

2019 SOURCE TESTING

Eco Waste Incinerators – Port Milne and Mary River
Port Milne and Mary River, Nunavut
Project # TC190713

Prepared for:

Baffinland Iron Ore Corporation

2275 Upper Middle Road East, Suite 300, Oakville, ON L6H 0C3

23-Oct-19

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Prepared for:

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2275 Upper Middle Road East, Suite 300, Oakville, ON L6H 0C3

Prepared by:

Wood Environment & Infrastructure Solutions
160 Traders Blvd. E
Suite 110
Mississauga, ON L4Z 3K7
Canada
T: 905-568-2929

23-Oct-19

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Executive summary

Baffinland Iron Ore Corporation (Baffinland) retained Wood Environment & Infrastructure Solutions (Wood) to conduct performance source testing on two Eco Waste Incinerators located in Mary River and Port Milne on Baffin Island, Nunavut. Testing was performed in order to ensure that Baffinland was meeting its obligations to the Nunavut Government.

The program was designed to measure incinerator emissions of total suspended particulate (TSP), mercury, and dioxins and furans (D/F). In-stack concentrations were calculated for these contaminants and compared against the Canadian Council of Minister of the Environment Canada-Wide Standards (CWS).

Testing was conducted from 18 August 2019 to 21 August 2019 at the Port Milne site, and from 23 August 2019 to 25 August 2019 at the Mary River site.

The testing results are summarized in Tables ES.1 to ES.3. Measurements were carried out in August of 2019. Sampling, analysis and reporting procedures were followed as per the Ontario Source Testing Code (OSTC) and U.S. Environmental Protection Agency (U.S. EPA) methods.

This report is subject to the Appended Statement of Limitations.

Table ES.1: Average Stack Gas Characteristics

Source	Flow (DRm ³ /s)*	Oxygen (% dry)	Carbon Dioxide (% dry)	Moisture (%)	Stack Temp. (°C)
Eco Waste – Mary River	1.11	13.5%	5.72%	6.08%	713
Eco Waste – Port Milne	0.828	15.4%	4.67%	6.99%	532

*DRm³ = Dry reference cubic metres (25°C, 101.3 kPa)

Table ES.2: Mary River Incinerator - Summary of In-Stack Limits

Contaminant	Units	In-Stack Concentration*	CWS Criteria	% Of Criteria
TSP	mg/DRm ³	13.24	N/A	N/A
Mercury	µg/DRm ³	0.013	20	0.06%
Dioxin/Furan TEQ	pg/DRm ³	393	80	491%

*Average of three tests, corrected to 11% O₂

Table ES.3: Port Milne Incinerator - Summary of In-Stack Limits

Contaminant	Units	In-Stack Concentration*	CWS Criteria	% Of Criteria
TSP	mg/DRm ³	61.89	N/A	N/A
Mercury	µg/DRm ³	0.567	20	2.84%
Dioxin/Furan TEQ	pg/DRm ³	4498	80	5622%

*Average of three tests, corrected to 11% O₂



Table of contents

1.0 INTRODUCTION 1
 1.1 Summary of Test Program..... 1
 1.2 Test Program Organization 2
2.0 SOURCE DESCRIPTION 3
3.0 TEST PROGRAM..... 4
 3.1 Objectives..... 4
 3.2 Test Matrix 5
4.0 SAMPLING LOCATIONS 6
5.0 SAMPLING AND ANALYTICAL PROCEDURES..... 7
 5.1 Total Suspended Particulates and Mercury 7
 5.2 Dioxins/Furans..... 8
 5.3 Combustion Gases..... 9
6.0 RESULTS..... 10
 6.1 Schedule of the Test Program 10
 6.2 Test Results..... 11
7.0 CLOSURE 15



List of tables

Table 1: Test Contaminants.....	1
Table 2: Test Matrix.....	5
Table 3: Mary River Test Schedule.....	10
Table 4: Port Milne Test Schedule	10
Table 5: Summary of Stack Gas Characteristics – Mary River	11
Table 6: Summary of Stack Gas Characteristics – Port Milne.....	12
Table 7: Summary of In-Stack Concentrations – Mary River.....	12
Table 8: Summary of In-Stack Concentrations – Port Milne	12
Table 9: Testing Results: TSP/Mercury – Mary River.....	13
Table 10: Testing Results: TSP/Mercury – Port Milne.....	13
Table 11: Testing Results: Dioxins/Furans – Mary River	13
Table 12: Testing Results: Dioxins/Furans – Port Milne.....	14

List of Appendices

Appendix A	Test Data and Calculations
Appendix B	Laboratory Certificates of Analysis
Appendix C	Raw Sampling Data
Appendix D	Calibration Sheets
Appendix E	Statement of Limitations



1.0 INTRODUCTION

Baffinland Iron Ore Corporation (Baffinland) retained Wood Environment & Infrastructure Solutions (Wood) to conduct performance source testing on two Eco Waste Incinerators located in Mary River and Port Milne on Baffin Island, Nunavut. Testing was conducted from 18 August 2019 to 21 August 2019 at the Port Milne site, and from 23 August 2019 to 25 August 2019 at the Mary River site.

The incinerator exhausts were tested for the following contaminants:

- Emission flow rates within the duct;
- Total suspended particulate matter (TSP);
- Mercury;
- Dioxins and furans; and
- Combustion gases (O₂, CO₂).

The incinerators are used to burn various wastes including personal domestic waste, kitchen waste, dewatered sewage sludge, paper, packaging, lumber and textiles, documents, occasional tires and clinical and medical waste.

The program was designed to measure the incinerators' emissions. In-stack concentrations were calculated for the above contaminants and compared against the Canadian Council of Ministers of the Environment Canada-Wide Standards (CWS).

Sampling, analysis and reporting procedures were followed as per the Ontario Source Testing Code (OSTC).

1.1 Summary of Test Program

The test contaminants included in this program and the corresponding testing protocols are listed below in Table 1.

Table 1: Test Contaminants

Test Contaminant	Sampling Method	Analytical Method
Flow Rate	OSTC Methods 1 – 4	N/A
Total Suspended Particulate (TSP)	OSTC Method 5	Gravimetric
Metals	U.S. EPA Method 29	ICAP, CVAAS
Dioxins / Furans	Env. Canada EPS 1/RM/2	EPS 1/RM/3 HRMS
Oxygen/Carbon Dioxide (O ₂ /CO ₂)	U.S. EPA Method 3A	Electrochemical / Non-dispersive Infrared

Note: EPA 40CFR60 – United States Environmental Protection Agency
EPS – Environment Canada's Environmental Protection Series
OSTC – Ontario Source Testing Code

1.2 Test Program Organization

- 1) Company Name: Baffinland Iron Ore Corp
Mary River Mine Site
Company Address / Plant Location: Baffin Island, Nunavut
Contact Name: William Bowden
Position: Project Manager
Telephone No.: 647-253-0596 x6016
Email: William.bowden@baffinland.com

- 2) Sampling Company: Wood Environment & Infrastructure Solutions
Project Coordinator: Steve McClure
Telephone No.: (905) 568-2929
Fax No.: (905) 568-1686
Email: steve.mcclure@woodplc.com
Sampling Team: Ozgun Kizilkaya, Steve McClure

- 3) Analytical Laboratory: ALS Global
Project Coordinator: Ron McLeod
Telephone No.: (905) 331-3111



2.0 SOURCE DESCRIPTION

Baffinland operates two dual chambered diesel fired Eco Waste incinerators, one each at Port Milne, and one at the Mary River site, in Nunavut. At each incinerator, wastes are manually loaded into the primary chamber whose function is to perform pyrolysis and gasification, and combustion of fixed carbon. The secondary chamber completes the combustion, and ensures that black soot is not released from the exhaust stack. The incinerator capacity is 2000kg per day.

Normal operation of the incinerators includes:

- loading waste into the primary chamber,
- pre-heating of the secondary chamber to a fixed set point
- firing the primary once the secondary chamber has achieved the set point temperature.

Once firing of the primary chamber has begun and combustion was established, emissions testing at the stack commenced.

3.0 TEST PROGRAM

3.1 Objectives

The purpose of the test program was to establish whether the performance of the installed equipment (Eco-Waste incinerator) meets emission guarantees.

Test objectives include the following:

- Measurement of the exhaust gas characteristics and emission rates of the contaminants; and
- Comparing in-stack concentrations to the Canada-Wide Standards for mercury and dioxins/furans.

3.2 Test Matrix

The test matrix for this program is provided below in Table 2.

Table 2: Test Matrix

No. of Runs / Unit	Sample/ Pollutant	Method Number	Sample Run (min)	Analytical Method	Analytical Laboratory
3	Particulate Matter / Hg	OSTC 5 EPA M29	120	Gravimetric ICP, CVAAS	ALS Global
3	Dioxins / Furans	EPS 1/RM/2	180	GC/HRMS GC/MS	ALS Global
6	O ₂ and CO ₂	EPA Method 3A	120/180	Electrochemical	Wood Analyzer



4.0 SAMPLING LOCATIONS

Gas streams emitted from the incinerators are discharged through a stack having an exit diameter of 0.80m. Figure 1 displays the incinerator and sampling location.

The isokinetic sampling locations are located as follows:

Port Milne:

ID: 0.80 m

Distance to upstream disturbance: approximately 4 diameters

Distance to downstream disturbance: >2 diameters

Only one traverse was tested due to port access issues.

For isokinetic tests, a total of six (6) sampling points (six (6) per traverse) were tested.

Mary River:

ID: 0.80 m

Distance to upstream disturbance: approximately 4 diameters

Distance to downstream disturbance: >2 diameters

For isokinetic tests, a total of six (6) sampling points (six (6) per traverse) were tested.

5.0 SAMPLING AND ANALYTICAL PROCEDURES

5.1 Total Suspended Particulates and Mercury

Sampling for total suspended particulate matter and trace metals was conducted with a single isokinetic sampling train based on Method 5 of the Ontario Source Testing Code and EPA Method 29. A pre-tared quartz filter with low metal traces was used. The standard Method 5 train was modified to include the following impinger solutions from U.S. EPA Method 29 for metals:

- Impinger 1 100 ml of 4% KMnO_4 / 10% H_2SO_4
- Impinger 2 100 ml of 4% KMnO_4 / 10% H_2SO_4
- Impinger 3 Empty
- Impinger 4 Silica Gel

The sampling time per test, excluding port changes, leak checks or process interruptions, was 120 minutes. Triplicate test runs were conducted. Each traverse point was sampled for 10 minutes. At 5-minute intervals throughout each test, the following information was measured and recorded for the modified Method 5 Train:

- 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 pressure

The sampling equipment consisted of a Method 5 train equipped with an air cooled quartz probe. Velocity measurements were taken using a pre-calibrated S-type pitot assembly in conjunction with an inclined manometer. Temperature measurements were made with a K-type thermocouple in conjunction with a digital thermometer. Sample volumes were determined with positive displacement dry gas meters. The gas meters were calibrated prior to the test program using a reference laboratory gas meter.

Following the conclusion of each test, the probe and sampling train were disassembled and recovered at a clean location on site. Particulate weights were determined by measuring the weight gain of the particulate filter along with the weight of the residue collected within the probe liner with an acetone probe rinse. Combined, these values represent the total suspended particulate catch per test.

In accordance with OSTC Method 5, all filters were desiccated for a period of 24 hours prior to weighing and acetone from all probe rinses was evaporated to dryness so as to avoid including any unnecessary moisture in the overall sample weight.

Mercury analyses on each sample were performed by the selected CALA accredited laboratory following U.S. EPA Method 29 using Cold Vapour Atomic Absorption Spectroscopy (CVAAS) analysis.

5.2 Dioxins/Furans

Sampling for dioxins and furans was conducted using a single isokinetic sampling train in accordance with the "Reference Method for Source Testing: Measurement of Releases of Selected Semi-Volatile Organic Compounds from Stationary Sources", Environment Canada Report EPS 1/RM/2. Performance of the method involved the use of an integrated sampling train consisting of a quartz filter (pre-rinsed with a Hexane/Acetone solution), condenser, polymeric resin trap (XAD-2), and impingers. The use of the condenser ensured that the sample gas passing through the XAD-2 resin trap was maintained at a temperature below 20°C.

All glassware, filters and resin used for this program were proofed prior to the performance of the sampling program in order to ensure no background organic contamination.

The sampling time per test, excluding port changes, leak checks or process interruptions, was 180 minutes and the sample volume exceeded 3.0 dry reference m³. Triplicate test runs were conducted. The source gas was collected using an air cooled quartz probe and then passed through the filter, condenser, XAD-2 resin, and impingers in sequence.

The front half of the impinger train, filter, resin, condensate trap and impinger contents were recovered as per the procedures outlined in the method for subsequent analysis according to the Environment Canada Method EPS 1/RM/3.

The Toxic Equivalency (TEQ) was calculated for dioxins and furans using the World Health Organization 2005 Toxic Equivalency Factors.

5.3 Combustion Gases

For the purpose of determining molecular weight and to correct for oxygen content, testing for O₂ and CO₂ was conducted. Sample gas was measured with every isokinetic reading throughout the sampling period following a modified US EPA Method 3A. Analyzer calibrations were conducted with US EPA Protocol 1 calibration gas.

As per the Canada-Wide Standards, the sample concentrations were corrected to 11% oxygen.



6.0 RESULTS

6.1 Schedule of the Test Program

The sampling program was conducted from 18 August 2019 to 25 August 2019 per the following schedule:

Table 3: Mary River Test Schedule

Test ID	Date	Start	Finish
ORG-1	23-Aug-19	8:23	11:23
ORG-2	24-Aug-19	13:14	16:14
ORG-3	25-Aug-19	11:01	14:01
MET-1	23-Aug-19	10:39	12:39
MET-2	24-Aug-19	16:42	18:42
MET-3	25-Aug-19	14:27	16:29

Table 4: Port Milne Test Schedule

Test ID	Date	Start	Finish
ORG-1	18-Aug-19	13:12	16:12
ORG-2	19-Aug-19	7:24	10:24
ORG-3	20-Aug-19	9:58	12:58
MET-1	18-Aug-19	16:39	18:40
MET-2	20-Aug-19	10:59	12:59
MET-3	21-Aug-19	13:27	15:27



6.2 Test Results

Results of the sampling program can be found within Tables 5 to 12. Calculations are shown in Appendix A. Field data sheets can be found in Appendix C.

These results are subject to the Appended Statement of Limitations (Appendix E).

Table 5: Summary of Stack Gas Characteristics – Mary River

Test ID	Flow (DRm ³ /s)*	Oxygen (% dry)	Carbon Dioxide (% dry)	Moisture (%)	Stack Temp. (°C)
ORG-1	1.08	11.6%	6.84%	7.65%	828
ORG-2	1.09	13.9%	5.40%	5.15%	739
ORG-3	1.18	13.3%	6.06%	6.92%	731
Average	1.12	12.9%	6.10%	6.58%	949
MET-1	1.15	13.0%	6.08%	6.16%	668
MET-2	1.10	14.9%	4.74%	4.93%	646
MET-3	1.06	14.3%	5.20%	5.69%	665
Average	1.10	14.1%	5.34%	5.59%	659
Total Average	1.11	13.5%	5.72%	6.08%	713

*DRm³ = Dry reference cubic metres (25°C, 101.3 kPa)

Table 6: Summary of Stack Gas Characteristics – Port Milne

Test ID	Flow (DRm ³ /s)*	Oxygen (% dry)	Carbon Dioxide (% dry)	Moisture (%)	Stack Temp. (°C)
ORG-1	0.855	14.7%	5.47%	8.89%	563
ORG-2	1.03	14.1%	5.57%	7.90%	618
ORG-3	0.877	14.6%	5.14%	8.34%	534
Average	0.923	14.5%	5.39%	8.37%	572
MET-1	0.842	16.5%	3.87%	6.01%	483
MET-2	0.836	16.3%	3.90%	5.29%	500
MET-3	0.805	16.1%	4.07%	5.49%	495
Average	0.828	16.3%	3.94%	5.60%	493
Total Average	0.875	15.4%	4.67%	6.99%	532

*DRm³ = Dry reference cubic metres (25°C, 101.3 kPa)

Table 7: Summary of In-Stack Concentrations – Mary River

Contaminant	Units	In-Stack Concentration*	Criteria	% Of Criteria
TSP	mg/DRm ³	13.24	N/A	N/A
Mercury	µg/DRm ³	0.013	20	0.06%
Dioxin/Furan TEQ	pg/DRm ³	393	80	491%

*Average of three tests, corrected to 11% O₂

Table 8: Summary of In-Stack Concentrations – Port Milne

Contaminant	Units	In-Stack Concentration*	Criteria	% Of Criteria
TSP	mg/DRm ³	61.90	N/A	N/A
Mercury	µg/DRm ³	0.567	20	2.84%
Dioxin/Furan TEQ	pg/DRm ³	4498	80	5622%

*Average of three tests, corrected to 11% O₂



Table 9: Testing Results: TSP/Mercury – Mary River

Compound	CAS	Test 1 (g/s)	Test 2 (g/s)	Test 3 (g/s)	Average (g/s)
TSP	N/A	0.010	0.004	0.0158	0.010
Mercury	7439-97-6	5.66E-09	1.61E-08	5.29E-09	9.03E-09

Table 10: Testing Results: TSP/Mercury – Port Milne

Compound	CAS	Test 1 (g/s)	Test 2 (g/s)	Test 3 (g/s)	Average (g/s)
TSP	N/A	0.029	0.023	0.020	0.024
Mercury	7439-97-6	2.51E-07	1.41E-07	2.62E-07	2.18E-07

Table 11: Testing Results: Dioxins/Furans – Mary River

Compound	CAS	Test 1 (pg/s)	Test 2 (pg/s)	Test 3 (pg/s)	Average (pg/s)
2,3,7,8-TCDD	1746-01-6	34	7	10	17
1,2,3,7,8-PeCDD	40321-76-4	169	36	43	83
1,2,3,4,7,8-HxCDD	39227-28-6	118	22	38	59
1,2,3,6,7,8-HxCDD	57653-85-7	221	45	154	140
1,2,3,7,8,9-HxCDD	19408-74-3	247	42	118	136
1,2,3,4,6,7,8-HpCDD	35822-46-9	1535	187	865	862
OCDD	3268-87-9	2490	203	718	1137
2,3,7,8-TCDF	51207-31-9	178	72	92	114
1,2,3,7,8-PeCDF	57117-41-6	322	61	87	156
2,3,4,7,8-PeCDF	57117-31-4	602	179	242	341
1,2,3,4,7,8-HxCDF	70648-26-9	508	93	132	244
1,2,3,6,7,8-HxCDF	57117-44-9	600	99	139	279
2,3,4,6,7,8-HxCDF	72918-21-9	764	168	258	397
1,2,3,7,8,9-HxCDF	60851-34-5	184	42	63	96
1,2,3,4,6,7,8-HpCDF	67562-39-4	2270	281	507	1019
1,2,3,4,7,8,9-HpCDF	55673-89-7	278	63	83	141
OCDF	39001-02-1	1153	189	375	573
Dioxins/Furans (TEQ)	N/A	718	162	242	374



Table 12: Testing Results: Dioxins/Furans – Port Milne

Compound	CAS	Test 1 (pg/s)	Test 2 (pg/s)	Test 3 (pg/s)	Average (pg/s)
2,3,7,8-TCDD	1746-01-6	82	769	54	302
1,2,3,7,8-PeCDD	40321-76-4	318	1996	240	852
1,2,3,4,7,8-HxCDD	39227-28-6	230	1034	304	523
1,2,3,6,7,8-HxCDD	57653-85-7	433	1165	359	653
1,2,3,7,8,9-HxCDD	19408-74-3	444	1416	401	754
1,2,3,4,6,7,8-HpCDD	35822-46-9	2811	4749	4347	3969
OCDD	3268-87-9	3007	3467	10322	5599
2,3,7,8-TCDF	51207-31-9	393	3205	294	1297
1,2,3,7,8-PeCDF	57117-41-6	826	5419	563	2270
2,3,4,7,8-PeCDF	57117-31-4	1022	4371	826	2073
1,2,3,4,7,8-HxCDF	70648-26-9	959	4196	925	2027
1,2,3,6,7,8-HxCDF	57117-44-9	1148	4633	1049	2277
2,3,4,6,7,8-HxCDF	72918-21-9	1211	2736	1569	1839
1,2,3,7,8,9-HxCDF	60851-34-5	418	746	454	539
1,2,3,4,6,7,8-HpCDF	67562-39-4	2873	7168	5027	5023
1,2,3,4,7,8,9-HpCDF	55673-89-7	678	860	848	795
OCDF	39001-02-1	1596	1451	3546	2198
Dioxins/Furans (TEQ)	N/A	1322	6294	1202	2939



7.0 CLOSURE

The Wood sampling team is grateful for the cooperation of Baffinland Iron Ore during the execution of this test program. Wood looks forward to future projects together.

Yours truly,

Wood Environment & Infrastructure Solutions
a Division of Wood Americas Limited

Prepared by:

Reviewed by:



Ryan Fletcher, P Eng.
Air Quality Services
Wood
Environment & Infrastructure Solutions



Steve McClure, B.E.S.
Manger, Air Quality Services
Wood
Environment & Infrastructure Solutions



Appendix A
Test Data and Calculations

Project Number
Company Name
Location
Source
Test Type

TC190714
Baffinland Iron Mines
Mary River Mine, Baffin Island, NU
Eco Waste Incinerator
Dioxins/Furans

Test Number		ORG-1	ORG-2	ORG-3
Date		23-Aug-19	24-Aug-19	25-Aug-19
Start Time Trav. 1		08:23	13:14	11:01
End Time Trav. 1		11:23	16:14	14:01
Number of Traverses Tested		1	1	1
Gas Meter Coefficient		0.997	0.997	0.997
Pitot Tube Coefficient		0.840	0.840	0.840
Stack Diameter	feet	2.63	2.63	2.63
Nozzle Diameter	inches	0.625	0.625	0.625
Barometric Pressure	" Hg	29.14	28.98	29.24
Static Pressure	" H2O	-0.10	-0.10	-0.10
Impinger Collection				
Impinger 1	g	250	136	214
Impinger 2	g	10	3	15
Impinger 3	g	8	4	4
Impinger 4	g	6	43	28
Total		274.0	186.0	261.0

Test Number		ORG-1	ORG-2	ORG-3	Averages
Equivalent Moisture Sample Volume	rcf	13.1	8.9	12.5	
Dry Gas Sample Volume at Meter	cf	160.07	169.09	168.79	165.98
Average Meter Temp	°F	70	78	69	72
Average Meter Pressure	"H2O	1.16	1.29	1.35	1.27
Dry Ref. Sample Volume	drcf	158.37	163.93	168.04	163.45
Dry Ref. Sample Volume	drm3	4.486	4.644	4.760	4.630
Stack Area	ft2	5.41	5.41	5.41	
Nozzle Area	inches2	0.3068	0.3068	0.3068	
Stack Pressure	"Hg	29.13	28.97	29.23	29.11
Potential Saturation Moisture	%	>100%	>100%	>100%	
Dry Mol. Weight of Gas	g/gmol	29.56	29.42	29.50	29.49
Wet Mol. Weight of Gas	g/gmol	28.67	28.83	28.71	28.74
Nominal Contaminant Conc. (per analysed µg)	ug/DRm3	0.223	0.215	0.210	0.216
Nominal Contaminant Emission (per analysed µg)	g/s	2.42E-07	2.36E-07	2.49E-07	2.42E-07

STACK PARAMETERS SUMMARY

Test Number		ORG-1	ORG-2	ORG-3	Averages
Moisture Vapour Content*	% v/v	7.65%	5.15%	6.92%	6.58%
Oxygen	% v/v dry	11.57%	13.91%	13.28%	12.92%
Carbon Dioxide	% v/v dry	6.84%	5.40%	6.06%	6.10%
Argon	% v/v dry	0.08%	0.08%	0.08%	0.08%
Nitrogen	% v/v dry	81.50%	80.61%	80.57%	80.90%
Average Stack Velocity	ft/s	28.9	26.2	28.4	27.8
	m/s	8.8	8.0	8.6	8.5
Average Stack Temperature	°F	1523	1362	1348	1411
	°C	828	739	731	766
Actual Stack Flow	acfm	9377	8515	9212	9034
	am3/s	4.43	4.02	4.35	4.27
Dry Ref. Stack Flow	drcfm	2297	2321	2506	2375
	drm3/s	1.085	1.096	1.183	1.121

*Moisture Content is calculated from the lower of measured and saturation moisture (based on stack temperature)

Project Number	TC190714					
Company Name	Baffinland Iron Mines					
Location	Mary River Mine, Baffin Island, NU					
Source	Eco Waste Incinerator					
Test Type	Dioxins/Furans					
Analysis		ORG-1	ORG-2	ORG-3	Average	Criteria
Dioxins/Furans	TEQ pg	2970	687	975		
2,3,7,8-TCDD	pg	141	27.7	40.2		
1,2,3,7,8-PeCDD	pg	699	153	172		
1,2,3,4,7,8-HxCDD	pg	487	94.5	151		
1,2,3,6,7,8-HxCDD	pg	913	190	621		
1,2,3,7,8,9-HxCDD	pg	1020	177	476		
1,2,3,4,6,7,8-HpCDD	pg	6350	792	3480		
OCDD	pg	10300	861	2890		
2,3,7,8-TCDF	pg	736	307	369		
1,2,3,7,8-PeCDF	pg	1330	257	349		
2,3,4,7,8-PeCDF	pg	2490	760	973		
1,2,3,4,7,8-HxCDF	pg	2100	395	533		
1,2,3,6,7,8-HxCDF	pg	2480	418	558		
2,3,4,6,7,8-HxCDF	pg	3160	714	1040		
1,2,3,7,8,9-HxCDF	pg	760	180	254		
1,2,3,4,6,7,8-HpCDF	pg	9390	1190	2040		
1,2,3,4,7,8,9-HpCDF	pg	1150	265	332		
OCDF	pg	4770	803	1510		
Concentration						
Dioxins/Furans	TEQ pg/DRm3	662	148	205	338	
Dioxins/Furans corrected to 11% o2	TEQ pg/DRm3	703	210	266	393	80.0
2,3,7,8-TCDD	pg/DRm3	31	6	8		
1,2,3,7,8-PeCDD	pg/DRm3	156	33	36		
1,2,3,4,7,8-HxCDD	pg/DRm3	109	20	32		
1,2,3,6,7,8-HxCDD	pg/DRm3	204	41	130		
1,2,3,7,8,9-HxCDD	pg/DRm3	227	38	100		
1,2,3,4,6,7,8-HpCDD	pg/DRm3	1415	171	731		
OCDD	pg/DRm3	2296	185	607		
2,3,7,8-TCDF	pg/DRm3	164	66	78		
1,2,3,7,8-PeCDF	pg/DRm3	296	55	73		
2,3,4,7,8-PeCDF	pg/DRm3	555	164	204		
1,2,3,4,7,8-HxCDF	pg/DRm3	468	85	112		
1,2,3,6,7,8-HxCDF	pg/DRm3	553	90	117		
2,3,4,6,7,8-HxCDF	pg/DRm3	704	154	218		
1,2,3,7,8,9-HxCDF	pg/DRm3	169	39	53		
1,2,3,4,6,7,8-HpCDF	pg/DRm3	2093	256	429		
1,2,3,4,7,8,9-HpCDF	pg/DRm3	256	57	70		
OCDF	pg/DRm3	1063	173	317		
Emissions						
	TEQ pg/s	718	162	242	374	
	TEQ g/s	7.18E-10	1.62E-10	2.42E-10	3.74E-10	
2,3,7,8-TCDD	pg/s	34	7	10	17	
1,2,3,7,8-PeCDD	pg/s	169	36	43	83	
1,2,3,4,7,8-HxCDD	pg/s	118	22	38	59	
1,2,3,6,7,8-HxCDD	pg/s	221	45	154	140	
1,2,3,7,8,9-HxCDD	pg/s	247	42	118	136	
1,2,3,4,6,7,8-HpCDD	pg/s	1535	187	865	862	
OCDD	pg/s	2490	203	718	1137	
2,3,7,8-TCDF	pg/s	178	72	92	114	
1,2,3,7,8-PeCDF	pg/s	322	61	87	156	
2,3,4,7,8-PeCDF	pg/s	602	179	242	341	
1,2,3,4,7,8-HxCDF	pg/s	508	93	132	244	
1,2,3,6,7,8-HxCDF	pg/s	600	99	139	279	
2,3,4,6,7,8-HxCDF	pg/s	764	168	258	397	
1,2,3,7,8,9-HxCDF	pg/s	184	42	63	96	
1,2,3,4,6,7,8-HpCDF	pg/s	2270	281	507	1019	
1,2,3,4,7,8,9-HpCDF	pg/s	278	63	83	141	
OCDF	pg/s	1153	189	375	573	

PROJECT NUMBER : TC190714
 TEST NUMBER : ORG-1
 DATE : 23-Aug-19
 TIME : 1st Trav.
 Start 08:23
 Finish 11:23

COMPANY : Baffinland Iron Mines
 LOCATION : Mary River Mine, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	TRAVERSE POINT DATA			O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
					STACK TEMP (deg F)	GAS METER IN (deg F)	TEMP OUT (deg F)			(ft/s)	%I
1	0.0	920.96	0.067	2.30	1450	60	59			28	102.2
	5.0	925.55	0.062	2.04	1565	65	60	9.7	8.5	28	73.4
	10.0	928.65	0.065	2.20	1517	67	61	11.1	7.4	28	98.0
	15.0	932.95	0.062	2.10	1507	68	61	11.5	7.1	27	99.8
	20.0	937.24	0.066	2.20	1538	69	61	11.2	7.3	28	99.7
	25.0	941.63	0.059	1.90	1573	69	62	11.3	7.2	27	102.3
2	30.0	945.86	0.063	2.10	1552	70	63	10.9	7.6	28	99.3
	35.0	950.13	0.064	2.10	1568	71	63	10.9	7.6	28	98.8
	40.0	954.40	0.062	2.10	1542	72	64	11.2	7.1	28	99.5
	45.0	958.67	0.065	2.10	1599	72	65	10.6	7.6	29	97.1
	50.0	962.88	0.075	2.50	1582	72	65	10.7	7.6	31	96.1
	55.0	967.37	0.080	2.60	1591	74	66	10.6	7.5	32	97.6
3	60.0	972.08	0.089	3.00	1576	73	66	10.6	7.6	33	96.3
	65.0	976.99	0.076	2.50	1603	74	67	10.6	7.6	31	98.4
	70.0	981.61	0.065	2.10	1619	73	68	10.4	7.7	29	105.7
	75.0	986.19	0.072	2.40	1619	74	68	10.4	7.6	30	97.2
	80.0	990.62	0.081	2.70	1575	74	68	10.7	7.4	32	100.9
	85.0	995.55	0.081	2.70	1568	74	69	10.6	7.4	32	96.6
4	90.0	1000.28	0.062	2.40	1543	74	69	12.0	6.4	28	110.8
	95.0	1005.06	0.073	2.50	1505	74	69	12.5	6.1	30	96.3
	100.0	1009.61	0.066	2.30	1501	74	70	12.5	6.3	28	100.6
	105.0	1014.14	0.066	2.30	1514	74	70	11.9	6.5	28	100.0
	110.0	1018.63	0.069	2.40	1495	74	70	12.1	6.3	29	96.9
	115.0	1023.10	0.062	2.10	1505	74	70	12.1	6.4	27	101.3
5	120.0	1027.52	0.073	2.60	1465	75	70	12.5	6.1	29	95.8
	125.0	1032.10	0.070	2.50	1490	75	71	12.4	6.1	29	96.8
	130.0	1036.61	0.065	2.30	1473	75	71	12.2	6.3	28	101.5
	135.0	1041.19	0.062	2.20	1490	75	71	12.1	6.3	27	97.3
	140.0	1045.46	0.061	2.10	1499	75	71	11.9	6.5	27	101.3
	145.0	1049.86	0.080	2.80	1470	75	71	12.8	5.8	31	92.4
6	150.0	1054.48	0.109	2.80	1450	76	72	12.5	6.1	36	78.7
	155.0	1059.11	0.060	2.10	1454	76	72	12.5	6.0	27	92.1
	160.0	1063.13	0.060	2.10	1474	76	72	12.7	5.8	27	115.1
	165.0	1068.13	0.060	2.10	1448	76	72	12.7	5.9	27	99.0
	170.0	1072.46	0.060	2.10	1465	76	72	12.3	7.0	27	102.0
	175.0	1076.90	0.060	2.10	1448	76	72	12.5	5.9	27	94.5
180.0	1081.03										
Traverse 1		160.07	0.07	2.32	1523	73	68	11.6	6.8	28.88	98.1
TOTAL TEST		160.07	0.07	2.32	1523.1	72.8	67.5	11.6	6.8	28.9	98.1

PROJECT NUMBER : TC190714
 TEST NUMBER : ORG-2
 DATE : 24-Aug-19
 TIME : 1st Trav.
 Start 13:14
 Finish 16:14

COMPANY : Baffinland Iron Mines
 LOCATION : Mary River Mine, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	TRAVERSE POINT DATA			O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
					STACK TEMP (deg F)	GAS METER IN (deg F)	GAS METER OUT (deg F)			(ft/s)	%I
1	0.0	190.92	0.059	2.50	1357	71	71			26	98.6
	5.0	195.39	0.061	2.50	1363	71	71	13.8	5.4	26	96.7
	10.0	199.84	0.063	2.60	1359	74	69	14.0	5.3	27	101.2
	15.0	204.58	0.058	2.40	1351	75	69	14.3	5.1	25	99.5
	20.0	209.07	0.061	2.50	1371	77	69	13.2	5.9	26	98.9
	25.0	213.63	0.064	2.70	1361	78	70	13.6	5.6	27	99.6
2	30.0	218.35	0.055	2.30	1354	79	71	14.2	5.2	25	106.0
	35.0	223.03	0.063	2.60	1364	80	71	13.5	5.6	27	99.1
	40.0	227.70	0.061	2.60	1371	81	72	13.3	5.8	26	99.0
	45.0	232.29	0.061	2.60	1372	81	72	13.4	5.7	26	102.7
	50.0	237.05	0.059	2.50	1363	81	73	14.3	5.1	26	90.7
	55.0	241.20	0.062	2.60	1368	82	74	13.3	5.8	26	109.5
3	60.0	246.34	0.062	2.60	1368	82	74	13.6	5.6	26	99.3
	65.0	251.00	0.054	2.30	1349	82	74	14.7	5.9	25	104.6
	70.0	255.61	0.055	2.30	1368	83	75	13.8	5.5	25	99.5
	75.0	260.02	0.062	2.60	1364	83	75	13.6	5.6	26	99.4
	80.0	264.70	0.066	2.80	1350	83	76	14.2	5.2	27	100.9
	85.0	269.62	0.058	2.50	1357	84	76	14.5	5.0	25	102.4
4	90.0	274.30	0.059	2.50	1376	84	77	13.4	5.7	26	99.8
	95.0	278.88	0.060	2.50	1376	84	77	13.6	5.6	26	101.3
	100.0	283.57	0.071	3.00	1366	84	78	13.9	5.4	28	97.7
	105.0	288.50	0.067	2.80	1360	83	78	14.3	5.2	27	99.8
	110.0	293.40	0.065	2.70	1367	83	78	13.4	5.7	27	101.5
	115.0	298.30	0.065	2.70	1364	83	77	13.6	5.6	27	99.9
5	120.0	303.12	0.062	2.60	1353	83	77	14.6	4.9	26	102.1
	125.0	307.95	0.060	2.60	1343	84	77	14.6	4.8	26	102.8
	130.0	312.75	0.064	2.70	1358	84	77	13.5	5.7	27	99.5
	135.0	317.53	0.064	2.70	1359	84	77	13.7	5.5	27	99.4
	140.0	322.30	0.060	2.60	1349	85	78	14.7	4.8	26	100.8
	145.0	327.01	0.059	2.50	1350	84	78	14.2	5.2	26	102.2
6	150.0	331.74	0.064	2.70	1367	84	78	13.4	5.7	27	101.8
	155.0	336.62	0.061	2.60	1366	84	79	14.7	4.8	26	104.3
	160.0	341.51	0.056	2.40	1361	84	79	14.5	5.0	25	104.9
	165.0	346.23	0.058	2.50	1361	83	78	14.2	5.1	25	101.7
	170.0	350.88	0.065	2.70	1367	83	78	13.5	5.7	27	95.7
	175.0	355.50	0.066	2.80	1373	83	78	14.0	5.4	27	92.9
180.0	360.01										
Traverse 1		169.09	0.06	2.59	1362	81	75	13.9	5.4	26.22	100.4
TOTAL TEST		169.09	0.06	2.59	1362	81	75	13.9	5.4	26.2	100.4

PROJECT NUMBER : TC190714
 TEST NUMBER : ORG-3
 DATE : 25-Aug-19
 TIME : 1st Trav.
 Start 11:01
 Finish 14:01

COMPANY : Baffinland Iron Mines
 LOCATION : Mary River Mine, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	STACK TEMP (deg F)		GAS METER TEMP (deg F)		O2 (% dry)	CO2 (% dry)	GAS VELOCITY (ft/s) %I	
					TEMP	TEMP	IN	OUT				
1	0.0	474.16	0.042	1.70	1203	55	54				21	95.2
	5.0	477.78	0.043	1.70	1221	55	54	13.1	6.2		21	97.0
	10.0	481.49	0.044	1.70	1228	57	54	13.2	6.0		21	98.0
	15.0	485.28	0.045	1.80	1240	60	54	13.3	6.0		22	99.8
	20.0	489.18	0.039	1.50	1243	61	55	12.8	6.4		20	90.2
	25.0	492.47	0.135	4.60	1492	63	56	10.3	8.4		40	91.4
2	30.0	498.23	0.117	4.00	1454	66	57	12.1	7.1		37	98.3
	35.0	504.09	0.120	4.20	1452	66	58	12.1	7.0		37	97.8
	40.0	510.00	0.120	4.20	1458	68	59	12.1	7.0		38	100.8
	45.0	516.10	0.122	4.30	1455	69	60	12.9	6.3		38	91.9
	50.0	521.72	0.085	3.10	1354	71	61	14.0	5.6		31	98.8
	55.0	526.93	0.083	3.10	1341	71	61	13.8	5.7		30	93.5
3	60.0	531.82	0.074	2.70	1362	72	63	13.5	6.0		29	96.2
	65.0	536.56	0.077	2.90	1356	72	63	13.4	6.0		29	91.2
	70.0	541.15	0.070	2.60	1342	74	64	13.5	6.0		28	93.9
	75.0	545.69	0.070	2.60	1345	74	65	13.5	6.0		28	92.4
	80.0	550.16	0.070	2.60	1350	74	66	13.4	6.0		28	94.1
	85.0	554.71	0.068	2.60	1345	75	66	13.5	6.0		27	95.7
4	90.0	559.28	0.068	2.60	1347	75	67	13.5	6.0		27	100.9
	95.0	564.10	0.072	2.70	1348	77	68	13.5	5.9		28	91.9
	100.0	568.63	0.075	2.80	1350	77	68	13.5	6.0		29	95.3
	105.0	573.42	0.073	2.70	1355	77	69	13.5	6.0		28	95.0
	110.0	578.13	0.073	2.70	1358	77	69	13.4	6.0		29	95.9
	115.0	582.88	0.071	2.70	1357	78	70	13.5	5.9		28	100.3
5	120.0	587.79	0.070	2.60	1349	78	71	13.6	5.8		28	93.9
	125.0	592.37	0.071	2.70	1343	78	71	13.7	5.8		28	95.8
	130.0	597.08	0.068	2.60	1348	78	71	13.6	5.8		27	95.7
	135.0	601.68	0.065	2.50	1344	79	71	13.7	5.7		27	97.2
	140.0	606.26	0.070	2.60	1351	79	71	13.5	5.8		28	99.6
	145.0	611.12	0.066	2.50	1350	80	72	13.6	5.8		27	94.4
6	150.0	615.60	0.067	2.50	1348	80	72	13.6	5.8		27	94.4
	155.0	620.12	0.067	2.50	1351	80	73	13.6	5.8		27	97.8
	160.0	624.80	0.067	2.50	1351	80	73	13.6	5.8		27	100.3
	165.0	629.60	0.062	2.40	1343	80	74	13.8	5.6		26	96.1
	170.0	634.04	0.066	2.50	1347	80	74	13.7	5.7		27	95.6
	175.0	638.59	0.065	2.50	1347	80	74	13.6	5.7		27	92.3
180.0	642.95											
Traverse 1		168.79	0.07	2.74	1348	73	65	13.3	6.1		28.37	95.8
TOTAL TEST		168.79	0.07	2.74	1348	73	65	13.3	6.1		28.4	95.8

Project Number	TC190714
Company Name	BIM
Location	Mary River Mine, Baffin Island, NU
Source	Eco Waste Incinerator
Test Type	TSP, Mercury

Test Number		MET-1	MET-2	MET-3
Date		23-Aug-19	24-Aug-19	25-Aug-19
Start Time Trav. 1		10:39	16:42	14:27
End Time Trav. 1		18:54	18:42	16:29
Number of Traverses Tested		1	1	1
Gas Meter Coefficient		0.997	0.997	0.997
Pitot Tube Coefficient		0.840	0.840	0.840
Stack Diameter	feet	2.63	2.63	2.63
Nozzle Diameter	inches	0.625	0.625	0.625
Barometric Pressure	" Hg	28.98	28.98	29.24
Static Pressure	" H2O	-0.10	-0.10	-0.10
Impinger Collection				
Impinger 1	g	63	54	115
Impinger 2	g	56	40	-10
Impinger 3	g	9	4	9
Impinger 4	g	20	20	20
Total		148.0	118.0	134.0

Test Number		MET-1	MET-2	MET-3	Averages
Equivalent Moisture Sample Volume	rcf	7.1	5.7	6.4	
Dry Gas Sample Volume at Meter	cf	108.73	111.10	108.62	109.48
Average Meter Temp	°F	65	71	78	71
Average Meter Pressure	"H2O	1.34	1.30	1.12	1.25
Dry Ref. Sample Volume	drcf	108.06	109.09	106.31	107.82
Dry Ref. Sample Volume	drm3	3.061	3.090	3.011	3.054
Stack Area	ft2	5.41	5.41	5.41	
Nozzle Area	inches2	0.3068	0.3068	0.3068	
Stack Pressure	"Hg	28.97	28.97	29.23	29.06
Potential Saturation Moisture	%	>100%	>100%	>100%	
Dry Mol. Weight of Gas	g/gmol	29.49	29.35	29.41	29.42
Wet Mol. Weight of Gas	g/gmol	28.79	28.79	28.76	28.78
Nominal Contaminant Conc. (per analysed µg)	ug/DRm3	0.327	0.324	0.332	0.327
Nominal Contaminant Emission (per analysed µg)	g/s	3.77E-07	3.59E-07	3.53E-07	3.63E-07

STACK PARAMETERS SUMMARY					
Test Number		MET-1	MET-2	MET-3	Averages
Moisture Vapour Content*	% v/v	6.16%	4.93%	5.69%	5.59%
Oxygen	% v/v dry	13.02%	14.88%	14.35%	14.08%
Carbon Dioxide	% v/v dry	6.08%	4.74%	5.20%	5.34%
Argon	% v/v dry	0.08%	0.08%	0.08%	0.08%
Nitrogen	% v/v dry	80.81%	80.30%	80.37%	80.50%
Average Stack Velocity	ft/s	26.0	24.0	23.5	24.5
	m/s	7.9	7.3	7.2	7.5
Average Stack Temperature	°F	1234	1194	1228	1219
	°C	668	646	665	659
Actual Stack Flow	acfm	8427	7804	7637	7956
	am3/s	3.98	3.68	3.61	3.76
Dry Ref. Stack Flow	drcfm	2446	2349	2253	2349
	drm3/s	1.155	1.109	1.064	1.109

*Moisture Content is calculated from the lower of measured and saturation moisture (based on stack temperature)

Project Number	TC190714				
Company Name	BIM				
Location	Mary River Mine, Baffin Island, NU				
Source	Eco Waste Incinerator				
Test Type	TSP, Mercury				
Test		MET-1	MET-2	MET-3	Average
<u>Analyses</u>					
TSP - Filter	mg	21.30	5.10	27.80	
TSP - Acetone	mg	4.50	7.30	17.10	
TSP - Total	mg	25.80	12.40	44.90	
Hg - FH	µg	0.015	0.015	0.015	
Hg - Imipingers	µg	0.248	0.030	0.546	
Hg - HCl Rinse	µg	0.170	0.170	0.165	
Hg - Total	µg	0.015	0.045	0.015	
<u>Concentrations</u>					
TSP	mg/DRm3	8.43	4.01	14.91	9.12
TSP (corrected to 11% O2)	mg/DRm3	10.59	6.60	22.54	13.24
Hg	µg/DRm3	0.005	0.015	0.005	0.008
Hg (corrected to 11%O2)	µg/DRm3	0.01	0.02	0.01	0.013
<u>Emissions</u>					
TSP	g/s	0.010	0.004	0.0159	0.010
Hg	g/s	5.66E-09	1.61E-08	5.30E-09	9.03E-09

PROJECT NUMBER : TC190714
 TEST NUMBER : MET-1
 DATE : 23-Aug-19
 TIME : 1st Trav.

COMPANY : BIM
 LOCATION : Mary River Mine, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

Start 10:39
 Finish 18:54

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	TRAVERSE POINT DATA			O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
					STACK TEMP (deg F)	GAS METER IN (deg F)	TEMP OUT (deg F)			(ft/s)	%I
1	0.0	81.62	0.038	1.50	1173	52	51			20	88.8
	5.0	84.88	0.037	1.60	1183	53	51	11.8	7.1	19	94.9
	10.0	88.31	0.104	3.90	1301	55	52	11.4	7.6	34	86.4
	15.0	93.35	0.120	4.50	1298	60	52	11.5	7.4	36	89.0
2	20.0	98.95	0.100	3.80	1266	61	54	12.8	6.3	33	88.9
	25.0	104.13	0.078	3.00	1248	63	55	12.7	6.4	29	90.1
	30.0	108.81	0.076	3.20	1219	65	55	12.8	6.2	28	90.5
	35.0	113.50	0.072	3.10	1215	66	55	12.7	6.3	27	95.0
3	40.0	118.30	0.060	2.60	1207	68	57	13.6	5.6	25	99.2
	45.0	122.91	0.063	2.70	1196	69	58	12.4	6.5	25	94.8
	50.0	127.45	0.064	2.80	1190	70	60	13.6	5.7	26	93.3
	55.0	131.97	0.064	2.80	1200	72	60	13.6	5.5	26	94.6
4	60.0	136.55	0.060	2.60	1195	72	62	12.7	6.2	25	99.2
	65.0	141.22	0.059	2.60	1178	74	63	13.9	5.4	24	96.1
	70.0	145.74	0.064	2.80	1214	74	64	12.9	6.1	26	97.8
	75.0	150.48	0.058	2.50	1248	75	65	13.2	5.9	25	99.7
5	80.0	155.05	0.061	2.50	1262	75	65	13.1	5.8	25	98.9
	85.0	159.68	0.059	2.50	1255	76	67	13.1	6.0	25	94.3
	90.0	164.04	0.051	2.10	1255	77	68	13.8	5.4	23	101.1
	95.0	168.40	0.059	2.50	1252	77	68	13.1	6.0	25	94.2
6	100.0	172.77	0.050	2.10	1254	78	69	13.8	5.4	23	98.6
	105.0	176.99	0.057	2.40	1255	78	69	13.8	5.9	25	92.5
	110.0	181.21	0.063	2.70	1261	78	70	14.2	5.2	26	95.4
	115.0	185.78	0.058	2.50	1280	79	70	13.1	5.9	25	99.8
	120.0	190.35									
Traverse 1		108.73	0.07	2.72	1234	69	61	13.0	6.1	25.95	94.7
TOTAL TEST		108.73	0.07	2.72	1233.5	69.5	60.8	13.0	6.1	26.0	94.7

PROJECT NUMBER : TC190714
 TEST NUMBER : MET-2
 DATE : 24-Aug-19
 TIME : 1st Trav.
 Start 16:42
 Finish 18:42

COMPANY : BIM
 LOCATION : Mary River Mine, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	STACK TEMP (deg F)	GAS METER TEMP (deg F)		O2 (% dry)	CO2 (% dry)	GAS VELOCITY (ft/s)	
						IN	OUT			%I	%I
1	0.0	360.54	0.059	2.60	1243	72	72			25	96.9
	5.0	365.10	0.057	2.60	1229	69	71	15.7	4.1	24	98.4
	10.0	369.65	0.058	2.60	1233	71	69	14.7	4.8	25	93.3
	15.0	374.00	0.062	2.80	1225	72	68	14.7	4.8	25	90.7
2	20.0	378.38	0.052	2.40	1214	73	68	15.5	4.3	23	103.5
	25.0	382.98	0.051	2.30	1201	73	68	15.0	4.6	23	98.4
	30.0	387.33	0.060	2.70	1207	73	68	14.2	5.2	25	97.7
	35.0	392.00	0.058	2.60	1200	73	68	14.7	4.9	24	98.5
3	40.0	396.64	0.051	2.40	1185	74	68	15.3	4.4	23	103.7
	45.0	401.25	0.052	2.40	1193	74	68	14.8	4.8	23	98.3
	50.0	405.65	0.060	2.80	1191	74	68	14.4	5.1	25	96.3
	55.0	410.28	0.054	2.50	1173	75	68	15.5	4.3	23	100.8
4	60.0	414.91	0.053	2.50	1175	75	68	15.1	4.6	23	100.3
	65.0	419.47	0.060	2.80	1180	75	68	14.3	5.2	25	98.6
	70.0	424.23	0.063	2.90	1181	75	68	14.4	5.1	25	101.5
	75.0	429.25	0.061	2.80	1175	75	69	15.4	4.4	25	97.3
5	80.0	434.00	0.054	2.50	1174	75	69	15.4	4.4	23	97.9
	85.0	438.50	0.062	2.90	1181	75	69	14.6	5.0	25	97.8
	90.0	443.30	0.06	2.70	1180	75	70	14	5	24	105.7
	95.0	448.37	0.05	2.30	1174	75	70	15.2	4.5	22	102.3
6	100.0	452.90	0.05	2.30	1176	75	70	15.0	4.6	22	99.6
	105.0	457.31	0.06	2.80	1178	75	71	14.8	4.8	25	100.7
	110.0	462.19	0.06	2.70	1182	76	70	14.3	5.2	24	100.3
	115.0	466.96	0.06	2.70	1208	75	70	15.2	4.5	24	99.2
120.0	471.64										
Traverse 1		111.10	0.06	2.61	1194	74	69	14.9	4.7	24.03	99.1
TOTAL TEST		111.10	0.06	2.61	1194	74	69	14.9	4.7	24.0	99.1

PROJECT NUMBER : TC190714
 TEST NUMBER : MET-3
 DATE : 25-Aug-19
 TIME : 1st Trav.

Start 14:27
 Finish 16:29

COMPANY : BIM
 LOCATION : Mary River Mine, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	STACK TEMP (deg F)	GAS METER TEMP		O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
						IN (deg F)	OUT			(ft/s)	%I
1	0.0	643.31	0.054	2.40	1252	74	74			24	96.5
	5.0	647.61	0.053	2.40	1242	76	73	14.1	5.4	23	101.1
	10.0	652.09	0.050	2.30	1222	77	73	14.2	5.3	23	96.2
	15.0	656.26	0.053	2.40	1221	78	72	14.3	5.3	23	98.8
2	20.0	660.67	0.053	2.40	1219	77	73	14.4	5.2	23	118.9
	25.0	665.98	0.051	2.30	1212	79	73	14.5	5.1	23	97.5
	30.0	670.27	0.049	2.20	1221	80	73	14.6	5.1	22	99.7
	35.0	674.56	0.055	2.50	1225	80	74	14.5	5.1	24	100.7
3	40.0	679.15	0.053	2.40	1230	81	74	14.5	5.1	23	101.8
	45.0	683.70	0.051	2.30	1212	81	74	14.7	5.0	23	101.1
	50.0	688.16	0.057	2.60	1232	81	74	14.3	5.3	24	97.8
	55.0	692.69	0.056	2.50	1233	81	75	14.5	5.1	24	99.2
4	60.0	697.25	0.055	2.50	1236	81	75	14.5	5.1	24	104.2
	65.0	701.99	0.051	2.30	1233	81	75	14.5	5.1	23	98.0
	70.0	706.29	0.058	2.60	1229	82	75	14.5	5.1	24	100.5
	75.0	711.00	0.055	2.50	1219	83	76	14.0	5.4	24	101.4
5	80.0	715.65	0.054	2.40	1245	83	76	14.5	5.1	24	101.3
	85.0	720.22	0.058	2.60	1237	83	76	13.5	5.8	25	96.5
	90.0	724.74	0.05	2.40	1217	82	77	15	5	23	102.2
	95.0	729.30	0.06	2.80	1238	82	77	13.6	5.8	25	98.2
6	100.0	734.05	0.05	2.30	1218	83	77	14.8	4.9	23	103.3
	105.0	738.62	0.05	2.40	1227	83	77	13.6	5.7	23	100.8
	110.0	743.15	0.05	2.30	1230	83	77	14.8	4.9	23	101.2
	115.0	747.61	0.05	2.40	1226	83	77	14.5	5.0	23	97.0
120.0	751.93										
Traverse 1		108.62	0.05	2.43	1228	81	75	14.4	5.2	23.52	100.6
TOTAL TEST		108.62	0.05	2.43	1228	81	75	14.4	5.2	23.5	100.6

Project Number	TC190713
Company Name	Baffinland
Location	Port Milne, Baffin Island, NU
Source	Port Eco Waste Incinerator
Test Type	Dioxins/Furans

Test Number		ORG-1	ORG-2	ORG-3
Date		18-Aug-19	19-Aug-19	20-Aug-19
Start Time Trav. 1		13:12	07:24	09:58
End Time Trav. 1		16:12	10:24	12:58
Number of Traverses Tested		1	1	1
Gas Meter Coefficient		0.997	0.997	0.997
Pitot Tube Coefficient		0.840	0.840	0.840
Stack Diameter	feet	2.63	2.63	2.63
Nozzle Diameter	inches	0.500	0.625	0.625
Barometric Pressure	" Hg	29.89	29.92	29.98
Static Pressure	" H2O	-0.10	-0.10	-0.10
Impinger Collection				
Impinger 1	g	147	191	219
Impinger 2	g	3	7	8
Impinger 3	g	2	2	2
Impinger 4	g	14	25	13
Total		166.0	225.0	242.0

Test Number		ORG-1	ORG-2	ORG-3	Averages
Equivalent Moisture Sample Volume	rcf	8.0	10.8	11.6	
Dry Gas Sample Volume at Meter	cf	81.32	120.66	122.29	108.09
Average Meter Temp	°F	76	57	57	63
Average Meter Pressure	"H2O	0.28	0.88	0.74	0.63
Dry Ref. Sample Volume	drcf	81.52	125.68	127.45	111.55
Dry Ref. Sample Volume	drm3	2.309	3.560	3.610	3.160
Stack Area	ft2	5.41	5.41	5.41	
Nozzle Area	inches2	0.1963	0.3068	0.3068	
Stack Pressure	"Hg	29.88	29.91	29.97	29.92
Potential Saturation Moisture	%	>100%	>100%	>100%	
Dry Mol. Weight of Gas	g/gmol	29.46	29.46	29.41	29.44
Wet Mol. Weight of Gas	g/gmol	28.45	28.55	28.46	28.48
Nominal Contaminant Conc. (per analysed µg)	ug/DRm3	0.433	0.281	0.277	0.330
Nominal Contaminant Emission (per analysed µg)	g/s	3.70E-07	2.91E-07	2.43E-07	3.02E-07

STACK PARAMETERS SUMMARY

Test Number		ORG-1	ORG-2	ORG-3	Averages
Moisture Vapour Content*	% v/v	8.89%	7.90%	8.34%	8.37%
Oxygen	% v/v dry	14.72%	14.12%	14.62%	14.49%
Carbon Dioxide	% v/v dry	5.47%	5.57%	5.14%	5.39%
Argon	% v/v dry	0.08%	0.08%	0.08%	0.08%
Nitrogen	% v/v dry	79.73%	80.23%	80.15%	80.04%
Average Stack Velocity	ft/s	17.2	21.9	16.8	18.6
	m/s	5.2	6.7	5.1	5.7
Average Stack Temperature	°F	1046	1145	993	1061
	°C	563	618	534	572
Actual Stack Flow	acfm	5573	7097	5450	6040
	am3/s	2.63	3.35	2.57	2.85
Dry Ref. Stack Flow	drcfm	1811	2197	1857	1955
	drm3/s	0.855	1.037	0.877	0.923

*Moisture Content is calculated from the lower of measured and saturation moisture (based on stack temperature)

Project Number
Company Name
Location
Source
Test Type

TC190713
Baffinland
Port Milne, Baffin Island, NU
Port Eco Waste Incinerator
Dioxins/Furans

Analysis		ORG-1	ORG-2	ORG-3	Average
Dioxins/Furans	TEQ pg	3570	21600	4950	
2,3,7,8-TCDD	pg	221	2640	223	
1,2,3,7,8-PeCDD	pg	860	6850	990	
1,2,3,4,7,8-HxCDD	pg	621	3550	1250	
1,2,3,6,7,8-HxCDD	pg	1170	4000	1480	
1,2,3,7,8,9-HxCDD	pg	1200	4860	1650	
1,2,3,4,6,7,8-HpCDD	pg	7590	16300	17900	
OCDD	pg	8120	11900	42500	
2,3,7,8-TCDF	pg	1060	11000	1210	
1,2,3,7,8-PeCDF	pg	2230	18600	2320	
2,3,4,7,8-PeCDF	pg	2760	15000	3400	
1,2,3,4,7,8-HxCDF	pg	2590	14400	3810	
1,2,3,6,7,8-HxCDF	pg	3100	15900	4320	
2,3,4,6,7,8-HxCDF	pg	3270	9390	6460	
1,2,3,7,8,9-HxCDF	pg	1130	2560	1870	
1,2,3,4,6,7,8-HpCDF	pg	7760	24600	20700	
1,2,3,4,7,8,9-HpCDF	pg	1830	2950	3490	
OCDF	pg	4310	4980	14600	
Concentration					
Dioxins/Furans	TEQ pg/DRm:	1546	6067	1371	2995
Dioxins/Furans corrected to 11% O ₂	TEQ pg/DRm:	2476	8855	2163	4498
2,3,7,8-TCDD	pg/DRm3	96	742	62	
1,2,3,7,8-PeCDD	pg/DRm3	372	1924	274	
1,2,3,4,7,8-HxCDD	pg/DRm3	269	997	346	
1,2,3,6,7,8-HxCDD	pg/DRm3	507	1124	410	
1,2,3,7,8,9-HxCDD	pg/DRm3	520	1365	457	
1,2,3,4,6,7,8-HpCDD	pg/DRm3	3287	4578	4958	
OCDD	pg/DRm3	3516	3343	11771	
2,3,7,8-TCDF	pg/DRm3	459	3090	335	
1,2,3,7,8-PeCDF	pg/DRm3	966	5224	643	
2,3,4,7,8-PeCDF	pg/DRm3	1195	4213	942	
1,2,3,4,7,8-HxCDF	pg/DRm3	1122	4045	1055	
1,2,3,6,7,8-HxCDF	pg/DRm3	1342	4466	1197	
2,3,4,6,7,8-HxCDF	pg/DRm3	1416	2637	1789	
1,2,3,7,8,9-HxCDF	pg/DRm3	489	719	518	
1,2,3,4,6,7,8-HpCDF	pg/DRm3	3360	6910	5733	
1,2,3,4,7,8,9-HpCDF	pg/DRm3	792	829	967	
OCDF	pg/DRm3	1866	1399	4044	
Emissions					
	TEQ pg/s	1322	6294	1202	2939
	TEQ g/s	1.32E-09	6.29E-09	1.20E-09	2.94E-09
2,3,7,8-TCDD	pg/s	82	769	54	302
1,2,3,7,8-PeCDD	pg/s	318	1996	240	852
1,2,3,4,7,8-HxCDD	pg/s	230	1034	304	523
1,2,3,6,7,8-HxCDD	pg/s	433	1165	359	653
1,2,3,7,8,9-HxCDD	pg/s	444	1416	401	754
1,2,3,4,6,7,8-HpCDD	pg/s	2811	4749	4347	3969
OCDD	pg/s	3007	3467	10322	5599
2,3,7,8-TCDF	pg/s	393	3205	294	1297
1,2,3,7,8-PeCDF	pg/s	826	5419	563	2270
2,3,4,7,8-PeCDF	pg/s	1022	4371	826	2073
1,2,3,4,7,8-HxCDF	pg/s	959	4196	925	2027
1,2,3,6,7,8-HxCDF	pg/s	1148	4633	1049	2277
2,3,4,6,7,8-HxCDF	pg/s	1211	2736	1569	1839
1,2,3,7,8,9-HxCDF	pg/s	418	746	454	539
1,2,3,4,6,7,8-HpCDF	pg/s	2873	7168	5027	5023
1,2,3,4,7,8,9-HpCDF	pg/s	678	860	848	795
OCDF	pg/s	1596	1451	3546	2198

PROJECT NUMBER : TC190713
 TEST NUMBER : ORG-1
 DATE : 18-Aug-19
 TIME : 1st Trav.
 Start 13:12
 Finish 16:12

COMPANY : Baffinland
 LOCATION : Port Milne, Baffin Island, NU
 SOURCE : Port Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	TRaverse POINT DATA		O2 (% dry)	CO2 (% dry)	GAS VELOCITY		
					STACK TEMP (deg F)	GAS METER TEMP (deg F)			IN (deg F)	OUT (deg F)	(ft/s)
1	0.0	370.68	0.068	1.05	1164	58	58	10	8.7	26	100.6
	5.0	373.77	0.025	0.42	1030	61	58	12.1	7.2	15	107.5
	10.0	375.87	0.024	0.40	1041	63	59	12.3	7.0	15	100.9
	15.0	377.80	0.036	0.60	995	64	60	13.3	6.2	18	100.7
	20.0	380.20	0.028	0.48	1005	66	60	14.4	5.5	16	109.6
2	25.0	382.50	0.027	0.46	1006	66	61	14.7	5.3	15	109.6
	30.0	384.76	0.027	0.46	1013	68	62	17.0	5.1	16	99.9
	35.0	386.82	0.062	0.99	1113	68	63	17.0	5.0	24	97.5
	40.0	389.77	0.067	1.00	1152	68	63	13.5	6.1	26	108.2
	45.0	393.13	0.087	1.40	1242	72	65	12.7	6.8	30	97.4
3	50.0	396.50	0.085	1.40	1252	73	65	13.0	6.6	30	98.1
	55.0	399.85	0.059	0.99	1167	75	65	13.7	6.1	24	106.0
	60.0	402.95	0.062	1.10	1170	75	69	13.6	6.8	25	106.4
	65.0	406.15	0.054	0.85	1160	77	70	16.0	5.8	23	100.9
	70.0	409.00	0.040	0.65	1118	78	71	16.5	5.3	20	91.1
4	75.0	411.25	0.042	0.68	1121	78	73	14.3	5.4	20	95.2
	80.0	413.66	0.038	0.65	1049	80	74	14.8	5.3	19	95.9
	85.0	416.03	0.035	0.56	1049	80	75	14.6	5.4	18	93.5
	90.0	418.25	0.036	0.61	1052	82	77	16.7	5.4	18	98.1
	95.0	420.62	0.022	0.40	1010	82	78	14.8	5.2	14	104.8
5	100.0	422.63	0.023	0.38	1096	82	79	14.4	5.4	15	103.3
	105.0	424.60	0.023	0.40	999	83	80	15.0	5.1	14	99.3
	110.0	426.56	0.022	0.38	1025	83	81	15.0	5.1	14	99.7
	115.0	428.47	0.022	0.38	1006	83	81	14.5	5.4	14	105.8
	120.0	430.51	0.022	0.38	1005	84	82	14.4	5.4	14	102.5
6	125.0	432.49	0.020	0.37	1000	84	83	14.9	5.2	13	100.2
	130.0	434.34	0.021	0.37	1021	86	84	15.1	5.0	14	101.4
	135.0	436.25	0.021	0.37	986	86	84	15.1	5.0	14	98.1
	140.0	438.12	0.021	0.37	1007	86	84	15.1	5.0	14	97.2
	145.0	439.96	0.021	0.37	984	85	84	14.8	5.1	14	97.0
6	150.0	441.81	0.020	0.36	981	86	84	15.4	4.8	13	95.0
	155.0	443.58	0.015	0.28	926	86	84	16.3	4.1	11	102.6
	160.0	445.27	0.015	0.28	926	84	84	16.1	4.2	11	99.2
	165.0	446.90	0.018	0.33	969	84	84	16.2	4.1	12	104.9
	170.0	448.76	0.014	0.26	919	84	84	16.4	4.0	11	104.9
	175.0	450.43	0.014	0.27	906	85	85	17.0	4.1	11	98.0
	180.0	452.00									
Traverse 1		81.32	0.034	0.58	1046	77	74	14.7	5.5	17.16	100.9
TOTAL TEST		81.32	0.03	0.58	1046.3	77.4	73.7	14.7	5.5	17.2	100.9

PROJECT NUMBER : TC190713
 TEST NUMBER : ORG-2
 DATE : 19-Aug-19
 TIME : 1st Trav.
 Start 07:24
 Finish 10:24

COMPANY : Baffinland
 LOCATION : Port Milne, Baffin Island, NU
 SOURCE : Port Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	STACK TEMP (deg F)		GAS METER TEMP (deg F)		O2 (% dry)	CO2 (% dry)	GAS VELOCITY (ft/s) %I	
					IN	OUT	IN	OUT				
1	0.0	505.97	0.040	1.70	1438	49	49				21	95.9
	5.0	509.20	0.027	0.96	1406	49	48	10.6	8.6		17	90.2
	10.0	511.72	0.027	0.94	1435	50	47	10.6	8.6		18	99.2
	15.0	514.47	0.130	2.60	1383	52	48	12.7	6.9		38	52.7
	20.0	517.72	0.140	2.60	1385	54	48	12.8	6.9		39	51.5
2	25.0	521.02	0.140	2.60	1385	54	48	13.0	6.7		39	50.9
	30.0	524.28	0.130	2.60	1385	55	49	13.1	6.6		38	52.4
	35.0	527.52	0.120	2.60	1367	55	49	13.5	6.3		36	54.1
	40.0	530.75	0.130	2.60	1376	56	50	13.5	6.1		38	49.8
	45.0	533.84	0.090	2.60	1319	56	51	13.9	6.1		31	60.1
3	50.0	537.00	0.080	2.60	1292	57	51	14.2	5.8		29	64.4
	55.0	540.22	0.029	1.20	1101	57	52	14.6	5.3		17	95.0
	60.0	543.26	0.024	1.10	1061	58	52	15.3	4.9		15	104.6
	65.0	546.35	0.023	1.00	1038	58	52	15.1	5.0		14	99.2
	70.0	549.24	0.021	0.95	1017	58	53	15.2	4.9		14	91.2
4	75.0	551.80	0.038	1.70	1068	57	54	14.6	5.2		19	90.4
	80.0	555.15	0.046	2.00	1107	58	54	15.2	5.0		21	90.6
	85.0	558.80	0.043	1.80	1097	60	54	14.3	5.7		20	84.3
	90.0	562.10	0.041	1.80	1089	61	55	14.1	5.8		20	93.7
	95.0	565.70	0.044	1.90	1085	63	55	13.9	6.0		20	93.7
5	100.0	569.44	0.040	1.80	1085	63	56	14.0	5.9		19	96.0
	105.0	573.10	0.039	1.70	1074	63	56	14.0	5.9		19	98.0
	110.0	576.80	0.039	1.70	1068	64	57	14.0	5.9		19	89.9
	115.0	580.21	0.042	1.90	1065	64	57	14.1	5.8		20	93.5
	120.0	583.89	0.038	1.70	1053	64	58	14.2	5.7		19	99.6
6	125.0	587.64	0.038	1.70	1050	65	58	14.3	5.6		19	98.6
	130.0	591.36	0.038	1.70	1042	64	58	14.3	5.6		19	96.3
	135.0	595.00	0.040	1.80	1041	64	58	14.4	5.5		19	94.7
	140.0	598.67	0.038	1.70	1032	64	58	14.5	5.4		18	98.4
	145.0	602.40	0.037	1.70	1028	64	58	14.6	5.4		18	98.8
TOTAL TEST	150.0	606.10	0.039	1.80	1024	64	59	14.5	5.4		19	99.9
	155.0	609.95	0.027	1.30	963	64	59	15.4	4.7		15	108.3
	160.0	613.50	0.028	1.30	969	64	58	15.4	4.7		16	99.1
	165.0	616.80	0.028	1.30	966	64	59	15.5	4.5		16	98.9
	170.0	620.10	0.026	1.20	956	64	55	15.6	4.5		15	101.7
175.0	623.37	0.025	1.20	954	63	59	15.6	4.5		15	103.1	
180.0	626.63											
Traverse 1		120.66	0.053	1.76	1145	59	54	14.1	5.6		21.86	87.2
TOTAL TEST		120.66	0.05	1.76	1145	59	54	14.1	5.6		21.9	87.2

PROJECT NUMBER : TC190713
 TEST NUMBER : ORG-3
 DATE : 20-Aug-19
 TIME : 1st Trav.
 Start 09:58
 Finish 12:58

COMPANY : Baffinland
 LOCATION : Port Milne, Baffin Island, NU
 SOURCE : Port Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	TRaverse POINT DATA		O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
					STACK TEMP (deg F)	GAS METER TEMP (deg F)			IN	OUT
1	0.0	715.76	0.030	1.40	945	50			16	97.7
	5.0	719.07	0.026	1.20	935	50	13.28	6.20	15	99.3
	10.0	722.21	0.026	1.20	959	51	13.10	6.30	15	96.9
	15.0	725.25	0.031	1.40	1014	53	13.40	6.10	17	99.5
	20.0	728.60	0.045	2.00	1032	55	13.60	5.98	20	96.7
2	25.0	732.50	0.037	1.70	1011	57	14.40	6.33	18	100.6
	30.0	736.22	0.034	1.50	1018	57	14.54	5.15	17	105.3
	35.0	739.95	0.035	1.60	1024	58	14.79	4.92	18	102.3
	40.0	743.62	0.063	2.60	1124	59	12.18	7.09	25	91.7
	45.0	747.89	0.090	3.50	1251	60	13.16	6.34	30	92.5
3	50.0	752.84	0.065	2.60	1184	61	13.09	6.38	25	99.8
	55.0	757.49	0.054	2.52	1162	60	13.21	6.15	23	106.0
	60.0	762.02	0.047	2.00	1132	60	13.87	5.67	21	99.2
	65.0	766.02	0.034	1.50	1045	60	13.83	5.83	18	100.0
	70.0	769.55	0.036	1.60	1034	60	13.84	5.79	18	93.3
4	75.0	772.95	0.039	1.70	1034	61	13.81	5.81	19	92.6
	80.0	776.47	0.040	1.80	1046	61	13.96	5.74	19	94.7
	85.0	780.10	0.032	1.40	1030	61	13.70	5.69	17	98.0
	90.0	783.48	0.035	1.60	1014	61	14.06	5.67	18	97.1
	95.0	787.00	0.033	1.50	1045	61	13.25	6.03	17	102.3
5	100.0	790.57	0.035	1.60	1019	62	14.08	5.52	18	100.4
	105.0	794.21	0.038	1.70	1022	63	14.08	5.52	18	97.2
	110.0	797.88	0.036	1.60	1009	62	14.23	5.46	18	100.7
	115.0	801.60	0.021	1.00	930	62	15.70	4.20	13	104.3
	120.0	804.63	0.021	1.00	900	62	16.20	3.90	13	95.7
6	125.0	807.44	0.021	1.00	893	62	16.00	3.99	13	96.1
	130.0	810.27	0.025	1.23	931	62	15.60	4.30	14	97.3
	135.0	813.35	0.019	0.92	912	63	16.10	3.95	13	98.1
	140.0	816.08	0.019	0.92	899	63	16.00	4.03	12	99.0
	145.0	818.85	0.024	1.20	915	63	15.90	4.08	14	96.7
TOTAL TEST	150.0	821.87	0.018	0.89	880	63	16.30	3.77	12	97.3
	155.0	824.54	0.015	0.74	873	63	16.45	3.70	11	98.7
	160.0	827.02	0.019	0.95	873	63	16.45	3.72	12	99.4
	165.0	829.83	0.019	0.93	888	63	16.29	3.78	12	98.5
	170.0	832.60	0.017	0.84	887	63	16.73	3.43	12	99.2
175.0	835.24	0.019	0.95	867	63	16.69	3.46	12	99.2	
180.0	838.05									
Traverse 1		122.29	0.033	1.49	993	60	14.6	5.1	16.78	98.4
TOTAL TEST		122.29	0.03	1.49	993	60	14.6	5.1	16.8	98.4

Project Number	TC190714
Company Name	BIM
Location	Port Milne, Baffin Island, NU
Source	Eco Waste Incinerator
Test Type	TSP, Mercury

Test Number		MET-1	MET-2	MET-3
Date		18-Aug-19	20-Aug-19	21-Aug-19
Start Time Trav. 1		16:39	10:59	13:27
End Time Trav. 1		18:40	12:59	15:27
Number of Traverses Tested		1	1	1
Gas Meter Coefficient		0.997	0.997	0.997
Pitot Tube Coefficient		0.840	0.840	0.840
Stack Diameter	feet	2.63	2.63	2.63
Nozzle Diameter	inches	0.500	0.625	0.625
Barometric Pressure	" Hg	29.89	29.92	29.92
Static Pressure	" H2O	-0.10	-0.12	-0.10
Impinger Collection				
Impinger 1	g	45	55	57
Impinger 2	g	11	23	21
Impinger 3	g	2	4	5
Impinger 4	g	9	14	13
Total		67.0	96.0	96.0

Test Number		MET-1	MET-2	MET-3	Averages
Equivalent Moisture Sample Volume	rcf	3.2	4.6	4.6	
Dry Gas Sample Volume at Meter	cf	50.70	79.98	77.14	69.27
Average Meter Temp	°F	83	63	64	70
Average Meter Pressure	"H2O	0.26	0.65	0.61	0.51
Dry Ref. Sample Volume	drcf	50.15	82.30	79.20	70.55
Dry Ref. Sample Volume	drm3	1.421	2.332	2.244	1.999
Stack Area	ft2	5.41	5.41	5.41	
Nozzle Area	inches2	0.1963	0.3068	0.3068	
Stack Pressure	"Hg	29.88	29.91	29.91	29.90
Potential Saturation Moisture	%	>100%	>100%	>100%	
Dry Mol. Weight of Gas	g/gmol	29.28	29.28	29.29	29.28
Wet Mol. Weight of Gas	g/gmol	28.60	28.68	28.67	28.65
Nominal Contaminant Conc. (per analysed µg)	ug/DRm3	0.704	0.429	0.446	0.526
Nominal Contaminant Emission (per analysed µg)	g/s	5.93E-07	3.59E-07	3.59E-07	4.37E-07

STACK PARAMETERS SUMMARY					
Test Number		MET-1	MET-2	MET-3	Averages
Moisture Vapour Content*	% v/v	6.01%	5.29%	5.49%	5.60%
Oxygen	% v/v dry	16.49%	16.35%	16.06%	16.30%
Carbon Dioxide	% v/v dry	3.87%	3.90%	4.07%	3.94%
Argon	% v/v dry	0.08%	0.08%	0.08%	0.08%
Nitrogen	% v/v dry	79.57%	79.67%	79.79%	79.68%
Average Stack Velocity	ft/s	14.8	14.9	14.3	14.7
	m/s	4.5	4.5	4.3	4.5
Average Stack Temperature	°F	902	932	923	919
	°C	483	500	495	493
Actual Stack Flow	acfm	4815	4833	4632	4760
	am3/s	2.27	2.28	2.19	2.25
Dry Ref. Stack Flow	drcfm	1784	1771	1705	1754
	drm3/s	0.843	0.836	0.805	0.828

*Moisture Content is calculated from the lower of measured and saturation moisture (based on stack temperature)

Test		MET-1	MET-2	MET-3	Average
Analyses					
TSP - Filter	mg	42.80	54.20	47.10	
TSP - Acetone	mg	6.00	8.80	7.50	
TSP - Total	mg	48.80	63.00	54.60	
Hg - FH	µg	0.0174	0.0177	0.015	
Hg - Impingers	µg	0.175	0.247	0.536	
Hg - HCl Rinse	µg	0.231	0.128	0.18	
Hg - Total	µg	0.423	0.393	0.731	
Concentrations					
TSP	mg/DRm3	34.35	27.02	24.34	28.57
TSP (corrected to 11% O2)	mg/DRm3	77.05	58.82	49.82	61.90
Hg	µg/DRm3	0.298	0.168	0.326	0.264
Hg (corrected to 11%O2)	µg/DRm3	0.67	0.37	0.67	0.567
Emissions					
TSP	g/s	0.029	0.023	0.0196	0.024
Hg	g/s	2.51E-07	1.41E-07	2.62E-07	2.18E-07

PROJECT NUMBER : TC190714
 TEST NUMBER : MET-1
 DATE : 18-Aug-19
 TIME : 1st Trav.
 Start 16:39
 Finish 18:40

COMPANY : BIM
 LOCATION : Port Milne, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	TRAVERSE POINT DATA			O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
					STACK TEMP (deg F)	GAS METER IN (deg F)	TEMP OUT (deg F)			(ft/s)	%I
1	0.0	452.47	0.027	0.49	965	85	85			15	92.4
	5.0	454.54	0.032	0.580	968	84	84	16.3	3.9	17	63.8
	10.0	456.09	0.032	0.580	959	84	84	16.5	3.9	17	100.1
2	15.0	458.53	0.038	0.690	962	85	85	16.4	3.9	18	92.9
	20.0	461.00	0.032	0.590	956	84	84	16.6	3.9	17	97.5
	25.0	463.38	0.041	0.740	980	84	84	16.5	3.8	19	92.4
3	30.0	465.91	0.032	0.590	957	84	83	16.7	3.7	17	91.9
	35.0	468.15	0.028	0.520	946	83	83	16.5	3.8	15	102.7
	40.0	470.50	0.026	0.500	890	83	83	16.3	4.0	15	88.9
4	45.0	472.50	0.026	0.590	903	83	83	15.8	5.2	15	93.8
	50.0	474.60	0.024	0.460	900	83	83	16.2	4.0	14	94.2
	55.0	476.63	0.023	0.440	878	83	83	16.2	4.1	14	94.1
5	60.0	478.63	0.025	0.490	872	83	83	16.5	3.9	14	95.4
	65.0	480.75	0.023	0.440	902	83	83	16.3	4.0	14	98.7
	70.0	482.83	0.025	0.490	860	83	83	16.5	3.9	14	93.7
6	75.0	484.92	0.024	0.460	888	83	83	16.1	4.0	14	109.1
	80.0	487.28	0.022	0.460	838	83	83	16.9	3.6	13	93.8
	85.0	489.26	0.022	0.460	838	81	81	16.9	3.6	13	77.0
6	90.0	490.88	0.028	0.460	849	81	81	16.2	3.9	15	94.8
	95.0	493.12	0.024	0.460	888	81	81	16.3	3.9	14	95.6
	100.0	495.18	0.022	0.460	875	81	81	17.1	3.4	13	93.1
6	105.0	497.11	0.022	0.460	870	81	81	16.4	3.8	13	94.3
	110.0	499.07	0.028	0.460	881	80	80	16.9	3.4	15	93.1
	115.0	501.24	0.022	0.460	830	79	79	17.1	3.3	13	91.8
	120.0	503.17									
TOTAL TEST		50.70	0.03	0.51	902	83	83	16.5	3.9	14.83	93.1
TOTAL TEST		50.70	0.03	0.51	902.3	82.7	82.6	16.5	3.9	14.8	93.1

PROJECT NUMBER : TC190714
 TEST NUMBER : MET-2
 DATE : 20-Aug-19
 TIME : 1st Trav.
 Start 10:59
 Finish 12:59

COMPANY : BIM
 LOCATION : Port Milne, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

TRAVERSE POINT DATA

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	STACK	GAS METER TEMP		O2 (% dry)	CO2 (% dry)	GAS VELOCITY	
					TEMP (deg F)	IN (deg F)	OUT (deg F)			(ft/s)	%I
1	0.0	628.23	0.031	1.50	975	58	58			16	98.2
	5.0	631.73	0.029	1.40	966	61	57	16.8	3.5	16	93.2
	10.0	634.96	0.032	1.50	957	63	57	16.8	3.5	16	108.5
2	15.0	638.93	0.028	1.30	967	64	58	16.3	3.9	15	77.5
	20.0	641.58	0.028	1.35	939	64	58	16.3	3.8	15	99.1
	25.0	645.00	0.028	1.35	947	65	58	17.0	3.3	15	99.3
	30.0	648.42	0.031	1.50	981	65	58	16.3	3.9	16	102.8
3	35.0	652.10	0.028	1.30	1003	66	59	16.8	3.5	16	96.0
	40.0	655.35	0.034	1.60	981	66	60	16.6	3.7	17	96.8
	45.0	658.99	0.033	1.50	1001	66	60	16.3	3.9	17	99.5
	50.0	662.65	0.024	1.20	942	67	60	15.6	4.4	14	103.5
	55.0	665.97	0.029	1.40	962	67	60	14.9	4.8	16	99.4
4	60.0	669.45	0.026	1.30	933	68	60	15.7	4.5	15	102.9
	65.0	672.90	0.030	1.50	924	68	61	15.7	4.5	16	93.5
	70.0	676.28	0.027	1.30	928	68	61	16.2	4.1	15	97.5
5	75.0	679.62	0.028	1.40	933	68	61	16.2	4.1	15	97.1
	80.0	683.00	0.026	1.30	920	68	61	16.3	4.0	15	99.4
	85.0	686.35	0.028	1.40	938	67	62	15.8	4.4	15	99.3
	90.0	689.80	0.024	1.20	892	67	61	16.3	4.0	14	102.4
6	95.0	693.15	0.020	1.00	846	66	61	17.1	3.5	13	106.4
	100.0	696.38	0.018	0.94	845	66	61	17.1	3.3	12	99.6
	105.0	699.25	0.029	1.50	885	66	60	15.7	4.4	15	93.8
	110.0	702.62	0.016	0.83	852	66	60	17.3	3.2	11	107.1
	115.0	705.52	0.015	0.77	860	66	60	17.0	3.4	11	102.9
	120.0	708.21									
Traverse 1		79.98	0.03	1.31	932	66	60	16.4	3.9	14.89	99.0
TOTAL TEST		79.98	0.03	1.31	932	66	60	16.4	3.9	14.9	99.0

PROJECT NUMBER : TC190714
 TEST NUMBER : MET-3
 DATE : 21-Aug-19
 TIME : 1st Trav.
 Start 13:27
 Finish 15:27

COMPANY : BIM
 LOCATION : Port Milne, Baffin Island, NU
 SOURCE : Eco Waste Incinerator

TRAVERSE POINT DATA

POINT NO.	TIME (min)	GAS VOLUME (ft3)	dP (in H2O)	dH (in H2O)	STACK TEMP (deg F)	GAS METER TEMP (deg F)		O2 (% dry)	CO2 (% dry)	GAS VELOCITY (ft/s)	
						IN	OUT			%I	%O
1	0.0	838.51	0.029	1.40	923	60	59			16	100.4
	5.0	842.04	0.024	1.20	923	61	58	16.7	3.4	14	108.2
	10.0	845.50	0.029	1.40	944	62	58	15.9	4.0	16	72.2
	15.0	848.02	0.033	1.60	962	63	58	15.5	4.2	17	122.1
2	20.0	852.54	0.036	1.70	998	64	58	16.1	3.9	18	95.7
	25.0	856.20	0.038	1.90	955	65	58	16.6	3.6	18	95.3
	30.0	860.00	0.024	1.20	927	65	59	16.8	3.4	14	99.7
	35.0	863.20	0.025	1.30	923	65	59	16.1	4.0	14	100.6
3	40.0	866.50	0.025	1.30	926	65	59	15.9	4.1	14	100.1
	45.0	869.78	0.025	1.30	926	65	60	15.9	4.1	14	95.1
	50.0	872.90	0.023	1.10	955	66	60	16.9	4.8	14	99.4
	55.0	876.00	0.021	1.10	906	66	60	15.5	4.4	13	102.2
4	60.0	879.10	0.021	1.10	920	68	62	15.5	4.4	13	101.0
	65.0	882.16	0.029	1.40	939	68	63	14.6	5.1	16	95.0
	70.0	885.52	0.021	1.10	896	69	63	16.3	3.9	13	104.9
	75.0	888.73	0.026	1.30	906	69	64	16.2	3.9	15	96.3
5	80.0	892.00	0.027	1.30	946	69	64	14.9	4.9	15	93.8
	85.0	895.20	0.021	1.10	884	68	64	16.3	3.9	13	104.7
	90.0	898.42	0.022	1.10	890	68	64	16.3	3.9	13	97.8
	95.0	901.49	0.024	1.20	921	68	64	16.1	4.1	14	95.3
6	100.0	904.58	0.019	0.85	923	68	64	16.4	3.8	13	92.6
	105.0	907.25	0.020	1.00	926	69	65	15.6	4.5	13	100.3
	110.0	910.22	0.015	0.79	868	69	65	16.7	3.6	11	102.6
	115.0	912.91	0.018	0.95	862	70	66	16.6	3.6	12	95.1
	120.0	915.65									
Traverse 1		77.14	0.02	1.24	923	66	61	16.1	4.1	14.26	98.8
TOTAL TEST		77.14	0.02	1.24	923	66	61	16.1	4.1	14.3	98.8

Appendix B

Laboratory Certificates of Analysis



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Claire Kocharakkal
ALS Project ID: WOO159
ALS WO#: L2338355
Date of Report: 18-Sep-19
Date of Sample Receipt: 28-Aug-19

Client Name: Wood Environment & Infrastructure Solutions
Client Address: 160 Traders Blvd. East, Suite 110
Mississauga, ON L4Z 3K7
Canada
Client Contact: Steve McClure
Client Project ID: TC190713 BAFFINLAND INCINERATORS

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (PE/GN 6-Sep-19)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a $\geq 99\%$ confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank

CVS = Continuing Verification Standard Sample (limits: ± 2 in the last decimal)

LOR = Limit of Reporting

Certified by: _____

Claire Kocharakkal
Project Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Environmental

Sample Analysis Summary Report

Sample Name		PORT MET-1	PORT MET-2	PORT MET-3	MINE MET-1	MINE MET-2
ALS Sample ID		L2338355-1	L2338355-2	L2338355-3	L2338355-4	L2338355-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		18-Aug-19	20-Aug-19	21-Aug-19	24-Aug-19	24-Aug-19
Date of Receipt		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19
<hr/>						
PM via Gravimetric Analysis		LOR				
	Method 5	mg	mg	mg	mg	mg
	Filter Particulate Matter	0.8	42.8	54.2	47.1	21.3
	Acetone Particulate Matter	0.4	6.0	8.8	7.5	4.5
		g	g	g	g	g
	Acetone Mass	0.02	28.8	78.5	66.0	39.9

ALS Environmental

Sample Analysis Summary Report

Sample Name	MINE MET-3	MET-BLANK	MB
ALS Sample ID	L2338355-6	L2338355-7	L2338355-MB
Matrix	Stack	Stack	n/a
Analysis type	Sample	Sample	Sample
Sampling Date/Time	25-Aug-19	25-Aug-19	n/a
Date of Receipt	28-Aug-19	28-Aug-19	n/a
PM via Gravimetric Analysis			
Method 5	LOR		
	mg	mg	mg
Filter Particulate Matter	0.8	27.8	0.3 J <0.1
Acetone Particulate Matter	0.4	17.1	<0.1 <0.1
	g	g	g
Acetone Mass	0.02	96.1	43.4 31.9



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Claire Kocharakkal
ALS Project ID: WOO159
ALS WO#: L2338355
Date of Report: 18-Sep-19
Date of Sample Receipt: 28-Aug-19

Client Name: Wood Environment & Infrastructure Solutions
Client Address: 160 Traders Blvd. East Suite 110
Mississauga, ON L4Z 3K7
Canada
Client Contact: Steve McClure
Client Project ID: TC190713 BAFFINLAND INCINERATORS

COMMENTS:

Sample Preparation via USEPA Method 29 (AB 11,12,17-SEP-2019)
Mercury Analysis via CVAA using Method USEPA 7470A (AB 12,18-SEP-2019)

LOR = Limit of Reporting
LCB = Laboratory Control Blank (limits: <LOR)
LCS = Laboratory Control Sample (limits: hivol, solids: 85-115%, stack: 90-110%)
MS = Matrix Spike Sample (limits: 75-125%)
RPD = Relative Percent Difference (limits: <20%)
CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by: _____

Claire Kocharakkal
Project Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Environmental

Sample Analysis Summary Report

Sample Name		PORT MET-1	PORT MET-2	PORT MET-3	MINE MET-1	MINE MET-2
ALS Sample ID		L2338355-1	L2338355-2	L2338355-3	L2338355-4	L2338355-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		18-Aug-19	20-Aug-19	21-Aug-19	24-Aug-19	24-Aug-19
Date of Receipt		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19

Mercury via CVAA		LOR					
	Method 29	ug	ug	ug	ug	ug	ug
Analytical Fraction 1B	0.015	0.0174	0.0177	<0.015	<0.015	<0.015	<0.015
Analytical Fraction 3B	0.025	0.175	0.247	0.536	0.248	<0.03	<0.03
Analytical Fraction 3C	0.25	0.231	0.128	0.180	0.170	0.170	0.170

ALS Environmental

Sample Analysis Summary Report

Sample Name	MINE MET-3	MET-BLANK
ALS Sample ID	L2338355-6	L2338355-7
Matrix	Stack	Stack
Analysis type	Sample	Sample
Sampling Date/Time	25-Aug-19	25-Aug-19
Date of Receipt	28-Aug-19	28-Aug-19

Mercury via CVAA	Method 29	LOR ug	ug	ug
Analytical Fraction 1B	0.015	<0.015		0.0171
Analytical Fraction 3B	0.025	0.546		<0.0125
Analytical Fraction 3C	0.25	0.165		<0.125

ALS Environmental

Sample QC Summary Report

Sample Name	LCB	LCS	LCS	LCSD	LCSD	
ALS Sample ID	LCB	LCS	LCS	LCSD	LCSD	
Analysis type	Method Blank	Blank Spike	Blank Spike	Blank Spike Dup	Blank Spike Dup	
Sampling Date/Time	N/A	N/A	N/A	N/A	N/A	
Date of Receipt	N/A	N/A	N/A	N/A	N/A	
Mercury via CVAA	Method 29	LOR ug	ug	% Rec	ug	% Rec
Analytical Fraction 1B	0.015	<0.015	0.282	94%	0.283	94%
Analytical Fraction 3B	0.025	<0.025	0.477	94%	0.481	95%
Analytical Fraction 3C	0.25	<0.15	2.90	96%	3.00	99%

ALS Environmental

Sample QC Summary Report

Sample Name		PORT MET-1	PORT MET-1	PORT MET-1	PORT MET-1	PORT MET-1	PORT MET-1
ALS Sample ID		L2338355-1	L2338355-1DUP	L2338355-1MS	L2338355-1MS	L2338355-1MSD	L2338355-1MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Dup
Sampling Date/Time		18-Aug-19	18-Aug-19	18-Aug-19	18-Aug-19	18-Aug-19	18-Aug-19
Date of Receipt		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19
Mercury via CVAA							
	Method 29	LOR					
		ug	ug	ug	% Rec	ug	% Rec
Analytical Fraction 1B	0.015	0.0174	0.0171	0.312	98%	0.300	94%
Analytical Fraction 3B	0.025	0.175	0.175	0.682	92%	0.682	92%
Analytical Fraction 3C	0.250	0.231	0.216	3.03	93%	2.95	91%



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Claire Kocharakkal
ALS Project ID: WOO159
ALS WO#: L2338384
Date of Report: 19-Sep-19
Date of Sample Receipt: 28-Aug-19

Client Name: Wood Environment & Infrastructure Solutions
Client Address: 160 Traders Blvd. East Suite 110
Mississauga, ON L4Z 3K7
Canada
Client Contact: Steve McClure
Client Project ID: TC190713 BAFFINLAND INCINERATORS

COMMENTS: PCDD/F by EPA M23

Certified by:

A handwritten signature in black ink, appearing to read "Bradley Reimer", is written over a horizontal line.

Bradley Reimer
GC/MS Laboratory Senior Technical Specialist

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Life Sciences

Sample Analysis Summary Report

Sample Name	PORT ORG-1	PORT ORG-2	PORT ORG-3	MINE ORG-1	MINE ORG-2	MINE ORG-3
ALS Sample ID	L2338384-1	L2338384-2	L2338384-3	L2338384-4	L2338384-5	L2338384-6
Sample Size	1	1	1	1	1	1
Sample size units	Train	Train	Train	Train	Train	Train
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Stack	Stack	Stack	Stack	Stack	Stack
Sampling Date	18-Aug-19	20-Aug-19	21-Aug-19	23-Aug-19	24-Aug-19	25-Aug-19
Extraction Date	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19	11-Sep-19
Target Analytes	pg	pg	pg	pg	pg	pg
2,3,7,8-TCDD	221	2640	223	141	27.7	40.2
1,2,3,7,8-PeCDD	860	6850	990	699	153	172
1,2,3,4,7,8-HxCDD	621	3550	1250	487	94.5	151
1,2,3,6,7,8-HxCDD	1170	4000	1480	913	190	621
1,2,3,7,8,9-HxCDD	1200	4860	1650	1020	177	476
1,2,3,4,6,7,8-HpCDD	7590	16300	17900	6350	792	3480
OCDD	8120	11900	42500	10300	861	2890
2,3,7,8-TCDF	1060	11000	1210	736	307	369
1,2,3,7,8-PeCDF	2230	18600	2320	1330	257	349
2,3,4,7,8-PeCDF	2760	15000	3400	2490	760	973
1,2,3,4,7,8-HxCDF	2590	14400	3810	2100	395	533
1,2,3,6,7,8-HxCDF	3100	15900	4320	2480	418	558
2,3,4,6,7,8-HxCDF	3270	9390	6460	3160	714	1040
1,2,3,7,8,9-HxCDF	1130	2560	1870	760	180	254
1,2,3,4,6,7,8-HpCDF	7760	24600	20700	9390	1190	2040
1,2,3,4,7,8,9-HpCDF	1830	2950	3490	1150	265	332
OCDF	4310	4980	14600	4770	803	1510
Field Spike Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	82	94	87	88	86	83
13C12-1,2,3,4,7,8-HxCDD	82	96	92	75	81	78
13C12-2,3,4,7,8-PeCDF	108	112	104	108	102	104
13C12-1,2,3,4,7,8-HxCDF	91	95	92	89	87	86
13C12-1,2,3,4,7,8,9-HpCDF	97	96	95	104	98	99
Extraction Standards						
13C12-2,3,7,8-TCDD	76	92	91	84	87	88
13C12-1,2,3,7,8-PeCDD	108	102	92	110	90	120
13C12-1,2,3,6,7,8-HxCDD	78	94	95	91	93	96
13C12-1,2,3,4,6,7,8-HpCDD	96	97	99	110	86	112
13C12-OCDD	82	71	78	97	63	97
13C12-2,3,7,8-TCDF	74	88	89	83	89	87
13C12-1,2,3,7,8-PeCDF	100	97	90	103	91	114
13C12-1,2,3,6,7,8-HxCDF	75	101	99	85	93	96
13C12-1,2,3,4,6,7,8-HpCDF	94	99	98	103	85	109
Cleanup Standard						
13C12-1,2,3,7,8,9-HxCDF	77	93	86	80	80	82
Homologue Group Totals	pg	pg	pg	pg	pg	pg
Total-TCDD	3420	39200	5280	4420	1610	1250
Total-PeCDD	7560	51000	8970	9920	2870	6410
Total-HxCDD	10800	46400	16400	12400	2720	11800
Total-HpCDD	13100	30200	31500	12800	1650	8620
Total-TCDF	28600	282000	36100	23600	7260	9130
Total-PeCDF	30500	235000	40900	27100	6620	8230
Total-HxCDF	25200	120000	41100	21600	4550	5860
Total-HpCDF	15100	37500	35700	14500	2490	3740
Toxic Equivalency - (WHO 2005)						
Lower Bound PCDD/F TEQ (WHO 2005)	3570	21600	4950	2970	687	975
Mid Point PCDD/F TEQ (WHO 2005)	3570	21600	4950	2970	687	975
Upper Bound PCDD/F TEQ (WHO 2005)	3570	21600	4950	2970	687	975

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	ORG-BLANK
ALS Sample ID	L2338384-7
Sample Size	1
Sample size units	Train
Percent Moisture	n/a
Sample Matrix	Stack
Sampling Date	25-Aug-19
Extraction Date	11-Sep-19

Target Analytes	pg
2,3,7,8-TCDD	<0.66
1,2,3,7,8-PeCDD	1.53
1,2,3,4,7,8-HxCDD	<2.2
1,2,3,6,7,8-HxCDD	4.23
1,2,3,7,8,9-HxCDD	3.66
1,2,3,4,6,7,8-HpCDD	49.4
OCDD	183
2,3,7,8-TCDF	2.00
1,2,3,7,8-PeCDF	2.94
2,3,4,7,8-PeCDF	5.49
1,2,3,4,7,8-HxCDF	6.44
1,2,3,6,7,8-HxCDF	7.36
2,3,4,6,7,8-HxCDF	11.9
1,2,3,7,8,9-HxCDF	2.76
1,2,3,4,6,7,8-HpCDF	77.7
1,2,3,4,7,8,9-HpCDF	5.01
OCDF	48.5

Field Spike Standards	% Rec
37Cl4-2,3,7,8-TCDD	90
13C12-1,2,3,4,7,8-HxCDD	75
13C12-2,3,4,7,8-PeCDF	107
13C12-1,2,3,4,7,8-HxCDF	87
13C12-1,2,3,4,7,8,9-HpCDF	98

Extraction Standards	%
13C12-2,3,7,8-TCDD	106
13C12-1,2,3,7,8-PeCDD	110
13C12-1,2,3,6,7,8-HxCDD	110
13C12-1,2,3,4,6,7,8-HpCDD	98
13C12-OCDD	66
13C12-2,3,7,8-TCDF	105
13C12-1,2,3,7,8-PeCDF	104
13C12-1,2,3,6,7,8-HxCDF	109
13C12-1,2,3,4,6,7,8-HpCDF	97

Cleanup Standard	%
13C12-1,2,3,7,8,9-HxCDF	87

Homologue Group Totals	pg
Total-TCDD	5.80
Total-PeCDD	7.03
Total-HxCDD	35.7
Total-HpCDD	93.4
Total-TCDF	32.8
Total-PeCDF	48.9
Total-HxCDF	51.6
Total-HpCDF	93.9

Toxic Equivalency - (WHO 2005)	
Lower Bound PCDD/F TEQ (WHO 2005)	8.49
Mid Point PCDD/F TEQ (WHO 2005)	9.04
Upper Bound PCDD/F TEQ (WHO 2005)	9.37

ALS Life Sciences

Quality Control Summary Report

Sample Name	Method Blank Reagent	Method Blank Media	Laboratory Control Sample
ALS Sample ID	WG3150248-1	WG3150248-4	WG3150248-2
Sample Size	1	1	1
Sample size units	Train	Train	n/a
Percent Moisture	n/a	n/a	n/a
Sample Matrix	QC	QC	QC
Sampling Date	n/a	n/a	n/a
Extraction Date	11-Sep-19	11-Sep-19	11-Sep-19
Target Analytes	pg	pg	% Rec
2,3,7,8-TCDD	<0.69	<3.6	100
1,2,3,7,8-PeCDD	<0.41	<1.5	104
1,2,3,4,7,8-HxCDD	<0.46	<1.5	94
1,2,3,6,7,8-HxCDD	<0.42	<1.4	108
1,2,3,7,8,9-HxCDD	<0.50	<1.4	112
1,2,3,4,6,7,8-HpCDD	2.15	<1.8	102
OCDD	11.2	24.7	99
2,3,7,8-TCDF	<0.52	<2.6	96
1,2,3,7,8-PeCDF	<0.77	<1.4	109
2,3,4,7,8-PeCDF	<0.38	<1.3	99
1,2,3,4,7,8-HxCDF	<0.58	<1.2	101
1,2,3,6,7,8-HxCDF	<0.73	<1.2	119
2,3,4,6,7,8-HxCDF	<0.58	<1.2	115
1,2,3,7,8,9-HxCDF	<0.94	<1.4	125
1,2,3,4,6,7,8-HpCDF	1.02	<0.71	106
1,2,3,4,7,8,9-HpCDF	<0.43	<0.84	105
OCDF	<2.3	<4.6	110
Field Spike Standards	% Rec	% Rec	% Rec
37Cl4-2,3,7,8-TCDD	NS	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS	NS
Extraction Standards			
13C12-2,3,7,8-TCDD	94	97	107
13C12-1,2,3,7,8-PeCDD	97	129	149
13C12-1,2,3,6,7,8-HxCDD	89	85	93
13C12-1,2,3,4,6,7,8-HpCDD	90	113	126
13C12-OCDD	62	88	105
13C12-2,3,7,8-TCDF	97	95	100
13C12-1,2,3,7,8-PeCDF	97	123	138
13C12-1,2,3,6,7,8-HxCDF	91	85	86
13C12-1,2,3,4,6,7,8-HpCDF	94	103	122
Cleanup Standard			
13C12-1,2,3,7,8,9-HxCDF	82	78	90
Homologue Group Totals	pg	pg	
Total-TCDD	<0.69	<3.6	
Total-PeCDD	<0.41	<1.5	
Total-HxCDD	<0.46	<1.5	
Total-HpCDD	3.38	1.79	
Total-TCDF	<0.52	<2.6	
Total-PeCDF	<0.42	<1.4	
Total-HxCDF	<0.66	<1.4	
Total-HpCDF	1.02	<0.84	
Toxic Equivalency - (WHO 2005)			
Lower Bound PCDD/F TEQ (WHO 2005)	0.0351	0.00741	
Mid Point PCDD/F TEQ (WHO 2005)	1.01	3.40	
Upper Bound PCDD/F TEQ (WHO 2005)	1.75	6.76	

ALS Life Sciences

Sample Analysis Report

Sample Name PORT ORG-1
 ALS Sample ID L2338384-1
 Analysis Method EPA M23
 Analysis Type Sample
 Sample Matrix Stack

Sampling Date 18-Aug-19
 Extraction Date 11-Sep-19
 Sample Size 1 Train
 Percent Moisture n/a
 Split Ratio 2

Approved:
T. Patterson
 --e-signature--
 18-Sep-2019

Run Information **Run 1**
 Filename 7-190916A23
 Run Date 17-Sep-19 06:34
 Final Volume 20 uL
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	27.96	221	5.6			20
1,2,3,7,8-PeCDD	1	32.05	860	3.4			100
1,2,3,4,7,8-HxCDD	0.1	34.08	621	4.1			100
1,2,3,6,7,8-HxCDD	0.1	34.13	1170	3.8			100
1,2,3,7,8,9-HxCDD	0.1	34.26	1200	3.9			100
1,2,3,4,6,7,8-HpCDD	0.01	35.74	7590	6.5			100
OCDD	0.0003	37.22	8120	5.4			200
2,3,7,8-TCDF	0.1	27.04	1060	10			20
1,2,3,7,8-PeCDF	0.03	31.12	2230	5.1			100
2,3,4,7,8-PeCDF	0.3	31.83	2760	4.6			100
1,2,3,4,7,8-HxCDF	0.1	33.59	2590	7.5			100
1,2,3,6,7,8-HxCDF	0.1	33.66	3100	7.0			100
2,3,4,6,7,8-HxCDF	0.1	33.99	3270	7.5			100
1,2,3,7,8,9-HxCDF	0.1	34.43	1130	8.5			100
1,2,3,4,6,7,8-HpCDF	0.01	35.18	7760	5.1			100
1,2,3,4,7,8,9-HpCDF	0.01	35.98	1830	6.1			100
OCDF	0.0003	37.31	4310	4.0			200

Field Spike Standards	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD	400	27.95	82 70-130
13C12-1,2,3,4,7,8-HxCDD	4000	34.08	82 70-130
13C12-2,3,4,7,8-PeCDF	4000	31.83	108 70-130
13C12-1,2,3,4,7,8-HxCDF	4000	33.59	91 70-130
13C12-1,2,3,4,7,8,9-HpCDF	4000	35.98	97 70-130

Extraction Standards	pg	Conc.	EDL
13C12-2,3,7,8-TCDD	4000	27.93	76 40-130
13C12-1,2,3,7,8-PeCDD	4000	32.04	108 40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.13	78 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.73	96 25-130
13C12-OCDD	8000	37.21	82 25-130
13C12-2,3,7,8-TCDF	4000	27.01	74 40-130
13C12-1,2,3,7,8-PeCDF	4000	31.10	100 40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.66	75 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.17	94 25-130

Cleanup Standard	pg	Conc.	EDL
13C12-1,2,3,7,8,9-HxCDF	4000	34.40	77 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	
Total-TCDD	14	3420	5.6	20
Total-PeCDD	9	7560	3.4	100
Total-HxCDD	7	10800	4.1	100
Total-HpCDD	2	13100	6.5	100
Total-TCDF	22	28600	10	20
Total-PeCDF	15	30500	5.1	100
Total-HxCDF	13	25200	8.5	100
Total-HpCDF	4	15100	6.1	100

Toxic Equivalency - (WHO 2005)	pg
Lower Bound PCDD/F TEQ (WHO 2005)	3570
Mid Point PCDD/F TEQ (WHO 2005)	3570
Upper Bound PCDD/F TEQ (WHO 2005)	3570

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name PORT ORG-2 ALS Sample ID L2338384-2 Analysis Method EPA M23 Analysis Type Sample Sample Matrix Stack	Sampling Date 20-Aug-19 Extraction Date 11-Sep-19 Sample Size 1 Train Percent Moisture n/a Split Ratio 2	Approved: <i>T. Patterson</i> --e-signature-- 18-Sep-2019
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Run Information	Run 1	Run 2
Filename	7-190916A24	7-190917A12
Run Date	17-Sep-19 07:16	17-Sep-19 19:24
Final Volume	20 uL	20 uL
Dilution Factor	1	5
Analysis Units	pg	pg
Instrument - Column	HRMS-7 DB5MSUST470135H	HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	EMPC pg	LQL	Ret. Time	Conc. pg	EDL pg	EMPC pg	LQL
2,3,7,8-TCDD	1	27.92	2640	1.8		20					
1,2,3,7,8-PeCDD	1	32.04	6850	2.4		100					
1,2,3,4,7,8-HxCDD	0.1	34.08	3550	3.5		100					
1,2,3,6,7,8-HxCDD	0.1	34.13	4000	3.2		100					
1,2,3,7,8,9-HxCDD	0.1	34.25	4860	3.3		100					
1,2,3,4,6,7,8-HpCDD	0.01	35.73	16300	4.8		100					
OCDD	0.0003	37.21	11900	3.2		200					
2,3,7,8-TCDF	0.1						27.05	11000	53		100
1,2,3,7,8-PeCDF	0.03	31.10	18600	6.9		100					
2,3,4,7,8-PeCDF	0.3	31.82	15000	6.2		100					
1,2,3,4,7,8-HxCDF	0.1	33.59	14400	11		100					
1,2,3,6,7,8-HxCDF	0.1	33.66	15900	10		100					
2,3,4,6,7,8-HxCDF	0.1	33.98	9390	11		100					
1,2,3,7,8,9-HxCDF	0.1	34.42	2560	12		100					
1,2,3,4,6,7,8-HpCDF	0.01	35.17	24600	3.2		100					
1,2,3,4,7,8,9-HpCDF	0.01	35.98	2950	3.8		100					
OCDF	0.0003	37.30	4980	3.8		200					
Field Spike Standards	pg	% Rec	Limits				% Rec				
37Cl4-2,3,7,8-TCDD	400	27.92	94	70-130							
13C12-1,2,3,4,7,8-HxCDD	4000	34.07	96	70-130							
13C12-2,3,4,7,8-PeCDF	4000	31.82	112	70-130							
13C12-1,2,3,4,7,8-HxCDF	4000	33.58	95	70-130							
13C12-1,2,3,4,7,8,9-HpCDF	4000	35.97	96	70-130							
Extraction Standards											
13C12-2,3,7,8-TCDD	4000	27.89	92	40-130							
13C12-1,2,3,7,8-PeCDD	4000	32.03	102	40-130							
13C12-1,2,3,6,7,8-HxCDD	4000	34.12	94	40-130							
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.73	97	25-130							
13C12-OCDD	8000	37.21	71	25-130							
13C12-2,3,7,8-TCDF	4000			40-130			27.02	88			
13C12-1,2,3,7,8-PeCDF	4000	31.09	97	40-130							
13C12-1,2,3,6,7,8-HxCDF	4000	33.65	101	40-130							
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.17	99	25-130							
Cleanup Standard	pg										
13C12-1,2,3,7,8,9-HxCDF	4000	34.39	93	40-130							
Homologue Group Totals	# peaks	Conc. pg	EDL pg				# peaks	Conc. pg	EDL pg		
Total-TCDD	16	39200	1.8		20						
Total-PeCDD	10	51000	2.4		100						
Total-HxCDD	7	46400	3.5		100						
Total-HpCDD	2	30200	4.8		100						
Total-TCDF							21	282000	53		20
Total-PeCDF	21	235000	6.9		100						
Total-HxCDF	15	120000	12		100						
Total-HpCDF	4	37500	3.8		100						

Toxic Equivalency - (WHO 2005)	pg
Lower Bound PCDD/F TEQ (WHO 2005)	21600
Mid Point PCDD/F TEQ (WHO 2005)	21600
Upper Bound PCDD/F TEQ (WHO 2005)	21600

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor
 TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name PORT ORG-3
 ALS Sample ID L2338384-3
 Analysis Method EPA M23
 Analysis Type Sample
 Sample Matrix Stack

Sampling Date 21-Aug-19
 Extraction Date 11-Sep-19
 Sample Size 1 Train
 Percent Moisture n/a
 Split Ratio 2

Approved:
T. Patterson
 --e-signature--
 18-Sep-2019

Run Information **Run 1**
 Filename 7-190916A25
 Run Date 17-Sep-19 07:58
 Final Volume 20 uL
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	EMPC pg	LQL
2,3,7,8-TCDD	1	27.92	223	1.3		20
1,2,3,7,8-PeCDD	1	32.04	990	1.4		100
1,2,3,4,7,8-HxCDD	0.1	34.08	1250	4.1		100
1,2,3,6,7,8-HxCDD	0.1	34.13	1480	3.8		100
1,2,3,7,8,9-HxCDD	0.1	34.26	1650	3.9		100
1,2,3,4,6,7,8-HpCDD	0.01	35.74	17900	7.0		100
OCDD	0.0003	37.22	42500	5.3		200
2,3,7,8-TCDF	0.1	26.99	1210	2.8		20
1,2,3,7,8-PeCDF	0.03	31.10	2320	3.8		100
2,3,4,7,8-PeCDF	0.3	31.83	3400	3.4		100
1,2,3,4,7,8-HxCDF	0.1	33.59	3810	4.9		100
1,2,3,6,7,8-HxCDF	0.1	33.66	4320	4.5		100
2,3,4,6,7,8-HxCDF	0.1	33.99	6460	4.8		100
1,2,3,7,8,9-HxCDF	0.1	34.43	1870	5.5		100
1,2,3,4,6,7,8-HpCDF	0.01	35.18	20700	6.1		100
1,2,3,4,7,8,9-HpCDF	0.01	35.98	3490	7.2		100
OCDF	0.0003	37.31	14600	3.2		200

Field Spike Standards	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD	400	27.92	87 70-130
13C12-1,2,3,4,7,8-HxCDD	4000	34.08	92 70-130
13C12-2,3,4,7,8-PeCDF	4000	31.82	104 70-130
13C12-1,2,3,4,7,8-HxCDF	4000	33.59	92 70-130
13C12-1,2,3,4,7,8,9-HpCDF	4000	35.98	95 70-130

Extraction Standards	pg	Conc.	EDL
13C12-2,3,7,8-TCDD	4000	27.90	91 40-130
13C12-1,2,3,7,8-PeCDD	4000	32.03	92 40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.13	95 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.73	99 25-130
13C12-OCDD	8000	37.21	78 25-130
13C12-2,3,7,8-TCDF	4000	26.98	89 40-130
13C12-1,2,3,7,8-PeCDF	4000	31.09	90 40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.65	99 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.17	98 25-130

Cleanup Standard	pg	Conc.	EDL
13C12-1,2,3,7,8,9-HxCDF	4000	34.39	86 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	
Total-TCDD	16	5280	1.3	20
Total-PeCDD	8	8970	1.4	100
Total-HxCDD	7	16400	4.1	100
Total-HpCDD	2	31500	7.0	100
Total-TCDF	23	36100	2.8	20
Total-PeCDF	22	40900	3.8	100
Total-HxCDF	14	41100	5.5	100
Total-HpCDF	4	35700	7.2	100

Toxic Equivalency - (WHO 2005) **pg**
Lower Bound PCDD/F TEQ (WHO 2005) 4950
Mid Point PCDD/F TEQ (WHO 2005) 4950
Upper Bound PCDD/F TEQ (WHO 2005) 4950

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name MINE ORG-1
 ALS Sample ID L2338384-4
 Analysis Method EPA M23
 Analysis Type Sample
 Sample Matrix Stack

Sampling Date 23-Aug-19
 Extraction Date 11-Sep-19
 Sample Size 1 Train
 Percent Moisture n/a
 Split Ratio 2

Approved:
T. Patterson
 --e-signature--
 18-Sep-2019

Run Information **Run 1**
 Filename 7-190916A26
 Run Date 17-Sep-19 08:40
 Final Volume 20 uL
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	27.95	141	5.2			20
1,2,3,7,8-PeCDD	1	32.05	699	3.7			100
1,2,3,4,7,8-HxCDD	0.1	34.08	487	7.3			100
1,2,3,6,7,8-HxCDD	0.1	34.13	913	6.7			100
1,2,3,7,8,9-HxCDD	0.1	34.26	1020	6.9			100
1,2,3,4,6,7,8-HpCDD	0.01	35.74	6350	6.6			100
OCDD	0.0003	37.22	10300	5.4			200
2,3,7,8-TCDF	0.1	27.02	736	6.9			20
1,2,3,7,8-PeCDF	0.03	31.12	1330	3.9			100
2,3,4,7,8-PeCDF	0.3	31.83	2490	3.5			100
1,2,3,4,7,8-HxCDF	0.1	33.59	2100	7.1			100
1,2,3,6,7,8-HxCDF	0.1	33.66	2480	6.6			100
2,3,4,6,7,8-HxCDF	0.1	33.99	3160	7.1			100
1,2,3,7,8,9-HxCDF	0.1	34.43	760	8.1			100
1,2,3,4,6,7,8-HpCDF	0.01	35.18	9390	5.6			100
1,2,3,4,7,8,9-HpCDF	0.01	35.98	1150	6.6			100
OCDF	0.0003	37.31	4770	3.9			200

Field Spike Standards	pg	% Rec	Limits
37C14-2,3,7,8-TCDD	400	27.95	88 70-130
13C12-1,2,3,4,7,8-HxCDD	4000	34.07	75 70-130
13C12-2,3,4,7,8-PeCDF	4000	31.82	108 70-130
13C12-1,2,3,4,7,8-HxCDF	4000	33.59	89 70-130
13C12-1,2,3,4,7,8,9-HpCDF	4000	35.98	104 70-130

Extraction Standards	pg	Conc.	EDL
13C12-2,3,7,8-TCDD	4000	27.92	84 40-130
13C12-1,2,3,7,8-PeCDD	4000	32.03	110 40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.13	91 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.73	110 25-130
13C12-OCDD	8000	37.21	97 25-130
13C12-2,3,7,8-TCDF	4000	27.01	83 40-130
13C12-1,2,3,7,8-PeCDF	4000	31.09	103 40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.65	85 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.17	103 25-130

Cleanup Standard	pg	Conc.	EDL
13C12-1,2,3,7,8,9-HxCDF	4000	34.39	80 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	
Total-TCDD	13	4420	5.2	20
Total-PeCDD	9	9920	3.7	100
Total-HxCDD	7	12400	7.3	100
Total-HpCDD	2	12800	6.6	100
Total-TCDF	24	23600	6.9	20
Total-PeCDF	20	27100	3.9	100
Total-HxCDF	13	21600	8.1	100
Total-HpCDF	4	14500	6.6	100

Toxic Equivalency - (WHO 2005)
Lower Bound PCDD/F TEQ (WHO 2005) 2970
Mid Point PCDD/F TEQ (WHO 2005) 2970
Upper Bound PCDD/F TEQ (WHO 2005) 2970

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name MINE ORG-2
 ALS Sample ID L2338384-5
 Analysis Method EPA M23
 Analysis Type Sample
 Sample Matrix Stack

Sampling Date 24-Aug-19
 Extraction Date 11-Sep-19
 Sample Size 1 Train
 Percent Moisture n/a
 Split Ratio 2

Approved:
T. Patterson
 --e-signature--
 18-Sep-2019

Run Information **Run 1**
 Filename 7-190916A27
 Run Date 17-Sep-19 09:22
 Final Volume 20 uL
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	27.90	27.7	0.89			20
1,2,3,7,8-PeCDD	1	32.04	153	1.4			100
1,2,3,4,7,8-HxCDD	0.1	34.08	94.5	1.9	J		100
1,2,3,6,7,8-HxCDD	0.1	34.13	190	1.7			100
1,2,3,7,8,9-HxCDD	0.1	34.25	177	1.8			100
1,2,3,4,6,7,8-HpCDD	0.01	35.74	792	2.4			100
OCDD	0.0003	37.22	861	1.9			200
2,3,7,8-TCDF	0.1	26.99	307	2.2			20
1,2,3,7,8-PeCDF	0.03	31.09	257	2.9			100
2,3,4,7,8-PeCDF	0.3	31.82	760	2.6			100
1,2,3,4,7,8-HxCDF	0.1	33.59	395	2.8			100
1,2,3,6,7,8-HxCDF	0.1	33.66	418	2.6			100
2,3,4,6,7,8-HxCDF	0.1	33.99	714	2.7			100
1,2,3,7,8,9-HxCDF	0.1	34.42	180	3.1			100
1,2,3,4,6,7,8-HpCDF	0.01	35.18	1190	1.7			100
1,2,3,4,7,8,9-HpCDF	0.01	35.98	265	2.0			100
OCDF	0.0003	37.31	803	3.0			200

Field Spike Standards	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD	400	27.90	86 70-130
13C12-1,2,3,4,7,8-HxCDD	4000	34.07	81 70-130
13C12-2,3,4,7,8-PeCDF	4000	31.80	102 70-130
13C12-1,2,3,4,7,8-HxCDF	4000	33.58	87 70-130
13C12-1,2,3,4,7,8,9-HpCDF	4000	35.98	98 70-130

Extraction Standards	pg	Conc.	EDL
13C12-2,3,7,8-TCDD	4000	27.89	87 40-130
13C12-1,2,3,7,8-PeCDD	4000	32.03	90 40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.12	93 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.73	86 25-130
13C12-OCDD	8000	37.22	63 25-130
13C12-2,3,7,8-TCDF	4000	26.96	89 40-130
13C12-1,2,3,7,8-PeCDF	4000	31.08	91 40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.65	93 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.17	85 25-130

Cleanup Standard	pg	Conc.	EDL
13C12-1,2,3,7,8,9-HxCDF	4000	34.39	80 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	
Total-TCDD	15	1610	0.89	20
Total-PeCDD	9	2870	1.4	100
Total-HxCDD	7	2720	1.9	100
Total-HpCDD	2	1650	2.4	100
Total-TCDF	22	7260	2.2	20
Total-PeCDF	15	6620	2.9	100
Total-HxCDF	13	4550	3.1	100
Total-HpCDF	4	2490	2.0	100

Toxic Equivalency - (WHO 2005) **pg**
Lower Bound PCDD/F TEQ (WHO 2005) 687
Mid Point PCDD/F TEQ (WHO 2005) 687
Upper Bound PCDD/F TEQ (WHO 2005) 687

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency;

J Indicates that a target analyte was detected below the calibrated range.

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name MINE ORG-3
 ALS Sample ID L2338384-6
 Analysis Method EPA M23
 Analysis Type Sample
 Sample Matrix Stack

Sampling Date 25-Aug-19
 Extraction Date 11-Sep-19
 Sample Size 1 Train
 Percent Moisture n/a
 Split Ratio 2

Approved:
T. Patterson
 --e-signature--
 18-Sep-2019

Run Information **Run 1**
 Filename 7-190916A28
 Run Date 17-Sep-19 10:04
 Final Volume 20 uL
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS-7 DB5MSUST470135H

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	27.95	40.2	5.5	M		20
1,2,3,7,8-PeCDD	1	32.05	172	3.2			100
1,2,3,4,7,8-HxCDD	0.1	34.08	151	4.5			100
1,2,3,6,7,8-HxCDD	0.1	34.13	621	4.2			100
1,2,3,7,8,9-HxCDD	0.1	34.26	476	4.3			100
1,2,3,4,6,7,8-HpCDD	0.01	35.74	3480	6.9			100
OCDD	0.0003	37.23	2890	4.1			200
2,3,7,8-TCDF	0.1	27.02	369	7.3	M		20
1,2,3,7,8-PeCDF	0.03	31.12	349	5.1			100
2,3,4,7,8-PeCDF	0.3	31.84	973	4.5			100
1,2,3,4,7,8-HxCDF	0.1	33.59	533	7.2			100
1,2,3,6,7,8-HxCDF	0.1	33.66	558	6.7			100
2,3,4,6,7,8-HxCDF	0.1	33.99	1040	7.2			100
1,2,3,7,8,9-HxCDF	0.1	34.43	254	8.2			100
1,2,3,4,6,7,8-HpCDF	0.01	35.18	2040	4.5			100
1,2,3,4,7,8,9-HpCDF	0.01	35.99	332	5.3			100
OCDF	0.0003	37.31	1510	4.2			200

Field Spike Standards	pg	% Rec	Limits
37Cl4-2,3,7,8-TCDD	400	27.96	83 70-130
13C12-1,2,3,4,7,8-HxCDD	4000	34.08	78 70-130
13C12-2,3,4,7,8-PeCDF	4000	31.83	104 70-130
13C12-1,2,3,4,7,8-HxCDF	4000	33.59	86 70-130
13C12-1,2,3,4,7,8,9-HpCDF	4000	35.98	99 70-130

Extraction Standards	pg	Conc.	EDL
13C12-2,3,7,8-TCDD	4000	27.93	88 40-130
13C12-1,2,3,7,8-PeCDD	4000	32.04	120 40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.13	96 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.73	112 25-130
13C12-OCDD	8000	37.22	97 25-130
13C12-2,3,7,8-TCDF	4000	27.02	87 40-130
13C12-1,2,3,7,8-PeCDF	4000	31.10	114 40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.66	96 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.18	109 25-130

Cleanup Standard	pg	Conc.	EDL
13C12-1,2,3,7,8,9-HxCDF	4000	34.40	82 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg	
Total-TCDD	12	1250	5.5	20
Total-PeCDD	9	6410	3.2	100
Total-HxCDD	7	11800	4.5	100
Total-HpCDD	2	8620	6.9	100
Total-TCDF	18	9130	7.3	20
Total-PeCDF	13	8230	5.1	100
Total-HxCDF	13	5860	8.2	100
Total-HpCDF	4	3740	5.3	100

Toxic Equivalency - (WHO 2005) **pg**
Lower Bound PCDD/F TEQ (WHO 2005) 975
Mid Point PCDD/F TEQ (WHO 2005) 975
Upper Bound PCDD/F TEQ (WHO 2005) 975

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
 M Indicates that a peak has been manually integrated.

LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 EMPC Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	Method Blank Reagent	Sampling Date	n/a	
ALS Sample ID	WG3150248-1	Extraction Date	11-Sep-19	Approved: <i>T. Patterson</i> --e-signature-- 18-Sep-2019
Analysis Method	EPA M23	Sample Size	1	
Analysis Type	Blank	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	2	

Run Information		Run 1	
Filename	7-190916A20		
Run Date	17-Sep-19 04:27		
Final Volume	20	uL	
Dilution Factor	1		
Analysis Units	pg		
Instrument - Column	HRMS-7 DB5MSUST470135H		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	NotFnd	<0.69	0.69	U		20
1,2,3,7,8-PeCDD	1	NotFnd	<0.41	0.41	U		100
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<0.46	0.46	U		100
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<0.42	0.42	U		100
1,2,3,7,8,9-HxCDD	0.1	34.26	<0.50	0.43	M,J,R	0.50	100
1,2,3,4,6,7,8-HpCDD	0.01	35.75	2.15	0.47	M,J		100
OCDD	0.0003	37.23	11.2	1.4	M,J		200
2,3,7,8-TCDF	0.1	NotFnd	<0.52	0.52	U		20
1,2,3,7,8-PeCDF	0.03	31.10	<0.77	0.42	M,J,R	0.77	100
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.38	0.38	U		100
1,2,3,4,7,8-HxCDF	0.1	33.60	<0.58	0.58	M,U	0.53	100
1,2,3,6,7,8-HxCDF	0.1	33.67	<0.73	0.54	M,J,R	0.73	100
2,3,4,6,7,8-HxCDF	0.1	34.00	<0.58	0.58	M,U		100
1,2,3,7,8,9-HxCDF	0.1	34.41	<0.94	0.66	M,J,R	0.94	100
1,2,3,4,6,7,8-HpCDF	0.01	35.18	1.02	0.37	M,J		100
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.43	0.43	U		100
OCDF	0.0003	37.32	<2.3	0.82	M,J,R	2.3	200

Field Spike Standards	% Rec
37C14-2,3,7,8-TCDD	NS
13C12-1,2,3,4,7,8-HxCDD	NS
13C12-2,3,4,7,8-PeCDF	NS
13C12-1,2,3,4,7,8-HxCDF	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS

Extraction Standards	
13C12-2,3,7,8-TCDD	4000 27.89 94 40-130
13C12-1,2,3,7,8-PeCDD	4000 32.04 97 40-130
13C12-1,2,3,6,7,8-HxCDD	4000 34.13 89 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000 35.74 90 25-130
13C12-OCDD	8000 37.23 62 25-130
13C12-2,3,7,8-TCDF	4000 26.98 97 40-130
13C12-1,2,3,7,8-PeCDF	4000 31.09 97 40-130
13C12-1,2,3,6,7,8-HxCDF	4000 33.66 91 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000 35.18 94 25-130

Cleanup Standard	pg
13C12-1,2,3,7,8,9-HxCDF	4000 34.40 82 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg
Total-TCDD	0	<0.69	0.69 U 20
Total-PeCDD	0	<0.41	0.41 U 100
Total-HxCDD	0	<0.46	0.46 U 100
Total-HpCDD	2	3.38	0.47 100
Total-TCDF	0	<0.52	0.52 U 20
Total-PeCDF	0	<0.42	0.42 U 100
Total-HxCDF	0	<0.66	0.66 U 100
Total-HpCDF	1	1.02	0.43 100

Toxic Equivalency - (WHO 2005)	pg
Lower Bound PCDD/F TEQ (WHO 2005)	0.0351
Mid Point PCDD/F TEQ (WHO 2005)	1.01
Upper Bound PCDD/F TEQ (WHO 2005)	1.75

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.	
TEF	Indicates the Toxic Equivalency Factor	TEQ Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.	
U	Indicates that this compound was not detected above the EDL.	
J	Indicates that a target analyte was detected below the calibrated range.	
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.	
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.	
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure	
NS	Indicates that this standard was not spiked to sample	

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	Method Blank Media	Sampling Date	n/a	
ALS Sample ID	WG3150248-4	Extraction Date	11-Sep-19	
Analysis Method	EPA M23	Sample Size	1	Train
Analysis Type	Blank	Percent Moisture	n/a	
Sample Matrix	QC	Split Ratio	2	

Approved:
T. Patterson
--e-signature--
18-Sep-2019

Run Information		Run 1	
Filename	7-190916A21		
Run Date	17-Sep-19 05:10		
Final Volume	20	uL	
Dilution Factor	1		
Analysis Units	pg		
Instrument - Column	HRMS-7 DB5MSUST470135H		

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
2,3,7,8-TCDD	1	NotFnd	<3.6	3.6	U		20
1,2,3,7,8-PeCDD	1	NotFnd	<1.5	1.5	U		100
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<1.5	1.5	U		100
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<1.4	1.4	U		100
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<1.4	1.4	U		100
1,2,3,4,6,7,8-HpCDD	0.01	35.76	<1.8	1.1	M,J,R	1.8	100
OCDD	0.0003	37.24	24.7	2.5	M,J,B		200
2,3,7,8-TCDF	0.1	NotFnd	<2.6	2.6	U		20
1,2,3,7,8-PeCDF	0.03	31.14	<1.4	1.4	M,U	1.3	100
2,3,4,7,8-PeCDF	0.3	31.89	<1.3	1.3	M,U	0.63	100
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<1.2	1.2	U		100
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<1.2	1.2	U		100
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<1.2	1.2	U		100
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<1.4	1.4	U		100
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<0.71	0.71	U		100
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<0.84	0.84	U		100
OCDF	0.0003	37.33	<4.6	1.9	M,J,R	4.6	200

Field Spike Standards	% Rec
37C14-2,3,7,8-TCDD	NS
13C12-1,2,3,4,7,8-HxCDD	NS
13C12-2,3,4,7,8-PeCDF	NS
13C12-1,2,3,4,7,8-HxCDF	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS

Extraction Standards	Conc.	EDL
13C12-2,3,7,8-TCDD	4000	27.95 97 40-130
13C12-1,2,3,7,8-PeCDD	4000	32.05 129 40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.14 85 40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.75 113 25-130
13C12-OCDD	8000	37.24 88 25-130
13C12-2,3,7,8-TCDF	4000	27.04 95 40-130
13C12-1,2,3,7,8-PeCDF	4000	31.12 123 40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.67 85 40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.19 103 25-130

Cleanup Standard	pg	Conc.	EDL
13C12-1,2,3,7,8,9-HxCDF	4000	34.41	78 40-130

Homologue Group Totals	# peaks	Conc. pg	EDL pg
Total-TCDD	0	<3.6	3.6 U 20
Total-PeCDD	0	<1.5	1.5 U 100
Total-HxCDD	0	<1.5	1.5 U 100
Total-HpCDD	1	1.79	1.1 100
Total-TCDF	0	<2.6	2.6 U 20
Total-PeCDF	0	<1.4	1.4 U 100
Total-HxCDF	0	<1.4	1.4 U 100
Total-HpCDF	0	<0.84	0.84 U 100

Toxic Equivalency - (WHO 2005)	pg
Lower Bound PCDD/F TEQ (WHO 2005)	0.00741
Mid Point PCDD/F TEQ (WHO 2005)	3.40
Upper Bound PCDD/F TEQ (WHO 2005)	6.76

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.	
TEF	Indicates the Toxic Equivalency Factor	TEQ Indicates the Toxic Equivalency;
M	Indicates that a peak has been manually integrated.	
U	Indicates that this compound was not detected above the EDL.	
J	Indicates that a target analyte was detected below the calibrated range.	
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.	
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.	
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.	
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure	
NS	Indicates that this standard was not spiked to sample	

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	Laboratory Control Sample	Sampling Date	n/a
ALS Sample ID	WG3150248-2	Extraction Date	11-Sep-19
Analysis Method	EPA M23	Sample Size	1 n/a
Analysis Type	LCS	Percent Moisture	n/a
Sample Matrix	QC	Split Ratio	2

Approved:
T. Patterson
 --e-signature--
 18-Sep-2019

Run Information	Run 1
Filename	7-190916A17
Run Date	17-Sep-19 02:22
Final Volume	20 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUST470135H

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
2,3,7,8-TCDD	400	27.98	100	70-130	
1,2,3,7,8-PeCDD	2000	32.06	104	70-130	
1,2,3,4,7,8-HxCDD	2000	34.10	94	70-130	
1,2,3,6,7,8-HxCDD	2000	34.14	108	70-130	
1,2,3,7,8,9-HxCDD	2000	34.27	112	70-130	
1,2,3,4,6,7,8-HpCDD	2000	35.75	102	70-130	
OCDD	4000	37.24	99	70-130	
2,3,7,8-TCDF	400	27.05	96	70-130	
1,2,3,7,8-PeCDF	2000	31.13	109	70-130	
2,3,4,7,8-PeCDF	2000	31.85	99	70-130	
1,2,3,4,7,8-HxCDF	2000	33.60	101	70-130	
1,2,3,6,7,8-HxCDF	2000	33.68	119	70-130	
2,3,4,6,7,8-HxCDF	2000	34.00	115	70-130	
1,2,3,7,8,9-HxCDF	2000	34.41	125	70-130	
1,2,3,4,6,7,8-HpCDF	2000	35.19	106	70-130	
1,2,3,4,7,8,9-HpCDF	2000	36.00	105	70-130	
OCDF	4000	37.32	110	70-130	
Field Spike Standards					
			% Rec		
37Cl4-2,3,7,8-TCDD			NS		
13C12-1,2,3,4,7,8-HxCDD			NS		
13C12-2,3,4,7,8-PeCDF			NS		
13C12-1,2,3,4,7,8-HxCDF			NS		
13C12-1,2,3,4,7,8,9-HpCDF			NS		
Extraction Standards					
13C12-2,3,7,8-TCDD	4000	27.95	107	40-130	
13C12-1,2,3,7,8-PeCDD	4000	32.05	149	40-130	
13C12-1,2,3,6,7,8-HxCDD	4000	34.13	93	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.74	126	25-130	
13C12-OCDD	8000	37.23	105	25-130	
13C12-2,3,7,8-TCDF	4000	27.04	100	40-130	
13C12-1,2,3,7,8-PeCDF	4000	31.12	138	40-130	
13C12-1,2,3,6,7,8-HxCDF	4000	33.67	86	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.19	122	25-130	
Cleanup Standard					
	pg				
13C12-1,2,3,7,8,9-HxCDF	4000	34.41	90	40-130	

NS Indicates that this standard was not spiked to sample

Appendix C
Raw Sampling Data

Wood Environment & Infrastructure Solutions

MINE

TEST NO.: Org -1

JOB NUMBER: TC190714 STACK DIAMETER: _____
 DATE: 23 AUG 19
 COMPANY: BIM
 SOURCE: MINE INCINERATOR

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1		426	676	250
IMPINGER 2		688	698	10
IMPINGER 3		644	652	8
IMPINGER 4		918	924	6
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				274

	Filter ID	Filter Tare, g	Filter Final, g
FILTER RESIN	L2307480-13		

NOTES: _____ 160.07
 _____ 7.5

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINE SAMPLING, FIELD DATA SHEET

STATIC PRESSURE (IN H2O): -0.1 BAR. P. ("HG): 29.14
 ASSUMED MOISTURE VOL. %: 8
 NOZZLE DIAMETER (INCHES): 0.625
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): MB-10 1.739 0.997
 GAS COMPOSITION: CO2% 4 O2% 16 SO2%: 0

DATE: 08-23-19
 COMPANY: Mary River ITM
 SOURCE: Wastewater
 TEST NO.: ORG-1
 STARTUP TIME: 08:23 FINISH TIME: _____

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
		920.16	0.067	2.3	1450		60	59	230	51	7	21.0	0
5		916.55	0.062	2.04	1565		65	60	230	47	10	9.7	8.5
10		928.65	0.065	2.2	1517		67	61	230	47	11	11.08	7.4
15		932.95	0.062	2.1	1507		68	61	230	47	11	11.49	7.13
20		937.24	0.066	2.2	1538		69	61	230	49	12	11.20	7.25
25		941.63	0.059	1.9	1573		69	62	231	49	11	11.29	7.20
30		945.86	0.063	2.1	1552		70	63	230	49	11	10.92	7.55
35		950.13	0.064	2.1	1568		71	63	218	50	11	10.90	7.55
40		954.40	0.062	2.1	1542		72	64	214	51	11	11.18	7.07
45		958.67	0.065	2.1	1599		72	65	228	51	12	10.57	7.62
50		962.88	0.075	2.5	1582		72	65	220	53	14	10.61	7.56
55		967.37	0.080	2.6	1591		74	66	217	54	14	10.63	7.54
60		972.08	0.089	3.0	1576		73	66	219	55	17	10.57	7.63
65		976.99	0.076	2.5	1603		74	67	219	56	16	10.57	7.56
70		981.61	0.065	2.1	1619		73	68	223	57	16	10.42	7.66
75		986.19	0.072	2.4	1619		74	68	215	57	16	10.39	7.64
80		990.67	0.081	2.7	1575		74	68	216	57	16	10.70	7.40
85		995.55	0.081	2.7	1568		74	69	237	57	18	10.62	7.44
90		1000.28	0.072	2.4	1543		74	69	211	58	17	12.02	6.43
95		5.06	0.073	2.5	1505		74	69	221	59	17	12.50	6.14
100		9.61	0.066	2.3	1501		74	70	224	59	17	12.20	6.29
105		14.14	0.066	2.3	1514		74	70	220	59	17	11.91	6.50
110		18.63	0.069	2.4	1495		74	70	216	60	17	12.13	6.33
115		23.1	0.062	2.1	1505		74	70	205	60	17	12.08	6.38
120		27.52	0.073	2.6	1465		75	70	210	60	16	12.54	6.06

INITIAL L.C.: CC01 @ 15 "Hg
 FINAL L.C.: _____ @ _____ "Hg
 CONSOLE OPERATOR: OK OF 1 OF 2
 wood.

ISOKINE, SAMPLING, FIELD DATA SHEET

JOB NUMBER: _____ BAR. P. ("HG): _____
 DATE: _____
 COMPANY: _____
 SOURCE: _____
 TEST NO.: _____
 STARTUP TIME: _____ FINISH TIME: 11:23 CO2% _____ SO2% _____

STATIC PRESSURE (IN H2O): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): _____
 PITOT COEFFICIENT: _____
 CONTROL BOX (NAME, dH, GAMMA): _____

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
	125	32.10	0.07	2.5	1490		75	71	227	60	18	12.4	6.12
	130	36.61	0.065	2.3	1473		75	71	210	60	18	12.21	6.29
	135	41.99	0.062	2.2	1490		75	71	210	60	18	12.10	6.32
	140	45.46	0.061	2.1	1499		75	71	200	60	17	11.93	6.47
	145	49.86	0.08	2.8	1470		75	71	230	60	19	12.79	5.79
	150	54.48	0.109	2.8	1450		75	71	230	60	19	12.51	6.08
	155	59.11	0.06	2.7	1454		76	72	209	61	19	12.46	6.03
	160	63.61	0.06	2.1	1474		76	72	230	60	18	12.69	5.84
	165	68.13	0.06	2.1	1448		76	72	230	60	17	12.65	5.88
	170	72.46	0.06	2.1	1465		76	72	230	61	17	12.27	6.19
	175	76.90	0.06	2.1	1448		76	72	230	61	17	12.57	5.92
	180	81.03											

marked
11

wood.

CONSOLE OPERATOR: _____

INITIAL L.C.: _____
 FINAL L.C.: _____

6 @
0.005 @

20 OF

Wood Environment & Infrastructure Solutions

TEST NO.: ORG-2

JOB NUMBER: _____ STACK DIAMETER: _____
 DATE: 08/24/19
 COMPANY: BIM MINE
 SOURCE: Eco waste

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	Resin	432	568	136
IMPINGER 2		694	697	3
IMPINGER 3		648	652	4
IMPINGER 4	Sg	864	887	43
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				186

	Filter ID	Filter Tare, g	Filter Final, g
FILTER			

NOTES: L2307480-8

5.01% H₂O

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINE 1. SAMPLING, FIELD DATA SHEET

JOB NUMBER: C8124119
 DATE: 08-22
 COMPANY: RDM Mine
 SOURCE: ECO waste
 TEST NO.: 114pm FINISH TIME: _____
 STARTUP TIME: _____

STATIC PRESSURE (IN H2O): -0.1 BAR. P. ("HG): 28.98
 ASSUMED MOISTURE VOL. %: 6
 NOZZLE DIAMETER (INCHES): 0.625
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): MB-10 1.876 0.997
 GAS COMPOSITION: CO2%: 6 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
		190.92	0.059	2.5	1357	71	71	71	230	42	9	21.00	C
	5	195.39	0.061	2.5	1363	71	71	71	235	42	10	13.81	5.43
	10	199.84	0.063	2.6	1359	74	69	69	235	44	10	14.02	5.28
	15	204.58	0.058	2.4	1351	75	69	69	235	44	10	14.28	5.07
	20	209.07	0.061	2.5	1371	77	69	69	235	45	10	13.24	5.85
	25	213.63	0.064	2.7	1361	78	70	70	230	45	10	13.62	5.58
	30	218.35	0.055	2.3	1354	79	71	71	227	47	10	14.16	5.20
	35	223.03	0.063	2.6	1364	80	71	71	222	47	10	13.48	5.64
	40	227.70	0.061	2.6	1371	81	72	72	223	47	10	13.33	5.78
	45	232.29	0.061	2.6	1372	81	72	72	225	47	10	13.00	5.62
	50	237.05	0.059	2.5	1363	81	73	73	234	47	10	14.28	5.11
	55	241.7	0.062	2.6	1368	82	74	74	231	48	10	13.33	5.80
	60	246.34	0.062	2.6	1368	82	74	74	223	48	10	13.61	5.61
	65	251.00	0.054	2.3	1349	82	74	74	207	47	10	14.65	4.86
	70	255.61	0.055	2.3	1368	83	75	75	230	48	10	13.76	5.46
	75	260.02	0.062	2.6	1364	83	75	75	225	50	10	17.55	5.64
	80	264.70	0.066	2.8	1350	83	76	76	226	51	12	14.24	5.20
	85	269.62	0.058	2.5	1357	84	76	76	229	52	11	14.49	4.95
	90	274.3	0.059	2.5	1376	84	77	77	226	55	10	13.43	5.67
	95	278.88	0.060	2.5	1376	84	77	77	224	54	10	13.55	5.63
	400	283.57	0.071	3	1366	84	78	78	221	52	11	13.91	5.4
	105	288.50	0.067	2.8	1360	83	78	78	224	49	11	14.28	5.16
	110	293.40	0.065	2.7	1367	83	78	78	224	49	11	13.38	5.74
	115	298.3	0.065	2.7	1364	83	77	77	226	49	11	13.59	5.60
	120	303.12	0.062	2.6	1353	83	77	77	229	48	11	14.59	4.87

INITIAL L.C.: 0.005 @ 15 "Hg
 FINAL L.C.: _____ @ _____ "Hg
 CONSOLE OPERATOR: OK OF 1 2
 wood.

ISOKINE SAMPLING, FIELD DATA SHEET

JOB NUMBER: _____
 DATE: _____
 COMPANY: _____
 SOURCE: _____
 TEST NO.: _____
 STARTUP TIME: _____

STATIC PRESSURE (IN H2O): _____ BAR. P. ("HG): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): _____
 PITOT COEFFICIENT: _____
 CONTROL BOX (NAME, dH, GAMMA): _____
 GAS COMPOSITION: _____ CO2% _____ O2% _____ SO2% _____

FINISH TIME: 16:14

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBÉ (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
	125	308.95	0.06	2.6	1343	84	77	226	46	11	14.64	4.82	
	130	312.75	0.064	2.7	1358	84	77	228	47	11	12.46	5.69	
	135	312.53	0.064	2.7	1359	84	77	227	47	11	13.74	5.52	
	140	322.30	0.060	2.6	1349	85	78	228	49	11	14.70	4.82	
	145	327.01	0.059	2.5	1350	84	78	215	49	11	14.20	5.15	
	150	331.74	0.064	2.7	1367	84	78	221	50	11	13.42	5.74	
	155	336.62	0.061	2.6	1366	84	79	231	51	11	14.70	4.83	
	160	341.51	0.056	2.4	1361	84	79	229	51	11	14.46	4.95	
	165	346.23	0.058	2.5	1361	83	78	223	52	11	14.17	5.11	
	170	350.88	0.065	2.7	1367	83	78	226	53	11	13.59	5.68	
	175	355.50	0.066	2.8	1373	83	78	225	54	11	13.99	5.36	
	180	360.01											

wood.

INITIAL L.C.: 0.005 @ _____
 FINAL L.C.: 11 "Hg
 CONSOLE OPERATOR: OK OF 2

Wood Environment & Infrastructure Solutions

MINE

TEST NO.:

ORG-3

JOB NUMBER:

TC190713

STACK DIAMETER:

DATE:

8/25/19

COMPANY:

BIM

SOURCE:

MINE ECOWASTE INCINERATOR

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	XAD RESIN	426	640	214
IMPINGER 2	ORG FREE	694	709	15
IMPINGER 3	EMPTY	645	649	4
IMPINGER 4	SG	879	907	28
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				261

	Filter ID	Filter Tare, g	Filter Final, g
FILTER RESIN	L2307480-12		

NOTES:

MOISTURE = 6.9%

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINE SAMPLING, FIELD DATA SHEET

STATIC PRESSURE (IN H2O): -0.1 BAR. P. ("HG): 29.24
 ASSUMED MOISTURE VOL. %: 8
 NOZZLE DIAMETER (INCHES): 0.027
 PITOT COEFFICIENT: 0.54
 CONTROL BOX (NAME, dH, GAMMA): MB-10 1.876 0.997
 GAS COMPOSITION: CO2%: 4 O2%: 14 SO2%: 0

DATE: 2/25/19
 COMPANY: SEM M, INC
 SOURCE: ECOLYSTRE
 TEST NO.: CR6-3
 STARTUP TIME: 11:01 FINISH TIME:

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
		474.16	0.042	1.7	1203	55	54	220	46	6	29.0	10	
5		477.78	0.043	1.7	1221	55	54	225	47	7	13.10	6.16	
10		481.49	0.044	1.7	1228	57	54	229	46	7	13.24	6.04	
15		485.28	0.045	1.8	1240	60	54	229	46	8	13.30	6.03	
20		489.18	0.039	1.5	1243	61	55	227	47	7	12.82	6.41	
25		492.97	0.135	4.6	1492	63	56	231	47	16	10.33	8.38	
30		498.23	0.115	4.0	1454	66	57	232	48	15	12.09	7.06	
35		504.09	0.120	4.2	1452	66	58	229	50	14	12.09	7.01	
40		510.00	0.120	4.2	1458	68	59	234	51	14	12.10	6.95	
45		516.10	0.122	4.3	1455	69	60	226	52	14	12.86	6.29	
50		521.72	0.085	3.1	1354	71	61	225	52	10	14.01	5.57	
55		526.43	0.083	3.1	1341	71	61	226	51	10	13.83	5.70	
60		531.82	0.074	2.7	1362	72	63	224	49	10	13.49	5.95	
65		536.56	0.077	2.9	1356	72	63	225	48	10	13.44	5.99	
70		541.15	0.070	2.6	1342	74	64	224	48	10	13.51	5.95	
75		545.69	0.070	2.6	1345	74	65	225	48	10	13.47	5.96	
80		550.16	0.070	2.6	1350	74	66	224	48	10	13.37	6.03	
85		554.71	0.068	2.6	1345	75	66	227	48	10	13.47	5.96	
90		559.28	0.068	2.6	1347	75	67	226	49	10	13.49	5.95	
95		564.1	0.072	2.7	1348	77	68	226	50	10	13.54	5.90	
100		568.63	0.075	2.8	1350	77	68	224	50	10	13.48	5.95	
105		573.42	0.073	2.7	1355	77	69	226	50	10	13.45	5.95	
110		578.13	0.073	2.7	1358	77	69	227	50	10	13.41	5.97	
115		582.88	0.071	2.7	1357	78	70	226	52	10	13.50	5.89	
120		587.79	0.070	2.6	1349	78	71	226	51	10	13.57	5.84	

INITIAL L.C.: 0.001 @ 75 "Hg
 FINAL L.C.: 0.001 @ 75 "Hg
 CONSOLE OPERATOR: OK OF 1 wood.

ISOKINE: SAMPLING, FIELD DATA SHEET

STATIC PRESSURE (IN H2O): _____ BAR. P. ("HG): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): _____
 PITOT COEFFICIENT: _____
 CONTROL BOX (NAME, dH, GAMMA): _____
 GAS COMPOSITION: _____ CO2% _____ O2% _____ SO2%: _____

JOB NUMBER: _____
 DATE: _____
 COMPANY: _____
 SOURCE: _____
 TEST NO.: _____
 STARTUP TIME: 14:01 FINISH TIME: 14:01

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
125	592.37	0.071	1.7	1343	78	71	220	51	10	13.66	5.77		
130	577.08	0.068	2.6	1348	78	71	231	51	10	13.57	5.83		
135	601.68	0.065	2.5	1344	79	71	224	52	10	13.72	5.71		
140	606.26	0.070	2.6	1351	79	71	229	52	10	13.52	5.83		
145	611.12	0.066	2.5	1350	80	72	225	53	11	13.59	5.79		
150	615.6	0.067	2.5	1348	80	72	228	54	11	13.67	5.76		
155	620.12	0.069	2.5	1351	80	73	229	55	11	13.59	5.79		
160	624.80	0.067	2.5	1351	80	73	229	55	12	13.57	5.78		
165	629.60	0.062	2.4	1343	80	74	216	56	12	13.76	5.64		
170	634.04	0.066	2.5	1347	80	74	226	57	12	13.65	5.72		
175	638.59	0.065	2.5	1347	80	74	227	57	12	13.64	5.72		
180	642.95												

INITIAL L.C.: _____ @ _____ "Hg
 FINAL L.C.: 0.005 @ 1.6 "Hg
 CONSOLE OPERATOR: OK OF 2
 wood.

Wood Environment & Infrastructure Solutions

MINE

TEST NO.:

MET-1

JOB NUMBER:

TC1907143

STACK DIAMETER:

40.5" - 9" = 31.5"

DATE:

23 AUG 19

COMPANY:

BIM

SOURCE:

MINE

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	40K MnO ₄ / 10% H ₂ SO ₄	615	678	63
IMPINGER 2	" "	751	807	56
IMPINGER 3	BLANK	444	453	9
IMPINGER 4	SG	945	965	20
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				148
	Filter ID		Filter Tare, g	Filter Final, g
FILTER	QZ 6569			

NOTES:

ASSUME O₂ = 14%²⁰ 6.0%²⁰
 CO₂ = 5%²⁰
 H₂O = 8%²⁰

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINETIC SAMPLING, FIELD DATA SHEET

JOB NUMBER: 08224119 BAR. P. ("HG): 28.98
 DATE: 08/24/19
 COMPANY: BIM Pipe
 SOURCE: Ecovaste
 TEST NO.: Met-1
 STARTUP TIME: 10:39 FINISH TIME: 12:30
 STATIC PRESSURE (IN H2O): 8
 ASSUMED MOISTURE VOL. %: 0.625
 NOZZLE DIAMETER (INCHES): 0.84
 PITOT COEFFICIENT: 1.3-1.0
 CONTROL BOX (NAME, dH, GAMMA): 1.737 1.876 0.997
 GAS COMPOSITION: CO2% 0 SO2% 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
8488	5	81.62	0.038	1.5	1173	115	52	51	245	43	5	20.92	6
	10	84.88	0.037	1.6	1183		53	51	242	39	5	11.76	7.1
	15	88.31	0.104	3.9	1301		55	52	241	39	13	11.35	7.64
	20	92.35	0.12	4.5	1298		60	52	239	41	16	11.47	7.40
	25	98.95	0.1	3.8	1266		61	54	237	43	13	12.84	6.28
	30	104.13	0.078	3.0	1248		63	55	231	44	11	12.66	6.35
	35	108.81	0.076	3.2	1219		65	55	237	44	11	12.76	6.24
	40	113.50	0.072	3.1	1215		66	55	234	44	12	12.68	6.29
	45	118.30	0.060	2.6	1207		68	57	224	44	11	13.59	5.6
	50	122.91	0.063	2.7	1196		69	58	229	44	11	12.41	6.45
	55	127.45	0.064	2.8	1190		70	60	229	44	11	13.56	5.72
	60	131.97	0.064	2.8	1200		72	60	229	44	11	13.63	5.54
	65	136.55	0.060	2.6	1195		72	62	233	44	11	12.73	6.23
	70	141.22	0.059	2.6	1178		74	63	233	43	11	13.88	5.44
	75	145.74	0.064	2.8	1214		74	64	242	44	11	12.94	6.90
	80	150.48	0.058	2.5	1248		75	65	231	44	11	13.19	5.94
	85	155.05	0.061	2.5	1262		75	65	231	44	11	13.93	5.82
	90	159.68	0.059	2.5	1255		76	67	236	44	11	13.73	5.99
	95	164.04	0.051	2.1	1255		77	68	237	45	11	13.84	5.38
	100	168.40	0.059	2.5	1252		77	68	237	45	11	13.10	5.96
	105	172.77	0.05	2.1	1254		78	69	233	46	11	13.81	5.49
	110	176.99	0.057	2.4	1255		78	69	237	46	11	13.81	5.90
	115	181.21	0.063	2.7	1261		78	70	236	47	11	14.21	5.21
	120	185.78	0.058	2.5	1280		79	70	236	49	14	13.06	5.97
		190.35											

wood.

INITIAL L.C.: 0.001 @ 30 "Hg
 FINAL L.C.: 0.005 @ 75 "Hg
 CONSOLE OPERATOR: OK
1 OF 1

Wood Environment & Infrastructure Solutions

TEST NO.: MET-2

JOB NUMBER: TC190713 STACK DIAMETER: 31.5"
 DATE: 24 Aug 19
 COMPANY: BIM
 SOURCE: ECOVASTE MINE SITE

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	4% KMnO ₄ / 10% H ₂ SO ₄	612	666	54
IMPINGER 2	" "	755	795	40
IMPINGER 3	BLANK	444	448	4
IMPINGER 4	Silica Gel	932	952	20
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				118

	Filter ID	Filter Tare, g	Filter Final, g
FILTER	QZ 6568		

NOTES: Wood time = 16:11
Ecovaste time = 16:28

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINETIC SAMPLING FIELD DATA SHEET

JOB NUMBER: 08/24/99 BAR. P. ("HG): 28.98
 DATE: 08/24/99
 COMPANY: BIM MINE
 SOURCE: ECVATE
 TEST NO.: 111-2
 STARTUP TIME: 16:42 FINISH TIME: _____
 STATIC PRESSURE (IN H2O): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): 0.625
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): 173-10 1.876 0.997
 GAS COMPOSITION: CO2% 6 O2% 12 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
5		360.54	0.059	2.6	1243		72	92	230	40	5	20.65	0
10		365.1	0.057	2.6	1229		69	71	208	39	6	15.72	4.17
15		369.65	0.058	2.6	1233		71	69	223	39	6	14.67	4.83
20		374.00	0.062	2.8	1225		72	68	233	40	7	14.74	4.99
25		378.38	0.052	2.4	1214		73	68	210	39	8	15.50	4.27
30		382.98	0.051	2.3	1201		73	68	229	40	9	15.04	4.62
35		387.33	0.060	2.7	1207		73	68	239	41	10	14.23	5.20
40		392.00	0.058	2.6	1200		74	68	231	41	10	14.70	4.86
45		396.64	0.051	2.4	1185		74	68	237	41	11	15.30	4.44
50		401.25	0.052	2.4	1193		74	68	220	41	11	14.84	4.77
55		405.65	0.060	2.8	1191		74	68	220	41	11	14.41	5.07
60		410.28	0.054	2.5	1173		75	68	227	41	11	15.53	4.28
65		414.91	0.053	2.5	1175		75	68	227	41	12	18.07	4.60
70		419.47	0.060	2.8	1180		75	68	229	41	13	14.27	5.18
75		424.23	0.063	2.9	1181		75	68	229	42	15	14.39	5.10
80		429.25	0.061	2.8	1175		75	69	229	42	15	15.43	4.42
85		434.00	0.054	2.5	1174		75	69	227	43	15	15.36	4.40
90		438.50	0.062	2.9	1181		75	69	230	43	15	16.60	4.96
95		443.30	0.059	2.7	1180		75	70	230	43	17	13.94	7.40
100		448.37	0.050	2.3	1174		75	70	230	43	17	15.16	4.54
105		452.9	0.05	2.3	1176		75	70	230	43	16	15.04	4.64
110		457.31	0.06	2.8	1178		75	71	232	44	19	14.81	4.79
115		462.49	0.058	2.7	1182		76	70	229	44	19	14.26	5.18
120		466.96	0.058	2.7	1208		75	70	223	44	19	15.17	4.54
125		471.64											

INITIAL L.C.: 0.008 @ 15 "Hg
 FINAL L.C.: 0.01 @ 20 "Hg
 CONSOLE OPERATOR: Ok OF 1
 wood.

Wood Environment & Infrastructure Solutions

TEST NO.: Met -3

JOB NUMBER: 08/25/19 STACK DIAMETER: _____
 DATE: _____
 COMPANY: RIM Mine
 SOURCE: Eco waste

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1		643	758	115
IMPINGER 2		720	710	-10
IMPINGER 3		444	453	9
IMPINGER 4	Sg	949	969	20
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				124

	Filter ID	Filter Tare, g	Filter Final, g
FILTER	QZ 6567		

NOTES: _____

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINE 1. SAMPLING, FIELD DATA SHEET

JOB NUMBER: _____

DATE: _____

COMPANY: _____

SOURCE: _____

TEST NO.: _____

STARTUP TIME: _____

STATIC PRESSURE (IN H2O): _____

ASSUMED MOISTURE VOL. %: _____

NOZZLE DIAMETER (INCHES): _____

PITOT COEFFICIENT: _____

CONTROL BOX (NAME, dH, GAMMA): _____

GAS COMPOSITION: _____

BAR. P. ("HG): _____

NOZZLE DIAMETER (INCHES): _____

PITOT COEFFICIENT: _____

CONTROL BOX (NAME, dH, GAMMA): _____

GAS COMPOSITION: _____

FINISH TIME: _____

O2%: _____ CO2%: _____

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
		643.31	0.054	2.4	1252		74	74	210	51	10	2905	0.10
	5	647.61	0.053	2.4	1242		76	73	229	42	11	1408	5.36
	10	652.09	0.050	2.3	1222		77	73	236	40	12	1423	5.26
	15	656.26	0.053	2.4	1221		78	72	230	40	15	1419	5.26
	20	660.64	0.053	2.4	1219		77	73	226	42	5	1434	5.16
	25	665.98	0.051	2.3	1212		79	73	225	42	5	1442	5.09
	30	670.27	0.049	2.2	1221		80	73	223	42	5	1455	5.08
	35	674.56	0.055	2.5	1225		80	74	240	42	6	1458	5.06
	40	679.15	0.053	2.4	1230		81	74	210	43	6	1452	5.11
	45	683.70	0.051	2.3	1212		81	74	226	43	7	1471	2.97
	50	688.16	0.057	2.6	1232		81	74	228	43	7	1451	5.27
	55	692.69	0.056	2.5	1233		81	75	236	43	7	1448	5.13
	60	697.25	0.055	2.5	1236		82	75	235	43	8	1449	5.08
	65	701.99	0.051	2.3	1233		83	75	221	43	8	1452	5.08
	70	706.29	0.058	2.6	1229		83	76	237	44	9	1451	5.09
	75	711.00	0.055	2.5	1219		83	76	232	44	9	1397	5.43
	80	715.65	0.054	2.4	1245		83	76	218	45	9	1448	5.12
	85	720.22	0.058	2.6	1232		83	77	218	45	9	1354	5.79
	90	724.74	0.052	2.4	1217		82	77	229	47	10	1467	4.98
	95	729.30	0.062	2.8	1238		82	77	214	46	10	1358	5.76
	100	734.05	0.051	2.3	1218		83	77	240	47	10	1479	4.87
	105	738.62	0.053	2.4	1227		83	77	237	47	10	1357	5.67
	110	743.15	0.051	2.3	1230		83	77	226	47	10	1478	4.88
	115	747.61	0.052	2.4	1226		83	77	229	47	10	1454	5.00
	120	751.93											

INITIAL L.C.: _____

FINAL L.C.: _____

2009 @

2005 @

15 "Hg

11 "Hg

CONSOLE OPERATOR: _____

OK

1 OF 7

wood.

Wood Environment & Infrastructure Solutions

TEST NO.: Met - ~~4~~ 8 1

JOB NUMBER: TC190713
 DATE: 08/18/19
 COMPANY: Port
 SOURCE: Incinerator

STACK DIAMETER: _____

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	K Mn O ₄ / H ₂ SO ₄	622	667	45
IMPINGER 2	"	749	760	11
IMPINGER 3	Blank	446	448	2
IMPINGER 4	Sg	919	928	9
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				67

	Filter ID	Filter Tare, g	Filter Final, g
FILTER	<u>Q2 6579</u>		

NOTES: _____
 _____ 5/10/19
 _____ meis-6

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINE SAMPLING, FIELD DATA SHEET

JOB NUMBER: 08-25-19
 DATE: BTM
 COMPANY: Ecc waste for
 SOURCE: Met-41
 TEST NO.: 16-39
 STARTUP TIME: 18:40

STATIC PRESSURE (IN H2O): -0.1 BAR. P. ("HG): 29.89
 ASSUMED MOISTURE VOL. %: 13
 NOZZLE DIAMETER (INCHES): 0.5
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): 701C-1239 0.992
 GAS COMPOSITION: CO2% 12.4 O2% 16 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
1		452.47	0.027	0.49	965		85	85	230	60	2		
	5	454.54	0.032	0.58	968		84	84	230	60	2	16.32	3.93
	10	456.09	0.032	0.58	959		84	84	230	55	2	16.49	3.91
	15	458.53	0.038	0.69	962		85	85	230	55	2	16.26	3.85
	20	461.00	0.032	0.59	956		84	84	230	51	2	16.56	3.82
	25	463.38	0.041	0.74	980		84	84	230	50	3	16.51	3.81
	30	465.91	0.032	0.59	957		84	83	230	50	2	16.15	3.71
	35	468.75	0.028	0.52	946		83	83	230	52	3	16.46	3.77
	40	470.50	0.026	0.5	890		83	83	230	52	4	16.28	4.04
	45	472.50	0.026	0.59	903		83	83	230	52	4	15.83	4.72
	50	474.6	0.024	0.46	900		83	83	230	52	3	16.20	4.02
	55	476.63	0.023	0.44	878		83	83	230	52	3	16.28	4.13
	60	478.63	0.025	0.49	872		83	83	230	51	4	16.46	3.82
	65	480.75	0.023	0.44	902		83	83	235	51	4	16.34	3.99
	70	482.83	0.025	0.49	860		83	83	235	52	4	16.47	3.89
	75	484.92	0.024	0.46	858		83	83	235	52	4	16.10	3.99
	80	487.28	0.022	0.44	828		83	83	235	52	4	16.91	3.52
	85	489.26	0.022	0.44	838		81	81	234	54	4	16.9	3.59
	90	490.88	0.028	0.56	849		81	71	235	53	5	16.2	3.95
	95	493.12	0.024	0.44	868		81	81	235	51	5	16.24	3.89
	100	495.18	0.022	0.44	875		71	71	235	52	5	18.14	3.38
	105	497.11	0.022	0.44	870		81	81	235	52	5	18.36	3.77
	110	499.07	0.028	0.54	881		80	80	235	52	5	16.95	3.4
	115	501.24	0.026	0.44	830		75	79	235	52	5	16.1	3.3
	120	503.17											

INITIAL L.C.: 0.001 @ 15 "Hg
 FINAL L.C.: 0.001 @ 15 "Hg
 CONSOLE OPERATOR: OK OF 1
 wood.

Wood Environment & Infrastructure Solutions

TEST NO.: Met-2

JOB NUMBER: TC190713
 DATE: 08/19/19
 COMPANY: BIM PORT
 SOURCE: Ecomaste Port

STACK DIAMETER: _____

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	K ₂ MnO ₄ /H ₂ SO ₄	652	707	55
IMPINGER 2	"	726	749	23
IMPINGER 3	Blank	444	448	4
IMPINGER 4	Sg	926	940	14
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				96

	Filter ID	Filter Tare, g	Filter Final, g
FILTER	Q7 6580		

NOTES: _____

79.98
 mois = 5.3

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINETIC SAMPLING, FIELD DATA SHEET

JOB NUMBER: 08/20/19
 DATE: Bim Part
 COMPANY: Eco Waste Incinerator
 SOURCE: Met-2
 TEST NO.: 10:59 FINISH TIME: 12:59
 STARTUP TIME: 10:59

STATIC PRESSURE (IN H2O): -0.12 BAR. P. ("HG): 29.92
 ASSUMED MOISTURE VOL. %: 7
 NOZZLE DIAMETER (INCHES): 0.625
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): MB-10 17.39 0.997
 GAS COMPOSITION: CO2% 15.16 O2% 16.4 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
1	0	628.23	0.031	1.5	947.5		58	58	230	65	3	21.00	0
	5	631.73	0.029	1.4	966		61	57	291	64	4	16.8	3.5
	10	634.96	0.032	1.5	957		63	57	238	62	4	16.8	3.5
	15	638.93	0.028	1.3	967		64	58	239	61	4	16.3	3.9
2	20	641.58	0.028	1.35	939		64	58	238	60	5	16.3	3.8
	25	645.00	0.028	1.35	947		65	58	238	60	5	17.0	3.34
	30	648.42	0.031	1.5	981		65	59	235	61	5	16.3	3.9
	35	652.10	0.028	1.3	1003		66	59	235	60	5	16.8	3.5
3	40	655.35	0.034	1.6	981		66	60	236	61	6	16.6	3.7
	45	658.99	0.033	1.5	1001		66	60	236	61	6	16.26	3.93
	50	662.65	0.024	1.2	942		67	60	236	60	6	15.57	4.45
	55	665.97	0.029	1.4	962		67	60	236	55	5	14.97	4.79
4	60	669.45	0.026	1.3	933		68	60	235	53	5	15.73	4.50
	65	672.90	0.030	1.5	924		68	61	236	52	5	15.72	4.50
	70	676.28	0.027	1.3	928		68	61	235	52	5	16.18	4.07
	75	679.62	0.028	1.4	933		68	61	234	53	5	16.15	4.10
5	80	683.00	0.026	1.3	920		68	61	235	54	5	16.31	3.99
	85	686.35	0.028	1.4	938		67	62	235	54	5	15.79	4.43
	90	689.50	0.024	1.2	892		67	61	236	54	5	16.30	3.97
	95	693.15	0.020	1.0	846		66	61	233	54	5	17.06	3.47
6	100	696.38	0.018	0.94	845		66	61	231	54	5	17.12	3.32
	105	699.25	0.029	1.5	885		66	60	236	56	7	15.72	4.46
	110	702.62	0.016	0.83	852		66	60	234	58	6	17.27	3.20
	115	705.52	0.015	0.77	860		66	60	233	58	5	17.03	3.37
	120	708.21											

INITIAL L.C.: 0.001 @ 15 "Hg
 FINAL L.C.: 0.001 @ 10 "Hg
 CONSOLE OPERATOR: OK OF 1
 wood.

Wood Environment & Infrastructure Solutions

TEST NO.: Met 3

JOB NUMBER: TC190713
 DATE: 08/21/19
 COMPANY: DIM part
 SOURCE: Ecovaste - Part

STACK DIAMETER: _____

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	KMnO ₄ /H ₂ SO ₄	615	672	57
IMPINGER 2	"	743	764	21
IMPINGER 3	Blank	448	453	5
IMPINGER 4	Sg	937	950	13
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				96
	Filter ID	Filter Tare, g		Filter Final, g
FILTER	<u>QZ 6581</u>			

NOTES:

_____ 77.14
 _____ Moist=5.5

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINETIC SAMPLING, FIELD DATA SHEET

JOB NUMBER: 00121119

DATE: 08/21/19

COMPANY: BTM Port

SOURCE: Ecommerce

TEST NO.: Met-3

STARTUP TIME: 13:27

FINISH TIME: 15:27

STATIC PRESSURE (IN H2O): -0.1 BAR. P. ("HG): 29.92

ASSUMED MOISTURE VOL. %: 6

NOZZLE DIAMETER (INCHES): 0.025

PITOT COEFFICIENT: 0.84

CONTROL BOX (NAME, dH, GAMMA): MD-10 1.739 0.997

GAS COMPOSITION: CO2% 4 O2% 16 SO2% 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mv)	NOTES
1	1	838.51	0.029	1.4	923	60	59	225	52	4	21.0	0	
	5	842.04	0.024	1.2	923	61	58	235	45	4	16.72	3.4	
	10	845.5	0.029	1.4	944	62	58	235	45	4	15.89	3.99	
	15	848.02	0.033	1.6	962	63	58	246	45	5	15.56	4.26	
	20	852.54	0.036	1.7	998	64	58	234	44	6	16.06	3.93	
	25	856.20	0.038	1.9	955	65	58	237	48	6	16.64	3.62	
	30	860.00	0.024	1.2	927	65	59	234	49	6	16.82	3.40	
	35	863.2	0.025	1.3	923	65	59	233	47	6	16.13	3.98	
	40	866.50	0.025	1.3	926	65	59	235	48	6	15.97	4.09	
	45	869.78	0.025	1.3	926	65	60	234	49	6	15.98	4.10	
	50	872.90	0.023	1.1	955	66	60	236	50	6	14.93	4.84	
	55	876.00	0.021	1.1	906	66	60	235	51	6	15.55	4.37	
4	60	879.10	0.021	1.1	920	68	62	236	50	7	15.51	4.45	
	65	882.16	0.029	1.4	939	68	63	235	50	8	14.58	5.16	
	70	885.52	0.021	1.1	896	69	63	233	49	8	16.30	3.88	
	75	888.73	0.026	1.3	906	69	64	238	49	8	16.34	3.88	
	80	892.00	0.027	1.3	946	69	64	236	49	8	14.92	4.86	
	85	895.20	0.021	1.1	884	68	64	233	49	10	16.28	3.92	
	90	898.42	0.022	1.1	890	68	64	235	50	10	16.28	3.92	
	95	901.49	0.024	1.2	921	68	64	238	51	10	16.06	4.08	
	100	904.58	0.017	0.85	923	68	64	235	52	10	16.37	3.85	
	105	907.25	0.020	1	926	69	65	234	53	10	16.62	4.48	
	110	910.22	0.015	0.79	868	69	65	235	52	10	16.66	3.57	
	115	912.91	0.018	0.95	862	70	66	234	52	10	16.69	3.69	
	120	915.65											

wood.

CONSOLE OPERATOR: Ok OF 1

INITIAL L.C.: 0.001 @ 15 "Hg

FINAL L.C.: 0.004 @ 15 "Hg

Wood Environment & Infrastructure Solutions

TEST NO.: 019-~~5~~ 1

JOB NUMBER: TC190713
 DATE: 18 Aug 19
 COMPANY: BIM
 SOURCE: ECOWASTE PORT

STACK DIAMETER: 9inc 40.5
Minle
 $40.5'' - 9'' = 31.5''$

Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	408	555	147
IMPINGER 2	688	691	3
IMPINGER 3	640 646	648	2
IMPINGER 4	881	895	14
IMPINGER 5			
IMPINGER 6			
IMPINGER 7			
IMPINGER 8			
Total			166
Filter ID	Filter Tare, g		Filter Final, g
FILTER			

NOTES: 81.32
MCS = 8.83

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINETIC SAMPLING, FIELD DATA SHEET

JOB NUMBER: 08698/19 BAR. P. ("HG): 29.89
 DATE: 12/19/19
 COMPANY: ES&S
 SOURCE: Excavate Port
 TEST NO.: DRG-81
 STARTUP TIME: 1:12 pm FINISH TIME: _____
 STATIC PRESSURE (IN H2O): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): _____
 PITOT COEFFICIENT: _____
 CONTROL BOX (NAME, dH, GAMMA): MS-10 0.84 0.997
 GAS COMPOSITION: CO2% 13 O2% 3 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOISE
1	5	370.68	0.068	9.05	1064	58	58	236	236	55	3	9.2	8.65
	10	373.77	0.025	0.42	1030	61	58	236	236	55	2	12.07	7.2
	15	375.87	0.024	0.4	1041	63	59	238	238	50	2	12.27	7.02
	20	377.80	0.036	0.6	995	64	60	237	237	50	2	15.32	6.19
	25	380.2	0.018	0.48	1005	66	60	236	236	58	3	14.36	5.46
	30	382.5	0.027	0.46	1006	66	62	237	237	58	3	14.66	5.27
	35	384.76	0.027	0.46	1013	68	62	234	234	57	3	14.97	5.07
	40	386.82	0.062	0.99	1113	68	63	234	234	58	4	16.88	4.98
	45	389.77	0.067	1.00	1152	68	63	235	235	58	5	13.5	6.06
	50	393.13	0.087	1.4	1242	72	65	236	236	57	5	12.67	6.8
	55	396.50	0.085	1.4	1252	73	65	237	237	57	5	12.95	6.57
	60	399.85	0.059	0.99	1167	75	65	237	237	58	5	13.66	6.09
3	65	402.95	0.062	1.1	1170	75	69	236	236	58	5	13.51	6.77
	70	406.15	0.054	0.85	1160	77	70	236	236	59	4	16.00	5.77
	75	409.00	0.040	0.65	1118	78	71	234	234	61	4	14.51	5.33
	80	411.25	0.042	0.68	1121	78	73	234	234	61	4	14.32	5.42
	85	413.66	0.038	0.65	1049	80	74	235	235	61	4	14.71	5.28
	90	416.03	0.032	0.56	1049	80	75	234	234	64	3	14.63	5.37
4	95	418.25	0.036	0.61	1052	82	77	234	234	65	4	16.61	5.42
	100	420.62	0.022	0.4	1010	82	78	234	234	65	3	16.79	5.24
	105	422.63	0.023	0.38	1096	82	79	234	234	61	4	14.4	5.4
	110	424.60	0.023	0.38	999	83	80	235	235	60	4	15.0	5.1
	115	426.56	0.022	0.38	1025	83	81	234	234	60	4	14.97	5.13
	120	428.47	0.022	0.38	1006	83	81	234	234	60	4	14.47	5.38
5	120	430.51	0.022	0.38	1005	84	82	235	235	60	4	14.41	5.4

INITIAL L.C.: Gcc1 @ 15"Hg
 FINAL L.C.: _____ @ _____"Hg
 CONSOLE OPERATOR: Ok OF 1 wood.
2

ISOKINETIC SAMPLING, FIELD DATA SHEET

JOB NUMBER: _____ BAR. P. ("HG): _____
 DATE: _____
 COMPANY: _____
 SOURCE: _____
 TEST NO.: _____
 STARTUP TIME: _____ FINISH TIME: 16:12 SO2%: _____
 STATIC PRESSURE (IN H2O): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): _____
 PITOT COEFFICIENT: _____
 CONTROL BOX (NAME, dH, GAMMA): _____
 GAS COMPOSITION: _____ CO2%: _____

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
	125	432.49	0.020	0.36	1000		84	83	235	60	5	14.9	5.2
	130	434.34	0.021	0.34	1021		86	84	235	57	4	15.1	4.98
	135	436.25	0.021	0.37	986		86	84	235	60	4	15.1	5.0
	140	438.12	0.021	0.37	1007		86	84	235	60	4	15.1	4.98
	145	439.96	0.021	0.37	974		85	84	234	60	4	14.8	5.13
6	150	441.81	0.020	0.36	981		86	84	238	60	4	15.37	4.84
	155	443.58	0.025	0.28	926		86	84	238	60	4	16.27	4.06
	160	445.27	0.025	0.28	926		84	84	236	64	4	16.06	4.27
	165	446.90	0.028	0.33	969		84	84	235	65	4	16.22	4.1
	170	448.76	0.014	0.26	919		84	84	236	65	4	16.59	3.96
	175	450.43	0.014	0.27	906		85	85	236	65	4	16.96	4.72
	180	452.00											

INITIAL L.C.: _____ @ _____
 FINAL L.C.: 0.001 @ 15 "Hg
 CONSOLE OPERATOR: OK OF 2
 wood.

Wood Environment & Infrastructure Solutions

TEST NO.: ORG-2

JOB NUMBER: TC190713
20
 DATE: 08/10/19
 COMPANY: BIM PORT
 SOURCE: Ecc waste Port

STACK DIAMETER: _____

Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1	422	613	191
IMPINGER 2	677	684	7
IMPINGER 3	647	649	2
IMPINGER 4	891	916	25
IMPINGER 5			
IMPINGER 6			
IMPINGER 7			
IMPINGER 8			
Total			225

Filter ID	Filter Tare, g	Filter Final, g
FILTER		

NOTES: _____
 _____ 120.66
 _____ Moist = 7.9

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINE 1 SAMPLING, FIELD DATA SHEET

JOB NUMBER: 20 August-11-19 DATE: 08/20
 COMPANY: BIM PORT
 SOURCE: Esc waste Port
 TEST NO.: ORC-2
 STARTUP TIME: 07:24 FINISH TIME: _____

STATIC PRESSURE (IN H2O): -0.1 BAR. P. ("HG): 29.92
 ASSUMED MOISTURE VOL. %: 7
 NOZZLE DIAMETER (INCHES): 0.625
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): M9Aer-1239 O2%: 0.92
 GAS COMPOSITION: 16.4 CO2%: 4.16 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
1		505.97	0.049	1.7	1438		49	49	229	51	5	21.0	0
	5	509.20	0.027	0.96	1406		49	48	238	46	8	10.56	8.64
	10	511.72	0.027	0.94	1435		50	47	238	46	9	10.55	8.66
	15	514.47	0.13	1.6	1383		52	48	240	46	12	11.72	6.92
2	20	517.72	0.14	1.6	1385		54	48	238	46	16	12.82	6.85
	25	521.02	0.14	1.6	1385		54	48	239	46	16	12.98	6.73
2	30	524.28	0.13	1.6	1385		55	49	235	48	16	13.13	6.60
	35	527.52	0.12	1.6	1367		55	49	236	48	16	13.46	6.30
2	40	530.75	0.13	1.6	1376		56	50	238	48	16	13.46	6.12
	45	533.84	0.09	1.6	1319		56	51	234	50	16	13.86	6.12
	50	537.00	0.08	1.6	1292		57	51	235	50	17	14.16	5.83
	55	540.27	0.029	1.2	1101		57	52	232	50	17	14.57	5.34
3	60	543.26	0.024	1.1	1061		58	52	233	52	17	15.25	4.91
	65	546.35	0.023	1.0	1038		58	52	234	52	17	15.12	4.99
	70	549.24	0.021	0.95	1017		58	53	234	52	16	15.20	4.94
→	75	552.85	0.038	1.7	1068		57	54	230	52	6	14.62	5.22
8	80	555.15	0.046	2.0	1107		58	54	222	54	6	15.15	4.98
	85	558.80	0.043	1.8	1097		60	54	237	51	7	14.27	5.68
	90	562.1	0.041	1.8	1089		61	55	240	51	8	14.14	5.77
	95	565.7	0.044	1.9	1085		63	55	237	53	9	13.88	5.98
6	100	569.44	0.040	1.8	1085		63	56	236	53	10	13.95	5.92
	105	573.1	0.039	1.7	1074		63	56	236	53	10	13.96	5.89
	110	576.90	0.039	1.7	1068		64	57	236	55	10	14.01	5.85
	115	580.21	0.042	1.9	1065		64	57	235	55	11	14.08	5.79
	120	584.89	0.038	1.7	1053		64	58	235	55	12	14.24	5.65

M9Aer
↓

stop!
8:40am
Start!
8:46

INITIAL L.C.: 0.c.c.5 @ 10 "Hg
 FINAL L.C.: _____ @ _____ "Hg
 CONSOLE OPERATOR: 0k OF 1 wood.

ISOKINE) SAMPLING, FIELD DATA SHEET

JOB NUMBER: _____ BAR. P. ("HG): _____
 DATE: _____
 COMPANY: _____
 SOURCE: _____
 TEST NO.: _____
 STARTUP TIME: _____ FINISH TIME: 10:31
 STATIC PRESSURE (IN H2O): _____
 ASSUMED MOISTURE VOL. %: _____
 NOZZLE DIAMETER (INCHES): _____
 PITOT COEFFICIENT: _____
 CONTROL BOX (NAME, dH, GAMMA): _____
 GAS COMPOSITION: _____ CO2% _____ O2% _____ SO2% _____

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
	125	587.64	0.038	1.7	1050		64	58	236	57	10	14.26	5.61
	130	591.36	0.038	1.7	1042		65	58	235	57	12	14.29	5.58
	135	595.00	0.040	1.8	1041		64	58	235	58	12	14.37	5.50
	140	598.67	0.038	1.7	1032		64	58	235	57	13	14.50	5.40
	145	602.4	0.037	1.7	1028		64	58	235	58	14	14.55	5.35
	150	606.1	0.039	1.8	1024		64	59	235	58	15	14.46	5.40
	155	609.95	0.027	1.8 1.9	663		64	59	235	60	15	15.38	4.66
	160	613.50	0.028	1.3	969		64	58	236	58	14	15.37	4.68
	165	616.80	0.028	1.3	966		64	59	234	57	12	15.5	4.54
	170	620.10	0.026	1.2	956		64	59	234	58	12	15.62	4.47
	175	623.37	0.025	1.2	954		63	59	235	58	12	15.64	4.45
	180	626.63											

INITIAL L.C.: _____ @ _____ "Hg
 FINAL L.C.: GRC 1 @ 20 "Hg
 CONSOLE OPERATOR: OK OF 2
 wood.

Wood Environment & Infrastructure Solutions

TEST NO.: ORG-3

JOB NUMBER: TC190713 STACK DIAMETER: _____
 DATE: 08/21/19
 COMPANY: RIM Port
 SOURCE: Eco waste Port

	Contents	Tare Wt. g	Final Wt. g	Difference, g
IMPINGER 1		448	667	219
IMPINGER 2		682	690	8
IMPINGER 3		648	650	2
IMPINGER 4	Sg	913	926	13
IMPINGER 5				
IMPINGER 6				
IMPINGER 7				
IMPINGER 8				
Total				242

	Filter ID	Filter Tare, g	Filter Final, g
FILTER			

NOTES: L 2307480-9 122.29
8.4

NOTE: FOR SVOC TRAINS, "IMP. TEMP" INDICATES TEMP OF GAS ENTERING XAD RESIN



ISOKINETIC SAMPLING, FIELD DATA SHEET

JOB NUMBER: 08/21/99 BAR. P. ("HG): 29.98
 DATE: 8/21/99
 COMPANY: Bim Port
 SOURCE: Escrow side Port
 TEST NO.: OR03
 STARTUP TIME: 09:58 FINISH TIME: 09:58
 GAS COMPOSITION: CO2% 4 O2% 16 SO2%: 0

STATIC PRESSURE (IN H2O): -0.1
 ASSUMED MOISTURE VOL. %: 8
 NOZZLE DIAMETER (INCHES): 0.625
 PITOT COEFFICIENT: 0.84
 CONTROL BOX (NAME, dH, GAMMA): MB-10 1.739 0.997
 GAS COMPOSITION: CO2% 4 O2% 16 SO2%: 0

PT. #	TIME (MIN)	DGM Vol (FT3)	dP (IN H2O)	dH (IN H2O)	STACK (DEG F)	PROBE (deg F)	DGM IN (deg F)	DGM OUT (deg F)	OVEN (deg F)	IMP or XAD (deg F)	VACUUM (IN HG)	OXYGEN (mV)	NOTES
1	5	715.76	0.026	1.4	945		50	50	235	50	6	21.00	0
	10	719.07	0.026	1.2	935		50	49	237	50	6	13.28	6.2
	15	722.21	0.031	1.4	1014		51	49	237	44	6	13.1	6.3
	20	725.25	0.045	2.0	1032		53	49	237	44	8	13.4	6.1
	25	728.60	0.037	1.7	1011		55	49	237	44	11	13.6	5.98
	30	732.50	0.034	1.5	1018		57	50	235	44	9	14.50	5.33
2	35	736.22	0.035	1.6	1024		57	51	236	44	9	14.54	5.15
	40	739.95	0.063	2.6	1124		58	51	236	44	9	14.79	4.92
	45	743.82	0.09	3.5	1251		59	52	235	44	10	12.18	3.09
	50	747.89	0.065	2.6	1184		60	52	235	44	18	13.16	6.34
	55	752.84	0.054	2.2	1162		61	53	236	45	16	13.09	6.38
	60	757.49	0.047	2.0	1132		60	54	235	46	16	13.21	6.15
3	65	762.02	0.034	1.5	1045		60	54	234	47	16	13.87	5.67
	70	766.02	0.036	1.6	1034		60	54	235	47	10	13.83	5.83
	75	769.55	0.039	1.7	1034		60	54	234	47	10	13.84	5.79
	80	773.95	0.040	1.8	1046		61	55	233	47	10	13.81	5.81
	85	776.47	0.032	1.4	1046		61	55	235	48	10	13.96	5.74
	90	780.10	0.035	1.6	1030		61	55	235	49	10	13.70	5.69
4	95	783.48	0.033	1.5	1014		61	55	234	50	10	14.06	5.67
	100	787.00	0.035	1.6	1045		61	56	235	51	10	13.25	6.03
	105	790.57	0.035	1.6	1019		62	56	237	52	14	14.08	5.52
	110	794.21	0.038	1.7	1022		63	56	235	53	15	14.08	5.52
	115	797.88	0.036	1.6	1009		62	57	234	53	15	14.23	5.46
	120	801.60	0.021	1.0	930		62	57	235	51	10	15.7	4.20
5	120	804.63	0.021	1.0	900		62	57	235	50	10	16.2	3.9

INITIAL L.C.: 0.001 @ 20 "Hg
 FINAL L.C.: 0.001 @ 20 "Hg
 CONSOLE OPERATOR: OK OF 1 2
 wood.

Appendix D
Calibration Sheets

DRY GAS METER CALIBRATION FORM

Reference Meter ID:	26785	Ref Gamma:	1.020
Meter to be Calibrated ID:	6847798	MB-11	
Barometric Pressure:	29.59	Operator:	AZ
Date:	20-Feb-19		
Room Temperature:	67 °F		

Delta H in H2O	Ref DGM Volume Start, cf	Ref DGM Volume Finish, cf	Ref DGM Temp °F	DGM Volume Start, cf	DGM Volume Finish, cf	Temp In °F	Temp Out °F	Time Seconds	Ref DGM Gamma	min	sec	millisec
0.500	0.00	1.00	66	20.92	21.93	65.0	64.0	145.36	1.020	2	25	36
1.00	0.00	1.00	67	22.94	23.95	65.0	65.0	104.97	1.020	1	44	97
2.00	0.00	1.00	67	25.97	26.98	66.0	65.0	74.82	1.020	1	14	82
4.00	0.00	1.00	68	28.99	30.00	69.0	65.0	53.51	1.020		53	51
7.00	0.00	1.00	68	32.00	33.01	71.0	65.0	40.55	1.020		40	55
9.50	0.00	1.00	68	36.03	37.05	74.0	66.0	34.91	1.020		34	91

Ref DGM Temp °R	Ref DGM Volume Total, Rcf	Ave. DGM Temp. °R	DGM Volume Total, Rcf	DGM Gamma	Orifice Coeff.	Delta H @ in H2O	Ko	1/(Ko^2)	CFM approx
526.0	1.013	525	1.007	1.006	0.751	1.636	0.750	1.778	0.417
527.0	1.011	525	1.007	1.004	0.736	1.708	0.735	1.852	0.578
527.0	1.011	526	1.009	1.002	0.731	1.737	0.729	1.881	0.810
528.0	1.009	527	1.011	0.998	0.723	1.782	0.721	1.925	1.131
528.0	1.009	528	1.016	0.993	0.722	1.794	0.720	1.928	1.490
528.0	1.009	530	1.029	0.981	0.727	1.776	0.725	1.901	1.741

Averages **0.997** **0.732** **1.739** **0.730** **1.876**

Prepared By: AZ

*Rcf = 68 deg F, 29.92 "Hg
Adjustment nut: In increases volume reading,decreases Gamma: 1/2 turn = 1%

Appendix E
Statement of Limitations

Limitations (optional)

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
 - a. The Standard Terms and Conditions which form a part of our Professional Services Contract;
 - b. The Scope of Services;
 - c. Time and Budgetary limitations as described in our Contract; and
 - d. The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the Site and attendant structures. Our conclusions cannot and are not extended to include those portions of the Site or structures, which are not reasonably available, in Wood's opinion, for direct observation.
4. The environmental conditions at the Site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the Site with any applicable local, provincial or federal bylaws, orders-in-council, legislative enactments and regulations was not performed.
5. The Site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on-site and may be revealed by different or other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Wood must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Wood's services during the implementation of any remedial measures will allow Wood to observe compliance with the conclusions and recommendations contained in the report. Wood's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Wood accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Wood.
11. Provided that the report is still reliable, and less than 12 months old, Wood will issue a third-party reliance letter to parties that the client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Wood's report, by such reliance agree to be bound by our proposal and Wood's standard reliance letter. Wood's standard reliance letter indicates that in no event shall Wood be liable for any damages, howsoever arising, relating to third-party reliance on Wood's report. No reliance by any party is permitted without such agreement.