metrovancouver

Bottom Ash Data

2024 Week 7

The following analytical report represents bottom ash composite results for week 7 of 2024 (February 11, 2024 to February 17, 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	: **VA24A3381**	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	: 21-Feb-2024 15:00
PO	: VANCO0000052919	Date Analysis Commenced	: 24-Feb-2024
C-O-C number	: ----	Issue Date	: 01-Mar-2024 13:39
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
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
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Organics, Burnaby, British Columbia
Robert Nguyen	Analyst	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/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-1	BA2407-A-2	BA2407-A-3	BA2407-A-4	BA2407-A-5
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00
						VA24A3381-001	VA24A3381-002	VA24A3381-003	VA24A3381-004	VA24A3381-005
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/VA	0.25	%		24.5	24.2	24.3	25.0	23.9
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		12.5	12.5	12.5	12.4	12.5
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		35700	36200	30900	31700	39700
Antimony	7440-36-0	E440/VA	0.10	mg/kg		148	171	148	152	166
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		23.6	25.0	25.6	23.8	41.1
Barium	7440-39-3	E440/VA	0.50	mg/kg		504	473	472	429	428
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.41	0.46	0.43	0.42	0.47
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		10.3	11.5	10.9	10.9	12.1
Boron	7440-42-8	E440/VA	5.0	mg/kg		234	314	271	270	264
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		13.7	13.8	14.3	12.0	13.2
Calcium	7440-70-2	E440/VA	50	mg/kg		169000	176000	165000	169000	168000
Chromium	7440-47-3	E440/VA	0.50	mg/kg		310	172	231	158	228
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		70.7	152	113	31.4	263
Copper	7440-50-8	E440/VA	0.50	mg/kg		1710	3410	1630	3280	2640
Iron	7439-89-6	E440/VA	50	mg/kg		58400	57600	56500	60100	52900
Lead	7439-92-1	E440/VA	0.50	mg/kg		502	825	330	1330	412
Lithium	7439-93-2	E440/VA	2.0	mg/kg		33.6	40.8	30.4	30.4	40.2
Magnesium	7439-95-4	E440/VA	20	mg/kg		12600	13200	12500	12200	12400
Manganese	7439-96-5	E440/VA	1.0	mg/kg		985	930	816	1160	827
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		0.293	0.166	0.260	0.149	0.148
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		26.9	24.5	22.5	21.4	49.5
Nickel	7440-02-0	E440/VA	0.50	mg/kg		225	222	268	494	359
Phosphorus	7723-14-0	E440/VA	50	mg/kg		10200	11300	11000	12100	11800
Potassium	7440-09-7	E440/VA	100	mg/kg		6080	6430	6240	6420	6420
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.50	0.57	0.54	0.52	0.45
Silver	7440-22-4	E440/VA	0.10	mg/kg		13.1	10.7	8.38	6.73	10.3
Sodium	7440-23-5	E440/VA	50	mg/kg		17600	19000	18400	19300	18000
Strontium	7440-24-6	E440/VA	0.50	mg/kg		331	341	318	315	328

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-1	BA2407-A-2	BA2407-A-3	BA2407-A-4	BA2407-A-5
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00
						VA24A3381-001	VA24A3381-002	VA24A3381-003	VA24A3381-004	VA24A3381-005
						Result	Result	Result	Result	Result
Metals										
Sulfur	7704-34-9	E440/VA	1000	mg/kg		13800	14500	13800	13200	13800
Thallium	7440-28-0	E440/VA	0.050	mg/kg		0.054	<0.050	<0.050	<0.050	<0.050
Tin	7440-31-5	E440/VA	2.0	mg/kg		127	152	125	164	193
Titanium	7440-32-6	E440/VA	1.0	mg/kg		288	276	234	207	267
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		15.6	14.6	20.3	12.1	18.1
Uranium	7440-61-1	E440/VA	0.050	mg/kg		4.07	4.29	3.80	4.16	4.22
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		45.6	47.1	44.7	42.3	46.9
Zinc	7440-66-6	E440/VA	2.0	mg/kg		6040	5180	4640	5060	4720
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		1.6	1.8	1.8	2.2	2.4
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		12.0	12.0	12.0	12.1	12.0
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		6.68	7.75	7.37	6.71	8.17
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.92	2.92	2.92	2.92	2.92
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.89	7.94	7.78	7.87	7.19
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		2.47	2.51	2.45	2.44	2.69
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	0.106
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2500	2470	2420	2460	2420
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		0.171	0.238	0.298	0.226	0.546
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.772	0.834	0.777	0.785	0.776
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		126	122	123	121	126
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		<0.25	<0.25	<0.25	<0.25	0.28
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/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-1	BA2407-A-2	BA2407-A-3	BA2407-A-4	BA2407-A-5
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00
						VA24A3381-001	VA24A3381-002	VA24A3381-003	VA24A3381-004	VA24A3381-005
						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		<0.50	<0.50	<0.50	<0.50	5.94
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/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-6	BA2407-A-7	BA2407-A-8	BA2407-A-9	BA2407-A-10
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00
						VA24A3381-006	VA24A3381-007	VA24A3381-008	VA24A3381-009	VA24A3381-010
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/VA	0.25	%		23.6	23.4	23.8	23.4	23.8
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		12.5	12.5	12.5	12.5	12.5
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		40400	30400	35000	42400	37300
Antimony	7440-36-0	E440/VA	0.10	mg/kg		126	142	143	157	172
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		21.8	22.8	23.4	22.3	25.0
Barium	7440-39-3	E440/VA	0.50	mg/kg		386	397	426	488	434
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.41	0.41	0.40	0.77	0.44
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		9.94	13.0	11.5	14.1	12.9
Boron	7440-42-8	E440/VA	5.0	mg/kg		226	212	230	265	242
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		15.4	12.8	12.4	15.8	15.3
Calcium	7440-70-2	E440/VA	50	mg/kg		159000	167000	162000	161000	179000
Chromium	7440-47-3	E440/VA	0.50	mg/kg		190	174	192	225	167
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		91.7	164	61.7	76.8	124
Copper	7440-50-8	E440/VA	0.50	mg/kg		2880	2320	4510	3290	4890
Iron	7439-89-6	E440/VA	50	mg/kg		46800	52600	56500	48500	48100
Lead	7439-92-1	E440/VA	0.50	mg/kg		340	1480	432	496	553
Lithium	7439-93-2	E440/VA	2.0	mg/kg		31.9	33.3	32.3	31.5	35.7
Magnesium	7439-95-4	E440/VA	20	mg/kg		11600	12200	12100	12000	11900
Manganese	7439-96-5	E440/VA	1.0	mg/kg		832	1120	838	885	828
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		0.219	0.136	0.147	0.150	0.158
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		30.4	35.5	25.2	26.5	32.9
Nickel	7440-02-0	E440/VA	0.50	mg/kg		292	168	193	214	232
Phosphorus	7723-14-0	E440/VA	50	mg/kg		9790	10800	10600	10500	10800
Potassium	7440-09-7	E440/VA	100	mg/kg		6020	6130	6600	6780	5730
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.39	0.42	0.40	0.46	0.57
Silver	7440-22-4	E440/VA	0.10	mg/kg		6.88	7.87	7.11	9.22	8.08
Sodium	7440-23-5	E440/VA	50	mg/kg		16500	17800	18400	18000	17000
Strontium	7440-24-6	E440/VA	0.50	mg/kg		329	313	324	321	377
Sulfur	7704-34-9	E440/VA	1000	mg/kg		12000	13100	12600	15000	14100

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-6	BA2407-A-7	BA2407-A-8	BA2407-A-9	BA2407-A-10
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00
						VA24A3381-006	VA24A3381-007	VA24A3381-008	VA24A3381-009	VA24A3381-010
						Result	Result	Result	Result	Result
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	0.055
Tin	7440-31-5	E440/VA	2.0	mg/kg		140	202	171	139	150
Titanium	7440-32-6	E440/VA	1.0	mg/kg		190	152	179	265	226
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		8.62	10.2	11.0	10.4	15.2
Uranium	7440-61-1	E440/VA	0.050	mg/kg		4.06	4.07	4.20	4.18	4.56
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		42.1	44.7	44.8	49.4	44.8
Zinc	7440-66-6	E440/VA	2.0	mg/kg		7200	4220	4360	4710	8680
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		4.0	2.0	2.2	2.0	1.7
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		12.1	11.9	12.0	12.0	12.0
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		8.33	6.53	6.45	7.87	6.99
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.92	2.92	2.92	2.92	2.92
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.69	7.36	7.31	7.66	7.67
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		2.73	2.47	2.57	2.55	2.67
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		<0.050	0.070	0.091	0.091	<0.050
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2480	2380	2480	2450	2540
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		0.319	0.418	1.12	0.481	0.404
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.756	0.887	0.861	0.887	0.876
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		123	122	122	124	126
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		<0.25	0.29	0.35	<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/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-6	BA2407-A-7	BA2407-A-8	BA2407-A-9	BA2407-A-10
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00	14-Feb-2024 09:00
						VA24A3381-006	VA24A3381-007	VA24A3381-008	VA24A3381-009	VA24A3381-010
						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		0.70	4.08	9.17	0.92	0.58
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/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-11	BA2407-A-12	----	----	----
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	----	----	----
						VA24A3381-011	VA24A3381-012	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Moisture	----	E144/VA	0.25	%		25.0	22.8	----	----	----
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		12.5	12.5	----	----	----
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		33100	39400	----	----	----
Antimony	7440-36-0	E440/VA	0.10	mg/kg		146	164	----	----	----
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		20.1	22.6	----	----	----
Barium	7440-39-3	E440/VA	0.50	mg/kg		425	412	----	----	----
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.41	0.46	----	----	----
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		9.87	10.7	----	----	----
Boron	7440-42-8	E440/VA	5.0	mg/kg		307	257	----	----	----
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		13.2	16.8	----	----	----
Calcium	7440-70-2	E440/VA	50	mg/kg		166000	171000	----	----	----
Chromium	7440-47-3	E440/VA	0.50	mg/kg		165	179	----	----	----
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		46.4	152	----	----	----
Copper	7440-50-8	E440/VA	0.50	mg/kg		26400	14200	----	----	----
Iron	7439-89-6	E440/VA	50	mg/kg		61500	55400	----	----	----
Lead	7439-92-1	E440/VA	0.50	mg/kg		495	555	----	----	----
Lithium	7439-93-2	E440/VA	2.0	mg/kg		30.0	30.4	----	----	----
Magnesium	7439-95-4	E440/VA	20	mg/kg		11200	11200	----	----	----
Manganese	7439-96-5	E440/VA	1.0	mg/kg		775	884	----	----	----
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		0.177	0.168	----	----	----
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		27.8	23.5	----	----	----
Nickel	7440-02-0	E440/VA	0.50	mg/kg		171	208	----	----	----
Phosphorus	7723-14-0	E440/VA	50	mg/kg		9400	11100	----	----	----
Potassium	7440-09-7	E440/VA	100	mg/kg		5650	6520	----	----	----
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.41	0.45	----	----	----
Silver	7440-22-4	E440/VA	0.10	mg/kg		6.49	8.01	----	----	----
Sodium	7440-23-5	E440/VA	50	mg/kg		17100	16700	----	----	----
Strontium	7440-24-6	E440/VA	0.50	mg/kg		332	295	----	----	----
Sulfur	7704-34-9	E440/VA	1000	mg/kg		12300	15600	----	----	----

Analytical Results

Sub-Matrix: Soil/Solid (Matrix: Soil/Solid)					Client sample ID	BA2407-A-11	BA2407-A-12	----	----	----
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A3381-011	VA24A3381-012	--------	--------	--------
						Result	Result	----	----	----
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	<0.050	----	----	----
Tin	7440-31-5	E440/VA	2.0	mg/kg		129	148	----	----	----
Titanium	7440-32-6	E440/VA	1.0	mg/kg		196	302	----	----	----
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		10.5	15.8	----	----	----
Uranium	7440-61-1	E440/VA	0.050	mg/kg		3.92	4.15	----	----	----
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		41.6	45.6	----	----	----
Zinc	7440-66-6	E440/VA	2.0	mg/kg		7310	4280	----	----	----
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		2.4	2.8	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		12.1	12.0	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		8.31	7.64	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.92	2.92	----	----	----
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.77	7.70	----	----	----
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		2.57	2.38	----	----	----
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		<0.050	<0.050	----	----	----
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2450	2430	----	----	----
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		0.248	0.407	----	----	----
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.794	0.871	----	----	----
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		123	125	----	----	----
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		<0.25	<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/Solid (Matrix: Soil/Solid)					Client sample ID	BA2407-A-11	BA2407-A-12	----	----	----
					Client sampling date / time	14-Feb-2024 09:00	14-Feb-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A3381-011	VA24A3381-012	--------	--------	--------
						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		0.67	0.61	----	----	----
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.

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA24A3381**	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	: 21-Feb-2024 15:00
PO	: VANCO0000052919	Issue Date	: 01-Mar-2024 13:39
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
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 Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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
Duplicate (DUP) RPDs								
Metals	VA24A3381-001	BA2407-A-1	Cobalt	7440-48-4	E440	76.6 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Copper	7440-50-8	E440	55.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Lead	7439-92-1	E440	110 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Nickel	7440-02-0	E440	33.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Silver	7440-22-4	E440	45.4 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Tungsten	7440-33-7	E440	36.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Zinc	7440-66-6	E440	37.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A3381-001	BA2407-A-1	Mercury	7439-97-6	E510	0.162 % DUP-H, J	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).

Result Qualifiers

Qualifier	*Description*
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

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 BA2407-A-1	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-10	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-11	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-12	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-2	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-3	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-4	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 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 BA2407-A-5	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-6	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-7	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-8	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-9	E510	14-Feb-2024	29-Feb-2024	28 days	15 days	✓	29-Feb-2024	28 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-1	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-10	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-11	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-12	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 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 BA2407-A-2	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-3	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-4	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-5	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-6	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-7	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-8	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-9	E440	14-Feb-2024	29-Feb-2024	180 days	15 days	✓	29-Feb-2024	180 days	15 days	✓
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-1	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	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
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-10	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-11	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-12	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-2	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-3	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-4	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-5	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-6	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-7	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	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*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-8	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-9	E144	14-Feb-2024	----	----	----		28-Feb-2024	----	14 days	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-1	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-10	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-11	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-12	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-2	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-3	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-4	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 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 BA2407-A-5	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-6	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-7	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-8	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-9	E108	14-Feb-2024	29-Feb-2024	30 days	15 days	✓	29-Feb-2024	30 days	15 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-1	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-10	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-11	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-12	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 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*
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-2	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-3	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-4	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-5	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-6	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-7	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-8	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-9	E512	24-Feb-2024	28-Feb-2024	38 days	14 days	✓	28-Feb-2024	38 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-1	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 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) BA2407-A-10	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-11	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-12	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-2	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-3	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-4	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-5	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-6	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-7	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 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) BA2407-A-8	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-9	E444	24-Feb-2024	28-Feb-2024	190 days	14 days	✓	28-Feb-2024	190 days	15 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-1	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-10	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-11	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-12	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-2	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-3	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-4	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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*		*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) BA2407-A-5	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-6	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-7	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-8	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 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) BA2407-A-9	EPP444	14-Feb-2024	24-Feb-2024	----	----		----	28 days	10 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 in Soil/Solid by CVAAS	E510	1347641	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1347642	1	12	8.3	5.0	✓
Moisture Content by Gravimetry	E144	1347645	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1347644	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Mercury in Soil/Solid by CVAAS	E510	1347641	2	12	16.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1347642	2	12	16.6	10.0	✓
Moisture Content by Gravimetry	E144	1347645	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1347644	1	12	8.3	5.0	✓
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	1347639	1	12	8.3	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1347641	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1347640	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1347642	1	12	8.3	5.0	✓
Moisture Content by Gravimetry	E144	1347645	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1347639	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1347640	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	: **VA24A3381**	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, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 21-Feb-2024 15:00
PO	: VANCO0000052919	Date Analysis Commenced	: 24-Feb-2024
C-O-C number	: ----	Issue Date	: 01-Mar-2024 13:39
Sampler	: ---- ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
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
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Organics, Burnaby, British Columbia
Robert Nguyen	Analyst	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: 1347644)											
VA24A3381-001	BA2407-A-1	pH (1:2 soil:water)	----	E108	0.10	pH units	12.5	12.5	0.2%	5%	----
Physical Tests (QC Lot: 1347645)											
VA24A3381-001	BA2407-A-1	Moisture	----	E144	0.25	%	24.5	24.2	1.17%	20%	----
Metals (QC Lot: 1347641)											
VA24A3381-001	BA2407-A-1	Mercury	7439-97-6	E510	0.0500	mg/kg	0.293	# 0.130	0.162	Diff <2x LOR	DUP-H,J
Metals (QC Lot: 1347642)											
VA24A3381-001	BA2407-A-1	Aluminum	7429-90-5	E440	50	mg/kg	35700	36800	3.19%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	148	142	4.28%	30%	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	23.6	22.2	5.80%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	504	420	18.1%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.41	0.41	0.004	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	10.3	13.6	27.4%	30%	----
		Boron	7440-42-8	E440	5.0	mg/kg	234	200	15.7%	30%	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	13.7	15.0	8.80%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	169000	160000	5.77%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	310	254	19.9%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	70.7	158	76.6%	30%	DUP-H
		Copper	7440-50-8	E440	0.50	mg/kg	1710	3010	55.2%	30%	DUP-H
		Iron	7439-89-6	E440	50	mg/kg	58400	64100	9.33%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	502	1720	110%	40%	DUP-H
		Lithium	7439-93-2	E440	2.0	mg/kg	33.6	34.8	3.36%	30%	----
		Magnesium	7439-95-4	E440	20	mg/kg	12600	12200	3.53%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	985	942	4.48%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	26.9	27.7	2.87%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	225	315	33.2%	30%	DUP-H
		Phosphorus	7723-14-0	E440	50	mg/kg	10200	11800	15.1%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	6080	5920	2.60%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.50	0.43	0.08	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	13.1	8.24	45.4%	40%	DUP-H
		Sodium	7440-23-5	E440	50	mg/kg	17600	17800	0.630%	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: 1347642) - continued											
VA24A3381-001	BA2407-A-1	Strontium	7440-24-6	E440	0.50	mg/kg	331	384	14.8%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	13800	13800	0.294%	30%	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.054	0.063	0.009	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	127	169	28.6%	40%	----
		Titanium	7440-32-6	E440	1.0	mg/kg	288	215	28.9%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	15.6	10.8	36.0%	30%	DUP-H
		Uranium	7440-61-1	E440	0.050	mg/kg	4.07	4.04	0.850%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	45.6	47.3	3.64%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	6040	8800	37.2%	30%	DUP-H
		Zirconium	7440-67-7	E440	1.0	mg/kg	1.6	2.4	0.8	Diff <2x LOR	----

Qualifiers

Qualifier	*Description*
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

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: 1347645)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1347641)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1347642)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
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	<0.50	----
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: 1347642) - 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: 1347639)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 1347640)						
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	----

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	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1347644)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	100	95.0	105	----
Physical Tests (QCLot: 1347645)									
Moisture	----	E144	0.25	%	50 %	99.5	90.0	110	----
Metals (QCLot: 1347641)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	106	80.0	120	----
Metals (QCLot: 1347642)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	105	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	105	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	106	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	109	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	108	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	98.8	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	107	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	105	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	106	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	103	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	99.9	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	101	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	106	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	101	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	106	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	96.1	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	100	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	108	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	102	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	88.1	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	109	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	100	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.1	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1347642) - continued									
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	102	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	97.6	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	104	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	105	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	105	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	105	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	105	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	95.4	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: 1347639)										
VA24A3381-001	BA2407-A-1	Mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	100	50.0	140	----
TCLP Metals (QCLot: 1347640)										
VA24A3381-001	BA2407-A-1	Antimony, TCLP	7440-36-0	E444	5.16 mg/L	5 mg/L	103	50.0	140	----
		Arsenic, TCLP	7440-38-2	E444	5.0 mg/L	5 mg/L	101	50.0	140	----
		Barium, TCLP	7440-39-3	E444	13.7 mg/L	12.5 mg/L	110	50.0	140	----
		Beryllium, TCLP	7440-41-7	E444	0.257 mg/L	0.25 mg/L	103	50.0	140	----
		Boron, TCLP	7440-42-8	E444	10.4 mg/L	10 mg/L	104	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	0.238 mg/L	0.25 mg/L	95.3	50.0	140	----
		Calcium, TCLP	7440-70-2	E444	ND mg/L	250 mg/L	ND	50.0	140	----
		Chromium, TCLP	7440-47-3	E444	1.19 mg/L	1.25 mg/L	94.9	50.0	140	----
		Cobalt, TCLP	7440-48-4	E444	0.229 mg/L	0.25 mg/L	91.6	50.0	140	----
		Copper, TCLP	7440-50-8	E444	2.20 mg/L	2.5 mg/L	87.8	50.0	140	----
		Iron, TCLP	7439-89-6	E444	239 mg/L	250 mg/L	95.4	50.0	140	----
		Lead, TCLP	7439-92-1	E444	9.73 mg/L	10 mg/L	97.3	50.0	140	----
		Magnesium, TCLP	7439-95-4	E444	268 mg/L	250 mg/L	107	50.0	140	----
		Nickel, TCLP	7440-02-0	E444	2.31 mg/L	2.5 mg/L	92.5	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	4.86 mg/L	5 mg/L	97.2	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.079 mg/L	0.1 mg/L	79.0	50.0	140	----
		Thallium, TCLP	7440-28-0	E444	4.8 mg/L	5 mg/L	97.2	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	4.85 mg/L	5 mg/L	96.9	50.0	150	----
		Vanadium, TCLP	7440-62-2	E444	0.74 mg/L	0.75 mg/L	98.7	50.0	140	----
		Zinc, TCLP	7440-66-6	E444	8.96 mg/L	10 mg/L	89.6	50.0	140	----
		Zirconium, TCLP	7440-67-7	E444	0.8 mg/L	1 mg/L	85.8	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: 1347641)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	105	70.0	130	----
Metals (QCLot: 1347642)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	107	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	98.1	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	104	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	109	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	112	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	124	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	96.2	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	102	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	111	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	101	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	102	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	103	70.0	130	----
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	98.7	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	108	70.0	130	----
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	104	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	111	70.0	130	----
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	100	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	99.8	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	103	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	112	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	107	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	99.0	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	104	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	90.1	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	119	70.0	130	----

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: 1347642) - continued									
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	104	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	107	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	104	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	95.6	70.0	130	----

Chain of Custody / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____ Page ____ of ____

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:	ofetherstonhaugh@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# 46693 Weekly Bottom Ash - Suite			
Contact:				LSD:	(includes 2:1 pH)			
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				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
	BA2407-A-1	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-2	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-3	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-4	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-5	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-6	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-7	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-8	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-9	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-10	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-11	14-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-12	14-Feb-24	9:00	Soil	X	X				X							1

Environmental Division
Vancouver
Work Order Reference
VA24A3381

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
	21-Feb-24	15:00	MG	2/21	1500	16 °C				

GENF 20.00 Front

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS

Work Order	: **VA24A2931**	Page	: 1 of 13
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	: 14-Feb-2024 15:30
PO	: VANCO0000052919	Date Analysis Commenced	: 15-Feb-2024
C-O-C number	: ----	Issue Date	: 23-Feb-2024 22:49
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
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*
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Organics, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia

Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	Metals, Burnaby, British Columbia
Sam Silveira	Analyst	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: BA2407-A-1 Unprocessed	BA2407-A-2 Unprocessed	BA2407-A-3 Unprocessed	BA2407-A-4 Unprocessed	BA2407-A-5 Unprocessed
Client sampling date / time					12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00
					VA24A2931-001	VA24A2931-002	VA24A2931-003	VA24A2931-004	VA24A2931-005
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/VA	0.25	%	27.6	25.4	26.4	27.2	25.8
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	12.0	12.0	12.0	12.0	11.7
Metals									
Aluminum	7429-90-5	E440/VA	50	mg/kg	33300	28900	30900	25900	31800
Antimony	7440-36-0	E440/VA	0.10	mg/kg	171	178	147	177	171
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	30.8	35.6	26.6	36.8	32.0
Barium	7440-39-3	E440/VA	0.50	mg/kg	384	384	387	380	340
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.44	0.38	0.36	0.36	0.40
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	12.2	13.7	10.3	12.9	12.7
Boron	7440-42-8	E440/VA	5.0	mg/kg	234	152	223	148	182
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	13.3	13.7	12.8	15.0	13.5
Calcium	7440-70-2	E440/VA	50	mg/kg	158000	151000	150000	152000	153000
Chromium	7440-47-3	E440/VA	0.50	mg/kg	180	187	151	140	146
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	43.7	51.6	202	540	90.8
Copper	7440-50-8	E440/VA	0.50	mg/kg	1470	1750	7490	1060	1180
Iron	7439-89-6	E440/VA	50	mg/kg	35500	33400	39600	32600	34400
Lead	7439-92-1	E440/VA	0.50	mg/kg	438	856	2050	433	418
Lithium	7439-93-2	E440/VA	2.0	mg/kg	25.9	25.6	32.8	51.7	35.0
Magnesium	7439-95-4	E440/VA	20	mg/kg	11700	11700	12400	11000	11200
Manganese	7439-96-5	E440/VA	1.0	mg/kg	730	640	585	620	605
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	0.0759	0.0903	0.0784	0.0932	0.116
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	24.1	27.0	20.7	294	19.8
Nickel	7440-02-0	E440/VA	0.50	mg/kg	122	151	134	188	112
Phosphorus	7723-14-0	E440/VA	50	mg/kg	10100	10900	10800	12300	10300
Potassium	7440-09-7	E440/VA	100	mg/kg	6000	6330	5960	6260	6690
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.44	0.53	0.47	0.46	0.44
Silver	7440-22-4	E440/VA	0.10	mg/kg	5.63	21.0	5.01	4.83	6.64
Sodium	7440-23-5	E440/VA	50	mg/kg	16800	16700	17300	16600	18100
Strontium	7440-24-6	E440/VA	0.50	mg/kg	300	297	273	266	295

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-1 Unprocessed	BA2407-A-2 Unprocessed	BA2407-A-3 Unprocessed	BA2407-A-4 Unprocessed	BA2407-A-5 Unprocessed
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00
						VA24A2931-001	VA24A2931-002	VA24A2931-003	VA24A2931-004	VA24A2931-005
						Result	Result	Result	Result	Result
Metals										
Sulfur	7704-34-9	E440/VA	1000	mg/kg		13000	13400	12100	13700	13900
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	0.053	0.059	<0.050	<0.050
Tin	7440-31-5	E440/VA	2.0	mg/kg		137	159	142	148	136
Titanium	7440-32-6	E440/VA	1.0	mg/kg		211	164	182	143	222
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		11.7	48.3	11.5	17.2	13.7
Uranium	7440-61-1	E440/VA	0.050	mg/kg		4.79	4.67	4.31	5.11	4.34
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		44.5	47.0	42.1	44.4	42.3
Zinc	7440-66-6	E440/VA	2.0	mg/kg		4080	4020	4710	3590	3810
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		1.4	1.2	1.0	2.2	2.1
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		12.0	11.8	11.9	11.8	11.8
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		8.34	8.11	8.29	8.21	7.27
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.91	2.91	2.91	2.91	2.91
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.32	7.18	7.34	7.42	7.66
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		2.32	2.19	2.20	2.15	2.23
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.064	0.093	0.082	0.063	0.061
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2010	2020	1990	2000	2070
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		0.530	0.520	1.16	0.397	0.219
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.557	0.790	0.683	0.757	0.736
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	130	124	127	126
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		0.32	0.32	0.25	0.32	<0.25
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	BA2407-A-1 Unprocessed	BA2407-A-2 Unprocessed	BA2407-A-3 Unprocessed	BA2407-A-4 Unprocessed	BA2407-A-5 Unprocessed
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A2931-001	VA24A2931-002	VA24A2931-003	VA24A2931-004	VA24A2931-005
						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		2.46	4.30	2.17	2.02	<0.50
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: BA2407-A-6 Unprocessed	BA2407-A-7 Unprocessed	BA2407-A-8 Unprocessed	BA2407-A-9 Unprocessed	BA2407-A-10 Unprocessed
Client sampling date / time					12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00
					VA24A2931-006	VA24A2931-007	VA24A2931-008	VA24A2931-009	VA24A2931-010
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/VA	0.25	%	27.8	28.0	25.6	24.8	26.1
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	11.6	12.4	12.3	12.3	12.4
Metals									
Aluminum	7429-90-5	E440/VA	50	mg/kg	43400	30700	33300	38600	28200
Antimony	7440-36-0	E440/VA	0.10	mg/kg	138	170	146	161	141
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	26.5	36.4	28.0	32.3	39.4
Barium	7440-39-3	E440/VA	0.50	mg/kg	404	369	417	409	405
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.35	0.42	0.38	0.37	0.39
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	11.4	12.7	10.3	12.4	9.77
Boron	7440-42-8	E440/VA	5.0	mg/kg	168	145	231	176	205
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	11.0	12.4	11.3	16.0	11.2
Calcium	7440-70-2	E440/VA	50	mg/kg	152000	155000	144000	144000	144000
Chromium	7440-47-3	E440/VA	0.50	mg/kg	139	138	121	107	196
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	27.8	119	330	82.9	51.9
Copper	7440-50-8	E440/VA	0.50	mg/kg	1060	1180	2190	1020	1140
Iron	7439-89-6	E440/VA	50	mg/kg	29000	29300	32100	24700	44800
Lead	7439-92-1	E440/VA	0.50	mg/kg	442	476	325	424	365
Lithium	7439-93-2	E440/VA	2.0	mg/kg	25.3	31.6	36.6	26.9	27.0
Magnesium	7439-95-4	E440/VA	20	mg/kg	11400	11900	9510	10300	11000
Manganese	7439-96-5	E440/VA	1.0	mg/kg	604	725	559	587	831
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	0.0575	0.0861	0.0599	0.132	0.0606
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	24.6	25.0	22.9	21.4	69.7
Nickel	7440-02-0	E440/VA	0.50	mg/kg	119	126	104	204	92.8
Phosphorus	7723-14-0	E440/VA	50	mg/kg	11200	10800	9500	11200	10000
Potassium	7440-09-7	E440/VA	100	mg/kg	6760	6460	5980	7110	6390
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.36	0.52	0.40	0.45	0.46
Silver	7440-22-4	E440/VA	0.10	mg/kg	8.39	6.44	4.49	4.65	6.46
Sodium	7440-23-5	E440/VA	50	mg/kg	18100	17400	17200	19300	16800
Strontium	7440-24-6	E440/VA	0.50	mg/kg	299	292	252	287	281
Sulfur	7704-34-9	E440/VA	1000	mg/kg	12600	11300	11500	12600	12800

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2407-A-6 Unprocessed	BA2407-A-7 Unprocessed	BA2407-A-8 Unprocessed	BA2407-A-9 Unprocessed	BA2407-A-10 Unprocessed
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00
						VA24A2931-006	VA24A2931-007	VA24A2931-008	VA24A2931-009	VA24A2931-010
						Result	Result	Result	Result	Result
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Tin	7440-31-5	E440/VA	2.0	mg/kg		176	134	126	128	116
Titanium	7440-32-6	E440/VA	1.0	mg/kg		216	146	164	202	158
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		19.3	16.8	8.03	9.01	8.12
Uranium	7440-61-1	E440/VA	0.050	mg/kg		4.02	4.67	3.68	4.45	3.90
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		39.7	43.6	38.2	40.6	39.2
Zinc	7440-66-6	E440/VA	2.0	mg/kg		3470	5140	2980	3650	4280
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		2.8	1.2	2.5	2.1	2.2
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.9	12.0	11.9	12.0	11.9
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		8.38	8.64	8.36	8.58	8.20
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.91	2.91	2.91	2.91	2.91
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.62	7.00	6.91	7.26	7.02
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		2.12	2.10	2.25	2.16	2.16
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		<0.050	0.126	0.102	0.074	0.524
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2020	1960	1970	1980	1930
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		0.270	0.599	1.74	0.672	1.00
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.656	0.752	0.877	0.670	0.866
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		123	128	129	128	125
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		<0.25	0.37	0.34	0.28	0.38
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	BA2407-A-6 Unprocessed	BA2407-A-7 Unprocessed	BA2407-A-8 Unprocessed	BA2407-A-9 Unprocessed	BA2407-A-10 Unprocessed
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00	12-Feb-2024 09:00
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A2931-006	VA24A2931-007	VA24A2931-008	VA24A2931-009	VA24A2931-010
						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		<0.50	11.0	15.1	2.89	12.5
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	BA2407-A-11 Unprocessed	BA2407-A-12 Unprocessed	----	----	----
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A2931-011	VA24A2931-012	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Moisture	----	E144/VA	0.25	%		26.0	26.2	----	----	----
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		12.3	12.1	----	----	----
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		30900	39500	----	----	----
Antimony	7440-36-0	E440/VA	0.10	mg/kg		186	135	----	----	----
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		40.7	27.4	----	----	----
Barium	7440-39-3	E440/VA	0.50	mg/kg		414	401	----	----	----
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.40	0.36	----	----	----
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		13.2	11.5	----	----	----
Boron	7440-42-8	E440/VA	5.0	mg/kg		157	174	----	----	----
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		15.7	18.7	----	----	----
Calcium	7440-70-2	E440/VA	50	mg/kg		162000	143000	----	----	----
Chromium	7440-47-3	E440/VA	0.50	mg/kg		170	151	----	----	----
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		76.0	38.7	----	----	----
Copper	7440-50-8	E440/VA	0.50	mg/kg		1600	3450	----	----	----
Iron	7439-89-6	E440/VA	50	mg/kg		30000	40900	----	----	----
Lead	7439-92-1	E440/VA	0.50	mg/kg		436	569	----	----	----
Lithium	7439-93-2	E440/VA	2.0	mg/kg		34.0	25.6	----	----	----
Magnesium	7439-95-4	E440/VA	20	mg/kg		12800	11000	----	----	----
Manganese	7439-96-5	E440/VA	1.0	mg/kg		620	811	----	----	----
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		0.120	0.0726	----	----	----
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		23.8	26.6	----	----	----
Nickel	7440-02-0	E440/VA	0.50	mg/kg		180	139	----	----	----
Phosphorus	7723-14-0	E440/VA	50	mg/kg		11900	9460	----	----	----
Potassium	7440-09-7	E440/VA	100	mg/kg		6750	5940	----	----	----
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.64	0.39	----	----	----
Silver	7440-22-4	E440/VA	0.10	mg/kg		5.35	5.90	----	----	----
Sodium	7440-23-5	E440/VA	50	mg/kg		17400	17200	----	----	----
Strontium	7440-24-6	E440/VA	0.50	mg/kg		300	286	----	----	----
Sulfur	7704-34-9	E440/VA	1000	mg/kg		13500	12200	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2407-A-11 Unprocessed	BA2407-A-12 Unprocessed	----	----	----
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A2931-011	VA24A2931-012	--------	--------	--------
						Result	Result	----	----	----
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		0.050	<0.050	----	----	----
Tin	7440-31-5	E440/VA	2.0	mg/kg		256	120	----	----	----
Titanium	7440-32-6	E440/VA	1.0	mg/kg		170	220	----	----	----
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		11.8	8.64	----	----	----
Uranium	7440-61-1	E440/VA	0.050	mg/kg		5.63	3.91	----	----	----
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		47.8	40.2	----	----	----
Zinc	7440-66-6	E440/VA	2.0	mg/kg		4900	3820	----	----	----
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		<1.0	3.0	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		12.0	11.9	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		8.52	8.18	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.91	2.91	----	----	----
pH, TCLP final	----	EPP444/VA	0.010	pH units		7.44	7.45	----	----	----
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		2.11	2.14	----	----	----
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.064	0.221	----	----	----
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		2010	2000	----	----	----
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		0.400	0.405	----	----	----
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.655	0.683	----	----	----
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		124	126	----	----	----
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		<0.25	0.28	----	----	----
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	BA2407-A-11 Unprocessed	BA2407-A-12 Unprocessed	----	----	----
					Client sampling date / time	12-Feb-2024 09:00	12-Feb-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A2931-011	VA24A2931-012	--------	--------	--------
						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		2.12	1.28	----	----	----
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.

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA24A2931**	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	: 14-Feb-2024 15:30
PO	: VANCO0000052919	Issue Date	: 23-Feb-2024 22:49
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
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 Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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
Duplicate (DUP) RPDs								
Metals	VA24A2931-001	BA2407-A-1 Unprocessed	Boron	7440-42-8	E440	46.8 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A2931-001	BA2407-A-1 Unprocessed	Copper	7440-50-8	E440	68.7 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24A2931-001	BA2407-A-1 Unprocessed	Lithium	7439-93-2	E440	72.3 % 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 BA2407-A-1 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-10 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-11 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-12 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-2 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-3 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-4 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 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 BA2407-A-5 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-6 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-7 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-8 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2407-A-9 Unprocessed	E510	12-Feb-2024	23-Feb-2024	28 days	11 days	✓	23-Feb-2024	28 days	11 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-1 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-10 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-11 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-12 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 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 BA2407-A-2 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-3 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-4 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-5 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-6 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-7 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-8 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2407-A-9 Unprocessed	E440	12-Feb-2024	23-Feb-2024	180 days	11 days	✓	23-Feb-2024	180 days	12 days	✓
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-1 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	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
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-10 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-11 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-12 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-2 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-3 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-4 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-5 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-6 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-7 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	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
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-8 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2407-A-9 Unprocessed	E144	12-Feb-2024	----	----	----		22-Feb-2024	----	10 days	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-1 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-10 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-11 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-12 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-2 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-3 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-4 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 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 BA2407-A-5 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-6 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-7 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-8 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2407-A-9 Unprocessed	E108	12-Feb-2024	23-Feb-2024	30 days	11 days	✓	23-Feb-2024	30 days	11 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-1 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-10 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-11 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-12 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 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 : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-2 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-3 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-4 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-5 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-6 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-7 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-8 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2407-A-9 Unprocessed	E512	15-Feb-2024	22-Feb-2024	32 days	10 days	✓	22-Feb-2024	32 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-1 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 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) BA2407-A-10 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-11 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-12 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-2 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-3 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-4 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-5 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-6 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-7 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 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) BA2407-A-8 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 days	10 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2407-A-9 Unprocessed	E444	15-Feb-2024	21-Feb-2024	184 days	9 days	✓	22-Feb-2024	184 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) BA2407-A-1 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-10 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-11 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-12 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-2 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-3 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-4 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 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) BA2407-A-5 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-6 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-7 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-8 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2407-A-9 Unprocessed	EPP444	12-Feb-2024	15-Feb-2024	----	----		----	28 days	4 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 in Soil/Solid by CVAAS	E510	1341030	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1341031	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1341033	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1341032	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Mercury in Soil/Solid by CVAAS	E510	1341030	2	12	16.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1341031	2	20	10.0	10.0	✓
Moisture Content by Gravimetry	E144	1341033	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1341032	1	20	5.0	5.0	✓
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	1339574	1	12	8.3	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1341030	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1339575	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1341031	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1341033	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1339574	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1339575	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	: **VA24A2931**	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, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 14-Feb-2024 15:30
PO	: VANCO0000052919	Date Analysis Commenced	: 15-Feb-2024
C-O-C number	: ----	Issue Date	: 23-Feb-2024 22:49
Sampler	: ---- ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
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*
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Organics, 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: 1341032)											
VA24A2931-001	BA2407-A-1 Unprocessed	pH (1:2 soil:water)	----	E108	0.10	pH units	12.0	11.8	1.7%	5%	----
Physical Tests (QC Lot: 1341033)											
VA24A2931-001	BA2407-A-1 Unprocessed	Moisture	----	E144	0.25	%	27.6	26.9	2.73%	20%	----
Metals (QC Lot: 1341030)											
VA24A2931-001	BA2407-A-1 Unprocessed	Mercury	7439-97-6	E510	0.0500	mg/kg	0.0759	0.0760	0.00010	Diff <2x LOR	----
Metals (QC Lot: 1341031)											
VA24A2931-001	BA2407-A-1 Unprocessed	Aluminum	7429-90-5	E440	50	mg/kg	33300	34100	2.25%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	171	153	11.0%	30%	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	30.8	29.7	3.46%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	384	425	9.95%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.44	0.43	0.02	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	12.2	12.9	5.61%	30%	----
		Boron	7440-42-8	E440	5.0	mg/kg	234	146	46.8%	30%	DUP-H
		Cadmium	7440-43-9	E440	0.020	mg/kg	13.3	15.0	12.0%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	158000	157000	1.14%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	180	136	27.3%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	43.7	35.2	21.4%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	1470	3000	68.7%	30%	DUP-H
		Iron	7439-89-6	E440	50	mg/kg	35500	35700	0.509%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	438	482	9.72%	40%	----
		Lithium	7439-93-2	E440	2.0	mg/kg	25.9	55.2	72.3%	30%	DUP-H
		Magnesium	7439-95-4	E440	20	mg/kg	11700	11900	1.18%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	730	738	1.08%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	24.1	20.6	15.4%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	122	165	29.9%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	10100	13500	29.1%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	6000	6530	8.39%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.44	0.65	0.21	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	5.63	5.36	5.04%	40%	----
		Sodium	7440-23-5	E440	50	mg/kg	16800	18700	10.5%	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: 1341031) - continued											
VA24A2931-001	BA2407-A-1 Unprocessed	Strontium	7440-24-6	E440	0.50	mg/kg	300	290	3.40%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	13000	12300	5.26%	30%	----
		Thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	137	142	3.22%	40%	----
		Titanium	7440-32-6	E440	1.0	mg/kg	211	156	30.3%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	11.7	9.40	21.8%	30%	----
		Uranium	7440-61-1	E440	0.050	mg/kg	4.79	4.33	9.92%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	44.5	42.9	3.56%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	4080	4030	1.22%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	1.4	1.7	0.3	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: 1341033)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1341030)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1341031)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
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	<0.50	----
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: 1341031) - 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: 1339574)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 1339575)						
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	----

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	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1341032)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.7	95.0	105	----
Physical Tests (QCLot: 1341033)									
Moisture	----	E144	0.25	%	50 %	99.7	90.0	110	----
Metals (QCLot: 1341030)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	91.2	80.0	120	----
Metals (QCLot: 1341031)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	95.5	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	92.9	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	98.4	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	101	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	92.2	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	90.5	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	90.5	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	95.0	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	95.3	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	93.6	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	92.5	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	90.2	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	99.3	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	92.9	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	89.0	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	96.4	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	96.6	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	95.6	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	92.7	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	86.3	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	92.2	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	95.2	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	81.4	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	96.5	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	96.0	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	95.6	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1341031) - continued									
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	89.4	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	94.5	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	90.9	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	96.8	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	93.8	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	95.8	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	91.1	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	98.9	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: 1339574)										
VA24A2931-001	BA2407-A-1 Unprocessed	Mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	100	50.0	140	----
TCLP Metals (QCLot: 1339575)										
VA24A2931-001	BA2407-A-1 Unprocessed	Antimony, TCLP	7440-36-0	E444	5.00 mg/L	5 mg/L	100.0	50.0	140	----
		Arsenic, TCLP	7440-38-2	E444	5.1 mg/L	5 mg/L	103	50.0	140	----
		Barium, TCLP	7440-39-3	E444	12.3 mg/L	12.5 mg/L	98.6	50.0	140	----
		Beryllium, TCLP	7440-41-7	E444	0.251 mg/L	0.25 mg/L	100	50.0	140	----
		Boron, TCLP	7440-42-8	E444	9.10 mg/L	10 mg/L	91.0	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	0.243 mg/L	0.25 mg/L	97.3	50.0	140	----
		Calcium, TCLP	7440-70-2	E444	ND mg/L	250 mg/L	ND	50.0	140	----
		Chromium, TCLP	7440-47-3	E444	1.21 mg/L	1.25 mg/L	96.8	50.0	140	----
		Cobalt, TCLP	7440-48-4	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		Copper, TCLP	7440-50-8	E444	2.33 mg/L	2.5 mg/L	93.3	50.0	140	----
		Iron, TCLP	7439-89-6	E444	242 mg/L	250 mg/L	96.9	50.0	140	----
		Lead, TCLP	7439-92-1	E444	9.26 mg/L	10 mg/L	92.6	50.0	140	----
		Magnesium, TCLP	7439-95-4	E444	260 mg/L	250 mg/L	104	50.0	140	----
		Nickel, TCLP	7440-02-0	E444	2.44 mg/L	2.5 mg/L	97.7	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	4.88 mg/L	5 mg/L	97.6	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.087 mg/L	0.1 mg/L	87.0	50.0	140	----
		Thallium, TCLP	7440-28-0	E444	4.7 mg/L	5 mg/L	94.0	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	4.72 mg/L	5 mg/L	94.3	50.0	150	----
		Vanadium, TCLP	7440-62-2	E444	0.77 mg/L	0.75 mg/L	103	50.0	140	----
		Zinc, TCLP	7440-66-6	E444	9.33 mg/L	10 mg/L	93.3	50.0	140	----
		Zirconium, TCLP	7440-67-7	E444	0.9 mg/L	1 mg/L	93.0	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: 1341030)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	96.5	70.0	130	----
Metals (QCLot: 1341031)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	101	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	89.6	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	94.7	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	93.7	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	94.6	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	112	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	87.5	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	94.0	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	106	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	94.1	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	88.9	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	96.1	70.0	130	----
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	91.9	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	96.3	70.0	130	----
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	95.2	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	99.1	70.0	130	----
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	101	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	94.2	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	85.9	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	104	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	100	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	90.9	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	97.6	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	92.1	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	105	70.0	130	----

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: 1341031) - continued									
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	104	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	99.1	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	89.0	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	93.0	70.0	130	----

ALS Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page ____ of ____

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:	ofetherstonhaugh@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# 46693 Weekly Bottom Ash - Suite			
Contact:				LSD:	(includes 2:1 pH)			
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				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
	BA2407-A-1 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-2 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-3 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-4 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-5 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-6 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-7 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-8 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-9 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-10 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-11 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1
	BA2407-A-12 Unprocessed	12-Feb-24	9:00	Soil	X	X				X							1

Environmental Division
Vancouver
Work Order Reference
VA24A2931

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
[signature]	14-Feb-24	0900	RK	2/14	3:30pm	15,15°C				