

## Bottom Ash Data

2022 Week 35

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The following analytical report represents bottom ash composite results for week 35 of 2022 (August 28, 2022 to September 3, 2022).

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



**Environmental**

## CERTIFICATE OF ANALYSIS

**Work Order** : **VA22C1056**  
**Client** : **Covanta Burnaby Renewable Energy, ULC**  
**Contact** : Dan Skrypnyk  
**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** : 06-Sep-2022 11:50  
**Date Analysis Commenced** : 08-Sep-2022  
**Issue Date** : 19-Sep-2022 09:48

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>
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	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	BA2235-A-1	BA2235-A-2	BA2235-A-3	BA2235-A-4	BA2235-A-5
(Matrix: Soil/Solid)					Client sampling date / time	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-001	VA22C1056-002	VA22C1056-003	VA22C1056-004	VA22C1056-005	
					Result	Result	Result	Result	Result	
<b>Physical Tests</b>										
moisture	----	E144	0.25	%	18.6	18.3	18.8	13.7	16.5	
pH (1:2 soil:water)	----	E108	0.10	pH units	10.6	10.6	10.7	10.7	10.7	
<b>Metals</b>										
aluminum	7429-90-5	E440	50	mg/kg	31100	35600	38500	44500	41500	
antimony	7440-36-0	E440	0.10	mg/kg	177	127	183	149	908	
arsenic	7440-38-2	E440	0.10	mg/kg	37.8	28.3	28.6	23.1	28.8	
barium	7440-39-3	E440	0.50	mg/kg	466	538	588	583	652	
beryllium	7440-41-7	E440	0.10	mg/kg	0.36	0.40	0.35	0.35	5.73	
bismuth	7440-69-9	E440	0.20	mg/kg	10.6	7.72	8.06	21.6	8.42	
boron	7440-42-8	E440	5.0	mg/kg	230	161	194	202	172	
cadmium	7440-43-9	E440	0.020	mg/kg	32.5	9.48	13.1	8.96	7.96	
calcium	7440-70-2	E440	50	mg/kg	160000	136000	137000	126000	131000	
chromium	7440-47-3	E440	0.50	mg/kg	237	687	196	193	234	
cobalt	7440-48-4	E440	0.10	mg/kg	97.1	188	102	31.4	161	
copper	7440-50-8	E440	0.50	mg/kg	4620	3700	39100	29400	3730	
iron	7439-89-6	E440	50	mg/kg	65500	63500	55900	67800	61800	
lead	7439-92-1	E440	0.50	mg/kg	4220	396	434	266	14800	
lithium	7439-93-2	E440	2.0	mg/kg	30.6	26.0	22.8	24.5	27.9	
magnesium	7439-95-4	E440	20	mg/kg	12800	12200	11400	9950	11200	
manganese	7439-96-5	E440	1.0	mg/kg	902	919	1050	776	1080	
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	75.6	70.4	49.9	51.2	42.4	
nickel	7440-02-0	E440	0.50	mg/kg	224	492	175	1960	188	
phosphorus	7723-14-0	E440	50	mg/kg	14100	11900	11200	9760	11300	
potassium	7440-09-7	E440	100	mg/kg	6690	6000	5400	4750	6300	
selenium	7782-49-2	E440	0.20	mg/kg	0.49	0.35	0.30	0.23	0.32	
silver	7440-22-4	E440	0.10	mg/kg	4.77	6.21	4.60	4.39	9.21	
sodium	7440-23-5	E440	50	mg/kg	18200	16300	15300	14500	17400	
strontium	7440-24-6	E440	0.50	mg/kg	361	336	375	307	310	
sulfur	7704-34-9	E440	1000	mg/kg	15400	11500	11500	9800	10300	



## Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2235-A-1	BA2235-A-2	BA2235-A-3	BA2235-A-4	BA2235-A-5
Client sampling date / time					06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-001	VA22C1056-002	VA22C1056-003	VA22C1056-004	VA22C1056-005	
					Result	Result	Result	Result	Result	
<b>Metals</b>										
thallium	7440-28-0	E440	0.050	mg/kg	0.102	0.056	0.052	<0.050	0.067	
tin	7440-31-5	E440	2.0	mg/kg	187	96.4	196	70.8	150	
titanium	7440-32-6	E440	1.0	mg/kg	272	313	368	339	358	
tungsten	7440-33-7	E440	0.50	mg/kg	6.73	7.38	6.30	3.82	9.07	
uranium	7440-61-1	E440	0.050	mg/kg	6.66	5.68	5.37	4.65	5.37	
vanadium	7440-62-2	E440	0.20	mg/kg	58.6	62.8	50.5	47.8	49.5	
zinc	7440-66-6	E440	2.0	mg/kg	4690	7360	5010	5300	3470	
zirconium	7440-67-7	E440	1.0	mg/kg	1.9	2.0	1.8	3.0	1.9	
<b>TCLP Metals</b>										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.5	11.5	11.6	11.6	11.5	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	9.15	9.23	8.92	9.30	9.52	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.90	2.90	2.90	2.90	2.90	
pH, TCLP final	----	EPP444	0.010	pH units	6.52	6.50	6.55	6.56	6.50	
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	2.52	2.23	2.13	2.12	2.09	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.356	0.154	0.373	0.130	0.128	
calcium, TCLP	7440-70-2	E444	10	mg/L	1880	1920	1870	1830	1840	
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	1.62	1.31	1.29	0.995	1.16	
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.10	0.881	1.02	1.01	0.870	
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	119	123	127	122	130	
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	0.64	0.56	0.46	0.43	0.55	
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	BA2235-A-1	BA2235-A-2	BA2235-A-3	BA2235-A-4	BA2235-A-5
Client sampling date / time					06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-001	VA22C1056-002	VA22C1056-003	VA22C1056-004	VA22C1056-005	
					Result	Result	Result	Result	Result	
<b>TCLP Metals</b>										
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	29.1	30.5	20.9	24.8	24.9	24.9
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	BA2235-A-6	BA2235-A-7	BA2235-A-8	BA2235-A-9	BA2235-A-10
Client sampling date / time					06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-006	VA22C1056-007	VA22C1056-008	VA22C1056-009	VA22C1056-010	
					Result	Result	Result	Result	Result	
<b>Physical Tests</b>										
moisture	----	E144	0.25	%	16.6	17.5	16.5	16.4	17.4	
pH (1:2 soil:water)	----	E108	0.10	pH units	10.6	10.8	10.6	10.5	10.7	
<b>Metals</b>										
aluminum	7429-90-5	E440	50	mg/kg	40900	39200	31900	42400	38700	
antimony	7440-36-0	E440	0.10	mg/kg	104	97.7	125	96.3	124	
arsenic	7440-38-2	E440	0.10	mg/kg	26.0	23.7	38.4	29.0	30.5	
barium	7440-39-3	E440	0.50	mg/kg	590	683	550	687	627	
beryllium	7440-41-7	E440	0.10	mg/kg	0.36	0.36	0.39	0.37	0.41	
bismuth	7440-69-9	E440	0.20	mg/kg	6.67	5.44	38.3	99.5	5.75	
boron	7440-42-8	E440	5.0	mg/kg	164	202	193	164	154	
cadmium	7440-43-9	E440	0.020	mg/kg	186	7.88	10.3	9.25	9.75	
calcium	7440-70-2	E440	50	mg/kg	131000	134000	147000	128000	138000	
chromium	7440-47-3	E440	0.50	mg/kg	268	597	236	421	165	
cobalt	7440-48-4	E440	0.10	mg/kg	60.5	86.5	73.2	57.2	50.0	
copper	7440-50-8	E440	0.50	mg/kg	5440	2690	5920	3650	1360	
iron	7439-89-6	E440	50	mg/kg	70500	74600	66100	64800	50200	
lead	7439-92-1	E440	0.50	mg/kg	436	370	425	379	280	
lithium	7439-93-2	E440	2.0	mg/kg	21.9	20.4	24.9	25.7	33.1	
magnesium	7439-95-4	E440	20	mg/kg	10600	10800	13100	10800	11900	
manganese	7439-96-5	E440	1.0	mg/kg	982	850	920	2010	1560	
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	61.4	45.0	50.7	78.7	46.0	
nickel	7440-02-0	E440	0.50	mg/kg	163	377	1600	370	160	
phosphorus	7723-14-0	E440	50	mg/kg	12800	11600	12400	10300	13600	
potassium	7440-09-7	E440	100	mg/kg	5030	5000	5940	5650	5930	
selenium	7782-49-2	E440	0.20	mg/kg	0.35	0.29	0.35	0.30	0.29	
silver	7440-22-4	E440	0.10	mg/kg	13.9	2.91	4.39	2.88	6.40	
sodium	7440-23-5	E440	50	mg/kg	15000	14600	16300	15400	16800	
strontium	7440-24-6	E440	0.50	mg/kg	290	428	372	275	301	
sulfur	7704-34-9	E440	1000	mg/kg	10800	10000	13100	10800	11300	
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	0.060	0.054	0.054	0.069	



## Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2235-A-6	BA2235-A-7	BA2235-A-8	BA2235-A-9	BA2235-A-10
Client sampling date / time					06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-006	VA22C1056-007	VA22C1056-008	VA22C1056-009	VA22C1056-010	
					Result	Result	Result	Result	Result	
<b>Metals</b>										
tin	7440-31-5	E440	2.0	mg/kg	96.6	128	102	359	86.5	
titanium	7440-32-6	E440	1.0	mg/kg	246	255	268	292	220	
tungsten	7440-33-7	E440	0.50	mg/kg	7.03	5.96	11.8	4.32	4.25	
uranium	7440-61-1	E440	0.050	mg/kg	5.82	5.06	5.92	5.15	5.73	
vanadium	7440-62-2	E440	0.20	mg/kg	53.9	57.5	54.6	56.6	59.1	
zinc	7440-66-6	E440	2.0	mg/kg	3700	10700	4030	4860	3150	
zirconium	7440-67-7	E440	1.0	mg/kg	3.1	1.9	1.6	2.0	2.4	
<b>TCLP Metals</b>										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.4	11.6	11.5	11.5	11.4	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	9.56	9.26	9.40	9.11	9.46	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.90	2.90	2.90	2.90	2.90	
pH, TCLP final	----	EPP444	0.010	pH units	6.22	6.44	6.45	6.55	6.42	
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	2.17	2.49	2.00	2.24	1.98	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.187	0.149	0.589	0.112	0.365	
calcium, TCLP	7440-70-2	E444	10	mg/L	1730	1810	1690	1950	1800	
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	1.56	1.59	1.87	1.20	2.74	
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.28	1.08	1.12	0.994	0.776	
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	0.26	<0.25	<0.25	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	123	132	126	125	128	
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	0.50	0.46	0.53	0.42	0.65	
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	
uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	





## Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2235-A-6	BA2235-A-7	BA2235-A-8	BA2235-A-9	BA2235-A-10
Client sampling date / time					06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00	06-Sep-2022 09:00
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-006	VA22C1056-007	VA22C1056-008	VA22C1056-009	VA22C1056-010	
					Result	Result	Result	Result	Result	
<b>TCLP Metals</b>										
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	32.0	31.6	35.7	25.1	38.1	
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	BA2235-A-11	BA2235-A-12	----	----	----
(Matrix: Soil/Solid)					Client sampling date / time	06-Sep-2022 09:00	06-Sep-2022 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-011	VA22C1056-012	-----	-----	-----	
					Result	Result	---	---	---	
<b>Physical Tests</b>										
moisture	----	E144	0.25	%	17.6	18.6	----	----	----	
pH (1:2 soil:water)	----	E108	0.10	pH units	10.7	10.8	----	----	----	
<b>Metals</b>										
aluminum	7429-90-5	E440	50	mg/kg	56400	59900	----	----	----	
antimony	7440-36-0	E440	0.10	mg/kg	102	182	----	----	----	
arsenic	7440-38-2	E440	0.10	mg/kg	28.4	31.1	----	----	----	
barium	7440-39-3	E440	0.50	mg/kg	585	501	----	----	----	
beryllium	7440-41-7	E440	0.10	mg/kg	0.36	0.34	----	----	----	
bismuth	7440-69-9	E440	0.20	mg/kg	6.35	6.11	----	----	----	
boron	7440-42-8	E440	5.0	mg/kg	153	151	----	----	----	
cadmium	7440-43-9	E440	0.020	mg/kg	9.24	10.1	----	----	----	
calcium	7440-70-2	E440	50	mg/kg	137000	132000	----	----	----	
chromium	7440-47-3	E440	0.50	mg/kg	184	194	----	----	----	
cobalt	7440-48-4	E440	0.10	mg/kg	44.4	59.5	----	----	----	
copper	7440-50-8	E440	0.50	mg/kg	3290	9720	----	----	----	
iron	7439-89-6	E440	50	mg/kg	53000	58100	----	----	----	
lead	7439-92-1	E440	0.50	mg/kg	438	3630	----	----	----	
lithium	7439-93-2	E440	2.0	mg/kg	23.1	26.1	----	----	----	
magnesium	7439-95-4	E440	20	mg/kg	11100	11400	----	----	----	
manganese	7439-96-5	E440	1.0	mg/kg	952	1110	----	----	----	
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	----	----	----	
molybdenum	7439-98-7	E440	0.10	mg/kg	49.1	56.7	----	----	----	
nickel	7440-02-0	E440	0.50	mg/kg	140	184	----	----	----	
phosphorus	7723-14-0	E440	50	mg/kg	11100	11200	----	----	----	
potassium	7440-09-7	E440	100	mg/kg	5330	5060	----	----	----	
selenium	7782-49-2	E440	0.20	mg/kg	0.36	0.29	----	----	----	
silver	7440-22-4	E440	0.10	mg/kg	5.30	3.56	----	----	----	
sodium	7440-23-5	E440	50	mg/kg	16100	15900	----	----	----	
strontium	7440-24-6	E440	0.50	mg/kg	305	322	----	----	----	
sulfur	7704-34-9	E440	1000	mg/kg	12800	11500	----	----	----	
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	----	----	----	



**Analytical Results**

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2235-A-11	BA2235-A-12	----	----	----
Client sampling date / time					06-Sep-2022 09:00	06-Sep-2022 09:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-011	VA22C1056-012	-----	-----	-----	
					Result	Result	---	---	---	
<b>Metals</b>										
tin	7440-31-5	E440	2.0	mg/kg	88.4	128	---	---	---	
titanium	7440-32-6	E440	1.0	mg/kg	594	658	---	---	---	
tungsten	7440-33-7	E440	0.50	mg/kg	5.02	4.71	---	---	---	
uranium	7440-61-1	E440	0.050	mg/kg	5.39	5.19	---	---	---	
vanadium	7440-62-2	E440	0.20	mg/kg	51.2	51.9	---	---	---	
zinc	7440-66-6	E440	2.0	mg/kg	8300	4010	---	---	---	
zirconium	7440-67-7	E440	1.0	mg/kg	2.7	3.3	---	---	---	
<b>TCLP Metals</b>										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.6	11.4	---	---	---	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	9.63	9.09	---	---	---	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.90	2.90	---	---	---	
pH, TCLP final	----	EPP444	0.010	pH units	6.54	6.39	---	---	---	
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	2.15	2.30	---	---	---	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.220	0.307	---	---	---	
calcium, TCLP	7440-70-2	E444	10	mg/L	1940	1920	---	---	---	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	---	---	---	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.39	1.09	---	---	---	
copper, TCLP	7440-50-8	E444	0.050	mg/L	0.868	0.854	---	---	---	
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	129	127	---	---	---	
mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.57	0.63	---	---	---	
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	BA2235-A-11	BA2235-A-12	----	----	----
					Client sampling date / time	06-Sep-2022 09:00	06-Sep-2022 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA22C1056-011	VA22C1056-012	-----	-----	-----	
					Result	Result	---	---	---	
<b>TCLP Metals</b>										
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	----	----	----	
zinc, TCLP	7440-66-6	E444	0.50	mg/L	20.0	24.4	----	----	----	
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	: <b>VA22C1056</b>	Page	: 1 of 16
Client	: <b>Covanta Burnaby Renewable Energy, ULC</b>	Laboratory	: Vancouver - Environmental
Contact	: Dan Skrypyk	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	: 06-Sep-2022 11:50
PO	: VANCO 0000051213	Issue Date	: 19-Sep-2022 09:48
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
<b>Duplicate (DUP) RPDs</b>								
Metals	VA22C1056-001	BA2235-A-1	antimony	7440-36-0	E440	52.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	arsenic	7440-38-2	E440	45.3 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	bismuth	7440-69-9	E440	59.9 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	cadmium	7440-43-9	E440	106 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	copper	7440-50-8	E440	131 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	lead	7439-92-1	E440	144 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	nickel	7440-02-0	E440	81.8 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	sulfur	7704-34-9	E440	39.1 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-004	BA2235-A-4	tin	7440-31-5	E440	65.9 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	tin	7440-31-5	E440	96.6 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22C1056-001	BA2235-A-1	zinc	7440-66-6	E440	35.6 % 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		
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-1	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✓	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-10	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✓	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-11	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✓	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-12	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✓	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-2	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✓	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-3	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✓	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-4	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-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		
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-5	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✔	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-6	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✔	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-7	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✔	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-8	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✔	
<b>Metals : Mercury in Soil/Solid by CVAAS</b>											
LDPE bag BA2235-A-9	E510	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	28 days	9 days	✔	
<b>Metals : Metals in Soil/Solid by CRC ICPMS</b>											
LDPE bag BA2235-A-1	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✔	
<b>Metals : Metals in Soil/Solid by CRC ICPMS</b>											
LDPE bag BA2235-A-10	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✔	
<b>Metals : Metals in Soil/Solid by CRC ICPMS</b>											
LDPE bag BA2235-A-11	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✔	
<b>Metals : Metals in Soil/Solid by CRC ICPMS</b>											
LDPE bag BA2235-A-12	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-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							
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-2	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-3	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-4	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-5	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-6	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-7	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-8	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Metals : Metals in Soil/Solid by CRC ICMS</b>											
LDPE bag BA2235-A-9	E440	06-Sep-2022	14-Sep-2022	----	----		15-Sep-2022	180 days	10 days	✓	
<b>Physical Tests : Moisture Content by Gravimetry</b>											
LDPE bag BA2235-A-1	E144	06-Sep-2022	----	----	----		13-Sep-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	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-10	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-11	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-12	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-2	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-3	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-4	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-5	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-6	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----	
<b>Physical Tests : Moisture Content by Gravimetry</b>										
LDPE bag BA2235-A-7	E144	06-Sep-2022	----	----	----		13-Sep-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		
<b>Physical Tests : Moisture Content by Gravimetry</b>											
LDPE bag BA2235-A-8	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----		
<b>Physical Tests : Moisture Content by Gravimetry</b>											
LDPE bag BA2235-A-9	E144	06-Sep-2022	----	----	----		13-Sep-2022	----	----		
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-1	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-10	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-11	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-12	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-2	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-3	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-4	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-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		
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-5	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-6	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-7	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-8	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>Physical Tests : pH by Meter (1:2 Soil:Water Extraction)</b>											
LDPE bag BA2235-A-9	E108	06-Sep-2022	14-Sep-2022	----	----		14-Sep-2022	30 days	9 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
Glass vial - total (lab preserved) BA2235-A-1	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
Glass vial - total (lab preserved) BA2235-A-10	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
Glass vial - total (lab preserved) BA2235-A-11	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
Glass vial - total (lab preserved) BA2235-A-12	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 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		
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-2	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-3	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-4	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-5	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-6	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-7	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-8	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Mercury by CVAAS (TCLP)</b>											
<b>Glass vial - total (lab preserved)</b> BA2235-A-9	E512	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	28 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
<b>HDPE - total (lab preserved)</b> BA2235-A-1	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 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		
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-10	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-11	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-12	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-2	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-3	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-4	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-5	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-6	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✔	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
HDPE - total (lab preserved) BA2235-A-7	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 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		
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
<b>HDPE - total (lab preserved)</b> BA2235-A-8	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✓	
<b>TCLP Metals : Metals by CRC ICPMS (TCLP)</b>											
<b>HDPE - total (lab preserved)</b> BA2235-A-9	E444	08-Sep-2022	13-Sep-2022	----	----		13-Sep-2022	180 days	7 days	✓	
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-1	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----		
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-10	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----		
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-11	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----		
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-12	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----		
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-2	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----		
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-3	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----		
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>											
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-4	EPP444	06-Sep-2022	08-Sep-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	
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>										
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-5	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----	
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>										
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-6	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----	
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>										
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-7	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----	
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>										
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-8	EPP444	06-Sep-2022	08-Sep-2022	----	----		----	----	----	
<b>TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)</b>										
<b>Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI)</b> BA2235-A-9	EPP444	06-Sep-2022	08-Sep-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	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Mercury in Soil/Solid by CVAAS	E510	645616	1	19	5.2	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	651299	2	19	10.5	5.0	✔
Moisture Content by Gravimetry	E144	645620	1	20	5.0	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	645617	1	19	5.2	5.0	✔
<b>Laboratory Control Samples (LCS)</b>							
Mercury in Soil/Solid by CVAAS	E510	645616	2	19	10.5	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	651299	4	19	21.0	10.0	✔
Moisture Content by Gravimetry	E144	645620	1	20	5.0	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	645617	1	19	5.2	5.0	✔
<b>Method Blanks (MB)</b>							
Mercury by CVAAS (TCLP)	E512	644486	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	645616	1	19	5.2	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	644487	1	12	8.3	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	651299	2	19	10.5	5.0	✔
Moisture Content by Gravimetry	E144	645620	1	20	5.0	5.0	✔
<b>Matrix Spikes (MS)</b>							
Mercury by CVAAS (TCLP)	E512	644486	1	12	8.3	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	644487	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 $20 \pm 5^{\circ}\text{C}$ ), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at $<60^{\circ}\text{C}$ ) 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 $105^{\circ}\text{C}$ . 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 $\text{HNO}_3$ and $\text{HCl}$ .  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  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 $\text{HNO}_3$ and $\text{HCl}$ , followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512  Vancouver - Environmental	Soil/Solid	SW 846 -1311/245.1 CVAAS 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  Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at $<60^{\circ}\text{C}$ ) 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 $\text{HNO}_3$ and $\text{HCl}$ . This method is intended to liberate metals that may be environmentally available.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
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** : **VA22C1056**

**Client** : Covanta Burnaby Renewable Energy, ULC

**Contact** : Dan Skrypnyk

**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 13

**Laboratory** : Vancouver - Environmental

**Account Manager** : Brent Mack

**Address** : 8081 Lougheed Highway  
Burnaby, British Columbia Canada V5A 1W9

**Telephone** : 778-370-3279

**Date Samples Received** : 06-Sep-2022 11:50

**Date Analysis Commenced** : 08-Sep-2022

**Issue Date** : 19-Sep-2022 09:48

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>
Dan Gebert	Laboratory Analyst	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Qammar Almas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

Page : 2 of 13  
Work Order : VA22C1056  
Client : Covanta Burnaby Renewable Energy, ULC  
Project : Weekly Bottom Ash-Suite

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## **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**

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

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### 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
<b>Physical Tests (QC Lot: 645617)</b>											
VA22C1056-001	BA2235-A-1	pH (1:2 soil:water)	----	E108	0.10	pH units	10.6	10.8	1.6%	5%	----
<b>Physical Tests (QC Lot: 645620)</b>											
VA22C1056-001	BA2235-A-1	moisture	----	E144	0.25	%	18.6	16.6	11.6%	20%	----
<b>Metals (QC Lot: 645615)</b>											
VA22C1056-001	BA2235-A-1	aluminum	7429-90-5	E440	50	mg/kg	31100	40600	26.5%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	177	104	52.2%	30%	DUP-H
		arsenic	7440-38-2	E440	0.10	mg/kg	37.8	23.8	45.3%	30%	DUP-H
		barium	7440-39-3	E440	0.50	mg/kg	466	669	35.6%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.36	0.35	0.010	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	10.6	5.72	59.9%	30%	DUP-H
		boron	7440-42-8	E440	5.0	mg/kg	230	194	17.3%	30%	----
		cadmium	7440-43-9	E440	0.020	mg/kg	32.5	9.94	106%	30%	DUP-H
		calcium	7440-70-2	E440	50	mg/kg	160000	134000	18.0%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	237	231	2.41%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	97.1	79.9	19.4%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	4620	22300	131%	30%	DUP-H
		iron	7439-89-6	E440	50	mg/kg	65500	64200	1.99%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	4220	689	144%	40%	DUP-H
		lithium	7439-93-2	E440	2.0	mg/kg	30.6	26.9	13.0%	30%	----
		magnesium	7439-95-4	E440	20	mg/kg	12800	11300	12.4%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	902	1090	19.0%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	75.6	96.8	24.5%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	224	534	81.8%	30%	DUP-H
		phosphorus	7723-14-0	E440	50	mg/kg	14100	12000	15.8%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	6690	5540	18.8%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.49	0.30	0.18	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	4.77	6.55	31.4%	40%	----
		sodium	7440-23-5	E440	50	mg/kg	18200	16400	10.2%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	361	289	22.2%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	15400	10400	39.1%	30%	DUP-H
		thallium	7440-28-0	E440	0.050	mg/kg	0.102	0.056	0.046	Diff <2x LOR	----



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
<b>Metals (QC Lot: 645615) - continued</b>											
VA22C1056-001	BA2235-A-1	tin	7440-31-5	E440	2.0	mg/kg	187	536	96.6%	40%	DUP-H
		titanium	7440-32-6	E440	1.0	mg/kg	272	334	20.3%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	6.73	6.41	4.88%	30%	----
		uranium	7440-61-1	E440	0.050	mg/kg	6.66	5.84	13.1%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	58.6	52.9	10.3%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	4690	3270	35.6%	30%	DUP-H
		zirconium	7440-67-7	E440	1.0	mg/kg	1.9	2.1	0.3	Diff <2x LOR	----
<b>Metals (QC Lot: 645616)</b>											
VA22C1056-001	BA2235-A-1	mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
<b>Metals (QC Lot: 651299)</b>											
VA22C1056-004	BA2235-A-4	tin	7440-31-5	E440	5.8	mg/kg	70.8	140	65.9%	40%	DUP-H

**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
<b>Physical Tests (QCLot: 645620)</b>						
moisture	----	E144	0.25	%	<0.25	----
<b>Metals (QCLot: 645615)</b>						
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	----
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	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Metals (QCLot: 645615) - continued</b>						
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	----
<b>Metals (QCLot: 645616)</b>						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
<b>Metals (QCLot: 651299)</b>						
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	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Metals (QCLot: 651299) - continued</b>						
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	----
<b>TCLP Metals (QCLot: 644486)</b>						
mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
<b>TCLP Metals (QCLot: 644487)</b>						
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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
<b>Physical Tests (QCLot: 645617)</b>									
pH (1:2 soil:water)	---	E108	---	pH units	6 pH units	99.8	95.0	105	---
<b>Physical Tests (QCLot: 645620)</b>									
moisture	---	E144	0.25	%	50 %	98.0	90.0	110	---
<b>Metals (QCLot: 645615)</b>									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	108	80.0	120	---
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	107	80.0	120	---
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	110	80.0	120	---
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	105	80.0	120	---
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	99.0	80.0	120	---
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	113	80.0	120	---
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	94.1	80.0	120	---
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	98.5	80.0	120	---
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	101	80.0	120	---
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	---
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	102	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	97.2	80.0	120	---
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	108	80.0	120	---
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	96.8	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	104	80.0	120	---
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	101	80.0	120	---
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	103	80.0	120	---
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	107	80.0	120	---
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	110	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	89.2	80.0	120	---
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	110	80.0	120	---
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	106	80.0	120	---
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	102	80.0	120	---
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	117	80.0	120	---
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	95.7	80.0	120	---
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	102	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	
<b>Metals (QCLot: 645615) - continued</b>									
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	106	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	110	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	107	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	101	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	102	80.0	120	----
<b>Metals (QCLot: 645616)</b>									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
<b>Metals (QCLot: 651299)</b>									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	108	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	106	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	116	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	109	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	114	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	94.8	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	112	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	115	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	108	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	106	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	102	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	116	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	108	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	110	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	110	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	105	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	104	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	92.2	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	108	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	98.6	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	105	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	110	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	119	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	102	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	116	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	99.4	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	88.5	80.0	120	----

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 Work Order : VA22C1056  
 Client : Covanta Burnaby Renewable Energy, ULC  
 Project : Weekly Bottom Ash-Suite



Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
<b>Metals (QCLot: 651299) - continued</b>									
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	100	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	113	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	112	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	110	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	99.3	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**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	Target	MS	Low	High	
<b>TCLP Metals (QCLot: 644486)</b>										
VA22C1056-001	BA2235-A-1	mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	101	50.0	140	----
<b>TCLP Metals (QCLot: 644487)</b>										
VA22C1056-001	BA2235-A-1	antimony, TCLP	7440-36-0	E444	4.42 mg/L	5 mg/L	88.4	50.0	140	----
		arsenic, TCLP	7440-38-2	E444	4.7 mg/L	5 mg/L	94.4	50.0	140	----
		barium, TCLP	7440-39-3	E444	11.0 mg/L	12.5 mg/L	87.7	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.237 mg/L	0.25 mg/L	94.8	50.0	140	----
		boron, TCLP	7440-42-8	E444	8.88 mg/L	10 mg/L	88.8	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	ND mg/L	0.25 mg/L	ND	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	1.11 mg/L	1.25 mg/L	88.7	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	2.20 mg/L	2.5 mg/L	88.0	50.0	140	----
		iron, TCLP	7439-89-6	E444	230 mg/L	250 mg/L	91.8	50.0	140	----
		lead, TCLP	7439-92-1	E444	8.36 mg/L	10 mg/L	83.6	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	228 mg/L	250 mg/L	91.1	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.17 mg/L	2.5 mg/L	86.9	50.0	140	----
		selenium, TCLP	7782-49-2	E444	4.94 mg/L	5 mg/L	98.8	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.099 mg/L	0.1 mg/L	99.4	50.0	140	----
		thallium, TCLP	7440-28-0	E444	4.0 mg/L	5 mg/L	80.4	50.0	140	----
		uranium, TCLP	7440-61-1	E444	4.49 mg/L	5 mg/L	89.9	50.0	150	----
		vanadium, TCLP	7440-62-2	E444	0.70 mg/L	0.75 mg/L	93.1	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	8 mg/L	10 mg/L	75.7	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	
<b>Metals (QCLot: 645615)</b>									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	112	70.0	130	----
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	102	70.0	130	----
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	105	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	110	70.0	130	----
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	113	40.0	160	----
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	97.9	70.0	130	----
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	110	70.0	130	----
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	110	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	102	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	108	70.0	130	----
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	102	70.0	130	----
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	110	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	100	70.0	130	----
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	103	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	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	108	70.0	130	----
	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	96.6	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	115	70.0	130	----
	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	109	70.0	130	----
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	108	70.0	130	----
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	99.9	70.0	130	----
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	99.4	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	
<b>Metals (QCLot: 645616)</b>									
	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	99.8	70.0	130	---
<b>Metals (QCLot: 651299)</b>									
	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	113	70.0	130	---
	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	95.6	70.0	130	---
	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	96.2	70.0	130	---
	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	99.5	70.0	130	---
	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	99.5	70.0	130	---
	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	120	40.0	160	---
	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	94.8	70.0	130	---
	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	112	70.0	130	---
	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	109	70.0	130	---
	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	96.3	70.0	130	---
	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	96.1	70.0	130	---
	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	99.9	70.0	130	---
	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	118	70.0	130	---
	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	98.9	70.0	130	---
	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	112	70.0	130	---
	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	100.0	70.0	130	---
	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	102	70.0	130	---
	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	97.9	70.0	130	---
	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	94.6	70.0	130	---
	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	111	70.0	130	---
	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	102	70.0	130	---
	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	117	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	89.0	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	102	70.0	130	---
	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	101	70.0	130	---
	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	92.7	70.0	130	---
	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	90.6	70.0	130	---



Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # \_\_\_\_\_

Page 1 of 1

<b>Report To</b>		<b>Report Format / Distribution</b>		<b>Service Requested</b> (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:	Nicole Victor / Dan Skrypyk	<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:	nvictor@covanta.com	<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Phone:	604-521-1025	Fax:		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	

<input type="checkbox"/> Yes <input type="checkbox"/> No		Email 3: dskrypyk@covanta.com Email 4: brent.kirkpatrick@metrovancover.org Email 5: Sarah.Wellman@metrovancover.org		<b>Analysis Request</b>	
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<b>Invoice To</b> Same as Report ?		<b>Client / Project Information</b>		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 #:							
Company:		PO / AFE: PO# _____ Weekly Bottom Ash - Suite							
Contact:		LSD: (includes 2:1 pH)							
Address:		Quote #:							
Phone:		Fax:							

Lab Work Order # (lab use only)		ALS Contact:		Sampler:							
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Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)		MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)		Number of Containers
BA 2235-A-1			9:00	Soil	X	X			X		1
BA 2235-A-2			9:00	Soil	X	X			X		1
BA 2235-A-3			9:00	Soil	X	X			X		1
BA 2235-A-4			9:00	Soil	X	X			X		1
BA 2235-A-5			9:00	Soil	X	X			X		1
BA 2235-A-6			9:00	Soil	X	X			X		1
BA 2235-A-7			9:00	Soil	X	X			X		1
BA 2235-A-8			9:00	Soil	X	X			X		1
BA 2235-A-9			9:00	Soil	X	X			X		1
BA 2235-A-10			9:00	Soil	X	X			X		1
BA 2235-A-11			9:00	Soil	X	X			X		1
BA 2235-A-12			9:00	Soil	X	X			X		1

Environmental Division  
Vancouver  
Work Order Reference  
**VA22C1056**



Telephone : +1 604 253 4188

Special Instructions / F		E-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details									
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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:
KI	6-Sep-22	9:00	PL	9/6/22	11:50	21 °C				Yes / No ? If Yes add SIF