metrovancouver

Bottom Ash Data

2024 Week 16

The following analytical report represents bottom ash composite results for week 16 of 2024 (April 14, 2024 to April 20, 2024).

The bottom ash meets the conditions of Metro Vancouver's 2020 Bottom Ash Management Plan and is suitable for disposal.

CERTIFICATE OF ANALYSIS

Work Order	: **VA24A8696**	Page	: 1 of 11
Client	: **Covanta Burnaby Renewable Energy, ULC**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 23-Apr-2024 14:35
PO	: VANCO0000052919	Date Analysis Commenced	: 24-Apr-2024
C-O-C number	: ----	Issue Date	: 01-May-2024 16:49
Sampler	: ----		
Site	: ----		
Quote number	: Covanta Burnaby Standing Offer 2024		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
Ghazaleh Khanmirzaei	Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, 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*
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
pH units	pH units

<: 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: **Soil**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA 2416-A-1	BA 2416-A-2	BA 2416-A-3	BA 2416-A-4	BA 2416-A-5
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00
						VA24A8696-001	VA24A8696-002	VA24A8696-003	VA24A8696-004	VA24A8696-005
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/VA	0.25	%		24.2	22.9	24.5	25.1	26.1
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		10.4	10.4	10.4	10.3	10.4
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		37400	34300	34400	41000	31400
Antimony	7440-36-0	E440/VA	0.10	mg/kg		108	114	126	126	107
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		23.1	21.2	20.7	19.6	19.8
Barium	7440-39-3	E440/VA	0.50	mg/kg		379	447	392	488	384
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.37	0.36	0.34	0.38	0.36
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		12.0	18.6	8.37	7.53	9.03
Boron	7440-42-8	E440/VA	5.0	mg/kg		174	148	184	215	181
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		14.9	17.1	21.2	12.3	18.5
Calcium	7440-70-2	E440/VA	50	mg/kg		148000	136000	149000	139000	150000
Chromium	7440-47-3	E440/VA	0.50	mg/kg		156	145	175	180	148
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		75.0	65.4	128	85.1	167
Copper	7440-50-8	E440/VA	0.50	mg/kg		3120	2100	3640	1900	1720
Iron	7439-89-6	E440/VA	50	mg/kg		56500	56700	44000	64100	55200
Lead	7439-92-1	E440/VA	0.50	mg/kg		388	409	1120	338	331
Lithium	7439-93-2	E440/VA	2.0	mg/kg		28.9	31.5	47.6	25.6	29.5
Magnesium	7439-95-4	E440/VA	20	mg/kg		12500	11100	12600	11300	11600
Manganese	7439-96-5	E440/VA	1.0	mg/kg		739	733	723	760	686
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		0.0984	0.0690	0.242	0.433	0.0817
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		19.7	22.7	20.8	20.4	19.2
Nickel	7440-02-0	E440/VA	0.50	mg/kg		219	212	204	162	241
Phosphorus	7723-14-0	E440/VA	50	mg/kg		9860	9380	10600	8880	10300
Potassium	7440-09-7	E440/VA	100	mg/kg		6770	7100	7230	6520	6520
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.40	0.40	0.42	0.43	0.34
Silver	7440-22-4	E440/VA	0.10	mg/kg		12.6	9.62	8.36	9.30	8.81
Sodium	7440-23-5	E440/VA	50	mg/kg		20100	19700	20300	19500	18600
Strontium	7440-24-6	E440/VA	0.50	mg/kg		294	289	300	286	300

Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA 2416-A-1	BA 2416-A-2	BA 2416-A-3	BA 2416-A-4	BA 2416-A-5
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00
						VA24A8696-001	VA24A8696-002	VA24A8696-003	VA24A8696-004	VA24A8696-005
						Result	Result	Result	Result	Result
Metals										
Sulfur	7704-34-9	E440/VA	1000	mg/kg		13600	12700	14400	12900	13900
Thallium	7440-28-0	E440/VA	0.050	mg/kg		0.053	0.054	0.061	0.054	0.052
Tin	7440-31-5	E440/VA	2.0	mg/kg		131	125	141	104	96.8
Titanium	7440-32-6	E440/VA	1.0	mg/kg		402	330	281	560	322
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		34.4	36.9	36.6	37.6	46.7
Uranium	7440-61-1	E440/VA	0.050	mg/kg		3.27	3.10	3.58	3.37	3.53
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		42.1	38.7	42.4	42.1	42.1
Zinc	7440-66-6	E440/VA	2.0	mg/kg		3740	3220	3940	4960	3560
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		1.9	2.2	2.5	2.2	2.3
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.4	11.4	11.4	11.5	11.5
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		5.25	6.08	5.76	5.70	5.27
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.85	2.85	2.85	2.85	2.85
pH, TCLP final	----	EPP444/VA	0.010	pH units		6.53	6.64	6.62	6.77	6.56
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L		<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L		<2.5	<2.5	<2.5	<2.5	<2.5
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L		<0.025	<0.025	<0.025	<0.025	<0.025
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L		2.04	2.12	2.01	2.10	1.98
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.258	0.206	0.209	0.157	0.225
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		1990	2040	2000	2090	1990
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L		0.854	1.00	1.34	0.807	1.16
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.653	0.703	0.640	0.712	0.598
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L		122	123	124	125	116
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L		0.43	0.42	0.47	0.36	0.70
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA 2416-A-1	BA 2416-A-2	BA 2416-A-3	BA 2416-A-4	BA 2416-A-5
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A8696-001	VA24A8696-002	VA24A8696-003	VA24A8696-004	VA24A8696-005
						Result	Result	Result	Result	Result
TCLP Metals										
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L		40.6	17.8	22.8	12.9	19.0
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L		<10	<10	<10	<10	<10

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA 2416-A-6	BA 2416-A-7	BA 2416-A-8	BA 2416-A-9	BA 2416-A-10
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00
						VA24A8696-006	VA24A8696-007	VA24A8696-008	VA24A8696-009	VA24A8696-010
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/VA	0.25	%		24.5	24.6	24.1	25.0	24.1
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		10.4	10.4	10.3	10.3	10.3
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		39000	37000	38500	39500	47300
Antimony	7440-36-0	E440/VA	0.10	mg/kg		103	121	102	112	106
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		18.3	16.9	15.8	19.5	18.5
Barium	7440-39-3	E440/VA	0.50	mg/kg		452	549	497	594	493
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.36	0.38	0.35	0.39	0.35
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		7.58	7.20	9.46	14.9	15.9
Boron	7440-42-8	E440/VA	5.0	mg/kg		163	170	167	174	158
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		11.8	15.7	12.6	1900	15.6
Calcium	7440-70-2	E440/VA	50	mg/kg		147000	149000	138000	148000	140000
Chromium	7440-47-3	E440/VA	0.50	mg/kg		290	181	196	217	150
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		136	400	110	60.6	1240
Copper	7440-50-8	E440/VA	0.50	mg/kg		3370	4080	1430	2510	3190
Iron	7439-89-6	E440/VA	50	mg/kg		65700	51400	62900	63400	52400
Lead	7439-92-1	E440/VA	0.50	mg/kg		346	340	1180	313	397
Lithium	7439-93-2	E440/VA	2.0	mg/kg		38.0	66.1	28.3	31.4	50.7
Magnesium	7439-95-4	E440/VA	20	mg/kg		10900	10500	11600	12600	11800
Manganese	7439-96-5	E440/VA	1.0	mg/kg		816	723	818	1500	812
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		0.0918	0.0638	0.0903	0.139	0.0866
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		25.6	18.7	19.3	27.1	18.7
Nickel	7440-02-0	E440/VA	0.50	mg/kg		371	102	162	188	321
Phosphorus	7723-14-0	E440/VA	50	mg/kg		9360	11300	8670	9550	8330
Potassium	7440-09-7	E440/VA	100	mg/kg		6500	6570	6570	6900	6910
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.36	0.40	0.47	0.38	0.48
Silver	7440-22-4	E440/VA	0.10	mg/kg		8.09	6.53	6.81	12.0	15.4
Sodium	7440-23-5	E440/VA	50	mg/kg		18800	19400	17800	19500	18600
Strontium	7440-24-6	E440/VA	0.50	mg/kg		288	283	263	290	278
Sulfur	7704-34-9	E440/VA	1000	mg/kg		12200	13400	12100	12900	12400

Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA 2416-A-6	BA 2416-A-7	BA 2416-A-8	BA 2416-A-9	BA 2416-A-10
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00
						VA24A8696-006	VA24A8696-007	VA24A8696-008	VA24A8696-009	VA24A8696-010
						Result	Result	Result	Result	Result
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		0.054	0.057	0.053	0.057	0.098
Tin	7440-31-5	E440/VA	2.0	mg/kg		150	173	101	116	101
Titanium	7440-32-6	E440/VA	1.0	mg/kg		398	318	311	336	525
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		32.0	34.4	50.6	47.4	38.7
Uranium	7440-61-1	E440/VA	0.050	mg/kg		3.17	3.37	3.11	3.48	3.18
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		41.6	39.4	40.0	46.3	45.3
Zinc	7440-66-6	E440/VA	2.0	mg/kg		3750	4010	3780	3990	3870
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		2.6	2.6	2.5	2.4	2.3
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.5	11.5	11.4	11.5	11.4
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		5.24	5.54	5.24	5.39	5.42
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.85	2.85	2.85	2.85	2.85
pH, TCLP final	----	EPP444/VA	0.010	pH units		6.55	6.51	7.25	7.15	7.35
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L		<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L		<2.5	<2.5	<2.5	<2.5	<2.5
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L		<0.025	<0.025	<0.025	<0.025	<0.025
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L		2.04	1.88	1.88	1.81	1.77
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.223	0.209	0.141	0.112	0.075
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2050	1910	1860	1790	1740
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L		1.31	0.913	0.501	0.368	0.415
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.780	0.815	0.578	0.528	0.489
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L		127	118	109	98.9	94.2
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L		0.45	0.37	0.27	<0.25	<0.25
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA 2416-A-6	BA 2416-A-7	BA 2416-A-8	BA 2416-A-9	BA 2416-A-10
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00	17-Apr-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A8696-006	VA24A8696-007	VA24A8696-008	VA24A8696-009	VA24A8696-010
						Result	Result	Result	Result	Result
TCLP Metals										
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L		25.0	23.9	3.70	3.77	2.10
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L		<10	<10	<10	<10	<10

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)				Client sample ID	BA 2416-A-11	BA 2416-A-12	----	----	----
				Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A8696-011	VA24A8696-012	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Moisture	----	E144/VA	0.25	%	24.9	25.2	----	----	----
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	10.4	10.5	----	----	----
Metals									
Aluminum	7429-90-5	E440/VA	50	mg/kg	31600	32900	----	----	----
Antimony	7440-36-0	E440/VA	0.10	mg/kg	98.7	117	----	----	----
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	17.5	19.6	----	----	----
Barium	7440-39-3	E440/VA	0.50	mg/kg	461	416	----	----	----
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.35	0.31	----	----	----
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	8.35	10.4	----	----	----
Boron	7440-42-8	E440/VA	5.0	mg/kg	189	180	----	----	----
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	128	13.8	----	----	----
Calcium	7440-70-2	E440/VA	50	mg/kg	136000	136000	----	----	----
Chromium	7440-47-3	E440/VA	0.50	mg/kg	181	254	----	----	----
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	59.2	118	----	----	----
Copper	7440-50-8	E440/VA	0.50	mg/kg	1810	7380	----	----	----
Iron	7439-89-6	E440/VA	50	mg/kg	52900	97600	----	----	----
Lead	7439-92-1	E440/VA	0.50	mg/kg	298	481	----	----	----
Lithium	7439-93-2	E440/VA	2.0	mg/kg	23.2	27.0	----	----	----
Magnesium	7439-95-4	E440/VA	20	mg/kg	11200	11300	----	----	----
Manganese	7439-96-5	E440/VA	1.0	mg/kg	792	1110	----	----	----
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	0.0696	0.0622	----	----	----
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	36.8	30.3	----	----	----
Nickel	7440-02-0	E440/VA	0.50	mg/kg	423	263	----	----	----
Phosphorus	7723-14-0	E440/VA	50	mg/kg	8140	9710	----	----	----
Potassium	7440-09-7	E440/VA	100	mg/kg	6750	6020	----	----	----
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.34	0.45	----	----	----
Silver	7440-22-4	E440/VA	0.10	mg/kg	7.53	10.7	----	----	----
Sodium	7440-23-5	E440/VA	50	mg/kg	18900	17100	----	----	----
Strontium	7440-24-6	E440/VA	0.50	mg/kg	266	266	----	----	----
Sulfur	7704-34-9	E440/VA	1000	mg/kg	12000	11900	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA 2416-A-11	BA 2416-A-12	----	----	----
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A8696-011	VA24A8696-012	--------	--------	--------
						Result	Result	----	----	----
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	0.052	----	----	----
Tin	7440-31-5	E440/VA	2.0	mg/kg		101	325	----	----	----
Titanium	7440-32-6	E440/VA	1.0	mg/kg		295	338	----	----	----
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		27.6	42.7	----	----	----
Uranium	7440-61-1	E440/VA	0.050	mg/kg		3.14	3.22	----	----	----
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		40.1	39.2	----	----	----
Zinc	7440-66-6	E440/VA	2.0	mg/kg		4040	5720	----	----	----
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		1.9	2.3	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.4	11.5	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		5.58	5.26	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.85	2.85	----	----	----
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.26	7.32	----	----	----
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L		<1.00	<1.00	----	----	----
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L		<1.0	<1.0	----	----	----
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L		<2.5	<2.5	----	----	----
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L		<0.025	<0.025	----	----	----
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L		1.88	1.82	----	----	----
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.086	0.079	----	----	----
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		1790	1850	----	----	----
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L		<0.25	<0.25	----	----	----
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L		0.319	0.367	----	----	----
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.537	0.566	----	----	----
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L		<5.0	<5.0	----	----	----
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L		<0.25	<0.25	----	----	----
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L		99.9	105	----	----	----
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L		<0.0010	<0.0010	----	----	----
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L		0.34	<0.25	----	----	----
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L		<0.10	<0.10	----	----	----
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L		<0.050	<0.050	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA 2416-A-11	BA 2416-A-12	----	----	----
					Client sampling date / time	17-Apr-2024 09:00	17-Apr-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A8696-011	VA24A8696-012	--------	--------	--------
						Result	Result	----	----	----
TCLP Metals										
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L		<1.0	<1.0	----	----	----
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L		<0.20	<0.20	----	----	----
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L		<0.15	<0.15	----	----	----
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L		2.77	1.96	----	----	----
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L		<10	<10	----	----	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA24A8696**	Page	: 1 of 16
Client	: **Covanta Burnaby Renewable Energy, ULC**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 23-Apr-2024 14:35
PO	: VANCO0000052919	Issue Date	: 01-May-2024 16:49
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Covanta Burnaby Standing Offer 2024		
No. of samples received	: 12		
No. of samples analysed	: 12		

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 Service 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 Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- Duplicate outliers occur - please see following pages for full details.
- 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.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Metals	QC-MRG2-1419116 001	----	Aluminum	7429-90-5	E440	58 mg/kg B	50 mg/kg	Blank result exceeds permitted value
Metals	QC-MRG2-1419116 001	----	Barium	7440-39-3	E440	1.65 mg/kg B	0.5 mg/kg	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Duplicate (DUP) RPDs								
Metals	VA24A8696-001	BA 2416-A-1	Arsenic	7440-38-2	E440	36.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Bismuth	7440-69-9	E440	52.1 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Chromium	7440-47-3	E440	35.9 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Cobalt	7440-48-4	E440	37.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Copper	7440-50-8	E440	58.1 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Manganese	7439-96-5	E440	155 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Titanium	7440-32-6	E440	54.6 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A8696-001	BA 2416-A-1	Tungsten	7440-33-7	E440	40.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*

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: **Soil/Solid**

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

Analyte Group : Analytical Method / 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
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-1	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-10	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-11	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-12	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-2	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-3	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-4	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-5	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-6	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-7	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-8	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA 2416-A-9	E510	17-Apr-2024	29-Apr-2024	28 days	12 days	✓	30-Apr-2024	28 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-1	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-10	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-11	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-12	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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*
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-2	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-3	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-4	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-5	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-6	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-7	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-8	E440	17-Apr-2024	29-Apr-2024	180 days	12 days	✓	01-May-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA 2416-A-9	E440	17-Apr-2024	29-Apr-2024	180 days	14 days	✓	01-May-2024	180 days	14 days	✓
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-1	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-10	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-11	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-12	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-2	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-3	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-4	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-5	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-6	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-7	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-8	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA 2416-A-9	E144	17-Apr-2024	----	----	----		26-Apr-2024	----	9 days	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-1	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-10	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-11	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-12	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-2	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-3	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-4	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-5	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-6	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-7	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-8	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA 2416-A-9	E108	17-Apr-2024	29-Apr-2024	30 days	12 days	✓	29-Apr-2024	30 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2416-A-1	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2416-A-10	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2416-A-11	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA 2416-A-12	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-2	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-3	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-4	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-5	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-6	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-7	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-8	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved)										
BA 2416-A-9	E512	24-Apr-2024	26-Apr-2024	35 days	9 days	✓	26-Apr-2024	35 days	9 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved)										
BA 2416-A-1	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-10	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-11	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-12	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-2	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-3	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-4	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-5	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-6	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-7	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / 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*
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-8	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA 2416-A-9	E444	24-Apr-2024	26-Apr-2024	187 days	9 days	✓	26-Apr-2024	187 days	10 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-1	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-10	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-11	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-12	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-2	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-3	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA 2416-A-4	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS)										
BA 2416-A-5	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS)										
BA 2416-A-6	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS)										
BA 2416-A-7	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS)										
BA 2416-A-8	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS)										
BA 2416-A-9	EPP444	17-Apr-2024	24-Apr-2024	----	----		----	28 days	7 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: **Soil/Solid**

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)							
Mercury by CVAAS (TCLP)	E512	1418504	1	12	8.3	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1419116	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1418505	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1419117	2	17	11.7	5.0	✓
Moisture Content by Gravimetry	E144	1419119	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1419118	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Mercury in Soil/Solid by CVAAS	E510	1419116	2	12	16.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1419117	3	17	17.6	10.0	✓
Moisture Content by Gravimetry	E144	1419119	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1419118	1	12	8.3	5.0	✓
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	1418504	1	12	8.3	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1419116	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1418505	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1419117	1	17	5.8	5.0	✓
Moisture Content by Gravimetry	E144	1419119	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1418504	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1418505	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
pH by Meter (1:2 Soil:Water Extraction)	E108 ALS Environmental - Vancouver	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 ALS Environmental - Vancouver	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Vancouver	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Metals by CRC ICPMS (TCLP)	E444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311/6020B (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 ALS Environmental - Vancouver	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512 ALS Environmental - Vancouver	Soil/Solid	SW 846 -1311/245.1 CVAA ON TCLP LEACHATE	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Vancouver	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 ALS Environmental - Vancouver	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.

QUALITY CONTROL REPORT

Work Order	: **VA24A8696**	Page	: 1 of 12
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 23-Apr-2024 14:35
PO	: VANCO0000052919	Date Analysis Commenced	: 24-Apr-2024
C-O-C number	: ----	Issue Date	: 01-May-2024 16:49
Sampler	: ----		
Site	: ----		
Quote number	: Covanta Burnaby Standing Offer 2024		
No. of samples received	: 12		
No. of samples analysed	: 12		

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 Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

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*
Ghazaleh Khanmirzaei	Analyst	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Vancouver Metals, 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 Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent 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: **Soil/Solid**

					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
Physical Tests (QC Lot: 1419118)											
VA24A8696-001	BA 2416-A-1	pH (1:2 soil:water)	----	E108	0.10	pH units	10.4	10.4	0.2%	5%	----
Physical Tests (QC Lot: 1419119)											
VA24A8696-001	BA 2416-A-1	Moisture	----	E144	0.25	%	24.2	25.6	5.70%	20%	----
Metals (QC Lot: 1419116)											
VA24A8696-001	BA 2416-A-1	Mercury	7439-97-6	E510	0.0500	mg/kg	0.0984	0.0795	0.0189	Diff <2x LOR	----
Metals (QC Lot: 1419117)											
VA24A8696-001	BA 2416-A-1	Bismuth	7440-69-9	E440	0.20	mg/kg	12.0	7.06	52.1%	30%	DUP-H
VA24A8696-001	BA 2416-A-1	Aluminum	7429-90-5	E440	50	mg/kg	37400	34100	9.25%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	108	84.3	24.9%	30%	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	23.1	16.0	36.0%	30%	DUP-H
		Barium	7440-39-3	E440	0.50	mg/kg	379	344	9.57%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.37	0.35	0.02	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	174	203	15.4%	30%	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	14.9	14.1	5.88%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	148000	124000	17.1%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	156	224	35.9%	30%	DUP-H
		Cobalt	7440-48-4	E440	0.10	mg/kg	75.0	109	37.2%	30%	DUP-H
		Copper	7440-50-8	E440	0.50	mg/kg	3120	1720	58.1%	30%	DUP-H
		Iron	7439-89-6	E440	50	mg/kg	56500	61000	7.55%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	388	281	32.0%	40%	----
		Lithium	7439-93-2	E440	2.0	mg/kg	28.9	29.4	1.71%	30%	----
		Magnesium	7439-95-4	E440	20	mg/kg	12500	10400	17.6%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	739	5810	155%	30%	DUP-H
		Molybdenum	7439-98-7	E440	0.10	mg/kg	19.7	26.5	29.4%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	219	258	16.1%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	9860	8550	14.2%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	6770	6450	4.83%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.40	0.37	0.03	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	12.6	12.2	2.50%	40%	----
		Sodium	7440-23-5	E440	50	mg/kg	20100	17500	14.1%	40%	----

Sub-Matrix: **Soil/Solid**

					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*
Metals (QC Lot: 1419117) - continued											
VA24A8696-001	BA 2416-A-1	Strontium	7440-24-6	E440	0.50	mg/kg	294	312	5.83%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	13600	11300	18.4%	30%	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.053	<0.050	0.003	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	131	95.4	31.5%	40%	----
		Titanium	7440-32-6	E440	1.0	mg/kg	402	229	54.6%	40%	DUP-H
		Tungsten	7440-33-7	E440	0.50	mg/kg	34.4	22.9	40.2%	30%	DUP-H
		Uranium	7440-61-1	E440	0.050	mg/kg	3.27	2.91	11.8%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	42.1	38.3	9.54%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	3740	4210	11.7%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	1.9	3.8	1.8	Diff <2x LOR	----
TCLP Metals (QC Lot: 1418504)											
VA24A8696-001	BA 2416-A-1	Mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
TCLP Metals (QC Lot: 1418505)											
VA24A8696-001	BA 2416-A-1	Antimony, TCLP	7440-36-0	E444	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	0	Diff <2x LOR	----
		Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	0	Diff <2x LOR	----
		Boron, TCLP	7440-42-8	E444	0.50	mg/L	2.04	2.06	0.02	Diff <2x LOR	----
		Cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.258	0.260	0.002	Diff <2x LOR	----
		Calcium, TCLP	7440-70-2	E444	10	mg/L	1990	2010	1.02%	30%	----
		Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	----
		Cobalt, TCLP	7440-48-4	E444	0.050	mg/L	0.854	0.873	2.13%	30%	----
		Copper, TCLP	7440-50-8	E444	0.050	mg/L	0.653	0.660	1.11%	30%	----
		Iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	----
		Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	122	124	2.50%	30%	----
		Nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.43	0.43	0.0004	Diff <2x LOR	----
		Selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	0	Diff <2x LOR	----
		Zinc, TCLP	7440-66-6	E444	0.50	mg/L	40.6	41.3	1.72%	30%	----
		Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	<10	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

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: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1419119)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1419116)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1419117)						
Aluminum	7429-90-5	E440	50	mg/kg	# 58	B
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	# 1.65	B
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Calcium	7440-70-2	E440	50	mg/kg	<50	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Lithium	7439-93-2	E440	2	mg/kg	<2.0	----
Magnesium	7439-95-4	E440	20	mg/kg	<20	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Phosphorus	7723-14-0	E440	50	mg/kg	<50	----
Potassium	7440-09-7	E440	100	mg/kg	<100	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Sodium	7440-23-5	E440	50	mg/kg	<50	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1419117) - continued						
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
TCLP Metals (QCLot: 1418504)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 1418505)						
Antimony, TCLP	7440-36-0	E444	0.1	mg/L	<0.10	----
Arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
Calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
Cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
Copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
Iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
Nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
Thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	<0.20	----
Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
Zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----
Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	----

Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

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: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1419118)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.5	95.0	105	----
Physical Tests (QCLot: 1419119)									
Moisture	----	E144	0.25	%	50 %	99.8	90.0	110	----
Metals (QCLot: 1419116)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	102	80.0	120	----
Metals (QCLot: 1419117)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	120	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	102	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	103	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	101	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	98.9	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	98.1	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	100	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	101	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	99.1	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	98.7	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	97.2	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	105	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	100	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	101	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	99.5	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	97.2	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	104	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	97.2	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	110	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	98.8	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	103	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	92.9	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	99.8	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	110	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1419117) - continued									
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	102	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	101	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	94.8	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	100	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	104	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	107	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	102	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	101	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	106	80.0	120	----

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: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
TCLP Metals (QCLot: 1418504)										
VA24A8696-001	BA 2416-A-1	Mercury, TCLP	7439-97-6	E512	0.0009 mg/L	0.001 mg/L	92.4	50.0	140	----
TCLP Metals (QCLot: 1418505)										
VA24A8696-001	BA 2416-A-1	Antimony, TCLP	7440-36-0	E444	5.33 mg/L	5 mg/L	106	50.0	140	----
		Arsenic, TCLP	7440-38-2	E444	5.3 mg/L	5 mg/L	105	50.0	140	----
		Barium, TCLP	7440-39-3	E444	11.4 mg/L	12.5 mg/L	90.9	50.0	140	----
		Beryllium, TCLP	7440-41-7	E444	0.247 mg/L	0.25 mg/L	99.0	50.0	140	----
		Boron, TCLP	7440-42-8	E444	9.15 mg/L	10 mg/L	91.5	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	ND mg/L	----	ND	50.0	140	----
		Calcium, TCLP	7440-70-2	E444	ND mg/L	----	ND	50.0	140	----
		Chromium, TCLP	7440-47-3	E444	1.28 mg/L	1.25 mg/L	102	50.0	140	----
		Cobalt, TCLP	7440-48-4	E444	ND mg/L	----	ND	50.0	140	----
		Copper, TCLP	7440-50-8	E444	2.36 mg/L	2.5 mg/L	94.2	50.0	140	----
		Iron, TCLP	7439-89-6	E444	237 mg/L	250 mg/L	94.7	50.0	140	----
		Lead, TCLP	7439-92-1	E444	9.92 mg/L	10 mg/L	99.2	50.0	140	----
		Magnesium, TCLP	7439-95-4	E444	267 mg/L	250 mg/L	107	50.0	140	----
		Nickel, TCLP	7440-02-0	E444	2.44 mg/L	2.5 mg/L	97.5	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	4.82 mg/L	5 mg/L	96.4	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.092 mg/L	0.1 mg/L	92.0	50.0	140	----
		Thallium, TCLP	7440-28-0	E444	5.0 mg/L	5 mg/L	101	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	4.95 mg/L	5 mg/L	99.1	50.0	150	----
		Vanadium, TCLP	7440-62-2	E444	0.75 mg/L	0.75 mg/L	100	50.0	140	----
		Zinc, TCLP	7440-66-6	E444	ND mg/L	----	ND	50.0	140	----
		Zirconium, TCLP	7440-67-7	E444	0.9 mg/L	1 mg/L	94.4	50.0	150	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1419116)									
QC-1419116-003	MRCA-21	Mercury	7439-97-6	E510	0.068 mg/kg	101	70.0	130	----
Metals (QCLot: 1419117)									
QC-1419117-003	MRCA-21	Aluminum	7429-90-5	E440	22500 mg/kg	102	70.0	130	----
QC-1419117-003	MRCA-21	Antimony	7440-36-0	E440	24.8 mg/kg	93.3	70.0	130	----
QC-1419117-003	MRCA-21	Arsenic	7440-38-2	E440	21.2 mg/kg	98.7	70.0	130	----
QC-1419117-003	MRCA-21	Barium	7440-39-3	E440	788 mg/kg	91.8	70.0	130	----
QC-1419117-003	MRCA-21	Beryllium	7440-41-7	E440	1.82 mg/kg	108	70.0	130	----
QC-1419117-003	MRCA-21	Bismuth	7440-69-9	E440	1.78 mg/kg	91.6	70.0	130	----
QC-1419117-003	MRCA-21	Cadmium	7440-43-9	E440	2.15 mg/kg	102	70.0	130	----
QC-1419117-003	MRCA-21	Calcium	7440-70-2	E440	4900 mg/kg	105	70.0	130	----
QC-1419117-003	MRCA-21	Chromium	7440-47-3	E440	56.9 mg/kg	100	70.0	130	----
QC-1419117-003	MRCA-21	Cobalt	7440-48-4	E440	32 mg/kg	98.7	70.0	130	----
QC-1419117-003	MRCA-21	Copper	7440-50-8	E440	969 mg/kg	95.8	70.0	130	----
QC-1419117-003	MRCA-21	Iron	7439-89-6	E440	32700 mg/kg	103	70.0	130	----
QC-1419117-003	MRCA-21	Lead	7439-92-1	E440	919 mg/kg	98.2	70.0	130	----
QC-1419117-003	MRCA-21	Lithium	7439-93-2	E440	47.3 mg/kg	113	70.0	130	----
QC-1419117-003	MRCA-21	Magnesium	7439-95-4	E440	7780 mg/kg	94.2	70.0	130	----
QC-1419117-003	MRCA-21	Manganese	7439-96-5	E440	8640 mg/kg	98.4	70.0	130	----
QC-1419117-003	MRCA-21	Molybdenum	7439-98-7	E440	25.1 mg/kg	99.3	70.0	130	----
QC-1419117-003	MRCA-21	Nickel	7440-02-0	E440	1000 mg/kg	93.9	70.0	130	----
QC-1419117-003	MRCA-21	Phosphorus	7723-14-0	E440	660 mg/kg	112	70.0	130	----
QC-1419117-003	MRCA-21	Potassium	7440-09-7	E440	10800 mg/kg	101	70.0	130	----
QC-1419117-003	MRCA-21	Selenium	7782-49-2	E440	1.04 mg/kg	101	60.0	140	----
QC-1419117-003	MRCA-21	Silver	7440-22-4	E440	8.98 mg/kg	100	70.0	130	----
QC-1419117-003	MRCA-21	Sodium	7440-23-5	E440	1770 mg/kg	106	70.0	130	----
QC-1419117-003	MRCA-21	Strontium	7440-24-6	E440	41 mg/kg	102	70.0	130	----
QC-1419117-003	MRCA-21	Sulfur	7704-34-9	E440	3940 mg/kg	100	50.0	150	----
QC-1419117-003	MRCA-21	Thallium	7440-28-0	E440	0.907 mg/kg	96.0	70.0	130	----
QC-1419117-003	MRCA-21	Tin	7440-31-5	E440	3.79 mg/kg	99.3	40.0	160	----
QC-1419117-003	MRCA-21	Titanium	7440-32-6	E440	2790 mg/kg	103	70.0	130	----
QC-1419117-003	MRCA-21	Tungsten	7440-33-7	E440	6.99 mg/kg	113	70.0	130	----
QC-1419117-003	MRCA-21	Uranium	7440-61-1	E440	3.97 mg/kg	124	70.0	130	----
QC-1419117-003	MRCA-21	Vanadium	7440-62-2	E440	66.2 mg/kg	101	70.0	130	----

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Metals (QCLot: 1419117) - continued									
QC-1419117-003	MRCA-21	Zinc	7440-66-6	E440	828 mg/kg	98.0	70.0	130	----
QC-1419117-003	MRCA-21	Zirconium	7440-67-7	E440	6.91 mg/kg	104	70.0	130	----

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COC #

Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Covanta Energy			☐ Standard ☐ Other				◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Nicole Victor / Dan Skrypnyk			☑ PDF ☐ Excel ☐ Digital ☐ Fax				○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	5150 Riverbend Drive			Email 1:	nvictor@covanta.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Burnaby BC			Email 2:	rminchin@covanta.com			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-521-1025	Fax:		Email 3:	dskrypnyk@covanta.com			**Analysis Request**
		☐ Yes	☐ No		brent.kirkpatrick@metrovancouver.org			
					Sarah.Wellman@metrovancouver.org			
Invoice To	Same as Report ?			**Client / Project Information**				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?		☐ Yes	☐ No	Job #:				
Company:				PO / AFE:	PO# _VANCO 00000 Weekly Bottom Ash -			
Contact:				LSD:	(includes 2:1 pH)			
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)	A8696			**ALS Contact:**		**Sampler:**		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)	Number of Containers
	BA 2416-A-1	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-2	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-3	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-4	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-5	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-6	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-7	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-8	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-9	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-10	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-11	17-Apr-24	9:00	Soil	X	X		X	1
	BA 2416-A-12	17-Apr-24	9:00	Soil	X	X		X	1

Environmental Division
Vancouver
Work Order Reference
VA24A8696

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

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
kinglis	22/04/2024		CW	Apr 23	1435	23 °C				