A.Lanfranco & Associates Inc.
Environmental Consultants

Prepared for

METRO VANCOUVER

Metrotower III
4515 Central Boulevard
Burnaby, BC
V5H 0C6

WASTE TO ENERGY FACILITY

Appendices of Compliance Emissions Testing Report

February 2022 Survey

Table of Contents

APPENDIX – A

QUALITY ASSURANCE / QUALITY CONTROL RESULTS

Quality assurance / quality control (QA/QC) is divided into four categories: administration, preparation, testing, and analysis. The following sections detail results found for the above four categories.

Administration:

- All field, process, and analytical data was reviewed to ensure data integrity and accuracy.
- Duplicate proof of draft and final report, including data entry, conducted.

Preparation:

- All glassware cleaned
- Blank samples of reagents collected.

Testing:

- Stack diameter and absence of cyclonic flow confirmed
- Calibrated magnehelic used for all velocity measurements
- All trains past pre- and post- leak checks.
- Isokinetics all within 100% $\pm$ 10%.

Analysis:

- Trace Metals and Mercury analysis conducted at Element Labs, Surrey, B.C.
- Fluoride (HF) analysis conducted at ALS Environmental in Burnaby, B.C.
- Nitrous Oxide (N_2O) analysis conducted with portable analyzer by A. Lanfranco and Associates.
- Particulate analysis conducted at A. Lanfranco and Associates Inc., Surrey, BC.
- Chain of Custody protocols followed for all samples.
- Excellent blank values for all sample types. All samples blank corrected.

Sample Type	**Blank Value**		
First Survey 2022	**Unit 1**	**Unit 2**	**Unit 3**
Filter	0.0 mg	0.1 mg	0.1 mg
Front Half Washings	-0.7 mg	-1.4 mg	-0.2 mg
Mercury Front	<0.02 ug	<0.02 ug	<0.02 ug
Mercury Back	<0.17 ug	<0.21 ug	<0.21 ug
Trace Metals Front *	<55.9 ug	<51.3 ug	<58.1 ug
Trace Metals Back*	<34.6 ug	<35.0 ug	<30.4 ug
Fluoride	<5.0 ug	<5.0 ug	<5.0 ug

Sum of all reported elements except Hg*

APPENDIX - B

LABORATORY RESULTS

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: info.vancouver@element.com
W: www.element.com

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554859**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722489

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

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E: info.vancouver@element.com
W: www.element.com

Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554859**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722489

Reference Number	1554859-1	1554859-2	1554859-3
Sample Date	Feb 14, 2022	Feb 14, 2022	Feb 14, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Reagent Blank Unit 1 Container 1 (filter)	Reagent Blank Unit 2 Container 1 (filter)	Reagent Blank Unit 3 Container 1 (filter)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	<5	7	<5	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<1	<1	<1	1
Cadmium		µg	<0.3	<0.3	0.3	0.25
Chromium		µg	0.53	<0.2	<0.2	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	0.4	<0.3	<0.3	0.25
Lead		µg	<2	<2	<2	1.5
Manganese		µg	<0.3	0.3	11	0.25
Nickel		µg	<0.5	<0.5	<0.5	0.5
Phosphorus		µg	38	42	41	2.5
Selenium		µg	<2	<2	2.6	1.5
Tellurium		µg	<2	<2	4.4	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	2.5	2	2.6	0.5
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	<0.02	<0.02	<0.02	

Approved by:

Randy Neumann, BSc
Division Director

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

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W: www.element.com

Methodology and Notes

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554859**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722489

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 25, 2022	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted.

element
www.Element.com

Project Information

Project ID:	Metro Vancouver WTE
Project Name:	Filter Reagent Blanks
Project Location:	
Legal Location:	
PO/AFE#:	
Proj. Acct. Code:	
Quote #:	

Invoice To

Company:	A. Lanfranco & Associates Inc.
Address:	101-9488 189 Street
	Surrey BC, V4N 4W7
Attention:	
Phone:	604-881-2582
Cell:	
Fax:	
E-mail:	mark.lanfranco@alanfranco.com
Agreement ID:	
Copy of Report:	YES / NO

Report To

Company:	
Address:	
Attention:	
Phone:	
Cell:	
Fax:	
E-mail 1:	
E-mail 2:	
Copy of Invoice:	YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:

Sample Custody

Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

- [ ] Same Day (200%)
- [ ] Next Day/Two Day (100%)
- [ ] Three or Four Days (50%)
- [x] 5 to 7 Days (Regular TAT)

Date Required _____

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

Report Results

- [x] Email
- [ ] QA/QC
- [ ] Online
- [x] PDF
- [ ] Fax
- [ ] Excel

Requirements

- [ ] HCDWORG
- [ ] SPIGEC
- [ ] AB Tier 1
- [ ] BCCSR

Other (list below)

Special Instructions/Comments (please include contact information including phone number if different from above).

* Please report µg/sample

	Site I.D.	Sample Description	Depth start	Depth end	Date/Time sampled	Matrix	Sampling method	Number of Containers	ICAP	Hg
			in cm	m				↓	Enter tests above (✓ relevant samples below)	
1		Reagent Blank Unit 1 Container 1(filter)			14-Feb-22			1	✓	✓
2										
3		Reagent Blank Unit 2 Container 1 (filter)			14-Feb-22			1	✓	✓
4										
5		Reagent Blank Unit 3 Container 1 (filter)			14-Feb-22			1	✓	✓
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (https://www.element.com/terms/terms-and-conditions)

Page _____ of _____ Control #

ED 120-005

Lot: 1554859 COC

Temp. received: 17.4 °C

Date/Time stamp: FEB 22 14:44

Delivery Method:

Waybill:

Received by:

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
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Report Transmission Cover Page

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554677**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722236

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

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V3S 8P8, Canada

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W: www.element.com

Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554677**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722236

Reference Number	1554677-1	1554677-2	1554677-3
Sample Date	Feb 14, 2022	Feb 14, 2022	Feb 14, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Reagent Blank Unit 1	Reagent Blank Unit 2	Reagent Blank Unit 3
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	<5	<5	<5	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<1	2	<1	1
Cadmium		µg	<0.3	<0.3	<0.3	0.25
Chromium		µg	<0.2	<0.2	<0.2	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	1	<0.3	0.4	0.25
Lead		µg	<2	<2	<2	1.5
Manganese		µg	0.3	<0.3	<0.3	0.25
Nickel		µg	<0.5	<0.5	<0.5	0.5
Phosphorus		µg	<2	3	<2	2.5
Selenium		µg	<2	<2	2.9	1.5
Tellurium		µg	<2	2	<2	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	2	1	2	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	<5	<5	<5	5
Antimony		µg	<3	3	<3	2.5
Arsenic		µg	<1	<1	<1	1
Cadmium		µg	<0.3	<0.3	<0.3	0.25
Chromium		µg	0.2	<0.2	0.49	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	0.5	0.7	1	0.25
Lead		µg	4.2	2	3.7	1.5
Manganese		µg	0.8	0.7	0.5	0.25
Nickel		µg	0.5	<0.5	1	0.5
Phosphorus		µg	20	20	20	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	1	1	1	0.5
Volume	Sample	mL	230	230	230	
Volume	aliquot volume	mL	180	180	180	
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554677**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722236

Reference Number	1554677-1	1554677-2	1554677-3
Sample Date	Feb 14, 2022	Feb 14, 2022	Feb 14, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Reagent Blank Unit 1	Reagent Blank Unit 2	Reagent Blank Unit 3
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	<0.02	<0.02	<0.02	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	230	230	230	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	50	50	50	
Mercury	Fraction 2B	µg/sample	<0.1	<0.1	<0.1	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	100	98	97	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.008	<0.008	<0.008	
Mercury	As Tested	µg/L	0.08	0.06	0.06	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	0.03	0.02	0.02	

Approved by:

Randy Neumann, BSc
Division Director

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Methodology and Notes

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554677**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722236

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 23, 2022	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 23, 2022	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

element
www.Element.com

Project Information

Project ID:	Metro Vancouver WTE
Project Name:	Reagent Blanks
Project Location:	
Legal Location:	
PO/AFE#:	
Proj. Acct. Code:	
Quote #:	

Invoice To

Company:	A. Lanfranco & Associates Inc.
Address:	101-9488 189 Street
	Surrey BC, V4N 4W7
Attention:	
Phone:	604-881-2582
Cell:	
Fax:	
E-mail:	mark.lanfranco@alanfranco.com
Agreement ID:	
Copy of Report:	YES / NO

Report To

Company:	
Address:	
Attention:	
Phone:	
Cell:	
Fax:	
E-mail 1:	
E-mail 2:	
Copy of Invoice:	YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:

Sample Custody

Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

- [ ] Email
- [ ] QA/QC
- [ ] Online
- [x] PDF
- [ ] Fax
- [ ] Excel

Requirements

- [ ] HCDWORG
- [ ] SPIGEC
- [ ] AB Tier 1
- [ ] BCCSR

Other (list below)

- [ ] Same Day (200%)
- [ ] Next Day/Two Day (100%)
- [ ] Three or Four Days (50%)
- [x] 5 to 7 Days (Regular TAT)

Date Required

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

Special Instructions/Comments (please include contact information including phone number if different from above).

*Front and Back ICAP as per EPA Method 29. *Hg analysis as per EPA Method 29. *Please report µg/sample.

	Site I.D.	Sample Description	Depth start	Depth end	Date/Time sampled	Matrix	Sampling method	Number of Containers	Front ICAP	Back ICAP	Front Hg	Back Hg	5A Hg	5B Hg
			in cm	m				↓	Enter tests above (✓ relevant samples below)					
1		Reagent Blank Unit 1			14-Feb-22			5	✓	✓	✓	✓	✓	✓
2														
3		Reagent Blank Unit 2			14-Feb-22			5	✓	✓	✓	✓	✓	✓
4														
5		Reagent Blank Unit 3			14-Feb-22			5	✓	✓	✓	✓	✓	✓
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (https://www.element.com/terms/terms-and-conditions)

Page _____ of _____ Control #

ED 120-005

Lot: 1554677 COC

Temp. received: 17.4 °C

Date/Time stamp: FEB 22 14:44

Delivery Method:

Waybill:

Received by:

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: info.vancouver@element.com
W: www.element.com

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554669**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722220

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: info.vancouver@element.com
W: www.element.com

Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554669**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722220

Reference Number	1554669-1	1554669-2	1554669-3
Sample Date	Feb 15, 2022	Feb 16, 2022	Feb 17, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Field Blank Unit 1 (MV Unit 1 BLK + 4 Bottles)	Field Blank Unit 2 (MV Unit 2 BLK + 4 Bottles)	Field Blank Unit 3 (MV Unit 3 BLK + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	5	7	6	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<1	<1	<1	1
Cadmium		µg	<0.3	<0.3	<0.3	0.25
Chromium		µg	<0.2	<0.2	<0.2	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	1	<0.3	0.7	0.25
Lead		µg	<2	<2	<2	1.5
Manganese		µg	<0.3	0.7	0.3	0.25
Nickel		µg	<0.5	<0.5	<0.5	0.5
Phosphorus		µg	45	40	44	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<2	<2	2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	4.9	3.6	5.1	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	<5	<5	<5	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<0.9	<0.9	<0.9	1
Cadmium		µg	<0.2	<0.2	<0.2	0.25
Chromium		µg	0.65	<0.2	<0.2	0.2
Cobalt		µg	<0.2	<0.2	<0.2	0.25
Copper		µg	2	1	0.6	0.25
Lead		µg	3.0	2	3.3	1.5
Manganese		µg	0.8	0.3	0.6	0.25
Nickel		µg	1	1	0.9	0.5
Phosphorus		µg	20	25	20	2.5
Selenium		µg	5.1	3.7	<1	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<1	<1	3.0	1.5
Vanadium		µg	<0.9	<0.9	<0.9	1
Zinc		µg	2	2	2	0.5
Volume	Sample	mL	325	325	325	
Volume	aliquot volume	mL	275	275	275	
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554669**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722220

Reference Number	1554669-1	1554669-2	1554669-3
Sample Date	Feb 15, 2022	Feb 16, 2022	Feb 17, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Field Blank Unit 1 (MV Unit 1 BLK + 4 Bottles)	Field Blank Unit 2 (MV Unit 2 BLK + 4 Bottles)	Field Blank Unit 3 (MV Unit 3 BLK + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	<0.02	<0.02	<0.02	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	325	325	325	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	<0.1	<0.1	<0.1	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	165	170	155	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.01	<0.01	<0.01	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	500	1000	1000	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.04	<0.08	<0.08	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	<0.02	<0.02	<0.02	

Approved by:

Randy Neumann, BSc
Division Director

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
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V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554669**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722220

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 9, 2022	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 23, 2022	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 23, 2022	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

element
www.Element.com

Project Information

Project ID:	Metro Vancouver WTE
Project Name:	Field Blanks
Project Location:	
Legal Location:	
PO/AFE#:	
Proj. Acct. Code:	
Quote #:	

Invoice To

Company:	A. Lanfranco & Associates Inc.
Address:	101-9488 189 Street
	Surrey BC, V4N 4W7
Attention:	
Phone:	604-881-2582
Cell:	
Fax:	
E-mail:	mark.lanfranco@alanfranco.com
Agreement ID:	
Copy of Report:	YES / NO

Report To

Company:	
Address:	
Attention:	
Phone:	
Cell:	
Fax:	
E-mail 1:	
E-mail 2:	
Copy of Invoice:	YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:

Sample Custody

Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

- [ ] Same Day (200%)
- [ ] Next Day/Two Day (100%)
- [ ] Three or Four Days (50%)
- [x] 5 to 7 Days (Regular TAT)

Date Required

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

Report Results

- [x] Email
- [ ] QA/QC
- [ ] Online
- [x] PDF
- [x] Fax
- [ ] Excel

Requirements

- [ ] HCDWORG
- [ ] SPIGEC
- [ ] AB Tier 1
- [ ] BCCSR

Other (list below)

Special Instructions/Comments (please include contact information including phone number if different from above).

*Front and Back ICAP as per EPA Method 29. *Hg analysis as per EPA Method 29. *Please report µg/sample.

	Site I.D.	Sample Description	Depth start	Depth end	Date/Time sampled	Matrix	Sampling method	Number of Containers	Front ICAP	Back ICAP	Front Hg	Back Hg	5A Hg	5B Hg
1		Field Blank Unit 1 (MV Unit 1 BLK + 4 Bottles)			15-Feb-22			5	✓	✓	✓	✓	✓	✓
2														
3		Field Blank Unit 2 (MV Unit 2 BLK + 4 Bottles)			16-Feb-22			5	✓	✓	✓	✓	✓	✓
4														
5		Field Blank Unit 3 (MV Unit 3 BLK + 4 Bottles)			17-Feb-22			5	✓	✓	✓	✓	✓	✓
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

Enter tests above (✓ relevant samples below)

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (https://www.element.com/terms/terms-and-conditions)

Lot: 1554669 COC

Temp. received: 17.4 °C

Date/Time stamp: FEB 22 14:43

Delivery Method:

Waybill:

Received by:

Page _____ of _____

ED 120-005

Control #

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Report Transmission Cover Page

Bill To: A. Lanfranco & Associates
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V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
Email - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Reference Number	1554687-1	1554687-2	1554687-3
Sample Date	Feb 14, 2022	Feb 15, 2022	Feb 15, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 1 Run 1 (Unit 1 R-1 + 4 Bottles)	Unit 1 Run 2 (MV Unit 1 R-2 + 4 Bottles)	Unit 1 Run 3 (MV Unit 1 R-3 + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	27	20	20	5
Antimony		µg	<2	<2	3	2.5
Arsenic		µg	<1	<1	<1	1
Cadmium		µg	22	2.6	2	0.25
Chromium		µg	2.2	0.56	0.47	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	5.9	4.7	5.5	0.25
Lead		µg	6.7	4.5	8.5	1.5
Manganese		µg	2	2	2	0.25
Nickel		µg	3.3	2	0.9	0.5
Phosphorus		µg	51	50	46	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	4.4	<2	<2	2
Thallium		µg	<2	2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	86.7	74.5	99.7	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	41	49	45	5
Antimony		µg	2	<2	<2	2.5
Arsenic		µg	<0.8	1	<0.8	1
Cadmium		µg	5.0	<0.2	<0.2	0.25
Chromium		µg	0.90	0.91	0.36	0.2
Cobalt		µg	<0.2	0.5	0.2	0.25
Copper		µg	2	2	1	0.25
Lead		µg	5.8	4.1	<1	1.5
Manganese		µg	10.0	2	2	0.25
Nickel		µg	2	2	2	0.5
Phosphorus		µg	22	28	22	2.5
Selenium		µg	<1	<1	1	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<1	<1	<1	1.5
Vanadium		µg	<0.8	<0.9	<0.8	1
Zinc		µg	18	10	5.0	0.5
Volume	Sample	mL	940	825	940	
Volume	aliquot volume	mL	890	775	890	
Mercury by CVAA						
Mercury	As Tested	µg/L	0.11	0.06	0.07	0.05

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Reference Number	1554687-1	1554687-2	1554687-3
Sample Date	Feb 14, 2022	Feb 15, 2022	Feb 15, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 1 Run 1 (Unit 1 R-1 + 4 Bottles)	Unit 1 Run 2 (MV Unit 1 R-2 + 4 Bottles)	Unit 1 Run 3 (MV Unit 1 R-3 + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	0.044	0.03	0.03	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	940	825	940	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	<0.4	<0.3	<0.4	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	165	155	167	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.01	<0.01	<0.01	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	1000	500	1000	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.08	<0.04	<0.08	
Mercury	As Tested	µg/L	0.18	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	0.056	<0.02	<0.02	

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Analytical Report

Bill To: A. Lanfranco & Associates
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Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Reference Number	1554687-4	1554687-5	1554687-6
Sample Date	Feb 15, 2022	Feb 16, 2022	Feb 16, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 2 Run 1 (MV Unit 2 R-1 + 4 Bottles)	Unit 2 Run 2 (Unit 2 R-2 + 4 Bottles)	Unit 2 Run 3 (MV Unit 2 R-3 + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	20	10	20	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<1	<1	<1	1
Cadmium		µg	0.3	<0.3	<0.3	0.25
Chromium		µg	1.1	2.53	0.53	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	0.9	1	2	0.25
Lead		µg	<2	<2	<2	1.5
Manganese		µg	1	1	1	0.25
Nickel		µg	<0.5	2	2	0.5
Phosphorus		µg	43	41	43	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	2.5	3.9	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	11	5.6	7.7	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	<40	<40	<40	5
Antimony		µg	<20	<20	<20	2.5
Arsenic		µg	<8	<8	<9	1
Cadmium		µg	<2	<2	<2	0.25
Chromium		µg	3.8	3.2	<2	0.2
Cobalt		µg	<2	4	<2	0.25
Copper		µg	<2	8	<2	0.25
Lead		µg	<10	20	<10	1.5
Manganese		µg	2	2	<2	0.25
Nickel		µg	<4	<4	<4	0.5
Phosphorus		µg	<20	40	<20	2.5
Selenium		µg	<10	<10	<10	1.5
Tellurium		µg	<20	<20	<20	2
Thallium		µg	<10	24	<10	1.5
Vanadium		µg	<8	<8	<9	1
Zinc		µg	<4	7	<4	0.5
Volume	Sample	mL	910	910	800	
Volume	aliquot volume	mL	860	860	750	
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Reference Number	1554687-4	1554687-5	1554687-6
Sample Date	Feb 15, 2022	Feb 16, 2022	Feb 16, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 2 Run 1 (MV Unit 2 R-1 + 4 Bottles)	Unit 2 Run 2 (Unit 2 R-2 + 4 Bottles)	Unit 2 Run 3 (MV Unit 2 R-3 + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	<0.02	<0.02	<0.02	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	910	910	800	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	<0.4	<0.4	<0.3	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	198	150	135	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.02	<0.01	<0.01	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	1000	500	500	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.08	<0.04	<0.04	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	<0.02	<0.02	<0.02	

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Reference Number	1554687-7	1554687-8	1554687-9
Sample Date	Feb 16, 2022	Feb 17, 2022	Feb 17, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 3 Run 1 (MV Unit 3 R-1 + 4 Bottles)	Unit 3 Run 2 (MV Unit 3 R-2 + 4 Bottles)	Unit 3 Run 3 (Unit 3 R-3 + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	20	20	20	5
Antimony		µg	4	<2	<2	2.5
Arsenic		µg	2	1	<1	1
Cadmium		µg	2	1	2	0.25
Chromium		µg	0.65	0.88	0.56	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	4.7	5.1	5.1	0.25
Lead		µg	6.9	20	14	1.5
Manganese		µg	1	1	1	0.25
Nickel		µg	1	2	0.9	0.5
Phosphorus		µg	50	47	47	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	71.8	79.8	101	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	<40	100	10	5
Antimony		µg	<20	<20	<2	2.5
Arsenic		µg	<9	<9	<0.9	1
Cadmium		µg	<2	<2	<0.2	0.25
Chromium		µg	2	4.3	0.62	0.2
Cobalt		µg	<2	<2	<0.2	0.25
Copper		µg	<2	<2	2	0.25
Lead		µg	24	20	4.9	1.5
Manganese		µg	<2	<2	1	0.25
Nickel		µg	<4	<4	0.8	0.5
Phosphorus		µg	40	30	20	2.5
Selenium		µg	<10	<10	<1	1.5
Tellurium		µg	<20	<20	<2	2
Thallium		µg	<10	<10	<1	1.5
Vanadium		µg	<9	<9	<0.9	1
Zinc		µg	<4	6	6.0	0.5
Volume	Sample	mL	760	800	765	
Volume	aliquot volume	mL	710	750	715	
Mercury by CVAA						
Mercury	As Tested	µg/L	0.08	0.11	0.17	0.05

Element
#104, 19575-55 A Ave.
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W: www.element.com

Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Reference Number	1554687-7	1554687-8	1554687-9
Sample Date	Feb 16, 2022	Feb 17, 2022	Feb 17, 2022
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 3 Run 1 (MV Unit 3 R-1 + 4 Bottles)	Unit 3 Run 2 (MV Unit 3 R-2 + 4 Bottles)	Unit 3 Run 3 (Unit 3 R-3 + 4 Bottles)
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	0.03	0.044	0.068	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	760	800	765	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	<0.3	<0.3	<0.3	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	161	145	192	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.01	<0.01	<0.02	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	1000	1000	500	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.08	<0.08	<0.04	
Mercury	As Tested	µg/L	0.12	0.10	0.06	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	0.037	0.033	0.02	

Approved by:

Randy Neumann, BSc
Division Director

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

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E: info.vancouver@element.com
W: www.element.com

Methodology and Notes

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1554687**
Control Number:
Date Received: Feb 22, 2022
Date Reported: Mar 16, 2022
Report Number: 2722282

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 9, 2022	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Mar 14, 2022	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 23, 2022	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Feb 23, 2022	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

element
www.Element.com

Project Information

Project ID:	Metro Vancouver WTE
Project Name:	Metals and Hg Samples
Project Location:	
Legal Location:	
PO/AFE#:	
Proj. Acct. Code:	
Quote #:	

Invoice To

Company:	A. Lanfranco & Associates Inc.
Address:	101-9488 189 Street
	Surrey BC, V4N 4W7
Attention:	
Phone:	604-881-2582
Cell:	
Fax:	
E-mail:	mark.lanfranco@alanfranco.com
Agreement ID:	
Copy of Report:	YES / NO

Report To

Company:	
Address:	
Attention:	
Phone:	
Cell:	
Fax:	
E-mail 1:	
E-mail 2:	
Copy of Invoice:	YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:

Sample Custody

Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

- ☐ Same Day (200%)
- ☐ Next Day/Two Day (100%)
- ☐ Three or Four Days (50%)
- ☑ 5 to 7 Days (Regular TAT)

Date Required

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☑ Email ☐ QA/QC
- ☐ Online ☑ PDF
- ☐ Fax ☐ Excel

Requirements

- ☐ HCDWORG ☐ SPIGEC
- ☐ AB Tier 1 ☐ BCCSR

Other (list below)

Special Instructions/Comments (please include contact information including phone number if different from above).

*Front and Back ICAP as per EPA Method 29. *Hg analysis as per EPA Method 29. *Please report µg/sample.

	Site I.D.	Sample Description	Depth start	Depth end	Date/Time sampled	Matrix	Sampling method	Number of Containers	Front ICAP	Back ICAP	Front Hg	Back Hg	5A Hg	5B Hg
			in cm	m				↓	Enter tests above (✓ relevant samples below)					
1		Unit 1 Run 1 (Unit 1 R-1 + 4 Bottles)			14-Feb-22			5	✓	✓	✓	✓	✓	✓
2		Unit 1 Run 2 (MV Unit 1 R-2 + 4 Bottles)			15-Feb-22			5	✓	✓	✓	✓	✓	✓
3		Unit 1 Run 3 (MV Unit 1 R-3 + 4 Bottles)			15-Feb-22			5	✓	✓	✓	✓	✓	✓
4														
5		Unit 2 Run 1 (MV unit 2 Run- 1 + 4 Bottles)			15-Feb-22			5	✓	✓	✓	✓	✓	✓
6		Unit 2 Run 2 (unit 1 Run-2 + 4 Bottles)			16-Feb-22			5	✓	✓	✓	✓	✓	✓
7		Unit 2 Run 3 (MV unit 2 Run-3 + 4 Bottles)			16-Feb-22			5	✓	✓	✓	✓	✓	✓
8														
9		Unit 3 R - 1 (MV Unit 3 R-1 + 4 Bottles)			16-Feb-22			5	✓	✓	✓	✓	✓	✓
10		Unit 3 Run 2 (MV Unit 3 R-2 + 4 Bottles)			17-Feb-22			5	✓	✓	✓	✓	✓	✓
11		Unit 3 Run 3 (Unit 3 - R-3 + 4 Bottles)			17-Feb-22			5	✓	✓	✓	✓	✓	✓
12														
13														
14														
15														

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (https://www.element.com/terms/terms-and-conditions)

Lot: 1554687 COC

Temp. received: 7.4 °C

Date/Time stamp: FEB 22 14:43

Delivery Method:

Waybill:

Received by:

Page _____ of _____

Control #

ED 120-005

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22A3408**	Page	: 1 of 3
Client	: **A. Lanfranco & Associates Inc.**	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 18-Feb-2022 13:30
PO	: HF	Date Analysis Commenced	: 02-Mar-2022
C-O-C number	: ----	Issue Date	: 03-Mar-2022 10:33
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
µg/sample	micrograms per sample
mL	millilitre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	*Description*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*

Analytical Results

Sub-Matrix: **Impinger** (Matrix: **Air**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Unit 1 HF Run 1	Unit 1 HF Run 2	Unit 1 HF Run 3	Unit 2 HF Run 1	Unit 2 HF Run 2
					Client sampling date / time	15-Feb-2022	15-Feb-2022	15-Feb-2022	16-Feb-2022	16-Feb-2022
						VA22A3408-001	VA22A3408-002	VA22A3408-003	VA22A3408-004	VA22A3408-005
						Result	Result	Result	Result	Result
Field Tests										
volume, impinger	----	EP248	0.1	mL		290	340	340	295	365
Anions and Nutrients										
fluoride	16984-48-8	E248.F	5.0	µg/sample		<5.0	<34.0 DLDS	<17.0 DLDS	<14.8 DLDS	<18.2 DLDS

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: **Impinger** (Matrix: **Air**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	Unit 2 HF Run 3	Unit 3 HF Run 1	Unit 3 HF Run 2	Unit 3 HF Run 3	----
					Client sampling date / time	16-Feb-2022	17-Feb-2022	17-Feb-2022	17-Feb-2022	----
						VA22A3408-006	VA22A3408-007	VA22A3408-008	VA22A3408-009	--------
						Result	Result	Result	Result	----
Field Tests										
volume, impinger	----	EP248	0.1	mL		340	350	335	355	----
Anions and Nutrients										
fluoride	16984-48-8	E248.F	5.0	µg/sample		<17.0 DLDS	<17.5 DLDS	<16.8 DLDS	<17.8 DLDS	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22A3408**	Page	: 1 of 6
Client	: **A. Lanfranco & Associates Inc.**	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 18-Feb-2022 13:30
PO	: HF	Issue Date	: 03-Mar-2022 10:33
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Air**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 3 HF Run 1	E248.F	17-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	13 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 3 HF Run 2	E248.F	17-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	13 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 3 HF Run 3	E248.F	17-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	13 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 2 HF Run 1	E248.F	16-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	14 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 2 HF Run 2	E248.F	16-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	14 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 2 HF Run 3	E248.F	16-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	14 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 1 HF Run 1	E248.F	15-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	15 days	✓

Matrix: **Air**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 1 HF Run 2	E248.F	15-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	15 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 1 HF Run 3	E248.F	15-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	15 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Air**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓
Method Blanks (MB)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Fluoride by IC (Impinger, mg/sample)	E248.F Vancouver - Environmental	Air	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. Reported sample volumes are for the bottle/sub-sample submitted for the listed analyses.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of Anions for IC (Impinger)	EP248 Vancouver - Environmental	Air	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. Reported sample volumes are for the bottle/sub-sample submitted for the listed analyses.

QUALITY CONTROL REPORT

Work Order	: **VA22A3408**	Page	: 1 of 3
Client	: A. Lanfranco & Associates Inc.	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 18-Feb-2022 13:30
PO	: HF	Date Analysis Commenced	: 02-Mar-2022
C-O-C number	: ----	Issue Date	: 03-Mar-2022 10:33
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 9		
No. of samples analysed	: 9		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: **Air**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 421546)											
VA22A3407-001	Anonymous	fluoride	16984-48-8	E248.F	5.0	mg/sample	<5.0	<0.0050	0	Diff <2x LOR	----
		volume, impinger	----	EP248	0.1	mL	µg/sample 235	235		Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 421546)						
fluoride	16984-48-8	E248.F	0.005	mg/sample	<0.0050	----
volume, impinger	----	EP248	0.1	mL	500	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 421546)									
fluoride	16984-48-8	E248.F	0.005	mg/sample	0.5 mg/sample	101	90.0	110	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Air**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 421546)										
VA22A3407-002	Anonymous	fluoride	16984-48-8	E248.F	0.298 mg/sample	0.245 mg/sample	122	75.0	125	----

- **No Matrix Spike (MS) Results are required to be reported.**

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

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COC # _____

Page 1 of 1

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	A. Lanfranco and Associates			☑ Standard	☐ Other			◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Mark Lanfranco			☑ PDF	☐ Excel	☐ Digital	☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	Unit 101 9488 189 St			Email 1:	mark.lanfranco@alanfranco.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Surrey BC V4N 4W7			Email 2:				○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-881-2582	Fax:	604-881-2581	Email 3:				
Invoice To	Same as Report ?	☑ Yes	☐ No	Client / Project Information				
Hardcopy of Invoice with Report?		☑ Yes	☐ No	Job #:	Metro Vancouver WTE			
Company:				PO / AFE:	HF			
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				ALS Contact:	Brent Mack	Sampler:	A. Lanfranco and	

Analysis Request

Please indicate below Filtered, Preserved or both (F, P, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type		Number of Containers
	Unit 1 HF Run 1	15-Feb-22		Water	X	1
	Unit 1 HF Run 2			Water	X	1
	Unit 1 HF Run 3			Water	X	1
	Unit 2 HF Run 1	16-Feb-22		Water	X	1
	Unit 2 HF Run 2			Water	X	1
	Unit 2 HF Run 3			Water	X	1
	Unit 3 HF Run 1	17-Feb-22		Water	X	1
	Unit 3 HF Run 2			Water	X	1
	Unit 3 HF Run 3			Water	X	1

Environmental Division
Vancouver
Work Order Reference
VA22A3408

Telephone : +1 604 253 4188

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Please report ug/sample

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			HA	2/18	1.30p	19 °C				

GENF 20.00 Front

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22A3407**	Page	: 1 of 2
Client	: **A. Lanfranco & Associates Inc.**	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 18-Feb-2022 13:30
PO	: HF	Date Analysis Commenced	: 02-Mar-2022
C-O-C number	: ----	Issue Date	: 03-Mar-2022 10:32
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	*Description*
µg/sample	micrograms per sample
mL	millilitre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: **Impinger** (Matrix: **Air**)				*Client sample ID*	**Unit 1 HF Blank**	**Unit 2 HF Blank**	**Unit 3 HF Blank**	**----**	**----**
				Client sampling date / time	15-Feb-2022	16-Feb-2022	17-Feb-2022	----	----
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	**VA22A3407-001**	**VA22A3407-002**	**VA22A3407-003**	**--------**	**--------**
					Result	Result	Result	----	----
Field Tests									
volume, impinger	----	EP248	0.1	mL	235	245	240	----	----
Anions and Nutrients									
fluoride	16984-48-8	E248.F	5.0	µg/sample	<5.0	<5.0	<5.0	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA22A3407**	Page	: 1 of 5
Client	: **A. Lanfranco & Associates Inc.**	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 18-Feb-2022 13:30
PO	: HF	Issue Date	: 03-Mar-2022 10:33
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Air**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 3 HF Blank	E248.F	17-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	13 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 2 HF Blank	E248.F	16-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	14 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE										
Unit 1 HF Blank	E248.F	15-Feb-2022	02-Mar-2022	----	----		02-Mar-2022	28 days	15 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Air**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓
Method Blanks (MB)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Fluoride by IC (Impinger, mg/sample)	E248.F	421546	1	12	8.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Fluoride by IC (Impinger, mg/sample)	E248.F Vancouver - Environmental	Air	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. Reported sample volumes are for the bottle/sub-sample submitted for the listed analyses.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of Anions for IC (Impinger)	EP248 Vancouver - Environmental	Air	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. Reported sample volumes are for the bottle/sub-sample submitted for the listed analyses.

QUALITY CONTROL REPORT

Work Order	: **VA22A3407**	Page	: 1 of 3
Client	: A. Lanfranco & Associates Inc.	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 18-Feb-2022 13:30
PO	: HF	Date Analysis Commenced	: 02-Mar-2022
C-O-C number	: ----	Issue Date	: 03-Mar-2022 10:32
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 3		
No. of samples analysed	: 3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percentage Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: **Air**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 421546)											
VA22A3407-001	Unit 1 HF Blank	fluoride	16984-48-8	E248.F	5.0	mg/sample	<5.0	<0.0050	0	Diff <2x LOR	----
		volume, impinger	----	EP248	0.1	mL	235 µg/sample	235		Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 421546)						
fluoride	16984-48-8	E248.F	0.005	mg/sample	<0.0050	----
volume, impinger	----	EP248	0.1	mL	500	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 421546)									
fluoride	16984-48-8	E248.F	0.005	mg/sample	0.5 mg/sample	101	90.0	110	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Air**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 421546)										
VA22A3407-002	Unit 2 HF Blank	fluoride	16984-48-8	E248.F	0.298 mg/sample	0.245 mg/sample	122	75.0	125	----

- **No Matrix Spike (MS) Results are required to be reported.**

ALS Environmental

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COC # _____

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	A. Lanfranco and Associates	☑ Standard ☐ Other	◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Mark Lanfranco	☑ PDF ☐ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	Unit 101 9488 189 St	Email 1: mark.lanfranco@alanfranco.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Surrey BC V4N 4W7	Email 2:	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-881-2582 Fax: 604-881-2581	Email 3:	
Invoice To	Same as Report ? ☑ Yes ☐ No	**Client / Project Information**	
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #: Metro Vancouver WTE	
Company:		PO / AFE: HF	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		**ALS Contact:** Brent Mack	**Sampler:** A. Lanfranco and

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	F	Number of Containers
	Unit 1 HF Blank	15-Feb-22		Water	X	1
	Unit 2 HF Blank	16-Feb-22		Water	X	1
	Unit 3 HF Blank	17-Feb-22		Water	X	1

Environmental Division
Vancouver
Work Order Reference
VA22A3407

Telephone : +1 604 253 4188

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Please report ug/sample

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by: HA	Date: 2/18	Time: 1:30P	Temperature: 19 °C	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

GENF 20.00 Front

APPENDIX - C

COMPUTER GENERATED RESULTS

Client:	Metro Vancouver	**Date:**	14-Feb-22
Jobsite:	WTE (Burnaby, BC)	**Run:**	1 - Particulate / Metals
Source:	Unit 1	**Run Time:**	12:01 - 14:04

Concentrations:

Particulate	2.33	mg/dscm	0.00102	gr/dscf
	1.25	mg/Acm	0.00055	gr/Acf
	1.95	mg/dscm (@ 11% O2)	0.00085	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.159	Kg/hr	0.350	lb/hr

Flue Gas Characteristics:

Flow	1135	dscm/min	40079	dscf/min
	18.92	dscm/sec	668	dscf/sec
	2111	Acm/min	74548	Acf/min
Velocity	13.813	m/sec	45.32	f/sec
Temperature	156.2	oC	313.2	oF
Moisture	17.4	%		
Gas Analysis	9.1	% O2		
	10.4	% CO2		
	30.030	Mol. Wt (g/gmole) Dry		
	27.935	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.7048	dscm	95.520	dscf
Sample Time	120.0	minutes		
Isokineticity	105.2	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	14-Feb-22
Jobsite:	WTE (Burnaby, BC)	**Run:**	1 - Particulate / Metals
Source:	Unit 1	**Run Time:**	11:10 - 13:15

Control Unit (Y)	0.9864
Nozzle Diameter (in.)	0.3080
Pitot Factor	0.8525
Baro. Press. (in. Hg)	29.85
Static Press. (in. H20)	-18.00
Stack Height (ft)	30
Stack Diameter (in.)	70.90
Stack Area (sq.ft.)	27.417
Minutes Per Reading	5.0
Minutes Per Point	5.0

Collection:	
Filter (grams)	0.00320
Washings (grams)	0.00310
Total (grams)	**0.00630**

Gas Analysis (Vol. %):		
	CO2	O2
Traverse 1	10.50	9.03
Traverse 2	10.33	9.13
	10.42	**9.08**

Condensate Collection:	
Impinger 1	238.0
Impinger 2	130.0
Impinger 3	32.0
Impinger 4	8.0
Impinger 5	4.0
Impinger 6	2.0
Gel	13.9
Gain (grams)	**427.9**

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	307.768								
1	5.0	311.600	0.37	1.98	63	63	6	310	1.5	104.8
2	10.0	315.640	0.41	2.19	65	65	6	313	4.7	104.8
3	15.0	319.560	0.38	2.04	69	69	7	316	8.4	105.0
4	20.0	322.760	0.25	1.34	73	73	7	316	12.5	104.7
5	25.0	325.850	0.23	1.25	75	75	8	315	17.7	104.9
6	30.0	329.500	0.32	1.74	76	76	8	314	25.2	104.9
7	35.0	333.900	0.46	2.52	79	79	8	314	45.6	105.1
8	40.0	338.580	0.52	2.85	79	79	8	314	53.2	105.2
9	45.0	342.890	0.44	2.41	80	80	8	314	58.3	105.1
10	50.0	347.400	0.48	2.64	80	80	8	312	62.5	105.2
11	55.0	351.620	0.42	2.32	81	81	8	312	66.1	104.9
12	60.0	355.750	0.40	2.21	80	80	8	308	69.4	105.1
Traverse 2	0.0	355.750								
1	5.0	359.650	0.36	1.98	79	79	9	312	1.5	105.0
2	10.0	363.330	0.32	1.76	80	80	9	312	4.7	104.9
3	15.0	367.560	0.42	2.32	81	81	9	311	8.4	105.1
4	20.0	372.080	0.48	2.64	81	81	9	313	12.5	105.3
5	25.0	376.650	0.49	2.70	82	82	9	313	17.7	105.2
6	30.0	380.940	0.43	2.38	83	83	9	312	25.2	105.1
7	35.0	385.180	0.42	2.32	83	83	9	313	45.6	105.1
8	40.0	389.520	0.44	2.43	83	83	9	314	53.2	105.2
9	45.0	393.900	0.45	2.48	83	83	8	314	58.3	105.0
10	50.0	398.180	0.43	2.37	83	83	8	314	62.5	104.9
11	55.0	402.250	0.39	2.15	82	82	8	315	66.1	105.0
12	60.0	406.220	0.34	2.04	83	83	6	315	69.4	109.5
Average:			0.402	2.211	78.5	78.5	8.0	313.2		105.2

Client:	Metro Vancouver	**Date:**	15-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 1	**Run Time:**	09:01 - 11:23

Concentrations:

Particulate	1.89	mg/dscm	0.00083	gr/dscf
	1.04	mg/Acm	0.00045	gr/Acf
	1.55	mg/dscm (@ 11% O2)	0.00068	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.132	Kg/hr	0.290	lb/hr

Flue Gas Characteristics:

Flow	1163	dscm/min	41059	dscf/min
	19.38	dscm/sec	684	dscf/sec
	2110	Acm/min	74500	Acf/min
Velocity	13.804	m/sec	45.29	f/sec
Temperature	153.7	oC	308.6	oF
Moisture	16.7	%		
Gas Analysis	8.9	% O2		
	10.5	% CO2		
	30.040	Mol. Wt (g/gmole) Dry		
	28.035	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.7012	dscm	95.392	dscf
Sample Time	120.0	minutes		
Isokineticity	102.6	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	15-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 1	**Run Time:**	09:01 - 11:23

Control Unit (Y)	0.9864	**Collection:**			**Gas Analysis (Vol. %):**		**Condensate Collection:**	
Nozzle Diameter (in.)	0.3080	Filter (grams)	0.00410		CO2	O2	Impinger 1	206.0
Pitot Factor	0.8525	Washings (grams)	0.00100	Traverse 1	10.33	8.80	Impinger 2	134.0
Baro. Press. (in. Hg)	30.13			Traverse 2	10.75	8.90	Impinger 3	40.0
Static Press. (in. H20)	-18.00	**Total (grams)**	**0.00510**				Impinger 4	6.0
Stack Height (ft)	30						Impinger 5	3.0
Stack Diameter (in.)	70.90						Impinger 6	2.0
Stack Area (sq.ft.)	27.417						Gel	14.1
Minutes Per Reading	5.0				**10.54**	**8.85**	**Gain (grams)**	**405.1**
Minutes Per Point	5.0							

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	406.733								
1	5.0	410.250	0.33	1.70	56	56	6	305	1.5	102.2
2	10.0	413.990	0.37	1.91	58	58	6	305	4.7	102.6
3	15.0	417.790	0.38	1.97	60	60	5.5	305	8.4	102.5
4	20.0	421.360	0.33	1.73	64	64	5.5	303	12.5	102.3
5	25.0	425.510	0.44	2.32	66	66	5	302	17.7	102.7
6	30.0	429.190	0.34	1.81	71	71	5	303	25.2	102.6
7	35.0	433.130	0.39	2.07	72	72	5.5	304	45.6	102.5
8	40.0	436.930	0.36	1.92	74	74	5.5	304	53.2	102.5
9	45.0	440.900	0.39	2.09	76	76	5.5	304	58.3	102.5
10	50.0	444.820	0.38	2.03	77	77	5.5	306	62.5	102.5
11	55.0	448.640	0.36	1.93	78	78	5.5	307	66.1	102.4
12	60.0	452.350	0.34	1.82	78	78	5.5	308	69.4	102.4
Traverse 2	0.0	452.350								
1	5.0	455.900	0.33	1.71	63	63	6	310	1.5	102.4
2	10.0	459.400	0.32	1.66	63	63	6	310	4.7	102.5
3	15.0	463.320	0.40	2.08	64	64	6.5	310	8.4	102.6
4	20.0	467.470	0.44	2.31	69	69	6.5	310	12.5	102.7
5	25.0	470.960	0.31	1.63	70	70	7	311	17.7	102.6
6	30.0	474.510	0.32	1.68	72	72	7	312	25.2	102.4
7	35.0	479.420	0.61	3.21	72	72	7	312	45.6	102.9
8	40.0	484.170	0.57	3.00	74	74	7	315	53.2	102.8
9	45.0	489.050	0.60	3.16	75	75	7	315	58.3	102.8
10	50.0	493.750	0.55	2.90	75	75	7	315	62.5	103.3
11	55.0	498.230	0.51	2.69	75	75	6.5	315	66.1	102.2
12	60.0	502.602	0.48	2.53	75	75	6.5	315	69.4	102.8
Average:			0.411	2.161	69.9	69.9	6.1	308.6		102.6

Client:	Metro Vancouver	**Date:**	15-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 1	**Run Time:**	11:38 - 13:39

Concentrations:

Particulate	2.8	mg/dscm	0.0012	gr/dscf
	1.5	mg/Acm	0.0007	gr/Acf
	2.3	mg/dscm (@ 11% O2)	0.0010	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.195	Kg/hr	0.431	lb/hr

Flue Gas Characteristics:

Flow	1171	dscm/min	41363	dscf/min
	19.52	dscm/sec	689	dscf/sec
	2154	Acm/min	76062	Acf/min
Velocity	14.093	m/sec	46.24	f/sec
Temperature	157.1	oC	314.8	oF
Moisture	17.1	%		
Gas Analysis	9.0	% O2		
	10.4	% CO2		
	30.028	Mol. Wt (g/gmole) Dry		
	27.971	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.7338	dscm	96.545	dscf
Sample Time	120.0	minutes		
Isokineticity	103.1	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	15-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 1	**Run Time:**	11:38 - 13:39

Control Unit (Y)	0.9864	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.3080	Filter (grams)	0.00550		CO2	O2		Impinger 1	285.0
Pitot Factor	0.8525	Washings (grams)	0.00210	Traverse 1	10.33	9.17		Impinger 2	102.0
Baro. Press. (in. Hg)	30.13			Traverse 2	10.50	8.90		Impinger 3	14.0
Static Press. (in. H20)	-18.00	**Total (grams)**	**0.00760**					Impinger 4	4.0
Stack Height (ft)	30							Impinger 5	2.0
Stack Diameter (in.)	70.90							Impinger 6	1.0
Stack Area (sq.ft.)	27.417							Gel	15.3
Minutes Per Reading	5.0				**10.42**	**9.04**		**Gain (grams)**	**423.3**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	503.660								
1	5.0	507.210	0.33	1.71	63	63	6	309	1.5	102.8
2	10.0	510.820	0.34	1.77	65	65	6	312	4.7	102.8
3	15.0	514.690	0.39	2.02	65	65	7	314	8.4	103.1
4	20.0	518.850	0.45	2.34	66	66	7	314	12.5	103.1
5	25.0	522.430	0.33	1.72	69	69	7	316	17.7	103.0
6	30.0	526.080	0.34	1.78	72	72	7	316	25.2	102.8
7	35.0	530.710	0.55	2.87	71	71	6	317	45.6	103.1
8	40.0	535.470	0.58	3.03	71	71	6	317	53.2	103.3
9	45.0	540.210	0.57	2.99	73	73	6	317	58.3	103.3
10	50.0	544.780	0.53	2.78	73	73	6	317	62.5	103.3
11	55.0	549.220	0.50	2.62	73	73	6	316	66.1	103.2
12	60.0	553.580	0.48	2.52	74	74	6	316	69.4	103.2
Traverse 2	0.0	553.580								
1	5.0	557.600	0.41	2.15	72	72	6	314	1.5	103.1
2	10.0	561.360	0.36	1.89	72	72	6	314	4.7	102.9
3	15.0	565.420	0.42	2.20	71	71	6	314	8.4	103.1
4	20.0	569.280	0.38	1.99	71	71	6	315	12.5	103.1
5	25.0	573.430	0.44	2.30	71	71	6	315	17.7	103.1
6	30.0	577.670	0.46	2.41	71	71	6	315	25.2	103.0
7	35.0	581.820	0.44	2.31	71	71	9	314	45.6	103.0
8	40.0	585.680	0.38	1.99	72	72	9	315	53.2	102.9
9	45.0	589.590	0.39	2.04	71	71	9	314	58.3	103.0
10	50.0	593.400	0.37	1.94	71	71	9	314	62.5	103.0
11	55.0	597.050	0.34	1.78	71	71	9	314	66.1	102.9
12	60.0	600.753	0.35	1.83	65	71	9	315	69.4	103.6
Average:			0.422	2.208	70.2	70.4	6.9	314.8		103.1

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 1

Sample Type: HF

Parameter		Test 1	Test 2	Test 3
Test Date		15-Feb-22	15-Feb-22	15-Feb-22
Test Time		09:49 - 10:49	10:55 - 11:55	12:02 - 13:02
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	30.16	30.16	30.16
DGM Factor	(Y)	0.9886	0.9886	0.9886
Initial Reading	(m^3)	500.413	501.029	501.648
Final Reading	(m^3)	501.023	501.645	502.252
Temp. Outlet	(Avg. oF)	50.7	42.0	42.3
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.63	0.65	0.63
HF	(mg)	0.003	0.018	0.009
Oxygen	(Vol. %)	8.9	8.9	9.0
HF	**(mg/Sm^3)**	**0.004**	**0.028**	**0.014**
HF	**(mg/Sm^3 @ 11% O2)**	**0.003**	**0.023**	**0.012**
Moisture	**(Vol. %)**	16.7	16.7	17.1

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client:	Metro Vancouver	**Date:**	15-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 2	**Run Time:**	12:08 - 14:10

Concentrations:

Particulate	0.0	mg/dscm	0.0000	gr/dscf
	0.0	mg/Acm	0.0000	gr/Acf
	0.0	mg/dscm (@ 11% O2)	0.0000	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.003	Kg/hr	0.006	lb/hr

Flue Gas Characteristics:

Flow	1329	dscm/min	46945	dscf/min
	22.16	dscm/sec	782	dscf/sec
	2347	Acm/min	82902	Acf/min
Velocity	15.361	m/sec	50.40	f/sec
Temperature	151.0	oC	303.8	oF
Moisture	14.8	%		
Gas Analysis	9.9	% O2		
	9.9	% CO2		
	29.984	Mol. Wt (g/gmole) Dry		
	28.210	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	3.1589	dscm	111.557	dscf
Sample Time	120.0	minutes		
Isokineticity	104.9	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	15-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 2	**Run Time:**	12:08 - 14:10

Control Unit (Y)	0.9854	**Collection:**			**Gas Analysis (Vol. %):**		**Condensate Collection:**	
Nozzle Diameter (in.)	0.3080	Filter (grams)	0.00005		CO2	O2	Impinger 1	264.0
Pitot Factor	0.8525	Washings (grams)	0.00005	Traverse 1	10.00	9.83	Impinger 2	104.0
Baro. Press. (in. Hg)	30.13			Traverse 2	9.83	10.03	Impinger 3	20.0
Static Press. (in. H20)	-18.50	**Total (grams)**	**0.00010**				Impinger 4	5.0
Stack Height (ft)	30						Impinger 5	2.0
Stack Diameter (in.)	70.90						Impinger 6	2.0
Stack Area (sq.ft.)	27.417						Gel	14.7
Minutes Per Reading	5.0				**9.92**	**9.93**	**Gain (grams)**	**411.7**
Minutes Per Point	5.0							

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	443.103								
1	5.0	447.280	0.45	2.33	56	56	8	299	1.5	102.0
2	10.0	451.620	0.49	2.52	57	57	8	307	4.7	102.0
3	15.0	455.920	0.48	2.96	57	57	8	308	8.4	102.3
4	20.0	460.180	0.47	2.41	57	57	8	307	12.5	102.2
5	25.0	463.950	0.37	1.90	57	57	9	308	17.7	101.8
6	30.0	467.560	0.34	1.74	57	57	9	309	25.2	101.8
7	35.0	471.740	0.45	2.32	59	59	9	307	45.6	102.0
8	40.0	476.490	0.58	3.00	60	60	9	305	53.2	102.0
9	45.0	481.130	0.55	2.86	61	61	10	304	58.3	102.0
10	50.0	485.900	0.58	3.02	61	61	10	303	62.5	102.1
11	55.0	490.520	0.54	2.82	62	62	10	301	66.1	102.1
12	60.0	494.920	0.49	2.57	62	62	10	299	69.4	101.9
Traverse 2	0.0	494.920								
1	5.0	499.780	0.60	3.12	64	64	12	308	1.5	102.0
2	10.0	504.630	0.60	3.11	64	64	12	309	4.7	101.9
3	15.0	509.240	0.54	2.81	64	64	12	308	8.4	101.9
4	20.0	513.360	0.42	2.18	64	64	12	308	12.5	103.1
5	25.0	517.380	0.41	2.14	64	64	10	305	17.7	101.7
6	30.0	521.740	0.48	2.51	65	65	10	305	25.2	101.8
7	35.0	529.180	0.49	2.58	65	65	10	299	45.6	171.3
8	40.0	534.280	0.65	3.43	66	66	10	300	53.2	102.0
9	45.0	539.380	0.65	3.42	66	66	10	302	58.3	102.1
10	50.0	544.260	0.59	3.12	67	67	10	299	62.5	102.1
11	55.0	548.980	0.55	2.91	67	67	9	298	66.1	102.2
12	60.0	553.530	0.51	2.72	67	67	9	292	69.4	101.8
Average:			0.512	2.688	62.0	62.0	9.8	303.8		104.9

Client:	Metro Vancouver	**Date:**	16-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 2	**Run Time:**	08:53 - 10:55

Concentrations:

Particulate	0.45	mg/dscm	0.00020	gr/dscf
	0.27	mg/Acm	0.00012	gr/Acf
	0.41	mg/dscm (@ 11% O2)	0.00018	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.035	Kg/hr	0.076	lb/hr

Flue Gas Characteristics:

Flow	1270	dscm/min	44858	dscf/min
	21.17	dscm/sec	748	dscf/sec
	2170	Acm/min	76645	Acf/min
Velocity	14.201	m/sec	46.59	f/sec
Temperature	143.1	oC	289.6	oF
Moisture	13.8	%		
Gas Analysis	9.9	% O2		
	10.0	% CO2		
	29.988	Mol. Wt (g/gmole) Dry		
	28.329	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.7570	dscm	97.363	dscf
Sample Time	120.0	minutes		
Isokineticity	100.4	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	16-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 2	**Run Time:**	08:53 - 10:55

Control Unit (Y)	0.9854	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.3073	Filter (grams)	0.00005		CO2	O2		Impinger 1	174.0
Pitot Factor	0.8328	Washings (grams)	0.00120	Traverse 1	9.90	9.90		Impinger 2	110.0
Baro. Press. (in. Hg)	30.33			Traverse 2	10.00	9.90		Impinger 3	16.0
Static Press. (in. H20)	-20.00	**Total (grams)**	**0.00125**					Impinger 4	10.0
Stack Height (ft)	29.98							Impinger 5	4.0
Stack Diameter (in.)	70.90							Impinger 6	2.0
Stack Area (sq.ft.)	27.417							Gel	16.4
Minutes Per Reading	5.0				**9.95**	**9.90**		**Gain (grams)**	**332.4**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	553.958								
1	5.0	557.580	0.35	1.72	53	53	4	285	1.5	102.2
2	10.0	561.400	0.39	1.91	53	53	4	288	4.7	102.4
3	15.0	565.490	0.47	2.29	53	53	4	291	8.4	100.2
4	20.0	569.480	0.44	2.14	53	53	4	292	12.5	101.0
5	25.0	573.530	0.45	2.19	54	54	4	294	17.7	101.3
6	30.0	577.430	0.43	2.10	55	55	4	291	25.2	99.4
7	35.0	581.650	0.48	2.34	56	56	4	284	45.6	101.2
8	40.0	585.990	0.52	2.54	57	57	4	294	53.2	100.5
9	45.0	590.600	0.58	2.88	58	58	4	285	58.3	100.4
10	50.0	594.960	0.51	2.52	59	59	4	291	62.5	101.4
11	55.0	599.550	0.57	2.82	60	60	4	290	66.1	100.8
12	60.0	603.610	0.44	2.18	61	61	4	290	69.4	101.1
Traverse 2	0.0	603.610								
1	5.0	607.710	0.48	2.39	61	61	4	288	1.5	97.7
2	10.0	612.030	0.52	2.56	62	62	4	298	4.7	99.4
3	15.0	616.010	0.44	2.16	62	62	4	298	8.4	99.4
4	20.0	619.990	0.42	2.07	63	63	4	298	12.5	101.5
5	25.0	624.090	0.45	2.22	63	63	4	298	17.7	101.1
6	30.0	627.950	0.42	2.07	64	64	4	298	25.2	98.3
7	35.0	632.210	0.49	2.42	64	64	4	297	45.6	100.5
8	40.0	636.680	0.53	2.72	65	65	4	270	53.2	99.4
9	45.0	641.310	0.55	2.84	66	66	6	268	58.3	100.8
10	50.0	645.650	0.50	2.54	66	66	6	279	62.5	99.8
11	55.0	649.700	0.44	2.19	66	66	6	293	66.1	100.1
12	60.0	653.520	0.39	1.96	67	67	6	290	69.4	99.8
Average:			0.469	2.324	60.0	60.0	4.3	289.6		100.4

Client:	Metro Vancouver	**Date:**	16-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 2	**Run Time:**	11:10 - 13:12

Concentrations:

Particulate	0.8	mg/dscm	0.0004	gr/dscf
	0.5	mg/Acm	0.0002	gr/Acf
	0.8	mg/dscm (@ 11% O2)	0.0003	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.06	Kg/hr	0.136	lb/hr

Flue Gas Characteristics:

Flow	1222	dscm/min	43169	dscf/min
	20.37	dscm/sec	719	dscf/sec
	2134	Acm/min	75364	Acf/min
Velocity	13.964	m/sec	45.81	f/sec
Temperature	146.8	oC	296.3	oF
Moisture	14.8	%		
Gas Analysis	9.9	% O2		
	9.9	% CO2		
	29.984	Mol. Wt (g/gmole) Dry		
	28.206	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.8035	dscm	99.005	dscf
Sample Time	120.0	minutes		
Isokineticity	101.7	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	16-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 2	**Run Time:**	11:10 - 13:12

Control Unit (Y)	0.9958	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.3073	Filter (grams)	0.00005		CO2	O2		Impinger 1	178.0
Pitot Factor	0.8328	Washings (grams)	0.00230	Traverse 1	9.85	9.95		Impinger 2	122.0
Baro. Press. (in. Hg)	30.30			Traverse 2	10.00	9.85		Impinger 3	30.0
Static Press. (in. H20)	-20.00	**Total (grams)**	**0.0023**					Impinger 4	14.0
Stack Height (ft)	30							Impinger 5	4.0
Stack Diameter (in.)	70.90							Impinger 6	2.0
Stack Area (sq.ft.)	27.417							Gel	16.4
Minutes Per Reading	5.0				**9.93**	**9.90**		**Gain (grams)**	**366.4**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	654.975								
1	5.0	659.280	0.49	2.42	66	66	4	300	1.5	103.3
2	10.0	663.650	0.52	2.56	66	66	4	304	4.7	102.1
3	15.0	667.600	0.44	2.16	66	66	4	304	8.4	100.2
4	20.0	671.410	0.39	1.93	67	67	4	301	12.5	102.2
5	25.0	674.960	0.34	1.68	67	67	4	301	17.7	102.0
6	30.0	678.740	0.38	1.89	68	68	4	296	25.2	102.2
7	35.0	682.850	0.47	2.35	68	68	5	295	45.6	100.0
8	40.0	687.250	0.52	2.36	68	68	5	294	53.2	101.7
9	45.0	691.880	0.57	2.87	69	69	5	291	58.3	101.9
10	50.0	696.520	0.58	2.91	69	69	5	293	62.5	101.4
11	55.0	701.030	0.54	2.71	70	70	5	294	66.1	102.0
12	60.0	705.330	0.49	2.47	70	70	5	290	69.4	101.8
Traverse 2	0.0	705.330								
1	5.0	709.410	0.45	2.24	70	70	5	299	1.5	101.3
2	10.0	713.600	0.46	2.30	71	71	5	299	4.7	102.7
3	15.0	717.680	0.44	2.19	71	71	5	302	8.4	102.4
4	20.0	721.600	0.40	2.00	71	71	5	298	12.5	102.9
5	25.0	725.260	0.36	1.80	71	71	5	298	17.7	101.2
6	30.0	728.870	0.35	1.75	71	71	5	298	25.2	101.3
7	35.0	732.610	0.37	1.86	72	72	5	295	45.6	101.7
8	40.0	736.530	0.41	2.06	72	72	5	294	53.2	101.2
9	45.0	740.810	0.48	2.48	72	72	5	293	58.3	102.2
10	50.0	744.970	0.46	2.32	72	72	5	292	62.5	101.3
11	55.0	749.050	0.44	2.23	72	72	5	290	66.1	101.4
12	60.0	752.930	0.40	2.03	73	73	5	290	69.4	100.9
Average:			0.448	2.232	69.7	69.7	3.0	296.3		101.7

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 2

Sample Type: HF

Parameter		**Test 1**	**Test 2**	**Test 3**
Test Date		16-Feb-22	16-Feb-22	16-Feb-22
Test Time		10:09 - 11:09	11:19 - 12:129	12:29 - 13:29
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	30.27	30.27	30.27
DGM Factor	(Y)	0.9886	0.9886	0.9886
Initial Reading	(m^3)	502.258	502.852	503.466
Final Reading	(m^3)	502.848	503.461	504.072
Temp. Outlet	(Avg. oF)	51.0	43.0	46.7
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.61069	0.63954	0.63247
HF	(mg)	0.008	0.010	0.009
Oxygen	(Vol. %)	9.9	9.9	9.9
HF	**(mg/Sm^3)**	**0.013**	**0.015**	**0.014**
HF	**(mg/Sm^3 @ 11% O2)**	**0.011**	**0.013**	**0.013**
Moisture (isokinetic)	**(Vol. %)**	13.8	13.8	14.8

*Wet Basis Calculated on moisture from isokinetic tests

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client:	Metro Vancouver	**Date:**	16-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 3	**Run Time:**	11:58 - 13:59

Concentrations:

Particulate	3.41	mg/dscm	0.00149	gr/dscf
	1.85	mg/Acm	0.00081	gr/Acf
	2.96	mg/dscm (@ 11% O2)	0.00129	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.203	Kg/hr	0.448	lb/hr

Flue Gas Characteristics:

Flow	994	dscm/min	35089	dscf/min
	16.56	dscm/sec	585	dscf/sec
	1829	Acm/min	64579	Acf/min
Velocity	11.966	m/sec	39.26	f/sec
Temperature	154.4	oC	309.9	oF
Moisture	17.9	%		
Gas Analysis	9.5	% O2		
	10.3	% CO2		
	30.019	Mol. Wt (g/gmole) Dry		
	27.873	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.3160	dscm	81.789	dscf
Sample Time	120.0	minutes		
Isokineticity	103.4	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	16-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 3	**Run Time:**	11:58 - 13:59

Control Unit (Y)	1.0037
Nozzle Diameter (in.)	0.3073
Pitot Factor	0.8328
Baro. Press. (in. Hg)	30.26
Static Press. (in. H20)	-19.00
Stack Height (ft)	30
Stack Diameter (in.)	70.90
Stack Area (sq.ft.)	27.417
Minutes Per Reading	5.0
Minutes Per Point	5.0

Collection:	
Filter (grams)	0.00730
Washings (grams)	0.00060
Total (grams)	**0.00790**

Gas Analysis (Vol. %):	CO2	O2
Traverse 1	10.25	9.50
Traverse 2	10.25	9.45
	10.25	**9.48**

Condensate Collection:	
Impinger 1	256.0
Impinger 2	82.0
Impinger 3	14.0
Impinger 4	6.0
Impinger 5	3.0
Impinger 6	2.0
Gel	14.7
Gain (grams)	**377.7**

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	504.402								
1	5.0	508.160	0.41	1.81	58	58	5	300	1.5	103.7
2	10.0	511.960	0.42	1.85	58	58	5	301	4.7	103.6
3	15.0	515.790	0.43	1.87	59	59	5	310	8.4	103.6
4	20.0	519.600	0.44	1.92	59	59	5	310	12.5	101.9
5	25.0	523.250	0.39	1.70	60	60	4	311	17.7	103.5
6	30.0	526.720	0.35	1.53	61	61	4	311	25.2	103.2
7	35.0	529.410	0.21	0.92	61	61	6	310	45.6	103.5
8	40.0	532.290	0.24	1.05	62	62	6	309	53.2	103.5
9	45.0	535.110	0.23	1.01	63	63	8	310	58.3	103.3
10	50.0	538.000	0.24	1.05	64	64	8	311	62.5	103.5
11	55.0	540.950	0.25	1.10	65	65	7	311	66.1	103.4
12	60.0	543.790	0.23	1.02	66	66	7	310	69.4	103.5
Traverse 2	0.0	543.790								
1	5.0	546.640	0.23	1.02	67	67	8	306	1.5	103.4
2	10.0	549.420	0.22	0.97	67	67	8	311	4.7	103.0
3	15.0	552.320	0.24	1.06	67	67	8	311	8.4	103.3
4	20.0	555.290	0.25	1.11	69	69	8	312	12.5	103.4
5	25.0	558.380	0.27	1.19	69	69	6	312	17.7	103.5
6	30.0	561.410	0.26	1.15	69	69	6	313	25.2	103.5
7	35.0	565.030	0.37	1.64	70	70	6	312	45.6	103.5
8	40.0	568.600	0.36	1.60	70	70	6	312	53.2	103.5
9	45.0	572.320	0.39	1.73	70	70	5	311	58.3	103.5
10	50.0	576.230	0.43	1.91	71	71	5	312	62.5	103.6
11	55.0	580.230	0.45	2.00	71	71	4	312	66.1	103.6
12	60.0	584.283	0.46	2.05	71	71	4	310	69.4	103.7
Average:			0.324	1.428	65.3	65.3	6.0	309.9		103.4

Client:	Metro Vancouver	**Date:**	17-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 3	**Run Time:**	08:50 - 10:52

Concentrations:

Particulate	2.54	mg/dscm	0.00111	gr/dscf
	1.40	mg/Acm	0.00061	gr/Acf
	2.16	mg/dscm (@ 11% O2)	0.00094	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.147	Kg/hr	0.324	lb/hr

Flue Gas Characteristics:

Flow	966	dscm/min	34102	dscf/min
	16.09	dscm/sec	568	dscf/sec
	1753	Acm/min	61897	Acf/min
Velocity	11.469	m/sec	37.63	f/sec
Temperature	150.1	oC	302.1	oF
Moisture	17.5	%		
Gas Analysis	9.3	% O2		
	10.2	% CO2		
	30.003	Mol. Wt (g/gmole) Dry		
	27.897	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.2463	dscm	79.327	dscf
Sample Time	120.0	minutes		
Isokineticity	103.2	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	17-Feb-22
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 3	**Run Time:**	08:50 - 10:52

Control Unit (Y)	1.0037	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.3073	Filter (grams)	0.00560		CO2	O2		Impinger 1	232.0
Pitot Factor	0.8328	Washings (grams)	0.00010	Traverse 1	10.25	9.40		Impinger 2	78.0
Baro. Press. (in. Hg)	30.26			Traverse 2	10.15	9.15		Impinger 3	21.0
Static Press. (in. H20)	-19.00	**Total (grams)**	**0.00570**					Impinger 4	5.0
Stack Height (ft)	30							Impinger 5	4.0
Stack Diameter (in.)	70.90							Impinger 6	2.0
Stack Area (sq.ft.)	27.417							Gel	16.7
Minutes Per Reading	5.0				**10.20**	**9.28**		**Gain (grams)**	**358.7**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	584.855								
1	5.0	587.720	0.24	1.05	56	56	5.5	300	1.5	103.2
2	10.0	590.520	0.23	1.01	56	56	5.5	301	4.7	103.0
3	15.0	593.260	0.22	0.96	56	56	5.5	302	8.4	103.2
4	20.0	595.930	0.21	0.92	56	56	5.5	303	12.5	102.9
5	25.0	598.670	0.22	0.96	57	57	5.5	304	17.7	103.1
6	30.0	601.480	0.23	1.01	58	58	5.5	305	25.2	103.3
7	35.0	604.940	0.35	1.53	58	58	5	306	45.6	103.3
8	40.0	608.410	0.35	1.53	59	59	5	306	53.2	103.4
9	45.0	612.600	0.51	2.24	60	60	5.5	306	58.3	103.4
10	50.0	616.420	0.42	1.86	61	61	5.5	301	62.5	103.2
11	55.0	620.280	0.43	1.90	61	61	5.5	303	66.1	103.3
12	60.0	624.010	0.40	1.77	61	61	5.5	303	69.4	103.4
Traverse 2	0.0	624.010								
1	5.0	627.460	0.34	1.50	63	63	6.5	304	1.5	103.4
2	10.0	631.010	0.36	1.60	64	64	6.5	304	4.7	103.2
3	15.0	634.410	0.33	1.46	64	64	7	303	8.4	103.1
4	20.0	637.770	0.32	1.42	65	65	7	302	12.5	103.2
5	25.0	641.240	0.34	1.52	65	65	7.5	301	17.7	103.4
6	30.0	644.560	0.31	1.39	66	66	7.5	300	25.2	103.3
7	35.0	647.290	0.21	0.94	66	66	6.5	300	45.6	103.1
8	40.0	650.150	0.23	1.03	67	67	6.5	300	53.2	103.0
9	45.0	653.080	0.24	1.08	67	67	6.5	299	58.3	103.2
10	50.0	656.070	0.25	1.12	67	67	6.5	299	62.5	103.2
11	55.0	659.060	0.25	1.12	68	68	6	299	66.1	103.0
12	60.0	661.870	0.22	0.99	68	68	6	300	69.4	103.3
Average:			0.300	1.330	62.0	62.0	6.0	302.1		103.2

Client:	Metro Vancouver	**Date:**	17-Feb-22
Jobsite:	WTE(Burnaby,B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 3	**Run Time:**	11:12 - 13:14

Concentrations:

Particulate	2.28	mg/dscm	0.00100	gr/dscf
	1.24	mg/Acm	0.00054	gr/Acf
	2.03	mg/dscm (@ 11% O2)	0.00089	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.135	Kg/hr	0.298	lb/hr

Flue Gas Characteristics:

Flow	989	dscm/min	34939	dscf/min
	16.49	dscm/sec	582	dscf/sec
	1810	Acm/min	63932	Acf/min
Velocity	11.846	m/sec	38.86	f/sec
Temperature	155.3	oC	311.5	oF
Moisture	17.2	%		
Gas Analysis	9.8	% O2		
	10.8	% CO2		
	30.120	Mol. Wt (g/gmole) Dry		
	28.035	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.3708	dscm	83.726	dscf
Sample Time	120.0	minutes		
Isokineticity	103.1	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	17-Feb-22
Jobsite:	WTE(Burnaby,B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 3	**Run Time:**	11:12 - 13:14

Control Unit (Y)	1.0037	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.3120	Filter (grams)	0.00530		CO2	O2		Impinger 1	255.0
Pitot Factor	0.8525	Washings (grams)	0.00010	Traverse 1	10.60	9.60		Impinger 2	76.0
Baro. Press. (in. Hg)	30.26			Traverse 2	11.00	10.00		Impinger 3	14.0
Static Press. (in. H20)	-19.00	**Total (grams)**	**0.00540**					Impinger 4	6.0
Stack Height (ft)	30							Impinger 5	3.0
Stack Diameter (in.)	70.90							Impinger 6	1.0
Stack Area (sq.ft.)	27.417							Gel	14.6
Minutes Per Reading	5.0				**10.80**	**9.80**		**Gain (grams)**	**369.6**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	662.417								
1	5.0	665.920	0.31	1.54	67	67	7	303	1.5	103.1
2	10.0	669.460	0.32	1.57	66	66	7	309	4.7	103.2
3	15.0	673.110	0.34	1.68	67	67	8	308	8.4	103.0
4	20.0	676.700	0.33	1.62	66	66	8	309	12.5	103.1
5	25.0	680.600	0.39	1.91	66	66	8	310	17.7	103.1
6	30.0	684.410	0.37	1.82	67	67	8	310	25.2	103.2
7	35.0	687.480	0.24	1.18	67	67	5	310	45.6	103.1
8	40.0	690.490	0.23	1.13	67	67	5	308	53.2	103.1
9	45.0	693.620	0.25	1.25	68	68	5	312	58.3	102.9
10	50.0	696.870	0.27	1.33	68	68	5	313	62.5	102.9
11	55.0	699.940	0.24	1.18	68	68	5	313	66.1	103.1
12	60.0	702.880	0.22	1.08	68	68	5	313	69.4	103.1
Traverse 2	0.0	702.880								
1	5.0	705.950	0.24	1.18	68	68	5	310	1.5	102.9
2	10.0	709.080	0.25	1.23	68	68	5	314	4.7	103.1
3	15.0	712.090	0.23	1.13	68	68	5	311	8.4	103.1
4	20.0	715.020	0.22	1.08	69	69	5	317	12.5	102.8
5	25.0	718.090	0.24	1.18	69	69	6	315	17.7	103.0
6	30.0	721.290	0.26	1.28	69	69	6	313	25.2	103.1
7	35.0	724.950	0.34	1.68	70	70	9	313	45.6	103.0
8	40.0	728.720	0.36	1.78	70	70	9	312	53.2	103.1
9	45.0	732.440	0.35	1.73	70	70	10	312	58.3	103.1
10	50.0	736.600	0.44	2.16	69	69	10	313	62.5	103.2
11	55.0	740.670	0.42	2.07	69	69	10	311	66.1	103.2
12	60.0	744.613	0.39	1.93	70	70	10	318	69.4	104.0
Average:			0.302	1.488	68.1	68.1	6.9	311.5		103.1

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 3

Sample Type: HF

Parameter		**Test 1**	**Test 2**	**Test 3**
Test Date		17-Feb-22	17-Feb-22	17-Feb-22
Test Time		09:09 - 10:09	10:23 - 11:23	11:32 - 12:32
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	30.26	30.26	30.26
DGM Factor	(Y)	0.9886	0.9886	0.9886
Initial Reading	(m^3)	504.088	504.701	505.309
Final Reading	(m^3)	504.696	505.306	505.909
Temp. Outlet	(Avg. oF)	41.7	40.0	41.0
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.63962	0.63894	0.63239
HF	(mg)	0.009	0.009	0.009
Oxygen	(Vol. %)	9.3	9.3	9.8
HF	**(mg/Sm^3)**	**0.014**	**0.014**	**0.014**
HF	**(mg/Sm^3 @ 11% O2)**	**0.012**	**0.012**	**0.013**
Moisture (isokinetic)	**(Vol. %)**	17.5	17.5	17.2

*Wet Basis Calculated on moisture from isokinetic tests

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)

Parameter: N_2O

Molecular Weight: 44.00 grams/mol
Lab Detection Limit: 0.1 ppm
Reportable Detection Limit: 0.18 mg/Sm^3

Sample ID	Date	Time	N_2O ppm	N_2O mg/Sm^3	N_2O mg/Sm^3 @ 11% O_2
Unit 1 - Run 1	15-Feb-22	09:45 - 10:45	3.0	5.5	6.0
Unit 1 - Run 2	15-Feb-22	10:48 - 11:48	2.0	3.7	4.1
Unit 1 - Run 3	15-Feb-22	11:55 - 12:55	2.0	3.7	4.0
Average					**4.7**
Unit 1 - Run 1	16-Feb-22	09:15 - 10:15	1.0	1.8	1.9
Unit 2 - Run 2	16-Feb-22	10:32 - 11:32	1.0	1.8	1.8
Unit 2 - Run 3	16-Feb-22	11:36 - 12:36	0.0	0.2	0.2
Average					**1.3**
Unit 3 - Run 1	17-Feb-22	09:09 - 10:09	2.0	3.7	3.8
Unit 3 - Run 2	17-Feb-22	10:23 - 11:23	26.0	47.6	50.8
Unit 3 - Run 3	17-Feb-22	11:30 - 12:30	8.0	14.6	14.8
Average					**23.1**

APPENDIX - D

FIELD DATA SHEETS

A. Lanfranco and Associates Inc.

CLIENT	M.V. W.T.E	NOZZLE	G-307 DIAMETER, IN. 0.3080	IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
SOURCE	Unit #1	PROBE	7C Cp 0.8525	Imp. #1	0	238	238
PARAMETER / RUN No	Particulate / metals - Run 1	PORT LENGTH		Imp. #2	100	230	130
DATE	Feb. 14, 2022	STATIC PRESSURE, IN. H2O	- 18.0"	Imp. #3	100	132	32
OPERATOR:	DS	STACK DIAMETER	70.9"	Imp. #4	0	8	8
CONTROL UNIT	CAE A1-1 Y 0.9864	STACK HEIGHT	30.0'	Imp. #5	100	104	4
	ΔH@ 1.866			Imp. #6	100	102	2
BAROMETRIC PRESSURE, IN. Hg	29.85	INITIAL LEAK TEST	0.007 @ 15"	Upstream Diameters	Gel 500 g		
ASSUMED MOISTURE, Bw	15.5%	FINAL LEAK TEST	0.008 @ 15"	Downstream Diameters			

5 Point MIN	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %
	12:01	307.768										
1		311.60	0.37	1.98	63	310	253	251	50	6		
2		315.64	0.41	2.19	65	313					10.0	9.4
3		319.56	0.38	2.04	69	316	256	256	51	7		
4		322.76	0.25	1.35	73	316						
5		325.85	0.23	1.25	75	315	252	251	54	8		
6		329.50	0.32	1.74	76	314						
7		333.90	0.46	2.52	79	314	249	250	55	8	10.5	9.2
8		338.58	0.52	2.85	79	314						
9		342.89	0.44	2.41	80	314	250	248	56	8		
10		347.40	0.48	2.64	80	312						
11		351.62	0.42	2.32	81	312	247	247	52	8	11.0	8.5
12		355.75	0.40	2.21	80	308						
1		359.65	0.36	1.98	79	312	253	255	54	9		
2		363.33	0.32	1.76	80	312					10.5	8.9
3		367.56	0.42	2.32	81	311	254	253	55	9		
4		372.08	0.48	2.64	81	313						
5		376.65	0.49	2.70	82	313	251	251	45	9		
6		380.94	0.43	2.38	83	312						
7		385.18	0.42	2.32	83	313	250	250	46	9	10.5	9.1
8		389.52	0.44	2.43	83	314						
9		393.90	0.45	2.48	83	314	250	250	47	8		
10		398.18	0.43	2.37	83	314						
11		402.25	0.39	2.15	82	315	250	250	48	8	10.0	9.4
12	14:04	406.22	0.37	2.04	83	315						

S.H.

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METRO VANCOUVER WTE - BURNABY B.C.

SOURCE	Unit #1	NOZZLE G-307 DIAMETER, IN.	.3080
PARAMETER / RUN No	PM/Metals 2-2	PROBE 7C Cp	.8525
DATE	Feb 15, 2022	PORT LENGTH	
OPERATOR:	SG	STATIC PRESSURE, IN. H2O	-18.0
CONTROL UNIT	CAL-1 Y 1.9864	STACK DIAMETER	70.9"
	ΔH@ 1.866	STACK HEIGHT	30.0"
BAROMETRIC PRESSURE, IN. Hg	30.13	INITIAL LEAK TEST	.001@15"
ASSUMED MOISTURE, Bw	17 %	FINAL LEAK TEST	1000@15"

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	206	206
Imp. #2	100	139	134
Imp. #3	100	140	40
Imp. #4	0	6	6
Imp. #5	100	103	3
Imp. #6	100	102	2
Imp. #7	GEL		
Imp. #8			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
1	9:01	406.733												
1		~~410.25~~	.33	~~1.70~~	56	305	254	253	49	6.0				
2	10	413.99	.37	1.91	58	305					10.0	8.5		
3		417.79	.38	1.97	60	305	250	251	49	5.5				
4	20	421.36	.33	1.73	64	303								
5		425.51	.44	2.32	66	302	251	251	51	5.0				
6	30	429.19	.34	1.81	71	303					10.5	8.8		
7		433.13	.39	2.07	72	304	250	250	52	5.5				
8	40	436.93	.36	1.92	74	304								
9		440.90	.39	2.09	76	304	257	252	51	5.5				
10	50	444.82	.38	2.03	77	306					10.5	9.1		
11		448.64	.36	1.93	78	307	250	251	51	5.5				
12	60	452.35	.34	1.82	78	306								
1		455.90	.33	1.71	63	310	251	250	47	6.0				
2	10	459.40	.32	1.610	63	310					11.0	8.8		
3		463.32	.40	2.08	64	310	253	252	46	6.5				
4	20	467.47	.44	2.31	69	310								
5		470.96	.31	1.63	71	311	254	253	46	7.0				
6	30	474.51	.32	1.69	72	312					10.5	9.0		
7		478.42	.61	3.21	72	312	255	250	45	7.0				
8	40	482.17	.57	3.00	74	315								
9		485.05	.60	3.16	75	315	252	251	45	7.0				
10	50	493.73	.55	2.90	75	315								
11		498.23	.51	2.69	75	315	257	254	45	6.5				
12		502.602	.48	2.53	75	315								
	11:23	END test												

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S-H

METRO VANCOUVER WTE - BURNABY B.C.

SOURCE	Unit #1	NOZZLE G-307 DIAMETER, IN. .3080	
PARAMETER / RUN No	PAHs/metals 123	PROBE 7C Cp .8525	
DATE	Feb 15, 2022		
OPERATOR:	SG	PORT LENGTH	
CONTROL UNIT	CAE AL-1 Y .98164	STATIC PRESSURE, IN. H2O -18.0	
	ΔH@ 1.866	STACK DIAMETER 70.9"	
BAROMETRIC PRESSURE, IN. Hg	30.13	STACK HEIGHT 30.0"	
ASSUMED MOISTURE, Bw	17%	INITIAL LEAK TEST .001@15"	
		FINAL LEAK TEST .001@15"	

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	285	285
Imp. #2	100	207	107
Imp. #3	100	114	14
Imp. #4	0	4	4
Imp. #5	100	102	2
Imp. #6	100	101	1
Imp. #7	GEL		
Imp. #8			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
1	11:38	503.660	.33	1.71	63	309	750	251	48	4.0				
2	10	510.482	.34	1.77	65	312					10.5	9.2		
3		514.69	.39	2.02	65	314	252	254	48	4.0				
4	20	518.85	.45	2.34	66	314								
5		522.43	.33	1.72	69	316	750	251	47	5.0				
6	30	526.06	.34	1.78	72	316					9.5	8.2		
7		530.71	.55	2.87	71	317	251	254	50	5.5				
8	40	535.47	.58	3.03	71	317								
9		540.21	.57	2.99	73	317	252	249	50	4.5				
10	50	544.78	.53	2.78	73	317					11.0	9.1		
11		549.22	.50	2.62	73	316	249	251	49	4.5				
12	60	553.58	.48	2.52	74	316								
1		557.60	.41	2.15	72	314	250	252	48	4.0	10.5	8.5		
2	10	561.36	.36	1.89	72	314								
3		565.42	.42	2.20	71	314	251	249	48	4.5				
4	20	569.26	.38	1.99	71	315								
5		573.43	.44	2.30	71	315	250	249	47	4.5				
6	30	577.67	.46	2.41	71	315								
7		581.82	.44	2.31	71	314	251	250	47	4.5				
8	40	585.68	.38	1.99	72	315					10.5	9.3		
9		589.59	.39	2.04	71	314	250	249	45	4.0				
10	50	593.40	.37	1.94	71	314								
11		597.05	.34	1.78	71	314	253	248	44	4.0				
12		600.753	.35	1.83	71	315								
	13:39	END test												

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S.H

CLIENT	MV. W.T.E.	NOZZLE	G-307 DIAMETER, IN. 0.3080
SOURCE	Unit #2	PROBE	7C Cp 0.8525
PARAMETER / RUN No	metals / Particulate / Run 1	PORT LENGTH	
DATE	Feb. 15, 2022	STATIC PRESSURE, IN. H2O	-18.5"
OPERATOR:	DS	STACK DIAMETER	70.9"
CONTROL UNIT	CAE JD99 Y 0.9854	STACK HEIGHT	300'
	ΔH@ 1.825		
BAROMETRIC PRESSURE, IN. Hg	30.13	INITIAL LEAK TEST	0.001 @ 15"
ASSUMED MOISTURE, Bw	16%	FINAL LEAK TEST	0.004 @ 15"

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	264	264
Imp. #2	100	204	104
Imp. #3	100	120	20
Imp. #4	200g	5	5
Imp. #5	100	102	2
Imp. #6	100	102	2

Upstream Diameters [illegible]

Downstream Diameters

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %		
	12:08	443.103												
1		447.28	0.45	2.33	56	299	222	246	49	8				
2	10	451.62	0.49	2.52	57	307					10.0	9.6		
3		455.92	0.48	2.46	57	308	248	252	51	8				
4	20	460.18	0.47	2.41	57	307								
5		463.95	0.37	1.90	57	308	258	250	53	9				
6	30	467.56	0.34	1.74	57	309								
7		471.79	0.45	2.32	59	307	258	251	51	9	10.0	9.9		
8	40	476.49	0.58	3.00	60	305								
9		481.13	0.55	2.86	61	304	258	250	52	10				
10	50	485.90	0.58	3.02	61	303								
11		490.52	0.54	2.82	62	301	258	251	54	10	10.0	10.0		
12	60	494.97	0.49	2.57	62	299								
1		499.78	0.60	3.12	64	308	258	248	51	12				
2	10	504.63	0.60	3.11	64	309					9.5	10.2		
3		509.24	0.54	2.81	64	308	257	251	51	12				
4	20	513.36	0.42	2.18	64	308								
5		517.38	0.41	2.14	64	305	258	252	52	10				
6	30	521.74	0.48	2.51	65	305					10.0	9.8		
7		529.18	0.49	2.58	65	299	258	256	54	10				
8	40	534.28	0.65	3.43	66	300								
9		539.38	0.65	3.42	66	302	257	253	52	10				
10	50	544.26	0.59	3.12	67	299					10.0	10.1		
11		548.98	0.55	2.91	67	298	259	250	52	9				
12	14:10	553.53	0.51	2.72	67	292								

A. Lanfranco and Associates Inc.

P.H.

CLIENT MV Covanta	NOZZLE G-3072	DIAMETER, IN. .3073	IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
SOURCE Unit #2	PROBE AL GURD 1	Cp [illegible] 0.8328	Imp. #1	~~100~~ 0	174	174
PARAMETER / RUN No Metals PM R-2	PORT LENGTH 10"		Imp. #2	100	210	110
DATE Feb-16-22	STATIC PRESSURE, IN. H2O -20"		Imp. #3	100	116	16
OPERATOR: MG	STACK DIAMETER 70.90		Imp. #4	~~100~~	10	10
CONTROL UNIT CAE 3049 Y .9854	STACK HEIGHT 200'		Imp. #5	100	104	4
ΔH@ 1.827			Imp. #6	~~100~~ 100	102	2
BAROMETRIC PRESSURE, IN. Hg 30.33	INITIAL LEAK TEST 0.004 @ 15"		Upstream Diameters			
ASSUMED MOISTURE, Bw 18%	FINAL LEAK TEST 0.002 @ 15"		Downstream Diameters			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %		
	0853	553.958												
1		557.58	.35	1.72	53	283	251	251	51	5	9.8	10		
2		561.40	.39	1.91	53	288								
3		565.49	.47	2.29	53	291	251	252	50	5.5				
4		569.48	.44	2.14	53	292								
5		573.53	.45	2.19	54	294	253	251	51	5.5				
6		577.43	.43	2.1	55	291								
7		581.85	.48	2.34	56	284	253	254	53	6				
8		585.99	.52	2.54	57	294								
9		590.60	.58	2.88	58	285	253	251	53	6.5	10	9.8		
10		594.96	.51	2.52	59	291								
11		599.55	.57	2.82	60	290	251	253	54	6				
12		603.61	.44	2.18	61	290								
1		607.71	.48	2.39	61	288	257	252	54	6	10	9.8		
2		612.63	.52	2.56	62	298								
3		616.01	.44	2.16	62	298	255	255	53	5.5				
4		619.99	.42	2.07	63	298								
5		624.09	.45	2.22	63	298	252	252	53	5.5				
6		627.95	.42	2.07	64	298								
7		632.21	.49	2.42	64	297	258	254	54	6	10	10		
8		636.68	.53	2.72	65	270								
9		641.31	.55	2.84	66	268	258	251	55	6.5				
10		645.65	.50	2.54	66	279								
11		649.76	.44	2.19	66	293	259	250	55	6				
12	1055	653.52	.39	1.96	67	290								

A. Lanfranco and Associates Inc.

CLIENT	MV. Coronta	NOZZLE G-3077 DIAMETER, IN. 0.3073	
SOURCE	Unit-2	PROBE AL-1 Cp 0.8428	
PARAMETER / RUN No	metals R-3	PORT LENGTH	
DATE	Feb. 16 22	STATIC PRESSURE, IN. H2O 20.0	
OPERATOR:		STACK DIAMETER 70.90	
CONTROL UNIT	5099 Y 0.9854	STACK HEIGHT	
	ΔH@ 1.827		
BAROMETRIC PRESSURE, IN. Hg	30.30	INITIAL LEAK TEST 0.003 @ 15"	
ASSUMED MOISTURE, Bw	17%	FINAL LEAK TEST 0.003 @ 15"	

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	178	178
Imp. #2	100	222	122
Imp. #3	100	130	30
Imp. #4	0	14	14
Imp. #5	100	104	4
Imp. #6	100	107	7
Upstream Diameters			
Downstream Diameters			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
	11:10	654.975												
1		659.28	0.49	2.72	66	300	152	156	50	4	9.7	10.0		
2		663.65	0.52	2.56	66	307								
3		667.60	0.44	2.46	66	304	155	156	50	4				
4		671.41	0.39	2.13	67	301								
5		674.96	0.34	1.68	67	301	155	156	50	4				
6		678.54	0.30	1.89	68	296								
7		682.03	0.47	2.33	68	295	156	157	51	5				
8		687.33	0.52	2.60	69	294					10.0	9.9		
9		691.88	0.37	2.87	69	291	156	157	51	5				
10		696.32	0.58	2.91	69	293								
11		701.03	0.54	2.71	70	294	156	157	51	5				
12		705.33	0.49	2.47	70	290								
1		709.41	0.45	2.24	70	299	158	150	52	5				
2		713.64	0.46	2.30	71	299					10.0	10.0		
3		717.60	0.44	2.19	71	297	157	150	52	5				
4		721.60	0.40	2.00	71	298								
5		725.26	0.36	1.80	71	298	157	150	52	5				
6		728.87	0.33	1.73	71	295								
7		732.61	0.37	1.86	72	295	157	151	52	5				
8		736.33	0.41	2.06	72	294					10.0	9.7		
9		740.81	0.48	2.48	72	293	156	151	52	5				
10		744.97	0.46	2.32	72	292								
11		749.05	0.44	2.23	73	290	155	151	52	5				
12	13:12	752.93	0.40	2.03	73	290								

S.H.

A. Lanfranco and Associates Inc.

METRO VANCOUVER WTE - BURNABY B.C.

SOURCE	Unit #3
PARAMETER / RUN No	Metals R1
DATE	Feb 16, 2022
OPERATOR:	JG
CONTROL UNIT	Am 15
Y	1.0037
ΔH@	1.669
BAROMETRIC PRESSURE, IN. Hg	30.26
ASSUMED MOISTURE, Bw	17%

NOZZLE	G3072
DIAMETER, IN.	.3073
PROBE	AL GUARD-1
Cp	.8328
PORT LENGTH	
STATIC PRESSURE, IN. H2O	-19.00
STACK DIAMETER	70.90"
STACK HEIGHT	30.0"
INITIAL LEAK TEST	.0006@15"
FINAL LEAK TEST	.0006@15"

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	256	256
Imp. #2	100	187	87
Imp. #3	100	114	14
Imp. #4	0	6	6
Imp. #5	100	103	3
Imp. #6	100	102	2
Imp. #7	GEL		
Imp. #8			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
1	11:58	504.402												
1		508.16	.141	1.81	58	300	250	254	47	4.5				
2	10	511.96	.142	1.85	58	301					10.50	9.50		
3		515.79	.143	1.87	59	310	252	253	47	4.5				
4	20	519.60	.144	1.92	59	310								
5		523.25	.139	1.70	60	311	251	248	47	4.5				
6	30	526.72	.135	1.53	61	311					11.0	9.5		
7		529.41	.121	.142	61	310	250	251	48	4.0				
8	40	532.29	.124	1.05	62	309								
9		535.11	.123	1.01	63	310	249	252	48	4.0				
10	50	538.00	.124	1.05	64	311								
11		540.95	.125	1.10	65	311	250	251	47	4.0				
12	60	543.79	.123	1.02	66	310								
1		546.64	.123	1.02	67	306	251	249	49	4.0				
2	10	549.42	.122	.97	67	311					10.0	9.4		
3		552.32	.124	1.06	67	311	250	251	49	4.0				
4	20	555.29	.125	1.11	69	312								
5		558.36	.127	1.19	69	313	251	249	49	4.0				
6	30	561.41	.126	1.15	69	312								
7		565.03	.137	1.64	70	312	253	251	48	4.5				
8	40	568.60	.136	1.60	70	312					10.5	9.5		
9		572.32	.139	1.73	70	311	252	252	48	4.0				
10	50	576.23	.143	1.91	71	312								
11		580.23	.145	2.00	71	312	250	250	48	4.0				
12		584.283	.146	2.05	71	310								
	13:59	END test												

S.A.

A. Lanfranco and Associates Inc.

METRO VANCOUVER WTE - BURNABY B.C.

SOURCE	Unit #3	NOZZLE Cp 3.72 DIAMETER, IN. .3075	
PARAMETER / RUN No	partic/metals R2	PROBE AL GUARD-1 Cp .8328	
DATE	Feb 17, 2022	PORT LENGTH	
OPERATOR:	SG	STATIC PRESSURE, IN. H2O -19.00	
CONTROL UNIT	Am 15 Y 1.0037	STACK DIAMETER 70.90"	
	ΔH@ 1.669	STACK HEIGHT 30.01'	
BAROMETRIC PRESSURE, IN. Hg	30.26	INITIAL LEAK TEST .000@15"	
ASSUMED MOISTURE, Bw	17%	FINAL LEAK TEST .000@15"	

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	237	237
Imp. #2	100	178	78
Imp. #3	100	121	21
Imp. #4	0	3	3
Imp. #5	100	104	4
Imp. #6	100	102	2
Imp. #7	GEL		
Imp. #8			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %
1	8:50	584.855										
2		587.72	.124	1.05	56	300	250	257	49	5.5		
3	10	590.52	.123	1.01	56	301					10.5	9.5
4		593.26	.122	.96	56	302	252	253	49	5.5		
5	20	595.93	.121	.92	56	303						
6		598.67	.122	.96	57	304	254	253	48	5.5		
7	30	601.48	.124	1.01	58	305						
8		604.94	.133	1.53	58	306	255	250	46	5.0		
9	40	608.41	.135	1.53	59	306						
10		612.69	.151	1.64	60	306	257	249	48	5.5	10.0	9.3
11	50	616.42	.142	1.56	61	301						
12		620.28	.143	1.90	61	303	249	251	48			
	60	624.01	.140	1.77	61	303						
1		627.46	.134	1.50	63	304	250	251	48	6.5		
2	10	631.0	.136	1.60	64	304					9.5	8.5
3		634.49	.133	1.46	64	303	252	250	49	7.0		
4	20	637.177	.132	1.42	65	302						
5		641.24	.134	1.52	65	301	250	249	49	7.5		
6	30	644.56	.131	1.39	66	300						
7		647.29	.121	1.94	66	300	251	251	49	6.5		
8	40	650.15	.123	1.03	67	300					10.8	9.8
9		653.08	.124	1.08	67	299	250	248	48	6.5		
10	50	656.07	.125	1.12	67	299						
11		659.06	.125	1.12	68	299	251	252	48	6.0		
12		661.970	.122	.99	68	300						
	10:56	END test										

S-A5

A. Lanfranco and Associates Inc.

METRO VANCOUVER WTE - BURNABY B.C.

SOURCE	Unit #3
PARAMETER / RUN No	Partic / Metals 123
DATE	Feb 17, 2022
OPERATOR:	SG
CONTROL UNIT	Au 15 Y 1.0037 ΔH@ 1.669
BAROMETRIC PRESSURE, IN. Hg	30.26
ASSUMED MOISTURE, Bw	17%

NOZZLE G G318	DIAMETER, IN. .3170
PROBE G7C	Cp .8526
PORT LENGTH	
STATIC PRESSURE, IN. H2O	-1.0
STACK DIAMETER	10.90"
STACK HEIGHT	30.0"
INITIAL LEAK TEST	.0090 @ 15
FINAL LEAK TEST	.001 @ 6

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	6	255	255
Imp. #2	100	176	76
Imp. #3	100	114	14
Imp. #4	0	6	6
Imp. #5	100	103	3
Imp. #6	100	101	1
Imp. #7	SAT		
Imp. #8			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %
1		602.417										
2	10	605.97	.31	1.54	67	303	254	252	46	4.5		
3		609.46	.32	1.57	66	309					10.7	9.5
4	20	613.11	.34	1.68	67	308	253	252	46	4.5		
5		616.70	.33	1.62	66	309						
6	30	620.60	.32	1.61	69	310	252	253	46	5.0		
7		624.41	.37	1.82	67	310						
8	40	628.46	.24	1.18	67	310	250	251	46	5.0	10.5	9.7
9		630.40	.23	1.13	67	308						
10	50	633.62	.25	1.25	68	312	250	249	46	5.0		
11		636.87	.27	1.33	68	313						
12	60	639.94	.24	1.18	68	313	249	251	46	4.5		
		642.88	.22	1.09	66	313						
1		645.95	.24	1.18	68	310	250	249	45	4.5		
2	10	649.08	.25	1.23	68	311					11.0	9.8
3		652.09	.23	1.13	68	313	250	251	45	4.5		
4	20	655.02	.22	1.08	69	313						
5		658.09	.24	1.18	69	315	251	249	45	4.5		
6	30	661.29	.26	1.28	69	313						
7		664.95	.34	1.68	70	313	250	249	45	5.0		
8	40	668.72	.36	1.78	70	312						
9		672.44	.35	1.73	70	312	250	251	45	5.0	11.0	10.2
10	50	676.69	.44	2.16	69	313						
11		680.67	.42	2.07	69	311						
12		684.613	.39	1.93	70	318						
	13:14	END test										

A. Lanfranco and Associates Inc.

Client	COVANTA (MV WTE)	Y	LMU-A 0.9886		
Source	Unit #1	Cp			
Parameter	HF	Pbar	30.16	Static	-19.0
Date	Feb 15, 2022	Operator	Liam / christian		

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	09:49	500.4131	68		200			
			46					
	10:49	501.0234	38		262			
2	10:55	501.0285	46		200			
			42					
	11:55	501.6452	38		268			
3	12:02	501.6480	47		200			
			43					
	13:02	502.2516	37		260			

Client	COVANTA (MV WTE)	Y	LMU-A 0.9886		
Source	Unit #2	Cp			
Parameter	HF	Pbar	30.27	Static	-20.0
Date	Feb 16, 2022	Operator	Liam / christian		

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	09:17	502.2576	62		200			
			49					
	10:17	502.8478	42		245			
2	10:30	502.8521	48		200			
			42					
	11:30	503.4605	39		282			
3	11:45	503.4655	46		200			
			44					
	12:45	504.0716	50		262			

SH

A. Lanfranco and Associates Inc.

Client	COVANTA (MU WTE)	Y	LMU-A 0.9886	Client		Y	
Source	Unit #3	Cp		Source		Cp	
Parameter	HF	Pbar	30.26	Static	-19	Parameter		Pbar		Static	
Date	Feb 17, 2022	Operator	Liam/christian	Date		Operator	

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Leak Check	Run 1	Run 2	Run 3
Initial			
Final			

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	09:09	504.0884	46	~~200~~	200			
			40					
	10:09	504.6955	39		280			
2	10:23	504.7014	41		200			
			40					
	11:23	505.3058	39		275			
3	11:32	505.3092	41		200			
			42					
	12:32	505.9086	40		275			

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1								
2								
3								

APPENDIX – E

CALIBRATION SHEETS and

TECHNICIAN CERTIFICATES

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: AU 15
Serial #: 0028SPC-081915-1

Date: 11-Jan-22
Barometric Pressure: 30.01 (in. Hg)
Theoretical Critical Vacuum: 14.16 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-					
					Initial Temps.		Final Temps.					-- Ambient Temperature --		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
3.60	30.00	797.900	830.200	32.300	73.0	73.0	75.0	75.0	73	0.8185	17.0	71.0	79.0	75.0
1.80	16.00	830.400	842.834	12.434	75.0	75.0	76.0	76.0	63	0.5956	20.0	77.0	79.0	78.0
1.10	38.00	843.200	866.213	23.013	76.0	76.0	78.0	78.0	55	0.4606	22.0	78.0	81.0	79.5
0.61	29.00	866.600	879.867	13.267	78.0	78.0	78.0	78.0	48	0.3560	23.0	81.0	84.0	82.5
0.27	19.00	880.100	885.968	5.868	78.0	78.0	79.0	79.0	40	0.2408	24.5	81.0	82.0	81.5

********** RESULTS **********

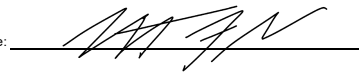
--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
					CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)	Ko (value)
32.303	914.8	31.859	902.2	32.197	0.986	-0.017	1.781	45.23	0.112	0.730
12.346	349.6	12.330	349.2	12.530	0.999	-0.005	1.686	42.83	0.017	0.742
22.747	644.2	22.614	640.4	23.046	0.994	-0.010	1.723	43.76	0.054	0.738
13.074	370.3	13.302	376.7	13.632	1.017	0.014	1.605	40.78	-0.063	0.748
5.772	163.5	5.900	167.1	6.035	1.022	0.018	1.549	39.34	-0.120	0.758
				Average Y---------->	**1.0037**		**Average dH@----->**	**1.669**	**42.4**	**Average Ko----->**	**0.743**

TEMPERATURE CALIBRATION

Calibration Standard -------> Omega Model CL23A S/N:T-218768

Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Results Variation (degF)	Results Percent of Absolute
32	32	0	0.00%
100	100	0	0.00%
300	300	0	0.00%
500	500	0	0.00%
1000	1000	0	0.00%

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Scott Ferguson Signature:  Date: January 11, 2022

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: CAE AL1
Serial #: 0028-070611-1

Date: 11-Jan-22
Barometric Pressure: 30.01 (in. Hg)
Theoretical Critical Vacuum: 14.16 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-					
					Initial Temps.		Final Temps.					-- Ambient Temperature --		
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
3.75	15.00	46.600	62.350	15.750	61.0	61.0	63.0	63.0	73	0.8185	18.0	66.0	70.0	68.0
1.90	24.00	62.800	81.430	18.630	64.0	64.0	67.0	67.0	63	0.5956	20.0	73.0	74.0	73.5
1.20	19.00	82.000	93.537	11.537	67.0	67.0	69.0	69.0	55	0.4606	22.0	76.0	77.0	76.5
0.68	15.00	94.000	100.938	6.938	69.0	69.0	70.0	70.0	48	0.3560	23.5	77.0	78.0	77.5
0.34	27.00	101.200	109.756	8.556	62.0	62.0	65.0	65.0	40	0.2408	24.5	64.0	73.0	68.5

********** RESULTS **********

--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
					CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)	Ko (value)
16.119	456.5	16.035	454.1	15.993	0.995	0.008	1.873	47.57	0.006	0.693
18.855	534.0	18.572	526.0	18.717	0.985	-0.001	1.799	45.68	-0.068	0.716
11.601	328.5	11.339	321.1	11.491	0.977	-0.009	1.901	48.29	0.035	0.702
6.948	196.8	6.912	195.8	7.018	0.995	0.008	1.802	45.76	-0.065	0.709
8.659	245.2	8.487	240.4	8.473	0.980	-0.006	1.958	49.73	0.092	0.691
				Average Y---------->	**0.9864**		**Average dH@----->**	**1.866**	**47.4**	**Average Ko----->**	**0.702**

TEMPERATURE CALIBRATION

Calibration Standard -------> Omega Model CL23A S/N:T-218768

Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Results Variation (degF)	Results Percent of Absolute
32	32	0	0.00%
100	100	0	0.00%
300	300	0	0.00%
500	500	0	0.00%
1000	1000	0	0.00%

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Scott Ferguson Signature: _____ Date: January 11, 2022

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: CAE JO99
Serial #: 0028-022210-1

Date: 11-Jan-22
Barometric Pressure: 30.01 (in. Hg)
Theoretical Critical Vacuum: 14.16 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	-- Ambient Temperature --		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
3.60	28.00	939.400	969.525	30.125	66.0	66.0	67.0	67.0	73	0.8185	16.0	65.0	76.0	70.5
1.85	15.00	897.500	909.074	11.574	62.0	62.0	63.0	63.0	63	0.5956	20.0	69.0	73.0	71.0
1.15	23.00	909.200	923.024	13.824	64.0	64.0	67.0	67.0	55	0.4606	22.0	74.0	80.0	77.0
0.66	18.00	923.500	931.772	8.272	67.0	67.0	69.0	69.0	48	0.3560	23.5	81.0	82.0	81.5
0.34	16.00	932.500	937.548	5.048	69.0	69.0	71.0	71.0	40	0.2408	24.5	80.0	83.0	81.5

********** RESULTS **********

--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
					CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)	Ko (value)
30.557	865.4	29.861	845.7	29.924	0.9772	-0.008	1.791	45.49	-0.034	0.721
11.779	333.6	11.635	329.5	11.671	0.9877	0.002	1.753	44.53	-0.072	0.722
13.965	395.5	13.719	388.5	13.917	0.9824	-0.003	1.832	46.54	0.007	0.711
8.307	235.3	8.264	234.0	8.453	0.9948	0.009	1.767	44.87	-0.058	0.716
5.046	142.9	4.969	140.7	5.082	0.9846	-0.001	1.982	50.33	0.157	0.683
				Average Y---------->	**0.9854**		**Average dH@----->**	**1.825**	**46.4**	**Average Ko----->**	**0.711**

TEMPERATURE CALIBRATION

Calibration Standard -------> Omega Model CL23A S/N:T-218768

Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Results Variation (degF)	Results Percent of Absolute
32	32	0	0.00%
100	100	0	0.00%
300	300	0	0.00%
500	500	0	0.00%
1000	1000	0	0.00%

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Scott Ferguson Signature:  Date: January 11, 2022

A. Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: LMU-A

Serial #: Kimmon 186

Date: 5-Jan-22

Barometric Pressure: 30.11 (in. Hg)

Theoretical Critical Vacuum: 14.20 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------

dH (in H2O)	Time (min)	Volume Initial (m^3)	Volume Final (m^3)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)
0.00	17.00	492.2545	492.4783	7.903	57.0	57.0	56.0	56.0
0.00	16.00	492.4790	492.6902	7.458	58.0	58.0	61.0	61.0
0.00	15.00	492.6910	492.8894	7.006	60.0	60.0	62.0	62.0

-CRITICAL ORIFICE READINGS-

Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- Initial (deg F)	Final (deg F)	Average (deg F)
48	0.3560	20.0	58.0	58.0	58.0
48	0.3560	20.0	55.0	57.0	56.0
48	0.3560	20.0	56.0	57.0	56.5

********** **RESULTS** **********

--- DRY GAS METER ---

VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)
8.127	230.2
7.626	216.0
7.143	202.3

--------- ORIFICE ---------

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
8.007	226.7	7.808
7.550	213.8	7.335
7.075	200.4	6.880

-- DRY GAS METER --

CALIBRATION FACTOR Y Value (number)	Variation (number)
0.985	-0.003
0.990	0.002
0.990	0.002

--------- ORIFICE ---------

CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
0.000	0.00	0.000
0.000	0.00	0.000
0.000	0.00	0.000

Average Y---------> 0.9886 **Average dH@-----> 0.0000 0.00**

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Liam Forrer Signature: L. Forrer Date: January 5, 2022

Pitot Tube Calibration

Date: 05-Jan-22
Pbar (in.Hg): 30.16

Temp (R): 530
Dn (in.): 0.25

Pitot ID: **7A-1**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.050	0.070	14.9	0.8367	0.0024
0.100	0.140	21.0	0.8367	0.0024
0.150	0.210	25.7	0.8367	0.0024
0.350	0.490	39.3	0.8367	0.0024
0.590	0.850	51.0	0.8248	0.0095
		Average :	0.8343	0.0038

Pitot ID: **ST 8A**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.040	0.055	13.3	0.8443	0.0027
0.080	0.110	18.8	0.8443	0.0027
0.180	0.250	28.2	0.8400	0.0016
0.300	0.420	36.4	0.8367	0.0049
0.500	0.690	47.0	0.8427	0.0011
		Average :	0.8416	0.0026

Pitot ID: **7B**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.030	0.040	11.4	0.8574	0.0056
0.120	0.160	22.8	0.8574	0.0056
0.200	0.247	29.5	0.8521	0.0003
0.380	0.520	40.6	0.8463	0.0055
0.730	1.000	56.3	0.8459	0.0059
		Average :	0.8518	0.0046

Pitot ID: **ST 8B**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.060	0.080	16.3	0.8574	0.0039
0.090	0.120	19.8	0.8574	0.0039
0.190	0.260	29.0	0.8463	0.0072
0.320	0.430	37.6	0.8540	0.0006
0.630	0.850	52.8	0.8523	0.0012
		Average :	0.8535	0.0033

Pitot ID: **7 AL GVRD-1**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.060	0.085	16.3	0.8318	0.0011
0.090	0.125	19.9	0.8400	0.0072
0.145	0.200	25.3	0.8430	0.0101
0.290	0.420	35.8	0.8226	0.0102
0.530	0.760	48.4	0.8267	0.0061
		Average :	0.8328	0.0069

Pitot ID: **ST 8C**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.050	0.070	14.9	0.8367	0.0031
0.085	0.120	19.4	0.8332	0.0004
0.195	0.270	29.0	0.8413	0.0078
0.420	0.600	43.1	0.8283	0.0053
0.630	0.900	52.8	0.8283	0.0053
		Average :	0.8336	0.0044

Pitot ID: **7C**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.030	0.040	11.4	0.8574	0.0048
0.060	0.080	16.3	0.8574	0.0048
0.110	0.150	21.9	0.8478	0.0047
0.210	0.280	30.5	0.8574	0.0048
0.500	0.690	47.0	0.8427	0.0098
		Average :	0.8525	0.0058

Pitot ID:

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
		Average :		

* Average absolute deviation must not exceed 0.01.

Calibrated by: Jeremy Gibbs Signature:  Date: January 5, 2022

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

GLASS NOZZLE DIAMETER CALIBRATION FORM

Calibrated by: Scott Ferguson
Date: January 18, 2022
Signature: Scott Ferguson

Nozzle I.D.	d1 (inch)	d2 (inch)	d3 (inch)	difference (inch)	average dia. (inch)	average area (ft^2)
A	0.1250	0.1240	0.1245	0.0010	0.1245	0.0000845
G-165	0.1640	0.1655	0.1660	0.0020	0.1652	0.0001488
G-170	0.1705	0.1695	0.1700	0.0010	0.1700	0.0001576
G-178	0.1780	0.1780	0.1790	0.0010	0.1783	0.0001735
J	0.1880	0.1880	0.1880	0.0000	0.1880	0.0001928
E	0.1880	0.1895	0.1882	0.0015	0.1886	0.0001939
Q	0.2070	0.2050	0.2060	0.0020	0.2060	0.0002315
L	0.2112	0.2120	0.2105	0.0015	0.2112	0.0002434
G-215	0.2150	0.2135	0.2160	0.0025	0.2148	0.0002517
G-218	0.2180	0.2175	0.2190	0.0015	0.2182	0.0002596
G-221	0.2195	0.2195	0.2225	0.0030	0.2205	0.0002652
G-2231	0.2230	0.2230	0.2225	0.0005	0.2228	0.0002708
G-2232	0.2220	0.2240	0.2235	0.0020	0.2232	0.0002716
G-225	0.2245	0.2250	0.2240	0.0010	0.2245	0.0002749
G-2251	0.2230	0.2260	0.2245	0.0030	0.2245	0.0002749
G-228	0.2280	0.2270	0.2300	0.0030	0.2283	0.0002844
P-18	0.2375	0.2370	0.2380	0.0010	0.2375	0.0003076
G-245	0.2440	0.2450	0.2450	0.0010	0.2447	0.0003265
G-247	0.2450	0.2470	0.2470	0.0020	0.2463	0.0003310
G-2501	0.2505	0.2500	0.2505	0.0005	0.2503	0.0003418
G-250	0.2505	0.2505	0.2500	0.0005	0.2503	0.0003418
G-253	0.2530	0.2520	0.2520	0.0010	0.2523	0.0003473
G-257	0.2565	0.2585	0.2570	0.0020	0.2573	0.0003612
P	0.2580	0.2570	0.2575	0.0010	0.2575	0.0003616
P-2	0.2787	0.2790	0.2785	0.0005	0.2787	0.0004237
G-280	0.2780	0.2800	0.2810	0.0030	0.2797	0.0004266
G-282	0.2810	0.2820	0.2840	0.0030	0.2823	0.0004348
G-287	0.2870	0.2880	0.2860	0.0020	0.2870	0.0004493
G-2871	0.2870	0.2875	0.2865	0.0010	0.2870	0.0004493
G-292	0.2922	0.2920	0.2926	0.0006	0.2923	0.0004659
G-294	0.2940	0.2935	0.2940	0.0005	0.2938	0.0004709
G-304	0.3040	0.3045	0.3045	0.0005	0.3043	0.0005052
MV-01	0.3050	0.3045	0.3055	0.0010	0.3050	0.0005074
G-3072	0.3070	0.3070	0.3080	0.0010	0.3073	0.0005152
G-307	0.3080	0.3080	0.3080	0.0000	0.3080	0.0005174
G-308	0.3065	0.3080	0.3095	0.0030	0.3080	0.0005174
G-309	0.3085	0.3085	0.3090	0.0005	0.3087	0.0005196
G-3091	0.3090	0.3090	0.3085	0.0005	0.3088	0.0005202
G-310	0.3090	0.3105	0.3095	0.0015	0.3097	0.0005230
G-312	0.3115	0.3130	0.3115	0.0015	0.3120	0.0005309
G-3121	0.3115	0.3125	0.3130	0.0015	0.3123	0.0005321
G-316	0.3160	0.3160	0.3170	0.0010	0.3163	0.0005458
V-06	0.3200	0.3210	0.3210	0.0010	0.3207	0.0005608
P-27	0.3387	0.3385	0.3390	0.0005	0.3387	0.0006258
G-344	0.3440	0.3450	0.3440	0.0010	0.3443	0.0006467
G-345	0.3450	0.3450	0.3450	0.0000	0.3450	0.0006492
G-346	0.3450	0.3460	0.3460	0.0010	0.3457	0.0006517
G-367	0.3675	0.3650	0.3670	0.0025	0.3665	0.0007326
P-14	0.3910	0.3935	0.3920	0.0025	0.3922	0.0008388
G-433	0.4335	0.4330	0.4330	0.0005	0.4332	0.0010234
G-437	0.4350	0.4345	0.4355	0.0010	0.4350	0.0010321
G-468	0.4677	0.4670	0.4670	0.0007	0.4672	0.0011907
P-29	0.4680	0.4680	0.4690	0.0010	0.4683	0.0011963
P-7	0.4965	0.4940	0.4930	0.0035	0.4945	0.0013337
B	0.5015	0.5030	0.5025	0.0015	0.5023	0.0013763
G-540	0.5405	0.5400	0.5405	0.0005	0.5403	0.0015924

Where:

(a) D1, D2, D3 = three different nozzle diameters; each diameter must be measured to within (0.025mm) 0.001 in.

(b) Difference = maximum difference between any two diameters; must be less than or equal to (0.1mm) 0.004 in.

(c) Average = average of D1, D2 and D3

BAROMETER CALIBRATION FORM

Device	Cal Date	Pbar Env Canada (kPa)	Pbar Env Canada (inches of Hg)	Device (inches of Hg) Reading	Device (inches of Hg) Elevation Corrected	Difference (Env Can - Elv Corr)
LA	5-Jan-22	102.5	30.27	30.16	30.23	0.04
DS	5-Jan-22	102.5	30.27	30.16	30.23	0.04
CL	5-Jan-22	102.5	30.27	30.17	30.24	0.03
ML	5-Jan-22	102.5	30.27	30.14	30.21	0.06
SB	5-Jan-22	102.5	30.27	30.15	30.22	0.05
SH	5-Jan-22	102.5	30.27	30.15	30.22	0.05
MG	5-Jan-22	102.5	30.27	30.23	30.30	-0.03
SF	5-Jan-22	102.5	30.27	30.16	30.23	0.04
JG	5-Jan-22	102.5	30.27	30.12	30.19	0.08
JC	5-Jan-22	102.5	30.27	30.15	30.22	0.05
LF	5-Jan-22	102.5	30.27	30.15	30.22	0.05

Calibrated by: Jeremy Gibbs Signature:  Date: 05-Jan-21

Performance Specification is
Device Corrected for Elevation must be +/- 0.1 " Hg of ENV CANADA SEA-LEVEL Pbar
Enter Environment canada Pressure from their website for Vancouver (link below)
and the reading from your barometer on the ground floor of the office.

https://weather.gc.ca/city/pages/bc-74_metric_e.html

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

TEMPERATURE CALIBRATION FORM

Calibrated by: Justin Ching

Date: 13-Jan-22

Signature: Carter Lanfranco

TEMPERATURE DEVICE CALIBRATIONS

Reference Device Model CL23A Calibrator			Temperature Settings (degrees F)													
			32		100		200		300		500		800		1700	
Device	**ALA #**	**Serial #**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**
Omega HH11A	3	300132	32.5	0.10%	99.1	-0.16%	200.9	0.14%	302.5	0.33%	497.2	-0.29%	797.3	-0.21%	1697	-0.14%
Omega HH11A	4	200167		-6.51%		-17.87%		-30.32%		-39.49%		-52.10%		-63.51%		-78.72%
Omega HH11A	6	600059	33	0.20%	99.6	-0.07%	201.6	0.24%	301.3	0.17%	498.2	-0.19%	799.6	-0.03%	1697	-0.14%
TPI 341K	7	2.0315E+10	30.9	-0.22%	98.6	-0.25%	198.6	-0.21%	298.7	-0.17%	498.4	-0.17%	795.9	-0.33%	1695	-0.23%
TPI 341K	8	2.0313E+10	32.1	0.02%	99	-0.18%	200.7	0.11%	300.2	0.03%	488.2	-1.23%	797.6	-0.19%	1696	-0.19%
Cont Cmpny	10	102008464	30.5	-0.31%	97.6	-0.43%	198.2	-0.27%	297.8	-0.29%	498	-0.21%	796.4	-0.29%	1695	-0.23%
Omega HH11	14	409426		-6.51%		-17.87%		-30.32%		-39.49%		-52.10%		-63.51%		-78.72%
TPI 341K	16	400120029	31	-0.20%	99	-0.18%	199.1	-0.14%	298.5	-0.20%	500	0.00%	799.9	-0.01%	1701	0.05%
TPI 341K	18	2.0329E+10	31.2	-0.16%	99.2	-0.14%	198.1	-0.29%	298.6	-0.18%	498.6	-0.15%	799.1	-0.07%	1697	-0.14%
TPI 341K	20	2.0329E+10	30.9	-0.22%	98	-0.36%	198.1	-0.29%	298.8	-0.16%	497.2	-0.29%	797.9	-0.17%	1697	-0.14%
TPI 341K	22	2.0329E+10	31.4	-0.12%	98.9	-0.20%	198	-0.30%	298.8	-0.16%	497.7	-0.24%	798	-0.16%	1697	-0.14%
Reference device is a NIST certified digital thermocouple calibrator																
Variation expressed as a percentage of the absolute temperature must be within 1.5 %																

Calibration Certificate

Date: 12-Jan-22
Calibrated by: Daryl Sampson
Authorizing Signature: Daryl Sampson

Insrtument Calibrated: Testo 1 (330-2LL)
Serial #: 03101345
Customer: ALA

Ambient Conditions: Temperature: 8 °C Barometric Pressure: 101.96 kPa Relative Humidity: 94%

A. Lanfranco and Associates Inc. certifies that the described instrument has been inspected and tested following calibration procedures in the Environment Canada Report EPS 1/PG/7 (Revised 2005). Below are the observed readings after calibrations are complete. Calibration checks should be completed at least every 6 months.

O_2	Initial Evaluation				After Calibration				
Gas	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Certified Value (vol %)
Zero	0.5	0.50	Pass		0.2	0.20	Pass		0
O_2	11.1	0.10	Pass		11.0	0.00	Pass		11.00
Ambient	20.9	0.05	Pass		21.0	0.00	Pass		20.95

Performance Specification: +/- 1% O_2 (absolute diff)

CO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	1	0.3%	Pass		0	0.0%	Pass		0
1 Gas	475	0.6%	Pass		472	0.1%	Pass		472
2 Gas	1912	0.3%	Pass		1909	0.1%	Pass		1907
3 Gas	998	0.3%	Pass		996	0.1%	Pass		995
4 Gas	242	0.5%	Pass		241	0.3%	Pass		240

Performance Specification: +/- 5% of Certified Gas Value

NO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	1	0.3%	Pass		0	0.0%	Pass		0
1 Gas	475	0.3%	Pass		474	0.1%	Pass		473
2 Gas	101	0.6%	Pass		100	0.4%	Pass		100.4
3 Gas	257	0.8%	Pass		256	0.4%	Pass		255
4 Gas	46	0.8%	Pass		46	0.8%	Pass		45.64

Performance Specification: +/- 5% of Certified Gas Value

NIST Traceable Calibration Gases:

Cylinder	Cylinder ID Number	Certification Date	Expiration Date	Cylinder Pressure (PSI)	O_2 (Vol. %)	CO (ppm)	NO (ppm)
Zero Gas (N_2)	2735278Y	27-Jul-2020	26-Jul-2025	300	0	0	0
1 Gas	SG9107852B	6-May-2021	5-May-2024	1100	-	471.5	473.4
2 Gas	XC004912B	10-Jun-2021	11-Jun-2029	1200	-	1907	100.4
3 Gas	DT0017994	10-Mar-2017	10-Mar-2025	250	-	995	255
4 Gas	CC428385	7-Apr-2021	8-Apr-2029	1200	-	240.3	45.64
O_2/CO_2	SX30844	16-Mar-2021	17-Mar-2029	700	11.00	-	-

Note: National Institute of Standards and Technology traceable certificates are available upon request.

Calibration Certificate

Date: 11-Jan-22
Calibrated by: Louis Agassiz
Authorizing Signature:

Insrtument Calibrated: Testo 2 (330-2LX)
Serial #: 03282252
Customer: ALA

Ambient Conditions: Temperature: 8 °C Barometric Pressure: 101.96 kPa Relative Humidity: 94%

A. Lanfranco and Associates Inc. certifies that the described instrument has been inspected and tested following calibration procedures in the Environment Canada Report EPS 1/PG/7 (Revised 2005). Below are the observed readings after calibrations are complete. Calibration checks should be completed at least every 6 months.

O_2	Initial Evaluation				After Calibration				
Gas	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Certified Value (vol %)
Zero	0.1	0.10	Pass		0	0.00	Pass		0
O_2	11.3	0.30	Pass		11.1	0.10	Pass		11.00
Ambient	20.9	0.06	Pass	Recal	20.9	0.06	Pass		20.96

Performance Specification: +/- 1% O_2 (absolute diff)

CO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	1618	15.2%	Fail	Recal	1906	0.1%	Pass		1907
2 Gas	225	6.4%	Fail		241	0.3%	Pass		240.3

Performance Specification: +/- 5% of Certified Gas Value

NO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	111	10.6%	Fail	Recal	100	0.4%	Pass		100.4
2 Gas	50	9.6%	Fail		46	0.8%	Pass		45.64

Performance Specification: +/- 5% of Certified Gas Value

NIST Traceable Calibration Gases:

Cylinder	Cylinder ID Number	Certification Date	Expiration Date	Cylinder Pressure (PSI)	O_2 (Vol. %)	CO (ppm)	NO (ppm)
Zero Gas (N_2)	2735278Y	27-Jul-2020	26-Jul-2025	300	0	0	0
1 Gas	XC004912B	10-Jun-2021	11-Jun-2029	1200	-	1907	100.4
2 Gas	CC428385	7-Apr-2021	8-Apr-2029	1200	-	240.3	45.64
O_2/CO_2	SX30844	16-Mar-2021	17-Mar-2029	700	11.00	-	-

Note: National Institute of Standards and Technology traceable certificates are available upon request.

Canadian Association for Laboratory Accreditation Inc.

Certificate of Accreditation

A. Lanfranco and Associates Inc.
101 - 9488 - 189th Street
Surrey, British Columbia

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Accreditation No.:	A4232
Issued On:	February 5, 2021
Accreditation Date:	February 5, 2021
Expiry Date:	August 6, 2023

President & CEO

MOUNT ROYAL COLLEGE

Faculty of Continuing Education and Extension

Daryl Sampson

has successfully completed

The program of studies and is awarded the certificate in

STACK SAMPLING

May 2005
Date

Donna Spaulding
Dean
Faculty of Continuing Education and Extension

MOUNT ROYAL UNIVERSITY

Faculty of Continuing Education and Extension

Michael Eugene Goods

has successfully completed

Stack Sampling

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May 22, 2019

Date

Dean
Faculty of Continuing Education and Extension

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BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY

BCIT

Shawn Harrington

has met the requirements of

Stack Testing for Pollutants

(CHSC 7760)

School of Process, Energy and Natural Resources
Chemical Sciences Program

Endorsed by:

Greater Vancouver Regional District

Environment Canada Environnement Canada

Province of British Columbia
Ministry of Environment, Lands and Parks

Marsh Hemekey, Dean
School of Process, Energy and Natural Resources

JUNE 21, 2001
Dated

MOUNT ROYAL UNIVERSITY

Faculty of Continuing Education and Extension

Jeremy Shawn Gibbs

has successfully completed

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May 22, 2019

Date

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BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional [1] providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act,* the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

a) an ownership interest in the regulated person's business;

b) an opportunity to influence a decision that leads to financial benefits from the regulated person or their business other than a standard fee for service (e.g. bonuses, stock options, other profit sharing arrangements);

c) a personal or professional interest in a specific outcome;

d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;

e) a spouse or other family member who will benefit from a specific outcome; or

f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Daryl Sampson, as a member of **Air and Waste Management Association** declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

Ministry of Environment and Climate Change Strategy

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

Further, I acknowledge that this disclosure may be interpreted as a threat to my independence and will be considered by the statutory decision maker accordingly.

This conflict of interest disclosure statement is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Signature:

X Daryl Sampson

Print name: Daryl Sampson

Witnessed by:

X

Print name: Mark Lanfranco

Date: Dec.18, 2020

[1]*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional [1] providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act,* the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

a) an ownership interest in the regulated person's business;

b) an opportunity to influence a decision that leads to financial benefits from the regulated person or their business other than a standard fee for service (e.g. bonuses, stock options, other profit sharing arrangements);

c) a personal or professional interest in a specific outcome;

d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;

e) a spouse or other family member who will benefit from a specific outcome; or

f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Jeremy Gibbs, as a member of **Air and Waste Management Association** declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

_____

_____

_____

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Signature:

X _____

Print name: Jeremy G. Sss

Witnessed by:

X _____

Print name: Mark Lanfranco

Date: Dec.16, 2020

[1]*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) *is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and*

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

Confidentiality and Impartiality Agreement

Confidentiality is legally enforceable in our client contracts for all projects and ensures that our firm, its personnel, and any outsourced bodies treat all information obtained or created during our scope of work as confidential. Our firm does not disclose information that is not public regarding a client or responsible party to a third party without express consent of that party. Our firm informs the client and responsible party before placing any information in the public domain and will use equipment and facilities to ensure the secure handling of confidential information.

Impartiality Our firm's policies and procedures regarding conflict of interest (COI) and safeguarding impartiality reflects the commitment to act impartially in all activities. Our firm understands that the principles of COI and impartiality are essential to providing independent services. Our team is required to personally declare any potential threat to impartiality or potential COI. Should a potential COI or threat to impartiality be identified, our team will work to determine mitigation measures, if applicable.

This agreement is made by and between

Michael Coats _____ (1st Party)

AND

A. Lanfranco and Associates Inc.
_____ (2nd Party)

As of 24 Nov ,2020

#101 9488 189 St. - Surrey, B.C. Canada - V4N 4W7 - 604 881 2582 - email: mark.lanfranco@alanfranco.com

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional [1] providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act,* the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

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c) a personal or professional interest in a specific outcome;

d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;

e) a spouse or other family member who will benefit from a specific outcome; or

f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Shawn Harrington, as a member of **Air and Waste Management Association** declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

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Signature:

X Shawn Harrington

Print name: Shawn Harrington

Witnessed by:

X

Print name: Mark Lanfranco

Date: Dec.16, 2020

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b) through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Daryl Sampson

   Title Senior Environmental Technician/Project Manager

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☒ No

   Name of Association: _____ Registration # _____

3. Brief description of professional services:

   Environmental consulting, specializing in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: Witnessed by:

X Daryl Sampson **X** _____

Print Name: Daryl Sampson Print Name: Louis Agassiz

Date signed: November 23, 2020

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

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1. Name of Qualified Professional Jeremy Gibbs

   Title Environmental technician

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☑ No

   Name of Association: _____ Registration # _____

3. Brief description of professional services:
   Environmental Consultant Specialize in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature:

X _____

Print Name: Jeremy Gibbs

Witnessed by:

X _____

Print Name: Connor Laan

Date signed: Nov 1, 2020

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

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BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

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1. Name of Qualified Professional Michael Goods

   Title Environmental Technician

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☐ No

   Name of Association: _____ Registration # _____

3. Brief description of professional services:

   Environmental Technician - specialising in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: Witnessed by:

X MGoods **X**

Print Name: Michael Goods Print Name: Scott Ferguson

Date signed: 11/23/2020

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BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

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1. Name of Qualified Professional Shawn Harrington

   Title Senior Environmental Technician /Project manager

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☑ No

   Name of Association: _____ Registration # _____

3. Brief description of professional services:

   Environmental consulting ,specializing in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature:

x Shawn Harrington

Print Name: Shawn Harrington

Witnessed by:

x

Print Name: Mark Lanfranco

Date signed: November 26, 2020

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

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