

Bottom Ash Data

2022 Week 20

The following analytical report represents bottom ash composite results for week 20 of 2022 (May 15, 2022 to May 21, 2022).

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 : **VA22B1271**
Client : **Covanta Burnaby Renewable Energy, ULC**
Contact : Steve McKinney
Address : 5150 Riverbend Drive
Burnaby BC Canada V3N 4V3
Telephone : 604 521 1025
Project : Weekly Bottom Ash - Suite
PO : VANCO 0000051213
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Standing Offer (BC work)
No. of samples received : 12
No. of samples analysed : 12

Page : 1 of 11
Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : 778-370-3279
Date Samples Received : 24-May-2022 11:50
Date Analysis Commenced : 26-May-2022
Issue Date : 31-May-2022 15:34

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	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).

<i>Unit</i>	<i>Description</i>
%	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					Client sample ID	BA2220-A-1	BA2220-A-2	BA2220-A-3	BA2220-A-4	BA2220-A-5
(Matrix: Soil/Solid)										
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-001	VA22B1271-002	VA22B1271-003	VA22B1271-004	VA22B1271-005	
					Result	Result	Result	Result	Result	
Physical Tests										
moisture	----	E144	0.25	%	17.9	19.1	17.0	18.8	17.0	
pH (1:2 soil:water)	----	E108	0.10	pH units	12.4	12.4	12.3	12.4	12.2	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	30100	29800	29700	48400	34300	
antimony	7440-36-0	E440	0.10	mg/kg	180	122	154	113	129	
arsenic	7440-38-2	E440	0.10	mg/kg	25.4	34.8	26.0	21.5	23.6	
barium	7440-39-3	E440	0.50	mg/kg	460	478	499	504	468	
beryllium	7440-41-7	E440	0.10	mg/kg	0.39	0.35	0.36	0.38	0.40	
bismuth	7440-69-9	E440	0.20	mg/kg	20.1	8.78	16.7	8.48	9.63	
boron	7440-42-8	E440	5.0	mg/kg	185	189	168	182	188	
cadmium	7440-43-9	E440	0.020	mg/kg	15.6	10.5	11.9	10.1	14.3	
calcium	7440-70-2	E440	50	mg/kg	153000	144000	157000	147000	153000	
chromium	7440-47-3	E440	0.50	mg/kg	169	167	178	163	161	
cobalt	7440-48-4	E440	0.10	mg/kg	267	58.0	30.7	51.6	65.0	
copper	7440-50-8	E440	0.50	mg/kg	2350	3720	1780	3670	10600	
iron	7439-89-6	E440	50	mg/kg	44900	60100	51500	53200	41300	
lead	7439-92-1	E440	0.50	mg/kg	764	410	472	539	2040	
lithium	7439-93-2	E440	2.0	mg/kg	74.1	22.0	21.1	31.9	23.6	
magnesium	7439-95-4	E440	20	mg/kg	12200	12800	13000	11500	12600	
manganese	7439-96-5	E440	1.0	mg/kg	1240	1110	1970	1110	1020	
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	
molybdenum	7439-98-7	E440	0.10	mg/kg	122	94.6	126	89.0	88.1	
nickel	7440-02-0	E440	0.50	mg/kg	116	378	158	108	279	
phosphorus	7723-14-0	E440	50	mg/kg	11600	10000	11400	11000	11200	
potassium	7440-09-7	E440	100	mg/kg	5070	4540	5230	4680	4950	
selenium	7782-49-2	E440	0.20	mg/kg	0.44	0.40	0.49	0.41	0.41	
silver	7440-22-4	E440.Ag	0.10	mg/kg	----	20.3	----	----	----	
silver	7440-22-4	E440	0.10	mg/kg	5.37	----	5.47	5.68	6.99	
sodium	7440-23-5	E440	50	mg/kg	14200	13300	14600	13800	13900	
strontium	7440-24-6	E440	0.50	mg/kg	450	313	338	320	322	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2220-A-1	BA2220-A-2	BA2220-A-3	BA2220-A-4	BA2220-A-5
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-001	VA22B1271-002	VA22B1271-003	VA22B1271-004	VA22B1271-005	
					Result	Result	Result	Result	Result	
Metals										
sulfur	7704-34-9	E440	1000	mg/kg	13000	11800	13300	12000	12200	
thallium	7440-28-0	E440	0.050	mg/kg	0.069	0.061	0.078	0.066	0.079	
tin	7440-31-5	E440	2.0	mg/kg	232	160	125	101	121	
titanium	7440-32-6	E440	1.0	mg/kg	397	344	349	479	376	
tungsten	7440-33-7	E440	0.50	mg/kg	17.0	17.5	14.6	15.1	41.8	
uranium	7440-61-1	E440	0.050	mg/kg	5.47	4.69	5.56	4.89	4.88	
vanadium	7440-62-2	E440	0.20	mg/kg	51.4	44.8	51.2	51.9	51.8	
zinc	7440-66-6	E440	2.0	mg/kg	3630	3400	3900	4400	3670	
zirconium	7440-67-7	E440	1.0	mg/kg	1.0	<1.0	<1.0	1.2	<1.0	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	12.2	12.2	12.2	12.2	11.9	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	10.6	10.6	10.4	10.4	9.87	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.87	2.87	2.87	2.87	2.87	
pH, TCLP final	----	EPP444	0.010	pH units	6.45	6.79	6.36	6.49	6.41	
antimony, TCLP	7440-36-0	E444	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.86	1.94	1.75	1.94	1.80	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.148	0.283	0.124	0.138	0.151	
calcium, TCLP	7440-70-2	E444	10	mg/L	2020	2170	1950	2160	2110	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.15	0.864	1.00	0.777	0.726	
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.26	0.535	0.859	0.606	0.779	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	120	128	115	121	115	
mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.47	0.33	0.65	0.40	0.48	
selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	
silver, TCLP	7440-22-4	E444	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	BA2220-A-1	BA2220-A-2	BA2220-A-3	BA2220-A-4	BA2220-A-5
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-001	VA22B1271-002	VA22B1271-003	VA22B1271-004	VA22B1271-005	
					Result	Result	Result	Result	Result	
TCLP Metals										
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
zinc, TCLP	7440-66-6	E444	0.50	mg/L	30.9	16.3	36.6	28.4	39.4	
zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	<10	<10	<10	<10	<10

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



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2220-A-6	BA2220-A-7	BA2220-A-8	BA2220-A-9	BA2220-A-10
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-006	VA22B1271-007	VA22B1271-008	VA22B1271-009	VA22B1271-010	
					Result	Result	Result	Result	Result	
Physical Tests										
moisture	----	E144	0.25	%	17.7	18.3	18.3	17.6	18.4	
pH (1:2 soil:water)	----	E108	0.10	pH units	12.4	12.4	12.3	12.4	12.3	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	35400	29400	30400	30500	34400	
antimony	7440-36-0	E440	0.10	mg/kg	122	124	128	111	144	
arsenic	7440-38-2	E440	0.10	mg/kg	22.6	22.6	29.3	21.8	22.7	
barium	7440-39-3	E440	0.50	mg/kg	459	408	481	556	603	
beryllium	7440-41-7	E440	0.10	mg/kg	0.37	0.40	0.37	0.44	0.44	
bismuth	7440-69-9	E440	0.20	mg/kg	9.53	9.59	11.2	9.42	8.08	
boron	7440-42-8	E440	5.0	mg/kg	179	172	184	144	177	
cadmium	7440-43-9	E440	0.020	mg/kg	10.3	11.0	11.0	9.53	12.4	
calcium	7440-70-2	E440	50	mg/kg	146000	157000	159000	138000	156000	
chromium	7440-47-3	E440	0.50	mg/kg	164	158	164	147	208	
cobalt	7440-48-4	E440	0.10	mg/kg	91.8	136	33.3	45.2	103	
copper	7440-50-8	E440	0.50	mg/kg	3260	3070	2020	2910	3000	
iron	7439-89-6	E440	50	mg/kg	59400	53600	57100	49800	53300	
lead	7439-92-1	E440	0.50	mg/kg	513	1470	737	1340	456	
lithium	7439-93-2	E440	2.0	mg/kg	22.5	25.4	21.1	19.5	22.6	
magnesium	7439-95-4	E440	20	mg/kg	11400	13000	12900	11600	12600	
manganese	7439-96-5	E440	1.0	mg/kg	828	1560	1260	734	1460	
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	
molybdenum	7439-98-7	E440	0.10	mg/kg	148	132	103	92.3	189	
nickel	7440-02-0	E440	0.50	mg/kg	122	186	216	143	333	
phosphorus	7723-14-0	E440	50	mg/kg	11000	10700	12100	10100	10200	
potassium	7440-09-7	E440	100	mg/kg	4750	4420	5110	4510	4880	
selenium	7782-49-2	E440	0.20	mg/kg	0.40	0.43	0.35	0.42	0.40	
silver	7440-22-4	E440.Ag	0.10	mg/kg	----	----	6.29	----	----	
silver	7440-22-4	E440	0.10	mg/kg	9.40	5.50	----	4.77	7.72	
sodium	7440-23-5	E440	50	mg/kg	13900	12800	14600	13100	13800	
strontium	7440-24-6	E440	0.50	mg/kg	368	333	356	333	360	
sulfur	7704-34-9	E440	1000	mg/kg	12100	15300	13000	11400	12000	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2220-A-6	BA2220-A-7	BA2220-A-8	BA2220-A-9	BA2220-A-10
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-006	VA22B1271-007	VA22B1271-008	VA22B1271-009	VA22B1271-010	
					Result	Result	Result	Result	Result	
Metals										
thallium	7440-28-0	E440	0.050	mg/kg	0.065	0.065	0.073	0.061	0.057	
tin	7440-31-5	E440	2.0	mg/kg	122	102	121	105	142	
titanium	7440-32-6	E440	1.0	mg/kg	445	422	372	585	627	
tungsten	7440-33-7	E440	0.50	mg/kg	20.0	21.4	48.1	18.1	14.6	
uranium	7440-61-1	E440	0.050	mg/kg	4.95	5.06	5.19	4.63	4.80	
vanadium	7440-62-2	E440	0.20	mg/kg	59.4	47.2	50.1	47.3	50.7	
zinc	7440-66-6	E440	2.0	mg/kg	4300	4770	4020	3810	4100	
zirconium	7440-67-7	E440	1.0	mg/kg	1.4	1.2	<1.0	1.0	1.2	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.9	11.9	11.9	12.1	12.2	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	9.94	9.57	9.26	10.7	10.6	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.87	2.87	2.87	2.87	2.87	
pH, TCLP final	----	EPP444	0.010	pH units	6.49	6.51	6.67	6.67	6.68	
antimony, TCLP	7440-36-0	E444	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.90	1.97	1.88	1.90	1.86	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.137	0.168	0.219	0.119	0.149	
calcium, TCLP	7440-70-2	E444	10	mg/L	2090	2220	2220	2160	2090	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.93	1.49	0.666	0.994	2.87	
copper, TCLP	7440-50-8	E444	0.050	mg/L	0.580	0.986	0.585	0.423	0.539	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	122	122	120	119	117	
mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.49	0.52	0.44	0.38	0.41	
selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2220-A-6	BA2220-A-7	BA2220-A-8	BA2220-A-9	BA2220-A-10
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00	18-May-2022 09:00
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-006	VA22B1271-007	VA22B1271-008	VA22B1271-009	VA22B1271-010	
					Result	Result	Result	Result	Result	
TCLP Metals										
uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
zinc, TCLP	7440-66-6	E444	0.50	mg/L	23.9	37.4	65.0	20.6	18.8	
zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	<10	<10	<10	<10	

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



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA2220-A-11	BA2220-A-12	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time	18-May-2022 09:00	18-May-2022 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-011	VA22B1271-012	-----	-----	-----	
					Result	Result	---	---	---	
Physical Tests										
moisture	----	E144	0.25	%	18.1	19.3	----	----	----	
pH (1:2 soil:water)	----	E108	0.10	pH units	12.3	12.3	----	----	----	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	30000	31500	----	----	----	
antimony	7440-36-0	E440	0.10	mg/kg	160	110	----	----	----	
arsenic	7440-38-2	E440	0.10	mg/kg	22.0	29.5	----	----	----	
barium	7440-39-3	E440	0.50	mg/kg	509	578	----	----	----	
beryllium	7440-41-7	E440	0.10	mg/kg	0.33	0.42	----	----	----	
bismuth	7440-69-9	E440	0.20	mg/kg	22.3	9.00	----	----	----	
boron	7440-42-8	E440	5.0	mg/kg	154	200	----	----	----	
cadmium	7440-43-9	E440	0.020	mg/kg	13.2	9.96	----	----	----	
calcium	7440-70-2	E440	50	mg/kg	149000	153000	----	----	----	
chromium	7440-47-3	E440	0.50	mg/kg	246	156	----	----	----	
cobalt	7440-48-4	E440	0.10	mg/kg	97.8	40.5	----	----	----	
copper	7440-50-8	E440	0.50	mg/kg	6630	5960	----	----	----	
iron	7439-89-6	E440	50	mg/kg	59700	58300	----	----	----	
lead	7439-92-1	E440	0.50	mg/kg	1120	356	----	----	----	
lithium	7439-93-2	E440	2.0	mg/kg	35.6	21.9	----	----	----	
magnesium	7439-95-4	E440	20	mg/kg	12100	12700	----	----	----	
manganese	7439-96-5	E440	1.0	mg/kg	839	893	----	----	----	
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	----	----	----	
molybdenum	7439-98-7	E440	0.10	mg/kg	159	86.6	----	----	----	
nickel	7440-02-0	E440	0.50	mg/kg	205	134	----	----	----	
phosphorus	7723-14-0	E440	50	mg/kg	9610	11000	----	----	----	
potassium	7440-09-7	E440	100	mg/kg	4540	4670	----	----	----	
selenium	7782-49-2	E440	0.20	mg/kg	0.39	0.40	----	----	----	
silver	7440-22-4	E440	0.10	mg/kg	5.52	5.60	----	----	----	
sodium	7440-23-5	E440	50	mg/kg	13400	14900	----	----	----	
strontium	7440-24-6	E440	0.50	mg/kg	317	310	----	----	----	
sulfur	7704-34-9	E440	1000	mg/kg	12200	11600	----	----	----	
thallium	7440-28-0	E440	0.050	mg/kg	0.061	0.072	----	----	----	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2220-A-11	BA2220-A-12	----	----	----
Client sampling date / time					18-May-2022 09:00	18-May-2022 09:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-011	VA22B1271-012	-----	-----	-----	
					Result	Result	---	---	---	
Metals										
tin	7440-31-5	E440	2.0	mg/kg	118	117	---	---	---	
titanium	7440-32-6	E440	1.0	mg/kg	393	395	---	---	---	
tungsten	7440-33-7	E440	0.50	mg/kg	17.5	19.3	---	---	---	
uranium	7440-61-1	E440	0.050	mg/kg	4.69	4.83	---	---	---	
vanadium	7440-62-2	E440	0.20	mg/kg	45.8	46.3	---	---	---	
zinc	7440-66-6	E440	2.0	mg/kg	4300	3700	---	---	---	
zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	<1.0	---	---	---	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	12.1	12.2	---	---	---	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	10.6	10.6	---	---	---	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.87	2.87	---	---	---	
pH, TCLP final	----	EPP444	0.010	pH units	6.84	6.69	---	---	---	
antimony, TCLP	7440-36-0	E444	1.00	mg/L	<1.00	<1.00	---	---	---	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	---	---	---	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	---	---	---	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	---	---	---	
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.88	1.89	---	---	---	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.109	0.104	---	---	---	
calcium, TCLP	7440-70-2	E444	10	mg/L	2120	2100	---	---	---	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	---	---	---	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	0.731	0.865	---	---	---	
copper, TCLP	7440-50-8	E444	0.050	mg/L	0.475	0.779	---	---	---	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	---	---	---	
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	---	---	---	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	114	118	---	---	---	
mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.31	0.39	---	---	---	
selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	---	---	---	
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	---	---	---	
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	---	---	---	
uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	---	---	---	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2220-A-11	BA2220-A-12	----	----	----
					Client sampling date / time	18-May-2022 09:00	18-May-2022 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22B1271-011	VA22B1271-012	-----	-----	-----	
					Result	Result	---	---	---	
TCLP Metals										
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	----	----	----	
zinc, TCLP	7440-66-6	E444	0.50	mg/L	10.2	20.4	----	----	----	
zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	<10	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA22B1271	Page	: 1 of 16
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: Vancouver - Environmental
Contact	: Steve McKinney	Account Manager	: Brent Mack
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 521 1025	Telephone	: 778-370-3279
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 24-May-2022 11:50
PO	: VANCO 0000051213	Issue Date	: 31-May-2022 15:19
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 Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Method Blank value outliers occur - please see following pages for full details.
- Duplicate outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Metals	QC-MRG2-5002230 01	----	copper	7440-50-8	E440	0.74 ^B mg/kg	0.5 mg/kg	Blank result exceeds permitted value

Result Qualifiers

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

Duplicate (DUP) RPDs								
Metals	VA22B1271-012	BA2220-A-12	chromium	7440-47-3	E440	45.2 % ^{DUP-H}	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	cobalt	7440-48-4	E440	35.2 % ^{DUP-H}	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	copper	7440-50-8	E440	67.9 % ^{DUP-H}	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	lead	7439-92-1	E440	74.8 % ^{DUP-H}	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	manganese	7439-96-5	E440	73.1 % ^{DUP-H}	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	nickel	7440-02-0	E440	34.9 % ^{DUP-H}	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	tin	7440-31-5	E440	41.2 % ^{DUP-H}	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22B1271-012	BA2220-A-12	vanadium	7440-62-2	E440	45.6 % ^{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 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		
Metals : High Silver in Soil/Solid by CRC ICPMS											
LDPE bag BA2220-A-2	E440.Ag	18-May-2022	30-May-2022	180 days	12 days	✓	30-May-2022	168 days	0 days	✓	
Metals : High Silver in Soil/Solid by CRC ICPMS											
LDPE bag BA2220-A-8	E440.Ag	18-May-2022	30-May-2022	180 days	12 days	✓	30-May-2022	168 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-12	E510	18-May-2022	29-May-2022	----	----		30-May-2022	28 days	12 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-1	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-10	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-11	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-2	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✓	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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		
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-3	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-4	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-5	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-6	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-7	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-8	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2220-A-9	E510	18-May-2022	27-May-2022	----	----		27-May-2022	28 days	9 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2220-A-1	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2220-A-10	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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		
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-11	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-2	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-3	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-4	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-5	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-6	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-7	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-8	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2220-A-9	E440	18-May-2022	27-May-2022	----	----		27-May-2022	180 days	10 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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		
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2220-A-12	E440	18-May-2022	29-May-2022	----	----		30-May-2022	180 days	12 days		✔
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-1	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-10	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-11	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-12	E144	18-May-2022	----	----	----		27-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-2	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-3	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-4	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-5	E144	18-May-2022	----	----	----		26-May-2022	----	----		



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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 BA2220-A-6	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-7	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-8	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2220-A-9	E144	18-May-2022	----	----	----		26-May-2022	----	----		
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-12	E108	18-May-2022	29-May-2022	----	----		29-May-2022	30 days	11 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-1	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-10	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-11	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-2	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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 : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-3	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-4	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-5	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-6	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-7	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-8	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2220-A-9	E108	18-May-2022	27-May-2022	----	----		27-May-2022	30 days	9 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-1	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-10	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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 : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-11	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-12	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-2	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-3	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-4	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-5	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-6	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-7	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-8	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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 : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2220-A-9	E512	26-May-2022	----	----	----		30-May-2022	28 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-1	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-10	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-11	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-12	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-2	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-3	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-4	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-5	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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 : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-6	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-7	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-8	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2220-A-9	E444	26-May-2022	----	----	----		30-May-2022	180 days	12 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-1	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-10	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-11	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-12	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-2	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		



Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group 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) BA2220-A-3	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-4	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-5	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-6	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-7	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-8	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2220-A-9	EPP444	18-May-2022	26-May-2022	----	----		----	----	----		

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Mercury in Soil/Solid by CVAAS	E510	500223	2	26	7.6	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	502567	2	26	7.6	5.0	✔
Moisture Content by Gravimetry	E144	502574	2	33	6.0	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	502569	2	26	7.6	5.0	✔
Laboratory Control Samples (LCS)							
High Silver in Soil/Solid by CRC ICPMS	E440.Ag	504077	1	4	25.0	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	500223	4	26	15.3	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	502567	4	26	15.3	10.0	✔
Moisture Content by Gravimetry	E144	502574	2	33	6.0	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	502569	2	26	7.6	5.0	✔
Method Blanks (MB)							
High Silver in Soil/Solid by CRC ICPMS	E440.Ag	504077	1	4	25.0	5.0	✔
Mercury by CVAAS (TCLP)	E512	503528	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	500223	2	26	7.6	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	503529	1	12	8.3	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	502567	2	26	7.6	5.0	✔
Moisture Content by Gravimetry	E144	502574	2	33	6.0	5.0	✔
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	503528	1	12	8.3	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	503529	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 Vancouver - Environmental	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 °C) 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 Vancouver - Environmental	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 Vancouver - Environmental	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 HNO ₃ 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.
High Silver in Soil/Solid by CRC ICPMS	E440.Ag Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	Samples are sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.
Metals by CRC ICPMS (TCLP)	E444 Vancouver - Environmental	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 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl, followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512 Vancouver - Environmental	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



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	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.
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
Digestion for Silver	EP440.Ag Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 Vancouver - Environmental	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	: VA22B1271	Page	: 1 of 16
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: Vancouver - Environmental
Contact	: Steve McKinney	Account Manager	: Brent Mack
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 521 1025	Telephone	: 778-370-3279
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 24-May-2022 11:50
PO	: VANCO 0000051213	Date Analysis Commenced	: 26-May-2022
C-O-C number	: ----	Issue Date	: 31-May-2022 15:19
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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Caleb Deroche	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Ophelia Chiu	Department Manager - Organics	Vancouver Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia

Page : 2 of 16
Work Order : VA22B1271
Client : Covanta Burnaby Renewable Energy, ULC
Project : Weekly Bottom Ash - Suite



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: 500225)											
VA22B0624-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	6.98	6.98	0.0%	5%	----
Physical Tests (QC Lot: 500228)											
VA22B1177-001	Anonymous	moisture	----	E144	0.25	%	14.8	15.1	2.15%	20%	----
Physical Tests (QC Lot: 502569)											
VA22B1271-012	BA2220-A-12	pH (1:2 soil:water)	----	E108	0.10	pH units	12.3	12.3	0.2%	5%	----
Physical Tests (QC Lot: 502574)											
VA22B1271-012	BA2220-A-12	moisture	----	E144	0.25	%	19.3	19.2	0.146%	20%	----
Metals (QC Lot: 500223)											
VA22B0624-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	1.32	1.11	17.3%	40%	----
Metals (QC Lot: 500224)											
VA22B0624-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	7760	7400	4.65%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	4.49	4.39	2.13%	30%	----
		arsenic	7440-38-2	E440	0.10	mg/kg	4.81	4.65	3.36%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	296	271	8.76%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.22	0.21	0.007	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	46.8	43.9	6.30%	30%	----
		boron	7440-42-8	E440	5.0	mg/kg	13.8	12.7	1.0	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	1.67	1.55	7.34%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	25200	24300	3.95%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	42.8	41.4	3.30%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	5.86	5.68	3.06%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	1740	1690	3.41%	30%	----
		iron	7439-89-6	E440	50	mg/kg	16900	16400	2.75%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	28.0	26.8	4.50%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	6.0	5.7	0.3	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	5720	5520	3.59%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	393	378	4.06%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	16.3	16.8	2.95%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	34.6	33.3	3.74%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	12000	11500	4.01%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	1190	1160	2.99%	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: 500224) - continued											
VA22B0624-001	Anonymous	selenium	7782-49-2	E440	0.20	mg/kg	7.61	7.30	4.14%	30%	----
		silver	7440-22-4	E440	0.10	mg/kg	4.31	3.97	8.18%	40%	----
		sodium	7440-23-5	E440	50	mg/kg	372	348	6.67%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	101	99.6	1.76%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	11200	10300	8.59%	30%	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.112	0.102	0.009	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	26.6	25.2	5.76%	40%	----
		titanium	7440-32-6	E440	1.0	mg/kg	45.6	42.1	7.89%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	3.90	3.29	17.0%	30%	----
		uranium	7440-61-1	E440	0.050	mg/kg	1.47	1.40	5.42%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	28.9	27.2	5.95%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	831	779	6.45%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	1.6	1.2	0.4	Diff <2x LOR	----
Metals (QC Lot: 502567)											
VA22B1271-012	BA2220-A-12	aluminum	7429-90-5	E440	50	mg/kg	31500	31600	0.294%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	110	147	29.2%	30%	----
		arsenic	7440-38-2	E440	0.10	mg/kg	29.5	27.9	5.50%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	578	469	20.8%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.42	0.40	0.02	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	9.00	10.0	10.7%	30%	----
		boron	7440-42-8	E440	5.0	mg/kg	200	204	1.93%	30%	----
		cadmium	7440-43-9	E440	0.020	mg/kg	9.96	10.7	7.07%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	153000	148000	3.12%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	156	248	45.2%	30%	DUP-H
		cobalt	7440-48-4	E440	0.10	mg/kg	40.5	57.8	35.2%	30%	DUP-H
		copper	7440-50-8	E440	0.50	mg/kg	5960	12100	67.9%	30%	DUP-H
		iron	7439-89-6	E440	50	mg/kg	58300	54200	7.20%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	356	781	74.8%	40%	DUP-H
		lithium	7439-93-2	E440	2.0	mg/kg	21.9	29.6	29.8%	30%	----
		magnesium	7439-95-4	E440	20	mg/kg	12700	11600	8.58%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	893	1920	73.1%	30%	DUP-H
		molybdenum	7439-98-7	E440	0.10	mg/kg	86.6	112	25.3%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	134	190	34.9%	30%	DUP-H
		phosphorus	7723-14-0	E440	50	mg/kg	11000	10800	1.59%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	4670	4830	3.37%	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: 502567) - continued											
VA22B1271-012	BA2220-A-12	selenium	7782-49-2	E440	0.20	mg/kg	0.40	0.45	0.05	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	5.60	6.39	13.2%	40%	----
		sodium	7440-23-5	E440	50	mg/kg	14900	15000	0.450%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	310	338	8.42%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	11600	13400	14.4%	30%	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.072	0.078	0.006	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	117	178	41.2%	40%	DUP-H
		titanium	7440-32-6	E440	1.0	mg/kg	395	370	6.68%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	19.3	16.5	15.4%	30%	----
		uranium	7440-61-1	E440	0.050	mg/kg	4.83	5.38	10.7%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	46.3	73.6	45.6%	30%	DUP-H
		zinc	7440-66-6	E440	2.0	mg/kg	3700	4300	14.9%	30%	----
zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----		
Metals (QC Lot: 502568)											
VA22B1271-012	BA2220-A-12	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----

Qualifiers

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



Method Blank (MB) Report

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

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 500228)						
moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 502574)						
moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 500223)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 500224)						
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	# 0.74	B
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	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 500224) - continued						
tin	7440-31-5	E440	2	mg/kg	<2.0	----
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	----
Metals (QCLot: 502567)						
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: 502567) - 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	----
Metals (QCLot: 502568)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 504077)						
silver	7440-22-4	E440.Ag	0.1	mg/kg	<0.10	----
TCLP Metals (QCLot: 503528)						
mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 503529)						
antimony, TCLP	7440-36-0	E444	0.1	mg/L	<1.00	----
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	----

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Work Order : VA22B1271
Client : Covanta Burnaby Renewable Energy, ULC
Project : Weekly Bottom Ash - Suite



Qualifiers

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



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 500225)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.8	95.0	105	----
Physical Tests (QCLot: 500228)									
moisture	----	E144	0.25	%	50 %	94.0	90.0	110	----
Physical Tests (QCLot: 502569)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.8	95.0	105	----
Physical Tests (QCLot: 502574)									
moisture	----	E144	0.25	%	50 %	101	90.0	110	----
Metals (QCLot: 500223)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 500224)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	97.3	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	112	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	99.1	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	94.8	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	90.9	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	99.1	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	96.6	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	95.5	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	92.4	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	87.4	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	103	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	94.7	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	108	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	98.8	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	103	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	95.2	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	94.7	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	97.9	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	94.5	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	94.1	80.0	120	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Metals (QCLot: 500224) - continued									
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	100	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	115	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	93.3	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	107	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	98.8	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	91.8	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	95.6	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	103	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	104	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	90.8	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	96.2	80.0	120	----
Metals (QCLot: 502567)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	99.4	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	103	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	101	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	99.1	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	102	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	95.1	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	101	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	97.6	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	101	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	98.4	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	94.5	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	98.8	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	103	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	94.4	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	103	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	102	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	99.0	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	98.9	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	106	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	97.1	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	108	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	92.2	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	105	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Metals (QCLot: 502567) - continued									
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	107	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	105	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	99.6	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	97.6	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	98.5	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	108	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	102	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	99.3	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	89.7	80.0	120	----
Metals (QCLot: 502568)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	103	80.0	120	----
Metals (QCLot: 504077)									
silver	7440-22-4	E440.Ag	0.1	mg/kg	10 mg/kg	86.2	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: 503528)										
VA22B1271-001	BA2220-A-1	mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	100	50.0	140	----
TCLP Metals (QCLot: 503529)										
VA22B1271-001	BA2220-A-1	antimony, TCLP	7440-36-0	E444	5.28 mg/L	5 mg/L	106	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	13.3 mg/L	12.5 mg/L	106	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.245 mg/L	0.25 mg/L	98.1	50.0	140	----
		boron, TCLP	7440-42-8	E444	10.3 mg/L	10 mg/L	103	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	0.236 mg/L	0.25 mg/L	94.5	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	1.26 mg/L	1.25 mg/L	101	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	2.38 mg/L	2.5 mg/L	95.1	50.0	140	----
		iron, TCLP	7439-89-6	E444	250 mg/L	250 mg/L	100.0	50.0	140	----
		lead, TCLP	7439-92-1	E444	10.6 mg/L	10 mg/L	106	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	263 mg/L	250 mg/L	105	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.47 mg/L	2.5 mg/L	98.8	50.0	140	----
		selenium, TCLP	7782-49-2	E444	5.25 mg/L	5 mg/L	105	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.109 mg/L	0.1 mg/L	109	50.0	140	----
		thallium, TCLP	7440-28-0	E444	5.5 mg/L	5 mg/L	109	50.0	140	----
		uranium, TCLP	7440-61-1	E444	5.69 mg/L	5 mg/L	114	50.0	150	----
		vanadium, TCLP	7440-62-2	E444	0.77 mg/L	0.75 mg/L	102	50.0	140	----
		zinc, TCLP	7440-66-6	E444	ND mg/L	10 mg/L	ND	50.0	140	----
		zirconium, TCLP	7440-67-7	E444	10 mg/L	10 mg/L	97.1	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:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 500223)									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	99.8	70.0	130	---
Metals (QCLot: 500224)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	96.7	70.0	130	---
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	106	70.0	130	---
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	99.8	70.0	130	---
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	102	70.0	130	---
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	100	70.0	130	---
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	106	40.0	160	---
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	96.3	70.0	130	---
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	108	70.0	130	---
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	101	70.0	130	---
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	96.5	70.0	130	---
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	95.2	70.0	130	---
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	97.3	70.0	130	---
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	106	70.0	130	---
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	100	70.0	130	---
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	105	70.0	130	---
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	98.1	70.0	130	---
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	108	70.0	130	---
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	96.8	70.0	130	---
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	99.8	70.0	130	---
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	101	70.0	130	---
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	93.7	70.0	130	---
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	113	70.0	130	---
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	107	40.0	160	---
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	100	70.0	130	---
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	98.7	70.0	130	---
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	100	70.0	130	---
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	102	70.0	130	---



Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 500224) - continued									
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	89.1	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	87.9	70.0	130	----
Metals (QCLot: 502567)									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	103	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	94.5	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	103	70.0	130	----
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	103	70.0	130	----
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	111	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	115	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	100	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	101	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	102	70.0	130	----
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	98.1	70.0	130	----
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	101	70.0	130	----
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	103	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	101	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	107	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	104	70.0	130	----
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	101	70.0	130	----
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	106	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	97.9	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	102	40.0	160	----
	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	101	70.0	130	----
	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	110	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	106	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	105	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	101	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	83.9	70.0	130	----
Metals (QCLot: 502568)									

Page : 16 of 16
 Work Order : VA22B1271
 Client : Covanta Burnaby Renewable Energy, ULC
 Project : Weekly Bottom Ash - Suite



Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 502568) - continued									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	107	70.0	130	----

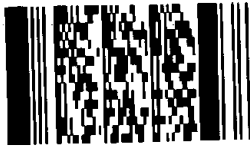


Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)	
Company: Covanta Energy		<input type="checkbox"/> Standard <input type="checkbox"/> Other		<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)	
Contact: Steve McKinney / Dan Skrypnik		<input checked="" type="checkbox"/> PDF <input type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
Address: 5150 Riverbend Drive Burnaby BC		Email 1: smckinney@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Phone: 604-521-1025		Email 2: rjohnson4@covanta.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
Fax: <input type="checkbox"/> Yes <input type="checkbox"/> No		Email 3: dskrypnik@covanta.com		Analysis Request	
		brent.kirkpatrick@metrovancover.org			
		Sarah.Wellman@metrovancover.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? <input type="checkbox"/> Yes <input type="checkbox"/> No		Job #:		MET-TCLP-VA (all metals, Hg) MOISTURE Chrome 6 MET-CSR-FULL-VA (all metals)										Number of Containers	
Company:		PO / AFE: PO# 46693 Weekly Bottom Ash - Suite													
Contact:		LSD: (includes 2:1 pH)													
Address:		Quote #:													
Phone:		Fax:		ALS Contact:		Sampler:									
Lab/Work Order # (lab use only)		1271													

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	
BA2220-A-1		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-2		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-3		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-4		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-5		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-6		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-7		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-8		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-9		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-10		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-11		18-May-22	9:00	Soil	X	X		X		1
BA2220-A-12		18-May-22	9:00	Soil	X	X		X		1

Environmental Division
 Vancouver
 Work Order Reference
VA22B1271



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)			Observations:	
Released by:	Date (dd-mmm-yy)	Time (hh:mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Yes / No ? If Yes add SIF
<i>[Signature]</i>	24-May-22	0800	<i>[Signature]</i>	May 24/22	11:50	22°C				