1.65	1.6	1.75	1.7	1.65	1.55	1,6	1.4	1.45	1.5	1.25	1.3	1.4	1.6	1.6	1.65	1.65	1.75	1.7	1.75
	DGM In	<b>4</b> 0	79	79	79	79	79		79	79	79	78	79	79	78	79	78	79	79	78	78	79	79	79	79	79	79	79	79	80	79	79	79
tures	DGM Out	₩,	80	80	80	80	80		80	79	80	79	79	62	79	80	79	80	80	79	79	80	80	79	80	80	80	80	80	81	80	81	80
Temperatures	Imp. Out	* <b>L</b>	49	49	49	50	50		29	51	51	20	51	52	20	47	46	46	46	45	45	46	47	46	47	47	47	46	46	47	46	46	47
	Stack	<b>4</b> °	287	287	288	288	288		288	291	291	289	289	290	290	289	288	289	289	290	291	291	292	290	290	290	289	289	290	290	292	293	295
	ΔP	"H2O	0.51	0.51	0.52	0.51	0.54		99.0	0.68	99.0	0.68	0.68	0.68	0.65	0.7	0.68	99.0	0.61	0.64	0.57	0.58	9.0	0.49	0.54	0.56	0.63	0.64	99.0	0.66	0.71	0.69	0.71
	DGM	Reading	180.57	183.65	186.72	189.80	192.91	196.09	196.46	199.95	203.48	206.93	210.42	213.88	217.32	220.76	224.35	227.90	231.41	234.79	238.25	241.47	244,75	248.06	251.14	254.26	257.47	260.86	264.31	267.80	271.29	274.90	278.44
		Time	155	160	165	170	175	180	0	ις	10	15	20	25	30	35	40	45	20	55	09	65	70	75	80	85	06	95	100	105	110	115	120
		Point			12				1			2			8			4			5			9			7			∞			6

Covanta - DYEC 2 - SVOC May 10, 2016 Plant: Test No.: Date:

Plant Location: Courtice, Ontario
Test Location: Unit No. 1 BH Outlet
Operator: TT

Combustion Gases	02% 7.67	CO2% 11.82	COppm 14.9		Measured H2O	16.1 %		
					0.37 ft³	5 minutes	2	12
0	0	912.3	23.6		ume	-	81	its / Port
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0.983	29.99 "Hg	-11.300 "H ₂ 0	0.2531 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%	100.6	101.1	101.2	101.9	101.2	101.6	100.2	100.9	100.9	100.6	101.7	101.5
	Velocity	m/s	16.73	16.45	16.45	15.91	15.90	16.18	16.44	16.43	16.14	13.51	13.65	
Leak	Check	Volume												
	Vacuum	"Hg	6.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	
	МΔ	"H20	1.6	1.55	1.55	1.45	1.45	1.5	1.55	1.55	1.5	1	1	
	DGM In	<b></b>	79	80	79	80	80	80	79	80	80	80	80	
atures	DGM Out	ሥ	81	80	80	80	81	81	80	81	81	81	81	
Temperatures	Imp. Out	<b>"</b>	46	47	47	48	48	49	48	50	20	20	51	
	Stack	<b>,</b>	295	294	294	294	293	293	293	292	290	290	288	
	ΔP	"H20	0.64	0.62	0.62	0.58	0.58	9.0	0.62	0.62	9.0	0.42	0.43	
	DGM	Reading	282.04	285.48	288.87	292.28	295.56	298.86	302.17	305.55	308.94	312.27	315.09	317.94
		Time	125	130	135	140	145	150	155	160	165	170	175	180
		Point			10			11			12			

Plant:

Covanta - DYEC

Plant Location:

Courtice, Ontario

Test Location:

Unit No. 1 BH Outlet

Test No.:

3 - SVOC

Date:

May 11, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.983
NOZZLE DIAMETER	6.43 mm
DRY REF GAS VOLUME SAMPLED	6.860 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	142.6 °C
AVERAGE GAS MOISTURE BY VOLUME	16.5 %
AVERAGE GAS VELOCITY	16.65 m/s
BAROMETRIC PRESSURE (Station)	101.355 Kpa
STATIC PRESSURE	-2.789 Kpa
ABSOLUTE GAS PRESSURE	98.566 Kpa
OXYGEN CONCENTRATION	7.53 %
CARBON DIOXIDE CONCENTRATION	11.92 %
CARBON MONOXIDE CONCENTRATION	11.9 ppm

## **FLOWRATE**

ACTUAL GAS FLOWRATE	24.60 m ³ /s
DRY REF GAS FLOWRATE	14.33 Rm ³ /s
DRY ADJ GAS FLOWRATE	19.36 Rm³/s
WET REF GAS FLOWRATE	17.16 Rm ³ /s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		6.860 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC 3 - SVOC May 11, 2016 Plant: Test No.: Date:

Plant Location: Courtice, Ontario
Test Location: Unit No. 1 BH Outlet
Operator: TT

Combustion Gases	02% 7.53	CO2% 11.92	COppm 11.9	1 1	0.47 ft ² Measured H2O	5 minutes 16.5 %	2	12
Filter (mg) 0	Probe (mg) 0	CWTR (g) 973.2	WCBDA(g) 20		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Dort
0.841	0.983	29.93 "Hg	-11.200 "H ₂ O	0.2531 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

Covanta - DYEC 3 - SVOC Plant: Test No.:

May 11, 2016 Date:

Plant Location: Courtice, Ontario Test Location: Unit No. 1 BH Outlet

Operator:

Combustion Gases 11.92 11.9 Measured H2O 16.5 % 7.53 02% C02% COppm 5 minutes 2 12 0.47 ft² 0 0 973.2 20 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval CWTR (g) WCBDA (g) Probe (mg) Filter (mg) 0.2531 inches 0.983 29.93 "Hg -11.200 "H₂O 0.000 ft 0.000 ft 4.500 ft **Barometric Pressure** Static Pressure Stack Diameter Pitot Factor DGMCF Nozzle Length Width

Leak	Check Velocity Isokinetic		15.46 101.4	0000
	Vacuum	"Hg	4.0	•
- 1	ΗØ	"H20	1.4	•
	DGM In	¥°	82	
atures	DGM Out	<b>4</b>	83	0
Temperatures	Imp. Out	ų.	46	•
	Stack	ii.	288	
	ΔР	"H20	0.55	
	DGM	Reading	126.65	
		Time	155	
		oint		

	Š						.74 101.4																										
	Check Velocity	Volume m/s	15.46	15.32	15.32	14.74	14.74	0.47	18.02	17.90	17.75	17.25	17.54	17.67		17.54	17.54 17.8(	17.54 17.80 17.33	17.54 17.80 17.35 17.07	17.54 17.86 17.35 17.07 17.07	17.54 17.87 17.37 17.07 17.07 16.93	17.54 17.86 17.32 17.07 17.09 16.97 16.93	17.54 17.86 17.32 17.05 16.97 16.97 16.84	17.54 17.86 17.35 17.07 16.97 16.87 16.87	17.54 17.86 17.35 17.07 16.97 16.87 16.37 16.37 16.37	17.54 17.86 17.35 17.07 16.97 16.37 16.37 16.17 16.17	17.54 17.86 17.35 17.05 16.97 16.31 16.31 16.31 16.31 16.31	17.54 17.80 17.32 17.05 16.97 16.31 16.31 16.11 16.11	17.54 17.80 17.32 17.05 16.97 16.31 16.31 16.11 16.11	17.54 17.80 17.32 17.05 16.97 16.33 16.31 16.17 16.17 16.17 16.17	17.54 17.57 17.05 16.97 16.31 16.31 16.17 16.17 16.17 16.17 16.17 16.17 16.17 16.17 16.17 16.17 16.17 16.17	17.54 17.32 17.05 16.87 16.87 16.87 16.11 16.11 16.11 16.11 16.11 16.11 16.11 16.11 16.11 16.11	17.54 17.80 17.32 17.09 16.97 16.31 16.17 16.16 16.16 16.18 16.18 16.18 16.18 16.18 16.43 16.43
	Vacuum	"Hg	4.0	4.0	4.0	4.0	4.0		5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0 5.0 5.0	5.0 5.0 5.0 5.0	5.0 5.0 5.0 5.0	5.0 5.0 5.0 5.0 5.0 5.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0. c,	0. c,	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	0. R R R R R R R R R R R R R R R R R R R		0. R.	
;	¥	"H20	1.4	1.4	1.4	1.25	1.25		1.9	1.9	1.9	1.75	1.8	1.8		1.8	1.8	1.8 1.85 1.75	1.8 1.85 1.75 1.65	1.8 1.85 1.75 1.65	1.8 1.85 1.75 1.65 1.65	1.85 1.75 1.65 1.65 1.6 1.6	1.85 1.75 1.75 1.65 1.65 1.6	1.85 1.85 1.75 1.65 1.65 1.6 1.6	1.85 1.85 1.75 1.65 1.65 1.6 1.6 1.5	1.85 1.85 1.65 1.65 1.6 1.6 1.6 1.5 1.5	1.85 1.85 1.75 1.65 1.65 1.6 1.6 1.5 1.5	1.85 1.85 1.75 1.65 1.65 1.6 1.6 1.5 1.5 1.5	1.85 1.85 1.65 1.65 1.65 1.6 1.5 1.5 1.5 1.5	1.8 1.85 1.75 1.65 1.65 1.6 1.5 1.5 1.5 1.5	1.8 1.85 1.65 1.65 1.6 1.6 1.5 1.5 1.5 1.5 1.5	1.8 1.85 1.75 1.65 1.6 1.6 1.5 1.5 1.5 1.55 1.55	1.8 1.85 1.75 1.65 1.6 1.6 1.5 1.5 1.5 1.55 1.55 1.5
	ב אַס	<u>u</u> ,	82	82	82	82	82		82	82	82	82	82	82		8.7	82 82	82 82 81	82 82 81 81	82 82 81 81	82 82 81 81 81	82 81 81 82 82	82 81 81 82 82 82	82 81 81 82 82 82	82 81 81 82 82 82 82	82 81 82 82 82 82 82 82	82 82 83 83 84 85 85 85 85 85	82 82 83 83 84 85 85 85 85 85 85	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
C 101	DGM Out	r.	83	83	83	83	83		82	82	82	82	82	82	82	1	82	82 82 83	82 82 82 82	82 82 82 83	82 82 82 82 82	82 82 82 82 82	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	82 82 82 83 83 83 83 83 83 83 83 83 83 83 83 83	82 82 83 83 83 83 83 83 83 83 83 83 83 83 83	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	83 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
וכווולכומנים	Imp. Out	<b>J</b> o	46	46	46	46	47		64	46	46	45	46	46	46		46	46 46	46 46 46	46 46 45	46 46 46 45 46	46 46 45 45 46	46 46 45 46 46	46 46 45 46 46 47	46 46 45 46 46 47	46 46 45 46 46 47 47	46 46 46 45 46 47 47	46 46 46 45 46 47 47 47	46 46 45 46 47 47 49 49	46 46 45 46 47 47 49 49	46 46 45 47 47 49 49	46 46 45 46 47 47 49 69 50	46 46 45 47 47 47 49 50 50
	Stack	<u>u</u>	288	288	288	288	288		285	285	286	286	286	286	286		287	287	287 288 289	287 288 289 290	287 288 289 290 291	287 288 289 290 291	287 288 289 290 291 291	287 288 290 291 291 291	287 288 290 291 291 291 292	287 288 289 290 291 291 291 292 290	287 288 289 290 291 291 291 292 290 289	287 288 289 290 291 291 292 290 289	287 288 289 290 291 291 292 290 289	287 288 289 290 291 292 290 289 289	287 288 289 290 291 292 290 289 289	287 288 289 290 291 291 292 290 289 289 289	287 288 289 290 291 291 290 290 289 289 289
1_	ΔP	"H20	0.55	0.54	0.54	0.5	0.5		0.75	0.74	0.73	0.69	0.71	0.72	0.71		0.73	0.73	0.73 0.69 0.67	0.73 0.69 0.67 0.67	0.73 0.69 0.67 0.67 0.66	0.73 0.69 0.67 0.67 0.66	0.73 0.69 0.67 0.67 0.66 0.65	0.73 0.69 0.67 0.67 0.65 0.63	0.73 0.69 0.67 0.67 0.65 0.65 0.63	0.73 0.69 0.67 0.67 0.65 0.65 0.63 0.63	0.73 0.69 0.67 0.67 0.65 0.63 0.63 0.6	0.73 0.69 0.67 0.67 0.65 0.63 0.63 0.63 0.63	0.73 0.69 0.67 0.67 0.65 0.63 0.63 0.63 0.63	0.73 0.69 0.67 0.67 0.65 0.63 0.6 0.63 0.63 0.63 0.63	0.73 0.69 0.67 0.67 0.65 0.63 0.6 0.6 0.6 0.6 0.6 0.6	0.73 0.69 0.67 0.67 0.65 0.63 0.6 0.6 0.6 0.6 0.62 0.62	0.73 0.69 0.67 0.67 0.65 0.63 0.6 0.6 0.62 0.62 0.62
	DGB DGB	Reading	126.65	129.85	133.04	136.25	139.32	142.39	142.86	146.58	150.31	154.04	157.66	161.31	164.96		168.62	168.62 172.29	168.62 172.29 175.91	168.62 172.29 175.91 179.43	168.62 172.29 175.91 179.43 182.96	168.62 172.29 175.91 179.43 182.96 186.46	168.62 172.29 175.91 179.43 182.96 186.46	168.62 172.29 175.91 179.43 182.96 186.46 189.98	168.62 172.29 175.91 179.43 182.96 186.46 189.98 193.32	168.62 172.29 175.91 179.43 182.96 186.46 189.98 193.32 196.76 200.15	168.62 172.29 175.91 179.43 182.96 189.98 193.32 196.76 200.15 203.48	168.62 172.29 175.91 179.43 182.96 186.46 189.98 193.32 196.76 200.15 206.92	168.62 172.29 175.91 179.43 182.96 186.46 189.98 193.32 196.76 200.15 203.48 206.92	168.62 172.29 175.91 179.43 182.96 189.98 193.32 196.76 200.15 206.92 210.27 213.63	168.62 172.29 175.91 179.43 182.96 189.98 193.32 196.76 200.15 203.48 206.92 210.27 216.99	168.62 172.29 175.91 179.43 182.96 189.98 193.32 196.76 200.15 206.92 206.92 210.27 210.27 210.27 220.38	168.62 172.29 175.91 179.43 182.96 189.98 193.32 196.76 200.15 206.92 210.27 210.27 210.27 210.27 220.38 220.38
		Time	155	160	165	170	175	180	0	5	10	15	20	25	30		35	35 40	35 40 45	35 40 50	35 40 50 55	35 40 45 50 55	35 40 45 50 55 60	35 40 45 50 55 60 65	35 40 40 50 50 60 70 75	35 40 40 50 55 60 65 70 80	35 40 40 50 50 60 65 70 75 85	35 40 45 50 55 60 65 77 75 80 85	35 40 40 50 60 65 77 75 80 85	35 40 45 50 50 60 65 70 75 80 85 90 100	35 40 45 50 50 60 65 70 75 80 85 90 100	35 40 45 50 55 60 65 70 75 80 85 90 100 110	35 40 45 50 50 65 70 75 80 80 85 90 100 110
		Point			12				1			2			m				4	4	4	4 v	4 s	4 s	4 S 9	4 V O	4 S O	4 S 9 M	4 % 9 <i>F</i>	4 S 9 L	4 5 9 1 8	4 S 9 L 8	4 S 9 L 8

Covanta - DYEC 3 - SVOC May 11, 2016 Plant: Test No.: Date:

Plant Location: Courtice, Ontario
Test Location: Unit No. 1 BH Outlet
Operator: TT

Combustion Gases	02% 7.53	: <b>02</b> % 11.92	Oppm 11.9		Measured H2O	16.5 %		
٥			3		0.47 ft	5 minutes	2	12
0	0	973.2	20					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0,983	29.93 "Hg	-11,200 "H ₂ O	0.2531 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%	103.5	0.96	9.66	98.8	98.1	100.6	101.5	101.4	102.6	103.4	101.1	101.2
	Velocity	- 1	16.85	16.72	16.98	16.84	17.46	16.70	16.94	16.55	15.46	14.73	14.43	
Leak	Check	Volume												
	Vacuum		5.0	5.0	5.0	2.0	5.3	5.0	5.0	5.0	5.0	4.0	4.0	
	НΩ	"H20	1.6	1.6	1.6	1.6	1.8	1.6	1.7	1.6	1.4	1.25	1.2	
	DGM In	<b>.</b>	83	82	83	83	82	82	83	83	83	83	83	
atures	DGM Out	°F	84	83	83	83	84	83	84	84	84	84	84	
Temperatures	Imp. Out	o L	52	51	51	51	51	51	52	52	52	52	52	
	Stack	ů.	292	292	292	291	290	290	288	288	288	287	287	
	ΔP	"H20	0.65	0.64	0.66	0.65	0.7	0.64	0.66	0.63	0.55	0.5	0.48	
	DGM	Reading	230.63	233.94	237.34	240.77	244.15	247.75	251.22	254.75	258.24	261.53	264.60	267.61
		Time	125	130	135	140	145	150	155	160	165	170	175	180
	*******	Point			10			11			12			



## **APPENDIX 26**

Particulate and Metals Test Emission Calculations at the Boiler No. 2 BH Outlet (12 pages)

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Boiler No. 2 BH Outlet 1 - Metals & Particulate

Test No.: Date:

May 3, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.984
NOZZLE DIAMETER	6.45 mm
DRY REF GAS VOLUME SAMPLED	3.714 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	142.6 °C
AVERAGE GAS MOISTURE BY VOLUME	15.5 %
AVERAGE GAS VELOCITY	18.00 m/s
BAROMETRIC PRESSURE (Station)	100.406 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	97.916 Kpa
OXYGEN CONCENTRATION	8.41 %
CARBON DIOXIDE CONCENTRATION	10.94 %
CARBON MONOXIDE CONCENTRATION	24.4 ppm

## FLOWRATE

ACTUAL GAS FLOWRATE	26.60 m³/s
DRY REF GAS FLOWRATE	15.57 Rm³/s
DRY ADJ GAS FLOWRATE	19.64 Rm³/s
WET REF GAS FLOWRATE	18.43 Rm ³ /s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.8 mg
	-FILTER	0.3 mg
	-TOTAL	2.1 mg
DRY REF GAS VOLUME SAMPLED		3.714 m ³
PARTICULATE CONC ACTUAL		0.331 mg/m ³
PARTICULATE CONC DRY REF		0.565 mg/m ³
PARTICULATE CONC DRY ADJ		0.448 mg/m ⁴
PARTICULATE CONC WET REF		0.478 mg/m ³
PARTICULATE EMISSION RATE		0.00880 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

Plant: Test No.: Date:

Covanta - DYEC 1 - Metals & Particulate May 3, 2016

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

	0.841	Filter (mg)	0.3		Combusti	on Gases
	0.984	Probe (mg)	1.8		02%	8.41
essure	29.65 "Hg	CWTR (g)	482.7		C02%	10.94
đ)	-10,000 "H ₂ O	WCBDA (g)	19.2		COppm 24.4	24.4
	0.2539 inches					
le,	4.500 ft	Leak Check Volume		0.53 ft³	Measured H2O	ed H20
Length	0.000 ft	Reading Interval		2.5 minutes	15.5 %	%
	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

		2	QV	Joeta	Temper	Femperatures	ng Mag	Į	Vacinim	Check	Velocity	Isokinetic
Time	Reading	*******	"H20		5 L	, L	, ,	"H20	2 H		m/s	%
0 76.93	76.93	1	0.91	285	61	75	75	2.3	6.0		19.91	
	78.98		0.94	293	45	76	9/	2.4	6.0		20.34	9.66
	81.17		0.95	293	39	76	9/	2.4	0.9		20.45	105.1
	83.37		0.95	294	37	9/	2/2	2.3	0.9		20.46	105.0
	85.52		96'0	294	37	9/	77	2.2	5.5		20.57	102.6
	87.62		0.94	294	36	77	77	2.1	5.5		20.36	9.66
	99.68		0.92	294	37	77	77	2.1	5.5		20.14	97.7
	91.69		6.0	293	37	77	78	2	2.0		19.90	98.2
	93.71		0.87	293	37	77	79	2	2.0		19.57	98.7
	95.70		0.82	293	37	77	79	1.9	5.0		19.00	98.8
	97.64		0.83	293	37	77	80	1.9	2.0		19.11	99.2
	99.61		0.82	293	38	77	81	1.9	5.0		19.00	100.0
	101.55		0.78	294	38	77	82	1.8	5.0		18.54	0.66
	103.44		0.74	293	39	77	82	1.7	5.0		18.05	98.8
	105.29		0.74	293	40	77	83	1.7	2.0		18.05	99.2
	107.14		69.0	293	40	78	84	1.5	5.0		17.43	99.1
	108.91		69.0	292	39	78	84	1.6	2.0		17.42	98.0
	110.69		69.0	292	39	78	85	1.6	5.0		17.42	98.5
	112.49		99.0	292	39	78	85	1.6	2.0		17.29	99.5
	114.30		0.64	292	38	78	98	1.5	5.0		16.77	100.8
	116.05		99.0	291	38	78	86	1.5	2.0		17.02	100.3
	117.79		0.67	293	38	79	86	1.6	2.0		17.17	98.2
	119.57		0.67	290	38	79	87	1.6	5.0		17.14	7.66
	121.36		0.67	290	38	79	87	1.6	2.0		17.14	100.0
	123.14		7.0	290	38	79	87	1.7	5.0		17.52	99.4
	124.95		0.72	290	38	79	87	1.7	5.0		17.77	99.0
	126.81		0.71	291	39	79	87	1.7	5.0		17.66	100.3
	128.65		0.71	290	39	79	87	1.7	5.0		17.64	100.0
	130.48		0.7	289	39	79	87	1.6	2.0		17.51	99.3
	132.28		0.7	289	39	80	87	1.6	5.0		17.51	98.3
	134.07		99.0	289	40	80	87	1.6	5.0		17.00	97.7

Covanta - DYEC Test No.: Date: Plant:

1 - Metals & Particulate May 3, 2016

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet Ā Operator: Combustion Gases 10.94 24.4 Measured H2O 15.5 % 8.41 CO2% COppm 02% 2.5 minutes 0.53 ft² 2 0.3 1.8 482.7 19.2 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval Filter (mg) Probe (mg) CWTR (g) WCBDA (g) 0.2539 inches 0.984 29.65 "Hg -10.000 "H₂O 0.000 ft 0.000 ft 4.500 ft **Barometric Pressure** Static Pressure Stack Diameter Pitot Factor DGMCF Length Nozzie Width

					Temperatures	atures				Leak		
		DGM	ďΣ	Stack	Imp. Out	DGM Out	DGM in	Ч	Vacuum	Check	Velocity	Isokinetic
Point	Time	Reading	"H20	٩,	J.	<u>u.</u>	<b>L</b> 0	"H20	"Hg	Volume	m/s	%
	77.5	135.86	0.66	289	40	80	87	1.5	5.0		17.00	100.6
	80	137.65	0.63	289	40	80	87	1.5	5.0		16.61	100.6
12	82.5	139.38	9.0	287	40	80	88	1.4	5.0		16.19	99.5
	85	141.06	9.0	285	41	80	88	1.4	5.0		16.17	98.8
	87.5	142.74	0.61	285	41	80	89	1,4	5.0		16.30	98.6
	06	144.44								0.53		98.9
1	0	144.97	0.79	285	54	80	82	2	6.0		18.55	
	2.5	146.91	0.78	288	46	80	83	1.8	5.5		18.47	6.66
	5	148.85	0.76	288	41	80	84	1.7	5.5		18.23	100.6
7	7.5	150.73	0.78	287	39	80	84	1.8	5.5		18.46	98.7
	10	152.63	0.8	287	38	80	85	1.9	5.5		18.69	98.4
	12.5	154.57	0.79	286	38	80	85	1.9	5,5		18.56	99.2
m	15	156.50	0.75	287	38	80	98	1.8	5.5		18.10	99.2
	17.5	158,42	0.75	286	37	80	98	1.7	5.5		18.09	101.2
	20	160.29	0.76	286	37	80	98	1.8	5.5		18.21	98.5
4	22.5	162.19	0.73	286	37	81	87	1.7	5.5		17.84	99.4
	25	164.05	0.73	285	37	81	87	1.7	5.5		17.83	99.1
	27.5	165.92	0.72	285	38	81	87	1.7	5.5		17.71	9.66
50	30	167.76	0.68	285	38	81	87	1.6	5.0		17.21	28.7
	32.5	169.58	0.65	285	38	81	88	1.65	5.5		16.83	100.4
	35	171.37	99.0	285	38	81	88	1.65	5.5		16.95	100.9
9	37.5	173.18	0.62	285	38	81	88	1.6	5.5		16.43	101.3
	40	174.90	0.62	285	38	81	68	1.6	5.5		16.43	99.3
	42.5	176.73	0.61	291	38	81	88	1.3	5.0		16.36	105.5
7	45	178.39	0.75	273	39	81	68	1.7	5.5		17.93	6.96
	47.5	180.23	0.76	286	39	81	68	1.8	5.5		18.21	95.7
	20	182.13	0.7	286	39	81	68	1.7	5.5		17.47	99.1
8	52.5	183.97	0.74	287	40	81	88	1.7	5.5		17.98	100.0
	55	185.85	0.75	286	40	81	88	1.75	5.5		18.09	99.5
	57.5	187.73	0.75	287	41	81	88	1.8	5.5		18.10	98.8
6	09	189.64	0.77	287	41	81	88	1.8	0.9		18.34	100.4

Covanta - DYEC 1 - Metals & Particulate May 3, 2016 Plant: Test No.: Date:

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

itot Factor	0.841	Filter (mg)	0.3		Combustion	n Gases
	0.984	Probe (mg)	1.8		02% 8,41	8.41
c Pressure	29.65 "Hg	CWTR (g)	482.7		CO2%	10.94
Static Pressure	-10.000 "H ₂ O	WCBDA (g)	19.2		COppm 24.4	24.4
	0.2539 inches					
tack Diameter	4.500 ft	Leak Check Volume		0.53 ft ²	Measured H2O	d H2O
	0.000 ft	Reading Interval		2.5 minutes	15.5 %	
	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

	Isokinetic	%	9.66	99.7	98.7	99.2	99.5	100.4	102.8	101.4	103.0	102.2	102.2	105.5
	Velocity	1	18.37	18.22	18.81	18.70	18.57	17.98	17.85	17.73	17.23	17.23	17.09	
Leak	Check	Volume												
	Vacuum	W.		6.0	6.0	0.9	6.0	6.0	6.0	6.0	6.0	6.0	0.9	
	В	"H2O	1.8	1.8	1.9	1.9	1.6	1.85	1.85	1.8	1.8	1.8	1.8	
	DGM In	۳.	88	88	88	87	87	87	87	87	87	87	88	
atures	DGM Out	9. T	82	81	81	81	82	81	81	82	82	82	82	
Temperatures	Imp. Out	<u>u</u>	41	41	42	42	42	42	42	43	43.	43	43	
	Stack	b.	290	287	287	288	287	287	287	287	287	287	286	
	ΔР	"H20	0.77	0.76	0.81	0.8	0.79	0.74	0.73	0.72	0.68	0.68	0.67	
	MBQ	Reading	191.56	193.48	195.37	197.33	199.28	201.24	203.18	205.08	207.00	208.85	210.70	212.60
		Time	62.5	65	67.5	70	72.5	75	77.5	80	82.5	85	87.5	06
		Point			10			11			12			

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Boiler No. 2 BH Outlet 2 - Metals & Particulate

Test No.: Date:

May 3, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.984
NOZZLE DIAMETER	6.45 mm
DRY REF GAS VOLUME SAMPLED	3.523 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	140.1 °C
AVERAGE GAS MOISTURE BY VOLUME	15.3 %
AVERAGE GAS VELOCITY	17.11 m/s
BAROMETRIC PRESSURE (Station)	100.203 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	97.713 Kpa
OXYGEN CONCENTRATION	8.22 %
CARBON DIOXIDE CONCENTRATION	11.18 %
CARBON MONOXIDE CONCENTRATION	19.3 ppm

## FLOWRATE

ACTUAL GAS FLOWRATE	25.28 m³/s
DRY REF GAS FLOWRATE	14.89 Rm ³ /s
DRY ADJ GAS FLOWRATE	19.07 Rm ³ /s
WET REF GAS FLOWRATE	17.59 Rm ³ /s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	2.1 mg
	-FILTER	0.3 mg
	-TOTAL	2.4 mg
DRY REF GAS VOLUME SAMPLED		3.523 m ³
PARTICULATE CONC ACTUAL		0.401 mg/m ³
PARTICULATE CONC DRY REF		0.681 mg/m ³
PARTICULATE CONC DRY ADJ		0.532 mg/m ⁴
PARTICULATE CONC WET REF		0.577 mg/m ³
PARTICULATE EMISSION RATE		0.01014 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

Covanta - DYEC Test No.: Date: Plant:

2 - Metals & Particulate May 3, 2016

Plant Location: Courtice, ON Test Location: Boiler No. 2 BH Outlet AN Operator: Combustion Gases 11.18 19.3 Measured H2O 15.3 % 8.22 CO2% 02% 2.5 minutes 0.63 ft³ 2 0.3 2.1 448.4 20.4 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval Filter (mg) Probe (mg) CWTR (g) WCBDA (g) 0.2539 inches 0.841 0.984 29.59 "Hg -10.000 "H₂O 0.000 ft 0.000 ft 4.500 ft Barometric Pressure Static Pressure Stack Diameter Pitot Factor DGMCF Length Nozzle Width

Covanta - DYEC 2 - Metals & Particulate May 3, 2016 Plant: Test No.: Date:

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

			COppm 19.3		0.63 ft ² Measured H2O	2.5 minutes 15.3 %	2	12
Filter (mg) 0.3	Probe (mg) 2.1	CWTR (g) 448.4			Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0.984	29.59 "Hg	-10.000 "H ₂ O	0.2539 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzie	Stack Diameter	Length	Width	

	Isokinetic	%	99.3	0.66	98.3	96.4	9.66	98.3		95.8	98.5	97.5	98.5	98.8	98.6	99.5	99.4	98.6	98.9	97.6	98.7	101.0	98,4	99.7	3.66	98.8	99.2	69.3	98.1	99.1	96.5	100.8	6.66
	Velocity	m/s	14.75	14.30	14.74	14.74	14.74		18.25	18.55	18.43	18.45	18.08	18.33	17.83	17.83	17.59	17.33	17.46	17.46	16.56	16.83	16.70	16.17	16.16	16.29	15.89	15.89	15.87	16.41	16.28	16.41	16.81
Leak	Check	Volume						0.63																									
	Vacuum	"Hg	5.0	2.0	2.0	2.0	2.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5
	МΔ	"H20	1.1	1.1	1.15	1.2	1.2		1.8	1.8	1.8	1.8	1.7	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.5	1.3	1.3	1.3	1.5	1.5	1.5	1.55
	DGM In	4	06	68	90	06	06		82	82	83	84	84	85	85	98	98	98	87	87	88	88	88	88	88	88	88	88	89	68	68	68	88
atures	DGM Out	T.	81	81	81	81	81		81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82
Temperatures	Imp. Out	<u></u>	46	46	46	46	46		63	51	48	48	48	49	50	20	20	51	51	52	52	53	53	52	52	51	50	50	20	20	50	50	50
	Stack	۳.	284	284	283	283	283		280	285	285	286	285	286	285	285	285	284	285	285	284	285	285	285	284	284	284	284	283	283	283	283	283
	ΔР	"H2O	0.5	0.47	0.5	0.5	0.5		0.77	0.79	0.78	0.78	0.75	0.77	0.73	0.73	0.71	69.0	0.7	0.7	0.63	0.65	0.64	9.0	9.0	0.61	0.58	0.58	0.58	0.62	0.61	0.62	0.65
	DGM	Reading	69.92	71.47	72.96	74.47	76.03	77.57	78.20	80.05	81.97	83.86	85.77	87.65	89.55	91.42	93.29	95.12	96.93	98.73	100.55	102.32	104.07	105.83	107.53	109.22	110.93	112.60	114.25	115.92	117.60	119.34	121.08
		Tíme	77.5	80	82.5	. 85	87.5	06	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	20	52.5	55	57.5	09
		Point			12				1			2			က			4			5			9			7			∞			6

Covanta - DYEC 2 - Metals & Particulate May 3, 2016 Plant: Test No.: Date:

Barometric Pressure Static Pressure

Pitot Factor DGMCF

Stack Diameter

Nozzle

Length Width

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

Combustion Gases	<b>02%</b> 8.22	CO2% 11.18	<b>COppm</b> 19.3		Measured H20	15.3 %		
	1				0.63 ft³	2.5 minutes	2	12
0.3	2.1	448.4	20.4					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Por
0.841	0.984	29.59 "Hg	-10.000 "H ₂ O	0.2539 inches	4.500 ft	0.000 ft	0.000 ft	

	Isokinetic	%	98.2	98.8	98.8	100.0	100.2	100.0	102.2	102.4	101.4	100.5	100.8	99.7
	Velocity	m/s	16.82	16.82	17.20	17.07	17.20	17.58	17.45	17.45	17.33	17.06	17.06	
Leak	Check	Volume												
	Vacuum	"Hg	5.5	5.5	5.5	5.5	5.5	5.8	5.8	5.5	5.5	5.5	5.5	
	НΩ	"H20	1.55	1.55	1.7	1.7	1.7	1.8	1.8	1.7	1.7	1.6	1.6	
	DGM In	<u>u</u>	88	88	87	87	87	87	87	86	98	86	86	
itures	DGM Out	<b>.</b>	82	82	82	82	82	82	82	82	82	82	82	
Temperatures	Imp. Out	Ľ.	50	50	20	20	20	20	50	20	51	51	52	
THE THE PROPERTY OF THE PROPER	Stack	<b></b>	284	284	284	284	284	284	284	284	284	283	283	
	ΔP	"H2O	0.65	0.65	0.68	0.67	0.68	0.71	0.7	0.7	69.0	0.67	0.67	
	DGM	Reading	122.83	124.59	126.35	128.17	129.98	131.80	133.70	135.59	137.46	139.30	141,12	142.92
		Time	62.5	65	67.5	70	72.5	75	77.5	80	82.5	85	87.5	06
		Point			10			11			12			

Plant:Covanta - DYECPlant Location:Courtice, ON

Test Location: Boiler No. 2 BH Outlet
Test No.: 3 - Metals & Particulate

Date: May 4, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.848
DGM CORRECTION FACTOR	0.984
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	3.559 m ³
AVGERGE ISOKINETICITY	100.1 %
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	140.2 °C
AVERAGE GAS MOISTURE BY VOLUME	15.4 %
AVERAGE GAS VELOCITY	17.14 m/s
BAROMETRIC PRESSURE (Station)	99.695 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	97.205 Kpa
OXYGEN CONCENTRATION	8.06 %
CARBON DIOXIDE CONCENTRATION	11.15 %
CARBON MONOXIDE CONCENTRATION	20.2 ppm

## FLOWRATE

ACTUAL GAS FLOWRATE	25.32 m³/s
DRY REF GAS FLOWRATE	14.83 Rm³/s
DRY ADJ GAS FLOWRATE	19.23 Rm³/s
WET REF GAS FLOWRATE	17.53 Rm³/s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	1.8 mg
	-FILTER	0.3 mg
	-TOTAL	2.1 mg
DRY REF GAS VOLUME SAMPLED		3.559 m ³
PARTICULATE CONC ACTUAL		0.346 mg/m ³
PARTICULATE CONC DRY REF		0.590 mg/m ³
PARTICULATE CONC DRY ADJ		0.455 mg/m⁴
PARTICULATE CONC WET REF		0.499 mg/m ³
PARTICULATE EMISSION RATE		0.00875 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  $25 \ \text{deg C}$  (77 deg F)and 1 atmosphere, adjusted to 11% oxygen by volume

Plant: Test No.: Date:

Covanta - DYEC 3 - Metals & Particulate May 4, 2016

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

		-						
ion Gases	8.06	11.15	20.2		ed H2O	%		
Combust	%20	CO2%	<b>COppm</b> 20.2		Measur	15.4 %		
					0.55 ft [*]	2.5 minutes	2	12
0.3	1,8	454.4	20.8					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.848	0.984	29.44 "Hg	-10.000 "H ₂ O	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	<b>Barometric Pressure</b>	Static Pressure	Nozzie	Stack Diameter	Length	Width	

ΔP Stack
0.68 284
0.77 286

Covanta - DYEC 3 - Metals & Particulate May 4, 2016 Plant: Test No.: Date:

 Plant Location:
 Courtice, ON

 Test Location:
 Boiler No. 2 BH Outlet

 Operator:
 AN

					AND DESCRIPTION OF THE PERSON	
Pitot Factor	0.848	Filter (mg)	0.3		Combustic	on Gases
DGMCF	0.984	Probe (mg)	1.8		<b>02%</b> 8.06	8.06
Barometric Pressure	29.44 "Hg	CWTR (g)	454.4		CO2%	11.15
Static Pressure	$-10.000 \text{ "H}_2^{-}$	WCBDA (g)	20.8		COppm	20.2
Nozzle	0.2543 inches					
Stack Diameter	4.500 ft	Leak Check Volume		0,55 ft²	Measure	ed H20
Length	0.000 ft	Reading Interval		2.5 minutes	15.4 %	%
Width	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

	Isokinetic	%	100.0	99.7	9.66	100.2	101.0	99.4		101.4	100.6	98.2	100.2	101.4	100.8	8.66	0.66	100.0	100.4	99.2	100.9	100.4	101.6	100.3	100.3	100.1	100.0	8.66	100.1	101.0	101.0	99.5	98.7
	Velocity	s/w	16.20	16.19	16.46	16.60	16.61		17.78	17.66	17.78	17.53	18.64	18.52	18.51	18.76	18.63	17.91	18.02	17.90	17.14	17.01	17.14	16.46	16.61	16.34	16.32	16.45	16.33	16.51	16.45	16.59	17.11
Leak	Check	Volume	,					0.55																									
	Vacuum	"Hg	5.0	5.0	5.0	2.0	5.0		2.0	2.0	2.0	2.0	0.9	0.9	0.9	0.9	0.9	2.0	2.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0
	H	"H20	1.4	1.4	1.5	1.5	1.5		1.7	1.7	1.7	1.7	2	1.95	1.9	1.9	1.9	1.8	1.8	1.8	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6
	DGM In	¥	68	68	90	91	90		85	84	85	85	98	87	87	87	88	88	88	88	88	89	68	68	89	89	06	90	06	06	06	06	06
atures		u.	84	84	84	84	84		84	84	84	84	83	84	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Temperatures	Imp. Out	٠ <del>١</del>	42	42	43	43	43		9	46	44	42	41	40	39	39	39	39	39	39	40	40	40	40	40	40	40	40	40	40	40	41	41
	Stack	Ľ.	284	283	283	283	284		285	285	285	285	285	285	284	285	284	285	284	284	284	284	284	283	284	284	282	282	283	287	282	282	282
	ΔP	"H20	0.59	0.59	0.61	0.62	0.62		0.71	0.7	0.71	69.0	0.78	0.77	0.77	0.79	0.78	0.72	0.73	0.72	99.0	0.65	99.0	0.61	0.62	9.0	9.0	0.61	9.0	0.61	0.61	0.62	99.0
	DGM	Reading	119.80	121.52	123.24	125.00	126.79	128.55	129.10	131.01	132.89	134.74	136.60	138.60	140.58	142.54	144.51	146.49	148.40	150.30	152.22	154.05	155.89	157.72	159.48	161.25	162.99	164.73	166.49	168.25	170.02	171.77	173.52
AND THE PARTY OF T		Time	77.5	80	82.5	85	87.5	06	0	2.5	25	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	20	52.5	55	57.5	09
		Point			12				Н			2			m			4			72			9			7			∞			6

Covanta - DYEC 3 - Metals & Particulate May 4, 2016 Plant: Test No.: Date:

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

on Gases	8.06	11.15	20.2		ed H20	%		
Combustion Gases	%20	C02%	COppm		Measured H20	15.4 9		
					0.55 ft [°]	2.5 minutes	2	12
0.3	1.8	454.4	20.8					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.848	0.984	29.44 "Hg	-10.000 "H ₂ O	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%	99.5	99.1	100.8	3.66	100.5	100.6	100.1	98.9	100.0	100.1	99.9	100.9
	Velocity	m/s	16.72	16.72	16.86	17.64	17.65	17.65	17.62	17.62	18.01	17.76	17.76	
Leak	Check	Volume												
	Vacuum	"Hg	5.0	2.0	5.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	6.0	
	¥	"H20	1.5	1.6	1.6	1.8	1.8	1.7	1.7	1.7	1.8	1.8	1.8	
	DGM In	<b>,</b>	06	90	06	90	68	89	89	68	88	68	68	
atures	DGM Out	ų.	84	84	84	84	84	84	84	84	84	84	84	
Temperatures	Imp. Out	ų.	41	42	42	42	43	43	43	43	44	44	44	
	Stack	<u>.</u>	282	282	283	283	284	284	282	282	283	283	283	
	ΔP	"H20	0.63	0.63	0.64	0.7	0.7	0.7	0.7	0.7	0.73	0.71	0.71	
	DGM	Reading	175.34	177.11	178.91	180.70	182.59	184.48	186.36	188.22	190.10	192.02	193.91	195.82
		Time	62.5	65	67.5	70	72.5	75	77.5	80	82.5	85	87.5	06
	***************************************	Point			10			11			12			



## **APPENDIX 27**

Particle Size Distribution Test Emission Calculations at the Boiler No. 2 BH Outlet (6 pages)

# EPA Draft Method - PM_{2.5} Calculations

Тивностиниция (предсервання выправления выпра				on the second of	
Date: 02-May-16	Project No.:	21656	Cyclon	<b>Cyclone Sampling Parameters</b>	
Client: Covanta	Operator:	na	Cyclone Qs _{ST}	Cyclone Qs _{ST} 0.37 Rft³/min*	10
Plant: DYEC			Cyclone Qs actual	0.61 ft³/min	Ţ
Location: Courtice, Ontario			Stack G	Stack Gas Sampling Parameters	
Test No.: Test 1			V _{ms}	44.6 Rft³*	1.2
Test Location: Unit No. 2 BH Outlet			Average Cyclone I Cut Diameter	iameter	9

Stack Diameter (m)	1.37
Stack Width (m)	00.00
Stack Breadth (m)	0.00
Stack Area (m²)	1.47
No. of Traverses	2
No. of Points Per Traverse	9
Data Readings Per Point	1
DGMCF	0.984
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.74
Static Pressure ("H ₂ O)	-9.10
Oxygen Content (%)	8.4
Carbon Dioxide Content (%)	11.2
Carbon Monoxide Content (PPM)	17
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773
THE PROPERTY OF THE PROPERTY O	

Cyclor	<b>Cyclone Sampling Parameters</b>	ers
Cyclone Qs _{ST}	0.37 Rft³/min*	10.4 I/min*
Cyclone Qs actual	0.61 ft³/min	17.3 I/min
Stack 6	Stack Gas Sampling Parameters	ters
Vms	44.6 Rft ^{3*}	1.263 Rm³*
Average Cyclone I Cut Diameter	<b>Diameter</b>	9.95 µm
Average Cyclone IV Cut Diameter	: Diameter	2.24 µm
Average Isokineticity		105.0 %
Stack (	Stack Gas Physical Parameters	ers
B _{ws}	15.0 % v/v	۸/۸
Average m	214.6 (dimensionless)	nsionless)
Ž	30.12 lbs/lbs mole	bs mole
Š	28.31 lbs/lbs mole	bs mole
Average T _s	282 °F	139 °C
Average U _s	57.0 ft/s	17.37 m/s
Stack Area	15.87 ft ²	$1.474  \mathrm{m}^2$
Actual Q _s	54256 ACFM	25.61 m³/s
Wet Reference Q,	38160 SCFM*	18.01 Rm³/s*
Dry Reference Q _s	32452 SCFM*	15.32 Rm³/s*
Summary	Summary of Particulate Emission Rates	n Rates
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	6.97 mg/Rm ^{3*}	0.1067 g/s
Total Part. (b)	23.7 mg/Rm ^{3*}	0.3626 g/s
PM _{2.5} Part. (a)	0.95 mg/Rm ^{3*}	0.01455 g/s
PM _{2.5} Part. (b)	$17.7 \text{ mg/Rm}^{3*}$	0.2705 g/s
Cond. Part.	16.7 mg/Rm³*	0.2559 g/s
Contract son coop (a)	ماطائمةمامة	

(a) does not include condensibles(b) includes condensibles

		Charles and the second	**************************************		The second secon
Impinger Recovery	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5
initial volume or weight (ml or mg)	475.2	561.6	780.5	986.3	
final volume or weight (ml or mg)	629.6	561.6	778.6	997.2	
gain in volume or weight (ml or mg)	154.4	0.0	-1.9	10.9	
	mandatalaski kirjaja kajaja kajaja kajaja kajaja kajaja kajaja kajajaja kajajaja kajajaja kajaja kajaja kajaja			TOTAL	163.4

Particulate Weight Gains	>10mm	>2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	<0.5	7.1	<0.5	0.7	21.1

^{*}Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

## **Test Data Page Calculations**

Date:	Date: 42492	with dissentant and dispersion regarding materials and dispersion of the contract of the contr		Plant: DYEC	DYEC			-	Test No.:		Test 1			Project No.: 21656	21656
Client:	Client: Covanta			Location: Courtice, Onta	Courtice,	Ontario		Test lo	Test location:		Unit No. 2 BH Outlet	BH Outlet		Operator: DU	DO
	AND THE PROPERTY OF THE PROPER	Valenta de la composição de la composiçã	Andrew Green State of the Contract of the Cont												
		Clock	Dwell	Dry Gas			Stack	Meter Temp	Temp	Meter	Pump	Stack	Cyclone I	Cyclone IV	OSI
Port	Point	Time	Time	Meter	2	Desired	Temp	Outlet	Inlet	Pressure	Vacuum	Gas	Cut Diam.	Cut Diam.	
ś			,			cfm				吾	Gauge	Velocity		market in the Carlo Carl	
	***************************************	(min)	(min)	(m³)	("H ₂ O)		(F)	(°F)	(°F)	("H ₂ O)	("Hg)	(ft/s)	(mm)	(mm)	(%)
+1	-	00:00	11.00	43.42	0.84	0.36	272	75	9/	0.45	5.0	62.4	9.83	2.18	95.2
	2	11.00	11.00	47.57	0.83	0.36	283	9/	77	0.45	5.0	62.5	9.81	2.19	97.0
	3	22.00	10.50	51.75	0.74	0.36	284	9/	81	0.45	5.0	59.1	10.04	2.27	9.66
	4	32.50	10.00	55.63	69.0	0.36	284	77	83	0.45	5.0	57.0	9.92	2.23	104.9
	5	42.50	9.00	59.40	0.53	0.36	282	7.7	84	0.45	5.0	49.9	9.99	2.25	118.3
	9	51.50	9.00	62.76	0.50	0.36	282	78	85	0.45	15.0	48.5	10.61	2.50	111.8
		60.50		65.85				-							
2	1	00:00	11.50	65.85	06.0	0.36	284	78	81	0.45	5.0	65.1	9:98	2.25	91.0
	2	11.50	10.50	70.14	0.82	0.36	285	78	85	0.45	5.0	62.2	10.27	2.37	91.7
	3	22.00	10.00	73.92	69.0	0.36	285	79	87	0.45	5.0	57.1	9.42	2.03	113.0
	4	32.00	9.50	78.00	0.62	0.36	285	79	87	0.45	5.0	54.1	98.6	2.21	111.6
	5	41.50	9.50	81.63	09.0	0.36	278	79	87	0.45	5.0	53.0	9.83	2.19	113.3
	9	51.00	10.50	85.27	09:0	0.36	278	80	87	0.45	5.0	53.0	68.6	2.21	112.2
		61.50		89.26											
Averages	;es	eriorist in mercanistation and the second	- Contraction of the Contraction		0.70		282	81	g=4	0.45		57.0	9.95	2.24	105.0

# EPA Draft Method - PM_{2.5} Calculations

<b>Date:</b> May 2, 2016	Project No.:	21656	Cyclon	Cyclone Samplii
Client: Covanta	Operator:	DO	Cyclone Qs _{ST} (	0.35 Rf
Plant: DYEC			Cyclone Qs _{actual}	0.59
Location: Courtice, Ontario			Stack G	Stack Gas Sampl
Test No.: Test 2	-		Vms	42.2
Test Location: Unit No. 2 BH Outlet	-		Average Cyclone I Cut Diameter	<b>Jiameter</b>

	inamius nadiaulėja lietuvo iško principaramantu ir aktivo na 100 m. n. 100 m. ir aktivo iškai ir aktivo ir akti
Stack Diameter (m)	1.37
Stack Width (m)	00.00
Stack Breadth (m)	0.00
Stack Area (m²)	1.47
No. of Traverses	2
No. of Points Per Traverse	9
Data Readings Per Point	1
DGMCF	0.984
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.73
Static Pressure ("H ₂ O)	02.6-
Oxygen Content (%)	8.1
Carbon Dioxide Content (%)	11.4
Carbon Monoxide Content (PPM)	12.8
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclor	Cyclone Sampling Parameters	ers
Cyclone QS _{ST}	0.35 Rft³/min*	9.9 I/min*
Cyclone Qs _{actual}	0.59 ft³/min	16.6 I/min
Stack 6	Stack Gas Sampling Parameters	ers
V _{ms}	42.2 Rft ^{3*}	1.194 Rm³*
Average Cyclone I Cut Diameter	Jiameter	10.22 µm
Average Cyclone IV Cut Diameter	Diameter	2.35 µm
Average Isokineticity		100.4 %
Stack (	Stack Gas Physical Parameters	ers
S _w	15.2 % v/v	۸/۸
Average m	213.8 (dimensionless)	nsionless)
ž	30,15 lbs/lbs mole	bs mole
, and a	28.30 lbs/lbs mole	bs mole
Average T _s	280 °F	138 °C
Average U _s	57.1 ft/s	17.39 m/s
Stack Area	15.87 ft²	1.474 m²
Actual Q _s	54331 ACFM	25.64 m³/s
Wet Reference Q _s	38223 SCFM*	18.04 Rm³/s*
Dry Reference Q _s	32400 SCFM*	15.29 Rm³/s*
Summary c	Summary of Particulate Emission Rates	n Rates
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	$2.26 \text{ mg/Rm}^{3*}$	0.0346 g/s
Total Part. (b)	$9.1\mathrm{mg/Rm^{3*}}$	0.1396 g/s
PM _{2.5} Part. (a)	$0.50  \text{mg/Rm}^{3*}$	0.00768 g/s
PM _{2.5} Part. (b)	7.4 mg/Rm³*	0.1127 g/s
Cond. Part.	6.9 mg/Rm³*	0.1050 g/s
		THE PROPERTY OF THE PROPERTY O

(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)	490.7	670.5	760.8	946.0	
final volume or weight (ml or mg)	639.5	670.2	758.6	927.6	
gain in volume or weight (ml or mg)	148.8	-0.3	-2.2	11.6	
	dessell transmission of the first of the fir	муринения		TOTAL	157.9

	CONTRACTOR			CARROLICATION CONTRACTOR CONTRACT	Charles and the second of the
ate W	>10mm	>2.5mm	<2.5mm	back-up filter	cond, part.
particulate weight gains (mg)	6.0	1.2	9.0	0.0	8.2

^{*}Reference conditions: 77°F, 29.92 in. Hg or 25°C, 101.3 KPa

## Test Data Page Calculations

Date	Date: May 2, 2016	91		Plant: DYEC	DYEC	Transmission of the production	***************************************	T	Test No.:	And the state of t	Test 2			Project No.: 21656	21656	1 1
Client	Client: Covanta	WARRY CONTRACTOR OF THE PROPERTY OF THE PROPER		Location: Courtice, Ontar	Courtice,	Ontario	NATIONAL PROPERTY OF THE PROPE	Test lo	Test location:		Unit No. 2 BH Outlet	3H Outlet		Operator: DU	DO	
- Commercial designation of the Comm	anjeratoromonistischen eine de Esteratoromonistischen	REPORTED THE PROPERTY OF THE P	Principal desired in the contract of the contr		Name and Associated As											
		Clock	Dwe	Dry Gas			Stack	Meter Temp	Temp	Meter	Pump	Stack	Cyclone I	Cyclone IV	ISO	
Port	Poir	in a	Ţ	Meter	8	Desired	Temp	Outlet	Inlet	Pressure	Vacuum	Gas	Cut Diam.	Cut Diam.		
Š						ctm	and the second	nasiasadona/WP:	D-4624-1.	품	Gauge	Velocity				
**************************************	SCORE ASSESSED	(min	(min)	(ft³)	("H ₂ O)		(%)	(°F)	(°F)	("H ₂ O)	(Hg	(ft/s)	(mm)	(mm)	(%)	- 1
П	1	0.00	11.00	389.42	0.85	98'0	277	79	79	0.40	5.0	63.1	9.84	2.19	94.7	1 1
	2	11.00	11,00	393.57	0.85	0.36	282	79	81	0,40	5.0	63.3	9.87	2.21	94.8	
	3	22.00	10.50	397.72	0.74	98'0	284	79	85	0.40	5.0	59.1	11.08	2.70	86.5	
	4	32,50	10.00	401.10	69'0	98'0	282	8	98	0.40	5.0	57.0	66'6	2.25	103.5	
Charles	5	42.50	9.00	404.83	09'0	0.36	281	80	88	0,40	5.0	53.1	10.30	2.38	106.2	1
	9	51,50	00'6	408.05	09'0	0.36	281	80	88	0.40	5.0	53.1	10.08	2.29	109.5	- 1
		60.50		411.37												- 1
2	1	00.00	11.50	411.37	98.0	0.36	278	80	85	0.40	5.0	63.5	9.91	2.22	93.4	1
	2	11,50	10.50	415.70	0.72	0.36	284	81	88	0,40	5.0	58.3	10,63	2.51	93.0	ŧ
	3	22.00	10,00	419.30	0.68	98'0	283	81	88	0.40	5.0	9'95	10.26	2.36	100.4	- 1
	4	32.00	9.50	422.90	0.57	98'0	277	81	68	0.40	5.0	51.6	10.19	2.33	110.1	- 1
	5	41.50	9.25	426.35	09'0	98'0	277	81	68	0.40	5.0	53.0	10.11	2.30	108.6	1
	9	50.75	9.25	429.75	09'0	0.36	277	81	89	0.40	5.0	53.0	10.44	2.43	103.8	- 1
		00'09		433.00												- 1
Averages	çes				0.70		280	83	*	0.40		57.1	10.22	2.35	100.4	

# EPA Draft Method - PM_{2.5} Calculations

<b>Date:</b> May 2, 2016	Project No.:	21656	Cyclon	Cyclone Sampling Parameter
Client: Covanta	Operator:	na	Cyclone Qs _{ST}	0.33 Rft³/min*
Plant: DYEC			Cyclone Qs _{actual}	0.56 ft³/min
Location: Courtice, Ontario			Stack G	Stack Gas Sampling Paramete
Test No.: Test 3			Vms	40.0 Rft ^{3*}
Test Location: Unit No. 2 BH Outlet			Average Cyclone I Cut Diameter	iameter
			Average Cyclone IV Cut Diameter	Diameter

Stack Diameter (m)	1.37
Stack Width (m)	0.00
Stack Breadth (m)	0.00
Stack Area (m²)	1.47
No. of Traverses	2
No. of Points Per Traverse	9
Data Readings Per Point	Ţ
DGMCF	0.984
Pitot Factor	0.846
Barometric Pressure (" Hg)	29.73
Static Pressure ("H ₂ O)	-9.70
Oxygen Content (%)	8.3
Carbon Dioxide Content (%)	11.3
Carbon Monoxide Content (PPM)	31.9
Assumed Moisture (%)	
Nozzle Diameter (inches)	0.1773

Cyclor	Cyclone Sampling Parameters	ers
Cyclone QS _{ST}	0.33 Rft³/min*	9.4 I/min*
Cyclone Qs actual	0.56 ft³/min	15.9 I/min
Stack 6	Stack Gas Sampling Parameters	ers
V _{ms}	40.0 Rft ^{3*}	1.133 Rm³*
Average Cyclone I Cut Diameter	iameter	10.53 µm
Average Cyclone IV Cut Diameter	Diameter	2.47 µm
Average Isokineticity		92.7 %
Stack (	Stack Gas Physical Parameters	ers
Bws	15.6 % v/v	۸/۸
Average m	214.1 (dimensionless)	nsionless)
M	30.14 lbs/lbs mole	bs mole
M	28.25 lbs/lbs mole	bs mole
Average T _s	282 °F	139 °C
Average U _s	59.3 ft/s	18.07 m/s
Stack Area	15.87 ft²	1.474 m²
Actual Q _s	56453 ACFM	26.64 m³/s
Wet Reference Q _s	39623 SCFM*	18.70 Rm³/s*
Dry Reference Q _s	33435 SCFM*	15.78 Rm³/s*
Summary c	Summary of Particulate Emission Rates	n Rates
	Dry Ref. Conc.	Emission Rate
Total Part. (a)	4.85 mg/Rm³*	0.0766 g/s
Total Part. (b)	$20.0 \text{ mg/Rm}^{3*}$	0.3161 g/s
PM _{2.5} Part. (a)	$1.15 \text{ mg/Rm}^{3*}$	0.01810 g/s
PM _{2.5} Part. (b)	16.3 mg/Rm³*	0.2576 g/s
Cond. Part.	$15.2 \text{ mg/Rm}^{3*}$	0.2395 g/s
	S S S S S S S S S S S S S S S S S S S	

⁽a) does not include condensibles (b) includes condensibles

Lacas Lacas Documents	1	6 1000	2 2000000000000000000000000000000000000	Impinor A	Imninger 5
	T iaguidiiii	mipinger 4	HINNISCI S	r iognidiii	C 129d.
initial volume or weight (ml or mg)	475.4	563.2	776.3	1003.6	
final volume or weight (ml or mg)	620.5	561.5	775.3	1015.5	
gain in volume or weight (ml or mg)	145.1	-1.7	-1.0	11.9	0:0
	algorinis feturalista de la facta de l	Charteron and the state of the		TOTAL	154.3

Particulate Weight Gains	>10mm	>2.5mm	<2.5mm	back-up filter	cond. part.
particulate weight gains (mg)	0.8	3.4	<0.5	0.8	17.2

## **Test Data Page Calculations**

Date:	Date: May 2, 2016	16		Plant: DYEC	DYEC		инистичновую меняствоние и поставления и по	F	Test No.:		Test 3	- Communication of the Communi		Project No.: 21656	21656
Client:	Client: Covanta			Location: Courtice, Onta	Courtice,	Ontario		Test lc	Test location:		Unit No. 2 BH Outlet	3H Outlet		Operator: DU	DU
- Anna San Control of the Control of				Ånssmanjoniquerquerdernonomonististernonom	Mercelland Company of the Company of			Haraconton property and the second of	Na stransverski se spransverski se	AMONICA NITRO PER GENERAL PER CONTRACTOR PARAMETERS AND STATE OF S	antichentelestation de l'action de la company de la compan				
		Clock	Dwell	Dry Gas			Stack	Meter Temp	Temp	Meter	Pump	Stack	Cyclone I	Cyclone IV	ISO
Port	Point	Time	Time	Meter	8	Desired	Temp	Outlet	Inlet	Pressure	Vacuum	Gas	Cut Diam,	Cut Diam.	
Š						t t			emiles (text	H	Gauge	Velocity			
***************************************		(min)	(min)	(ft³)	("H ₂ O)		(°F)	(°F)	(°F)	("H ₂ O)	("Hg)	(ft/s)	(mm)	(mm)	(%)
1	1	0.00	11.00	33.13	0.81	0.35	275	79	78	0.35	5.0	61.5	10.59	2.49	87.2
	2	11.00	11.00	36.85	0.80	0.35	283	79	81	0.35	5.0	61.5	10.57	2.49	88.7
	3	22.00	10.50	40.60	0.75	0.35	283	79	84	0.35	5.0	59.5	10.51	2.46	92.4
	4	32.50	10.00	44.22	0.75	0.35	285	79	98	0.35	5.0	29.6	10.52	2.47	92.4
	5	42.50	9.25	47.67	0.75	0.35	282	79	87	0.35	5.0	59.5	10.41	2.42	93.5
No. of Concession, Name of Street, or other party of the Street, o	9	51.75	9.25	50.91	0.73	0.35	280	79	88	0.35	5.0	58.6	10.46	2.44	94.0
		61.00		54.13											
2	1	0.00	11.25	54.13	0.95	0.35	279	79	85	0.35	5.0	8.99	10.52	2.47	81.6
	2	11.25	10.25	58.00	0.78	0.35	286	79	87	0.35	5.0	8.09	10.56	2.49	90.1
	3	21.50	10.00	61.52	0.73	0.35	285	79	88	0.35	5.0	58.8	10.55	2.49	93.2
	4	31.50	9.00	64.96	0.68	0.35	284	79	88	0.35	5.0	56.7	10.57	2.49	96.3
The state of the s	5	40.50	9.25	68.05	0.67	0.35	282	79	88	0.35	5.0	56.2	10.53	2.47	97.3
	9	49.75	9.25	71.24	0.57	0.35	280	79	88	0.35	5.0	51.8	10.53	2.47	105.4
		29.00		74.43											
Averages	es	ingradistration in the contract of the contrac			0.75		282	82	تم	0.35		59.3	10.53	2.47	92.7



## **APPENDIX 28**

Acid Gases Test Emission Calculations at the Boiler No. 2 BH Outlet (6 pages)

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Unit No. 2 BH Outlet

Test No.:

1 - Acid Gases (Method 26A)

Date:

May 3, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.98
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	1.184 m ³
AVGERGE ISOKINETICITY	98.5 %
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	144.1 °C
AVERAGE GAS MOISTURE BY VOLUME	15.2 %
AVERAGE GAS VELOCITY	17.26 m/s
BAROMETRIC PRESSURE (Station)	100.373 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	97.883 Kpa
OXYGEN CONCENTRATION	8.21 %
CARBON DIOXIDE CONCENTRATION	11.12 %
CARBON MONOXIDE CONCENTRATION	17.8 ppm

## FLOWRATE

ACTUAL GAS FLOWRATE	25.50 m ³ /s
DRY REF GAS FLOWRATE	14.92 Rm³/s
DRY ADJ GAS FLOWRATE	19.12 Rm³/s
WET REF GAS FLOWRATE	17.61 Rm³/s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.184 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC Plant: Test No.:

1 - Acid Gases (Method 26A) May 3, 2016

Date:

 Plant Location:
 Courtice, ON

 Test Location:
 Unit No. 2 BH Outlet

 Operator:
 TT

					Viji Kasakoor				
tion Gases	<b>02</b> % 8.21	11.12	COppm 17.8		Measured H20	%			
Combus	02%	CO2%	COppm		Measu	15.2 %			
					0 ft²	5 minutes	⊣	Н	
0	0	146.3	10.2						
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port	
0.841	0.98	29.64 "Hg	-10.000 "H ₂ O	0.2553 inches	4.500 ft	0.000 ft	0.000 ft		
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width		

	Isokinetic	%		97.4	97.2	97.8	99.3	98.8	99.1	98.7	0.66	98.3	98.8	99.3	98.7
	Velocity	m/s	17.14	17.42	17.53	17.43	17.42	17.16	17.14	17.14	17.13	17.24	17.24	17.13	
Leak	Check	Volume													
	Vacuum	"Hg	2.5	2.5	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	НΩ	"H20	1.6	1.65	1.7	1.7	1.7	1.65	1.65	1.65	1.65	1.7	1.7	1.65	
	DGM In	<b>.</b>	77	80	80	81	81	81	81	81	82	82	82	82	
atures	DGM Out	<b></b>	78	81	81	82	83	84	84	84	84	82	85	85	
Temperatures	Imp. Out	Ľ.	82	56	55	56	58	09	09	62	. 56	54	53	23	
territoria de la composición del la composición del composición del composición del composición de la composición de la composición de la composición del composic	Stack	ų.	291	293	292	294	293	293	291	291	290	289	289	290	
	Δp	"H20	0.67	0.69	0.7	69.0	69.0	79.0	0.67	0.67	79.0	0.68	0.68	79.0	
	DGM	Reading	24.28	27.79	31.36	34.98	38.63	42.27	45.87	49.46	53.06	56.64	60.27	63.92	67.52
		Time	0	2	10	15	20	25	30	35	40	45	50	55	09
		Point	1												

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Unit No. 2 BH Outlet

Test No.:

2 - Acid Gases (Method 26A)

Date:

May 3, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.98
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	1.256 m ³
AVGERGE ISOKINETICITY	99.1 %
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	144.6 °C
AVERAGE GAS MOISTURE BY VOLUME	15.5 %
AVERAGE GAS VELOCITY	18.31 m/s
BAROMETRIC PRESSURE (Station)	100.305 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	97.815 Kpa
OXYGEN CONCENTRATION	8.77 %
CARBON DIOXIDE CONCENTRATION	10.76 %
CARBON MONOXIDE CONCENTRATION	17.0 ppm

## **FLOWRATE**

ACTUAL GAS FLOWRATE	27.06 m ³ /s
DRY REF GAS FLOWRATE	15.74 Rm³/s
DRY ADJ GAS FLOWRATE	19.29 Rm³/s
WET REF GAS FLOWRATE	18.65 Rm ³ /s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.256 m ³
PARTICULATE CONC ACTUAŁ		0.000 mg/m ³
PARTICULATE CONC DRY REF		0.000 mg/m ³
PARTICULATE CONC DRY ADJ		0.000 mg/m ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE	•	0.00000 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

Covanta - DYEC Test No.: Plant:

May 3, 2016 Date:

2 - Acid Gases (Method 26A)

Test Location: Unit No. 2 BH Outlet Plant Location: Courtice, ON

Operator:

Combustion Gases 10.76 17.0 8.77 Measured H20 15.5 % CO2% COppm 02% 5 minutes 0 ft³ 157.2 12.8 0 0 Number of points / Port Leak Check Volume Number of Ports Reading Interval CWTR (g) WCBDA (g) Probe (mg) Filter (mg) 0.841 0.98 29.62 "Hg -10.000 "H₂O 0.2553 inches 0.000 ft 0.000 ft 4.500 ft Barometric Pressure Static Pressure Stack Diameter Pitot Factor DGMCF Nozzle Length Width

	Isokinetic	%		100.3	98.5	98.5	98.3	98.2	0.66	98.4	99.4	9.66	99.2	8.66	1001
	Velocity	m/s	17.90	18.16	17.92	18.17	18.17	18.17	18.17	18.18	18.66	18.91	18.79	18.56	
Leak	Check	Volume													
	Vacuum	"Hg	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.2	3.5	3.5	3.5	
	РΖ	"H20	1.8	1.85	1.75	1.85	1.85	1.85	1.85	1.85	1.95	2	7	1.9	
	DGM In	<b>4</b> ₀	82	82	82	82	82	82	82	83	83	83	83	83	
atures	DGM Out	<b>4</b> ₀	83	83	83	83	84	84	85	82	85	85	85	85	
Temperatures	Imp. Out	<u>t</u>	75	09	58	58	59	59	61	63	63	61	09	09	
	Stack	<b>.</b>	290	291	291	292	292	292	292	293	293	294	294	294	
	ΔP	"H20	0.73	0.75	0.73	0.75	0.75	0.75	0.75	0.75	0.79	0.81	0.8	0.78	
	DGM	Reading	67.97	71.77	75.55	79.28	83.05	86.82	90.62	94.40	98.22	102.15	106.11	110.07	113.99
		Time	0	5	10	15	20	25	30	35	40	45	20	55	09
		Point	1												

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Unit No. 2 BH Outlet

Test No.:

3 - Acid Gases (Method 26A)

Date:

May 3, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.841
DGM CORRECTION FACTOR	0.98
NOZZLE DIAMETER	6.48 mm
DRY REF GAS VOLUME SAMPLED	1.191 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	142.9 °C
AVERAGE GAS MOISTURE BY VOLUME	15.8 %
AVERAGE GAS VELOCITY	17.18 m/s
BAROMETRIC PRESSURE (Station)	100.203 Kpa
STATIC PRESSURE	-2.490 Kpa
ABSOLUTE GAS PRESSURE	97.7 <b>13</b> Kpa
OXYGEN CONCENTRATION	8.18 %
CARBON DIOXIDE CONCENTRATION	11.22 %
CARBON MONOXIDE CONCENTRATION	13.6 ppm

## **FLOWRATE**

ACTUAL GAS FLOWRATE	25.38 m ³ /s
DRY REF GAS FLOWRATE	14.77 Rm ³ /s
DRY ADJ GAS FLOWRATE	18.98 Rm³/s
WET REF GAS FLOWRATE	17.55 Rm ³ /s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		1.191 m³
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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Plant Location: Courtice, ON
Test Location: Unit No. 2 BH Outlet
Operator: TT

Plant:Covanta - DYECTest No.:3 - Acid Gases (Method 26A)Date:May 3, 2016

Combustion Gases	02% 8.18	CO2% 11.22	COppm 13.6		Measured H2O	15.8 %		
					0 ft ²	5 minutes	Н	П
0	0	154.4	9.7					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.841	0.98	29.59 "Hg	-10,000 "H ₂ O	0.2553 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%		102.5	99.5	100.3	2.66	8.66	9.66	8.66	100.8	100.2	100.3	99.1	100.3
	Velocity	s/w	17.29	17.16	17.15	17.02	17.27	17.40	17.40	17.65	17.02	16.63	17.02	17.15	
Leak	Check	Volume													
	Vacuum	aH.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
	Ч∇	"H20	1.7	1.7	1.7	1.65	1.7	1.7	1.7	1.8	1.65	1.6	1.65	1.7	
	DGM In	٩,	81	82	81	81	81	81	81	81	82	82	82	82	
atures	DGM Out	ታ,	82	82	82	. 82	83	83	83	84	84	84	84	84	
Temperatures	Imp. Out	<b>.</b>	78	56	53	53	53	53	53	54	55	26	57	58	
	Stack	<u>.</u>	290	290	289	289	289	289	289	289	289	289	289	289	
	ΔР	"H20	0.68	0.67	0.67	99.0	0.68	0.69	69.0	0.71	0.66	0.63	99.0	0.67	
	DGM	Reading	14.48	18.21	21.81	25.44	29.02	32.66	36.32	39.99	43.75	47.36	50.89	54.46	58.10
		Time	0	5	10	15	20	25	30	35	40	45	50	55	09
		Point	1												



## **APPENDIX 29**

SVOC Test Emission Calculations at the Boiler No. 2 BH Outlet (12 pages)

Plant:

Covanta - DYEC Courtice, ON

Plant Location: Test Location:

Boiler No. 2 BH Outlet

Test No.:

1 - SVOC

Date:

May 5, 2016

## STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.848
DGM CORRECTION FACTOR	0.984
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	7.287 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	139.9 °C
AVERAGE GAS MOISTURE BY VOLUME	16.2 %
AVERAGE GAS VELOCITY	17.47 m/s
BAROMETRIC PRESSURE (Station)	100.135 Kpa
STATIC PRESSURE	-2.565 Kpa
ABSOLUTE GAS PRESSURE	97.571 Kpa
OXYGEN CONCENTRATION	7.99 %
CARBON DIOXIDE CONCENTRATION	11.41 %
CARBON MONOXIDE CONCENTRATION	17.5 ppm

## FLOWRATE

ACTUAL GAS FLOWRATE	25.82 m³/s
DRY REF GAS FLOWRATE	15.04 Rm ³ /s
DRY ADJ GAS FLOWRATE	19.62 Rm³/s
WET REF GAS FLOWRATE	17.95 Rm³/s

## PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		7.287 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC 1 - SVOC May 5, 2016 Plant: Test No.: Date:

Plant Location: Courtice, ON
Test Location: Boiler No. 2 BH Outlet
Operator: AN

Combustion Gases	02% 7.99	CO2% 11.41	COppm 17.5		Measured H2O	16.2 %		
					0.53 ft³	5 minutes	2	12
С	0	1007.8	24.5					
Filter (mp)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0 848	0.984	29.57 "Hg	$-10.300 \text{ "H}_2^{\circ}$	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
Ditot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzie	Stack Diameter	Length	Width	

	Isokinetic	%		103.2	99.3	101.2	100.4	101.2	101.1	101.5	101.4	101.0	101.4	102.0	100.3	102.0	100.3	100.5	101.3	101.1	101.0	101.7	9.66	100.8	97.9	102.1	101.8	100.0	101.8	100.3	101.3	101.1	102.1
	Velocity	s/w	17.33	16.86	16.98	18.00	18.36	18.60	18.85	18.86	18.75	18.63	18.40	18.52	17.66	17.91	17.66	17.27	17.27	17.26	17.00	16.87	16.61	16.87	17.00	17.00	17.25	17.39	17.63	17.76	17.77	18.76	17.54
Leak	Check	Volume																															
	Vacuum	"Hg	7.0	7.0	7.0	7.0	7.5	7.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.0	7.0	7.0	7.5	7.0	7.0	7.0	7.0	7.0	7.0	7.5	7.5	7.5	8.0	8.0	8.0
	РИ	"H20	1.8	1.5	1.6	1.8	1.9	1.95	2	2	1.95	1.95	1.9	1.85	1.75	1.75	1.7	1.65	1.65	1.65	1.6	1.55	1.5	1.55	1.6	1.6	1.6	1.7	1.7	1.75	1.75	7	1.7
	DGM in	<u>u</u>	82	82	83	85	85	98	98	98	98	98	98	98	98	98	87	87	87	87	87	87	88	88	88	88	88	88	88	87	87	87	98
itures	DGM Out	u.	80	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	87	83	83	83	83	83	83	83
Temperatures	Imp. Out	ů.	72	45	45	45	44	44	45	45	45	46	46	46	47	47	47	48	48	48	49	47	47	46	46	46	46	46	47	47	47	47	47
	Stack	٦ ₀	280	284	283	283	283	283	284	285	285	285	286	286	286	286	286	286	286	285	285	285	285	285	285	285	284	285	284	284	285	286	287
	ΔР	"H20	0.68	0.64	0.65	0.73	0.76	0.78	0.8	8.0	0.79	0.78	0.76	0.77	0.7	0.72	0.7	0.67	0.67	0.67	0.65	0.64	0.62	0.64	0.65	0.65	0.67	0.68	0.7	0.71	0.71	0.79	69.0
	DGM	Reading	1.60	5.35	8.85	12.45	16.24	20.14	24.09	28.10	32.11	36.08	40.04	43.97	47.86	51.63	55.39	59.11	62.78	66.44	70.10	73.73	77.26	80.78	84.25	87.90	91.55	95.18	98.90	102.62	106.40	110.17	114.18
		Time	0	5	10	15	20	25	30	35	40	45	20	55	09	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150
		Point	1			2			က			4			2			9			7			8			6			10			11

Covanta - DYEC 1 - SVOC May 5, 2016 Plant: Test No.: Date:

Pitot Factor	0.848	Filter (mg)	0		Combusti	Combustion Gases
DGMCF	0.984	Probe (mg)	0		%20	7.99
Barometric Pressure	29.57 "Hg	CWTR (g)	1007.8		C02%	11.41
Static Pressure	-10.300 "H ₂ O	WCBDA (g)	24.5		COppm	17.5
Nozzle	0,2543 inches					
Stack Diameter	4,500 ft	Leak Check Volume		0.53 ft ³	Measured H2O	ed H2O
Length	0.000 ft	Reading Interval		5 minutes	16.2	%
Width	0.000 ft	Number of Ports		2		
		Number of points / Port		12		

***************************************	lenkinotin	source:	5 66	103.8	101.8	2.66	100.2	100.8	101.1		8.66	103.2	102.3	100.3	100.8	104.0	9.76	100.0	100.0	9.66	100.7	102.4	102.8	100.4	102.0	96.1	103.3	101.3	100.7	101.5	101.1	100.5	100.2	102.3
	Volocity	weiocity m/s	6/11	17.1U	17.10	17.97	18.13	17.92		18.20	18.23	18.11	18.94	18.96	18.84	18.83	18.23	18.35	17.61	18.13	18.25	17.55	17.12	17.63	16.06	15.64	15.64	16.33	16.18	16.19	16.31	16.31	16.45	17.51
1001	Chock	Volume	AOIGILICA						0.53																									
	Vacinim	"Ho	311	٠./	7.0	7.5	8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.5	8.0	8.0	8.0	7.5	8.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.5
	2	ממ"	7	J.6	1.55	1.8	1.8	1.75		1.9	1.9	1.9	2	2	2	2	1.9	1.9	1.7	1.8	1.9	1.7	1.6	1.8	1.4	1.4	1.3	1.45	1.45	1.45	1.5	1.5	1.6	1.7
AND REAL PROPERTY OF THE PROPE	2.540.0	= # = #	-	/8	98	87	87	98		83	84	85	85	86	85	85	85	98	98	98	98	86	98	87	98	98	87	88	88	89	88	89	89	68
	atures		_	83	83	83	83	83		82	82	82	82	82	82	82	82	82	82	82	82	83	83	83	83	83	83	83	83	83	83	83	83	83
	lemperatures	Tho de	_	47	47	47	47	48		64	48	49	50	46	46	46	45	45	45	45	45	46	46	47	48	48	48	49	49	49	49	49	49	20
		Stack oF	_	282	282	281	284	287		280	282	282	282	283	283	282	282	282	282	284	284	288	284	284	285	285	285	284	283	284	283	283	283	284
		<b>₹</b>	070	99.0	99'0	0.73	0.74	0.72		0.75	0.75	0.74	0.81	0.81	0.8	0.8	0.75	0.76	0.7	0.74	0.75	0.69	0.66	0.7	0.58	0.55	0.55	9.0	0.59	0.59	9.0	9.0	0.61	69:0
	c C	N DO	Keading	117.99	121.66	125.25	129.05	132.89	136.68	137.21	141.03	144.98	148.87	152.86	156.87	160.98	164.84	168.67	172.53	176.22	180.05	183.97	187.74	191.35	195.13	198.37	201.76	205.09	208.55	212.01	215.46	218.92	222.37	225.92
		ï	IIme	155	160	165	170	175	180	0	5	10	15	20	25	30	35	40	45	20	22	09	65	70	75	80	85	06	95	100	105	110	115	120
		i	Point			12				₩			2			m			4			2			9			7			∞			6

Plant: Covanta - DYEC

COVAINTA = DIEC	1 - SVOC	May 5, 2016	
1911	Test No.:	Date:	

on Gases	7.99	11,41	17.5		ed H2O	%		
Combustion Gases	02%	C02%	COppm 17.5		Measured H2O	16.2 9		
					0.53 ft²	5 minutes	2	12
0	0	1007.8	24.5					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.848	0.984	29.57 "Hg	-10.300 "H ₂ O	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzie	Stack Diameter	Length	Width	

	Isokinetic	%	100.6	101.0	101.1	101.6	100.4	102.3	102.6	100.2	101.1	102.5	100.7	100.8
	Velocity	m/s	17.50	17.88	17.51	17.65	17.76	16.47	16.71	16.57	15.60	15.74	16.16	
Leak	Check	Volume												
	Vacuum	"Hg	7.5	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.0	7.0	7.0	
	М	"H20	1.7	1.8	1.7	1.7	1.8	1.5	1.5	1.5	1.3	1.35	1.5	
	DGM In	°F.	89	89	89	89	89	89	89	91	80	06	90	
atures	DGM Out	Ľ.	84	84	84	84	84	84	84	84	84	84	84	
Temperatures	Imp. Out	Ľ.	50	20	51	51	51	51	51	52	51	52	52	
	Stack	°-	283	284	284	285	284	285	282	282	281	281	281	
•	ΔP	"H20	0.69	0.72	69.0	0.7	0.71	0.61	0.63	0.62	0.55	0.56	0.59	
	DGM	Reading	229.63	233.36	237.17	240.92	244.65	248.48	252.04	255.58	259.13	262.49	265.85	269.30
		Time	125	130	135	140	145	150	155	160	165	170	175	180
		Point			10			11			12			

Plant:Covanta - DYECPlant Location:Courtice, ON

Test Location: Boiler No. 2 BH Outlet

 Test No.:
 2 - SVOC

 Date:
 May 9, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.848
DGM CORRECTION FACTOR	0.984
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	6.961 m ³
AVGERGE ISOKINETICITY	100.0 %
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	138.0 °C
AVERAGE GAS MOISTURE BY VOLUME	16.1 %
AVERAGE GAS VELOCITY	16.64 m/s
BAROMETRIC PRESSURE (Station)	101.050 Kpa
STATIC PRESSURE	-2.565 Kpa
ABSOLUTE GAS PRESSURE	98.485 Kpa
OXYGEN CONCENTRATION	7.9 %
CARBON DIOXIDE CONCENTRATION	11.56 %
CARBON MONOXIDE CONCENTRATION	19.0 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE	24.58 m³/s
DRY REF GAS FLOWRATE	14.53 Rm ³ /s
DRY ADJ GAS FLOWRATE	19.08 Rm ³ /s
WET REF GAS FLOWRATE	17.33 Rm ³ /s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		6.961 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 ⁴
PARTICULATE CONC WET REF		0.000 mg/m ³
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC 2 - SVOC Plant:

May 9, 2016 Test No.: Date:

Boiler No. 2 BH Outlet Plant Location: Courtice, ON AN Test Location: Operator: Combustion Gases 11.56 19.0 Measured H2O 16.1 % 7.9 02% CO2% COppm 5 minutes 0.48 ft² 2 961.9 21.5 00 Number of points / Port Leak Check Volume **Number of Ports** Reading Interval Probe (mg) CWTR (g) WCBDA (g) Filter (mg) 0.2543 inches 29.84 "Hg -10.300 "H₂O 0.000 ft 0.000 ft 4.500 ft 0.984 **Barometric Pressure** Static Pressure Stack Diameter Pitot Factor DGMCF Length Nozzle Width

Temperatures

		;	-1					;		-		1000000
			ΔP	Stack	Imp. Out	DGM Out	E E	Ā	Vacuum	Z eck	Velocity	isokinetic
Point	Time	Reading	"H20	9°F	<b>4</b> 0	u. o	<b>=</b>	"H20	"Hg	Volume	m/s	%
1	0	35.00	0.68	278	71	71	71	1.6	7.0		17.22	
	5	38.62	99.0	278	43	73	73	1.5	7.5		16,97	101.7
	10	42.04	0.68	278	42	73	75	1.6	7.5		17.22	97.1
2	15	45.54	0.7	279	42	73	77	1.7	8.0		17.49	97.8
	20	49.20	0.7	279	42	73	79	1.7	8.0		17.49	100.7
	25	52.87	0.73	279	41	74	98	1.7	8.0		17.86	100.8
ю	30	56.53	0.7	279	42	74	82	1.7	8.0		17.49	7.76
	35	60.18	0.69	280	42	75	83	1.7	8.0		17.37	6.66
	40	63.82	0.7	280	42	75	83	1.7	8.0		17.50	100.2
4	45	67.46	0.64	280	43	75	84	1.5	8.0		16.73	99.5
	50	70.92	0.64	281	42	75	84	1.6	7.5		16.74	98.7
	55	74.44	99.0	280	42	75	84	1.6	7.5		16.99	100.5
2	09	77.97	0.59	280	42	9/	85	1.4	7.5		16.06	99.2
	65	81.36	0.55	281	42	9/	85	1.3	7.0		15.52	100.5
	70	84.64	0.54	281	42	9/	98	1.3	7.0		15.38	100.8
9	75	87.87	0.53	279	42	9/	85	1.3	7.0		15.22	100.1
	80	91.08	0.52	280	41	76	85	1.3	7.0		15.08	100.4
	85	94.27	0.51	280	40	76	85	1.2	7.0		14.94	100.8
7	06	97.40	0.5	283	40	76	87	1.2	7.0		14.82	8.66
	95	100.51	0.53	282	40	76	98	1.3	7.0		15.25	100.2
	100	103.74	0.53	281	40	9/	85	1.3	7.0		15.24	101.1
8	105	106.97	0.54	281	40	. 92	85	1.3	7.0		15.38	101.1
	110	110.19	0.54	281	40	76	85	1.3	7.0		15.38	6.66
	115	113.42	0.53	281	40	9/	85	1.3	7.0		15.24	100.2
6	120	116.64	0.57	281	41	75	85	1.3	7.0		15.80	100.8
	125	119.91	0.56	281	41	75	85	1.3	7.0		15.66	98.8
	130	123.20	0.56	280	41	92	84	1.3	7.0		15.65	100.3
10	135	126.49	0.56	280	40	75	84	1.3	7.0		15.65	100.2
	140	129.78	0.56	280	39	75	84	1.3	7.0		15.65	100.3
	145	133.06	0.54	281	39	92	82	1.3	7.0		15.38	100.0
11	150	136.29	0.55	279	39	75	84	1.3	7.0		15.50	100.2

Covanta - DYEC 2 - SVOC Plant: Test No.:

May 9, 2016 Date: Barometric Pressure Static Pressure

Pitot Factor DGMCF

Stack Diameter

Length Width

Nozzle

Plant Location: Courtice, ON

Test Location: Boiler No. 2 BH Outlet AN Operator:

Combustion Gases Measured H2O 16.1 % 02% C02% C0ppm 0.48 ft³ 5 minutes 2 12 0 0 961.9 21.5 Number of Ports Number of points / Port Leak Check Volume Reading Interval Probe (mg) CWTR (g) WCBDA (g) Filter (mg) 0.2543 inches 0.848 0.984 29.84 "Hg -10.300 "H₂O 0.000 ft 0.000 ft 4.500 ft

11.56 19.0

7.9

	Isokinetic	%	8 007
	Vacuum Check Velocity	s/m	L
Leak	Check	Volume	
	Vacuum	"Hg	
	ΗQ	"H20	
	DGM in	<b>J</b> ₀	
atures	DGM Out	<b></b>	
Temperatures	Imp. Out	<b>4</b> °	
	Stack	ሥ	
	Δb	"H20	
	DGM	Reading	
- And considerable and		Time	
		Point	

					Temperatures	atures				Lea X		
		DGM	ΔP	Stack	Imp. Out	DGM Out	DGM In	ЧΖ	Vacuum	Check	Velocity	Isokinetic
Point	Time	Reading	"H20	<b>4</b> 0	<b>.</b>	<b>4</b> °	<b>4</b> ₀	"H20	"Hg	Volume	m/s	%
	155	139,55	0.53	279	39	75	84	1.3	7.0		15.22	100.2
	160	142.81	0.54	279	39	75	85	1.3	7.0		15.36	102.1
12	165	146.07	0.54	279	38	75	84	1.3	7.0		15.36	101.1
	170	149.29	0.56	279	39	75	83	1.3	7.0		15.64	6.66
	175	152.55	0.57	279	39	75	85	1.35	7.0		15.78	99.4
	180	155.87								0.48		100.2
⊣	0	156.35	0.75	280	20	73	92	1.8	8.5		18.11	
	3	160.17	0.65	281	39	74	78	1.5	8.0		16.87	101.7
	10	163.73	0.63	281	39	73	79	1.4	7.5		16.61	101.5
2	15	167.10	0.74	281	39	73	80	1.8	8.0		18.00	97.6
	20	170.77	0.73	281	39	73	81	1.7	8.5		17.88	98.1
	25	174.47	0.74	281	38	73	81	1.8	8.5		18.00	99.4
က	30	178.24	0.74	282	38	73	81	1.8	8.5		18.02	100.7
	35	182.04	0.74	281	38	73	81	1.8	8.5		18.00	101.5
	40	185.75	0.74	282	39	73	81	1.8	8.5		18.02	99.1
4	45	189.55	0.72	282	39	73	81	1.7	8.5		17.77	101.5
	50	193.24	0.73	282	39	73	83	1.8	8.5		17.89	6.66
	55	196.98	0.71	282	39	74	85	1.7	8.5		17.65	100.4
2	09	200.68	0.69	283	40	73	81	1.7	8.5		17.41	100.4
	65	204.35	0.68	282	40	73	81	1.7	8.5		17.27	101.6
	70	207.99	0.68	282	40	73	81	1.6	8.0		17.27	101.4
9	75	211.59	0.64	282	41	73	82	1.5	8.0		16.75	100.3
	80	215.07	0.61	282	41	73	83	1.4	8.0		16.36	8.66
	85	218.50	9.0	281	41	73	82	1,4	8.0		16.21	100.7
7	06	222.03	0.63	281	41	73	82	1.5	8.0		16.61	104.5
	95	225.36	0.62	281	42	73	82	1.45	8.0		16.48	96.2
	100	228.74	0.62	281	42	73	82	1.45	8.0		16.48	98.4
8	105	232.11	99.0	281	42	73	83	1.55	8.0		17.00	98.1
	110	235.55	0.65	282	43	73	83	1.55	8.0		16.88	97.0
	115	239.07	0.63	282	43	74	85	1.3	7.5		16.62	100.1
6	120	242.38	0.71	282	44	73	82	1.7	8.0		17.65	95.3

Covanta - DYEC 2 - SVOC May 9, 2016

Plant: Test No.: Date:

7,9	11.56	n 19.0		sured H20	3.1%		
02%	C02%	COppu		Mea	16		
				0.48 ft [°]	5 minutes	2	12
0	961.9	21.5					
Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.984	29.84 "Hg	-10.300 "H2O	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	
	0.984 Probe (mg) 0	0.984 Probe (mg) 0 29.84 "Hg CWTR (g) 961.9	0.984 <b>Probe (mg)</b> 0 29.84 "Hg <b>CWTR (g)</b> 961.9 -10.300 "H ₂ O <b>WCBDA (g)</b> 21.5	0.984       Probe (mg)       0         29.84 "Hg       CWTR (g)       961.9         -10.300 "H2O       WCBDA (g)       21.5         0.2543 inches	0.984     Probe (mg)     0       essure     29.84 "Hg     CWTR (g)     961.9       2     -10.300 "H ₂ O     WCBDA (g)     21.5       0.2543 inches     Leak Check Volume     0.48 ft²	0.984     Probe (mg)     0       29.84 "Hg     CWTR (g)     961.9       -10.300 "H ₂ O     WCBDA (g)     21.5       0.2543 inches     Leak Check Volume     0.48 ft²       4.500 ft     Reading Interval     5 minutes	0.984       Probe (mg)       0         29.84 "Hg       CWTR (g)       961.9         -10.300 "H2O       WCBDA (g)       21.5         0.2543 inches       Leak Check Volume       0.48 ft²         4.500 ft       Reading Interval       5 minutes         0.000 ft       Number of Ports       2

	Isokinetic	%	98.4	0.66	100.7	100.4	100.5	101.3	6.66	99.1	7.66	98.4	103.2	99.7
	Velocity	s/m	17.52	17.27	17.53	17.52	17.13	17.38	16.83	16.72	17.34	16.55	16.94	
Leak	Check	Volume												
	Vacuum	"Hg	8.0	8.5	8.5	8.5	8.5	8.5	8.0	8.0	8.0	8.0	8.0	
	ЧΖ	"H20	1.7	1.65	1.7	1.7	1.65	1.65	1.5	1.5	1.6	1.6	1.6	
	DGM In	<b>.</b>	83	82	82	83	83	82	83	83	83	83	83	
atures	DGM Out	<u>u</u>	73	74	74	74	74	74	74	74	74	74	74	
Temperatures	Imp. Out	<b></b>	43	44	44	45	45	45	46	46	46	46	47	
	Stack	Ľ.	282	282	283	282	281	281	277	279	277	276	276	
	Δp	"H20	0.7	0.68	0.7	0.7	0.67	69.0	0.65	0.64	0.69	0.63	99.0	
	DGM	Reading	245.99	249.60	253.22	256.88	260.55	264.17	267.79	271.29	274.78	278.36	281.95	285.50
		Time	125	130	135	140	145	150	155	160	165	170	175	180
	.=	Point			10			11			12			

Plant:

Covanta - DYEC

Plant Location:

Courtice, ON

Test Location:

Boiler No. 2 BH Outlet

Test No.:

3 - SVOC

Date:

May 10, 2016

### STACK GAS SAMPLING PARAMETERS

PITOT TUBE COEFFICIENT	0.848
DGM CORRECTION FACTOR	0.984
NOZZLE DIAMETER	6.46 mm
DRY REF GAS VOLUME SAMPLED	7.048 m ³
AVGERGE ISOKINETICITY	99.3 %
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	138.6 °C
AVERAGE GAS MOISTURE BY VOLUME	15.7 %
AVERAGE GAS VELOCITY	16.81 m/s
BAROMETRIC PRESSURE (Station)	101.558 Kpa
STATIC PRESSURE	-2.565 Kpa
ABSOLUTE GAS PRESSURE	98.993 Kpa
OXYGEN CONCENTRATION	8.12 %
CARBON DIOXIDE CONCENTRATION	11.41 %
CARBON MONOXIDE CONCENTRATION	15.0 ppm

### FLOWRATE

ACTUAL GAS FLOWRATE	$24.84 \text{ m}^3/\text{s}$
DRY REF GAS FLOWRATE	14.81 Rm³/s
DRY ADJ GAS FLOWRATE	19.12 Rm³/s
WET REF GAS FLOWRATE	17.58 Rm³/s

### PARTICULATE EMISSION DATA

PARTICULATE COLLECTED	-PROBE	0 mg
	-FILTER	0 mg
	-TOTAL	0 mg
DRY REF GAS VOLUME SAMPLED		7.048 m ³
PARTICULATE CONC ACTUAL		$0.000 \text{ mg/m}^3$
PARTICULATE CONC DRY REF		$0.000 \text{ mg/m}^3$
PARTICULATE CONC DRY ADJ		0.000 mg/m ⁴
PARTICULATE CONC WET REF		$0.000 \text{ mg/m}^3$
PARTICULATE EMISSION RATE		0.00000 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

Covanta - DYEC 3 - SVOC May 10, 2016 Plant: Test No.: Date:

1				1				
ion Gases	8.12	CO2% 11.41	15.0		Measured H20	%		
Combust	02%	C02%	COppm		Measu	15.7 %		
					0.44 ft²	5 minutes	2	12
0	0	944.8	20.7					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.848	0.984	29.99 "Hg	-10.300 "H ₂ O	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%		102.0	97.2	96.5	1.66	100.6	9.66	98.7	97.5	98.2	95.8	6.66	97.8	8.66	99.7	7.66	98.6	98.6	0.66	97.2	98.6	96.9	101.0	98.5	8.66	96.4	100.3	100.0	6.66	101.2	100.3
	Velocity	s/m	17.19	16.83	17.20	18.07	17.58	17.58	17.70	17.69	17.70	17.06	17.06	17.19	16.94	16.95	16.95	16.15	16.15	16.14	16.15	16.01	16.01	16.56	16.43	16.56	17.46	16.98	16.96	17.34	17.23	17.21	17.46
Leak	Check	Volume																															
	Vacuum	"Hg	7.0	7.0	7.0	8.0	8.0	8.0	8.0	8.0	8.0	7.2	7.4	7.4	7.4	7.4	7.4	7.0	7.0	7.0	7.0	7.0	7.0	7.2	7.2	7.2	7.6	8.0	8.0	8.0	8.0	8.0	8.0
	PΛ	"H20	1.6	1.45	1.55	1.8	1.7	1.7	1.7	1.7	1.7	1.5	1.6	1.6	1.6	1.6	1.6	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.65	1.7
	DGM In	9F	76	74	76	78	80	82	83	89	85	85	98	98	98	87	87	87	87	88	88	88	88	88	80	88	88	88	92	90	88	88	88
atures		°F	74	74	74	75	75	75	9/	76	9/	7.7	77	77	77	78	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79
Temperatures	Imp. Out	4	74	43	43	42	41	41	40	41	40	40	40	40	40	41	41	41	40	41	41	40	40	40	40	41	40	40	40	40	41	40	41
	Stack	<u>u</u> .	280	282	281	281	281	281	281	280	281	280	280	280	280	281	281	280	280	279	280	280	280	281	281	281	282	284	282	282	283	282	282
	ΔD	"H20	0.68	0.65	0.68	0.75	0.71	0.71	0.72	0.72	0.72	0.67	0.67	0.68	99.0	99.0	99.0	9.0	9.0	9.0	9.0	0.59	0.59	0.63	0.62	0.63	0.7	99.0	99.0	69.0	0.68	0.68	0.7
	DGM	Reading	86.32	86.68	93.38	96.84	100.58	104.28	107.95	111.62	115.27	118.93	122.38	125.98	129.53	133.10	136.67	140.24	143.61	146.98	150.37	153.70	157.05	160.34	163.88	167.28	170.78	174.34	177.93	181.53	185.20	188.88	192.53
		Time	0	S	10	15	20	25	30	35	40	45	20	55	09	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150
		Point	1			2			m			4			5			9			7			8			6			10			11

Covanta - DYEC 3 - SVOC May 10, 2016 Plant: Test No.: Date:

on Gases	8.12	11.41	15.0		ed H2O	%	*	
Combusti	02%	CO2%	COppm 15.0		Measured H2O	15.7		
					0.44 ft³	5 minutes	2	12
0	0	944.8	20.7					
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.848	0.984	29.99 "Hg	$-10.300 \text{ "H}_2^{\circ}$	0.2543 inches	4,500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

		Isokinetic	%	6.66	100.1	100.3	100.8	100.9	101.0		100.6	9.66	99.8	99.1	2.66	100.7	100.9	101.3	100.2	100.7	100.4	93.6	98.8	98.5	97.4	97.5	97.2	98.8	100.9	7.76	366	100.0	6.66	98.8
	:	Velocity	m/s	17.09	17.21	17.21	16.84	16.56		17.44	17.19	16.94	17.81	18.29	18.53	18.32	18.30	18.44	17.45	17.45	17.45	16.82	16.69	16.69	16.30	16.30	16.44	15.76	16.16	16.18	15.91	16.19	15.63	16.30
1001	- Leak	Check	Volume						0.44																									
	•	Vacuum	"Hg	8.0	8.0	8.0	8.0	7.5		8.0	8.0	8.0	8.0	8,5	9.0	9.0	9.0	9.0	8.2	8.2	8.2	8.0	8.0	8.0	7.6	7.6	7.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5
		H :	"H20	1.6	1.65	1.65	1.55	1.5		1.7	1.6	1.6	1.8	1.9	1.95	1.9	1.9	1.9	1.7	1.7	1.7	1.5	1.5	1.5	1.4	1.4	1.45	1.4	1.4	1.45	1.35	1.45	1.3	1.45
		n Mga	<u>.</u>	88	88	88	88	88		82	82	84	85	87	87	87	87	87	88	88	88	88	88	68	89	68	89	68	68	06	06	06	91	06
	rures	DGM Out	LL.	80	79	79	79	79		79	79	79	79	79	79	79	79	79	79	79	79	79	79	80	80	80	80	80	80	80	80	80	81	81
	lemperatures	mp. Out	л П	41	41	41	42	42		64	41	42	42	42	43	43	44	44	44	44	44	45	46	46	46	46	45	45	45	46	46	46	47	47
		Stack	<b>L</b>	282	282	282	283	281		280	280	280	280	280	280	282	281	282	281	281	281	281	281	281	282	282	282	282	281	283	283	284	283	282
		ΔP	"H2O	0.67	0.68	0.68	0.65	0.63		0.7	0.68	99'0	0.73	0.77	0.79	0.77	0.77	0.78	0.7	0.7	0.7	0.65	0.64	0.64	0.61	0.61	0.62	0.57	9.0	9.0	0.58	9.0	0.56	0.61
		DGM	Reading	196.22	199.84	203.49	207.16	210.75	214.29	214.73	218.43	222.04	225.61	229.34	233.20	237.15	241.05	244.97	248.87	252.59	256.30	259.98	263.50	266.98	270.43	273.80	277.16	280.60	283.97	287.32	290.73	294.10	297.52	300.80
			Time	155	160	165	170	175	180	0	5	10	15	20	25	30	35	40	45	20	55	09	65	70	75	80	85	06	95	100	105	110	115	120
-			Point			12				⊣			2			က			4			Ŋ			9			7			∞			6

Covanta - DYEC 3 - SVOC May 10, 2016

Plant: Test No.: Date:

Combustion Gases	<b>02%</b> 8.12	CO2% 11.41	<b>COppm</b> 15.0		Measured H2O	15.7 %		
					0.44 ft³	5 minutes	2	12
0	0	944.8	20.7					ort
Filter (mg)	Probe (mg)	CWTR (g)	WCBDA (g)		Leak Check Volume	Reading Interval	Number of Ports	Number of points / Port
0.848	0.984	29.99 "Hg	$-10.300 \text{ "H}_2^{\circ}$ O	0.2543 inches	4.500 ft	0.000 ft	0.000 ft	
Pitot Factor	DGMCF	Barometric Pressure	Static Pressure	Nozzle	Stack Diameter	Length	Width	

	Isokinetic	%	98.5	98.6	98.1	98.8	98.4	98.9	98.1	9.66	99.5	98.2	103.3	98.5
	Velocity	s/ш	16.31	16.45	16.30	16.33	16.45	15.91	15.77	15.76	14.91	14.91	14.91	
Leak	Check	Volume												
	Vacuum	"Hg	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.2	7.2	7.0	
	4	"H20	1.45	1.45	1.45	1.45	1.45	1.35	1.35	1.35	1.25	1.25	1.15	
	DGM In	<mark>т</mark> ,	06	06	06	06	06	06	06	90	06	90	06	
atures	DGM Out	<u></u>	81	81	81	81	81	81	81	81	81	81	81	
Temperatures	Imp. Out	ů.	44	43	43	43	43	43	44	44	44	44	44	
	Stack	<u>.</u>	283	283	282	284	283	283	283	282	282	282	282	
	ΔЬ	"H20	0.61	0.62	0.61	0.61	0.62	0.58	0.57	0.57	0.51	0.51	0.51	
	DGM	Reading	304.21	307.62	311.04	314,46	317.86	321.31	324.62	327.95	331.28	334.39	337.66	340.78
		Time	125	130	135	140	145	150	155	160	165	170	175	180
		Point			10			11			12			



**APPENDIX 30** 

CALPUFF Zip Files (CD)



### **APPENDIX 31**

DYEC CEMS 1-Hour Average Data and ORTECH THC Data (6 pages)

Covanta - Durham York Energy Centre Total Hydrocarbons at the Boiler No. 1 BH Outlet April 20, 2016

Test No. 6	THC	mdd	0.3	4.0	4.0	4.0	0.4	SOUTH FOR THE			en e	*********	the works	2000000	giologica de Novembro			uonesne		cowalasca	union de stàl·le		and the same			awan.	manne.	MATERIAL STATES			TO THE OWNER OF THE OWNER.	<b>SERVICE</b>	0.0	00	on which	awas	0.2			gaylacan	ა.0
<b>-</b>		Time	14:43	14:44	14:45	14:46	14:47	14:48	14:49	14:50	14:51	14:52	14:53	14:54	14:55	14:56	14:57	14:58	14:59	15:00	15:01	15:02	15:03	15:04	15:05	15:06	15:07	15:08	15:09	15:10	15:11	15:12	15:13	28.5		Xe Xe	Avg			E ;	Max
Test No. 5	THC	mdd	0.8	0.8	1 0.7	9.0	9.0	9.0	9.0	0.4	en de marie		10/4 24		and an even	*********	20-10-loo		quincesson)		ALL CONTROL	·	SULTRAIN		mangka	ne oxoxo		neskezeli w				<del>- Transaction</del>	0.1			o ·	0.5		***************************************		1.0
		Time	14:12	14:13	14:14	14:15	14:16	14:17	14:18	14:19	14:20	14:21	14:22	14:23	14:24	14:25	14:26	14:27	14:28	14:29	14:30	14:31	14:32	14:33	14:34	14:35	14:36	14:37	14:38	14:39	14:40	14:41	14:42	-	Ē,	Max	Avg			Min (	Max
Test No. 4	THC	mdd	0.7	4.0	0.7	0.7	9.0	9.0	0.8	0.8		0.3	0.2	NACO NACO	2000	0.4	onedona	5-610000	4.0	(MENOR)	********	0.2			te Salahan	o de la composición dela composición de la composición dela composición de la compos	0.4		D-2004-000	9.0	0	0	0.4			V0000000	0.5				1.0
·		Time	13:41	13:42	13:43	13:44	13:45	13:46	13:47	13:48	13:49	13:50	13:51	13:52	13:53	13:54	13:55	13:56	13:57	13:58	13:59	14:00	14:01	14:02	14:03	14:04	14:05	14:06	14:07	14:08	14:09	14:10	14:11		E E	Max	Avg			Ē	X _a x W
Test No. 3	THC	mdd	1.2	-	0.7	1.2	0.7	1.2	4.1	6.0	0.8	0.7	4.0	***********	0.2	9.0	on since	8.0	0.8		waren.	0.7	9.0	e e e e e e e e e e e e e e e e e e e	more en	mares/e		0.7	propositei	0.3		0.3			- Kayoo	10000000	0.7		The Street of th		1.7
·		Time	13:10	13:11	13:12	13:13	13:14	13:15	13:16	13:17	13:18	13:19	13:20	13:21	13:22	13:23	13:24	13:25	13:26	13:27	13:28	13:29	13:30	13:31	13:32	13:33	13:34	13:35	13:36	13:37	13:38	13:39	13:40		E Z	Max	Avg		r	Ξ	Max
Test No. 2	THC	mdd			4.0	0.4	0.3	0.2	0.2	0.1	4.0	0.5	es (es es e	0.7		1.2	<u>.</u> .		1.2	1.3	1.2		1.3	1.5	9.1	2.0	2.6	3.2	3.8	4.2	6.4	īĊ,	5.5	The state of the s		Avendado.	1.6	f 16.5%	- 8	neg popular	9,9
,-		Time	09:11	09:12	09:13	09:14	09:15	09:16	09:17	09:18	09:19	09:20	09:21	09:22	09:23	09:24	09:25	09:26	09:27	09:28	09:29	09:30	09:31	09:32	09:33	09:34	09:35	98:60	09:37	09:38	68:60	09:40	09:41		Z Z	Max	Avg	Dry Rasis using measured moisture of 16.5%		Ä	Zez
Test No. 1	THC	mdd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.3	0.5	9.0	0.5	9.0	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	9.0	9.0	9.0	0.7	0.5	0.5	0.4		0.0	0.8	0,4	is using measu	School Suice of	0.0	1.0
F	•	Time	08:40	08:41	08:42	08:43	08:44	08:45	08:46	08:47	08:48	08:49	08:50	08:51	08:52	08:53	08:54	08:55	08:56	08:57	08:58	08:59	00:60	09:01	09:02	09:03	09:04	09:02	90:60	09:07	80:60	60:60	09:10	,	Zi.	Мах	Avg	20 Bas	Š	Min	Max

# Covanta - Durham York Energy Centre Boiler No. 1 CEMS

							BH Outle	et					Scrubber Inlet
		02	CO ₂		0		5O ₂		NOx		HCI	THC	O ₂
		%	kg/m³	mg/m³ (	@ 11% O ₂	mg/m³	@ 11% O ₂	mg/m³	@ 11% O₂	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
2-May-16 2-May-16	0:00 1:00	8.23 7.83	0.20 0.20	6 7		0		99 108		5 5		0	9
2-May-16	2:00	7.96	0.20	8		0		107		3		ō	9
2-May-16	3:00	8.14	0.20	11	8.0	0		106		4		0	9
2-May-16	4:00	7.79	0.20	5	7.8	0 0		106 124		7 5		0	8
2-May-16 2-May-16	5:00 6:00	6.96 6.99	0.21 0.22	5 6	7.3 6.8	0		115		5		0	8
2-May-16	7:00	7.49	0.21	7	5.8	0		123		6		0	issainni
2-May-16	8:00	7.37	0.21	9	6.8	0		100		5		0	8
2-May-16 2-May-16	9:00 10:00	7.26 6.77	0.21 0.22	8 20	7.5 11.0	0 0		97 123		5 5		0	8 7
2-May-16	11:00	6.94	0.21	12	12.3	Ö		100		5		0	8
2-May-16	12:00	8.19	0.20	18	14.5	0		99		9		0	9
2-May-16 2-May-16	13:00 14:00	7.35 7.04	0.21 0.22	9 <b>1</b> 0	14.8 12.3	0		109 101		6 5		0	8
2-May-16	15:00	7.22	0.21	10	11.8	0		111		7		0	8
2-May-16	16:00	8.61	0.19	27	14.0	0		109		10		0	9
2-May-16	17:00	7.27	0.20	9	14.0	0		100		5 5		0 0	8
2-May-16 2-May-16	18:00 19:00	7.61 7.21	0.21 0.21	13 20	14.8 17.3	0 0		108 108		4		0	8
2-May-16	20:00	7.48	0.21	16	14.5	0		103		5		0	8
2-May-16	21:00	7.72	0.20	16	16.3	0		106		5		0	8
2-May-16 2-May-16	22:00 23:00	7.78 8.05	0.20 0.20	18 15	17.5 16.3	0 0	0.0	102 108	107	6 6	5.5	0 0	9
3-May-16	0:00	7.49	0.21	24	18.3	Ö	0.0	101	107	5	5.5	Ō	8
3-May-16	1:00	7.38	0.21	24	20.3	0	0.0	112	107	4	5.5	0	8
3-May-16 3-May-16	2:00 3:00	7.42 7.47	0.21 0.21	25 17	22.0 22.5	0 0	0.0 0.0	100 108	107 107	5 5	5.6 5.6	0 0	8 8
3-May-16	4:00	7.50	0.21	21	21.8	Ö	0.0	93	107	6	5.6	Ö	8
3-May-16	5:00	7.62	0.20	16	19.8	0	0.0	110	106	5	5.6	0	8
3-May-16	6:00 7:00	7.30 7 <i>.</i> 35	0.21 0.21	14 19	17.0 17.5	0 0	0.0 0.0	107 114	106 105	2 4	5.5 5.4	0 0	8
3-May-16 3-May-16	8:00	7.55 8.41	0.19	9	14.5	0	0.0	108	106	5	5.4	ő	9
3-May-16	9:00	7.61	0.21	13	13.8	0	0.0	102	106	5	5.4	0	8
3-May-16	10:00 11:00	7.32 7.35	0.21 0.20	10 11	12.8 10.8	0 0	0.0 0.0	105 99	105 105	5 5	5.4 5.4	0	8
3-May-16 3-May-16	12:00	7.33 8.01	0.20	16	12.5	0	0.0	110	106	5	5.2	Ö	9
3-May-16	13:00	8.06	0.20	19	14.0	0	0.0	96	105	6	5.2	0	8
3-May-16	14:00 15:00	6.42 7.23	0.23 0.21	19 14	16.3 17.0	0	0.0 0.0	116 102	106 105	4 5	5.2 5.1	0 0	7 8
3-May-16 3-May-16	16:00	6.96	0.22	19	17.8	0	0.0	108	105	5	4.9	Ö	8
3-May-16	17:00	6.99	0.21	16	17.0	0	0.0	109	106	4	4.8	0	8
3-May-16	18:00 19:00	7.24 7.34	0.21 0.21	18 28	16.8 20.3	0 0	0.0 0.0	102 108	105 105	5 8	4.8 5.0	0 1	8
3-May-16 3-May-16	20:00	7.12	0.21	20	20.5	0	0.0	98	105	5	5.0	0	8
3-May-16	21:00	7.27	0.21	21	21.8	0	0.0	111	105	5	5.0	0	8
3-May-16 3-May-16	22:00 23:00	7.30 7.02	0.21 0.21	18 21	21.8 20.0	0 0	0.0 0.0	102 104	105 105	4 5	4.9 4.9	0 0	8 8
4-May-16	0:00	7.24	0.21	17	19.3	0	0.0	102	105	5	4.9	0	8
4-May-16	1:00	7.51	0.21	22	19.5	0	0.0	111	105	6	5.0	0	8
4-May-16 4-May-16	2:00 3:00	7.02 7.16	0.21 0.21	19 <b>21</b>	19.8 <b>19.</b> 8	0 0	0.0 0.0	103 103	105 105	5 5	5.0 5.0	0 0	8
4-May-16	4:00	7.49	0.20	23	21.3	Ô	0.0	106	106	6	5.0	Ö	8
4-May-16	5:00	7.31	0.20	19	20.5	0	0.0	110	106	5	5.0	0	8
4-May-16 4-May-16	6:00 7:00	7.39 7.42	0.21 0.21	19 <b>1</b> 4	20.5 18.8	0 0	0.0 0.0	103 119	106 106	4 5	5.0 5.1	0 0	8
4-May-16	8:00	7.70	0.20	13	16.3	0	0.0	96	105	5	5.1	Ö	8
4-May-16	9:00	7.56	0.20	13	14.8	0 .	0.0	111	106	5	5.1	0	8
4-May-16	10:00 11:00	7.44 7.56	0.21 0.20	16 19	14.0 15.3	0 0	0.0 0.0	102 105	105 106	5 7	5.1 5.2	0 0	8
4-May-16 4-May-16	12:00	8.93	0.20	28	19.0	0	0.0	114	106	8	5.3	0	9
4-May-16	13:00	7.43	0.20	6	17.3	0	0.0	101	106	5	5.3	0	8
4-May-16	14:00	6.81	0.21	13	16.5	0	0.0	106	106	4 5	5.3 5.3	0 0	7 8
4-May-16 4-May-16	15:00 16:00	7.35 7.21	0.21 0.21	19 15	16.5 13.3	0 0	0.0 0.0	106 99	106 105	5 5	5.3	0	8
4-May-16	17:00	6.72	0.21	13	15.0	0	0.0	107	105	5	5.3	0	8
4-May-16	18:00	7.37	0.21	16	15.8	0	0.0	109	106	6	5.3	0	8
4-May-16 4-May-16	19:00 20:00	7.04 6.89	0.21 0.22	22 17	16.5 17.0	0 0	0.0 0.0	104 107	106 106	5 5	5.2 5.2	0	8
4-May-16	21:00	6.69	0.22	21	19.0	0	0.0	113	106	5	5.2	0	8
4-May-16	22:00	6.97	0.21	17	19.3	0	0.0	94 96	106 105	5 5	5.3 5.3	0 0	8 8
4-May-16	23:00	6.75	0.21	18	18.3	0	0.0	96	105	5	5.3	U	8

# Covanta - Durham York Energy Centre Boiler No. 1 CEMS

							BH Outle	et					Scrubber Inlet
		O ₂	CO ₂	C			02		VOx		łCI	THC	O ₂
		%	kg/m³	mg/m³ @			9 11% O ₂		@ 11% O ₂		@ 11% O ₂	mg/m³ @ 11% O ₂	%
9-May-16	7ime 0:00	<b>1-hr</b> 7.25	1-hr 0.22	1-hr 14	Rolling 4-hr	1-hr 0	Rolling 24-hr	1-hr 108	Rolling 24-hr	1-hr 4	Rolling 24-hr	<b>1-hr</b> 0	1-hr 7
9-May-16	1:00	7.64	0.21	19		2		126		4		ő	8
9-May-16	2:00	7.65	0.21	18	47.0	1		96		4		0	8
9-May-16 9-May-16	3:00 4:00	7.26 7.51	0.22 0.21	18 15	17.3 17.5	0 0		110 115		5 6		0 0	8
9-May-16	5:00	7.84	0.20	15	16.5	Ō		107		6		0	8
9-May-16	6:00	8.13	0.20	20	17.0	0		114		5		0	8
9-May-16 9-May-16	7:00 8:00	7.28 7.45	0.21 0.21	16 24	16.5 18.8	0 0		114 108		4 3		0 0	8
9-May-16	9:00	7.65	0.21	20	20.0	0		116		2		ő	8
9-May-16	10:00	7.31	0.22	<b>1</b> 5	18.8	0		108		2		0	8
9-May-16 9-May-16	11:00 12:00	7.13 7.78	0.21 0.21	17 <b>1</b> 9	19.0 17.8	0 0		111 103		2 4		0 0	8
9-May-16	13:00	7.45	0.21	21	18.0	0		102		6		Ö	8
9-May-16	14:00	7.42	0.21	16	18.3	0		116		6		0	8
9-May-16	15:00	7.75 7.67	0.21	23 18	19.8 19.5	0 0		114 111		5 4		0 0	8
9-May-16 9-May-16	16:00 17:00	7.82	0.21 0.21	14	17.8	0		106		3		0	8
9-May-16	18:00	7.14	0.22	14	17.3	0		112		3		0	7
9-May-16	19:00	7.38	0.21	16	15.5	1		113		4		0 0	8
9-May-16 9-May-16	20:00 21:00	7.84 7.43	0.21 0.22	17 12	15.3 14.8	0 0		112 111		5 5		0	8
9-May-16	22:00	7.55	0.21	14	14.8	Ö		113		5		0	8
9-May-16	23:00	7.70	0.20	11	13.5	0	0.2	107	111	5	4.3	0	8
10-May-16 10-May-16	0:00 1:00	7.82 7.52	0.21 0.22	11 12	12.0 12.0	0 0	0.2 0.1	109 106	111 110	5 5	4.3 4.3	0 0	8 8
10-May-16	2:00	8.02	0.21	23	14.3	ő	0.0	116	111	6	4.4	0	8
10-May-16	3:00	8.66	0.20	16	15.5	0	0.0	108	111	5	4.4	0	9
10-May-16 10-May-16	4:00 5:00	8.38 6.96	0.20 0.21	17 12	17.0 17.0	0 0	0.0 0.0	105 117	110 111	5 3	4.4 4.3	0 0	9 7
10-May-16	6:00	7.55	0.21	12	14.3	0	0.0	96	110	4	4.2	0	8
10-May-16	7:00	7.68	0.21	15	14.0	1	0.1	116	110	5	4.3	0	8
10-May-16 10-May-16	8:00 9:00	7.95 7.68	0.21 0.21	14 15	13.3 14.0	1 0	0.1 0.1	108 115	110 110	5 5	4.3 4.5	0 0	8
10-May-16	10:00	7.47	0.22	17	15.3	0	0.1	109	110	5	4.6	ő	8
10-May-16	11:00	7.54	0.21	10	14.0	0	0.1	110	110	5	4.7	0	8
10-May-16	12:00 13:00	7.58 7.95	0.21 0.21	13 10	13.8 12.5	0 0	0.1 0.1	112 117	110 111	5 5	4.8 4.7	0 0	8 8
10-May-16 10-May-16	14:00	7.58	0.21	11	11.0	0	0.1	101	110	5	4.7	ő	8
10-May-16	15:00	7.82	0.21	12	11.5	0	0.1	109	110	6	4.7	0	8
10-May-16	16:00 17:00	7.83 7.62	0.21 0.20	8 10	10.3 10.3	0 0	0.1 0.1	116 101	110 110	5 4	4.8 4.8	0 0	8 8
10-May-16 10-May-16	18:00	7.46	0.22	8	9.5	0	0.1	114	110	4	4.8	ŏ	8
10-May-16	19:00	7.53	0.21	8	8.5	0	0.1	109	110	5	4.9	0	8
10-May-16 10-May-16	20:00 21:00	7.96 8.30	0.21 0.20	11 15	9.3 10.5	0	0.1 0.1	120 105	110 110	5 6	4.9 4.9	0 0	8 9
10-May-16	22:00	7.83	0.21	11	11.3	0	0.1	114	110	5	4.9	Õ	8
10-May-16	23:00	7.70	0.20	12	12.3	0	0.1	102	110	5	4.9	0	8
11-May-16 11-May-16	0:00 1:00	7.79 7.54	0.21 0.21	13 14	12.8 12.5	0 0	0.1 0.1	115 106	110 110	5 5	4.9 4.9	0 0	8 8
11-May-16	2:00	7.41	0.21	12	12.8	0	0.1	106	110	5	4.9	o	8
11-May-16	3:00	7.77	0.21	13	13.0	0	0.1	113	110	4	4.8	0	8
11-May-16 11-May-16	4:00 5:00	7.95 7.86	0.21 0.21	13 11	13.0 12.3	0 0	0.1 0.1	110 121	110 110	6 6	4.9 5.0	0 0	8 8
11-May-16	6:00	7.32	0.21	10	11.8	0	0.1	100	110	5	5.0	Ö	8
11-May-16	7:00	7.48	0.22	12	11.5	0	0.0	114	110	5	5.0	0	8
11-May-16 11-May-16	8:00 9:00	7.51 7.58	0.21 0.21	10 11	10.8 10.8	0 0	0.0 0.0	111 111	110 110	5 5	5.0 5.0	0 0	8 8
11-May-16	10:00	7.61	0.21	11	11.0	0	0.0	112	110	5	5.0	ő	8
11-May-16	11:00	7.41	0.21	9	10.3	0	0.0	107	110	5	5.0	0	8
11-May-16 11-May-16	12:00 13:00	7.52 7.37	0.21 0.22	10 9	10.3 9.8	0 0	0.0 0.0	112 119	110 110	5 5	5.0 5.0	0 0	8
11-May-16	14:00	7.54	0.22	10	9.5	0	0.0	99	110	5	5.0	Ō	8
11-May-16	15:00	7.69	0.21	9	9.5	0	0.0	117	111	6	5.0	0	8
11-May-16 11-May-16	16:00 17:00	7.95 7.52	0.21 0.21	13 13	10.3 11.3	0 0	0.0 0.0	110 105	110 111	7 6	5.1 5.2	0 0	8 8
11-May-16 11-May-16	18:00	7.52 7.68	0.21	15 16	12.8	0	0.0	112	110	5	5.3	0	8
11-May-16	19:00	7.53	0.21	13	13.8	0	0.0	107	110	5	5.3	0	8
11-May-16	20:00	7.48 7.37	0.21 0.22	11 11	13.3 12.8	0 0	0.0 0.0	107 114	110 110	6 5	5.3 5.3	0 0	8
11-May-16 11-May-16	21:00 22:00	7.37 7.67	0.22	11 17	12.8 13.0	0	0.0	114 114	110	6	5.3	0	8
11-May-16	23:00	7.45	0.21	12	12.8	0	0.0	100	110	7	5.4	Ō	8
	Min	6.42	0.17	5	5.8	0	0.0	93	105	2	4.2	0	7
	Max	8.93	0.23	28	22.5	2	0.0	126	111	10	5.6	1	9
	Avg	7.52	0.21	15	14.8	0	0.0	108	108	5	5.0	0 0.1	8
	Std Dev	0.39	0.01	4.9	3.8	0.2	0.0	6.5	2.3	1.1	0.3	0.T	0.4

Covanta - Durham York Energy Centre Total Hydrocarbons at the Boiler No. 2 BH Outlet April 19, 2016

Test No. 6	THC	mdd	0.5	0.7	0.7	4.0	4.0	4.0	0.5	0.5	9.0	2.0	2.0	2.0	0.7	8.0	2.0	0.8	6.0	6.0	0.8	8.0	8.0	8.0	0.8	0.8	8.0	0.7	2.0	9.0	0.7	9.0	0.7	0.4	0	0.7	National Control of the Control of t		0.5	1.	0.8	
Tes		Time	12:13	12:14	12:15	12:16	12:17	12:18	12:19	12:20	12:21	12:22	12:23	12:24	12:25	12:26	12:27	12:28	12:29	12:30	12:31	12:32	12:33	12:34	12:35	12:36	12:37	12:38	12:39	12:40	12:41	12:42	12:43	Min		AVE	,		Min	Мах	Avg	
Test No. 5	THC	mdd	<del>-</del>	9.0	8.0	0.7	9.0	4.0	4.0	4.0	4.0	0.3	0.3	0.3	0.2	0.2	0.2	6.0	0.2	0.2	0.3	0.3	0.5	0.5	4.0	0.5	0.5	0.5	0.5	0.5	4.0	0.5	0.5	0.0	7	0			0.2	1.3	0.5	
Tes		Time	11:41	11:42	11:43	11:44	11:45	11:46	11:47	11:48	11:49	11:50	11:51	11:52	11:53	11:54	11:55	11:56	11:57	11:58	11:59	12:00	12:01	12:02	12:03	12:04	12:05	12:06	12:07	12:08	12:09	12:10	12:11	Min		Avg			E	Max	Avg	
Test No. 4	THC	mdd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		) (	0.0			0.0	0.0	0.0	
Tes		Time	10:50	10:51	10:52	10:53	10:54	10:55	10:56	10:57	10:58	10:59	11:00	11:01	11:02	11:03	11:04	11:05	11:06	11:07	11:08	11:09	11:10	11:11	11:12	11:13	11:14	11:15	11:16	11:17	11:18	11:19	11:20	Z.		Max			Min	Max	Avg	
Test No. 3	THC	mdd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	) ·	- 0			0.0	0.1	0.0	
Tesi		Time	10:19	10:20	10:21	10:22	10:23	10:24	10:25	10:26	10:27	10:28	10:29	10:30	10:31	10:32	10:33	10:34	10:35	10:36	10:37	10:38	10:39	10:40	10:41	10:42	10:43	10:44	10:45	10:46	10:47	10:48	10:49	2		Max	9		Min	Max	Avg	
Test No. 2	THC	mdd	1.5	4.	1.3	4.	1.2		6.0	8.0	8.0	8.0	8.0	2.0	8.0	8.0	0.7	0.7	0.7	0.5	0.5	0.5	0.5	6.0	0.3	6.0	0.2	4.0	4.0	0.3	0.2	0.2	0.2	0.0	, i	1.5 5		.2%	0.2	1.8	0.8	
Test		Time	08:45	08:46	08:47	08:48	08:49	08:20	08:51	08:52	08:53	08:54	08:55	08:56	08:57	08:58	08:59	00:60	09:01	09:02	09:03	09:04	09:02	90:60	09:07	80:60	60:60	09:10	09:11	09:12	09:13	09:14	09:15	9		Max		moisture of 16	Z.	Max	Avg	
Test No. 1	THC	mdd	6.8	5.8	5.0	4.5	4. L.	3.9	3.6	3.5	3.4	3.3	3.1	2.8	2.6	2.4	2.4	2.4	2.5	2.3	2.0	8.1	1.7	1.7	<del>6</del> .	1.6	6.	1.6	9.1	1.6	1.6	1.7	1.5	7 7		ω, α α	O.	Dry Basis using measured moisture of 16.2%	1.8	8.1	3.3	
Test		Time	08:10	08:11	08:12	08:13	08:14	08:15	08:16	08:17	08:18	08:19	08:20	08:21	08:22	08:23	08:24	08:25	08:26	08:27	08:28	08:29	08:30	08:31	08:32	08:33	08:34	08:35	08:36	08:37	08:38	08:39	08:40		<b>5</b>	Max		Dry Basis (	Min	Max	Avg	

# Covanta - Durham York Energy Centre Boiler No. 2 CEMS

							BH Outi	et					Scrubber Inlet
		02	CO ₂		0		SO₂		NOx		HCI	THC	O ₂
		%	kg/m³		@ 11% O ₂	-	@ 11% O ₂		@ 11% O ₂		@ 11% 02	mg/m³ @ 11% O ₂	%
Date	Time 0:00	1-hr 8.56	<b>1-hr</b> 0.19	1-hr 12	Rolling 4-hr	1-hr 0	Rolling 24-hr	1-hr 106	Rolling 24-hr	1-hr 3	Rolling 24-hr	1-hr 0	1-hr 8
2-May-16 2-May-16	1:00	8.89	0.19	10		0		99		3		Ô	8
2-May-16	2:00	8.71	0.19	10		0		112		3		0	8
2-May-16	3:00	8.62	0.19	10	10.5	0		106		3		0	8
2-May-16 2-May-16	4:00 5:00	8.24 8.03	0.20 0.20	9 <b>1</b> 2	9.8 10.3	0 0		1 <b>1</b> 4 129		4 3		0 0	8 7
2-May-16	6:00	7.84	0.21	13	11.0	Ö		98		4		Ō	7
2-May-16	7:00												8
2-May-16	8:00	0.10	0.70	10	12.0	0		108		3		0	7
2-May-16 2-May-16	9:00 10:00	8.18 8.03	0.20 0.21	18 19	13.0 15.5	0 0		108		3 4		0	7
2-May-16	11:00	8.38	0.20	14	16.0	Ö		108		5		0	8
2-May-16	12:00	8.62	0.20	15	16.5	0		105		6		0	8
2-May-16	13:00 14:00	8.28 8.32	0.20 0.20	10 10	14.5 12.3	0	0.0 0.0	106 112	108 109	5 4	3.8 3.9	0 0	8
2-May-16 2-May-16	15:00	7.89	0.20	13	12.0	0	0.0	94	103	4	4.0	0	7
2-May-16	16:00	8.93	0.19	37	17.5	0	0.0	116	109	3	4.0	1	8
2-May-16	17:00	9.06	0.18	18	19.5	0	0.0	104	109	3	4.0	0	8
2-May-16	18:00 19:00	7.83 8.64	0.21 0.20	18 32	21.5 26.3	0	0.0 0.0	92 104	107 <b>10</b> 5	3 3	3.9 3.9	0 0	7
2-May-16 2-May-16	20:00	8.46	0.20	31	24.8	0	0.0	110	106	3	3.8	0	8
2-May-16	21:00	8.15	0.21	27	27.0	0	0.0	108	106	3	3.8	0	7
2-May-16	22:00	8.38	0.20	29	29.8	0	0.0	105	105	4	3.8	0 0	8
2-May-16 3-May-16	23:00 0:00	8.27 8.66	0.20 0.20	24 30	27.8 27.5	0 0	0.0 0.0	98 107	105 105	4 4	3.8 3.6	0	8
3-14/ay-16	1:00	8.67	0.19	15	24.5	0	0.0	103	104	5	3.6	Ō	8
3-May-16	2:00	8.50	0.19	24	23.3	0	0.0	105	104	4	3.6	0	8
3-May-16	3:00	8.23	0.20	20	22.3	0	0.0	108	105	4	3.6 3.7	0 0	7 8
3-May-16 3-May-16	4:00 5:00	8.17 8.37	0.20 0.20	15 19	18.5 19.5	0 0	0.0 0.0	102 122	104 105	4 3	3.7	U	8
3-May-16	6:00	8.57	0.20	26	20.0	Ö	0.0	106	107	4	3.8		8
3-May-16	7:00												7
3-May-16	8:00 9:00												7 8 ass
3-May-16 3-May-16	10:00	8.09	0.20	15	18.8	0	0.0	100	106	3	3.8	0	7
3-May-16	11:00	8.65	0.19	17	19.3	0	0.0	118	107	3	3.8	0	8
3-May-16	12:00	8.71	0.20 0.20	13	17.8	0 0	0.0 0.0	107 105	107 107	4 4	3.8 3.8	0 0	8 8
3-May-16 3-May-16	13:00 14:00	8.23 8.01	0.20	12 18	14.3 15.0	0	0.0	103	107	4	3.8	0	7
3-May-16	15:00	8.38	0.20	22	16.3	0	0.0	109	107	4	3.8	0	8
3-May-16	16:00	7.95	0.21	14	16.5	0 0	0.0	110	108	4 5	3.8 3.8	0 0	7 7
3-May-16 3-May-16	17:00 18:00	7.86 8.11	0.21 0.20	13 14	16.8 15.8	0	0.0 0.0	104 99	108 107	5	3.9	0	7
3-May-16	19:00	8.00	0.20	16	14.3	Ō	0.0	106	108	5	4.0	0	7
3-May-16	20:00	7.83	0.21	12	13.8	0	0.0	106	106	6	4.3	0	7
3-May-16 3-May-16	21:00 22:00	8.43 8.41	0.20 0.20	16 18	14.5 15.5	0 0	0.0 0.0	107 116	106 108	5 6	4.3 4.6	0 0	8
3-May-16	23:00	8.31	0.20	23	17.3	0	0.0	97	106	5	4.8	Ō	8
4-May-16	0:00	7.67	0.21	12	17.3	0	0.0	108	106	5	4.8	0	7
4-May-16	1:00	7.93	0.21	17 17	17.5	0 0	0.0 0.0	108	106 106	5 6	4.9 5.1	0 0	7 8
4-May-16 4-May-16	2:00 3:00	8.42 7.88	0.20 0.21	17 13	17.3 14.8	0	0.0	102 105	106	5	5.2	0	7
4-May-16	4:00	8.11	0.20	15	15.5	0	0.0	112	106	6	5.3	0	7
4-May-16	5:00	8.15	0.20	13	14.5	0	0.0	123	107	5	5.3	0	7
4-May-16 4-May-16	6:00 7:00	8.11	0.20	20	15.3	0	0.0	101	108	6	5.4	0	8
4-May-16	8:00	7 <i>.</i> 76	0.21	15	15.8	0	0.0	121	109	5	5.4	0	7
4-May-16	9:00	7.84	0.21	12	15.0	0	0.0	103	109	4	5.3	0	7
4-May-16 4-May-16	10:00 11:00	8.19 8.43	0.20 0.19	12 65	14.8 26.0	0 0	0.0 0.0	106 103	<b>1</b> 09 107	4 4	5.2 5.0	0 0	8 8
4-May-16	12:00	7.97	0.19	6	23.8	0	0.0	107	107	3	4.8	o	7
4-May-16	13:00	7.72	0.20	7	22.5	0	0.0	111	109	3	4.7	0	7
4-May-16	14:00	7.61	0.21	16	23.5	0	0.0	102	108	4	4.6	0	7
4-May-16 4-May-16	15:00 16:00	7.84 8.08	0.20 0.20	15 15	11.0 13.3	0 0	0.0 0.0	122 107	110 110	2 2	4.3 4.0	0 0	7
4-May-16	17:00	8.30	0.20	21	16.8	0	0.0	102	109	3	3.8	ő	8
4-May-16	18:00	7.85	0.21	23	18.5	0	0.0	108	108	5	3.8	0	7
4-May-16	19:00	8.14 7.79	0.20	15 <b>1</b> 2	18.5	0 0	0.0 0.0	102 109	108 107	5 5	3.7 3.7	1 0	8 7
4-May-16 4-May-16	20:00 21:00	7.79 7.55	0.21 0.21	12 16	17.8 16.5	0	0.0	109	107	5	3.7	0	7
4-May-16	22:00	7.72	0.21	15	14.5	0	0.0	111	107	5	3.8	0	7
4-May-16	23:00	7.97	0.21	15	14.5	0	0.0	103	107	5	3.9	0	7

# Covanta - Durham York Energy Centre Boiler No. 2 CEMS

							BH Outi	et					Scrubber Inlet
		O ₂	CO2	,co			02		Ох		Cl	THC	O ₂
	-	%	kg/m³	mg/m³ @		mg/m³ @	_		9 11% O ₂		0 11% O ₂	mg/m³ @ 11% O ₂	%
5-May-16	Time 0:00	1-hr 7.90	1-hr 0.21	1-hr 21	Rolling 4-hr 16.8	1-hr 0	Rolling 24-hr 0.0	1-hr 111	Rolling 24-hr 107	1-hr 4	Rolling 24-hr 4.0	1-hr 0	1-hr 7
5-May-16	1:00	7.98	0.21	18	17.3	0	0.0	103	107	4	4.1	0	7
5-May-16	2:00	7.41	0.21	21	18.8	0	0.0	104	107	3	4.0	0	7
5-May-16 5-May-16	3:00 4:00	7.29 7.90	0.22 0.21	16 16	19.0 17.8	0 0	0.0 0.0	106 104	106 105	4 4	4.2 4.3	0 0	7
5-May-16	5:00	7.68	0.21	12	16.3	ő	0.0	122	107	3	4.3	Ö	7
5-May-16	6:00	7.77	0.21	15	14.8	0	0.0	107	107	4	4.3	0	7
5-May-16	7:00	8.16	0.20	17 16	15.0 15.0	0 0	0.0 0.0	122 108	109	6 5	4.3	0 0	8 7
5-May-16 5-May-16	8:00 9:00	7. <b>7</b> 9 7.91	0.21 0.21	16 19	16.8	0	0.0	108	108 109	5	4.3 4.3	0	7 7
5-May-16	10:00	8.04	0.20	20	18.0	Ö	0.0	106	109	4	4.3	Ō	7
5-May-16	11:00	7.86	0.21	14	17.3	0	0.0	104	109	4	4.2	0	7
5-May-16 5-May-16	12:00 13:00	8.21 7.90	0.20 0.21	13 11	16.5 14.5	0 0	0.0	103 111	108 109	3 3	4. <b>1</b> 4.0	0 0	8 7
5-May-16	14:00	8.14	0.20	16	13.5	0	0.0	104	109	4	4.1	ő	8
5-May-16	15:00	8.12	0.20	14	13.5	0	0.0	109	109	4	4.1	0	8
5-May-16	16:00												8 7
5-May-16 5-May-16	17:00 18:00												7 7
5-May-16	19:00	7.83	0.21	12	13.3	0	0.0	127	111	5	4.2	0	7
5-May-16	20:00	7.93	0.21	16	14.5	0	0.0	103	109	8	4.6	0	7
5-May-16	21:00 22:00	7.61 7.86	0.22 0.22	21 18	15.8 16.8	0 0	0.0 0.0	112 102	110 108	7 7	4.8 4.9	0 0	7
5-May-16 5-May-16	23:00	7.79	0.22	17	18.0	0	0.0	105	108	6	5.0	0	7
·													and the same of th
9-May-16	0:00	7.52 7.58	0.21 0.21	12 25		0 0		108 110		5 6		0 0	7 7
9-May-16 9-May-16	1:00 2:00	7.58 7.95	0.21	16		0		100		6		0	7
9-May-16	3:00	7.73	0.21	18	17.8	0		101		5		0	7
9-May-16	4:00	7.08	0.22	20	19.8	0		106		4		0	7
9-May-16 9-May-16	5:00 6:00	8.05 8.10	0.20 0.20	22 22	19.0 20.5	0		124 99		3 4		0	8 7
9-May-16	7:00	7.39	0.21	25	22.3	0		134		4		Ö	7
9-May-16	8:00	7.93	0.21	17	21.5	0		104		4		0	7
9-May-16	9:00	7.73	0.21	22 22	21.5 21.5	0 0		100 108		4 4		0 0	7 7
9-May-16 9-May-16	10:00 11:00	7.41 7.68	0.21 0.21	15	19.0	0		106		3		0	7
9-May-16	12:00	7.86	0.21	16	18.8	0		105		5		0	7
9-May-16	13:00	7.86	0.21	15	17.0	0		97		5		0	7
9-May-16 9-May-16	14:00 15:00	8.26 8.16	0.20 0.20	16 16	15.5 15.8	0		107 108		4 4		0	8 7
9-May-16	16:00	8.34	0.20	22	17.3	Ö		108		4		Ö	8
9-May-16	17:00	7.91	0.21	16	17.5	0		112		4		0	7
9-May-16 9-May-16	18:00 19:00	7.81 8.32	0.21 0.20	13 14	16.8 16.3	0 0		99 105		3 2		0	7 8
9-May-16	20:00	8.12	0.20	15	14.5	0		106		3		0	7
9-May-16	21:00	8.09	0.21	13	13.8	0		109		4		0	7
9-May-16	22:00	8.39	0.20	19 17	15.3	0 0	0.0	105 103	107	4 4	4.1	0 0	8 7
9-May-16 10-May-16	23:00 0:00	8.21 7.95	0.20 0.21	12	16.0 15.3	0	0.0	103	107 107	4	4.1 4.0	0	7
10-May-16	1:00	8.39	0.20	17	16.3	0	0.0	103	106	4	4.0	0	8
10-May-16	2:00	8.08	0.21	21	16.8	0	0.0	116	107	4	3.9	0	7
10-May-16 10-May-16	3:00 4:00	7.92 7.74	0.21 0.21	17 16	16.8 17.8	0 0	0.0 0.0	98 107	107 107	4 4	3.8 3.8	0 0	7 7
10-May-16	5:00	8.28	0.20	18	18.0	Ö	0.0	122	107	2	3.8	0	8
10-May-16	6:00	7.90	0.21	20	17.8	0	0.0	110	107	3	3.8	0	7
10-May-16 10-May-16	7:00 8:00	7.85 8.20	0.21 0.20	18 14	18.0 17.5	0	0.0 0.0	130 107	107 107	6 5	3.8 3.9	0 0	7 8
10-May-16	9:00	8.00	0.21	15	16.8	ő	0.0	106	108	5	3.9	Ö	7
10-May-16	10:00	7.81	0.21	14	15.3	0	0.0	104	107	5	4.0	0	7
10-May-16 10-May-16	11:00 12:00	8.22 7.98	0.20 0.21	12 10	13.8 12.8	0 0	0.0 0.0	97 113	107 107	5 5	4.0 4.0	0 0	8 7
10-May-16	13:00	8.42	0.20	13	12.3	0	0.0	103	108	5	4.0	o	8
10-May-16	14:00	8.15	0.20	13	12.0	0	0.0	107	108	5	4.1	0	8
10-May-16	15:00	8.25	0.20	14	12.5	0	0.0	106	107	5 5	4.1	0 0	8 7
10-May-16 10-May-16	16:00 17:00	7.80 8.17	0.21 0.20	12 17	13.0 14.0	0	0.0 0.0	109 101	108 107	4	4.2 4.2	0	8
10-May-16	18:00	8.32	0.20	21	16.0	0	0.0	104	107	5	4.3	0	8
10-May-16	19:00	8.27	0.20	12	15.5	0	0.0	103	107	4	4.3	0	8
10-May-16 10-May-16	20:00 21:00	8.28 7.70	0.20 0.21	11 11	15.3 13.8	0 0	0.0 0.0	108 108	107 107	4 4	4.4 4.4	0 0	8 7
10-May-16	22:00	8.04	0.21	11	11.3	0	0.0	109	107	5	4.4	0	7
10-May-16	23:00	8.45	0.20	13	11.5	0	0.0	104	107	6	4.5	0	8
	Min	7.08	0.18	6	9.8	0	0.0	92	104	2	3.6	0	7
	Max	9.06	0.22	65	29.8	0	0.0	134	111	8	5.4	1	8
	Avg	8.08	0.20	17 6.5	16.9	0	0.0	107	107	4	4.2	0	7 0.5
	Std Dev	0.34	0.01	6.5	3.8	0	0.0	7.08	1.3	1.1	0.5	0.1	U.S



# **APPENDIX 32**

DYEC AMESA Dioxin and Furan Analytical Report and Results



AMESA Dioxin and Furan Emission Data Calculated with AMESA Cartridge and Probe Rinse (55 pages)

# TABLE 1 Covanta - Durham York Energy Centre AMESA Monitor Dioxin and Furan Test Schedule

# **Boiler No. 1 BH Outlet**

Test	Test Date	Samplin	g Period	Sampling Time
Number		Start	Finish	min
1	May 9, 2016	10:04	16:17	373
2	May 10, 2016	8:49	15:08	379
3	May 11, 2016	8:24	14:31	367

# Boiler No. 2 BH Outlet

Test	Test Date	Samplin	g Period	Sampling Time
Number		Start	Finish	min
1	May 6, 2016	8:48	15:00	372
2	May 9, 2016	10:04	16:21	377
3	May 10, 2016	8:54	15:12	378

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

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	902	76.2	978	0.14	0.24	0.18	0.20	3.31
Pentachlorodibenzo-p-dioxins	22900	5590	28490	4.10	7.04	5.21	5.91	96.4
Hexachlorodibenzo-p-dioxins	44000	50100	94100	13.5	23.2	17.2	19.5	318
Heptachlorodibenzo-p-dioxins	24200	56600	80800	11.6	20.0	14.8	16.8	273
Octachlorodibenzo-p-dioxin	7560	25200	32760	4.72	8.09	5.99	6.80	111
Total			237128	34.1	58.6	43.4	49.2	802

### **Furans**

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	1700	103	1803	0.26	0.45	0.33	0.37	6.10
Pentachlorodibenzofurans	9880	2590	12470	1.80	3.08	2.28	2.59	42.2
Hexachlorodibenzofurans	15000	12200	27200	3.92	6.72	4.97	5.65	92.0
Heptachlorodibenzofurans	7100	14200	21300	3.07	5.26	3.90	4.42	72.1
Octachlorodibenzofuran	<1900	<5900	<7800	<1.12	<1.93	<1.43	<1.62	<26.4
Total	<35580		<70573	<10.2	<17.4	<12.9	<14.6	<239

Dry Gas Volume Sampled (Nm³***):	3.710
Dry Gas Volume Sampled (Rm³*):	4.050
Actual Flowrate (m³/s):	23.5
Dry Reference Flowrate (Rm³/s*):	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*) :	16.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 2

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	128	196	324	0.046	0.078	0.058	0.065	1.09
Pentachlorodibenzo-p-dioxins	3300	3830	7130	1.00	1.72	1.29	1.44	23.9
Hexachlorodibenzo-p-dioxins	6710	22200	28910	4.07	6.97	5.21	5.84	96.9
Heptachlorodibenzo-p-dioxins	4620	23600	28220	3.98	6.81	5.09	5.70	94.6
Octachlorodibenzo-p-dioxin	1680	12000	13680	1.93	3.30	2.47	2.76	45.9
Total			78264	11.0	18.9	14.1	15.8	262

### **Furans**

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	302	276	578	0.081	0.14	0.10	0.12	1.94
Pentachlorodibenzofurans	1320	1780	3100	0.44	0.75	0.56	0.63	10.4
Hexachlorodibenzofurans	2050	6240	8290	1.17	2.00	1.49	1.67	27.8
Heptachlorodibenzofurans	1150	6520	7670	1.08	1.85	1.38	1.55	25.7
Octachlorodibenzofuran	<370	<2900	<3270	<0.46	<0.79	<0.59	<0.66	<11.0
Total			<22908	<3.23	<5.53	<4.13	<4.63	<76.8

Dry Gas Volume Sampled (Nm ³ ***):	3.798
Dry Gas Volume Sampled (Rm ³ *):	4.146
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*):	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*):	16.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 3

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	25.6	28.3	53.9	0.0074	0.013	0.0094	0.011	0.18
Pentachlorodibenzo-p-dioxins	1310	623	1933	0.27	0.46	0.34	0.38	6.57
Hexachlorodibenzo-p-dioxins	2920	3940	6860	0.95	1.63	1.20	1.36	23.3
Heptachlorodibenzo-p-dioxins	1030	5570	6600	0.91	1.57	1.16	1.30	22.4
Octachlorodibenzo-p-dioxin	163	3980	4143	0.57	0.98	0.73	0.82	14.1
Total			19590	2.71	4.66	3.43	3.87	66.6

### **Furans**

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
				-				
Tetrachlorodibenzofurans	65.4	41.0	106	0.015	0.025	0.019	0.021	0.36
Pentachlorodibenzofurans	570	263	833	0.12	0.20	0.15	0.16	2.83
Hexachlorodibenzofurans	1020	1150	2170	0.30	0.52	0.38	0.43	7.37
Heptachlorodibenzofurans	375	1320	1695	0.23	0.40	0.30	0.33	5.76
Octachlorodibenzofuran	<44	<850	<894	<0.12	<0.21	<0.16	<0.18	<3.04
Total			<5698	<0.79	<1.35	<1.00	<1.13	<19.4

Dry Gas Volume Sampled (Nm ³ ***):	3.855
Dry Gas Volume Sampled (Rm ³ *):	4.208
Actual Flowrate (m ³ /s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*) :	17.2

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 5

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Actual Concentrations

Congener			Coefficient		
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzo-p-dioxins	0.14	0.046	0.0074	0.065	106
Pentachlorodibenzo-p-dioxins	4.10	1.00	0.0074	1.79	114
Hexachlorodibenzo-p-dioxins	13.5	4.07	0.95	6.19	106
Heptachlorodibenzo-p-dioxins	11.6	3.98	0.91	5.51	100
Octachlorodibenzo-p-dioxin	4.72	1.93	0.57	2.41	87.8
Total	34.1	11.0	2.71	16.0	102

Congener		Actual Concentration					
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	ng/m³	ng/m³	ng/m³	ng/m³	%		
Tetrachlorodibenzofurans	0.26	0.081	0.015	0.12	107		
Pentachlorodibenzofurans	1.80	0.44	0.12	0.78	114		
Hexachlorodibenzofurans	3.92	1.17	0.30	1.79	105		
Heptachlorodibenzofurans	3.07	1.08	0.23	1.46	99.6		
Octachlorodibenzofuran	<1.12	<0.46	<0.12	<0.57	89.4		
Total	<10.2	<3.23	<0.79	<4.72	103		

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Dry Reference Concentrations

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.24	0.078	0.013	0.11	106
Pentachlorodibenzo-p-dioxins	7.04	1.72	0.46	3.07	114
Hexachlorodibenzo-p-dioxins	23.2	6.97	1.63	10.6	106
Heptachlorodibenzo-p-dioxins	20.0	6.81	1.57	9.44	100
Octachlorodibenzo-p-dioxin	8.09	3.30	0.98	4.12	87.9
Total	58.6	18.9	4.66	27.4	102

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.45	0.14	0.025	0.20	107
Pentachlorodibenzofurans	3.08	0.75	0.20	1.34	114
Hexachlorodibenzofurans	6.72	2.00	0.52	3.08	105
Heptachlorodibenzofurans	5.26	1.85	0.40	2.50	99.6
Octachlorodibenzofuran	<1.93	<0.79	<0.21	<0.98	89.4
Total	<17.4	<5.53	<1.35	<8.10	103

^{*} At 25°C and 1 atmosphere

TABLE 7
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Dry Adjusted Concentrations

Congener		Coefficient			
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
I 1   P	0.40	0.050	0.0004	0.002	100
Tetrachlorodibenzo-p-dioxins	0.18	0.058	0.0094	0.082	106
Pentachlorodibenzo-p-dioxins	5.21	1.29	0.34	2.28	113
Hexachlorodibenzo-p-dioxins	17.2	5.21	1.20	7.87	106
Heptachlorodibenzo-p-dioxins	14.8	5.09	1.16	7.01	100
Octachlorodibenzo-p-dioxin	5.99	2.47	0.73	3.06	87.6
Total	43.4	14.1	3.43	20.3	102

Congener		Coefficient			
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
Tetrachlorodibenzofurans	0.33	0.10	0.019	0.15	107
Pentachlorodibenzofurans	2.28	0.56	0.15	1.00	114
Hexachlorodibenzofurans	4.97	1.49	0.38	2.28	105
Heptachlorodibenzofurans	3.90	1.38	0.30	1.86	99.3
Octachlorodibenzofuran	<1.43	<0.59	<0.16	<0.72	89.1
Total	<12.9	<4.13	<1.00	<6.01	103

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

TABLE 8

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Wet Reference Concentrations

Congener		Wet Reference Concentration					
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%		
Tetrachlorodibenzo-p-dioxins	0.20	0.065	0.011	0.093	107		
Pentachlorodibenzo-p-dioxins	5.91	1.44	0.38	2.58	114		
Hexachlorodibenzo-p-dioxins	19.5	5.84	1.36	8.91	106		
Heptachlorodibenzo-p-dioxins	16.8	5.70	1.30	7.92	101		
Octachlorodibenzo-p-dioxin	6.80	2.76	0.82	3.46	88.2		
Total	49.2	15.8	3.87	23.0	102		

Congener	voga, en	Wet reference	Concentration		Coefficient
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.37	0.12	0.021	0.17	107
Pentachlorodibenzofurans	2.59	0.63	0.16	1.13	114
Hexachlorodibenzofurans	5.65	1.67	0.43	2.58	105
Heptachlorodibenzofurans	4.42	1.55	0.335	2.10	99.8
Octachlorodibenzofuran	<1.62	<0.66	<0.18	<0.82	89.7
Total	<14.6	<4.63	<1.13	<6.80	103

^{*} At 25°C and 1 atmosphere

TABLE 9
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Rates

Congener		Emissi	on Rate		Coefficient
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%%
	2.24	4.00	0.40	4.50	405
Tetrachlorodibenzo-p-dioxins	3.31	1.09	0.18	1.53	105
Pentachlorodibenzo-p-dioxins	96.4	23.9	6.57	42.3	113
Hexachlorodibenzo-p-dioxins	318	96.9	23.3	146	105
Heptachlorodibenzo-p-dioxins	273	94.6	22.4	130	99.3
Octachlorodibenzo-p-dioxin	111	45.9	14.1	56.9	86.6
Total	802	262	66.6	377	101

7 Test No. 3 ng/s 0.36 2.83	Average ng/s 2.80 18.5	of Variation % 106 113
		113
7.37	42.4	104
5.76	34.5	98.6
<3.04	<13.5	88.2
<19.4	<112	102
	<3.04	<3.04 <13.5

TABLE 10

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Congener Group Emission Data

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	0.065	0.11	0.082	0.093	1.53
Pentachlorodibenzo-p-dioxins	1.79	3.07	2.28	2.58	42.3
Hexachlorodibenzo-p-dioxins	6.19	10.6	7.87	8.91	146
Heptachlorodibenzo-p-dioxins	5.51	9.44	7.01	7.92	130
Octachlorodibenzo-p-dioxin	2.41	4.12	3.06	3.46	56.9
Total	16.0	27.4	20.3	23.0	377

Congener Group	Actual Concentration	Dry Reference Concentration	ry Reference Dry Adjusted oncentration		Emission Rate	
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s	
Tetrachlorodibenzofurans	0.12	0.20	0.15	0.17	2.80	
Pentachlorodibenzofurans	0.12	1.34	1.00	1.13	2.80 18.5	
Hexachlorodibenzofurans	1.79	3.08	2.28	2.58	42.4	
Heptachlorodibenzofurans	1.46	2.50	1.86	2.10	34.5	
Octachlorodibenzofuran	<0.57	<0.98	<0.72	<0.82	<13.5	
Total	<4.72	<8.10	<6.01	<6.80	<112	

^{*} At 25°C and 1 atmosphere

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

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 1

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tatra shlava dibanza na diavina	149	170	210	0.041	0.070	0.054	0.058	1.05
Tetrachlorodibenzo-p-dioxins		170	319	0.041	0.070			
Pentachlorodibenzo-p-dioxins	673	2500	3173	0.41	0.70	0.53	0.58	10.5
Hexachlorodibenzo-p-dioxins	1450	13800	15250	1.95	3.35	2.57	2.79	50.3
Heptachlorodibenzo-p-dioxins	1080	24300	25380	3.24	5.58	4.27	4.65	83.7
Octachlorodibenzo-p-dioxin	403	12500	12903	1.65	2.84	2.17	2.36	42.5
Total			57025	7.29	12.5	9.59	10.4	188

### **Furans**

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	262	252	514	0.066	0.11	0.086	0.094	1.69
Pentachlorodibenzofurans	332	1050	1382	0.18	0.30	0.23	0.25	4.56
Hexachlorodibenzofurans	376	3870	4246	0.54	0.93	0.71	0.78	14.0
Heptachlorodibenzofurans	279	5360	5639	0.72	1.24	0.95	1.03	18.6
Octachlorodibenzofuran	<68	<2900	<2968	<0.38	<0.65	<0.50	<0.54	<9.79
Total			<14749	<1.88	<3.24	<2.48	<2.70	<48.6

Dry Gas Volume Sampled (Nm³***):	4.168
Dry Gas Volume Sampled (Rm ³ *):	4.549
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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

^{***} At 0°C and 1 atmosphere

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 2

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	90.7	<15	<106	<0.014	<0.024	<0.018	<0.020	<0.35
Pentachlorodibenzo-p-dioxins	377	478	855	0.11	0.19	0.15	0.16	2.79
Hexachlorodibenzo-p-dioxins	847	4090	4937	0.66	1.11	0.84	0.93	16.1
Heptachlorodibenzo-p-dioxins	655	5260	5915	0.79	1.33	1.01	1.12	19.3
Octachlorodibenzo-p-dioxin	293	3530	3823	0.51	0.86	0.65	0.72	12.5
Total			<15636	<2.08	<3.52	<2.67	<2.95	<51.1

### **Furans**

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
_								
Tetrachlorodibenzofurans	185	6.8	192	0.025	0.043	0.033	0.036	0.63
Pentachlorodibenzofurans	212	240	452	0.060	0.10	0.077	0.085	1.48
Hexachlorodibenzofurans	187	1110	1297	0.17	0.29	0.22	0.24	4.24
Heptachlorodibenzofurans	150	1170	1320	0.18	0.30	0.23	0.25	4.31
Octachlorodibenzofuran	<45	<730	<775	<0.10	<0.17	<0.13	<0.15	<2.53
Total			<4036	<0.54	<0.91	<0.69	<0.76	<13.2

Dry Gas Volume Sampled (Nm³***) :	4.068
Dry Gas Volume Sampled (Rm³*) :	4.440
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*) :	17.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 13

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

AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
135	234	369	0.048	0.081	0.063	0.068	1.20
379	1890	2269	0.30	0.50	0.39	0.42	7.38
972	8860	9832	1.29	2.16	1.67	1.82	32.0
850	14700	15550	2.04	3.42	2.65	2.87	50.6
394	8770	9164	1.20	2.01	1.56	1.69	29.8
		37184	4.88	8.17	6.33	6.87	121
	\$ample pg 135 379 972 850	Sample         Rinse           pg         pg           135         234           379         1890           972         8860           850         14700	Sample         Rinse         Collected           pg         pg         pg           135         234         369           379         1890         2269           972         8860         9832           850         14700         15550           394         8770         9164	Sample         Rinse         Collected         Concentration           pg         pg         pg         ng/m³           135         234         369         0.048           379         1890         2269         0.30           972         8860         9832         1.29           850         14700         15550         2.04           394         8770         9164         1.20	Sample         Rinse         Collected         Concentration         Concentration           pg         pg         pg         ng/m³         ng/Rm³*           135         234         369         0.048         0.081           379         1890         2269         0.30         0.50           972         8860         9832         1.29         2.16           850         14700         15550         2.04         3.42           394         8770         9164         1.20         2.01	Sample         Rinse         Collected         Concentration         Concentration         Concentration           pg         pg         pg         ng/m³         ng/Rm³*         ng/Rm³**           135         234         369         0.048         0.081         0.063           379         1890         2269         0.30         0.50         0.39           972         8860         9832         1.29         2.16         1.67           850         14700         15550         2.04         3.42         2.65           394         8770         9164         1.20         2.01         1.56	Sample         Rinse         Collected         Concentration         Concentration         Concentration         Concentration           pg         pg         pg         ng/m³         ng/Rm³*         ng/Rm³**         ng/Rm³**           135         234         369         0.048         0.081         0.063         0.068           379         1890         2269         0.30         0.50         0.39         0.42           972         8860         9832         1.29         2.16         1.67         1.82           850         14700         15550         2.04         3.42         2.65         2.87           394         8770         9164         1.20         2.01         1.56         1.69

### **Furans**

Congener Group	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	224	365	589	0.077	0.13	0.10	0.11	1.92
Pentachlorodibenzofurans	230	965	1195	0.16	0.26	0.20	0.22	3.89
Hexachlorodibenzofurans	231	2590	2821	0.37	0.62	0.48	0.52	9.17
Heptachlorodibenzofurans	213	3710	3923	0.51	0.86	0.67	0.72	12.8
Octachlorodibenzofuran	<65	<2000	<2065	<0.27	<0.45	<0.35	<0.38	<6.72
Total			<10593	<1.39	<2.33	<1.80	<1.96	<34.5

Dry Gas Volume Sampled (Nm ³ ***):	4.169
Dry Gas Volume Sampled (Rm³*):	4.551
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*) :	
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*) :	17.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 14

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Actual Concentrations

	Coefficient			
Test No. 1	Test No. 2	Test No. 3	Average	of Variation %
ng/m³	ng/m³	ng/m³	ng/m³	
0.041	<0.014	0.048	<0.034	52.5
0.41	0.11	0.30	0.27	54.2
1.95	0.66	1.29	1.30	49.8
3.24	0.79	2.04	2.02	60.8
1.65	0.51	1.20	1.12	51.4
7.29	<2.08	4.88	<4.75	55.0
	ng/m³  0.041 0.41 1.95 3.24 1.65	Test No. 1         Test No. 2           ng/m³         ng/m³           0.041         <0.014	ng/m³         ng/m³         ng/m³           0.041         <0.014	Test No. 1         Test No. 2         Test No. 3         Average           ng/m³         ng/m³         ng/m³         ng/m³           0.041         <0.014

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.066	0.025	0.077	0.056	48.4
Pentachlorodibenzofurans	0.18	0.060	0.16	0.13	47.6
Hexachlorodibenzofurans	0.54	0.17	0.37	0.36	51.3
Heptachlorodibenzofurans	0.72	0.18	0.51	0.47	58.6
Octachlorodibenzofuran	<0.38	<0.10	<0.27	<0.25	55.5
Total	<1.88	<0.54	<1.39	<1.27	53.7

TABLE 15

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Dry Reference Concentrations

Congener	***************************************	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%%
  Tetrachlorodibenzo-p-dioxins	0.070	<0.024	0.081	<0.058	52.1
Pentachlorodibenzo-p-dioxins	0.70	0.19	0.50	0.46	54.9
Hexachlorodibenzo-p-dioxins	3.35	1.11	2.16	2.21	50.8
Heptachlorodibenzo-p-dioxins	5.58	1.33	3.42	3.44	61.7
Octachlorodibenzo-p-dioxin	2.84	0.86	2.01	1.90	52.1
Total	12.5	<3.52	8.17	<8.08	55.8

Congener	USAN ESTATE HEAVEN CONTRACTOR OF THE STATE O	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.11	0.043	0.13	0.095	48.1
Pentachlorodibenzofurans	0.30	0.10	0.26	0.22	47.9
Hexachlorodibenzofurans	0.93	0.29	0.62	0.62	52.1
Heptachlorodibenzofurans	1.24	0.30	0.86	0.80	59.3
Octachlorodibenzofuran	<0.65	<0.17	<0.45	<0.43	56.2
Total	<3.24	<0.91	<2.33	<2.16	54.4

^{*} At 25°C and 1 atmosphere

TABLE 16

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Dry Adjusted Concentrations

Congener		Coefficient				
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %	
Tetrachlorodibenzo-p-dioxins	0.054	<0.018	0.063	<0.045	52.7	
Pentachlorodibenzo-p-dioxins	0.53	0.15	0.39	0.36	55.0	
Hexachlorodibenzo-p-dioxins	2.57	0.84	1.67	1.69	50.8	
Heptachlorodibenzo-p-dioxins	4.27	1.01	2.65	2.64	61.6	
Octachlorodibenzo-p-dioxin	2.17	0.65	1.56	1.46	52.2	
Total	9.59	<2.67	6.33	<6.20	55.8	

Congener		Coefficient				
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %	
Tetrachlorodibenzofurans	0.086	0.033	0.10	0.073	48.7	
Pentachlorodibenzofurans	0.086	0.033	0.10	0.073	48.7 48.2	
Hexachlorodibenzofurans	0.71	0.22	0.48	0.47	52.2	
Heptachlorodibenzofurans	0.95	0.23	0.67	0.61	59.3	
Octachlorodibenzofuran	<0.50	<0.13	<0.35	<0.33	56.3	
Total	<2.48	<0.69	<1.80	<1.66	54.5	

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

TABLE 17

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Wet Reference Concentrations

## Dioxins

Congener		Wet Reference Concentration						
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation			
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%			
Tetrachlorodibenzo-p-dioxins	0.058	<0.020	0.068	<0.049	52.2			
Pentachlorodibenzo-p-dioxins	0.58	0.16	0.42	0.39	54.7			
Hexachlorodibenzo-p-dioxins	2.79	0.93	1.82	1.85	50.4			
Heptachlorodibenzo-p-dioxins	4.65	1.12	2.87	2.88	61.3			
Octachlorodibenzo-p-dioxin	2.36	0.72	1.69	1.59	51.8			
Total	10.4	<2.95	6.87	<6.76	55.5			

## **Furans**

Congener		Wet Reference Concentration						
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation			
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%%			
Tetrachlorodibenzofurans	0.094	0.026	0.11	0.000	40.3			
Pentachlorodibenzofurans	*****	0.036	0.11	0.080	48.2			
	0.25	0.085	0.22	0.19	47.8			
Hexachlorodibenzofurans	0.78	0.24	0.52	0.51	51.8			
Heptachlorodibenzofurans	1.03	0.25	0.72	0.67	59.0			
Octachlorodibenzofuran	<0.54	<0.15	<0.38	<0.36	<b>55.</b> 9			
Total .	<2.70	<0.76	<1.96	<1.81	54.2			

^{*} At 25°C and 1 atmosphere

TABLE 18

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Emission Rates

## Dioxins

	Coefficient			
Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	of Variation %
1.05	<0.35	1.20	<0.87	52.8
10.5	2.79	7.38	6.88	56.1
50.3	16.1	32.0	32.8	52.1
83.7	19.3	50.6	51.2	62.9
42.5	12.5	29.8	28.3	53.4
188	<51.1	121	<120	57.1
	1.05 10.5 50.3 83.7 42.5	Test No. 1 ng/s         Test No. 2 ng/s           1.05	ng/s         ng/s         ng/s           1.05         <0.35	Test No. 1 ng/s         Test No. 2 ng/s         Test No. 3 ng/s         Average ng/s           1.05         <0.35

## Furans

Congener		Emission Rate						
Group	Test No. 1 ng/s	Test No. 2 Test No. ng/s ng/s		Average ng/s	of Variation %			
Tetrachlorodibenzofurans	1.69	0.63	1.92	1.41	48.8			
Pentachlorodibenzofurans	4.56	1.48	3.89	3.31	49.0			
Hexachlorodibenzofurans	14.0	4.24	9.17	9.14	53.4			
Heptachlorodibenzofurans	18.6	4.31	12.8	11.9	60.4			
Octachlorodibenzofuran	<9.79	<2.53	<6.72	<6.34	57.4			
Total	<48.6	<13.2	<34.5	<32.1	55.6			

TABLE 19

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Congener Group Emission Data

### Dioxins

Congener Group	Actual Concentration	Dry Reference Concentration	- •	Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	<0.034	<0.058	<0.045	<0.049	<0.87
Pentachlorodibenzo-p-dioxins	0.27	0.46	0.36	0.39	6.88
Hexachlorodibenzo-p-dioxins	1.30	2.21	1.69	1.85	32.8
Heptachlorodibenzo-p-dioxins	2.02	3.44	2.64	2.88	51.2
Octachlorodibenzo-p-dioxin	1.12	1.90	1.46	1.59	28.3
Total	<4.75	<8.08	<6.20	<6.76	<120

#### **Furans**

Congener Group	Actual Concentration	Dry Reference Concentration		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.056	0.095	0.073	0.080	1.41
Pentachlorodibenzofurans	0.13	0.22	0.17	0.19	3.31
Hexachlorodibenzofurans	0.36	0.62	0.47	0.51	9.14
Heptachlorodibenzofurans	0.47	0.80	0.61	0.67	11.9
Octachlorodibenzofuran	<0.25	<0.43	<0.33	<0.36	<6.34
Total	<1.27	<2.16	<1.66	<1.81	<32.1

^{*} At 25°C and 1 atmosphere

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

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
351.76	pg	pg	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
								loomers A 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
2378-tetrachlorodibenzo-p-dioxin	24.0	<5.2	<29.2	<4.20	<7.21	<5.34	<6.06	<0.099
12378-pentachlorodibenzo-p-dioxin	396	186	582	83.8	144	106	121	1.97
123478-hexachlorodibenzo-p-dioxin	1070	1310	2380	343	588	435	494	8.05
123678-hexachlorodibenzo-p-dioxin	3090	4210	7300	1051	1803	1335	1515	24.7
123789-hexachlorodibenzo-p-dioxin	2770	4010	6780	976	1674	1240	1407	22.9
1234678-heptachlorodibenzo-p-dioxin	11600	28200	39800	5730	9828	7278	8261	135
Octachlorodibenzo-p-dioxin	7560	25200	32760	4716	8090	5991	6799	111
2378-tetrachlorodibenzofuran	<150	<66	<216	<31.1	<53.3	<39.5	<44.8	<0.73
12378-pentachlorodibenzofuran	335	81.1	416	59.9	103	76.1	86.4	1.41
23478-pentachlorodibenzofuran	<1000	432	<1432	<206	<354	<262	<297	<4.84
123478-hexachlorodibenzofuran	3350	2780	6130	882	1514	1121	1272	20.7
123678-hexachlorodibenzofuran	1630	1430	3060	441	756	560	635	10.4
234678-hexachlorodibenzofuran	2210	2750	4960	714	1225	907	1029	16.8
123789-hexachlorodibenzofuran	<130	<200	<330	<47.5	<81.5	<60	<68.5	<1.12
1234678-heptachlorodibenzofuran	4130	7630	11760	1693	2904	2151	2441	39.8
1234789-heptachlorodibenzofuran	698	1600	2298	331	567	420	477	7.77
Octachlorodibenzofuran	<1900	<5900	<7800	<1123	<1926	<1426	<1619	<26.4
Total Dioxins & Furans Only			<128033	<18432	<31617	<23413	<26573	<433

Dry Gas Volume Sampled (Nm ³ ***):	3.710
Dry Gas Volume Sampled (Rm ³ *):	4.050
Actual Flowrate (m³/s) :	23.5
Dry Reference Flowrate (Rm³/s*):	13.7
Dry Adjusted Flowrate (Rm³/s**) :	18.5
Wet Reference Flowrate (Rm³/s*):	16.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<5.8	<5.0	<10.8	<1.52	<2.61	<1.95	<2.18	<0.036
12378-pentachlorodibenzo-p-dioxin	57.4	95.7	153	21.6	36.9	27.6	30.9	0.51
123478-hexachlorodibenzo-p-dioxin	149	618	767	108	185	138	155	2.57
123678-hexachlorodibenzo-p-dioxin	433	1780	2213	312	534	399	447	7.42
123789-hexachlorodibenzo-p-dioxin	409	1790	2199	310	530	396	444	7.37
1234678-heptachlorodibenzo-p-dioxin	2120	12000	14120	1989	3406	2545	2852	47.3
Octachlorodibenzo-p-dioxin	1680	12000	13680	1927	3300	2466	2763	45.9
2378-tetrachlorodibenzofuran	<35	<22	<57.0	<8.03	<13.7	<10.3	<11.5	<0.19
12378-pentachlorodibenzofuran	52.0	50.1	102	14.4	24.6	18.4	20.6	0.34
23478-pentachlorodibenzofuran	<150	255	<405	<57.1	<97.7	<73.0	<81.8	<1.36
123478-hexachlorodibenzofuran	450	1370	1820	256	439	328	368	6.10
123678-hexachlorodibenzofuran	220	668	888	125	214	160	179	2.98
234678-hexachlorodibenzofuran	260	1390	1650	232	398	297	333	5.53
123789-hexachlorodibenzofuran	<15	<74	<89.0	<12.5	<21.5	<16.0	<18.0	< 0.30
1234678-heptachlorodibenzofuran	649	3530	4179	589	1008	753	844	14.0
1234789-heptachlorodibenzofuran	118	728	846	119	204	153	171	2.84
Octachlorodibenzofuran	<370	<2900	<3270	<461	<789	<589	<660	<11.0
Total Dioxins & Furans Only			<46449	<6544	<11204	<8373	<9382	<156

Dry Gas Volume Sampled (Nm ³ ***):	3.798
Dry Gas Volume Sampled (Rm³*):	4.146
Actual Flowrate (m³/s):	23.8
Dry Reference Flowrate (Rm³/s*) :	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 22
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 3

Specific Isomer	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	<2.3	<4.1	<6.40	<0.88	<1.52	<1.12	<1.26	<0.022
12378-pentachlorodibenzo-p-dioxin	25.7	16.0	41.7	5.76	9.91	7.30	8.24	0.14
123478-hexachlorodibenzo-p-dioxin	58.4	10.0	161	22.3	38.4	28.3	31.9	0.55
123678-hexachlorodibenzo-p-dioxin	180	293	473	65.3	112	82.9	93.5	1.61
123789-hexachlorodibenzo-p-dioxin	158	333	491	67.8	117	86.0	97.0	1.67
1234678-heptachlorodibenzo-p-dioxin	445	2750	3195	441	759	560	631	10.9
Octachlorodibenzo-p-dioxin	163	3980	4143	572	985	726	819	14.1
F								
2378-tetrachlorodibenzofuran	<14	<7.1	<21.1	<2.91	<5.01	<3.70	<4.17	< 0.072
12378-pentachlorodibenzofuran	20.0	9.8	29.8	4.12	7.08	5.22	5.89	0.10
23478-pentachlorodibenzofuran	59.3	46.1	105	14.6	25.0	18.5	20.8	0.36
123478-hexachlorodibenzofuran	220	231	451	62.3	107	79.0	89.1	1.53
123678-hexachlorodibenzofuran	118	123	241	33.3	57.3	42.2	47.6	0.82
234678-hexachlorodibenzofuran	100	284	384	53.0	91.3	67.3	75.9	1.30
123789-hexachlorodibenzofuran	<7.2	<13	<20.2	<2.79	<4.80	<3.54	<3.99	< 0.069
1234678-heptachlorodibenzofuran	232	729	961	133	228	168	190	3.27
1234789-heptachlorodibenzofuran	30.0	157	187	25.8	44.4	32.8	36.9	0.64
Octachlorodibenzofuran	<44	<850	<894	<124	<212	<157	<177	<3.04
Total Dioxins & Furans Only			<11806	<1631	<2806	<2068	<2333	<40.1

Dry Gas Volume Sampled (Nm ³ ***):	3.855
Dry Gas Volume Sampled (Rm ³ *):	4.208
Actual Flowrate (m³/s):	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm ³ /s*) :	17.2

^{*} At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit),

and the value of the detection limit was used to calculate the emission data.

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

^{***} At 0°C and 1 atmosphere

TABLE 23

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Actual Concentrations

Specific		Actual Con	centration	***************************************	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/m³	pg/m³	pg/m³	pg/m³	%
					and the second s
2378-tetrachlorodibenzo-p-dioxin	<4.20	<1.52	<0.88	<2.20	80.0
12378-pentachlorodibenzo-p-dioxin	83.8	21.6	5.76	37.0	111
123478-hexachlorodibenzo-p-dioxin	343	108	22.3	158	105
123678-hexachlorodibenzo-p-dioxin	1051	312	65.3	476	108
123789-hexachlorodibenzo-p-dioxin	976	310	67.8	451	104
1234678-heptachlorodibenzo-p-dioxin	5730	1989	441	2720	100
Octachlorodibenzo-p-dioxin	4716	1927	572	2405	87.8
2378-tetrachlorodibenzofuran	<31.1	<8.03	<2.91	<14.0	107
12378-pentachlorodibenzofuran	59.9	14.4	4.12	26.1	114
23478-pentachlorodibenzofuran	<206	<57.1	14.6	<92.6	109
123478-hexachlorodibenzofuran	882	256	62.3	400	107
123678-hexachlorodibenzofuran	441	125	33.3	200	107
234678-hexachlorodibenzofuran	714	232	53.0	333	103
123789-hexachlorodibenzofuran	<47.5	<12.5	<2.79	<20.9	112
1234678-heptachlorodibenzofuran	1693	589	133	805	99.7
1234789-heptachlorodibenzofuran	331	119	25.8	159	98.5
Octachlorodibenzofuran	<1123	<461	<124	<569	89.4
Total Dioxins & Furans Only	<18432	<6544	<1631	<8869	97.4

TABLE 24

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific	Dry Reference Concentration				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
					AGE
2378-tetrachlorodibenzo-p-dioxin	<7.21	<2.61	<1.52	<3.78	79.9
12378-pentachlorodibenzo-p-dioxin	144	36.9	9.91	63.5	111
123478-hexachlorodibenzo-p-dioxin	588	185	38.4	270	105
123678-hexachlorodibenzo-p-dioxin	1803	534	112	816	108
123789-hexachlorodibenzo-p-dioxin	1674	530	117	774	104
1234678-heptachlorodibenzo-p-dioxin	9828	3406	759	4665	100
Octachlorodibenzo-p-dioxin	8090	3300	985	4125	87.9
2378-tetrachlorodibenzofuran	<53.3	<13.7	<5.01	<24.0	107
12378-pentachlorodibenzofuran	103	24.6	7.08	44.8	114
23478-pentachlorodibenzofuran	<354	<97.7	25.0	<159	109
123478-hexachlorodibenzofuran	1514	439	107	687	107
123678-hexachlorodibenzofuran	756	214	57.3	342	107
234678-hexachlorodibenzofuran	1225	398	91.3	571	103
123789-hexachlorodibenzofuran	<81.5	<21.5	<4.80	<35.9	112
1234678-heptachlorodibenzofuran	2904	1008	228	1380	99.7
1234789-heptachlorodibenzofuran	567	204	44.4	272	98.5
Octachlorodibenzofuran	<1926	<789	<212	<976	89.4
Total Dioxins & Furans Only	<31617	<11204	<2806	<15209	97.4

^{*} At 25°C and 1 atmosphere

TABLE 25

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific		Dry Adjusted Concentration					
lsomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%		
2378-tetrachlorodibenzo-p-dioxin	<5.34	<1.95	<1.12	<2.80	79.8		
12378-pentachlorodibenzo-p-dioxin	106	27.6	7.30	47.1	111		
123478-hexachlorodibenzo-p-dioxin	435	138	28.3	201	105		
123678-hexachlorodibenzo-p-dioxin	1335	399	82.9	606	108		
123789-hexachlorodibenzo-p-dioxin	1240	396	86.0	574	104		
1234678-heptachlorodibenzo-p-dioxin	7278	2545	560	3461	100		
Octachlorodibenzo-p-dioxin	5991	2466	726	3061	87.6		
2378-tetrachlorodibenzofuran	<39.5	<10.3	<3.70	<17.8	107		
12378-pentachlorodibenzofuran	76.1	18.4	5.22	33.2	113		
23478-pentachlorodibenzofuran	<262	<73.0	18.5	<118	108		
123478-hexachlorodibenzofuran	1121	328	79.0	509	107		
123678-hexachlorodibenzofuran	560	160	42.2	254	107		
234678-hexachlorodibenzofuran	907	297	67.3	424	102		
123789-hexachlorodibenzofuran	<60	<16.0	<3.54	<26.6	112		
1234678-heptachlorodibenzofuran	2151	753	168	1024	99		
1234789-heptachlorodibenzofuran	420	153	32.8	202	98.3		
Octachlorodibenzofuran	<1426	<589	<157	<724	89.1		
Total Dioxins & Furans Only	<23413	<8373	<2068	<11285	97.2		

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

TABLE 26

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific	V	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	<6.06	<2.18	<1.26	<3.17	80.3
12378-pentachlorodibenzo-p-dioxin	121	30.9	8.24	53.3	112
123478-hexachlorodibenzo-p-dioxin	494	155	31.9	227	105
123678-hexachlorodibenzo-p-dioxin	1515	447	93.5	685	108
123789-hexachlorodibenzo-p-dioxin	1407	444	97.0	649	105
1234678-heptachlorodibenzo-p-dioxin	8261	2852	631	3915	100
Octachlorodibenzo-p-dioxin	6799	2763	819	3460	88.2
2378-tetrachlorodibenzofuran	<44.8	<11.5	<4.17	<20.2	107
12378-pentachlorodibenzofuran	86.4	20.6	5.89	37.6	114
23478-pentachlorodibenzofuran	<297	<81.8	20.8	<133	109
123478-hexachlorodibenzofuran	1272	368	89.1	576	107
123678-hexachlorodibenzofuran	635	179	47.6	287	107
234678-hexachlorodibenzofuran	1029	333	75.9	480	103
123789-hexachlorodibenzofuran	<68.5	<18.0	<3.99	<30.2	113
1234678-heptachlorodibenzofuran	2441	844	190	1158	100
1234789-heptachlorodibenzofuran	477	171	36.9	228	98.8
Octachlorodibenzofuran	<1619	<660	<177	<819	89.7
Total Dioxins & Furans Only	<26573	<9382	<2333	<12763	97.7

^{*} At 25°C and 1 atmosphere

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Rates

Specific	4	Coefficient				
Isomer	Test No. 1	o. 1 Test No. 2 Test No. 3		Average	of Variation	
	ng/s	ng/s	ng/s	ng/s	%	
2378-tetrachlorodibenzo-p-dioxin	<0.099	<0.036	<0.022	<0.052	78.4	
12378-pentachlorodibenzo-p-dioxin	1.97	0.51	0.14	0.87	110	
123478-hexachlorodibenzo-p-dioxin	8.05	2.57	0.55	3.72	104	
123678-hexachlorodibenzo-p-dioxin	24.7	7.42	1.61	11.2	107	
123789-hexachlorodibenzo-p-dioxin	22.9	7.37	1.67	10.7	103	
1234678-heptachlorodibenzo-p-dioxin	135	47.3	10.9	64.3	99.0	
Octachlorodibenzo-p-dioxin	111	45.9	14.1	56.9	86.6	
2378-tetrachlorodibenzofuran	<0.73	<0.19	<0.072	<0.33	106	
12378-pentachlorodibenzofuran	1.41	0.34	0.10	0.62	113	
23478-pentachlorodibenzofuran	<4.84	<1.36	0.36	<2.19	108	
123478-hexachlorodibenzofuran	20.7	6.10	1.53	9.46	106	
123678-hexachlorodibenzofuran	10.4	2.98	0.82	4.72	106	
234678-hexachlorodibenzofuran	16.8	5.53	1.30	7.87	102	
123789-hexachlorodibenzofuran	<1.12	<0.30	<0.069	< 0.49	111	
1234678-heptachlorodibenzofuran	39.8	14.0	3.27	19.0	98.7	
1234789-heptachlorodibenzofuran	7.77	2.84	0.64	3.75	97.5	
Octachlorodibenzofuran	<26.4	<11.0	<3.04	<13.5	88.2	
Total Dioxins & Furans Only	<433	<156	<40.1	<210	96.3	

TABLE 28

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

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	<2.20	<3.78	<2.80	<3.17	<0.052
12378-pentachlorodibenzo-p-dioxin	37.0	63.5	47.1	53.3	0.87
123478-hexachlorodibenzo-p-dioxin	158	270	201	227	3.72
123678-hexachlorodibenzo-p-dioxin	476	816	606	685	11.2
123789-hexachlorodibenzo-p-dioxin	451	774	574	649	10.7
1234678-heptachlorodibenzo-p-dioxin	2720	4665	3461	3915	64.3
Octachlorodibenzo-p-dioxin	2405	4125	3061	3460	56.9
  2378-tetrachlorodibenzofuran	<14.0	<24.0	<17.8	<20.2	<0.33
12378-pentachlorodibenzofuran	26.1	44.8	33.2	37.6	0.62
23478-pentachlorodibenzofuran	<92.6	<159	<118	<133	<2.19
123478-hexachlorodibenzofuran	400	687	50 <del>9</del>	576	9.46
123678-hexachlorodibenzofuran	200	342	254	287	4.72
234678-hexachlorodibenzofuran	333	571	424	480	7.87
123789-hexachlorodibenzofuran	<20.9	<35.9	<26.6	<30.2	< 0.49
1234678-heptachlorodibenzofuran	805	1380	1024	1158	19.0
1234789-heptachlorodibenzofuran	159	272	202	228	3.75
Octachlorodibenzofuran	<569	<976	<724	<819	<13.5
Total Dioxins & Furans Only	<8869	<15209	<11285	<12763	<210
•					

^{*} At 25°C and 1 atmosphere

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

TABLE 29

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific	Toxicity		Actual Con	centration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	<4.20	<1.52	<0.88	<2.20
12378-pentachlorodibenzo-p-dioxin	1.000	83.8	21.6	5.76	37.0
123478-hexachlorodibenzo-p-dioxin	0.100	34.3	10.8	2.23	15.8
123678-hexachlorodibenzo-p-dioxin	0.100	105	31.2	6.53	47.6
123789-hexachlorodibenzo-p-dioxin	0.100	97.6	31.0	6.78	45.1
1234678-heptachlorodibenzo-p-dioxin	0.010	57.3	19.9	4.41	27.2
Octachlorodibenzo-p-dioxin	0.0003	1.41	0.58	0.17	0.72
2378-tetrachlorodibenzofuran	0.100	<3.11	<0.80	<0.29	<1.40
12378-pentachlorodibenzofuran	0.030	1.80	0.43	0.12	0.78
23478-pentachlorodibenzofuran	0.300	<61.8	<17.1	4.37	<27.8
123478-hexachlorodibenzofuran	0.100	88.2	25.6	6.23	40.0
123678-hexachlorodibenzofuran	0.100	44.1	12.5	3.33	20.0
234678-hexachlorodibenzofuran	0.100	71.4	23.2	5.30	33.3
123789-hexachlorodibenzofuran	0.100	<4.75	<1.25	<0.28	<2.09
1234678-heptachlorodibenzofuran	0.010	16.9	5.89	1.33	8.05
1234789-heptachlorodibenzofuran	0.010	3.31	1.19	0.26	1.59
Octachlorodibenzofuran	0.0003	<0.34	<0.14	<0.037	<0.17
Total Dioxins & Furans Only		<679	<205	<48.3	<311

TABLE 30

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific	Toxicity Dry Reference Concentration				
lsomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ^{3*}
2378-tetrachlorodibenzo-p-dioxin	1.000	<7.21	<2.61	<1.52	<3.78
12378-pentachlorodibenzo-p-dioxin	1.000	144	36.9	9.91	63.5
123478-hexachlorodibenzo-p-dioxin	0.100	58.8	18.5	3.84	27.0
123678-hexachlorodibenzo-p-dioxin	0.100	180	53.4	11.2	81.6
123789-hexachlorodibenzo-p-dioxin	0.100	167	53.0	11.7	77.4
1234678-heptachlorodibenzo-p-dioxin	0.010	98.3	34.1	7.59	46.6
Octachlorodibenzo-p-dioxin	0.0003	2.43	0.99	0.30	1.24
2378-tetrachlorodibenzofuran	0.100	<5.33	<1.37	<0.50	<2.40
12378-pentachlorodibenzofuran	0.030	3.08	0.74	0.21	1.34
23478-pentachlorodibenzofuran	0.300	<106	<29.3	7.51	<47.6
123478-hexachlorodibenzofuran	0.100	151	43.9	10.7	68.7
123678-hexachlorodibenzofuran	0.100	75.6	21.4	5.73	34.2
234678-hexachlorodibenzofuran	0.100	122	39.8	9.13	57.1
123789-hexachlorodibenzofuran	0.100	<8.15	<2.15	<0.48	<3.59
1234678-heptachlorodibenzofuran	0.010	29.0	10.1	2.28	13.8
1234789-heptachlorodibenzofuran	0.010	5.67	2.04	0.44	2.72
Octachlorodibenzofuran	0.0003	<0.58	<0.24	<0.064	<0.29
Total Dioxins & Furans Only		<1165	<351	<83.1	<533

#### * At 25°C and 1 atmosphere

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

TABLE 31

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Specific	Toxicity Dry Adjusted Concentration				
lsomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm ³ *
					2.22
2378-tetrachlorodibenzo-p-dioxin	1.000	<5.34	<1.95	<1.12	<2.80
12378-pentachlorodibenzo-p-dioxin	1.000	106	27.6	7.30	47.1
123478-hexachlorodibenzo-p-dioxin	0.100	43.5	13.8	2.83	20.1
123678-hexachlorodibenzo-p-dioxin	0.100	133	39.9	8.2 <del>9</del>	60.6
123789-hexachlorodibenzo-p-dioxin	0.100	124	39.6	8.60	57.4
1234678-heptachlorodibenzo-p-dioxin	0.010	72.8	25.5	5.60	34.6
Octachlorodibenzo-p-dioxin	0.0003	1.80	0.74	0.22	0.92
   2378-tetrachlorodibenzofuran	0.100	<3.95	<1.03	<0.37	<1.78
12378-pentachlorodibenzofuran	0.030	2.28	0.55	0.16	1.00
23478-pentachlorodibenzofuran	0.300	<78.6	<21.9	5.54	<35.3
123478-hexachlorodibenzofuran	0.100	112	32.8	7.90	50.9
123678-hexachlorodibenzofuran	0.100	56.0	16.0	4.22	25.4
234678-hexachlorodibenzofuran	0.100	90.7	29.7	6.73	42.4
123789-hexachlorodibenzofuran	0.100	<6.03	<1.60	<0.35	<2.66
1234678-heptachlorodibenzofuran	0.010	21.5	7.53	1.68	10.2
1234789-heptachlorodibenzofuran	0.010	4.20	1.53	0.33	2.02
Octachlorodibenzofuran	0.0003	<0.43	<0.18	<0.047	<0.22
Total Dioxins & Furans Only		<863	<262	<61.3	<395

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

TABLE 31A

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using Half the Detection Limit

Specific	Toxicity	Dry Adjusted Concentration				
Isomer	Equivalency Factor	Test No. 1 pg TEQ/Rm³*	Test No. 2 pg TEQ/Rm³*	Test No. 3 pg TEQ/Rm³*	Average pg TEQ/Rm³*	
	4 000		0.07	0.50		
2378-tetrachlorodibenzo-p-dioxin	1.000	4.86	0.97	0.56	2.13	
12378-pentachlorodibenzo-p-dioxin	1.000	106	27.6	7.30	47.1	
123478-hexachlorodibenzo-p-dioxin	0.100	43.5	13.8	2.83	20.1	
123678-hexachlorodibenzo-p-dioxin	0.100	133	39.9	8.29	60.6	
123789-hexachlorodibenzo-p-dioxin	0.100	124	39.6	8.60	57.4	
1234678-heptachlorodibenzo-p-dioxin	0.010	72.8	25.5	5.60	34.6	
Octachlorodibenzo-p-dioxin	0.0003	1.80	0.74	0.22	0.92	
2378-tetrachlorodibenzofuran	0.100	1.97	0.51	0.18	0.89	
12378-pentachlorodibenzofuran	0.030	2.28	0.55	0.16	1.00	
23478-pentachlorodibenzofuran	0.300	51.1	17.8	5.54	24.8	
123478-hexachlorodibenzofuran	0.100	112	32.8	7.90	50.9	
123678-hexachlorodibenzofuran	0.100	56.0	16.0	4.22	25.4	
234678-hexachlorodibenzofuran	0.100	90.7	29.7	6.73	42.4	
123789-hexachlorodibenzofuran	0.100	3.02	0.80	0.18	1.33	
1234678-heptachlorodibenzofuran	0.010	21.5	7.53	1.68	10.2	
1234789-heptachlorodibenzofuran	0.010	4.20	1.53	0.33	2.02	
Octachlorodibenzofuran	0.0003	0.21	0.088	0.023	0.11	
Total Dioxins & Furans Only		830	256	60.3	382	

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

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

TABLE 31B

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using the Full Detection Limit

Equivalency	Test No. 1			
	1 C36 180. Z	Test No. 2	Test No. 3	Average
Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm³*
1.000	<5.34	<1.95	<1.12	<2.80
0.500	53.2	13.8	3.65	23.6
0.100	43.5	13.8	2.83	20.1
0.100	133	39.9	8.29	60.6
0.100	124	39.6	8.60	57.4
0.010	72.8	25.5	5.60	34.6
0.001	5.99	2.47	0.73	3.06
0.100	<3.95	<1.03	<0.37	<1.78
0.050	3.80	0.92	0.26	1.66
0.500	<131	<36.5	9.23	<58.9
0.100	112	32.8	7.90	50.9
0.100	56.0	16.0	4.22	25.4
0.100	90.7	29.7	6.73	42.4
0.100	<6.03	<1.60	<0.35	<2.66
0.010	21.5	7.53	1.68	10.2
0.010	4.20	1.53	0.33	2.02
0.001	<1.43	<0.59	<0.16	<0.72
	<869	<265	<62.0	<399
				60
-	1.000 0.500 0.100 0.100 0.010 0.010 0.001 0.100 0.500 0.100 0.100 0.100 0.100 0.100 0.100 0.010	1.000       <5.34	1.000       <5.34	1.000       <5.34

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

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 32

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific	Toxicity		Wet Reference	Concentration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *
2378-tetrachlorodibenzo-p-dioxin	1.000	<6.06	<2.18	<1.26	<3.17
12378-pentachlorodibenzo-p-dioxin	1.000	121	30.9	8.24	53.3
123478-hexachlorodibenzo-p-dioxin	0.100	49.4	15.5	3.19	22.7
123678-hexachlorodibenzo-p-dioxin	0.100	152	44.7	9.35	68.5
123789-hexachlorodibenzo-p-dioxin	0.100	141	44.4	9.70	64.9
1234678-heptachlorodibenzo-p-dioxin	0.010	82.6	28.5	6.31	39.1
Octachlorodibenzo-p-dioxin	0.0003	2.04	0.83	0.25	1.04
2378-tetrachlorodibenzofuran	0.100	<4.48	<1.15	<0.42	<2.02
12378-pentachlorodibenzofuran	· 0.030	2.59	0.62	0.18	1.13
23478-pentachlorodibenzofuran	0.300	<89.2	<24.5	6.25	<40.0
123478-hexachlorodibenzofuran	0.100	127	36.8	8.91	57.6
123678-hexachlorodibenzofuran	0.100	63.5	17.9	4.76	28.7
234678-hexachlorodibenzofuran	0.100	103	33.3	7.59	48.0
123789-hexachlorodibenzofuran	0.100	<6.85	<1.80	< 0.40	<3.02
1234678-heptachlorodibenzofuran	0.010	24.4	8.44	1.90	11.6
1234789-heptachlorodibenzofuran	0.010	4.77	1.71	0.37	2.28
Octachlorodibenzofuran	0.0003	<0.49	<0.20	<0.053	<0.25
Total Dioxins & Furans Only		<980	<294	<69.1	<447

# * At 25°C and 1 atmosphere

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

TABLE 33

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Emission Rates

Specific	Toxicity		Emissi		
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	ng TEQ/s	ng TEQ/s	ng TEQ/s	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	<0.099	<0.036	<0.022	<0.052
12378-pentachlorodibenzo-p-dioxin	1.000	1.97	0.51	0.14	0.87
123478-hexachlorodibenzo-p-dioxin	0.100	0.81	0.26	0.055	0.37
123678-hexachlorodibenzo-p-dioxin	0.100	2.47	0.74	0.16	1.12
123789-hexachlorodibenzo-p-dioxin	0.100	2.29	0.74	0.17	1.07
1234678-heptachlorodibenzo-p-dioxin	0.010	1.35	0.47	0.11	0.64
Octachlorodibenzo-p-dioxin	0.0003	0.033	0.014	0.0042	0.017
2378-tetrachlorodibenzofuran	0.100	<0.073	<0.019	<0.0072	<0.033
12378-pentachlorodibenzofuran	0.030	0.042	0.010	0.0030	0.019
23478-pentachlorodibenzofuran	0.300	<1.45	< 0.41	0.11	<0.66
123478-hexachlorodibenzofuran	0.100	2.07	0.61	0.15	0.95
123678-hexachlorodibenzofuran	0.100	1.04	0.30	0.082	0.47
234678-hexachlorodibenzofuran	0.100	1.68	0.55	0.13	0.79
123789-hexachlorodibenzofuran	0.100	<0.11	<0.030	<0.0069	< 0.049
1234678-heptachlorodibenzofuran	0.010	0.40	0.14	0.033	0.19
1234789-heptachlorodibenzofuran	0.010	0.078	0.028	0.0064	0.037
Octachlorodibenzofuran	0.0003	<0.0079	<0.0033	<0.00091	<0.0040
Total Dioxins & Furans Only		<16.0	<4.87	<1.19	<7.34

TABLE 34

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using the Full Detection Limit

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm ^{3**}	pg TEQ/Rm ^{3*}	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<2.20	<3.78	<2.80	<3.17	<0.052
12378-pentachlorodibenzo-p-dioxin	37.0	63.5	47.1	53.3	0.87
		27.0			0.87
123478-hexachlorodibenzo-p-dioxin	15.8		20.1	22.7	
123678-hexachlorodibenzo-p-dioxin	47.6	81.6	60.6	68.5	1.12
123789-hexachlorodibenzo-p-dioxin	45.1	77.4	57.4	64.9	1.07
1234678-heptachlorodibenzo-p-dioxin	27.2	46.6	34.6	39.1	0.64
Octachlorodibenzo-p-dioxin	0.72	1.24	0.92	1.04	0.017
2378-tetrachlorodibenzofuran	<1.40	<2.40	<1.78	<2.02	<0.033
12378-pentachlorodibenzofuran	0.78	1.34	1.00	1.13	0.019
23478-pentachlorodibenzofuran	<27.8	<47.6	<35.3	<40.0	< 0.66
123478-hexachlorodibenzofuran	40.0	68.7	50.9	57.6	0.95
123678-hexachlorodibenzofuran	20.0	34.2	25.4	28.7	0.47
234678-hexachlorodibenzofuran	33.3	57.1	42.4	48.0	0.79
123789-hexachlorodibenzofuran	<2.09	<3.59	<2.66	<3.02	< 0.049
1234678-heptachlorodibenzofuran	8.05	13.8	10.2	11.6	0.19
1234789-heptachlorodibenzofuran	1.59	2.72	2.02	2.28	0.037
Octachlorodibenzofuran	<0.17	<0.29	<0.22	<0.25	<0.0040
Total Dioxins & Furans Only	<311	<533	<395	<447	<7.34

^{*} At 25°C and 1 atmosphere

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

TABLE 35

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using Half the Detection Limit

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm ³ *	pg TEQ/Rm ^{3**}	pg TEQ/Rm³*	ng TEQ/s
2270 tetus able medibers as a district	1.60	2.00	2.12	2.41	0.040
2378-tetrachlorodibenzo-p-dioxin	1.68	2.88	2.13	2.41	0.040
12378-pentachlorodibenzo-p-dioxin	37.0	63.5	47.1	53.3	0.87
123478-hexachlorodibenzo-p-dioxin	15.8	27.0	20.1	22.7	0.37
123678-hexachlorodibenzo-p-dioxin	47.6	81.6	60.6	68.5	1.12
123789-hexachlorodibenzo-p-dioxin	45.1	77.4	57.4	64.9	1.07
1234678-heptachlorodibenzo-p-dioxin	27.2	46.6	34.6	39.1	0.64
Octachlorodibenzo-p-dioxin	0.72	1.24	0.92	1.04	0.017
   2378-tetrachlorodibenzofuran	0.70	1.20	0.89	1.01	0.017
12378-pentachlorodibenzofuran	0.78	1.34	1.00	1.13	0.019
23478-pentachlorodibenzofuran	19.5	33.5	24.8	28.1	0.46
123478-hexachlorodibenzofuran	40.0	68.7	50.9	57.6	0.95
123678-hexachlorodibenzofuran	20.0	34.2	25.4	28.7	0.47
234678-hexachlorodibenzofuran	33.3	57.1	42.4	48.0	0.79
123789-hexachlorodibenzofuran	1.05	1.80	1.33	1.51	0.025
1234678-heptachlorodibenzofuran	8.05	13.8	10.2	11.6	0.19
1234789-heptachlorodibenzofuran	1.59	2.72	2.02	2.28	0.037
Octachlorodibenzofuran	0.085	0.15	0.11	0.12	0.0020
Total Dioxins & Furans Only	300	515	382	432	7.09

^{*} At 25°C and 1 atmosphere

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

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

TABLE 36
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	6.9	6.3	13.2	1.69	2.90	2.22	2.42	0.044
12378-pentachlorodibenzo-p-dioxin	13.7	91.4	105	13.4	23.1	17.7	19.3	0.35
123478-hexachlorodibenzo-p-dioxin	26.9	385	412	52.6	90.5	69.3	75.4	1.36
123678-hexachlorodibenzo-p-dioxin	81.8	1110	1192	152	262	200	218	3.93
123789-hexachlorodibenzo-p-dioxin	75.6	1220	1296	166	285	218	237	4.27
1234678-heptachlorodibenzo-p-dioxin	464	12000	12464	1593	2740	2097	2283	41.1
Octachlorodibenzo-p-dioxin	403	12500	12903	1649	2836	2171	2363	42.5
2378-tetrachlorodibenzofuran	<18	<33	<51.0	<6.52	<11.2	<8.58	<9.34	<0.17
12378-pentachlorodibenzofuran	17.8	59.8	77.6	9.92	17.1	13.1	14.2	0.26
23478-pentachlorodibenzofuran	30.4	<180	<210	<26.9	<46.2	<35.4	<38.5	< 0.69
123478-hexachlorodibenzofuran	77.2	833	910	116	200	153	167	3.00
123678-hexachlorodibenzofuran	39.8	448	488	62.3	107	82.1	89.4	1.61
234678-hexachlorodibenzofuran	45.9	888	934	119	205	157	171	3.08
123789-hexachlorodibenzofuran	<3.2	<89	<92.2	<11.8	<20.3	<15.5	<16.9	< 0.30
1234678-heptachlorodibenzofuran	162	2820	2982	381	655	502	546	9.83
1234789-heptachlorodibenzofuran	21.3	751	772	98.7	170	130	141	2.55
Octachlorodibenzofuran	<68	<2900	<2968	<379	<652	<499	<544	<9.79
Total Dioxins & Furans Only			<37870	<4840	<8324	<6370	<6937	<125

Dry Gas Volume Sampled (Nm ³ ***):	4.168
Dry Gas Volume Sampled (Rm ³ *):	4.549
Actual Flowrate (m³/s):	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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

^{***} At 0°C and 1 atmosphere

TABLE 37
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	pg	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
		.2.2	.6.3	-0.04	-4.42	.4.00	4.40	-0.021
2378-tetrachlorodibenzo-p-dioxin	4.1	<2.2	<6.3	<0.84	<1.42	<1.08	<1.19	<0.021
12378-pentachlorodibenzo-p-dioxin	8.0	16.1	24.1	3.20	5.43	4.12	4.55	0.079
123478-hexachlorodibenzo-p-dioxin	17.8	118	136	18.0	30.6	23.2	25.6	0.44
123678-hexachlorodibenzo-p-dioxin	48.8	335	384	50.9	86.4	65.6	72.4	1.25
123789-hexachlorodibenzo-p-dioxin	43.4	347	390	51.8	87.9	66.7	73.7	1.27
1234678-heptachlorodibenzo-p-dioxin	291	2580	2871	381	647	491	542	9.38
Octachlorodibenzo-p-dioxin	293	3530	3823	507	861	654	722	12.5
2378-tetrachlorodibenzofuran	7.2	6.8	14.0	1.86	3.15	2.39	2.64	0.046
12378-pentachlorodibenzofuran	13.0	8.1	21.1	2.80	4.75	3.61	3.98	0.069
23478-pentachlorodibenzofuran	18.8	42.0	60.8	8.07	13.7	10.4	11.5	0.20
123478-hexachlorodibenzofuran	44.2	237	281	37.3	63.3	48.1	53.1	0.92
123678-hexachlorodibenzofuran	<22	119	<141	<18.7	<31.8	<24.1	<26.6	< 0.46
234678-hexachlorodibenzofuran	30.6	292	323	42.8	72.7	55.2	60.9	1.05
123789-hexachlorodibenzofuran	2.9	<16	<18.9	<2.51	<4.26	<3.23	<3.57	<0.062
1234678-heptachlorodibenzofuran	88.1	649	737	97.8	166	126	139	2.41
1234789-heptachlorodibenzofuran	14.5	140	155	20.5	34.8	26.4	29.2	0.50
Octachlorodibenzofuran	<45	<730	<775	<103	<175	<133	<146	<2.53
Total Dioxins & Furans Only			<10161	<1349	<2288	<1737	<1918	<33.2

Dry Gas Volume Sampled (Nm³***):	4.068
Dry Gas Volume Sampled (Rm ³ *):	4.440
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm ³ /s*):	17.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 38

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Data

Test No. 3

Specific Isomer	AMESA Sample	Probe Rinse	Total Collected	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
isomer	pg	pg	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
				1.0/	<u> </u>	FO		
2378-tetrachlorodibenzo-p-dioxin	5.0	5.9	10.9	1.43	2.40	1.86	2.01	0.035
12378-pentachlorodibenzo-p-dioxin	9.0	66.9	75.9	9.95	16.7	12.9	14.0	0.25
123478-hexachlorodibenzo-p-dioxin	19.2	251	270	35.4	59.4	46.0	49.9	0.88
123678-hexachlorodibenzo-p-dioxin	59.3	704	763	100	168	130	141	2.48
123789-hexachlorodibenzo-p-dioxin	52.4	742	794	104	175	135	147	2.58
1234678-heptachlorodibenzo-p-dioxin	373	7230	7603	997	1671	1295	1405	24.7
Octachlorodibenzo-p-dioxin	394	8770	9164	1202	2014	1560	1693	29.8
2378-tetrachlorodibenzofuran	<11	<31	<42.0	<5.51	<9.23	<7.15	<7.76	<0.14
12378-pentachlorodibenzofuran	13.6	42.8	56.4	7.40	12.4	9.60	10.4	0.18
23478-pentachlorodibenzofuran	21.1	126	147	19.3	32.3	25.0	27.2	0.48
123478-hexachlorodibenzofuran	53.8	536	590	77.3	130	100	109	1.92
123678-hexachlorodibenzofuran	<26	287	<313	<41.0	<68.8	<53.3	<57.8	<1.02
234678-hexachlorodibenzofuran	36.4	588	624	81.9	137	106	115	2.03
123789-hexachlorodibenzofuran	<3.2	<51	<54.2	<7.11	<11.9	<9.23	<10.0	<0.18
1234678-heptachlorodibenzofuran	122	1960	2082	273	458	355	385	6.77
1234789-heptachlorodibenzofuran	18.6	497	516	67.6	113	87.8	95.3	1.68
Octachlorodibenzofuran	<65	<2000	<2065	<271	<454	<352	<382	<6.72
Total Dioxins & Furans Only			<25171	<3301	<5531	<4286	<4651	<81.9

Dry Gas Volume Sampled (Nm³***):	4.169
Dry Gas Volume Sampled (Rm³*):	4.551
Actual Flowrate (m³/s):	24.8
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 39

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Actual Concentrations

Specific		Actual Con	centration	Stational freezeway measure as we reconstruct on the property of the property	Coefficient
lsomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/m³	pg/m³	pg/m³	pg/m³	%
	1.50	201	4.40	4.00	22.4
2378-tetrachlorodibenzo-p-dioxin	1.69	<0.84	1.43	<1.32	33.1
12378-pentachlorodibenzo-p-dioxin	13.4	3.20	9.95	8.86	58.7
123478-hexachlorodibenzo-p-dioxin	52.6	18.0	35.4	35.4	48.9
123678-hexachlorodibenzo-p-dioxin	152	50.9	100	101	50.1
123789-hexachlorodibenzo-p-dioxin	166	51.8	104	107	53.1
1234678-heptachlorodibenzo-p-dioxin	1593	381	997	990	61.2
Octachlorodibenzo-p-dioxin	1649	507	1202	1119	51.4
   2378-tetrachlorodibenzofuran	<6.52	1.86	<5.51	<4.63	53.0
12378-pentachlorodibenzofuran	9.92	2.80	7.40	6.70	53.8
23478-pentachlorodibenzofuran	<26.9	8.07	19.3	<18.1	52.3
123478-hexachlorodibenzofuran	116	37.3	77.3	77.0	51.3
123678-hexachlorodibenzofuran	62.3	<18.7	<41.0	<40.7	53.6
234678-hexachlorodibenzofuran	119	42.8	81.9	81.4	47.0
123789-hexachlorodibenzofuran	<11.8	<2.51	<7.11	<7.13	65.0
1234678-heptachlorodibenzofuran	381	97.8	273	251	57.0
1234789-heptachlorodibenzofuran	98.7	20.5	67.6	62.3	63.2
Octachlorodibenzofuran	<379	<103	<271	<251	55.5
Total Dioxins & Furans Only	<4840	<1349	<3301	<3163	55.3

TABLE 40

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific	D	ry Reference	Concentration	1	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	2.90	<1.42	2.40	<2.24	33.7
12378-pentachlorodibenzo-p-dioxin	23.1	5.43	16.7	15.1	59.4
123478-hexachlorodibenzo-p-dioxin	90.5	30.6	59.4	60.2	49.8
123678-hexachlorodibenzo-p-dioxin	262	86.4	168	172	51.1
123789-hexachlorodibenzo-p-dioxin	285	87.9	175	182	54.1
1234678-heptachlorodibenzo-p-dioxin	2740	647	1671	1686	62.1
Octachlorodibenzo-p-dioxin	2836	861	2014	1904	52.1
2378-tetrachlorodibenzofuran	<11.2	3.15	<9.23	<7.86	53.4
12378-pentachlorodibenzofuran	17.1	4.75	12.4	11.4	54.5
23478-pentachlorodibenzofuran	<46.2	13.7	32.3	<30.8	53.1
123478-hexachlorodibenzofuran	200	63.3	130	131	52.2
123678-hexachlorodibenzofuran	107	<31.8	<68.8	<69.3	54.5
234678-hexachlorodibenzofuran	205	72.7	137	138	47.9
123789-hexachlorodibenzofuran	<20.3	<4.26	<11.9	<12.1	65.9
1234678-heptachlorodibenzofuran	655	166	458	426	57.8
1234789-heptachlorodibenzofuran	170	34.8	113	106	64.0
Octachlorodibenzofuran	<652	<175	<454	<427	56.2
Total Dioxins & Furans Only	<8324	<2288	<5531	<5381	56.1

^{*} At 25°C and 1 atmosphere

TABLE 41

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific	Dry Adjusted Concentration				Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	2.22	<1.08	1.86	<1.72	34.0
12378-pentachlorodibenzo-p-dioxin	17.7	4.12	12.9	11.6	59.4
123478-hexachlorodibenzo-p-dioxin	69.3	23.2	46.0	46.2	49.9
123678-hexachlorodibenzo-p-dioxin	200	65.6	130	132	51.1
123789-hexachlorodibenzo-p-dioxin	218	66.7	135	140	54.1
1234678-heptachlorodibenzo-p-dioxin	2097	491	1295	1294	62.0
Octachlorodibenzo-p-dioxin	2171	654	1560	1462	52.2
2378-tetrachlorodibenzofuran	<8.58	2.39	<7.15	<6.04	53.6
12378-pentachlorodibenzofuran	13.1	3.61	9.60	8.76	54.6
23478-pentachlorodibenzofuran	<35.4	10.4	25.0	<23.6	53.2
123478-hexachlorodibenzofuran	153	48.1	100	101	52.2
123678-hexachlorodibenzofuran	82.1	<24.1	<53.3	<53.2	54.5
234678-hexachlorodibenzofuran	157	55.2	106	106	48.0
123789-hexachlorodibenzofuran	<15.5	<3.23	<9.23	<9.32	65.9
1234678-heptachlorodibenzofuran	502	126	355	327	57.8
1234789-heptachlorodibenzofuran	130	26.4	87.8	81.4	64.0
Octachlorodibenzofuran	<499	<133	<352	<328	56.3
Total Dioxins & Furans Only	<6370	<1737	<4286	<4131	56.2

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

TABLE 42

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific	n	Coefficient			
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	2.42	<1.19	2.01	<1.87	33.4
12378-pentachlorodibenzo-p-dioxin	19.3	4.55	14.0	12.6	59.1
123478-hexachlorodibenzo-p-dioxin	75.4	25.6	49.9	50.3	49.5
123678-hexachlorodibenzo-p-dioxin	218	72.4	141	144	50.7
123789-hexachlorodibenzo-p-dioxin	237	73.7	147	153	53.7
1234678-heptachlorodibenzo-p-dioxin	2283	542	1405	1410	61.7
Octachlorodibenzo-p-dioxin	2363	722	1693	1593	51.8
2378-tetrachlorodibenzofuran	<9.34	2.64	<7.76	<6.58	53.2
12378-pentachlorodibenzofuran	14.2	3.98	10.4	9.54	54.2
23478-pentachlorodibenzofuran	<38.5	11.5	27.2	<25.7	52.8
123478-hexachlorodibenzofuran	167	53.1	109	110	51.8
123678-hexachlorodibenzofuran	89.4	<26.6	<57.8	<57.9	54.1
234678-hexachlorodibenzofuran	171	60.9	115	116	47.6
123789-hexachlorodibenzofuran	<16.9	<3.57	<10.0	<10.2	65.6
1234678-heptachlorodibenzofuran	546	139	385	357	57.5
1234789-heptachlorodibenzofuran	141	29.2	95.3	88.6	63.7
Octachlorodibenzofuran	<544	<146	<382	<357	55.9
Total Dioxins & Furans Only	<6937	<1918	<4651	<4502	55.8

### * At 25°C and 1 atmosphere

TABLE 43

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Rates

Specific	Emission Rate				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	0.044	<0.021	0.035	<0.033	35.1
12378-pentachlorodibenzo-p-dioxin	0.35	0.079	0.25	0.22	60.4
123478-hexachlorodibenzo-p-dioxin	1.36	0.44	0.88	0.89	51.2
123678-hexachlorodibenzo-p-dioxin	3.93	1.25	2.48	2.56	52.4
123789-hexachlorodibenzo-p-dioxin	4.27	1.27	2.58	2.71	55.4
1234678-heptachlorodibenzo-p-dioxin	41.1	9.38	24.7	25.1	63.3
Octachlorodibenzo-p-dioxin	42.5	12.5	29.8	28.3	53.4
2378-tetrachlorodibenzofuran	<0.17	0.046	<0.14	<0.12	54.4
12378-pentachlorodibenzofuran	0.26	0.069	0.18	0.17	55.6
23478-pentachlorodibenzofuran	< 0.69	0.20	0.48	< 0.46	54.3
123478-hexachlorodibenzofuran	3.00	0.92	1.92	1.95	53.5
123678-hexachlorodibenzofuran	1.61	< 0.46	<1.02	<1.03	55.8
234678-hexachlorodibenzofuran	3.08	1.05	2.03	2.05	49.3
123789-hexachlorodibenzofuran	< 0.30	< 0.062	< 0.18	< 0.18	67.1
1234678-heptachlorodibenzofuran	9.83	2.41	6.77	6.34	58.9
1234789-heptachlorodibenzofuran	2.55	0.50	1.68	1.58	65.0
Octachlorodibenzofuran	<9.79	<2.53	<6.72	<6.34	57.4
Total Dioxins & Furans Only	<125	<33.2	<81.9	<80.0	57.4

TABLE 44

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

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	<1.32	<2.24	<1.72	<1.87	<0.033
12378-pentachlorodibenzo-p-dioxin	8.86	15.1	11.6	12.6	0.22
123478-hexachlorodibenzo-p-dioxin	35.4	60.2	46.2	50.3	0.89
123678-hexachlorodibenzo-p-dioxin	101	172	132	144	2.56
123789-hexachlorodibenzo-p-dioxin	107	182	140	153	2.71
1234678-heptachlorodibenzo-p-dioxin	990	1686	1294	1410	25.1
Octachlorodibenzo-p-dioxin	1119	1904	1462	1593	28.3
2378-tetrachlorodibenzofuran	<4.63	<7.86	<6.04	<6.58	<0.12
12378-pentachlorodibenzofuran	6.70	11.4	8.76	9.54	0.17
23478-pentachlorodibenzofuran	<18.1	<30.8	<23.6	<25.7	<0.46
123478-hexachlorodibenzofuran	77.0	131	101	110	1.95
123678-hexachlorodibenzofuran	<40.7	<69.3	<53.2	<57.9	<1.03
234678-hexachlorodibenzofuran	81.4	138	106	116	2.05
123789-hexachlorodibenzofuran	<7.13	<12.1	<9.32	<10.2	<0.18
1234678-heptachlorodibenzofuran	251	426	327	357	6.34
1234789-heptachlorodibenzofuran	62.3	106	81.4	88.6	1.58
Octachlorodibenzofuran	<251	<427	<328	<357	<6.34
Total Dioxins & Furans Only	<3163	<5381	<4131	<4502	<80.0

^{*} At 25°C and 1 atmosphere

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

TABLE 45

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific	Toxicity		Actual Con	centration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	1.69	<0.84	1.43	<1.32
12378-pentachlorodibenzo-p-dioxin	1.000	13.4	3.20	9.95	8.86
123478-hexachlorodibenzo-p-dioxin	0.100	5.26	1.80	3.54	3.54
123678-hexachlorodibenzo-p-dioxin	0.100	15.2	5.09	10.0	10.1
123789-hexachlorodibenzo-p-dioxin	0.100	16.6	5.18	10.4	10.7
1234678-heptachlorodibenzo-p-dioxin	0.010	15.9	3.81	9.97	9.90
Octachlorodibenzo-p-dioxin	0.0003	0.49	0.15	0.36	0.34
2378-tetrachlorodibenzofuran	0.100	<0.65	0.19	<0.55	<0.46
12378-pentachlorodibenzofuran	0.030	0.30	0.084	0.22	0.20
23478-pentachlorodibenzofuran	0.300	<8.07	2.42	5.79	<5.42
123478-hexachlorodibenzofuran	0.100	11.6	3.73	7.73	7.70
123678-hexachlorodibenzofuran	0.100	6.23	<1.87	<4.10	<4.07
234678-hexachlorodibenzofuran	0.100	11.9	4.28	8.19	8.14
123789-hexachlorodibenzofuran	0.100	<1.18	<0.25	<0.71	<0.71
1234678-heptachlorodibenzofuran	0.010	3.81	0.98	2.73	2.51
1234789-heptachlorodibenzofuran	0.010	0.99	0.21	0.68	0.62
Octachlorodibenzofuran	0.0003	<0.11	<0.031	<0.081	<0.075
Total Dioxins & Furans Only		<113	<34.1	<76.5	<74.7

TABLE 46

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Factor  1.000	Test No. 1 pg TEQ/Rm³* 2.90	Test No. 2 pg TEQ/Rm ³ *	Test No. 3 pg TEQ/Rm ^{3*}	Average pg TEQ/Rm³*
1.000		pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*
	2.90			
	7.90	-1 43	2.40	12.24
7 / / / / /		<1.42	2.40	<2.24
				15.1
0.100		<del>-</del>		6.02
0.100	26.2	8.64	16.8	17.2
0.100	28.5	8.79	17.5	18.2
0.010	27.4	6.47	16.7	16.9
0.0003	0.85	0.26	0.60	0.57
0.100	<1.12	0.32	<0.92	<0.79
0.030	0.51	0.14	0.37	0.34
0.300	<13.9	4.11	9.70	<9.23
0.100	20.0	6.33	13.0	13.1
0.100	10.7	<3.18	<6.88	<6.93
0.100	20.5	7.27	13.7	13.8
0.100	<2.03	< 0.43	<1.19	<1.21
0.010	6.55	1.66	4.58	4.26
0.010	1.70	0.35	1.13	1.06
0.0003	<0.20	<0.052	<0.14	<0.13
	<195	<57.9	<128	<127
	0.100 0.010 0.0003 0.100 0.030 0.300 0.100 0.100 0.100 0.100 0.010	0.100       9.05         0.100       26.2         0.100       28.5         0.010       27.4         0.0003       0.85         0.100       <1.12	0.100       9.05       3.06         0.100       26.2       8.64         0.100       28.5       8.79         0.010       27.4       6.47         0.0003       0.85       0.26         0.100       <1.12	0.100       9.05       3.06       5.94         0.100       26.2       8.64       16.8         0.100       28.5       8.79       17.5         0.010       27.4       6.47       16.7         0.0003       0.85       0.26       0.60         0.100       <1.12

### * At 25°C and 1 atmosphere

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

TABLE 47

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Specific	Toxicity	city Dry Adjusted Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	
2279 tetraphleredihenze n dievin	1.000	2.22	<1.08	1.86	<1.72	
2378-tetrachlorodibenzo-p-dioxin	1.000	2.22 17.7	4.12	12.9	11.6	
12378-pentachlorodibenzo-p-dioxin		=				
123478-hexachlorodibenzo-p-dioxin	0.100	6.93	2.32	4.60	4.62	
123678-hexachlorodibenzo-p-dioxin	0.100	20.0	6.56	13.0	13.2	
123789-hexachlorodibenzo-p-dioxin	0.100	21.8	6.67	13.5	14.0	
1234678-heptachlorodibenzo-p-dioxin	0.010	21.0	4.91	12.9	12.9	
Octachlorodibenzo-p-dioxin	0.0003	0.65	0.20	0.47	0.44	
   2378-tetrachlorodibenzofuran	0.100	<0.86	0.24	<0.72	<0.60	
12378-pentachlorodibenzofuran	0.030	0.39	0.11	0.29	0.26	
23478-pentachlorodibenzofuran	0.300	<10.6	3.12	7.51	<7.08	
123478-hexachlorodibenzofuran	0.100	15.3	4.81	10.0	10.1	
123678-hexachlorodibenzofuran	0.100	8.21	<2.41	<5.33	<5.32	
234678-hexachlorodibenzofuran	0.100	15.7	5.52	10.6	10.6	
123789-hexachlorodibenzofuran	0.100	<1.55	<0.32	<0.92	<0.93	
1234678-heptachlorodibenzofuran	0.010	5.02	1.26	3.55	3.27	
1234789-heptachlorodibenzofuran	0.010	1.30	0.26	0.88	0.81	
Octachlorodibenzofuran	0.0003	<0.15	<0.040	<0.11	<0.098	
Total Dioxins & Furans Only		<149	<43.9	<99.3	<97.5	

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

TABLE 47A

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using Half the Detection Limit

Specific	Toxicity	Dry Adjusted Concentration				
lsomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	
					4.55	
2378-tetrachlorodibenzo-p-dioxin	1.000	2.22	0.89	1.86	1.66	
12378-pentachlorodibenzo-p-dioxin	1.000	17.7	4.12	12.9	11.6	
123478-hexachlorodibenzo-p-dioxin	0.100	6.93	2.32	4.60	4.62	
123678-hexachlorodibenzo-p-dioxin	0.100	20.0	6.56	13.0	13.2	
123789-hexachlorodibenzo-p-dioxin	0.100	21.8	6.67	13.5	14.0	
1234678-heptachlorodibenzo-p-dioxin	0.010	21.0	4.91	12.9	12.9	
Octachlorodibenzo-p-dioxin	0.0003	0.65	0.20	0.47	0.44	
2378-tetrachlorodibenzofuran	0.100	0.43	0.24	0.36	0.34	
12378-pentachlorodibenzofuran	0.030	0.39	0.11	0.29	0.26	
23478-pentachlorodibenzofuran	0.300	6.08	3.12	7.51	5.57	
123478-hexachlorodibenzofuran	0.100	15.3	4.81	10.0	10.1	
123678-hexachlorodibenzofuran	0.100	8.21	2.22	5.11	5.18	
234678-hexachlorodibenzofuran	0.100	15.7	5.52	10.6	10.6	
123789-hexachlorodibenzofuran	0.100	0.78	0.19	0.46	0.47	
1234678-heptachlorodibenzofuran	0.010	5.02	1.26	3.55	3.27	
1234789-heptachlorodibenzofuran	0.010	1.30	0.26	0.88	0.81	
Octachlorodibenzofuran	0.0003	0.075	0.020	0.053	0.049	
Total Dioxins & Furans Only		144	43.4	98.2	95.1	

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

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

TABLE 47B

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using the Full Detection Limit

Toxicity	Dry Adjusted Concentration				
Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	
1.000	2.22	<1.08	1.86	<1.72	
0.500	8.84	2.06	6.46	5.79	
0.100	6.93	2.32	4.60	* 4.62	
0.100	20.0	6.56	13.0	13.2	
0.100	21.8	6.67	13.5	14.0	
0.010	21.0	4.91	12.9	12.9	
0.001	2.17	0.65	1.56	1.46	
0.100	<0.86	0.24	<0.72	<0.60	
0.050	0.65	0.18	0.48	0.44	
0.500	<17.7	5.20	12.5	<11.8	
0.100	15.3	4.81	10.0	10.1	
0.100	8.21	<2.41	<5.33	<5.32	
0.100	15.7	5.52	10.6	10.6	
0.100	<1.55	<0.32	<0.92	< 0.93	
0.010	5.02	1.26	3.55	3.27	
0.010	1.30	0.26	0.88	0.81	
0.001	<0.50	<0.13	<0.35	<0.33	
	<150	<44.6	<99.4	<97.9	
				60	
	1.000 0.500 0.100 0.100 0.100 0.010 0.001 0.001 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100	Equivalency         Test No. 1           Factor         pg TEQ/Rm³*           1.000         2.22           0.500         8.84           0.100         20.0           0.100         20.0           0.100         21.8           0.010         21.0           0.001         2.17           0.100         <0.86	Equivalency         Test No. 1         Test No. 2           Factor         pg TEQ/Rm³*         pg TEQ/Rm³*           1.000         2.22         <1.08	Equivalency         Test No. 1         Test No. 2         Test No. 3           Factor         pg TEQ/Rm³*         pg TEQ/Rm³*         pg TEQ/Rm³*           1.000         2.22         <1.08	

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

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 48

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Toxicity	Wet Reference Concentration				
Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm ³ *	
4 000	2.42	4.40	2.04	4.07	
				<1.87	
				12.6	
				5.03	
0.100	21.8	7.24	14.1	14.4	
0.100	23.7	7.37	14.7	15.3	
0.010	22.8	5.42	14.0	14.1	
0.0003	0.71	0.22	0.51	0.48	
0.100	<0.93	0.26	<0.78	<0.66	
0.030	0.43	0.12	0.31	0.29	
0.300	<11.6	3.44	8.15	<7.72	
0.100	16.7	5.31	10.9	11.0	
0.100	8.94	<2.66	<5.78	<5.79	
0.100	17.1	6.09	11.5	11.6	
0.100	<1.69	< 0.36	<1.00	<1.02	
0.010	5.46	1.39	3.85	3.57	
0.010	1.41	0.29	0.95	0.89	
0.0003	<0.16	<0.044	<0.11	<0.11	
	<163	<48.5	<108	<106	
	1.000 1.000 0.100 0.100 0.100 0.010 0.003 0.300 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100	Equivalency         Test No. 1           Factor         pg TEQ/Rm³*           1.000         2.42           1.000         19.3           0.100         7.54           0.100         21.8           0.100         23.7           0.010         22.8           0.0003         0.71           0.100         <0.93	Equivalency         Test No. 1         Test No. 2           Factor         pg TEQ/Rm³*         pg TEQ/Rm³*           1.000         2.42         <1.19	Equivalency         Test No. 1         Test No. 2         Test No. 3           Factor         pg TEQ/Rm³*         pg TEQ/Rm³*         pg TEQ/Rm³*           1.000         2.42         <1.19	

### * At 25°C and 1 atmosphere

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

TABLE 49
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Toxicity Equivalent Emission Rates

Specific	Toxicity		Emissio	<b>Emission Rate</b>		
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	ng TEQ/s	ng TEQ/s	ng TEQ/s	ng TEQ/s	
2378-tetrachlorodibenzo-p-dioxin	1.000	0.044	<0.021	0.035	<0.033	
12378-pentachlorodibenzo-p-dioxin	1.000	0.35	0.079	0.25	0.22	
123478-hexachlorodibenzo-p-dioxin	0.100	0.14	0.044	0.088	0.089	
123678-hexachlorodibenzo-p-dioxin	0.100	0.39	0.13	0.25	0.26	
123789-hexachlorodibenzo-p-dioxin	0.100	0.43	0.13	0.26	0.27	
1234678-heptachlorodibenzo-p-dioxin	0.010	0.41	0.094	0.25	0.25	
Octachlorodibenzo-p-dioxin	0.0003	0.013	0.0037	0.0089	0.0085	
2378-tetrachlorodibenzofuran	0.100	<0.017	0.0046	<0.014	<0.012	
12378-pentachlorodibenzofuran	0.030	0.0077	0.0021	0.0055	0.0051	
23478-pentachlorodibenzofuran	0.300	<0.21	0.060	0.14	< 0.14	
123478-hexachlorodibenzofuran	0.100	0.30	0.092	0.19	0.19	
123678-hexachlorodibenzofuran	0.100	0.16	<0.046	<0.10	< 0.10	
234678-hexachlorodibenzofuran	0.100	0.31	0.11	0.20	0.21	
123789-hexachlorodibenzofuran	0.100	<0.030	<0.0062	<0.018	<0.018	
1234678-heptachlorodibenzofuran	0.010	0.098	0.024	0.068	0.063	
1234789-heptachlorodibenzofuran	0.010	0.025	0.0050	0.017	0.016	
Octachlorodibenzofuran	0.0003	<0.0029	<0.00076	<0.0020	<0.0019	
Total Dioxins & Furans Only		<2.93	<0.84	<1.90	<1.89	

TABLE 50

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using the Full Detection Limit

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm ³ *	pg TEQ/Rm ^{3**}	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<1.32	<2.24	<1.72	<1.87	<0.033
12378-pentachlorodibenzo-p-dioxin	8.86	15.1	11.6	12.6	0.22
123478-hexachlorodibenzo-p-dioxin	3.54	6.02	4.62	5.03	0.089
123678-hexachlorodibenzo-p-dioxin	10.1	17.2	13.2	14.4	0.26
123789-hexachlorodibenzo-p-dioxin	10.7	18.2	14.0	15.3	0.27
1234678-heptachlorodibenzo-p-dioxin	9.90	16.9	12.9	14.1	0.25
Octachlorodibenzo-p-dioxin	0.34	0.57	0.44	0.48	0.0085
2378-tetrachlorodibenzofuran	<0.46	<0.79	<0.60	<0.66	<0.012
12378-pentachlorodibenzofuran	0.20	0.34	0.26	0.29	0.0051
23478-pentachlorodibenzofuran	<5.42	<9.23	<7.08	<7.72	<0.14
123478-hexachlorodibenzofuran	7.70	13.1	10.1	11.0	0.19
123678-hexachlorodibenzofuran	<4.07	<6.93	<5.32	<5.79	<0.10
234678-hexachlorodibenzofuran	8.14	13.8	10.6	11.6	0.21
123789-hexachlorodibenzofuran	< 0.71	<1.21	<0.93	<1.02	<0.018
1234678-heptachlorodibenzofuran	2.51	4.26	3.27	3.57	0.063
1234789-heptachlorodibenzofuran	0.62	1.06	0.81	0.89	0.016
Octachlorodibenzofuran	<0.075	<0.13	<0.098	<0.11	<0.0019
Total Dioxins & Furans Only	<74.7	<127	<97.5	<106	<1.89

^{*} At 25°C and 1 atmosphere

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

TABLE 51

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using Half the Detection Limit

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
isomer	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm³**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.27	2.16	1.66	1.80	0.032
12378-pentachlorodibenzo-p-dioxin	8.86	15.1	11.6	12.6	0.22
123478-hexachlorodibenzo-p-dioxin	3.54	6.02	4.62	5.03	0.089
123678-hexachlorodibenzo-p-dioxin	10.1	17.2	13.2	14.4	0.26
123789-hexachlorodibenzo-p-dioxin	10.7	18.2	14.0	15.3	0.27
1234678-heptachlorodibenzo-p-dioxin	9.90	16.9	12.9	14.1	0.25
Octachlorodibenzo-p-dioxin	0.34	0.57	0.44	0.48	0.0085
2378-tetrachlorodibenzofuran	0.26	0.45	0.34	0.37	0.0066
12378-pentachlorodibenzofuran	0.20	0.34	0.26	0.29	0.0051
23478-pentachlorodibenzofuran	4.27	7.25	5.57	6.07	0.11
123478-hexachlorodibenzofuran	7.70	13.1	10.1	11.0	0.19
123678-hexachlorodibenzofuran	3.96	6.75	5.18	5.64	0.10
234678-hexachlorodibenzofuran	8.14	13.8	10.6	11.6	0.21
123789-hexachlorodibenzofuran	0.36	0.62	0.47	0.52	0.0092
1234678-heptachlorodibenzofuran	2.51	4.26	3.27	3.57	0.063
1234789-heptachlorodibenzofuran	0.62	1.06	0.81	0.89	0.016
Octachlorodibenzofuran	0.038	0.064	0.049	0.054	0.00095
Total Dioxins & Furans Only	72.8	124	95.1	104	1.84

^{*} At 25°C and 1 atmosphere

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

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



AMESA Dioxin and Furan Emission Data Calculated with AMESA Cartridge Only (55 pages)

# TABLE 1 Covanta - Durham York Energy Centre AMESA Monitor Dioxin and Furan Test Schedule

# Boiler No. 1 BH Outlet

Test	Test Date	Sampling Period		Sampling Time
Number		Start Finish		min
1	May 9, 2016	10:04	16:17	373
2	May 10, 2016	8:49	15:08	379
3	May 11, 2016	8:24	14:31	367

# Boiler No. 2 BH Outlet

Test	Test Date	Samplin	Sampling Time		
Number		Start	Finish	min	
1	May 6, 2016	8:48	15:00	372	
2	May 9, 2016	10:04	16:21	377	
3	May 10, 2016	8:54	15:12	378	
	:				

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

Congener Group	AMESA Sample	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	902	0.13	0.22	0.16	0.19	3.05
Pentachlorodibenzo-p-dioxins	22900	3.30	5.65	4.19	4.75	77.5
Hexachlorodibenzo-p-dioxins	44000	6.33	10.9	8.05	9.13	149
Heptachlorodibenzo-p-dioxins	24200	3.48	5.98	4.43	5.02	81.9
Octachlorodibenzo-p-dioxin	7560	1.09	1.87	1.38	1.57	25.6
Total	99562	14.3	24.6	18.2	20.7	337

#### **Furans**

Congener Group	AMESA Sample	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	1700	0.24	0.42	0.31	0.35	5.75
Pentachlorodibenzofurans	1700 9880	0.24 1.42	2.44	1.81	2.05	3.75 33.4
Hexachlorodibenzofurans	15000	2.16	3.70	2.74	3.11	50.7
Heptachlorodibenzofurans	7100	1.02	1.75	1.30	1.47	24.0
Octachlorodibenzofuran	<1900	<0.27	<0.47	<0.35	<0.39	<6.43
Total	<35580	<5.12	<8.79	<6.51	<7.38	<120

Dry Gas Volume Sampled (Nm³***) :	3.710
Dry Gas Volume Sampled (Rm ³ *):	4.050
Actual Flowrate (m³/s) :	23.5
Dry Reference Flowrate (Rm³/s*):	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*) :	16.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 3
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 2

Congener Group	AMESA Sample	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	128	0.018	0.031	0.023	0.026	0.43
Pentachlorodibenzo-p-dioxins	3300	0.46	0.80	0.59	0.67	11.1
Hexachlorodibenzo-p-dioxins	6710	0.95	1.62	1.21	1.36	22.5
Heptachlorodibenzo-p-dioxins	4620	0.65	1.11	0.83	0.93	15.5
Octachlorodibenzo-p-dioxin	1680	0.24	0.41	0.30	0.34	5.63
Total	16438	2.32	3.97	2.96	3.32	55.1

#### **Furans**

Congener Group	AMESA Sample	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
I t	202	0.040	0.073	0.054	0.061	1.01
Tetrachlorodibenzofurans	302	0.043	0.073	0.054	0.061	1.01
Pentachlorodibenzofurans	1320	0.19	0.32	0.24	0.27	4.43
Hexachlorodibenzofurans	2050	0.29	0.49	0.37	0.41	6.87
Heptachlorodibenzofurans	1150	0.16	0.28	0.21	0.23	3.86
Octachlorodibenzofuran	<370	<0.052	<0.089	<0.067	<0.075	<1.24
Total	<5192	<0.73	<1.25	<0.94	<1.05	<17.4

Dry Gas Volume Sampled (Nm ³ ***):	3.798
Dry Gas Volume Sampled (Rm ³ *):	4.146
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*) :	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 4
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 3

Congener Group	AMESA Sample	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	25.6	0.0035	0.0061	0.0045	0.0051	0.087
Pentachlorodibenzo-p-dioxins	1310	0.18	0.31	0.23	0.26	4.45
Hexachlorodibenzo-p-dioxins	2920	0.40	0.69	0.51	0.58	9.92
Heptachlorodibenzo-p-dioxins	1030	0.14	0.24	0.18	0.20	3.50
Octachlorodibenzo-p-dioxin	163	0.023	0.039	0.029	0.032	0.55
Total	5449	0.75	1.29	0.95	1.08	18.5

#### **Furans**

Congener Group	AMESA Sample	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	65.4	0.0090	0.016	0.011	0.013	0.22
Pentachlorodibenzofurans	570	0.079	0.14	0.10	0.11	1.94
Hexachlorodibenzofurans	1020	0.14	0.24	0.18	0.20	3.47
Heptachlorodibenzofurans	375	0.052	0.089	0.066	0.074	1.27
Octachlorodibenzofuran	<44	<0.0061	<0.010	<0.0077	<0.0087	<0.15
Total	<2074	<0.29	<0.49	<0.36	<0.41	<7.05

Dry Gas Volume Sampled (Nm ³ ***):	3.855
Dry Gas Volume Sampled (Rm³*):	4.208
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*):	17.2

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 5

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Actual Concentrations

Congener	DOCK OF THE STATE	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
   Tetrachlorodibenzo-p-dioxins	0.13	0.018	0.0035	0.050	137
Pentachlorodibenzo-p-dioxins	3.30	0.46	0.18	1.31	131
Hexachlorodibenzo-p-dioxins	6.33	0.95	0.40	2.56	128
Heptachlorodibenzo-p-dioxins	3.48	0.65	0.14	1.43	126
Octachlorodibenzo-p-dioxin	1.09	0.24	0.023	0.45	126
Total	14.3	2.32	0.75	5.80	128

Congener	ELECTRA DEL PROCESSO ANTINOMENTAL REPORTANTA DE REPORTANTA DE LA CARROLLA DEL CARROLLA DE LA CARROLLA DE LA CARROLLA DEL CARROLLA DE LA CARRO	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/m³	ng/m³	ng/m³	ng/m³	%
Tetrachlorodibenzofurans	0.24	0.043	0.0090	0.099	129
Pentachlorodibenzofurans	1.42	0.19	0.079	0.56	133
Hexachlorodibenzofurans	2.16	0.29	0.14	0.86	130
Heptachlorodibenzofurans	1.02	0.16	0.052	0.41	129
Octachlorodibenzofuran	<0.27	<0.052	<0.0061	<0.11	129
Total	<5.12	<0.73	<0.29	<2.05	131

TABLE 6
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Dry Reference Concentrations

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.22	0.031	0.0061	0.087	137
Pentachlorodibenzo-p-dioxins	5.65	0.80	0.31	2.25	131
Hexachlorodibenzo-p-dioxins	10.9	1.62	0.69	4.39	128
Heptachlorodibenzo-p-dioxins	5.98	1.11	0.24	2.45	126
Octachlorodibenzo-p-dioxin	1.87	0.41	0.039	0.77	126
Total	24.6	3.97	1.29	9.95	128

Congener	NAMEN PROPERTY AND THE RESIDENCE PROPERTY AND THE PROPERT	Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.42	0.073	0.016	0.17	129
Pentachlorodibenzofurans	2.44	0.32	0.14	0.96	133
Hexachlorodibenzofurans	3.70	0.49	0.24	1.48	130
Heptachlorodibenzofurans	1.75	0.28	0.089	0.71	129
Octachlorodibenzofuran	<0.47	<0.089	<0.010	<0.19	129
Total	<8.79	<1.25	<0.49	<3.51	131

^{*} At 25°C and 1 atmosphere

TABLE 7

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Dry Adjusted Concentrations

Congener Group		Coefficient			
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm ³ *	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
Tetrachlorodibenzo-p-dioxins	0.16	0.023	0.0045	0.064	137
Pentachlorodibenzo-p-dioxins	4.19	0.59	0.23	1.67	131
Hexachlorodibenzo-p-dioxins	8.05	1.21	0.51	3.26	128
Heptachlorodibenzo-p-dioxins	4.43	0.83	0.18	1.81	126
Octachlorodibenzo-p-dioxin	1.38	0.30	0.029	0.57	125
Total	18.2	2.96	0.95	7.37	128

Congener Group		Coefficient			
	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm ³ *	Average ng/Rm³*	of Variation %
	0.04	0.054	0.044	0.40	420
Tetrachlorodibenzofurans	0.31	0.054	0.011	0.13	129
Pentachlorodibenzofurans	1.81	0.24	0.10	0.71	133
Hexachlorodibenzofurans	2.74	0.37	0.18	1.10	130
Heptachlorodibenzofurans	1.30	0.21	0.066	0.52	129
Octachlorodibenzofuran	<0.35	<0.067	<0.0077	<0.14	129
Total	<6.51	<0.94	<0.36	<2.60	130

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

TABLE 8

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Wet Reference Concentrations

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.19	0.026	0.0051	0.073	137
Pentachlorodibenzo-p-dioxins	4.75	0.67	0.26	1.89	131
Hexachlorodibenzo-p-dioxins	9.13	1.36	0.58	3.69	128
Heptachlorodibenzo-p-dioxins	5.02	0.93	0.20	2.05	127
Octachlorodibenzo-p-dioxin	1.57	0.34	0.032	0.65	126
Total	20.7	3.32	1.08	8.35	128

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzofurans	0.35	0.061	0.013	0.14	129
Pentachlorodibenzofurans	2.05	0.27	0.11	0.81	133
Hexachlorodibenzofurans	3.11	0.41	0.20	1.24	131
Heptachlorodibenzofurans	1.47	0.23	0.074	0.59	129
Octachlorodibenzofuran	<0.39	<0.075	<0.0087	<0.16	130
Total	<7.38	<1.05	<0.41	<2.95	131

^{*} At 25°C and 1 atmosphere

TABLE 9

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Emission Rates

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%
Tetrachlorodibenzo-p-dioxins	3.05	0.43	0.087	1.19	136
Pentachlorodibenzo-p-dioxins	77.5	11.1	4.45	31.0	130
Hexachlorodibenzo-p-dioxins	149	22.5	9.92	60.4	127
Heptachlorodibenzo-p-dioxins	81.9	15.5	3.50	33.6	126
Octachlorodibenzo-p-dioxin	25.6	5.63	0.55	10.6	125
Total	337	55.1	18.5	137	127

Congener Group		Coefficient			
	Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	of Variation %
Tetrachlorodibenzofurans	5.75	1.01	0.22	2.33	128
Pentachlorodibenzofurans	33.4	4.43	1.94	13.3	132
Hexachlorodibenzofurans	50.7	6.87	3.47	20.4	129
Heptachlorodibenzofurans	24.0	3.86	1.27	9.72	128
Octachlorodibenzofuran	<6.43	<1.24	<0.15	<2.61	129
Total	<120	<17.4	<7.05	<48.3	130

TABLE 10

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Congener Group Emission Data

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	0.050	0.087	0.064	0.073	1.19
Pentachlorodibenzo-p-dioxins	1.31	2.25	1.67	1.89	31.0
Hexachlorodibenzo-p-dioxins	2.56	4.39	3.26	3.69	60.4
Heptachlorodibenzo-p-dioxins	1.43	2.45	1.81	2.05	33.6
Octachlorodibenzo-p-dioxin	0.45	0.77	0.57	0.65	10.6
Total	5.80	9.95	7.37	8.35	137

Congener Group	Actual Concentration	Dry Reference Dry Adjusted Concentration		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.099	0.17	0.13	0.14	2.33
Pentachlorodibenzofurans	0.56	0.96	0.71	0.81	13.3
Hexachlorodibenzofurans	0.86	1.48	1.10	1.24	20.4
Heptachlorodibenzofurans	0.41	0.71	0.52	0.59	9.72
Octachlorodibenzofuran	<0.11	<0.19	<0.14	<0.16	<2.61
Total	<2.05	<3.51	<2.60	<2.95	<48.3

^{*} At 25°C and 1 atmosphere

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

TABLE 11
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 1

Congener Group	AMESA Sample	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
T-4	140	0.019	0.033	0.025	0.027	0.49
Tetrachlorodibenzo-p-dioxins Pentachlorodibenzo-p-dioxins	149 673	0.019	0.033	0.025	0.027	2.22
Hexachlorodibenzo-p-dioxins	1450	0.19	0.32	0.24	0.27	4.78
Heptachlorodibenzo-p-dioxins	1080	0.14	0.24	0.18	0.20	3.56
Octachlorodibenzo-p-dioxin	403	0.052	0.089	0.068	0.074	1.33
Total	3755	0.48	0.83	0.63	0.69	12.4

## **Furans**

Congener Group	AMESA Sample	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	262	0.033	0.058	0.044	0.048	0.86
Pentachlorodibenzofurans	332	0.042	0.073	0.056	0.061	1.09
Hexachlorodibenzofurans	376	0.048	0.083	0.063	0.069	1.24
Heptachlorodibenzofurans	279	0.036	0.061	0.047	0.051	0.92
Octachlorodibenzofuran	<68	<0.0087	<0.015	<0.011	<0.012	<0.22
Total	<1317	<0.17	<0.29	<0.22	<0.24	<4.34

Dry Gas Volume Sampled (Nm³***) :	4.168
Dry Gas Volume Sampled (Rm³*):	4.549
Actual Flowrate (m³/s) :	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
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

^{***} At 0°C and 1 atmosphere

TABLE 12
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 2

Congener Group	AMESA Sample	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	90.7	0.012	0.020	0.016	0.017	0.30
Pentachlorodibenzo-p-dioxins	377	0.050	0.085	0.064	0.071	1.23
Hexachlorodibenzo-p-dioxins	847	0.11	0.19	0.14	0.16	2.77
Heptachlorodibenzo-p-dioxins	655	0.087	0.15	0.11	0.12	2.14
Octachlorodibenzo-p-dioxin	293	0.039	0.066	0.050	0.055	0.96
Total	2263	0.30	0.51	0.39	0.43	7.39

#### **Furans**

Congener Group	AMESA Sample	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	185	0.025	0.042	0.032	0.035	0.60
Pentachlorodibenzofurans	212	0.028	0.048	0.036	0.040	0.69
Hexachlorodibenzofurans	187	0.025	0.042	0.032	0.035	0.61
Heptachlorodibenzofurans	150	0.020	0.034	0.026	0.028	0.49
Octachlorodibenzofuran	<45	<0.0060	<0.010	<0.0077	<0.0085	<0.15
Total	<779	<0.10	<0.18	<0.13	<0.15	<2.54

Dry Gas Volume Sampled (Nm ³ ***):	4.068
Dry Gas Volume Sampled (Rm ³ *):	4.440
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 13
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Dioxin and Furan Congener Group Emission Data
Test No. 3

Congener Group	AMESA Sample	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
	pg	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
	40-	0.010		0.000	0.005	0.44
Tetrachlorodibenzo-p-dioxins	135	0.018	0.030	0.023	0.025	0.44
Pentachlorodibenzo-p-dioxins	379	0.050	0.083	0.065	0.070	1.23
Hexachlorodibenzo-p-dioxins	972	0.13	0.21	0.17	0.18	3.16
Heptachlorodibenzo-p-dioxins	850	0.11	0.19	0.14	0.16	2.76
Octachlorodibenzo-p-dioxin	394	0.052	0.087	0.067	0.073	1.28
Total	2730	0.36	0.60	0.46	0.50	8.88

#### **Furans**

Congener Group	AMESA Sample	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	224	0.029	0.049	0.038	0.041	0.73
Pentachlorodibenzofurans	230	0.030	0.051	0.039	0.043	0.75
Hexachlorodibenzofurans	231	0.030	0.051	0.039	0.043	0.75
Heptachlorodibenzofurans	213	0.028	0.047	0.036	0.039	0.69
Octachlorodibenzofuran	<65	<0.0085	<0.014	<0.011	<0.012	<0.21
Total	<963	<0.13	<0.21	<0.16	<0.18	<3.13

Dry Gas Volume Sampled (Nm ³ ***):	4.169
Dry Gas Volume Sampled (Rm ³ *):	4.551
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*):	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 14

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Actual Concentrations

Congener		Actual Concentration						
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation			
	ng/m³	ng/m³	ng/m³	ng/m³	%			
  Tetrachlorodibenzo-p-dioxins	0.019	0.012	0.018	0.016	22.9			
Pentachlorodibenzo-p-dioxins	0.019	0.012	0.018	0.018	33.7			
Hexachlorodibenzo-p-dioxins	0.19	0.11	0.13	0.14	27.1			
Heptachlorodibenzo-p-dioxins	0.14	0.087	0.11	0.11	22.8			
Octachlorodibenzo-p-dioxin	0.052	0.039	0.052	0.047	15.5			
Total	0.48	0.30	0.36	0.38	24.2			

Congener		Coefficient				
Group	Test No. 1	Test No. 1 Test No. 2 T		Test No. 3 Average		
	ng/m³	ng/m³	ng/m³	ng/m³	%	
Tetrachlorodibenzofurans	0.033	0.025	0.029	0.029	15.3	
Pentachlorodibenzofurans	0.042	0.028	0.030	0.034	23.0	
Hexachlorodibenzofurans	0.048	0.025	0.030	0.034	35.3	
Heptachlorodibenzofurans	0.036	0.020	0.028	0.028	28.3	
Octachlorodibenzofuran	<0.0087	<0.0060	<0.0085	<0.0077	19.7	
Total	<0.17	<0.10	<0.13	<0.13	24.8	

TABLE 15

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Dry Reference Concentrations

Congener		Dry Reference Concentration					
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%		
T-1	0.000	0.000	0.020	0.020	23.2		
Tetrachlorodibenzo-p-dioxins	0.033	0.020	0.030	0.028	23.2		
Pentachlorodibenzo-p-dioxins	0.15	0.085	0.083	0.11	35.0		
Hexachlorodibenzo-p-dioxins	0.32	0.19	0.21	0.24	28.3		
Heptachlorodibenzo-p-dioxins	0.24	0.15	0.19	0.19	23.6		
Octachlorodibenzo-p-dioxin	0.089	0.066	0.087	0.080	15.6		
Total	0.83	0.51	0.60	0.64	25.2		

Congener	<del></del>	Dry Reference Concentration					
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%		
					45.4		
Tetrachlorodibenzofurans	0.058	0.042	0.049	0.049	16.1		
Pentachlorodibenzofurans	0.073	0.048	0.051	0.057	24.2		
Hexachlorodibenzofurans	0.083	0.042	0.051	0.059	36.5		
Heptachlorodibenzofurans	0.061	0.034	0.047	0.047	29.1		
Octachlorodibenzofuran	<0.015	<0.010	<0.014	<0.013	19.9		
Total	<0.29	<0.18	<0.21	<0.23	25.8		

^{*} At 25°C and 1 atmosphere

TABLE 16

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Dry Adjusted Concentrations

Congener		Coefficient			
Group	roup Test No. 1 Test No. 2 Test No. 3  ng/Rm ^{3*} ng/Rm ^{3*} ng/Rm ^{3*}			Average ng/Rm³*	of Variation %
					00 -
Tetrachlorodibenzo-p-dioxins	0.025	0.016	0.023	0.021	23.7
Pentachlorodibenzo-p-dioxins	0.11	0.064	0.065	0.081	34.8
Hexachlorodibenzo-p-dioxins	0.24	0.14	0.17	0.18	28.3
Heptachlorodibenzo-p-dioxins	0.18	0.11	0.14	0.15	23.9
Octachlorodibenzo-p-dioxin	0.068	0.050	0.067	0.062	16.3
Total	0.63	0.39	0.46	0.49	25.3

Congener		Coefficient			
Group	Test No. 1 ng/Rm³*	Test No. 2 ng/Rm³*	Test No. 3 ng/Rm³*	Average ng/Rm³*	of Variation %
Tetrachlorodibenzofurans	0.044	0.032	0.038	0.038	16.4
Pentachlorodibenzofurans	0.056	0.036	0.039	0.044	24.2
Hexachlorodibenzofurans	0.063	0.032	0.039	0.045	36.5
Heptachlorodibenzofurans	0.047	0.026	0.036	0.036	29.3
Octachlorodibenzofuran	<0.011	<0.0077	<0.011	<0.010	20.5
Total	<0.22	<0.13	<0.16	<0.17	25.9

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

TABLE 17

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Wet Reference Concentrations

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%
Tetrachlorodibenzo-p-dioxins	0.027	0.017	0.025	0.023	23.0
Pentachlorodibenzo-p-dioxins	0.12	0.071	0.070	0.088	34.5
Hexachlorodibenzo-p-dioxins	0.27	0.16	0.18	0.20	27.9
Heptachlorodibenzo-p-dioxins	0.20	0.12	0.16	0.16	23.3
Octachlorodibenzo-p-dioxin	0.074	0.055	0.073	0.067	15.5
Total	0.69	0.43	0.50	0.54	24.8

Congener		Wet reference Concentration					
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	ng/Rm³*	ng/Rm³*	ng/Rm³*	ng/Rm³*	%		
Tetrachlorodibenzofurans	0.048	0.035	0.041	0.041	15.8		
Pentachlorodibenzofurans	0.061	0.040	0.043	0.048	23.8		
Hexachlorodibenzofurans	0.069	0.035	0.043	0.049	36.0		
Heptachlorodibenzofurans	0.051	0.028	0.039	0.040	28.8		
Octachlorodibenzofuran	<0.012	<0.0085	<0.012	<0.011	19.8		
Total	<0.24	<0.15	<0.18	<0.19	25.4		

^{*} At 25°C and 1 atmosphere

TABLE 18

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Congener Group Emission Rates

Congener		Coefficient			
Group	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%%
	0.40	0.20	0.44	0.41	24.7
Tetrachlorodibenzo-p-dioxins	0.49	0.30	0.44	0.41	24.7
Pentachlorodibenzo-p-dioxins	2.22	1.23	1.23	1.56	36.5
Hexachlorodibenzo-p-dioxins	4.78	2.77	3.16	3.57	29.9
Heptachlorodibenzo-p-dioxins	3.56	2.14	2.76	2.82	25.3
Octachlorodibenzo-p-dioxin	1.33	0.96	1.28	1.19	17.0
Total	12.4	7.39	8.88	9.55	26.8

Congener	erinda on committeen en	Coefficient			
Group	Test No. 1 ng/s	Test No. 2 ng/s	Test No. 3 ng/s	Average ng/s	of Variation %
Tetrachlorodibenzofurans	0.86	0.60	0.73	0.73	17.7
Pentachlorodibenzofurans	1.09	0.69	0.75	0.84	25.8
Hexachlorodibenzofurans	1.24	0.61	0.75	0.87	38.1
Heptachlorodibenzofurans	0.92	0.49	0.69	0.70	30.7
Octachlorodibenzofuran	<0.22	<0.15	<0.21	<0.19	21.3
Total	<4.34	<2.54	<3.13	<3.34	27.5

TABLE 19
Covanta - Durham York Energy Centre
Boiler No. 2 BH Outlet - AMESA Monitor
Summary of Dioxin and Furan Congener Group Emission Data

Congener Group	Actual Concentration	Dry Reference Concentration		Wet Reference Concentration	Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzo-p-dioxins	0.016	0.028	0.021	0.023	0.41
Pentachlorodibenzo-p-dioxins	0.062	0.11	0.081	0.088	1.56
Hexachlorodibenzo-p-dioxins	0.14	0.24	0.18	0.20	3.57
Heptachlorodibenzo-p-dioxins	0.11	0.19	0.15	0.16	2.82
Octachlorodibenzo-p-dioxin	0.047	0.080	0.062	0.067	1.19
Total	0.38	0.64	0.49	0.54	9.55

Congener Group	Actual Concentration	Actual Dry Reference Dry Adjusted centration Concentration			Emission Rate
	ng/m³	ng/Rm³*	ng/Rm³**	ng/Rm³*	ng/s
Tetrachlorodibenzofurans	0.029	0.049	0.038	0.041	0.73
Pentachlorodibenzofurans	0.034	0.057	0.044	0.048	0.84
Hexachlorodibenzofurans	0.034	0.059	0.045	0.049	0.87
Heptachlorodibenzofurans	0.028	0.047	0.036	0.040	0.70
Octachlorodibenzofuran	<0.0077	<0.013	<0.010	<0.011	<0.19
Total	<0.13	<0.23	<0.17	<0.19	<3.34

^{*} At 25°C and 1 atmosphere

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

TABLE 20
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 1

Specific Isomer	AMESA Sample	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	24.0	3.46	5.93	4.39	4.98	0.081
12378-pentachlorodibenzo-p-dioxin	396	57.0	97.8	72.4	82.2	1.34
123478-hexachlorodibenzo-p-dioxin	1070	154	264	196	222	3.62
123678-hexachlorodibenzo-p-dioxin	3090	445	763	565	641	10.5
123789-hexachlorodibenzo-p-dioxin	2770	399	684	507	575	9.37
1234678-heptachlorodibenzo-p-dioxin	11600	1670	2865	2121	2408	39.2
Octachlorodibenzo-p-dioxin	7560	1088	1867	1382	<b>156</b> 9	25.6
2378-tetrachlorodibenzofuran	<150	<21.6	<37.0	<27.4	<31.1	<0.51
12378-pentachlorodibenzofuran	335	48.2	82.7	61.3	69.5	1.13
23478-pentachlorodibenzofuran	<1000	<144	<247	<183	<208	<3.38
123478-hexachlorodibenzofuran	3350	482	827	613	695	11.3
123678-hexachlorodibenzofuran	1630	235	403	298	338	5.51
234678-hexachlorodibenzofuran	2210	318	546	404	459	7.48
123789-hexachlorodibenzofuran	<130	<18.7	<32.1	<23.8	<27.0	< 0.44
1234678-heptachlorodibenzofuran	4130	595	1020	755	857	14.0
1234789-heptachlorodibenzofuran	698	100	172	128	145	2.36
Octachlorodibenzofuran	<1900	<274	<469	<347	<394	<6.43
Total Dioxins & Furans Only	<42043	<6053	<10382	<7688	<8726	<142

Dry Gas Volume Sampled (Nm³***):	3.710
Dry Gas Volume Sampled (Rm ³ *):	4.050
Actual Flowrate (m³/s) :	23.5
Dry Reference Flowrate (Rm³/s*) :	13.7
Dry Adjusted Flowrate (Rm³/s**):	18.5
Wet Reference Flowrate (Rm³/s*) :	16.3

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 21
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Data
Test No. 2

Specific Isomer	AMESA Sample	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	<5.8	<0.82	<1.40	<1.05	<1.17	<0.019
12378-pentachlorodibenzo-p-dioxin	57 <i>.</i> 4	8.09	13.8	10.3	11.6	0.19
123478-hexachlorodibenzo-p-dioxin	149	21.0	35.9	26.9	30.1	0.50
123678-hexachlorodibenzo-p-dioxin	433	61.0	104	78.1	87.5	1.45
123789-hexachlorodibenzo-p-dioxin	409	57.6	98.7	73.7	82.6	1.37
1234678-heptachlorodibenzo-p-dioxin	2120	299	511	382	428	7.11
Octachlorodibenzo-p-dioxin	1680	237	405	303	339	5.63
   2378-tetrachlorodibenzofuran	<35	<4.93	<8.44	<6.31	<7.07	<0.12
12378-pentachlorodibenzofuran	52.0	7.33	12.5	9.37	10.5	0.17
23478-pentachlorodibenzofuran	<150	<21.1	<36.2	<27.0	<30.3	< 0.50
123478-hexachlorodibenzofuran	450	63.4	109	81.1	90.9	1.51
123678-hexachlorodibenzofuran	220	31.0	53.1	39.7	44.4	0.74
234678-hexachlorodibenzofuran	260	36.6	62.7	46.9	52.5	0.87
123789-hexachlorodibenzofuran	<15	<2.11	<3.62	<2.70	<3.03	< 0.050
1234678-heptachlorodibenzofuran	649	91.4	157	117	131	2.18
1234789-heptachlorodibenzofuran	118	16.6	28.5	21.3	23.8	0.40
Octachlorodibenzofuran	<370	<52.1	<89.3	<66.7	<74.7	<1.24
Total Dioxins & Furans Only	<7173	<1011	<1730	<1293	<1449	<24.1

Dry Gas Volume Sampled (Nm³***):	3.798
Dry Gas Volume Sampled (Rm³*):	4.146
Actual Flowrate (m³/s) :	23.8
Dry Reference Flowrate (Rm³/s*) :	13.9
Dry Adjusted Flowrate (Rm³/s**):	18.6
Wet Reference Flowrate (Rm³/s*) :	16.6

^{*} At 25°C and 1 atmosphere

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

^{***} At 0°C and 1 atmosphere

TABLE 22

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Data

Test No. 3

Specific Isomer	AMESA Sample	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	<2.3	<0.32	<0.55	<0.40	<0.45	<0.0078
12378-pentachlorodibenzo-p-dioxin	25.7	3.55	6.11	4.50	5.08	0.087
123478-hexachlorodibenzo-p-dioxin	58.4	8.07	13.9	10.2	11.5	0.20
123678-hexachlorodibenzo-p-dioxin	180	24.9	42.8	31.5	35.6	0.61
123789-hexachlorodibenzo-p-dioxin	158	21.8	37.5	27.7	31.2	0.54
1234678-heptachlorodibenzo-p-dioxin	445	61.5	106	78.0	87.9	1.51
Octachlorodibenzo-p-dioxin	163	22.5	38.7	28.6	32.2	0.55
2378-tetrachlorodibenzofuran	<14	<1.93	<3.33	<2.45	<2.77	<0.048
12378-pentachlorodibenzofuran	20.0	2.76	4.75	3.50	3.95	0.068
23478-pentachlorodibenzofuran	59.3	8.19	14.1	10.4	11.7	0.20
123478-hexachlorodibenzofuran	220	30.4	52.3	38.5	43.5	0.75
123678-hexachlorodibenzofuran	118	16.3	28.0	20.7	23.3	0.40
234678-hexachlorodibenzofuran	100	13.8	23.8	17.5	19.8	0.34
123789-hexachlorodibenzofuran	<7.2	<0.99	<1.71	<1.26	<1.42	<0.024
1234678-heptachlorodibenzofuran	232	32.1	55.1	40.6	45.8	0.79
1234789-heptachlorodibenzofuran	30.0	4.14	7.13	5.26	5.93	0.10
Octachlorodibenzofuran	<44	<6.08	<10.5	<7.71	<8.69	<0.15
Total Dioxins & Furans Only	<1877	<259	<446	<329	<371	<6.38

Dry Gas Volume Sampled (Nm ³ ***):	3.855
Dry Gas Volume Sampled (Rm³*) :	4.208
Actual Flowrate (m³/s) :	24.6
Dry Reference Flowrate (Rm³/s*) :	14.3
Dry Adjusted Flowrate (Rm³/s**):	19.4
Wet Reference Flowrate (Rm³/s*):	17.2

^{*} At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit),

and the value of the detection limit was used to calculate the emission data.

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

^{***} At 0°C and 1 atmosphere

TABLE 23

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Actual Concentrations

Specific		Actual Concentration				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
	pg/m³	pg/m³	pg/m³	pg/m³	%	
				_		
2378-tetrachlorodibenzo-p-dioxin	3.46	<0.82	<0.32	<1.53	110	
12378-pentachlorodibenzo-p-dioxin	57.0	8.09	3.55	22.9	130	
123478-hexachlorodibenzo-p-dioxin	154	21.0	8.07	61.0	132	
123678-hexachlorodibenzo-p-dioxin	445	61.0	24.9	177	132	
123789-hexachlorodibenzo-p-dioxin	399	57.6	21.8	159	131	
1234678-heptachlorodibenzo-p-dioxin	1670	299	61.5	677	128	
Octachlorodibenzo-p-dioxin	1088	237	22.5	449	126	
   2378-tetrachlorodibenzofuran	<21.6	<4.93	<1.93	<9.49	112	
12378-pentachlorodibenzofuran	48.2	7.33	2.76	19.4	129	
23478-pentachlorodibenzofuran	<144	<21.1	8.19	<57.8	130	
123478-hexachlorodibenzofuran	482	63.4	30.4	192	131	
123678-hexachlorodibenzofuran	235	31.0	16.3	94.0	130	
234678-hexachlorodibenzofuran	318	36.6	13.8	123	138	
123789-hexachlorodibenzofuran	<18.7	<2.11	< 0.99	<7.27	136	
1234678-heptachlorodibenzofuran	595	91.4	32.1	239	129	
1234789-heptachlorodibenzofuran	100	16.6	4.14	40.4	130	
Octachlorodibenzofuran	<274	<52.1	<6.08	<111	129	
Total Dioxins & Furans Only	<6053	<1011	<259	<2441	129	

TABLE 24

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific	Dry Reference Concentration Coeffi				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	5.93	<1.40	<0.55	<2.62	110
12378-pentachlorodibenzo-p-dioxin	97.8	13.8	6.11	39.2	130
123478-hexachlorodibenzo-p-dioxin	264	35.9	13.9	105	132
123678-hexachlorodibenzo-p-dioxin	763	104	42.8	303	132
123789-hexachlorodibenzo-p-dioxin	684	98.7	37.5	273	131
1234678-heptachlorodibenzo-p-dioxin	2865	511	106	1161	128
Octachlorodibenzo-p-dioxin	1867	405	38.7	770	126
2378-tetrachlorodibenzofuran	<37.0	<8.44	<3.33	<16.3	112
12378-pentachlorodibenzofuran	82.7	12.5	4.75	33.3	129
23478-pentachlorodibenzofuran	<247	<36.2	14.1	<99.1	130
123478-hexachlorodibenzofuran	827	109	52.3	329	131
123678-hexachlorodibenzofuran	403	53.1	28.0	161	130
234678-hexachlorodibenzofuran	546	62.7	23.8	211	138
123789-hexachlorodibenzofuran	<32.1	<3.62	<1.71	<12.5	136
1234678-heptachlorodibenzofuran	1020	157	55.1	411	129
1234789-heptachlorodibenzofuran	172	28.5	7.13	69.3	130
Octachlorodibenzofuran	<469	<89.3	<10.5	<190	129
Total Dioxins & Furans Only	<10382	<1730	<446	<4186	129

^{*} At 25°C and 1 atmosphere

TABLE 25

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific	E	Ory Adjusted (	Concentration	CONTRACTOR HECKS AND CONTRACTOR C	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	4.39	<1.05	<0.40	<1.95	110
12378-pentachlorodibenzo-p-dioxin	72.4	10.3	4.50	29.1	129
123478-hexachlorodibenzo-p-dioxin	196	26.9	10.2	77.6	132
123678-hexachlorodibenzo-p-dioxin	565	78.1	31.5	225	131
123789-hexachlorodibenzo-p-dioxin	507	73.7	27.7	203	130
1234678-heptachlorodibenzo-p-dioxin	2121	382	78.0	860	128
Octachlorodibenzo-p-dioxin	1382	303	28.6	571	125
2378-tetrachlorodibenzofuran	<27.4	<6.31	<2.45	<12.1	111
12378-pentachlorodibenzofuran	61.3	9.37	3.50	24.7	129
23478-pentachlorodibenzofuran	<183	<27.0	10.4	<73.4	130
123478-hexachlorodibenzofuran	613	81.1	38.5	244	131
123678-hexachlorodibenzofuran	298	39.7	20.7	119	130
234678-hexachlorodibenzofuran	404	46.9	17.5	156	138
123789-hexachlorodibenzofuran	<23.8	<2.70	<1.26	<9.25	136
1234678-heptachlorodibenzofuran	755	117	40.6	304	129
1234789-heptachlorodibenzofuran	128	21.3	5.26	51.4	129
Octachlorodibenzofuran	<347	<66.7	<7.71	<141	129
Total Dioxins & Furans Only	<7688	<1293	<329	<3103	129

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

TABLE 26

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific	V	/et Reference	Concentration	n	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
					displanation of the state of th
2378-tetrachlorodibenzo-p-dioxin	4.98	<1.17	<0.45	<2.20	110
12378-pentachlorodibenzo-p-dioxin	82.2	11.6	5.08	33.0	130
123478-hexachlorodibenzo-p-dioxin	222	30.1	11.5	87.9	133
123678-hexachlorodibenzo-p-dioxin	641	87.5	35.6	255	132
123789-hexachlorodibenzo-p-dioxin	575	82.6	31.2	230	131
1234678-heptachlorodibenzo-p-dioxin	2408	428	87.9	975	129
Octachlorodibenzo-p-dioxin	1569	339	32.2	647	126
2378-tetrachlorodibenzofuran	<31.1	<7.07	<2.77	<13.7	112
12378-pentachlorodibenzofuran	69.5	10.5	3.95	28.0	129
23478-pentachlorodibenzofuran	<208	<30.3	11.7	<83.2	130
123478-hexachlorodibenzofuran	695	90.9	43.5	277	131
123678-hexachlorodibenzofuran	338	44.4	23.3	135	130
234678-hexachlorodibenzofuran	459	52.5	19.8	177	138
123789-hexachlorodibenzofuran	<27.0	<3.03	<1.42	<10.5	137
1234678-heptachlorodibenzofuran	857	131	45.8	345	129
1234789-heptachlorodibenzofuran	145	23.8	5.93	58.2	130
Octachlorodibenzofuran	<394	<74.7	<8.69	<159	130
Total Dioxins & Furans Only	<8726	<1449	<371	<3515	129

^{*} At 25°C and 1 atmosphere

TABLE 27
Covanta - Durham York Energy Centre
Boiler No. 1 BH Outlet - AMESA Monitor
Dioxin and Furan Specific Isomer Emission Rates

Specific		Emissio	on Rate	***********************************	Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	0.081	<0.019	<0.0078	<0.036	109
12378-pentachlorodibenzo-p-dioxin	1.34	0.19	0.087	0.54	129
123478-hexachlorodibenzo-p-dioxin	3.62	0.50	0.20	1.44	132
123678-hexachlorodibenzo-p-dioxin	10.5	1.45	0.61	4.17	131
123789-hexachlorodibenzo-p-dioxin	9.37	1.37	0.54	3.76	130
1234678-heptachlorodibenzo-p-dioxin	39.2	7.11	1.51	16.0	128
Octachlorodibenzo-p-dioxin	25.6	5.63	0.55	10.6	125
2378-tetrachlorodibenzofuran	<0.51	<0.12	<0.048	<0.22	111
12378-pentachlorodibenzofuran	1.13	0.17	0.068	0.46	128
23478-pentachlorodibenzofuran	<3.38	<0.50	0.20	<1.36	129
123478-hexachlorodibenzofuran	11.3	1.51	0.75	4.53	130
123678-hexachlorodibenzofuran	5.51	0.74	0.40	2.22	129
234678-hexachlorodibenzofuran	7.48	0.87	0.34	2.90	137
123789-hexachlorodibenzofuran	< 0.44	<0.050	<0.024	<0.17	136
1234678-heptachlorodibenzofuran	14.0	2.18	0.79	5.65	128
1234789-heptachlorodibenzofuran	2.36	0.40	0.10	0.95	129
Octachlorodibenzofuran	<6.43	<1.24	<0.15	<2.61	129
Total Dioxins & Furans Only	<142	<24.1	<6.38	<57.6	128

TABLE 28

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Specific Isomer Emission Data

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
	.4.50	.2.62	.4.05	-2.20	.0.026
2378-tetrachlorodibenzo-p-dioxin	<1.53	<2.62	<1.95	<2.20	<0.036
12378-pentachlorodibenzo-p-dioxin	22.9	39.2	29.1	33.0	0.54
123478-hexachlorodibenzo-p-dioxin	61.0	105	77.6	87.9	1.44
123678-hexachlorodibenzo-p-dioxin	177	303	225	255	4.17
123789-hexachlorodibenzo-p-dioxin	159	273	203	230	3.76
1234678-heptachlorodibenzo-p-dioxin	677	1161	860	975	16.0
Octachlorodibenzo-p-dioxin	449	770	571	647	10.6
2378-tetrachlorodibenzofuran	<9.49	<16.3	<12.1	<13.7	<0.22
12378-pentachlorodibenzofuran	19.4	33.3	24.7	28.0	0.46
23478-pentachlorodibenzofuran	<57.8	<99.1	<73.4	<83.2	<1.36
123478-hexachlorodibenzofuran	192	329	244	277	4.53
123678-hexachlorodibenzofuran	94.0	161	119	135	2.22
234678-hexachlorodibenzofuran	123	211	156	177	2.90
123789-hexachlorodibenzofuran	<7.27	<12.5	<9.25	<10.5	< 0.17
1234678-heptachlorodibenzofuran	239	411	304	345	5.65
1234789-heptachlorodibenzofuran	40.4	69.3	51.4	58.2	0.95
Octachlorodibenzofuran	<111	<190	<141	<159	<2.61
Total Dioxins & Furans Only	<2441	<4186	<3103	<3515	<57.6

^{*} At 25°C and 1 atmosphere

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

TABLE 29

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific	Toxicity	icity Actual Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³	
2378-tetrachlorodibenzo-p-dioxin	1.000	3.46	<0.82	<0.32	<1.53	
12378-pentachlorodibenzo-p-dioxin	1.000	57.0	8.09	3.55	22.9	
123478-hexachlorodibenzo-p-dioxin	0.100	15.4	2.10	0.81	6.10	
123678-hexachlorodibenzo-p-dioxin	0.100	44.5	6.10	2.49	17.7	
123789-hexachlorodibenzo-p-dioxin	0.100	39.9	5.76	2.18	<b>1</b> 5.9	
1234678-heptachlorodibenzo-p-dioxin	0.010	16.7	2.99	0.61	6.77	
Octachlorodibenzo-p-dioxin	0.0003	0.33	0.071	0.0068	0.13	
2378-tetrachlorodibenzofuran	0.100	<2.16	<0.49	<0.19	<0.95	
12378-pentachlorodibenzofuran	0.030	<b>1.</b> 45	0.22	0.083	0.58	
23478-pentachlorodibenzofuran	0.300	<43.2	<6.34	2.46	<17.3	
123478-hexachlorodibenzofuran	0.100	48.2	6.34	3.04	19.2	
123678-hexachlorodibenzofuran	0.100	23.5	3.10	1.63	9.40	
234678-hexachlorodibenzofuran	0.100	31.8	3.66	1.38	12.3	
123789-hexachlorodibenzofuran	0.100	<1.87	<0.21	<0.099	< 0.73	
1234678-heptachlorodibenzofuran	0.010	5.95	0.91	0.32	2.39	
1234789-heptachlorodibenzofuran	0.010	1.00	0.17	0.041	0.40	
Octachlorodibenzofuran	0.0003	<0.082	<0.016	<0.0018	<0.033	
Total Dioxins & Furans Only		<336	<47.4	<19.2	<134	

TABLE 30

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific Isomer	Toxicity	Dry Reference Concentration				
	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	
	4 000			0.55	2.62	
2378-tetrachlorodibenzo-p-dioxin	1.000	5.93	<1.40	<0.55	<2.62	
12378-pentachlorodibenzo-p-dioxin	1.000	97.8	13.8	6.11	39.2	
123478-hexachlorodibenzo-p-dioxin	0.100	26.4	3.59	1.39	10.5	
123678-hexachlorodibenzo-p-dioxin	0.100	76.3	10.4	4.28	30.3	
123789-hexachlorodibenzo-p-dioxin	0.100	68.4	9.87	3.75	27.3	
1234678-heptachlorodibenzo-p-dioxin	0.010	28.6	5.11	1.06	11.6	
Octachlorodibenzo-p-dioxin	0.0003	0.56	0.12	0.012	0.23	
2378-tetrachlorodibenzofuran	0.100	<3.70	<0.84	<0.33	<1.63	
12378-pentachlorodibenzofuran	0.030	2.48	0.38	0.14	1.00	
23478-pentachlorodibenzofuran	0.300	<74.1	<10.9	4.23	<29.7	
123478-hexachlorodibenzofuran	0.100	82.7	10.9	5.23	32.9	
123678-hexachlorodibenzofuran	0.100	40.3	5.31	2.80	16.1	
234678-hexachlorodibenzofuran	0.100	54.6	6.27	2.38	21.1	
123789-hexachlorodibenzofuran	0.100	<3.21	<0.36	< 0.17	<1.25	
1234678-heptachlorodibenzofuran	0.010	10.2	1.57	0.55	4.11	
1234789-heptachlorodibenzofuran	0.010	1.72	0.28	0.071	0.69	
Octachlorodibenzofuran	0.0003	<0.14	<0.027	<0.0031	<0.057	
Total Dioxins & Furans Only		<577	<81.1	<33.1	<230	

# * At 25°C and 1 atmosphere

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

TABLE 31

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Specific	Toxicity	Dry Adjusted Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	
2279 totrachlorodihonzo n diovin	1.000	4.39	<1.05	<0.40	<1.95	
2378-tetrachlorodibenzo-p-dioxin   12378-pentachlorodibenzo-p-dioxin	1.000	72.4	10.3	4.50	29.1	
123478-hexachlorodibenzo-p-dioxin	0.100	19.6	2.69	1.02	7.76	
· · ·	0.100	19.6 56.5	7.81	3.15	22.5	
123678-hexachlorodibenzo-p-dioxin			7.81 7.37	2.77	20.3	
123789-hexachlorodibenzo-p-dioxin	0.100	50.7	7.57 3.82	0.78	8.60	
1234678-heptachlorodibenzo-p-dioxin	0.010	21.2			-	
Octachlorodibenzo-p-dioxin	0.0003	0.41	0.091	0.0086	0.17	
2378-tetrachlorodibenzofuran	0.100	<2.74	<0.63	<0.25	<1.21	
12378-pentachlorodibenzofuran	0.030	1.84	0.28	0.11	0.74	
23478-pentachlorodibenzofuran	0.300	<54.9	<8.11	3.12	<22.0	
123478-hexachlorodibenzofuran	0.100	61.3	8.11	3.85	24.4	
123678-hexachlorodibenzofuran	0.100	29.8	3.97	2.07	11.9	
234678-hexachlorodibenzofuran	0.100	40.4	4.69	1.75	15.6	
123789-hexachlorodibenzofuran	0.100	<2.38	<0.27	< 0.13	< 0.92	
1234678-heptachlorodibenzofuran	0.010	7.55	1.17	0.41	3.04	
1234789-heptachlorodibenzofuran	0.010	1.28	0.21	0.053	0.51	
Octachlorodibenzofuran	0.0003	<0.10	<0.020	<0.0023	<0.042	
Total Dioxins & Furans Only		<427	<60.6	<24.4	<171	

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

TABLE 31A

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using Half the Detection Limit

Specific	Toxicity Dry Adjusted Concentration				74-74-7-10-7-1-7-1-7-1-7-1-7-1-7-1-7-1-7-1-7-
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	4.39	0.52	0.20	1.70
12378-pentachlorodibenzo-p-dioxin	1.000	72.4	10.3	4.50	29.1
123478-hexachlorodibenzo-p-dioxin	0.100	19.6	2.69	1.02	7.76
123678-hexachlorodibenzo-p-dioxin	0.100	56.5	7.81	3.15	22.5
123789-hexachlorodibenzo-p-dioxin	0.100	50.7	7.37	2.77	20.3
1234678-heptachlorodibenzo-p-dioxin	0.010	21.2	3.82	0.78	8.60
Octachlorodibenzo-p-dioxin	0.0003	0.41	0.091	0.0086	0.17
2378-tetrachlorodibenzofuran	0.100	1.37	0.32	0.12	0.60
12378-pentachlorodibenzofuran	0.030	1.84	0.28	0.11	0.74
23478-pentachlorodibenzofuran	0.300	27.4	4.06	3.12	11.5
123478-hexachlorodibenzofuran	0.100	61.3	8.11	3.85	24.4
123678-hexachlorodibenzofuran	0.100	29.8	3.97	2.07	11.9
234678-hexachlorodibenzofuran	0.100	40.4	4.69	1.75	15.6
123789-hexachlorodibenzofuran	0.100	2.38	0.14	0.063	0.86
1234678-heptachlorodibenzofuran	0.010	7.55	1.17	0.41	3.04
1234789-heptachlorodibenzofuran	0.010	1.28	0.21	0.053	0.51
Octachlorodibenzofuran	0.0003	0.052	0.010	0.0012	0.021
Total Dioxins & Furans Only		399	55.6	24.0	159

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

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

TABLE 31B

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using the Full Detection Limit

Specific	Toxicity				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm ^{3*}	pg TEQ/Rm ^{3*}	pg TEQ/Rm ³ *
2378-tetrachlorodibenzo-p-dioxin	1.000	4.39	<1.05	<0.40	<1.95
12378-pentachlorodibenzo-p-dioxin	0.500	36.2	5.2	2.25	14.5
123478-hexachlorodibenzo-p-dioxin	0.100	19.6	2.69	1.02	7.76
123678-hexachlorodibenzo-p-dioxin	0.100	56.5	7.81	3.15	22.5
123789-hexachlorodibenzo-p-dioxin	0.100	50.7	7.37	2.77	20.3
1234678-heptachlorodibenzo-p-dioxin	0.010	21.2	3.82	0.78	8.60
Octachlorodibenzo-p-dioxin	0.001	1.38	0.30	0.029	0.57
2378-tetrachlorodibenzofuran	0.100	<2.74	<0.63	<0.25	<1.21
12378-pentachlorodibenzofuran	0.050	3.06	0.47	0.18	1.24
23478-pentachlorodibenzofuran	0.500	<91.4	<13.5	5.19	<36.7
123478-hexachlorodibenzofuran	0.100	61.3	8.11	3.85	24.4
123678-hexachlorodibenzofuran	0.100	29.8	3.97	2.07	11.9
234678-hexachlorodibenzofuran	0.100	40.4	4.69	1.75	15.6
123789-hexachlorodibenzofuran	0.100	<2.38	<0.27	< 0.13	< 0.92
1234678-heptachlorodibenzofuran	0.010	7.55	1.17	0.41	3.04
1234789-heptachlorodibenzofuran	0.010	1.28	0.21	0.053	0.51
Octachlorodibenzofuran	0.001	<0.35	<0.067	<0.0077	< 0.14
Total Dioxins & Furans		<430	<61.3	<24.3	<172
In-Stack Emission Limit					60
			**************************************		

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

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 32

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific	Toxicity	Wet Reference Concentration					
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average		
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*		
2270	1 000	4.00	.4.47	10 AF	-2.20		
2378-tetrachlorodibenzo-p-dioxin	1.000	4.98	<1.17	<0.45	<2.20		
12378-pentachlorodibenzo-p-dioxin	1.000	82.2	11.6	5.08	33.0		
123478-hexachlorodibenzo-p-dioxin	0.100	22.2	3.01	1.15	8.79		
123678-hexachlorodibenzo-p-dioxin	0.100	64.1	8.75	3.56	25.5		
123789-hexachlorodibenzo-p-dioxin	0.100	57.5	8.26	3.12	23.0		
1234678-heptachlorodibenzo-p-dioxin	0.010	24.1	4.28	0.88	9.75		
Octachlorodibenzo-p-dioxin	0.0003	0.47	0.10	0.0097	0.19		
   2378-tetrachlorodibenzofuran	0.100	<3.11	<0.71	<0.28	<1.37		
12378-pentachlorodibenzofuran	0.030	2.09	0.32	0.12	0.84		
23478-pentachlorodibenzofuran	0.300	<62.3	<9.1	3.52	<25.0		
123478-hexachlorodibenzofuran	0.100	69.5	9.09	4.35	27.7		
123678-hexachlorodibenzofuran	0.100	33.8	4.44	2.33	13.5		
234678-hexachlorodibenzofuran	0.100	45.9	5.25	1.98	17.7		
123789-hexachlorodibenzofuran	0.100	<2.70	<0.30	< 0.14	<1.05		
1234678-heptachlorodibenzofuran	0.010	8.57	1.31	0.46	3.45		
1234789-heptachlorodibenzofuran	0.010	1.45	0.24	0.059	0.58		
Octachlorodibenzofuran	0.0003	<0.12	<0.022	<0.0026	<0.048		
Total Dioxins & Furans Only		<485	<67.9	<27.5	<193		

# * At 25°C and 1 atmosphere

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

TABLE 33

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Emission Rates

Specific	Toxicity		Emissi		
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	ng TEQ/s	ng TEQ/s	ng TEQ/s	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.000	0.081	<0.019	<0.0078	<0.036
12378-pentachlorodibenzo-p-dioxin	1.000	1.34	0.19	0.087	0.54
123478-hexachlorodibenzo-p-dioxin	0.100	0.36	0.050	0.020	0.14
123678-hexachlorodibenzo-p-dioxin	0.100	1.05	0.15	0.061	0.42
123789-hexachlorodibenzo-p-dioxin	0.100	0.94	0.14	0.054	0.38
1234678-heptachlorodibenzo-p-dioxin	0.010	0.39	0.071	0.015	0.16
Octachlorodibenzo-p-dioxin	0.0003	0.0077	0.0017	0.00017	0.0032
2378-tetrachlorodibenzofuran	0.100	<0.051	<0.012	<0.0048	<0.022
12378-pentachlorodibenzofuran	0.030	0.034	0.0052	0.0020	0.014
23478-pentachlorodibenzofuran	0.300	<1.01	<0.15	0.060	< 0.41
123478-hexachlorodibenzofuran	0.100	1.13	0.15	0.075	0.45
123678-hexachlorodibenzofuran	0.100	0.55	0.074	0.040	0.22
234678-hexachlorodibenzofuran	0.100	0.75	0.087	0.034	0.29
123789-hexachlorodibenzofuran	0.100	< 0.044	<0.0050	<0.0024	< 0.017
1234678-heptachlorodibenzofuran	0.010	0.14	0.022	0.0079	0.056
1234789-heptachlorodibenzofuran	0.010	0.024	0.0040	0.0010	0.0095
Octachlorodibenzofuran	0.0003	<0.0019	<0.00037	<0.000045	<0.00078
Total Dioxins & Furans Only		<7.91	<1.13	<0.47	<3.17

TABLE 34

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using the Full Detection Limit

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm³*	pg TEQ/Rm3**	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	<1.53	<2.62	<1.95	<2.20	<0.036
12378-pentachlorodibenzo-p-dioxin	22.9	39.2	29.1	33.0	0.54
123478-hexachlorodibenzo-p-dioxin	6.10	10.5	7.76	8.79	0.14
123678-hexachlorodibenzo-p-dioxin	17.7	30.3	22.5	25.5	0.42
123789-hexachlorodibenzo-p-dioxin	15.9	27.3	20.3	23.0	0.38
1234678-heptachlorodibenzo-p-dioxin	6.77	11.6	8.60	9.75	0.16
Octachlorodibenzo-p-dioxin	0.13	0.23	0.17	0.19	0.0032
2378-tetrachlorodibenzofuran	<0.95	<1.63	<1.21	<1.37	<0.022
12378-pentachlorodibenzofuran	0.58	1.00	0.74	0.84	0.014
23478-pentachlorodibenzofuran	<17.3	<29.7	<22.0	<25.0	<0.41
123478-hexachlorodibenzofuran	19.2	32.9	24.4	27.7	0.45
123678-hexachlorodibenzofuran	9.40	16.1	11.9	13.5	0.22
234678-hexachlorodibenzofuran	12.3	21.1	15.6	17.7	0.29
123789-hexachlorodibenzofuran	< 0.73	<1.25	<0.92	<1.05	<0.017
1234678-heptachlorodibenzofuran	2.39	4.11	3.04	3.45	0.056
1234789-heptachlorodibenzofuran	0.40	0.69	0.51	0.58	0.0095
Octachlorodibenzofuran	<0.033	<0.057	<0.042	<0.048	<0.00078
Total Dioxins & Furans Only	<134	<230	<171	<193	<3.17

^{*} At 25°C and 1 atmosphere

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

TABLE 35

Covanta - Durham York Energy Centre

Boiler No. 1 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using Half the Detection Limit

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm ³ *	pg TEQ/Rm ^{3**}	pg TEQ/Rm ³ *	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	1.34	2.30	1.70	1.93	0.032
12378-pentachlorodibenzo-p-dioxin	22.9	39.2	29.1	33.0	0.54
123478-hexachlorodibenzo-p-dioxin	6.10	10.5	7.76	8.79	0.14
123678-hexachlorodibenzo-p-dioxin	17.7	30.3	22.5	25.5	0.42
123789-hexachlorodibenzo-p-dioxin	15.9	27.3	20.3	23.0	0.38
1234678-heptachlorodibenzo-p-dioxin	6.77	11.6	8.60	9.75	0.16
Octachlorodibenzo-p-dioxin	0.13	0.23	0.17	0.19	0.0032
  2378-tetrachlorodibenzofuran	0.47	0.81	0.60	0.68	0.011
12378-pentachlorodibenzofuran	0.58	1.00	0.74	0.84	0.014
23478-pentachlorodibenzofuran	9.07	15.6	11.5	13.1	0.21
123478-hexachlorodibenzofuran	19.2	32.9	24.4	27.7	0.45
123678-hexachlorodibenzofuran	9.40	16.1	11.9	13.5	0.22
234678-hexachlorodibenzofuran	12.3	21.1	15.6	17.7	0.29
123789-hexachlorodibenzofuran	0.68	1.16	0.86	0.97	0.016
1234678-heptachlorodibenzofuran	2.39	4.11	3.04	3.45	0.056
1234789-heptachlorodibenzofuran	0.40	0.69	0.51	0.58	0.0095
Octachlorodibenzofuran	0.017	0.028	0.021	0.024	0.00039
Total Dioxins & Furans Only	125	215	159	181	2.96

^{*} At 25°C and 1 atmosphere

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

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

TABLE 36

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Data

Test No. 1

Specific	AMESA	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Sample	Concentration	Concentration	Concentration	Concentration	Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	6.9	0.88	1.52	1.16	1.26	0.023
12378-pentachlorodibenzo-p-dioxin	13.7	1.75	3.01	2.30	2.51	0.023
123478-hexachlorodibenzo-p-dioxin	26.9	3.44	5.01 5.91	4.53	4.93	0.043
· ·				4.55 13.8	4.95 15.0	0.089
123678-hexachlorodibenzo-p-dioxin	81.8	10.5	18.0			
123789-hexachlorodibenzo-p-dioxin	75.6	9.66	16.6	12.7	13.8	0.25
1234678-heptachlorodibenzo-p-dioxin	464	59.3	102	78.1	85.0	1.53
Octachlorodibenzo-p-dioxin	403	51.5	88.6	67.8	73.8	1.33
2378-tetrachlorodibenzofuran	<18	<2.30	<3.96	<3.03	<3.30	<0.059
12378-pentachlorodibenzofuran	17.8	2.27	3.91	2.99	3.26	0.059
23478-pentachlorodibenzofuran	30.4	3.88	6.68	5.11	5.57	0.10
123478-hexachlorodibenzofuran	77.2	9.87	17.0	13.0	14.1	0.25
123678-hexachlorodibenzofuran	39.8	5.09	8.75	6.70	7.29	0.13
234678-hexachlorodibenzofuran	45.9	5.87	10.1	7.72	8.41	0.15
123789-hexachlorodibenzofuran	<3.2	< 0.41	<0.70	< 0.54	<0.59	< 0.011
1234678-heptachlorodibenzofuran	162	20.7	35.6	27.3	29.7	0.53
1234789-heptachlorodibenzofuran	21.3	2.72	4.68	3.58	3.90	0.070
Octachlorodibenzofuran	<68	<8.69	<14.9	<11.4	<12.5	<0.22
Total Dioxins & Furans Only	<1556	<199	<342	<262	<285	<5.13

Dry Gas Volume Sampled (Nm ³ ***):	4.168
Dry Gas Volume Sampled (Rm³*):	4.549
Actual Flowrate (m ³ /s):	25.8
Dry Reference Flowrate (Rm³/s*):	15.0
Dry Adjusted Flowrate (Rm³/s**):	19.6
Wet Reference Flowrate (Rm³/s*):	18.0

^{*} At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit), and the value of the detection limit was used to calculate the emission data.

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

^{***} At 0°C and 1 atmosphere

TABLE 37

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Data

Test No. 2

Specific	AMESA	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Sample	Concentration	Concentration	Concentration	Concentration	Rate
	pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	4.1	0.54	0.92	0.70	0.77	0.013
12378-pentachlorodibenzo-p-dioxin	8.0	1.06	1.80	1.37	1.51	0.026
123478-hexachlorodibenzo-p-dioxin	17.8	2.36	4.01	3.04	3.36	0.058
123678-hexachlorodibenzo-p-dioxin	48.8	6.48	11.0	8.34	9.21	0.16
123789-hexachlorodibenzo-p-dioxin	43.4	5.76	9.77	7.42	8.19	0.14
1234678-heptachlorodibenzo-p-dioxin	291	38.6	65.5	49.8	54.9	0.95
Octachlorodibenzo-p-dioxin	293	38.9	66.0	50.1	55.3	0.96
2378-tetrachlorodibenzofuran	7.2	0.96	1.62	1.23	1.36	0.024
12378-pentachlorodibenzofuran	13.0	1.73	2.93	2.22	2.45	0.042
23478-pentachlorodibenzofuran	18.8	2.50	4.23	3.21	3.55	0.061
123478-hexachlorodibenzofuran	44.2	5.87	9.95	7.56	8.34	0.14
123678-hexachlorodibenzofuran	<22	<2.92	<4.95	<3.76	<4.15	< 0.072
234678-hexachlorodibenzofuran	30.6	4.06	6.89	5.23	5.78	0.10
123789-hexachlorodibenzofuran	2.9	0.38	0.65	0.50	0.55	0.0095
1234678-heptachlorodibenzofuran	88.1	11.7	19.8	15.1	16.6	0.29
1234789-heptachlorodibenzofuran	14.5	1.92	3.27	2.48	2.74	0.047
Octachlorodibenzofuran	<45	<5.97	<10.1	<7.69	<8.49	<0.15
Total Dioxins & Furans Only	<992	<132	<223	<170	<187	<3.24

Dry Gas Volume Sampled (Nm³***):	4.068
Dry Gas Volume Sampled (Rm ³ *):	4.440
Actual Flowrate (m ³ /s):	24.6
Dry Reference Flowrate (Rm³/s*):	14.5
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*):	17.3

^{*} At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit), and the value of the detection limit was used to calculate the emission data.

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

^{***} At 0°C and 1 atmosphere

TABLE 38

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Data

Test No. 3

Specific Isomer	AMESA	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
isomei	Sample pg	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	5.0	0.66	1.10	0.85	0.92	0.016
12378-pentachlorodibenzo-p-dioxin	9.0	1.18	1.98	1.53	1.66	0.029
123478-hexachlorodibenzo-p-dioxin	19.2	2.52	4.22	3.27	3.55	0.062
123678-hexachlorodibenzo-p-dioxin	59.3	7.78	13.0	10.1	11.0	0.19
123789-hexachlorodibenzo-p-dioxin	52.4	6.87	11.5	8.92	9.68	0.17
1234678-heptachlorodibenzo-p-dioxin	373	48.9	82.0	63.5	68.9	1.21
Octachlorodibenzo-p-dioxin	394	51.7	86.6	67.1	72.8	1.28
2378-tetrachlorodibenzofuran	<11	<1.44	<2.42	<1.87	<2.03	<0.036
12378-pentachlorodibenzofuran	13.6	1.78	2.99	2.32	2.51	0.044
23478-pentachlorodibenzofuran	21.1	2.77	4.64	3.59	3.90	0.069
123478-hexachlorodibenzofuran	53.8	7.06	11.8	9.16	9.94	0.17
123678-hexachlorodibenzofuran	<26	<3.41	<5.71	<4.43	<4.80	<0.085
234678-hexachlorodibenzofuran	36.4	4.77	8.00	6.20	6.73	0.12
123789-hexachlorodibenzofuran	<3.2	< 0.42	<0.70	<0.54	<0.59	< 0.010
1234678-heptachlorodibenzofuran	122	16.0	26.8	20.8	22.5	0.40
1234789-heptachlorodibenzofuran	18.6	2.44	4.09	3.17	3.44	0.060
Octachlorodibenzofuran	<65	<8.52	<14.3	<11.1	<12.0	<0.21
Total Dioxins & Furans Only	<1283	<168	<282	<218	<237	<4.17

Dry Gas Volume Sampled (Nm³***) :	4.169
Dry Gas Volume Sampled (Rm³*) :	4.551
Actual Flowrate (m³/s) :	24.8
Dry Reference Flowrate (Rm³/s*) :	14.8
Dry Adjusted Flowrate (Rm³/s**):	19.1
Wet Reference Flowrate (Rm³/s*) :	17.6

^{*} At 25°C and 1 atmosphere

Note: "<" indicates that the analyte was not detected (was less than the analytical detection limit),

and the value of the detection limit was used to calculate the emission data.

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

^{***} At 0°C and 1 atmosphere

TABLE 39

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Actual Concentrations

Specific	and the second s	ecarstansesteraturostation estaturatura estatura estatura estatura estatura estatura estatura estatura estatur	Coefficient		
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	pg/m³	pg/m³	pg/m³	pg/m³	%
2378-tetrachlorodibenzo-p-dioxin	0.88	0.54	0.66	0.69	24.8
12378-pentachlorodibenzo-p-dioxin	1.75	1.06	1.18	1.33	27.7
123478-hexachlorodibenzo-p-dioxin	3.44	2.36	2.52	2.77	21.0
123678-hexachlorodibenzo-p-dioxin	10.5	6.48	7.78	8.24	24.6
123789-hexachlorodibenzo-p-dioxin	9.66	5.76	6.87	7.43	27.0
1234678-heptachlorodibenzo-p-dioxin	59.3	38.6	48.9	48.9	21.1
Octachlorodibenzo-p-dioxin	51.5	38.9	51.7	47.4	15.5
2378-tetrachlorodibenzofuran	<2.30	0.96	<1.44	<1.57	43.5
12378-pentachlorodibenzofuran	2.27	1.73	1.78	1.93	15.6
23478-pentachlorodibenzofuran	3.88	2.50	2.77	3.05	24.1
123478-hexachlorodibenzofuran	9.87	5.87	7.06	7.60	27.0
123678-hexachlorodibenzofuran	5.09	<2.92	<3.41	<3.81	29.8
234678-hexachlorodibenzofuran	5.87	4.06	4.77	4.90	18.5
123789-hexachlorodibenzofuran	< 0.41	0.38	< 0.42	< 0.40	4.4
1234678-heptachlorodibenzofuran	20.7	11.7	16.0	16.1	27.9
1234789-heptachlorodibenzofuran	2.72	1.92	2.44	2.36	17.1
Octachlorodibenzofuran	<8.69	<5.97	<8.52	<7.73	19.7
Total Dioxins & Furans Only	<199	<132	<168	<166	20.2

TABLE 40

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Reference Concentrations

Specific	C	Dry Reference Concentration					
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation		
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%		
2378-tetrachlorodibenzo-p-dioxin	1.52	0.92	1.10	1.18	25.8		
12378-pentachlorodibenzo-p-dioxin	3.01	1.80	1.98	2.26	28.9		
123478-hexachlorodibenzo-p-dioxin	5.91	4.01	4.22	4.71	22.1		
123678-hexachlorodibenzo-p-dioxin	18.0	11.0	13.0	14.0	25.7		
123789-hexachlorodibenzo-p-dioxin	16.6	9.77	11.5	12.6	28.1		
1234678-heptachlorodibenzo-p-dioxin	102	65.5	82.0	83.2	22.0		
Octachlorodibenzo-p-dioxin	88.6	66.0	86.6	80.4	15.6		
2378-tetrachlorodibenzofuran	<3.96	1.62	<2.42	<2.67	44.5		
12378-pentachlorodibenzofuran	3.91	2.93	2.99	3.28	16.8		
23478-pentachlorodibenzofuran	6.68	4.23	4.64	5.18	25.3		
123478-hexachlorodibenzofuran	17.0	9.95	11.8	12.9	28.1		
123678-hexachlorodibenzofuran	8.75	<4.95	<5.71	<6.47	31.0		
234678-hexachlorodibenzofuran	10.1	6.89	8.00	8.33	19.5		
123789-hexachlorodibenzofuran	< 0.70	0.65	<0.70	< 0.69	4.2		
1234678-heptachlorodibenzofuran	35.6	19.8	26.8	27.4	28.8		
1234789-heptachlorodibenzofuran	4.68	3.27	4.09	4.01	17.7		
Octachlorodibenzofuran	<14.9	<10.1	<14.3	<13.1	19.9		
Total Dioxins & Furans Only	<342	<223	<282	<282	21.0		

# * At 25°C and 1 atmosphere

TABLE 41

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Dry Adjusted Concentrations

Specific	•	Coefficient			
Isomer	Test No. 1	t No. 1 Test No. 2 Test No. 3		Average	of Variation
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%
2378-tetrachlorodibenzo-p-dioxin	1.16	0.70	0.85	0.90	25.9
12378-pentachlorodibenzo-p-dioxin	2.30	1.37	1.53	1.73	28.8
123478-hexachlorodibenzo-p-dioxin	4.53	3.04	3.27	3.61	22.1
123678-hexachlorodibenzo-p-dioxin	13.8	8.34	10.1	10.7	25.7
123789-hexachlorodibenzo-p-dioxin	12.7	7.42	8.92	9.69	28.2
1234678-heptachlorodibenzo-p-dioxin	78.1	49.8	63.5	63.8	22.2
Octachlorodibenzo-p-dioxin	67.8	50.1	67.1	61.7	16.3
   2378-tetrachlorodibenzofuran	<3.03	1.23	<1.87	<2.04	44.5
12378-pentachlorodibenzofuran	2.99	2.22	2.32	2.51	16.8
23478-pentachlorodibenzofuran	5.11	3.21	3.59	3.97	25.3
123478-hexachlorodibenzofuran	13.0	7.56	9.16	9.90	28.2
123678-hexachlorodibenzofuran	6.70	<3.76	<4.43	<4.96	31.0
234678-hexachlorodibenzofuran	7.72	5.23	6.20	6.38	19.7
123789-hexachlorodibenzofuran	< 0.54	0.50	< 0.54	< 0.53	5.1
1234678-heptachlorodibenzofuran	27.3	15.1	20.8	21.0	29.0
1234789-heptachlorodibenzofuran	3.58	2.48	3.17	3.08	18.1
Octachlorodibenzofuran	<11.4	<7.69	<11.1	<10.1	20.5
Total Dioxins & Furans Only	<262	<170	<218	<217	21.3

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

TABLE 42

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Wet Reference Concentrations

Specific	N	Wet Reference Concentration				
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation	
	pg/Rm³*	pg/Rm³*	pg/Rm³*	pg/Rm³*	%	
2378-tetrachlorodibenzo-p-dioxin	1.26	0.77	0.92	0.99	25.4	
12378-pentachlorodibenzo-p-dioxin	2.51	1.51	1.66	1.89	28.4	
123478-hexachlorodibenzo-p-dioxin	4.93	3.36	3.55	3.95	21.7	
123678-hexachlorodibenzo-p-dioxin	15.0	9.21	11.0	11.7	25.3	
123789-hexachlorodibenzo-p-dioxin	13.8	8.19	9.68	10.6	27.7	
1234678-heptachlorodibenzo-p-dioxin	85.0	54.9	68.9	69.6	21.6	
Octachlorodibenzo-p-dioxin	73.8	55.3	72.8	67.3	15.5	
2378-tetrachlorodibenzofuran	<3.30	1.36	<2.03	<2.23	44.1	
12378-pentachlorodibenzofuran	3.26	2.45	2.51	2.74	16.4	
23478-pentachlorodibenzofuran	5.57	3.55	3.90	4.34	24.9	
123478-hexachlorodibenzofuran	14.1	8.34	9.94	10.8	27.7	
123678-hexachlorodibenzofuran	7.29	<4.15	<4.80	<5.42	30.6	
234678-hexachlorodibenzofuran	8.41	5.78	6.73	6.97	19.1	
123789-hexachlorodibenzofuran	<0.59	0.55	< 0.59	<0.57	4.2	
1234678-heptachlorodibenzofuran	29.7	16.6	22.5	22.9	28.5	
1234789-heptachlorodibenzofuran	3.90	2.74	3.44	3.36	<b>17</b> .5	
Octachlorodibenzofuran	<12.5	<8.49	<12.0	<11.0	19.8	
Total Dioxins & Furans Only	<285	<187	<237	<236	20.6	

# * At 25°C and 1 atmosphere

TABLE 43

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Specific Isomer Emission Rates

Specific	ic Emissi				Coefficient
Isomer	Test No. 1	Test No. 2	Test No. 3	Average	of Variation
	ng/s	ng/s	ng/s	ng/s	%
2378-tetrachlorodibenzo-p-dioxin	0.023	0.013	0.016	0.017	27.5
12378-pentachlorodibenzo-p-dioxin	0.045	0.026	0.029	0.034	30.5
123478-hexachlorodibenzo-p-dioxin	0.089	0.058	0.062	0.070	23.7
123678-hexachlorodibenzo-p-dioxin	0.27	0.16	0.19	0.21	27.3
123789-hexachlorodibenzo-p-dioxin	0.25	0.14	0.17	0.19	29.8
1234678-heptachlorodibenzo-p-dioxin	1.53	0.95	1.21	1.23	23.6
Octachlorodibenzo-p-dioxin	1.33	0.96	1.28	1.19	17.0
2378-tetrachlorodibenzofuran	< 0.059	0.024	<0.036	<0.040	46.1
12378-pentachlorodibenzofuran	0.059	0.042	0.044	0.048	18.4
23478-pentachlorodibenzofuran	0.10	0.061	0.069	0.077	26.9
123478-hexachlorodibenzofuran	0.25	0.14	0.17	0.19	29.7
123678-hexachlorodibenzofuran	0.13	<0.072	<0.085	<0.096	32.6
234678-hexachlorodibenzofuran	0.15	0.10	0.12	0.12	21.1
123789-hexachlorodibenzofuran	< 0.011	0.0095	< 0.010	<0.010	5.8
1234678-heptachlorodibenzofuran	0.53	0.29	0.40	0.41	30.4
1234789-heptachlorodibenzofuran	0.070	0.047	0.060	0.059	19.3
Octachlorodibenzofuran	<0.22	<0.15	<0.21	<0.19	21.3
Total Dioxins & Furans Only	<5.13	<3.24	<4.17	<4.18	22.6

TABLE 44

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Specific Isomer Emission Data

Specific Isomer	Actual Concentration	Dry Reference Concentration	Dry Adjusted Concentration	Wet Reference Concentration	Emission Rate
1301116.	pg/m³	pg/Rm³*	pg/Rm³**	pg/Rm³*	ng/s
2378-tetrachlorodibenzo-p-dioxin	0.6 <del>9</del>	1.18	0.90	0.99	0.017
12378-pentachlorodibenzo-p-dioxin	1.33	2.26	1.73	1.89	0.034
123478-hexachlorodibenzo-p-dioxin	2.77	4.71	3.61	3.95	0.070
123678-hexachlorodibenzo-p-dioxin	8.24	14.0	10.7	11.7	0.21
123789-hexachlorodibenzo-p-dioxin	7.43	12.6	9.69	10.6	0.19
1234678-heptachlorodibenzo-p-dioxin	48.9	83.2	63.8	69.6	1.23
Octachlorodibenzo-p-dioxin	47.4	80.4	61.7	67.3	1.19
  2378-tetrachlorodibenzofuran	<1.57	<2.67	<2.04	<2.23	<0.040
12378-pentachlorodibenzofuran	1.93	3.28	2.51	2.74	0.048
23478-pentachlorodibenzofuran	3.05	5.18	3.97	4.34	0.077
123478-hexachlorodibenzofuran	7.60	12.9	9.90	10.8	0.19
123678-hexachlorodibenzofuran	<3.81	<6.47	<4.96	<5.42	<0.096
234678-hexachlorodibenzofuran	4.90	8.33	6.38	6.97	0.12
123789-hexachlorodibenzofuran	< 0.40	< 0.69	<0.53	<0.57	<0.010
1234678-heptachlorodibenzofuran	16.1	27.4	21.0	22.9	0.41
1234789-heptachlorodibenzofuran	2.36	4.01	3.08	3.36	0.059
Octachlorodibenzofuran	<7.73	<13.1	<10.1	<11.0	<0.19
Total Dioxins & Furans Only	<166	<282	<217	<236	<4.18

^{*} At 25°C and 1 atmosphere

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

TABLE 45

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Actual Concentrations

Specific	Toxicity		Actual Con	centration	
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/m ³	pg TEQ/m³	pg TEQ/m³	pg TEQ/m³
2378-tetrachlorodibenzo-p-dioxin	1.000	0.88	0.54	0.66	0.69
12378-pentachlorodibenzo-p-dioxin	1.000	1.75	1.06	1.18	1.33
123478-hexachlorodibenzo-p-dioxin	0.100	0.34	0.24	0.25	0.28
123678-hexachlorodibenzo-p-dioxin	0.100	1.05	0.65	0.78	0.82
123789-hexachlorodibenzo-p-dioxin	0.100	0.97	0.58	0.69	0.74
1234678-heptachlorodibenzo-p-dioxin	0.010	0.59	0.39	0.49	0.49
Octachlorodibenzo-p-dioxin	0.0003	0.015	0.012	0.016	0.014
2378-tetrachlorodibenzofuran	0.100	<0.23	0.096	<0.14	<0.16
12378-pentachlorodibenzofuran	0.030	0.068	0.052	0.054	0.058
23478-pentachlorodibenzofuran	0.300	1.17	0.75	0.83	0.91
123478-hexachlorodibenzofuran	0.100	0.99	0.59	0.71	0.76
123678-hexachlorodibenzofuran	0.100	0.51	<0.29	< 0.34	<0.38
234678-hexachlorodibenzofuran	0.100	0.59	0.41	0.48	0.49
123789-hexachlorodibenzofuran	0.100	< 0.041	0.038	<0.042	< 0.040
1234678-heptachlorodibenzofuran	0.010	0.21	0.12	0.16	0.16
1234789-heptachlorodibenzofuran	0.010	0.027	0.019	0.024	0.024
Octachlorodibenzofuran	0.0003	<0.0026	<0.0018	<0.0026	<0.0023
Total Dioxins & Furans Only		<9.42	<5.82	<6.84	<7.36

TABLE 46

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Reference Concentrations

Specific	Toxicity	city Dry Reference Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	
2378-tetrachlorodibenzo-p-dioxin	1.000	1.52	0.92	1.10	1.18	
12378-pentachlorodibenzo-p-dioxin	1.000	3.01	1.80	1.98	2.26	
123478-hexachlorodibenzo-p-dioxin	0.100	0.59	0.40	0.42	0.47	
123678-hexachlorodibenzo-p-dioxin	0.100	1.80	1.10	1.30	1.40	
123789-hexachlorodibenzo-p-dioxin	0.100	1.66	0.98	1.15	1.26	
1234678-heptachlorodibenzo-p-dioxin	0.010	1.02	0.66	0.82	0.83	
Octachlorodibenzo-p-dioxin	0.0003	0.027	0.020	0.026	0.024	
2378-tetrachlorodibenzofuran	0.100	<0.40	0.16	<0.24	<0.27	
12378-pentachlorodibenzofuran	0.030	0.12	0.088	0.090	0.098	
23478-pentachlorodibenzofuran	0.300	2.00	1.27	1.39	1.56	
123478-hexachlorodibenzofuran	0.100	1.70	1.00	1.18	1.29	
123678-hexachlorodibenzofuran	0.100	0.87	<0.50	<0.57	< 0.65	
234678-hexachlorodibenzofuran	0.100	1.01	0.69	0.80	0.83	
123789-hexachlorodibenzofuran	0.100	<0.070	0.065	<0.070	< 0.069	
1234678-heptachlorodibenzofuran	0.010	0.36	0.20	0.27	0.27	
1234789-heptachlorodibenzofuran	0.010	0.047	0.033	0.041	0.040	
Octachlorodibenzofuran	0.0003	<0.0045	<0.0030	<0.0043	<0.0039	
Total Dioxins & Furans Only		<16.2	<9.88	<11.5	<12.5	

# * At 25°C and 1 atmosphere

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

TABLE 47

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Specific Toxicity Dry Adjusted Concentration					
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *
			0.70	0.05	0.00
2378-tetrachlorodibenzo-p-dioxin	1.000	1.16	0.70	0.85	0.90
12378-pentachlorodibenzo-p-dioxin	1.000	2.30	1.37	1.53	1.73
123478-hexachlorodibenzo-p-dioxin	0.100	0.45	0.30	0.33	0.36
123678-hexachlorodibenzo-p-dioxin	0.100	1.38	0.83	1.01	1.07
123789-hexachlorodibenzo-p-dioxin	0.100	1.27	0.74	0.89	0.97
1234678-heptachlorodibenzo-p-dioxin	0.010	0.78	0.50	0.64	0.64
Octachlorodibenzo-p-dioxin	0.0003	0.020	0.015	0.020	0.018
2378-tetrachlorodibenzofuran	0.100	<0.30	0.12	<0.19	<0.20
12378-pentachlorodibenzofuran	0.030	0.090	0.067	0.069	0.075
23478-pentachlorodibenzofuran	0.300	1.53	0.96	1.08	1.19
123478-hexachlorodibenzofuran	0.100	1.30	0.76	0.92	0.99
123678-hexachlorodibenzofuran	0.100	0.67	<0.38	< 0.44	<0.50
234678-hexachlorodibenzofuran	0.100	0.77	0.52	0.62	0.64
123789-hexachlorodibenzofuran	0.100	<0.054	0.050	< 0.054	< 0.053
1234678-heptachlorodibenzofuran	0.010	0.27	0.15	0.21	0.21
1234789-heptachlorodibenzofuran	0.010	0.036	0.025	0.032	0.031
Octachlorodibenzofuran	0.0003	<0.0034	<0.0023	<0.0033	<0.0030
Total Dioxins & Furans Only		<12.4	<7.50	<8.88	<9.59

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

TABLE 47A

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using Half the Detection Limit

Specific	Toxicity	Dry Adjusted Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm ³ *	
2378-tetrachlorodibenzo-p-dioxin	1.000	1.16	0.70	0.85	0.90	
12378-pentachlorodibenzo-p-dioxin	1.000	2.30	1.37	1.53	1.73	
123478-hexachlorodibenzo-p-dioxin	0.100	0.45	0.30	0.33	0.36	
123678-hexachlorodibenzo-p-dioxin	0.100	1.38	0.83	1.01	1.07	
123789-hexachlorodibenzo-p-dioxin	0.100	1.27	0.74	0.89	0.97	
1234678-heptachlorodibenzo-p-dioxin	0.010	0.78	0.50	0.64	0.64	
Octachlorodibenzo-p-dioxin	0.0003	0.020	0.015	0.020	0.018	
2378-tetrachlorodibenzofuran	0.100	0.15	0.12	0.094	0.12	
12378-pentachlorodibenzofuran	0.030	0.090	0.067	0.069	0.075	
23478-pentachlorodibenzofuran	0.300	1.53	0.96	1.08	1.19	
123478-hexachlorodibenzofuran	0.100	1.30	0.76	0.92	0.99	
123678-hexachlorodibenzofuran	0.100	0.67	0.19	0.22	0.36	
234678-hexachlorodibenzofuran	0.100	0.77	0.52	0.62	0.64	
123789-hexachlorodibenzofuran	0.100	0.027	0.050	0.027	0.035	
1234678-heptachlorodibenzofuran	0.010	0.27	0.15	0.21	0.21	
1234789-heptachlorodibenzofuran	0.010	0.036	0.025	0.032	0.031	
Octachlorodibenzofuran	0.0003	0.0017	0.0012	0.0017	0.0015	
Total Dioxins & Furans Only		12.2	7.31	8.53	9.35	

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

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

TABLE 47B

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Dry Adjusted Concentrations

Calculated Using the Full Detection Limit

Specific	Toxicity Dry Adjusted Concentration				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *	pg TEQ/Rm³*
2378-tetrachlorodibenzo-p-dioxin	1.000	1.16	0.70	0.85	0.90
12378-pentachlorodibenzo-p-dioxin	0.500	1.15	0.68	0.77	0.87
123478-hexachlorodibenzo-p-dioxin	0.100	0.45	0.30	0.33	0.36
123678-hexachlorodibenzo-p-dioxin	0.100	1.38	0.83	1.01	1.07
123789-hexachlorodibenzo-p-dioxin	0.100	1.27	0.74	0.89	0.97
1234678-heptachlorodibenzo-p-dioxin	0.010	0.78	0.50	0.64	0.64
Octachlorodibenzo-p-dioxin	0.001	0.068	0.050	0.067	0.062
2378-tetrachlorodibenzofuran	0.100	<0.30	0.12	<0.19	<0.20
12378-pentachlorodibenzofuran	0.050	0.15	0.11	0.12	0.13
23478-pentachlorodibenzofuran	0.500	2.56	1.61	1.80	1.99
123478-hexachlorodibenzofuran	0.100	1.30	0.76	0.92	0.99
123678-hexachlorodibenzofuran	0.100	0.67	<0.38	<0.44	< 0.50
234678-hexachlorodibenzofuran	0.100	0.77	0.52	0.62	0.64
123789-hexachlorodibenzofuran	0.100	< 0.054	0.050	< 0.054	< 0.053
1234678-heptachlorodibenzofuran	0.010	0.27	0.15	0.21	0.21
1234789-heptachlorodibenzofuran	0.010	0.036	0.025	0.032	0.031
Octachlorodibenzofuran	0.001	<0.011	<0.0077	<0.011	<0.010
Total Dioxins & Furans		<12.4	<7.54	<8.93	<9.62
In-Stack Emission Limit					60

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

NATO/CCMS (1989) Toxicity Equivalency Factors

TABLE 48

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Wet Reference Concentrations

Specific	Toxicity		Wet Reference	Concentration	
lsomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average
	Factor	pg TEQ/Rm ³ *	pg TEQ/Rm³*	pg TEQ/Rm³*	pg TEQ/Rm ³ *
2378-tetrachlorodibenzo-p-dioxin	1.000	1.26	0.77	0.92	0.99
12378-pentachlorodibenzo-p-dioxin	1.000	2.51	1.51	1.66	1.89
123478-hexachlorodibenzo-p-dioxin	0.100	0.49	0.34	0.35	0.39
123678-hexachlorodibenzo-p-dioxin	0.100	1.50	0.92	1.10	1.17
123789-hexachlorodibenzo-p-dioxin	0.100	1.38	0.82	0.97	1.06
1234678-heptachlorodibenzo-p-dioxin	0.010	0.85	0.55	0.69	0.70
Octachlorodibenzo-p-dioxin	0.0003	0.022	0.017	0.022	0.020
   2378-tetrachlorodibenzofuran	0.100	<0.33	0.14	<0.20	<0.22
12378-pentachlorodibenzofuran	0.030	0.098	0.074	0.075	0.082
23478-pentachlorodibenzofuran	0.300	1.67	1.06	1.17	1.30
123478-hexachlorodibenzofuran	0.100	1.41	0.83	0.99	1.08
123678-hexachlorodibenzofuran	0.100	0.73	<0.42	<0.48	<0.54
234678-hexachlorodibenzofuran	0.100	0.84	0.58	0.67	0.70
123789-hexachlorodibenzofuran	0.100	< 0.059	0.055	< 0.059	<0.057
1234678-heptachlorodibenzofuran	0.010	0.30	0.17	0.23	0.23
1234789-heptachlorodibenzofuran	0.010	0.039	0.027	0.034	0.034
Octachlorodibenzofuran	0.0003	<0.0037	<0.0025	<0.0036	<0.0033
Total Dioxins & Furans Only		<13.5	<8.28	<9.64	<10.5

# * At 25°C and 1 atmosphere

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

TABLE 49

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Dioxin and Furan Toxicity Equivalent Emission Rates

Specific	Toxicity	y Emission Rate				
Isomer	Equivalency	Test No. 1	Test No. 2	Test No. 3	Average	
	Factor	ng TEQ/s	ng TEQ/s	ng TEQ/s	ng TEQ/s	
2378-tetrachlorodibenzo-p-dioxin	1.000	0.023	0.013	0.016	0.017	
12378-pentachlorodibenzo-p-dioxin	1.000	0.045	0.026	0.029	0.034	
123478-hexachlorodibenzo-p-dioxin	0.100	0.0089	0.0058	0.0062	0.0070	
123678-hexachlorodibenzo-p-dioxin	0.100	0.027	0.016	0.019	0.021	
123789-hexachlorodibenzo-p-dioxin	0.100	0.025	0.014	0.017	0.019	
1234678-heptachlorodibenzo-p-dioxin	0.010	0.015	0.0095	0.012	0.012	
Octachlorodibenzo-p-dioxin	0.0003	0.00040	0.00029	0.00038	0.00036	
2378-tetrachlorodibenzofuran	0.100	<0.0059	0.0024	<0.0036	<0.0040	
12378-pentachlorodibenzofuran	0.030	0.0018	0.0013	0.0013	0.0015	
23478-pentachlorodibenzofuran	0.300	0.030	0.018	0.021	0.023	
123478-hexachlorodibenzofuran	0.100	0.025	0.014	0.017	0.019	
123678-hexachlorodibenzofuran	0.100	0.013	<0.0072	<0.0085	<0.0096	
234678-hexachlorodibenzofuran	0.100	0.015	0.010	0.012	0.012	
123789-hexachlorodibenzofuran	0.100	< 0.0011	0.00095	< 0.0010	<0.0010	
1234678-heptachlorodibenzofuran	0.010	0.0053	0.0029	0.0040	0.0041	
1234789-heptachlorodibenzofuran	0.010	0.00070	0.00047	0.00060	0.00059	
Octachlorodibenzofuran	0.0003	<0.000067	<0.000044	<0.000063	<0.000058	
Total Dioxins & Furans Only		<0.24	<0.14	<0.17	<0.19	

TABLE 50

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

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/Rm ³ *	pg TEQ/Rm ³ **	pg TEQ/Rm³*	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.69	1.18	0.90	0.99	0.017
12378-pentachlorodibenzo-p-dioxin	1.33	2.26	1.73	1.89	0.034
123478-hexachlorodibenzo-p-dioxin	0.28	0.47	0.36	0.39	0.0070
123678-hexachlorodibenzo-p-dioxin	0.82	1.40	1.07	1.17	0.021
123789-hexachlorodibenzo-p-dioxin	0.74	1.26	0.97	1.06	0.019
1234678-heptachlorodibenzo-p-dioxin	0.49	0.83	0.64	0.70	0.012
Octachlorodibenzo-p-dioxin	0.014	0.024	0.018	0.020	0.00036
2378-tetrachlorodibenzofuran	<0.16	<0.27	<0.20	<0.22	<0.0040
12378-pentachlorodibenzofuran	0.058	0.098	0.075	0.082	0.0015
23478-pentachlorodibenzofuran	0.91	1.56	1.19	1.30	0.023
123478-hexachlorodibenzofuran	0.76	1.29	0.99	1.08	0.019
123678-hexachlorodibenzofuran	<0.38	< 0.65	<0.50	<0.54	<0.0096
234678-hexachlorodibenzofuran	0.49	0.83	0.64	0.70	0.012
123789-hexachlorodibenzofuran	< 0.040	< 0.069	<0.053	< 0.057	<0.0010
1234678-heptachlorodibenzofuran	0.16	0.27	0.21	0.23	0.0041
1234789-heptachlorodibenzofuran	0.024	0.040	0.031	0.034	0.00059
Octachlorodibenzofuran	<0.0023	<0.0039	<0.0030	<0.0033	<0.000058
Total Dioxins & Furans Only	<7.36	<12.5	<9.59	<10.5	<0.19

^{*} At 25°C and 1 atmosphere

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

TABLE 51

Covanta - Durham York Energy Centre

Boiler No. 2 BH Outlet - AMESA Monitor

Summary of Dioxin and Furan Toxicity Equivalent Emission Data

Calculated Using Half the Detection Limit

Specific	Actual	Dry Reference	Dry Adjusted	Wet Reference	Emission
Isomer	Concentration	Concentration	Concentration	Concentration	Rate
	pg TEQ/m³	pg TEQ/Rm ³ *	pg TEQ/Rm ^{3**}	pg TEQ/Rm ³ *	ng TEQ/s
2378-tetrachlorodibenzo-p-dioxin	0.69	1.18	0.90	0.99	0.017
12378-pentachlorodibenzo-p-dioxin	1.33	2.26	1.73	1.89	0.034
123478-hexachlorodibenzo-p-dioxin	0.28	0.47	0.36	0.39	0.0070
123678-hexachlorodibenzo-p-dioxin	0.82	1.40	1.07	1.17	0.021
123789-hexachlorodibenzo-p-dioxin	0.74	1.26	0.97	1.06	0.019
1234678-heptachlorodibenzo-p-dioxin	0.49	0.83	0.64	0.70	0.012
Octachlorodibenzo-p-dioxin	0.014	0.024	0.018	0.020	0.00036
2378-tetrachlorodibenzofuran	0.094	0.16	0.12	0.13	0.0024
12378-pentachlorodibenzofuran	0.058	0.098	0.075	0.082	0.0015
23478-pentachlorodibenzofuran	0.91	1.56	1.19	1.30	0.023
123478-hexachlorodibenzofuran	0.76	1.29	0.99	1.08	0.019
123678-hexachlorodibenzofuran	0.28	0.47	0.36	0.39	0.0070
234678-hexachlorodibenzofuran	0.49	0.83	0.64	0.70	0.012
123789-hexachlorodibenzofuran	0.027	0.045	0.035	0.038	0.00066
1234678-heptachlorodibenzofuran	0.16	0.27	0.21	0.23	0.0041
1234789-heptachlorodibenzofuran	0.024	0.040	0.031	0.034	0.00059
Octachlorodibenzofuran	0.0012	0.0020	0.0015	0.0016	0.000029
Total Dioxins & Furans Only	7.18	12.2	9.35	10.2	0.18

^{*} At 25°C and 1 atmosphere

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

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



AMESA Analytical Report (38 pages)



Your P.O. #: 21656-J2227 Your Project #: 21656 Site Location: COVANTA

#### Attention:Chris Belore

ORTECH Environmental 804 Southdown Road Mississauga, ON L5J 2Y4

Report Date: 2016/06/03

Report #: R4014596 Version: 2 - Final

# **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: 8696222 Received: 2016/05/12, 12:30

Sample Matrix: Stack Sampling Train

# Samples Received: 14

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
2,3,7,8-TCDF Confirmation (M23)	13	N/A	2016/06/02	BRL SOP-00404	EPA M23/23A m
Dioxins/Furans in Air (Method 23)	14	2016/05/17	2016/05/28	BRL SOP-00404	EPA M23/23A m

 $Reference\ Method\ suffix\ "m"\ indicates\ test\ methods\ incorporate\ validated\ modifications\ from\ specific\ reference\ methods\ to\ improve\ performance.$ 

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: Clohnson@maxxam.ca Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

^{*} RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ898							
Sampling Date		2016/05/03				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR- PRETEST-U1- 160503	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<4.2	4.2	20	4.0	1.00	4.20	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	94.3	3.3	20	4.0	1.00	94.3	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	934	4.8	20	4.0	0.100	93.4	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	3290	4.9	20	4.0	0.100	329	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	3200 (1)	4.3	20	4.0	0.100	320	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	74900 (2)	40	200	6.0	0.0100	749	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	172000 (2)	24	2000	6.0	0.000300	51.6	N/A	4510009
Total Tetra CDD *	pg	76.9	4.2	20	N/A	N/A	N/A	6	4510009
Total Penta CDD *	pg	3110	3.3	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	38400	4.7	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	154000 (2)	40	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	68.3	3.1	20	4.0	0.0300	2.05	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	223	3.1	20	4.0	0.300	66.9	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	2860 (1)	2.2	20	4.0	0.100	286	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	1710	2.0	20	4.0	0.100	171	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	2750	2.2	20	4.0	0.100	275	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<160 (3)	160	20	4.0	0.100	16.0	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	21300 (2)	32	200	6.0	0.0100	213	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	4420 (2)	39	200	4.0	0.0100	44.2	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<31000 (3)	31000	200	10	0.000300	9.30	N/A	4510009
Total Tetra CDF **	pg	115	4.2	20	N/A	N/A	N/A	8	4510009
Total Penta CDF **	pg	1760	3.1	20	N/A	N/A	N/A	13	4510009
Total Hexa CDF **	pg	13800	2.2	20	N/A	N/A	N/A	12	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) ** From 10X Dilution **

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ898							
Sampling Date		2016/05/03				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR- PRETEST-U1- 160503	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	38000 (1)	35	200	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<27 (2)	27	20	N/A	0.100	2.70	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	2730	N/A	N/A
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	126 (1)	N/A	N/A	N/A	N/A	N/A	N/A	451 <b>0</b> 009
C13-1234678 HeptaCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	121	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	116	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	127 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".

Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference..



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ899							
Sampling Date		2016/05/03				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR- PRETEST-U2- 160503	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	51.5	4.8	20	4.0	1.00	51.5	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	1060	4.6	20	4.0	1.00	1060	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	5210 (1)	17	200	4.0	0.100	521	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	15300 (1)	17	200	4.0	0.100	1530	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	15600 (2)	16	200	4.0	0.100	1560	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	142000 (1)	37	200	6.0	0.0100	1420	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	153000 (1)	40	2000	6.0	0.000300	45.9	N/A	4510009
Total Tetra CDD *	pg	1390	4.8	20	N/A	N/A	N/A	12	4510009
Total Penta CDD *	pg	24500	4.6	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	189000 (1)	17	200	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	292000 (1)	37	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	653	3.2	20	4.0	0.0300	19.6	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	<2200 (3)	2200	20	4.0	0.300	660	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	10000 (4)	19	200	4.0	0.100	1000	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	5240 (1)	18	200	4.0	0.100	524	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	11800 (1)	19	200	4.0	0.100	1180	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	811 (1)	21	200	4.0	0.100	81.1	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	36100 (1)	30	200	6.0	0.0100	361	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	8000 (1)	37	200	4.0	0.0100	80.0	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<28000 (3)	28000	200	10	0.000300	8.40	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

(2) ** From 10X Dilution **

#### EMPC / Merged Peak

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(4)

** From 10X Dilution **

EMPC / Merged Peak



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ899							
Sampling Date		2016/05/03				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR- PRETEST-U2- 160503	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Tetra CDF **	pg	1990	6.2	20	N/A	N/A	N/A	15	4510009
Total Penta CDF **	pg	11800	3.2	20	N/A	N/A	N/A	13	4510009
Total Hexa CDF **	pg	46700 (1)	19	200	N/A	N/A	N/A	11	4510009
Total Hepta CDF **	pg	67200 (1)	33	200	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<280 (2)	280	20	N/A	0.100	28.0	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	10100	N/A	N/A
Surrogate Recovery (%)					-				
Confirmation C13-2378 TetraCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	124 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	114 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	114 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	115 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	111	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	111	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	126 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ901							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR-U1-160509-T1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<5.2	5.2	20	4.0	1.00	5.20	N/A .	4510009
1,2,3,7,8-Penta CDD *	pg	186	4.9	20	4.0	1.00	186	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	1310 (1)	26	200	4.0	0.100	131	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	4210 (1)	26	200	4.0	0.100	421	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	4010 (2)	23	200	4.0	0.100	401	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	28200 (1)	19	200	6.0	0.0100	282	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	25200	4.7	200	6.0	0.000300	7.56	N/A	4510009
Total Tetra CDD *	pg	76.2	5.2	20	N/A	N/A	N/A	4	4510009
Total Penta CDD *	pg	5590	4.9	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	50100 (1)	25	200	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	56600 (1)	19	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	81.1	4.4	20	4.0	0.0300	2.43	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	432	4.4	20	4.0	0.300	130	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	2780 (3)	6.6	20	4.0	0.100	278	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	1430	6.1	20	4.0	0.100	143	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	2750	6.7	20	4.0	0.100	275	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<200 (4)	200	20	4.0	0.100	20.0	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	7630 (1)	18	200	6.0	0.0100	76.3	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	1600 (1)	22	200	4.0	0.0100	16.0	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<5900 (4)	5900	200	10	0.000300	1.77	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) ** From 10X Dilution **

(2) ** From 10X Dilution **

EMPC / Merged Peak

(3) EMPC / Merged Peak

(4) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ901							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR-U1-160509-T1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Tetra CDF **	pg	103	4.1	20	N/A	N/A	N/A	5	4510009
Total Penta CDF **	pg	2590	4.4	20	N/A	N/A	N/A	14	4510009
Total Hexa CDF **	pg	12200	6.6	20	N/A	N/A	N/A	12	4510009
Total Hepta CDF **	pg	14200 (1)	20	200	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<66 (2)	66	20	N/A	0.100	6.60	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	2380	N/A	N/A
Surrogate Recovery (%)					7				
Confirmation C13-2378 TetraCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	115 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	118 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	122 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ903							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 1 160509-18	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	24.0 (1)	3.9	20	4.0	1.00	24.0	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	396	5.3	20	4.0	1.00	396	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	1070	3.1	20	4.0	0.100	107	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	3090	3.1	20	4.0	0.100	309	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	2770 (2)	2.8	20	4.0	0.100	277	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	11600 (3)	22	200	6.0	0.0100	116	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	7560	3.8	200	6.0	0.000300	2.27	N/A	4510009
Total Tetra CDD *	pg	902	3.9	20	N/A	N/A	N/A	13	4510009
Total Penta CDD *	pg	22900	5.3	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	44000	3.0	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	24200 (3)	22	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	335	6.2	20	4.0	0.0300	10.1	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	<1000 (4)	1000	20	4.0	0.300	300	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	3350 (2)	5.7	20	4.0	0.100	335	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	1630	5.2	20	4.0	0.100	163	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	2210	5.7	20	4.0	0.100	221	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<130 (4)	130	20	4.0	0.100	13.0	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	4130 (3)	19	200	6.0	0.0100	41.3	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	698 (3)	24	200	4.0	0.0100	6.98	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<1900 (4)	1900	200	10	0.000300	0.570	N/A	4510009
Total Tetra CDF **	pg	1700	3.5	20	N/A	N/A	N/A	16	4510009
Total Penta CDF **	pg	9880	6.2	20	N/A	N/A	N/A	14	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Ratio - Isotopic ratio adjusted to meet theoretical

(2) EMPC / Merged Peak

(3) ** From 10X Dilution **

(4) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ903							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 1 160509-18	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hexa CDF **	pg	15000	5.7	20	N/A	N/A	N/A	13	4510009
Total Hepta CDF **	pg	7100 (1)	21	200	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<150 (2)	150	20	N/A	0.100	15.0	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	2340	N/A	N/A
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	120 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	116 (1)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDD *	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDF **	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234789 HeptaCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	123	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	118	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-23478 PentaCDF **	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4510009
Cl37-2378 TetraCDD *	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) ** From 10X Dilution **

(2) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ904							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR-U1-160510-T2	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<5.0	5.0	20	4.0	1.00	5.00	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	95.7	7.6	20	4.0	1.00	95.7	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	618	3.6	20	4.0	0.100	61.8	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	1780	3.7	20	4.0	0.100	178	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	1790 (1)	3.3	20	4.0	0.100	179	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	12000 (2)	23	200	6.0	0.0100	120	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	12000	2.8	200	6.0	0.000300	3.60	N/A	4510009
Total Tetra CDD *	pg	196	5.0	20	N/A	N/A	N/A	6	4510009
Total Penta CDD *	pg	3830	7.6	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	22200	3.5	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	23600 (2)	23	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	50.1	4.4	20	4.0	0.0300	1.50	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	255	4.4	20	4.0	0.300	76.5	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	1370 (1)	7.2	20	4.0	0.100	137	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	668	6.6	20	4.0	0.100	66.8	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	1390	7.2	20	4.0	0.100	139	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<74 (3)	74	20	4.0	0.100	7.40	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	3530	2.5	20	6.0	0.0100	35.3	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	728	3.1	20	4.0	0.0100	7.28	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<2900 (3)	2900	200	10	0.000300	0.870	N/A	4510009
Total Tetra CDF **	pg	276	3.3	20	N/A	N/A	N/A	11	4510009
Total Penta CDF **	pg	1780	4.4	20	N/A	N/A	N/A	14	4510009
Total Hexa CDF **	pg	6240	7.2	20	N/A	N/A	N/A	12	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) ** From 10X Dilution **

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ904								
Sampling Date		2016/05/10				TOXIC EQUIVALENCY		# of		
	UNITS	AMESA-PR-U1-160510-T2	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch	
Total Hepta CDF **	pg	6520	2.8	20	N/A	N/A	N/A	4	4510009	
Confirmation 2,3,7,8-Tetra CDF **	pg	<22 (1)	22	20	N/A	0.100	2.20	N/A	4523344	
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	1120	N/A	N/A	
Surrogate Recovery (%)										
Confirmation C13-2378 TetraCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4523344	
C13-1234678 HeptaCDD *	%	120 (2)	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-1234678 HeptaCDF **	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-123678 HexaCDD *	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-123678 HexaCDF **	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-12378 PentaCDD *	%	116	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-12378 PentaCDF **	%	110	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-123789 HexaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-2378 TetraCDD *	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-2378 TetraCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009	
C13-Octachlorodibenzo-p-Dioxin	%	105	N/A	N/A	N/A	N/A	N/A	N/A	4510009	

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(2) ** From 10X Dilution **



ORTECH Environmental
Client Project #: 21656
Site Location: COVANTA
Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ907							
Sampling Date		2016/05/10				TOXIC EQUIVALENCY		# of	
	UNITS	UNIT 1 160510-19	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<5.8	5.8	20	4.0	1.00	5.80	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	57.4	4.4	20	4.0	1.00	57.4	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	149	4.8	20	4.0	0.100	14.9	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	433	4.9	20	4.0	0.100	43.3	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	409 (1)	4.3	20	4.0	0.100	40.9	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	2120	4.1	20	6.0	0.0100	21.2	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	1680	3.2	200	6.0	0.000300	0.504	N/A	4510009
Total Tetra CDD *	pg	128	5.8	20	N/A	N/A	N/A	6	4510009
Total Penta CDD *	pg	3300	4.4	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	6710	4.6	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	4620	4.1	20	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	52.0	2.7	20	4.0	0.0300	1.56	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	<150 (2)	150	20	4.0	0.300	45.0	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	450 (1)	2.1	20	4.0	0.100	45.0	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	220	1.9	20	4.0	0.100	22.0	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	260	2.1	20	4.0	0.100	26.0	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<15 (3)	15	20	4.0	0.100	1.50	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	649	1.3	20	6.0	0.0100	6.49	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	118	1.6	20	4.0	0.0100	1.18	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ907							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 1 160510-19	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
1,2,3,4,6,7,8,9-Octa CDF **	pg	<370 (1)	370	200	10	0.000300	0.111	N/A	4510009
Total Tetra CDF **	pg	302	3.6	20	N/A	N/A	N/A	12	4510009
Total Penta CDF **	pg	1320	2.7	20	N/A	N/A	N/A	14	4510009
Total Hexa CDF **	pg	2050	2.1	20	N/A	N/A	N/A	13	4510009
Total Hepta CDF **	pg	1150	1.4	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<35 (2)	35	20	N/A	0.100	3.50	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	336	N/A	N/A
Surrogate Recovery (%)	***************************************								
Confirmation C13-2378 TetraCDF **	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	111	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234789 HeptaCDF **	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	118	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	116	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	125	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	118	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-23478 PentaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".

Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ907	T						
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 1 160510-19	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
C13-2378 TetraCDD *	%	109	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	108	N/A	N/A	N/A	N/A	N/A	N/A	4510009
Cl37-2378 TetraCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ908							
Sampling Date		2016/05/11				TOXIC EQU	IIVALENCY	# of	
	UNITS	AMESA-PR-U1-160511-T3	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<4.1	4.1	20	4.0	1.00	4.10	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	16.0	3.0	20	4.0	1.00	16.0	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	103	2.3	20	4.0	0.100	10.3	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	293	2.4	20	4.0	0.100	29.3	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	333 (1)	2.1	20	4.0	0.100	33.3	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	2750	5.0	20	6.0	0.0100	27.5	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	3980	2.7	200	6.0	0.000300	1.19	N/A	4510009
Total Tetra CDD *	pg	28.3	4.1	20	N/A	N/A	N/A	3	4510009
Total Penta CDD *	pg	623	3.0	20	N/A	N/A	N/A	11	4510009
Total Hexa CDD *	pg	3940	2.3	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	5570	5.0	20	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	9.8	3.8	20	4.0	0.0300	0.294	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	46.1	3.8	20	4.0	0.300	13.8	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	231 (1)	4.1	20	4.0	0.100	23.1	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	123	3.8	20	4.0	0.100	12.3	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	284	4.1	20	4.0	0.100	28.4	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<13 (2)	13	20	4.0	0.100	1.30	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	729	1.4	20	6.0	0.0100	7.29	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	157	1.7	20	4.0	0.0100	1.57	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<850 (3)	850	200	10	0.000300	0.255	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".
Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".

Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ908							
Sampling Date		2016/05/11				TOXIC EQU	IIVALENCY	# of	
	UNITS	AMESA-PR-U1-160511-T3	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Tetra CDF **	pg	41.0	3.3	20	N/A	N/A	N/A	4	4510009
Total Penta CDF **	pg	263	3.8	20	N/A	N/A	N/A	11	4510009
Total Hexa CDF **	pg	1150	4.1	20	N/A	N/A	N/A	11	4510009
Total Hepta CDF **	pg	1320	1.6	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<7.1 (1)	7.1	20	N/A	0.100	0.710	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	211	N/A	N/A
Surrogate Recovery (%)									11.0
Confirmation C13-2378 TetraCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	115	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	113	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	108	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID	5	CIQ909							
Sampling Date		2016/05/11				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 1 160511-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<2.3	2.3	20	4.0	1.00	2.30	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	25.7	2.2	20	4.0	1.00	25.7	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	58.4	2.2	20	4.0	0.100	5.84	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	180	2.3	20	4.0	0.100	18.0	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	158 (1)	2.0	20	4.0	0.100	15.8	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	445	2.1	20	6.0	0.0100	4.45	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	163	2.2	200	6.0	0.000300	0.0489	N/A	4510009
Total Tetra CDD *	pg	25.6	2.3	20	N/A	N/A	N/A	4	4510009
Total Penta CDD *	pg	1310	2.2	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	2920	2.2	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	1030	2.1	20	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	20.0	2.3	20	4.0	0.0300	0.600	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	59.3	2.3	20	4.0	0.300	17.8	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	220	2.2	20	4.0	0.100	22.0	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	118	2.1	20	4.0	0.100	11.8	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	100	2.2	20	4.0	0.100	10.0	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<7.2 (2)	7.2	20	4.0	0.100	0.720	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	232	2.1	20	6.0	0.0100	2.32	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	30.0	2.5	20	4.0	0.0100	0.300	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<44 (2)	44	200	10	0.000300	0.0132	N/A	4510009
Total Tetra CDF **	pg	65.4	2.4	20	N/A	N/A	N/A	6	4510009
Total Penta CDF **	pg	570	2.3	20	N/A	N/A	N/A	14	4510009
Total Hexa CDF **	pg	1020	2.2	20	N/A	N/A	N/A	11	4510009
Total Hepta CDF **	pg	375	2.3	20	N/A	N/A	N/A	4	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ909							
Sampling Date		2016/05/11				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 1 160511-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Confirmation 2,3,7,8-Tetra CDF **	pg	<14 (1)	14	20	N/A	0.100	1.40	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	139	N/A	N/A
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDF **	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234789 HeptaCDF **	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	105	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-23478 PentaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	101	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
Cl37-2378 TetraCDD *	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".

Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ910							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR-U2-160505-T1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	6.3	2.1	20	4.0	1.00	6.30	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	91.4	2.1	20	4.0	1.00	91.4	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	385	2.4	20	4.0	0.100	38.5	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	1110	2.5	20	4.0	0.100	111	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	1220 (1)	2.2	20	4.0	0.100	122	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	12000 (2)	21	200	6.0	0.0100	120	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	12500	2.9	200	6.0	0.000300	3.75	N/A	4510009
Total Tetra CDD *	pg	170	2.1	20	N/A	N/A	N/A	9	4510009
Total Penta CDD *	pg	2500	2.1	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	13800	2.3	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	24300 (2)	21	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	59.8	2.3	20	4.0	0.0300	1.79	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	<180 (3)	180	20	4.0	0.300	54.0	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	833 (1)	2.6	20	4.0	0.100	83.3	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	448	2.3	20	4.0	0.100	44.8	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	888	2.6	20	4.0	0.100	88.8	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<89 (3)	89	20	4.0	0.100	8.90	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	2820	2.2	20	6.0	0.0100	28.2	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	751	2.6	20	4.0	0.0100	7.51	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<2900 (3)	2900	200	10	0.000300	0.870	N/A	4510009
Total Tetra CDF **	pg	252	2.2	20	N/A	N/A	N/A	14	4510009
Total Penta CDF **	pg	1050	2.2	20	N/A	N/A	N/A	14	4510009
Total Hexa CDF **	pg	3870	2.6	20	N/A	N/A	N/A	12	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) Results from 10xdiln

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ910							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR-U2-160505-T1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	5360	2.4	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<33 (1)	33	20	N/A	0.100	3.30	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	814	N/A	N/A
Surrogate Recovery (%)	-1								
Confirmation C13-2378 TetraCDF **	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	119 (2)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	111	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	110	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	111	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	115	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(2) Results from 10xdiln



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ911							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 2 160505-17	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	6.9 (1)	2.2	20	4.0	1.00	6.90	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	13.7	2.1	20	4.0	1.00	13.7	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	26.9	2.2	20	4.0	0.100	2.69	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	81.8	2.2	20	4.0	0.100	8.18	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	75.6 (2)	1.9	20	4.0	0.100	7.56	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	464	2.1	20	6.0	0.0100	4.64	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	403	2.2	200	6.0	0.000300	0.121	N/A	4510009
Total Tetra CDD *	pg	149	2.2	20	N/A	N/A	N/A	9	4510009
Total Penta CDD *	pg	673	2.1	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	1450	2.1	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	1080	2.1	20	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	17.8	2.2	20	4.0	0.0300	0.534	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	30.4	2.2	20	4.0	0.300	9.12	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	77.2 (2)	2.2	20	4.0	0.100	7.72	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	39.8	2.1	20	4.0	0.100	3.98	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	45.9	2.2	20	4.0	0.100	4.59	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<3.2 (3)	3.2	20	4.0	0.100	0.320	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	162	2.0	20	6.0	0.0100	1.62	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	21.3	2.4	20	4.0	0.0100	0.213	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<68 (4)	68	200	10	0.000300	0.0204	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

- ** CDF = Chloro Dibenzo-p-Furan
- (1) EMPC / Ratio Isotopic ratio adjusted to meet theoretical
- (2) EMPC / Merged Peak
- (3) EEMPC / DPE Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

(4) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ911							
Sampling Date		2016/05/05				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 2 160505-17	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	isomers	QC Batch
Total Tetra CDF **	pg	262	2.3	20	N/A	N/A	N/A	13	4510009
Total Penta CDF **	pg	332	2.2	20	N/A	N/A	N/A	12	4510009
Total Hexa CDF **	pg	376	2.2	20	N/A	N/A	N/A	12	4510009
Total Hepta CDF **	pg	279	2.1	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<18 (1)	18	20	N/A	0.100	1.80	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	73.7	N/A	N/A
Surrogate Recovery (%)	***************************************					<u> </u>			
Confirmation C13-2378 TetraCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDD *	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDF **	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234789 HeptaCDF **	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-23478 PentaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	89	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	87	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	91	N/A	N/A	N/A	N/A	N/A	N/A	4510009
Cl37-2378 TetraCDD *	%	98	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".

Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ912							
Sampling Date		2016/05/09				TOXIC EQU	IIVALENCY	# of	
	UNITS	AMESA-PR-U2-160509-T2	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	<2.2	2.2	20	4.0	1.00	2.20	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	16.1	2.2	20	4.0	1.00	16.1	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	118	2.4	20	4.0	0.100	11.8	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	335	2.4	20	4.0	0.100	33.5	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	347 (1)	2.2	20	4.0	0.100	34.7	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	2580	2.2	20	6.0	0.0100	25.8	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	3530	2.1	200	6.0	0.000300	1.06	N/A	4510009
Total Tetra CDD *	pg	<15 (2)	15	20	N/A	N/A	N/A	0	4510009
Total Penta CDD *	pg	478	2.2	20	N/A	N/A	N/A	10	4510009
Total Hexa CDD *	pg	4090	2.3	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	5260	2.2	20	N/A	N/A	N/A	2	4510009
2,3,7,8-Tetra CDF **	pg	6.8	2.2	20	4.0	0.100	0.680	N/A	4510009
1,2,3,7,8-Penta CDF **	pg	8.1	2.3	20	4.0	0.0300	0.243	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	42.0	2.3	20	4.0	0.300	12.6	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	237 (1)	2.1	20	4.0	0.100	23.7	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	119	1.9	20	4.0	0.100	11.9	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	292	2.1	20	4.0	0.100	29.2	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<16 (3)	16	20	4.0	0.100	1.60	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	649	2.0	20	6.0	0.0100	6.49	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	140	2.5	20	4.0	0.0100	1.40	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<730 (3)	730	200	10	0.000300	0.219	N/A	4510009
Total Tetra CDF **	pg	6.8	2.2	20	N/A	N/A	N/A	1	4510009
Total Penta CDF **	pg	240	2.3	20	N/A	N/A	N/A	12	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<".

Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ912			·				
Sampling Date		2016/05/09				TOXIC EQU	IIVALENCY	# of	
	UNITS	AMESA-PR-U2-160509-T2	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hexa CDF **	pg	1110	2.1	20	N/A	N/A	N/A	10	4510009
Total Hepta CDF **	pg	1170	2.2	20	N/A	N/A	N/A	4	4510009
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	213	N/A	N/A
Surrogate Recovery (%)				<del></del>					
C13-1234678 HeptaCDD *	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	118	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	112	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	90	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ913							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 2 160509-19	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	4.1 (1)	2.2	20	4.0	1.00	4.10	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	8.0 (1)	2.4	20	4.0	1.00	8.00	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	17.8	2.4	20	4.0	0.100	1.78	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	48.8	2.4	20	4.0	0.100	4.88	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	43.4 (2)	2.2	20	4.0	0.100	4.34	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	291	2.2	20	6.0	0.0100	2.91	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	293	2.3	200	6.0	0.000300	0.0879	N/A	4510009
Total Tetra CDD *	pg	90.7	2.2	20	N/A	N/A	N/A	6	4510009
Total Penta CDD *	pg	377	2.4	20	N/A	N/A	N/A	8	4510009
Total Hexa CDD *	pg	847	2.3	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	655	2.2	20	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	13.0	2.1	20	4.0	0.0300	0.390	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	18.8	2.1	20	4.0	0.300	5.64	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	44.2 (2)	2.0	20	4.0	0.100	4.42	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	<22 (3)	22	20	4.0	0.100	2.20	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	30.6	2.0	20	4.0	0.100	3.06	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	2.9	2.2	20	4.0	0.100	0.290	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	88.1	2.0	20	6.0	0.0100	0.881	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	14.5	2.4	20	4.0	0.0100	0.145	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<45 (3)	45	200	10	0.000300	0.0135	N/A	4510009
Total Tetra CDF **	pg	185	2.2	20	N/A	N/A	N/A	11	4510009
Total Penta CDF **	pg	212	2.1	20	N/A	N/A	N/A	11	4510009
Total Hexa CDF **	pg	187	2.0	20	N/A	N/A	N/A	9	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Ratio - Isotopic ratio adjusted to meet theoretical

(2) EMPC / Merged Peak

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ913							
Sampling Date		2016/05/09				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 2 160509-19	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	150	2.2	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	7.2 (1)	2.0	20	N/A	0.100	0.720	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	43.9	N/A	N/A
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	130	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	110	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDD *	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234789 HeptaCDF **	%	109	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	108	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	114	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	93	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-23478 PentaCDF **	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	106	N/A	N/A	N/A	N/A	N/A	N/A	4510009
Cl37-2378 TetraCDD *	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / Ratio - Isotopic ratio adjusted to meet theoretical



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ915							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	AMESA-PR-U2-160510-T3	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	5.9	2.3	20	4.0	1.00	5.90	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	66.9	2.3	20	4.0	1.00	66.9	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	251	2.4	20	4.0	0.100	25.1	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	704	2.5	20	4.0	0.100	70.4	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	742 (1)	2.2	20	4.0	0.100	74.2	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	7230 (2)	24	200	6.0	0.0100	72.3	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	8770	2.1	200	6.0	0.000300	2.63	N/A	4510009
Total Tetra CDD *	pg	234	2.3	20	N/A	N/A	N/A	9	4510009
Total Penta CDD *	pg	1890	2.3	20	N/A	N/A	N/A	12	4510009
Total Hexa CDD *	pg	8860	2.4	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	14700 (2)	24	200	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	42.8	2.1	20	4.0	0.0300	1.28	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	126	2.1	20	4.0	0.300	37.8	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	536 (1)	2.2	20	4.0	0.100	53.6	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	287	2.1	20	4.0	0.100	28.7	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	588	2.3	20	4.0	0.100	58.8	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<51 (3)	51	20	4.0	0.100	5.10	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	1960	3.1	20	6.0	0.0100	19.6	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	497	3.8	20	4.0	0.0100	4.97	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<2000 (3)	2000	200	10	0.000300	0.600	N/A	4510009
Total Tetra CDF **	pg	365	2.1	20	N/A	N/A	N/A	13	4510009
Total Penta CDF **	pg	965	2.1	20	N/A	N/A	N/A	15	4510009
Total Hexa CDF **	pg	2590	2.2	20	N/A	N/A	N/A	12	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) Results from 10xdiln

(3) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ915							
Sampling Date		2016/05/10				TOXIC EQU	JIVALENCY	# of	
	UNITS	AMESA-PR-U2-160510-T3	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	3710	3.4	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<31 (1)	31	20	N/A	0.100	3.10	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	531	N/A	N/A
Surrogate Recovery (%)									
Confirmation C13-2378 TetraCDF **	%	135	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	120 (2)	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	108	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	114	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	103	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	117	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	114	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	109	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

(2) Results from 10xdiln



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ916							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 2 160510-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
2,3,7,8-Tetra CDD *	pg	5.0 (1)	2.3	20	4.0	1.00	5.00	N/A	4510009
1,2,3,7,8-Penta CDD *	pg	9.0	2.2	20	4.0	1.00	9.00	N/A	4510009
1,2,3,4,7,8-Hexa CDD *	pg	19.2	2.2	20	4.0	0.100	1.92	N/A	4510009
1,2,3,6,7,8-Hexa CDD *	pg	59.3	2.2	20	4.0	0.100	5.93	N/A	4510009
1,2,3,7,8,9-Hexa CDD *	pg	52.4 (2)	2.0	20	4.0	0.100	5.24	N/A	4510009
1,2,3,4,6,7,8-Hepta CDD *	pg	373	2.0	20	6.0	0.0100	3.73	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDD *	pg	394	2.3	200	6.0	0.000300	0.118	N/A	4510009
Total Tetra CDD *	pg	135	2.3	20	N/A	N/A	N/A	8	4510009
Total Penta CDD *	pg	379	2.2	20	N/A	N/A	N/A	8	4510009
Total Hexa CDD *	pg	972	2.1	20	N/A	N/A	N/A	7	4510009
Total Hepta CDD *	pg	850	2.0	20	N/A	N/A	N/A	2	4510009
1,2,3,7,8-Penta CDF **	pg	13.6	2.4	20	4.0	0.0300	0.408	N/A	4510009
2,3,4,7,8-Penta CDF **	pg	21.1	2.4	20	4.0	0.300	6.33	N/A	4510009
1,2,3,4,7,8-Hexa CDF **	pg	53.8 (2)	2.2	20	4.0	0.100	5.38	N/A	4510009
1,2,3,6,7,8-Hexa CDF **	pg	<26 (3)	26	20	4.0	0.100	2.60	N/A	4510009
2,3,4,6,7,8-Hexa CDF **	pg	36.4	2.2	20	4.0	0.100	3.64	N/A	4510009
1,2,3,7,8,9-Hexa CDF **	pg	<3.2 (3)	3.2	20	4.0	0.100	0.320	N/A	4510009
1,2,3,4,6,7,8-Hepta CDF **	pg	122	2.0	20	6.0	0.0100	1.22	N/A	4510009
1,2,3,4,7,8,9-Hepta CDF **	pg	18.6	2.4	20	4.0	0.0100	0.186	N/A	4510009
1,2,3,4,6,7,8,9-Octa CDF **	pg	<65 (3)	65	200	10	0.000300	0.0195	N/A	4510009
Total Tetra CDF **	pg	224	2.4	20	N/A	N/A	N/A	12	4510009
Total Penta CDF **	pg	230	2.4	20	N/A	N/A	N/A	11	4510009
Total Hexa CDF **	pg	231	2.2	20	N/A	N/A	N/A	11	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

- ** CDF = Chloro Dibenzo-p-Furan
- (1) EMPC / Ratio Isotopic ratio adjusted to meet theoretical
- (2) EMPC / Merged Peak
- (3) EMPC / DPE Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

Maxxam ID		CIQ916							
Sampling Date		2016/05/10				TOXIC EQU	IVALENCY	# of	
	UNITS	UNIT 2 160510-20	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hepta CDF **	pg	213	2.1	20	N/A	N/A	N/A	4	4510009
Confirmation 2,3,7,8-Tetra CDF **	pg	<11 (1)	11	20	N/A	0.100	1.10	N/A	4523344
TOTAL TOXIC EQUIVALENCY	pg	N/A	N/A	N/A	N/A	N/A	52.1	N/A	N/A
Surrogate Recovery (%)		- Manual Constitution of the Constitution of t							***************************************
Confirmation C13-2378 TetraCDF **	%	115	N/A	N/A	N/A	N/A	N/A	N/A	4523344
C13-1234678 HeptaCDD *	%	105	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234678 HeptaCDF **	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDD *	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123478 HexaCDF **	%	95	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-1234789 HeptaCDF **	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDD *	%	104	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123678 HexaCDF **	%	105	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDD *	%	107	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-12378 PentaCDF **	%	100	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-123789 HexaCDF **	%	94	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-23478 PentaCDF **	%	92	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDD *	%	97	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-2378 TetraCDF **	%	96	N/A	N/A	N/A	N/A	N/A	N/A	4510009
C13-Octachlorodibenzo-p-Dioxin	%	99	N/A	N/A	N/A	N/A	N/A	N/A	4510009
Cl37-2378 TetraCDD *	%	102	N/A	N/A	N/A	N/A	N/A	N/A	4510009

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,

The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

(1) EMPC / DPE - Diphenylether interference present caused the dibenzofuran isomer result (pg) to become "non-detected" as shown by "<". Due to this interference the dibenzofuran isomer result (pg) may be less than the reported detection limit. The TEQ calculation is based on the reported detection limit of each dibenzofuran isomer impacted by the diphenylether interference.

EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CIQ898

Sample ID: AMESA-PR-PRETEST-U1-160503

Matrix: Stack Sampling Train

Collected: Shipped:

2016/05/03

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ899

Sample ID: AMESA-PR-PRETEST-U2-160503

Matrix: Stack Sampling Train

Collected: 2016/05/03

Shipped: Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ901

Sample ID: AMESA-PR-U1-160509-T1

Matrix: Stack Sampling Train

Collected: 2016/05/09

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ903

Sample ID: UNIT 1 160509-18

Matrix: Stack Sampling Train

Collected: 2016/05/09

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ904

Sample ID: AMESA-PR-U1-160510-T2

Matrix: Stack Sampling Train

Collected: 2016/05/10

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst	
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cath <b>y</b> Xu	
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby	

Maxxam ID: CIQ907

Sample ID: UNIT 1 160510-19
Matrix: Stack Sampling Train

Collected: 2016/05/10 Shipped:

Received: 2016/05/12

**Test Description** Instrumentation Batch Extracted Date Analyzed Analyst 2,3,7,8-TCDF Confirmation (M23) HRMS/MS 4523344 N/A 2016/06/02 Cathy Xu Dioxins/Furans in Air (Method 23) HRMS/MS 4510009 2016/05/17 2016/05/28 Owen Cosby



**ORTECH Environmental** Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

### **TEST SUMMARY**

Maxxam ID: CIQ908

Sample ID:

AMESA-PR-U1-160511-T3

Matrix: Stack Sampling Train

Collected:

2016/05/11

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID:

CIQ909

UNIT 1 160511-20 Sample ID:

Matrix: Stack Sampling Train Collected:

2016/05/11

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID:

CIQ910

AMESA-PR-U2-160505-T1 Sample ID: Matrix: Stack Sampling Train

Collected:

2016/05/05

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ911

Sample ID: UNIT 2 160505-17

Matrix: Stack Sampling Train

Collected:

2016/05/05

Shipped:

Received: 2016/05/12

Test Description	instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ912

Sample ID: Matrix:

AMESA-PR-U2-160509-T2 Stack Sampling Train

Collected:

2016/05/09

Shipped: Received:

2016/05/12

Test Description	instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ913

Sample ID: UNIT 2 160509-19

Matrix: Stack Sampling Train

Collected: Shipped:

2016/05/09

Received: 2016/05/12

**Test Description** Extracted Date Analyzed Analyst Instrumentation Batch 2,3,7,8-TCDF Confirmation (M23) 2016/06/02 Cathy Xu HRMS/MS 4523344 N/A Dioxins/Furans in Air (Method 23) HRMS/MS 2016/05/17 2016/05/28 Owen Cosby 4510009



**ORTECH** Environmental Client Project #: 21656 Site Location: COVANTA

Your P.O. #: 21656-J2227

## **TEST SUMMARY**

Maxxam ID: CIQ915

Sample ID: AMESA-PR-U2-160510-T3

Matrix: Stack Sampling Train

Collected: 2016/05/10

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby

Maxxam ID: CIQ916

Sample ID: UNIT 2 160510-20 Matrix: Stack Sampling Train Collected:

2016/05/10

Shipped:

Received: 2016/05/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
2,3,7,8-TCDF Confirmation (M23)	HRMS/MS	4523344	N/A	2016/06/02	Cathy Xu
Dioxins/Furans in Air (Method 23)	HRMS/MS	4510009	2016/05/17	2016/05/28	Owen Cosby



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## **GENERAL COMMENTS**

# EPS 1/RM/19 DIOXINS AND FURANS (STACK SAMPLING TRAIN)

SPIKED BLANK Dioxins/Furans in Air (Method 23): ** Native percent recoveries were calculated with respect to the Method Spike **

Results relate only to the items tested.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# **QUALITY ASSURANCE REPORT**

QA/QC				Date	<del></del>	%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4510009	OBC	Spiked Blank	C13-1234678 HeptaCDD	2016/05/27		98	%	25 - 130
			C13-1234678 HeptaCDF	2016/05/27		98	%	25 - 130
			C13-123678 HexaCDD	2016/05/27		105	%	40 - 130
			C13-123678 HexaCDF	2016/05/27		96	%	40 - 130
			C13-12378 PentaCDD	2016/05/27		110	%	40 - 130
			C13-12378 PentaCDF	2016/05/27		101	%	40 - 130
			C13-123789 HexaCDF	2016/05/27		93	%	40 - 130
			C13-2378 TetraCDD	2016/05/27		97	%	40 - 130
			C13-2378 TetraCDF	2016/05/27		96	%	40 - 130
			C13-Octachlorodibenzo-p-Dioxin	2016/05/27		98	%	25 - 130
			2,3,7,8-Tetra CDD	2016/05/27		95	%	80 - 140
			1,2,3,7,8-Penta CDD	2016/05/27		99	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2016/05/27		113	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2016/05/27		96	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2016/05/27		113	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2016/05/27		101	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDD	2016/05/27		102	%	80 - 140
			2,3,7,8-Tetra CDF	2016/05/27		99	%	80 - 140
			1,2,3,7,8-Penta CDF	2016/05/27		106	%	80 - 140
			2,3,4,7,8-Penta CDF	2016/05/27		107	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2016/05/27		117	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2016/05/27		107	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2016/05/27		109	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2016/05/27		112	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2016/05/27		98	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2016/05/27		99	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDF	2016/05/27		104	%	80 - 140
4510009	OBC	Spiked Blank DUP	C13-1234678 HeptaCDD	2016/05/27		103	%	25 - 130
			C13-1234678 HeptaCDF	2016/05/27		103	%	25 - 130
			C13-123678 HexaCDD	2016/05/27		102	%	40 - 130
			C13-123678 HexaCDF	2016/05/27		98	%	40 - 130
			C13-12378 PentaCDD	2016/05/27		115	%	40 - 130
			C13-12378 PentaCDF	2016/05/27		107	%	40 - 130
			C13-123789 HexaCDF	2016/05/27		91	%	40 - 130
			C13-2378 TetraCDD	2016/05/27		100	%	40 - 130
			C13-2378 TetraCDF	2016/05/27		104	%	40 - 130
			C13-Octachlorodibenzo-p-Dioxin	2016/05/27		101	%	25 - 130
			2,3,7,8-Tetra CDD	2016/05/27		98	%	80 - 140
			1,2,3,7,8-Penta CDD	2016/05/27		98	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2016/05/27		116	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2016/05/27		102	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2016/05/27		115	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2016/05/27		102	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDD	2016/05/27		101	%	80 - 140
			2,3,7,8-Tetra CDF	2016/05/27		101	%	80 - 140
			1,2,3,7,8-Penta CDF	2016/05/27		102	%	80 - 140
			2,3,4,7,8-Penta CDF	2016/05/27		105	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2016/05/27		117	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2016/05/27		107	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2016/05/27		117	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2016/05/27		112	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2016/05/27		96	%	80 - 140



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

# QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			1,2,3,4,7,8,9-Hepta CDF	2016/05/27		98	%	80 - 140
			1,2,3,4,6,7,8,9-Octa CDF	2016/05/27		103	%	80 - 140
4510009	OBC	RPD	2,3,7,8-Tetra CDD	2016/05/27	NC		%	20
			1,2,3,7,8-Penta CDD	2016/05/27	NC		%	20
			1,2,3,4,7,8-Hexa CDD	2016/05/27	2.6		%	20
			1,2,3,6,7,8-Hexa CDD	2016/05/27	NC		%	20
			1,2,3,7,8,9-Hexa CDD	2016/05/27	1.8		%	20
			1,2,3,4,6,7,8-Hepta CDD	2016/05/27	0.99		%	20
			1,2,3,4,6,7,8,9-Octa CDD	2016/05/27	NC		%	20
			2,3,7,8-Tetra CDF	2016/05/27	NC		%	20
			1,2,3,7,8-Penta CDF	2016/05/27	3.8		%	20
			2,3,4,7,8-Penta CDF	2016/05/27	1.9		%	20
			1,2,3,4,7,8-Hexa CDF	2016/05/27	0		%	20
			1,2,3,6,7,8-Hexa CDF	2016/05/27	0		%	20
			2,3,4,6,7,8-Hexa CDF	2016/05/27	7.1		%	20
			1,2,3,7,8,9-Hexa CDF	2016/05/27	0		%	20
			1,2,3,4,6,7,8-Hepta CDF	2016/05/27	NC		%	20
			1,2,3,4,7,8,9-Hepta CDF	2016/05/27	NC		%	20
			1,2,3,4,6,7,8,9-Octa CDF	2016/05/27	NC		%	20
4510009	OBC	Method Blank	C13-1234678 HeptaCDD	2016/05/28		100	%	25 - 130
			C13-1234678 HeptaCDF	2016/05/28		101	%	25 - 130
			C13-123678 HexaCDD	2016/05/28		98	%	40 - 130
	·		C13-123678 HexaCDF	2016/05/28		95	%	40 - 130
			C13-12378 PentaCDD	2016/05/28		109	%	40 - 130
			C13-12378 PentaCDF	2016/05/28		106	%	40 - 130
			C13-123789 HexaCDF	2016/05/28		94	%	40 - 130
			C13-2378 TetraCDD	2016/05/28		94	%	40 - 130
			C13-2378 TetraCDF	2016/05/28		95	%	40 - 130
			C13-Octachlorodibenzo-p-Dioxin	2016/05/28		98	%	25 - 130
			2,3,7,8-Tetra CDD	2016/05/28	<3.7, EDL=3.7		pg	
			1,2,3,7,8-Penta CDD	2016/05/28	<2.0, EDL=2.0		pg	
			1,2,3,4,7,8-Hexa CDD	2016/05/28	<2.5, EDL=2.5		pg	
			1,2,3,6,7,8-Hexa CDD	2016/05/28	<2.5, EDL=2.5		pg	
			1,2,3,7,8,9-Hexa CDD	2016/05/28	<2.2, EDL=2.2		pg	
			1,2,3,4,6,7,8-Hepta CDD	2016/05/28	3.0, EDL=1.7		pg	
			1,2,3,4,6,7,8,9-Octa CDD	2016/05/28	5.5, EDL=2.0		pg	
			Total Tetra CDD	2016/05/28	<23, EDL=23 (1)		pg	
			Total Penta CDD	2016/05/28	<15, EDL=15 (1)		pg	
			Total Hexa CDD	2016/05/28	<30, EDL=30 (1)		pg	
			Total Hepta CDD	2016/05/28	5.5, EDL=1.7		pg	



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

## QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
			2,3,7,8-Tetra CDF	2016/05/28	<2.1, EDL=2.1		pg	
			1,2,3,7,8-Penta CDF	2016/05/28	<2.8, EDL=2.8		pg	
			2,3,4,7,8-Penta CDF	2016/05/28	<2.7, EDL=2.7		pg	
			1,2,3,4,7,8-Hexa CDF	2016/05/28	<2.0, EDL=2.0		pg	
			1,2,3,6,7,8-Hexa CDF	2016/05/28	<1.8, EDL=1.8		pg	
			2,3,4,6,7,8-Hexa CDF	2016/05/28	<2.0, EDL=2.0		pg	
			1,2,3,7,8,9-Hexa CDF	2016/05/28	<2.1, EDL=2.1		pg	
			1,2,3,4,6,7,8-Hepta CDF	2016/05/28	<1.7, EDL=1.7		pg	
			1,2,3,4,7,8,9-Hepta CDF	2016/05/28	<2.0, EDL=2.0		pg	
			1,2,3,4,6,7,8,9-Octa CDF	2016/05/28	<2.1, EDL=2.1		pg	
			Total Tetra CDF	2016/05/28	<5.0, EDL=5.0 (1)		pg	
			Total Penta CDF	2016/05/28	<2.7, EDL=2.7		pg	
			Total Hexa CDF	2016/05/28	<2.0, EDL=2.0		pg	
			Total Hepta CDF	2016/05/28	<1.8, EDL=1.8		pg	
4523344	CXU	Method Blank	Confirmation 2,3,7,8-Tetra CDF	2016/06/02	<2.6, EDL=2.6		pg	
			Confirmation C13-2378 TetraCDF	2016/06/02		83	%	40 - 135

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.



ORTECH Environmental Client Project #: 21656 Site Location: COVANTA Your P.O. #: 21656-J2227

### **VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Kay Shaw, C. Chem, Sr Scientific Specialist, HRMS Services

Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



AMESA Run Summary Data (6 pages)

COVANTA CANADA - STACK UNIT 1 Amesa_860142-P86.020.3-11.05.2016-15:00

Cartridge box no..: 1 Cartridge box name: COVANTA - STACK 1

Measurement no. 18

	0												[Reason]	[]	Manual command	14: unknown
[.leakr]	1 [FA]	] '	1	1 1	ì	1	1	1	ı	1	1	ı	[FA]	]	i	ı
[.NGUP] (ISORAT] [MPSTAT] [MTRG] [MVH] [lepres] [] [] [hPa] [.Grd.C] [m/s] [hPa]	11.8 09-05-16/C .manual 2	[.Grd.C] [.Grd.C] [.Grd.C] [] [		1600 99.98 Mainten 1600 100.03	1600 99.98	1600 100.03	1600 100.03	1600 100	1600 100.01	1600 100	1600 99.98	1600 100	[BDFAKT] [PGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TC1] [TC5] [TCF] [ISORAT] [Substi [AW]	[] [hPa] [.Grd.C] [.Grd.C] [.Grd.C] [.Grd.C] [.Grd.C] [] [	1600 99.98	1600 99.98
[ISORAT] [N	99.96 TCS] [	3rd.C] [.( 1600	1600	1600 1600	1600	1600	1600	1600	1600	1600	1600	1600	.TCS] [	3rd.C] [.(	1600	1600
[.NGUP] [i:	463 TC1] [	Grd.cj [:	30	g g	30	30	30	29	53	29	29	29	TCd] [	Grd.C] [.(	29	29
	TKTMAX] [	.Grd.C] [. 27.2	27.1	27.1 27.1	26.9	26.8	26.5	26.3	26.2	26.2	26.2	26	TKTMAX] [.	.Grd.C] [.	25.9	25.9
[lopres] [.leakr] [hPa] [SLM] 134.2 0 [Substi [AW] [	2] [TRGMAX] [TH	[hPa] [.Grd.C] [.Grd.C] [.Grd.C]	146	146 146	147	147	143	143	141	141	143	143	TRGMAX] [	[Grd.C]	143	143
	2 . [TRGMIN]	[.Grd.C]   145	145	146 146	146	143	142	141	140	140	141	142	[TRGMIN] [	[.Grd.C]	142	142
[DW] [Substt[AW] [Substt[AW] [] [] [] [] [] [] [] [] [] [] [] [] []	.manual [TGU]	[.Grd.C] 25	25	25 25	25	25	25	25	25	25	25	25	[TGU]	[.Grd.C]	25	25
nd    DW     Substi  AW     Substi  AW     Substi  AW	11.8 09-05-16/C .manual	[hPa] 876.3	866.5	856.8 870.8	861.9	870.1	883.9	881.5	885,3	882.3	871.1	869.5	[PGU]	[hPa]	867	1017.3
[End] [] .manual [.MCO2]		[] 0.789		0.784	0.781	0.781	0.78	0.782	0.783	0.784	0.784	0.784	[BDFAKT]	[]	0.784	0.784
5R] [Start] ] [] 1 .manual ORG] [MO2]	6.9 [FM]	[g/m3] 119.2		109.4	117.7	111.9	113.7	123.5	120.8	116.2	117.4	111.8	[ <del></del> ]	[g/m3]	111	111
[.HuMiD] [CO2MAX] [TRGUGR] [.020GR] [.VHUGR] [Start] [.g/m3] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [%] [Mburst] [TGVNMD] [TGVNGU] [CONVOL] [BDFAKT] [MHZORG] [M02] [%] [%]	6:09 3.71 3.64 0.39 0.784 114.767 	[m/s] [m3] [%] [] [.g/m3] [%] [g/m3] [.g/m3] [g/m3] [g/m3]	5990'0 1	0.0965 0.1242	3 0.1581	3 0,1906	0.2235	1 0.2568	0.2892	7 0.3204	3 0.3529	0.3845	vH] [TGVNMD] [TGVNGU] [02] [F]	[/s] [m3] [m3] [] [] []	0,3948	11.2 0.3948
[.02UGR] [%] 5 (BDFAKT]	0.784 [cozM]	[%]	5 12.1	12.1	7 11.8	11.3	5 11.4	12.4	12.1	3 11.7	3 11.8	3 11.2	[co2]	[%]	11.2	11.2
[.020GR]  %]  0 2:   [CONVOL]	4 0.39	[%] 1 6.7	7 6.5	1 6	.6	5 7.4	1 7.5	4 6.2	5 6.2	1 7.3	2 6.8	3 7.:	[02]	[%]	4 7	7.3
() [TRGUGR [.Grd.C] 5 1 [TGVNGU	1 3.6 )] [TGVNGU	[m3] 7 0.291	_	8 0.881 6 1.184	7 1.488	3 1.795	.2 2.101	9 2.384	7 2.666	7 2.951	4 3.242	1 3,543	o] [TGVNGU	[m3]	1 3.64	3.64
] [CO2MA) [%] 17 [TGVNMI]	3.7 [TGVNM]	[m3] .3 0.297		.3 0.898 .4 1.206	1.517	.9 1.83	.8 2.142	.7 2.429	.6 2.717	.6 3.007	.1 3.304	.5 3.611	[TGVNM[	[m3]	.6 3.7	.9 3.71
[.HUMID [g/m3] 11 [MDurat] [.hh:mm]	60:9 [mHv]	[m/s] 15.	15	15.3	1	15.9	15.8	14.7	14.6	14.6	15.1	15.5	[vH]	[s/m]	Т	15.9
м м м ш ш	.7 E f: L		۲ د	4 4 L L	4 L	4 L	4 L	4 L	4 L	4 L	4 L	4 L	×	×	×	×
Startrecord: 09-05-16/10:04 Endrecord:	09-05-16/16:17 Runtimerecord:	09-05-16/10:34	09-05-16/11:04	09-05-16/11:34 09-05-16/12:04	09-05-16/12:34	09-05-16/13:04	09-05-16/13:34	09-05-16/14:04	09-05-16/14:34	09-05-16/15:04	09-05-16/15:34	09-05-16/16:04	Eventrecord:		09-05-16/16:13	09-05-16/16:14

FA events during measurement: 0

Total FA time ....: 0:00 h:min Total Fire on time: 6:13 h:min

COVANTA CANADA - STACK UNIT 1 Amesa_860142-P86.020.3-11.05.2016-15:01

Cartridge box no..: 1 Cartridge box name: COVANTA - STACK 1

Measurement no. 19

													[Reason]	[]	Manual command	14: unknown
_	[FA]	ı	1 1	ŧ	i	1	ł		į	ı	9	ı	[FA]		i	
[NGUP] [ISORAT] [MPSTAT] [MTRG] [MVH] [lcpres] [.leakr] [] [] [hPa] [.Grd.C] [m/s] [hPa] [SLM]	[Substi [AW]	99.61	100	66.99	100	100.01	100.01	100	66.66	86.98	100.02	100	[BDFAKT] [PGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TC1] [TC5] [TCF] [ISORAT] [Substi [AW]	[.Grd.C] [.Grd.C] [] [	100	100
MPSTAT] [. hPa] [.	[TCF] [!	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	TCF] (R	Grd.C] [-	1600	1600
[ISORAT] [h	[TCS] [[]	1600	1600 1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	TCS] [.	.Grd.C]	1600	1600
[.NGUP]	4	31	31 31	31	31	31	31	31	31	31	31	31	[TC1]		31	31
- E = =	[TRGMIN] [TRGMAX] [TKTMAX] [TC1] [.grd.C] [.Grd.C] [.Grd.C] [.Grd.C]	28.4	26.3 25.9	25.8	25.7	25.4	25.5	25.6	25.6	25.6	25.6	25.7	[TKTMAX]	[.Grd.C] [.Grd.C] [.Grd.C] [.Grd.C]	25.7	25.7
[lcpres] [.leakr] [hPa] [SLM] 136.5 [Substi [AW]	[] [TRGMAX] [TKTN	146	144 142	144	145	144	144	144	145	144	147	146	[TRGMAX]	['Grd.C]	144	144
	[TRGMIN]	144	5 142	5 142	5 143	5 143	5 143	5 143	5 143	144	144	144	[TRGMIN]	[.Grd.C]	5 143	143
[DW] [Substi [AW] [Substi [AW] [] 5	[PGU] [TGU]	6 25	3 25	4 25	5 25	6 25	9 2	9 25	9 25	4 25	1 25	2 25	[TGU]	[hPa] [.Grd.C]	2 25	3 25
End]			5 923 7 924.1	5 903.4	2 905	2 906	905.9	8 905.9	7 902.9	6 892.4	5 900.1	4 900.2	[PGU]		4 902.2	4 1025.3
[End [] .manu [.MCC			2 0.825 1 0.827	1 0.825	5 0.822	5 0.82	2 0.819	1 0.818	6 0.817	2 0.816	9 0.815	1 0.814	[BDFAKT]		0.814	0.814
5R] [Start] 1 [] 1 .manual 1 .MG2] 5RG] [MO2]	] [FM] [g/m3]	4 118.8	9 117,2 5 119.1		3 117.5	5 85.5	5 117.2	1 118.1	2 119.6	9 113.2	4 116.9	7 119.1		[g/m3]	3 110	3 110
[m/s] 0 [MH2OR0] [g/m3]	[CONVOL	9 0.034	.8 0.0669 .2 0.1005		.8 0.1693	.8 0.1945	.8 0.2275	.8 0.261	.2 0.2952	4 0.3299	7 0.3654	.2 0.3997	[CONVOL	- - -	11 0.4173	10.8 0.4173
] [.O2UGR [%] 25 [] [BDFAKT]	[cozm]	7 11.9	7.1 11.8 6.9 12	6.5 12.3	6.9 11.8	8.6 11.8	.1 11	6.8 11	6.7	.3 11	6,8 11.7	6.6	[co2]	[%]	8.1	8.1 10
R] [.020GR] [%] 10 25 U] [CONVOL] [6]	U] [02M]						17 7			45 7			J] [02]	[%]	36 8	
[HUMID] [COZMAX] [TRGUGR] [.020GR] [.02UGR] [.WHUGR] [Start] [		0.301 0.303	o	1.19 1.202	.492 1.507	1.8 1.819	2.095 2.117	2,394 2,418	2.693 2.721	14 3.045	3.333 3.367	34 3.671	[vH] [TGVNMD] [TGVNGU] [02] [F]	[m/s] [m3] [m3] [] [] [] [] [m3]	3,836	3,798 3.836
11D] [CO2M/ 33] [%] 122 at] [TGVNN im] [m3]	[TGVNN	15.4 0.3	15 0.S96 14.9 0.891	15.2 1.	15.3 1.4	15.1	15 2.0	15.1 2.3	15.2 2.6	16.3 3.014	16.3 3.3	15.4 3.634	(TGVNN	[m3]	15.5 3.798	15.6 3.7
[.HUMID] [.g/m3] 12 [MDurat] [.hh:mm]	] [mHv] [s/m]	· ਜਾਂ	ਜੰ	Ţ	H	Ţ		1	<b>-i</b>	ű	Ţ	1	[Hv]	[s/m]	H	Ħ
е 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	; ;; ; ;	7 61	ا 6 1 6	-1 6t	-1 6:	1 6t		_ _ 6:	٦ 6	기 6t	J 6:	J 6t	×	×	× 50	× 50
Startrecord: 10-05-16/08:49 Endrecord:	Runtimerecord:	10-05-16/09:19	10-05-16/09:49	10-05-16/10:49	10-05-16/11:19	10-05-16/11:49	10-05-16/12:19	10-05-16/12:49	10-05-16/13:19	10-05-16/13:49	10-05-16/14:19	10-05-16/14:49	Eventrecord:		10-05-16/15:05	10-05-16/15:05

FA events during measurement: 0

Total FA time ....: 0:00 h:min Total Fire on time: 6:19 h:min

COVANTA CANADA - STACK UNIT 1 Amesa_860142-P86.020.3-11.05.2016-15:02

Cartridge box no..: 1 Cartridge box name: COVANTA - STACK 1

Measurement no. 20

0		[Reason] [] Manual command 14: unknown
_		[]
[NGUP] [ISORAT] [MPSTAT] [MTRG] [MVH] [lcpres] [.leakr] [] [hPa] [Grd.C] [m/s] [hPa] [SLM] 474 99.96 986.5 143 16.09 135.5	[TCF] [ISORAT] [Substi [AW] [ded.] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [.	[BDFAKT] [PGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TCL] [TCS] [TCF] [ISORAT] [Subst[AW] [TC] [TCF] [TCF] [ISORAT] [Subst[AW] [] [
MPSTAT]	TCF]  TCF	TCF] [ .Grd.C] [ 1600
[ISORAT] [ [] [	Grd.C    G	[Tcs] [Tcr] [.Grd.C] [.Grd.C] 4 1600 160 4 1600 160
[.NGUP] [] 474	[Grd.C] 34 34 34 34 34 34 34 34 34 34 34 34 34	TC1] [ Grd.C] [ 34 34
o 55 5	[Grd.C] 31 30.2 30.2 30.2 30.2 30.2 30.2 30.2 29.8 29.8 29.8 29.8	[.Grd.C] 30
[lcpres] [.leakr] [hPa] [sLM] 136.2 0 [Substi [AM] [Substi [AM] [] 2	[Grd.C] [Grd.C	[TRGMIN] [TRGMAX] [TKTMAX] [TCJ] [.Grd.C] [.Grd.C] [.Grd.C] [.Grd.C] 25 142 142 30 25 142 142 30
	('Grd.C) 140 143 143 144 141 141 142 143 143 143	[TRGMIN] [.Grd.C] 142 142
al lbst	[Teu] [.Grd.c] 25 25 25 25 25 25 25 25 25 25 25 25 25	[TGU] [.Grd.C] 25 25
	[] [PGU] [TGU] [T	[PGU] [TGU] [hPa] [.crd.C] 926.8 1027.2
] [Start] [] 1 .manual G] [MO2] [%]	[FM] [.g/m3] [116.9 1116.9 1118.5 1118.7 1119.8 82.2 1119.8 1120.6 1120.6	[F] [g/m3] 119 118
[.vHuGR] [m/s] ) 1 [MH2ORG [.g/m3]	[CONVOL] [] 0.0361 0.0361 0.01079 0.14079 0.2167 0.2167 0.2189 0.3509 0.3509	[CONVOL] [] [1.8 0.4297
[HUMID] [CO2MAX] [TRGUGR] [.020GR] [.VHUGR] [Start] [/s] [MH2ORG] [M02] [MDIrat] [TGVNMD] [TGVNGU] [BDFAKT] [MH2ORG] [M02] [/s] [.		[%]
[%] 0 2. 1 [CONVOL. [1] 2 0.4	[2M] [36] 9 6.7 6.7 8 8 6.8 6.9 6.7 7 6.7 7 6.7 7 6.7 9 6.9 9 6.5 9 6.5 9 6.5 9 6.5 9 6.5 9 6.5 9 6.5 9 6.5 9 6.5 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	] [02] [%] 2 6.8 2 6.8
() [TRGUGR [.Grd.c] 5 1 5 1 [TGVNGU [m3] 5 3.93	[m3] 4 (0.319) 3 (0.644) 9 (0.644) 9 (1.293) 1 (1.293) 1 (1.293) 1 (1.293) 2 (1.293) 4 (2.267) 4 (2.267) 8 (2.293) 8 (2.293) 8 (3.231) 8 (3.231) 8 (3.231)	o] [TGVNGU] [m3] 5 3.932 5 3.932
[%] [%] [%] [.] [m3] [m3] [m3]	[TGVNMD] [m3] 6 0.314 2.0 0.633 3.1 0.95 9 1.887 8 1.289 9 1.897 8 2.224 6 2.538 6 2.585 7 3.488	[TGVNMD] [T [m3] [ 7 3.855 8 3.855
(.HUMID) [g/m3] 117 [MDurat] (.hh.mm]	[m/s] [m/s] 16 16 16.1 16.2 16.3 15.9 15.9 15.9 16.2 16.2	[vH] [ [m/s] [. 15.7 15.8
24 S S S S S S S S S S S S S S S S S S S	Hermony 2	×××× 888
Startrecord: 11-05-16/08:24 Endrecord: 11-05-16/14:31	Runtimerecord: 11-05-16/08:54 11-05-16/09:24 11-05-16/10:25 11-05-16/11:24 11-05-16/11:24 11-05-16/12:24 11-05-16/12:24 11-05-16/12:24 11-05-16/12:24	Eventrecord: 11-05-16/14:28 11-05-16/14:28

FA events during measurement: 0

Total FA time .....: 0:00 h:min Total Fire on time: 6:07 h:min

COVANTA CANADA - STACK UNIT 2 Amesa_860154-P86.020.3-11.05.2016-15:02

Cartridge box no..: 1 Cartridge box name: COVANTA - STACK 2

Measurement no. 18

		0														[Reason]	[]	Manual command	14: unknown
			[FA]		1	1	í	i	F	ı	1	i	ı	1	1	[FA]	[]	t	ţ
Edocati (LAMA ) Experts (Expert) Experts (Edocated)	[hPa] [.Grd.C] [m/s] [hPa]	17.29 145.1	(BDFAKT) [PGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TC1] [TC3] [TCF] [ISORAT] [Substi [AW]	00 51	66'66	100,01	100	100	66.66	100.02	.00.02		99.97	100.04	100	[BDFAKT] [PGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TC1] [TC5] [TCF] [ISORAT] [Substi [AW]	[] []	100.02	100.02
COL	[.Grd.C]	142.3	[ISORAT] [	99 51	99.99	100,001	100	100	99.99	100.02	100.02	99.98	99.97	100.04	100	[ISORAT]	_		100.02
; ; ; ;	[hPa]	974.5	[TCF]	1.01d.c.J	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	[TCF]	[.Grd.C]	1600	1600
	[]	96.66	[TCS]	[.GIQ.C]	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	[TCS]	[.Grd.C] [.Grd.C]		1600
	[]	528	[Tc1]	[.dia.c.]		36	37	37	37	37	37	37	37	36	36	[TC1]	[.Grd.c]	36	36
[.leakr] [SLM] 45 0	.[]	1	[TKTMAX]	[.Grd.c] [.Grd.c] [.Grd.c]			31	31	31	31.1	31.5	31.5	31.2	30.9	31	[TKTMAX]	[] [.Grd.C] [.Grd.C] [.Grd.C] [.Grd.C] [.Grd.C]	31	31
[lcpres] [.leakr] [sLM] [SLM]	[]	2	[TRGMAX]			144	143	143	. 143	142	142	141	. 142	144	145	[TRGMAX]	[.Grd.C]	145	145
ti [AW] [] 	[v]	7	[TRGMIN]	[.era.c.]			5 142	5 142	5 141	5 142	5 139	5 139	5 141	5 142	5 144	[TRGMIN]	[.Grd.C]	5 145	5 145
[DW] [Substi [AW] [mm] [	[]	/c .manuaí	[TGU]	[nPa] [.ord.c.]			7 2!	2 2	6 26	5 26	5 26	9 26	3 26	5 26	8 26	[TGU]	[.Grd.C]	3 26	1 26
[DW]	[%] [] []	11.6 06-05-16/C .manual	[PGU]		5 835.8		5 842.7	4 841.2	3 839,6	3 845	4 851.6	4 841.9	3 823	3 843.5	3 842.8	[PGU]	[hPa]	3 847.3	3 998.1
[End] [] .manual	[.wicoz]	6 11.	[BDFAKT]	]			3 0.755	8 0.754	6 0.753	5 0.753	8 0.754	8 0.754	8 0.753	3 0.753	2 0.753	[BDFAKT]		8 0.753	9 0.753
[Start] [] 1 .manual	[%]	7 6.6	] [FM]	[g/m3]	, 117.6 5 117.6		7 115.3	7 121.8	2 80.6	9 115	6 113.8	4 118.8	5 118.8	2 111.3	4 112	E5	[g/m3]	8 108	8 109
[.VHUGR] 	[g/m3]	3 112.8	[CONVOL	[]	7 0.0337 8 0.0725		6 0.1417	2 0.1797	3 0.2052	6 0.2409	4 0.2746		9 0.3475		2 0.4154	[CONVOL	[····]	10.8 0.4258	11 0.4258
[.HUMID] [CO2MAX] [TRGUGR] [.020GR] [.02UGR] [.WHUGR] [Start] [%] [%] [	MDURAI    IGVNANI    IGVNACU    BDFAN    IMHZOKG   MOZ    [MDTAN  ]   [MZ]   [	4.168 3.987 0.43 0.753 112.87	vHm] [TGVNMD] [TGVNGU] [O2M] [CO2M] [FM]	···	6.6 11.8		6.8 11.6	5.9 12.	.7 11.	.6 11.6	.6 11.4	4 11.9	4 11.9	.1 11.2	7 11.2	[vH] [TGVNMD] [TGVNGU] [02] [CONVOL] [F]	[m3] [m3] [m3] [] [m3] [m3]	5 10.	7.5 1
() [.020GR] [%] 10 2		37 0.4	J [02M]	[%]			.3		5.1 6.7	9	12 6.	9	9	.6 7.	1	[02]	[%]	7 7.	
X] [TRGUGF [.Grd.C] 5	UJ [16VNGU [m3]	36.8	D] [TGVNGL	m3]	27 0.523		59 1	1.628	1.961	92 2.288	72 2.602	51 2.919	3.248	38 3.576	58 3.891	D] [TGVNGL	[m3]	3.987	4.168 3.987
)] [CO2MA [%] 17	[] [!m3]	4.1	(TGVNM	[m3]	755.0 4.757	7.5 1.025	1.359	7.7 1.701	7.1 2.05	17.5 2.392	16.6 2.72	16.9 3.051	17.7 3.396	17.5 3.738	16.9 4.068	[TGVNM	[m3]	16.7 4.168	17 4.16
[g/miD]	[.hh:mm	6:09	[vHm]	[:m/s]	17	17.	17	17	17.1	17	16	16	17.	17.	16	[Hv]	[m/s]	16	, 1
<b>აი</b> ა ა	ш	ш	٦ 	ـ ـ						1	ب.	7	_	ب.		×	×	×	×
Startrecord: 06-05-16/08:48	Endrecord:	06-05-16/15:00	Runtimerecord:	4	06-03-16/09:18	06-05-16/10:18	06-05-16/10:48	06-05-16/11:18	06-05-16/11:48	06-05-16/12:18	06-05-16/12:48	06-05-16/13:18	06-05-16/13:48	06-05-16/14:18	06-05-16/14:48	Eventrecord:		06-05-16/14:57	06-05-16/14:57

FA events during measurement: 0

Total FA time .....: 0:00 h:min Total Fire on time: 6:12 h:min

COVANTA CANADA - STACK UNIT 2 Amesa_860154-P86.020.3-11.05.2016-15:03

Cartridge box no..: 1 Cartridge box name: COVANTA - STACK 2

Measurement no. 19

																	[Reason] [] Manual command 14: unknown
		[,leakr] [SLM]	0	[FA]	. 1	ı	i	i	ı	ı	ı	ı	ı	ı	i	ı	[]
		[.NGUP] [ISORAT] [MPSTAT] [MTRG] [MVH] [lcpres] [.leakr] [] [] [hPa] [.Grd.C] [m/s] [hPa] [SLM]	984.8 140 16.39 146.7	[ISORAT] [Substi [AW]	Ö	1600 100.01	1600 99.96 Mainten	1600 100.05	1600 100.01	1600 100	1600 99.99	1600 100	1600 100	1600 99.99	1600 100.02	1600 100	[BDFAKT] [PGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TC1] [TC3] [TCF] [ISORAT] [Substi [AW] [] [hPa] [Substi [AW] [] [
		[ISORAT] [MP9	96.96	[TCS] [TCF]	1600	1600	1600	1600	1600	1600	1600	1600	1,600	1600	1600	1600	rcs] [Tc rd.C] [.Gro 1600 1600
		[.NGUP] [ISC [] [	501	("PGU) ["TGU] [TRGMIN] [TRGMAX] [אברנו] ["TCI] ["TCI] ["TCI] ["TCI] ו השם והמילו המילו המ	32	32	32	32	32	32	32	32	32	32	32	32	TC1] [] Grd.C] [.G 32 32
SLM]	0		ŀ	TKTMAX] [.	28.3	28	28.2	28.1	28	28	27.9	27.7	27.3	27.3	27.2	27.3	TKTMAX] [. .Grd.C] [. 27.4 27.4
[lcpres] [.leakr] [hPa] [SLM]	146.6	[Substi [AW]	2	[TRGMIN] [TRGMAX] [TKTMAX] [TC1]	139	140	140	140	140	140	140	141	141	141	141	141	[TRGMAX] [ [.Grd.C] [ 140 140
	ı	[NEV]	2	[TRGMIN]	139	139	139	140	140	140	140	140	141	140	140	140	[TRGMIN] [.Grd.C] 140 140
[.End] [DW] [Substi [AW]	S		.manual	[TGU]	26	25	25	25	25	25	25	25	25	26	25	25	[TGU] [.Grd.C] 25 25
[Dw]	S	[.MCO2] [Paramacct [.End.] [%] [] []	11.6 09-05-16/C .manual	[BDFAKT] [PGU] [TGU]	862.5	862.3	843.1	865.4	867.1	864.9	8.658	857	857.5	854.6	859.5	856.9	[PGU] [hPa] 856.8 1004.5
[End] []	.manual	[.MCO2] [%]		[BDFAKT]	0.781	0.778	0.777	0.775	0.775	0.776	0.775	0.775	0.774	0.774	0.773	0.773	[BDFAKT] [ [] [ 0.773 0.773
[Start] []	.manual	[M02] [%]	6.4	[FM]	120.5	114.5	101.8	99.4	116.8	115.5	118	112.9	112.5	112	112.7	114.7	[F] [g/m3] 111 114
[.vHUGR] [m/s]	₩.	[MH2ORG] [g/m3]	112.484	[CONVOL]	0.0344	0.0675	0.0959	0.1261	0.1598	0.1932	0.2278	0.2615	0.2952	0.3286	0.3626	0.3968	2] [CONVOL]   [] 11.4 0.4126 11.5 0.4126
[.o2UGR] [%]		[BDFAKT] []	. 0.773	[co2M]	12.1	11.5	11.5	11.9	11.7	11.6	11.9	11.3	, 11.3	11.2	11.3	11.5	[CO2] [( [%] [. 11.4
	121 5 10 25 0 1.manual	[MDurat] [TGVNMD] [TGVNGU] [CONVOJ] [BDFAKT] [MH20RG] [Mo2] [m3] [m3] [m] [m] [Ms]	3 0.41	vHm] [TGVNMD] [TGVNGU] [O2M] [CO2M] [CONVOL] [FM]	2 5.8	9 6,4	7.9 4	3 6.1	5.6.3	1 6.4	1 6.1	3.9	5 6.7	1 6.8	1 6.5	9.9	[VH] [TGVNMD] [TGVNGU] [O2] [C1] [F] [F] [F] [A] [F] [A]
] [TRGUGR] [.Grd.C]	5	)] [TGVNGU [m3]	3.88	)] [TGVNGU	6 0.302		8 0.914	9 1.23	9 1,535	9 1.841	5 2.151	5 2.468	9 2.785	5 3.101	3 3.421	3 3.736	rNMD] [TGVNGU]   13]   4.068   3.883   4.068   3.883
[CO2MA)		[TGVNMI	4,06	[TGVNM[	6 0.316	1 0.637	9 0.958	3 1.289	2 1.609	1 1.929	4 2.255	6 2.586	8 2.919	6 3.25	8 3.583	6 3.913	[TGVNMD] [   [m3] [   16.8 4.068   16.5 4.068
[.HUMID] [g/m3]	12	[MDurat] [.hh:mm]	6:14	[vHm]	1	16.1	15.	16.3	16.2	16.1	16.4	16.6	16.8	16,6	16.8	16.6	[vH] [m/s] 16.
νν	S	шш	ш		ר י			-1	_		_		_	_	_	٦	××××
Startrecord:	09-05-16/10:04	Endrecord:	09-05-16/16:21	Runtimerecord:	09-05-16/10;34	09-05-16/11:04	09-05-16/11:34	09-05-16/12:04	09-05-16/12:34	09-05-16/13:04	09-05-16/13:34	09-05-16/14:04	09-05-16/14:34	09-05-16/15:04	09-05-16/15;34	09-05-16/16:04	Eventrecord: 09-05-16/16:18 09-05-16/16:18

FA events during measurement: 0

Total FA time ....: 0:00 h:min Total Fire on time: 6:17 h:min

COVANTA CANADA - STACK UNIT 2 Amesa_860154-P86,020.3-11.05.2016-15:03

Cartridge box no..: 1
Cartridge box name: COVANTA - STACK 2

Measurement no. 20

													[Reason] [] Manual command 14: unknown
[.leakr] [5LM]	[FA] []	ī	i	1 1	ı	ş	1	ı	ì	ı	ı	1	[FA]
[lcpres]	. 147.1 i [Aw] . []	,	1	1 1	3	1	1	1	1	1	1	1	i[AW]
11	11.4 10-05-16/C.manual 2	99.51	100	100	100	100	100.01	100	99,99		001	100	DRAT] [Substi ] [
[MTRG]	140.3 [ISORAT] []	99.51								•	•		[ISORAT] [] 100.01
[MPSTAT] [hPa]	990.1 [TCF] [ [.Grd.C] [	1600	1600	1600	1600	1600	1600	1600		1600	1600	1600	[TCF] [.Grd.C] 1600
[ISORAT]	99.96 [TCS] [.Grd.C]	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	[TCS] [.Grd.C] 1600 1600
	508 [TC1] [.Grd.C]	33	33	34	34	34	34	34	34	34	34	35	[TC1] [.Grd.C] 35 35
[.leakr] [SLM] 0 [[AW] . []	2	29.4	29.1	29.4	29.2	29.3	29.5	29.5		29.6	29.6	29.7	[TKTMAX] [.Grd.C] 29.8 29.8
[lcpres] [.leakr] [hPa] [SLM] 148.1 [Substi [AW] [	2] [] [TRGMAX] [TKTN [.Grd.C] [.Grd.	140	140		141	141	140	141	140	141	142	142	[TRGMAX] [.Grd.C] 142 142
	2 [TRGMIN] [.Grd.C]	140	139	139	140	140	140	140	140	140	141	141	[TRGMIN] [.Grd.C] 142 142
[DW] [Substi [AW [mm] [[] 5	10-05-16/C .manual [PGU] [TGU] [hPa] [.Grd.Cl	25	25	25	25	25	25	25	25	25	25	25	[TGU] [.Grd.C] 25 25
[bW] [Substi [AW] [mm] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] [] []	11.4 10-05-16/C .manual .kT] [PGU] [TGU] hPa] [.Grd.Cl	882	877.1	874	874.6	878.3	879.5	876.6	870.1	867.8	866.6	866	[PGU] [hPa] 870.3 1017.8
[End] [] .manual [.MCO2] [%]	11.4 [BDFAKT] []	0.793	0.79	0.789	0.788	0.786	0.786	0.786	0.786	0.785	0.784	0.784	[BDFAKT] [] 0.783 0.783
	^	7	117.8	116,9	117.8	81,9	113.5	113.1	112	109.4	115	111.8	[F] [g/m3] 107 110
[.vHUGR] [m/s] 1 [MHZORG] [g/m3]	111.629 [CONVOL]	0.0338	0.0688	0.1373	0.1726	0,1982	0.2319	0.2659	0.2992	0.3328	0.3683	0.4028	02] [CONVOL] %] [] 10.9 0.4194 11 0.4194
[.o2uGR] [%] 0 [BDFAKT] []	0.783 [co2M] [%]	11.4	11.8	11.7	11.8	11.2	11.4	11.4	11.2	11	11.5	11.2	[co2] [%] 10.9
HUMID  [CO2MAX] [TRGUGR] [O2DGR] [O2UGR] [Start]   Start]   Star	0.42 [02M]	6.8	6,3	6.5	6.4	6,8	6.6	6.5	7.1	7.2	6.4	7.1	[92] [. [%] ]. 7.4 7.4
[TRGUGR] [.Grd.C] 10 [TGVNGU] [m3]	3.982 [TGVNGU]	0.315	0.627	1.251	1.568	1.894	2.207	2.525	2.84	3.166	3.492	3.82	[TGVNGU] [ [m3] [ 3.982 3.982
[CO2MAX] [%] 5 [TGVNMD] [m3]	4.169 [TGVNMD]	0.329	0.656	1.31	1.642	1.983	2.312	2.645	2,974	3.315	3,656	3,999	[TGVNMD] [TG   [m3] [1   17 4.169  7.2 4.169
[.HUMID] [COZMAX] [TRGUGR] [.O2UGR] [.VHUGR] [Start] [%] [%] [%] [%] [%] [] [] [112 5 10 25 0 1manual [Mburat] [TGVNMD] [TGVNGU] [CONVOL] [BDFAKT] [MH2ORG] [02] [m3] [] [] [%]	6:15 4.169 3.982 0.42 0.783 111.629 6.  [vHm] [TGVNMD] [TGVNGU] [c2M] [c2M] [FM] [n4] [m3] [m3] [5] [5]	16.5	16.4	16.5	16.7	16.4	16.4	16,6	16.4	17	17.1	17.2	[vH] [TGVNMD] [TGVNGU] [02] [02] [CONVOL] [F] [BDFAKT] [FGU] [TGU] [TRGMIN] [TRGMAX] [TKTMAX] [TC1] [TC5] [TC5
о о о о	E E	·	. L	- t - t	4 .	<b>4</b>	4	4 L	4	4	4	4 L	× × × ×
Startrecord: 10-05-16/08:54 Endrecord:	10-05-16/15:12 Runtimerecord:	10-05-16/09:24	10-05-16/09:54	10-05-16/10:24	10-05-16/11:24	10-05-16/11:54	10-05-16/12:24	10-05-16/12:54	10-05-16/13:24	10-05-16/13:54	10-05-16/14:24	10-05-16/14:54	Eventrecord: 10-05-16/15:09 10-05-16/15:09

FA events during measurement: 0

Total FA time .....: 0:00 h:min Total Fire on tíme: 6:18 h:min