Bottom Ash Data

2022 Week 2

The following analytical report represents bottom ash composite results for week 2 of 2022 (January 9, 2022 to January 15, 2022).

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **VA22A0863**	Page	: 1 of 11
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 BC Canada V5A 1W9
Telephone	: 604 521 1025	Telephone	: 778-370-3279
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 18-Jan-2022 11:45
PO	: VANCO 0000051213	Date Analysis Commenced	: 25-Jan-2022
C-O-C number	: ----	Issue Date	: 31-Jan-2022 09:19
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 Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	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).

Unit	*Description*
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

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

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

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

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-1	BA2202-A-2	BA2202-A-3	BA2202-A-4	BA2202-A-5
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00
						VA22A0863-001	VA22A0863-002	VA22A0863-003	VA22A0863-004	VA22A0863-005
						Result	Result	Result	Result	Result
Physical Tests										
moisture	----	E144	0.25	%		27.6	26.5	25.9	24.7	26.0
pH (1:2 soil:water)	----	E108	0.10	pH units		10.3	10.2	10.6	10.3	10.4
Metals										
aluminum	7429-90-5	E440	50	mg/kg		46800	44900	39800	36500	43700
antimony	7440-36-0	E440	0.10	mg/kg		359	123	128	131	119
arsenic	7440-38-2	E440	0.10	mg/kg		14.1	13.2	14.9	13.2	16.8
barium	7440-39-3	E440	0.50	mg/kg		808	706	678	720	738
beryllium	7440-41-7	E440	0.10	mg/kg		0.44	0.41	0.39	0.43	0.44
bismuth	7440-69-9	E440	0.20	mg/kg		15.4	20.2	9.94	11.1	8.53
boron	7440-42-8	E440	5.0	mg/kg		262	278	203	190	203
cadmium	7440-43-9	E440	0.020	mg/kg		25.3	8.82	9.41	12.0	8.80
calcium	7440-70-2	E440	50	mg/kg		159000	148000	151000	149000	138000
chromium	7440-47-3	E440	0.50	mg/kg		154	148	200	127	185
cobalt	7440-48-4	E440	0.10	mg/kg		158	51.5	123	37.2	50.7
copper	7440-50-8	E440	0.50	mg/kg		8780	3400	3840	6260	2770
iron	7439-89-6	E440	50	mg/kg		73600	61400	69500	43700	68300
lead	7439-92-1	E440	0.50	mg/kg		1690	1280	583	506	390
lithium	7439-93-2	E440	2.0	mg/kg		41.2	31.9	38.5	24.1	27.5
magnesium	7439-95-4	E440	20	mg/kg		14900	13300	13200	13200	13800
manganese	7439-96-5	E440	1.0	mg/kg		1210	850	907	1240	857
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	<0.0500	0.0616	0.0517	<0.0500
molybdenum	7439-98-7	E440	0.10	mg/kg		38.7	38.7	55.8	64.3	39.2
nickel	7440-02-0	E440	0.50	mg/kg		182	122	210	83.0	122
phosphorus	7723-14-0	E440	50	mg/kg		14200	12600	12600	13300	12400
potassium	7440-09-7	E440	100	mg/kg		5850	5200	5000	6120	5120
selenium	7782-49-2	E440	0.20	mg/kg		0.35	0.32	0.46	0.33	0.28
silver	7440-22-4	E440.Ag	0.10	mg/kg		----	----	6.14	----	----
silver	7440-22-4	E440	0.10	mg/kg		9.27	6.10	----	7.24	6.22
sodium	7440-23-5	E440	50	mg/kg		18500	16400	14900	17600	15500
strontium	7440-24-6	E440	0.50	mg/kg		402	326	338	360	331

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-1	BA2202-A-2	BA2202-A-3	BA2202-A-4	BA2202-A-5
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00
						VA22A0863-001	VA22A0863-002	VA22A0863-003	VA22A0863-004	VA22A0863-005
						Result	Result	Result	Result	Result
Metals										
sulfur	7704-34-9	E440	1000	mg/kg		11900	11000	11000	10900	9300
thallium	7440-28-0	E440	0.050	mg/kg		0.064	0.054	0.057	0.062	0.054
tin	7440-31-5	E440	2.0	mg/kg		246	124	138	108	172
titanium	7440-32-6	E440	1.0	mg/kg		571	678	435	437	507
tungsten	7440-33-7	E440	0.50	mg/kg		14.9	22.9	28.6	20.4	24.4
uranium	7440-61-1	E440	0.050	mg/kg		6.03	5.62	5.70	6.21	5.49
vanadium	7440-62-2	E440	0.20	mg/kg		51.9	49.4	49.6	47.0	48.2
zinc	7440-66-6	E440	2.0	mg/kg		4190	3160	4130	4300	4810
zirconium	7440-67-7	E440	1.0	mg/kg		2.2	2.1	2.2	2.2	2.6
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units		11.4	11.4	11.6	11.5	11.6
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units		8.67	8.87	8.82	8.33	8.63
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		6.26	6.09	6.21	5.80	5.95
antimony, TCLP	7440-36-0	E444	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
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		2.06	2.19	2.30	2.28	2.22
cadmium, TCLP	7440-43-9	E444	0.050	mg/L		0.153	0.157	2.11	0.158	0.466
calcium, TCLP	7440-70-2	E444	10	mg/L		2250	2210	2180	2420	2350
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		1.12	2.18	0.847	2.91	1.48
copper, TCLP	7440-50-8	E444	0.050	mg/L		2.02	1.17	1.91	1.62	2.01
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		164	161	159	173	164
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	0.74	0.72	0.45	0.58
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**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-1	BA2202-A-2	BA2202-A-3	BA2202-A-4	BA2202-A-5
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00
						VA22A0863-001	VA22A0863-002	VA22A0863-003	VA22A0863-004	VA22A0863-005
						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
uranium, TCLP	7440-61-1	E444	0.20	mg/L		<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
zinc, TCLP	7440-66-6	E444	0.50	mg/L		49.5	32.8	34.2	63.8	82.0
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**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-6	BA2202-A-7	BA2202-A-8	BA2202-A-9	BA2202-A-10
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00
						VA22A0863-006	VA22A0863-007	VA22A0863-008	VA22A0863-009	VA22A0863-010
						Result	Result	Result	Result	Result
Physical Tests										
moisture	----	E144	0.25	%		25.7	26.2	27.6	26.9	26.1
pH (1:2 soil:water)	----	E108	0.10	pH units		10.5	10.7	10.6	10.6	10.7
Metals										
aluminum	7429-90-5	E440	50	mg/kg		43600	43900	40400	36400	36200
antimony	7440-36-0	E440	0.10	mg/kg		118	124	123	148	113
arsenic	7440-38-2	E440	0.10	mg/kg		11.8	14.3	14.6	14.7	19.2
barium	7440-39-3	E440	0.50	mg/kg		706	692	652	697	611
beryllium	7440-41-7	E440	0.10	mg/kg		0.40	0.45	0.41	0.39	0.56
bismuth	7440-69-9	E440	0.20	mg/kg		11.2	12.5	8.68	10.4	11.7
boron	7440-42-8	E440	5.0	mg/kg		230	201	170	207	196
cadmium	7440-43-9	E440	0.020	mg/kg		10.8	9.02	8.19	8.27	12.4
calcium	7440-70-2	E440	50	mg/kg		146000	146000	152000	142000	147000
chromium	7440-47-3	E440	0.50	mg/kg		122	168	158	189	159
cobalt	7440-48-4	E440	0.10	mg/kg		48.4	244	64.3	29.6	101
copper	7440-50-8	E440	0.50	mg/kg		1800	4220	2170	15500	8110
iron	7439-89-6	E440	50	mg/kg		55000	35100	58400	66700	63800
lead	7439-92-1	E440	0.50	mg/kg		330	386	426	379	362
lithium	7439-93-2	E440	2.0	mg/kg		24.6	51.0	26.9	22.9	22.1
magnesium	7439-95-4	E440	20	mg/kg		12600	12800	14200	12200	13000
manganese	7439-96-5	E440	1.0	mg/kg		874	1020	788	897	1200
mercury	7439-97-6	E510	0.0500	mg/kg		<0.0500	<0.0500	<0.0500	0.0539	<0.0500
molybdenum	7439-98-7	E440	0.10	mg/kg		37.6	36.6	33.6	37.3	41.3
nickel	7440-02-0	E440	0.50	mg/kg		100	175	636	138	164
phosphorus	7723-14-0	E440	50	mg/kg		15700	14300	13700	13700	11600
potassium	7440-09-7	E440	100	mg/kg		5300	5600	4990	5660	4920
selenium	7782-49-2	E440	0.20	mg/kg		0.36	0.33	0.36	0.29	0.33
silver	7440-22-4	E440	0.10	mg/kg		5.54	7.58	4.26	6.30	7.99
sodium	7440-23-5	E440	50	mg/kg		16900	17700	15600	16800	15300
strontium	7440-24-6	E440	0.50	mg/kg		424	355	302	315	338
sulfur	7704-34-9	E440	1000	mg/kg		10600	11100	10200	9600	10000
thallium	7440-28-0	E440	0.050	mg/kg		0.056	0.060	<0.050	<0.050	<0.050

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-6	BA2202-A-7	BA2202-A-8	BA2202-A-9	BA2202-A-10
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00
						VA22A0863-006	VA22A0863-007	VA22A0863-008	VA22A0863-009	VA22A0863-010
						Result	Result	Result	Result	Result
Metals										
tin	7440-31-5	E440	2.0	mg/kg		545	103	209	134	115
titanium	7440-32-6	E440	1.0	mg/kg		374	485	441	436	340
tungsten	7440-33-7	E440	0.50	mg/kg		18.2	24.8	13.7	15.2	17.0
uranium	7440-61-1	E440	0.050	mg/kg		5.66	6.07	5.41	5.36	5.52
vanadium	7440-62-2	E440	0.20	mg/kg		46.5	49.7	45.4	44.4	46.6
zinc	7440-66-6	E440	2.0	mg/kg		4680	5100	6710	3590	3290
zirconium	7440-67-7	E440	1.0	mg/kg		1.8	2.2	2.6	2.8	2.3
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units		11.5	11.6	11.6	11.3	11.4
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units		8.68	8.82	8.64	8.37	8.62
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		6.02	5.96	6.03	5.78	5.97
antimony, TCLP	7440-36-0	E444	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
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		2.18	2.33	2.19	2.22	2.25
cadmium, TCLP	7440-43-9	E444	0.050	mg/L		0.219	0.189	0.156	0.156	0.152
calcium, TCLP	7440-70-2	E444	10	mg/L		2180	2180	2220	2280	2310
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		0.955	1.09	1.58	1.30	1.62
copper, TCLP	7440-50-8	E444	0.050	mg/L		2.05	1.63	1.39	1.44	0.949
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		0.34	<0.25	<0.25	<0.25	<0.25
magnesium, TCLP	7439-95-4	E444	2.5	mg/L		167	160	168	178	170
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		0.44	0.49	0.67	0.55	0.54
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**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-6	BA2202-A-7	BA2202-A-8	BA2202-A-9	BA2202-A-10
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00	12-Jan-2022 09:00
						VA22A0863-006	VA22A0863-007	VA22A0863-008	VA22A0863-009	VA22A0863-010
						Result	Result	Result	Result	Result
TCLP Metals										
vanadium, TCLP	7440-62-2	E444	0.15	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15
zinc, TCLP	7440-66-6	E444	0.50	mg/L		42.1	64.6	42.6	119	40.7
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**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method	LOR	Unit	Client sample ID: BA2202-A-11	BA2202-A-12	----	----	----
					Client sampling date / time: 12-Jan-2022 09:00	12-Jan-2022 09:00	----	----	----
					VA22A0863-011	VA22A0863-012	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
moisture	----	E144	0.25	%	25.8	25.7	----	----	----
pH (1:2 soil:water)	----	E108	0.10	pH units	10.7	10.5	----	----	----
Metals									
aluminum	7429-90-5	E440	50	mg/kg	47900	48500	----	----	----
antimony	7440-36-0	E440	0.10	mg/kg	113	114	----	----	----
arsenic	7440-38-2	E440	0.10	mg/kg	19.3	12.4	----	----	----
barium	7440-39-3	E440	0.50	mg/kg	665	708	----	----	----
beryllium	7440-41-7	E440	0.10	mg/kg	0.42	0.44	----	----	----
bismuth	7440-69-9	E440	0.20	mg/kg	10.7	13.5	----	----	----
boron	7440-42-8	E440	5.0	mg/kg	251	248	----	----	----
cadmium	7440-43-9	E440	0.020	mg/kg	8.01	28.0	----	----	----
calcium	7440-70-2	E440	50	mg/kg	159000	152000	----	----	----
chromium	7440-47-3	E440	0.50	mg/kg	203	132	----	----	----
cobalt	7440-48-4	E440	0.10	mg/kg	42.4	158	----	----	----
copper	7440-50-8	E440	0.50	mg/kg	1880	1830	----	----	----
iron	7439-89-6	E440	50	mg/kg	51000	43300	----	----	----
lead	7439-92-1	E440	0.50	mg/kg	403	356	----	----	----
lithium	7439-93-2	E440	2.0	mg/kg	24.9	43.0	----	----	----
magnesium	7439-95-4	E440	20	mg/kg	13900	13700	----	----	----
manganese	7439-96-5	E440	1.0	mg/kg	1340	789	----	----	----
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	----	----	----
molybdenum	7439-98-7	E440	0.10	mg/kg	48.9	35.9	----	----	----
nickel	7440-02-0	E440	0.50	mg/kg	173	102	----	----	----
phosphorus	7723-14-0	E440	50	mg/kg	11700	11600	----	----	----
potassium	7440-09-7	E440	100	mg/kg	4810	5600	----	----	----
selenium	7782-49-2	E440	0.20	mg/kg	0.29	0.27	----	----	----
silver	7440-22-4	E440	0.10	mg/kg	4.61	10.3	----	----	----
sodium	7440-23-5	E440	50	mg/kg	16600	16600	----	----	----
strontium	7440-24-6	E440	0.50	mg/kg	314	372	----	----	----
sulfur	7704-34-9	E440	1000	mg/kg	10000	9800	----	----	----
thallium	7440-28-0	E440	0.050	mg/kg	<0.050	0.065	----	----	----

Analytical Results

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

Analyte	CAS Number	Method	LOR	Unit	Client sample ID	BA2202-A-11	BA2202-A-12	----	----	----
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	----	----	----
						VA22A0863-011	VA22A0863-012	--------	--------	--------
						Result	Result	----	----	----
Metals										
tin	7440-31-5	E440	2.0	mg/kg		130	215	----	----	----
titanium	7440-32-6	E440	1.0	mg/kg		396	638	----	----	----
tungsten	7440-33-7	E440	0.50	mg/kg		18.7	22.8	----	----	----
uranium	7440-61-1	E440	0.050	mg/kg		5.28	5.62	----	----	----
vanadium	7440-62-2	E440	0.20	mg/kg		60.4	54.2	----	----	----
zinc	7440-66-6	E440	2.0	mg/kg		2980	4340	----	----	----
zirconium	7440-67-7	E440	1.0	mg/kg		2.5	2.2	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units		11.3	11.3	----	----	----
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units		9.15	8.56	----	----	----
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units		2.90	2.90	----	----	----
pH, TCLP final	----	EPP444	0.010	pH units		6.62	5.82	----	----	----
antimony, TCLP	7440-36-0	E444	1.0	mg/L		<1.0	<1.0	----	----	----
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		2.07	2.28	----	----	----
cadmium, TCLP	7440-43-9	E444	0.050	mg/L		0.102	0.166	----	----	----
calcium, TCLP	7440-70-2	E444	10	mg/L		2010	2390	----	----	----
chromium, TCLP	7440-47-3	E444	0.25	mg/L		<0.25	<0.25	----	----	----
cobalt, TCLP	7440-48-4	E444	0.050	mg/L		1.07	0.872	----	----	----
copper, TCLP	7440-50-8	E444	0.050	mg/L		0.774	1.90	----	----	----
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	0.31	----	----	----
magnesium, TCLP	7439-95-4	E444	2.5	mg/L		148	171	----	----	----
mercury, TCLP	7439-97-6	E512	0.0010	mg/L		<0.0010	<0.0010	----	----	----
nickel, TCLP	7440-02-0	E444	0.25	mg/L		0.32	0.53	----	----	----
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	BA2202-A-11	BA2202-A-12	----	----	----
					Client sampling date / time	12-Jan-2022 09:00	12-Jan-2022 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit		VA22A0863-011	VA22A0863-012	--------	--------	--------
						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		22.1	52.9	----	----	----
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	: **VA22A0863**	Page	: 1 of 15
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	: 18-Jan-2022 11:45
PO	: VANCO 0000051213	Issue Date	: 31-Jan-2022 09:19
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 Services number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Metals	VA22A0863-001	BA2202-A-1	antimony	7440-36-0	E440	98.9 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22A0863-001	BA2202-A-1	cadmium	7440-43-9	E440	96.6 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22A0863-001	BA2202-A-1	cobalt	7440-48-4	E440	77.1 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22A0863-001	BA2202-A-1	lithium	7439-93-2	E440	49.4 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22A0863-001	BA2202-A-1	manganese	7439-96-5	E440	42.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22A0863-001	BA2202-A-1	tin	7440-31-5	E440	140 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA22A0863-001	BA2202-A-1	tungsten	7440-33-7	E440	42.1 % 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : High Silver in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-3	E440.Ag	12-Jan-2022	28-Jan-2022	----	----		28-Jan-2022	----	16 days	
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-1	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-10	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-11	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-12	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-2	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-3	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-4	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-5	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-6	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-7	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-8	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2202-A-9	E510	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	28 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-1	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-10	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-11	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-12	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-2	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-3	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-4	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-5	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-6	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-7	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-8	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2202-A-9	E440	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	180 days	15 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-1	E144	12-Jan-2022	----	----	----		26-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-10	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-11	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-12	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-2	E144	12-Jan-2022	----	----	----		26-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-3	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-4	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-5	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-6	E144	12-Jan-2022	----	----	----		25-Jan-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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-7	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-8	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2202-A-9	E144	12-Jan-2022	----	----	----		25-Jan-2022	----	----	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-1	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-10	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-11	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-12	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-2	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-3	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-4	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-5	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-6	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-7	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-8	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2202-A-9	E108	12-Jan-2022	27-Jan-2022	----	----		27-Jan-2022	30 days	15 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-1	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-10	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-11	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-12	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-2	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-3	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-4	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-5	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-6	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-7	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-8	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 days	
TCLP Metals : Mercury by CVAAS (TCLP)										
HDPE - total (lab preserved) BA2202-A-9	E512	25-Jan-2022	----	----	----		26-Jan-2022	----	14 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-1	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-10	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-11	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-12	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-2	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-3	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-4	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-5	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-6	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-7	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-8	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2202-A-9	E444	25-Jan-2022	----	----	----		26-Jan-2022	180 days	14 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-1	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-10	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-11	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-12	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-2	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-3	EPP444	12-Jan-2022	25-Jan-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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-4	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-5	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-6	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-7	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-8	EPP444	12-Jan-2022	25-Jan-2022	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2202-A-9	EPP444	12-Jan-2022	25-Jan-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			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Mercury in Soil/Solid by CVAAS	E510	394396	2	30	6.6	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	394819	2	32	6.2	5.0	✓
Moisture Content by Gravimetry	E144	394823	2	19	10.5	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	394821	2	30	6.6	5.0	✓
Laboratory Control Samples (LCS)							
High Silver in Soil/Solid by CRC ICPMS	E440.Ag	397044	1	1	100.0	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	394396	4	30	13.3	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	394819	4	32	12.5	10.0	✓
Moisture Content by Gravimetry	E144	394823	2	19	10.5	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	394821	2	30	6.6	5.0	✓
Method Blanks (MB)							
High Silver in Soil/Solid by CRC ICPMS	E440.Ag	397044	1	1	100.0	5.0	✓
Mercury by CVAAS (TCLP)	E512	394965	1	12	8.3	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	394396	2	30	6.6	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	394966	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	394819	2	32	6.2	5.0	✓
Moisture Content by Gravimetry	E144	394823	2	19	10.5	5.0	✓
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	394965	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	394966	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 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 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 HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Elemental Sulfur may be poorly recovered by this method. 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 HNO3 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 HNO3 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

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°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 HNO3 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 HNO3 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.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **VA22A0863**	Page	: 1 of 15
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	: 18-Jan-2022 11:45
PO	: VANCO 0000051213	Date Analysis Commenced	: 25-Jan-2022
C-O-C number	: ----	Issue Date	: 31-Jan-2022 09:19
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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Laboratory Department*
Caleb Deroche	Lab Analyst	Metals, Burnaby, British Columbia
Dan Gebert	Laboratory Analyst	Metals, Burnaby, British Columbia
Dee Lee	Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	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 ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

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

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: 394398)											
FJ2200164-001	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	5.15	5.16	0.2%	5%	----
Physical Tests (QC Lot: 394399)											
VA22A0863-003	BA2202-A-3	moisture	----	E144	0.25	%	25.9	21.9	16.8%	20%	----
Physical Tests (QC Lot: 394821)											
VA22A0863-001	BA2202-A-1	pH (1:2 soil:water)	----	E108	0.10	pH units	10.3	10.2	0.9%	5%	----
Physical Tests (QC Lot: 394823)											
VA22A0863-001	BA2202-A-1	moisture	----	E144	0.25	%	27.6	26.3	4.84%	20%	----
Metals (QC Lot: 394396)											
FJ2200164-001	Anonymous	mercury	7439-97-6	E510	0.0500	mg/kg	0.0519	0.0575	0.0056	Diff <2x LOR	----
Metals (QC Lot: 394397)											
FJ2200164-001	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	15500	16200	4.73%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.79	0.85	7.77%	30%	----
		arsenic	7440-38-2	E440	0.10	mg/kg	10.2	10.3	1.90%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	167	179	6.88%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.58	0.65	0.07	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	0.22	0.02	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	7.3	6.8	0.5	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.172	0.198	13.8%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	618	664	7.15%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	25.9	27.2	5.08%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	6.10	8.12	28.4%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	19.4	22.3	14.1%	30%	----
		iron	7439-89-6	E440	50	mg/kg	23800	27700	15.0%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	12.4	14.8	18.3%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	12.7	13.1	0.4	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	2860	3040	6.18%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	146	195	28.3%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.55	1.73	10.9%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	18.5	21.2	13.4%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	299	316	18	Diff <2x LOR	----
		potassium	7440-09-7	E440	100	mg/kg	1680	1650	1.89%	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: 394397) - continued											
FJ2200164-001	Anonymous	selenium	7782-49-2	E440	0.20	mg/kg	1.04	1.18	0.15	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	144	144	0.2	Diff <2x LOR	----
		strontium	7440-24-6	E440	0.50	mg/kg	30.8	34.4	11.0%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.200	0.210	0.010	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	42.1	34.4	20.2%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.887	0.963	8.20%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	54.5	53.8	1.31%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	77.8	86.1	10.1%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	1.1	1.4	0.3	Diff <2x LOR	----
Metals (QC Lot: 394819)											
VA22A0863-001	BA2202-A-1	aluminum	7429-90-5	E440	50	mg/kg	46800	42100	10.5%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	359	122	98.9%	30%	DUP-H
		arsenic	7440-38-2	E440	0.10	mg/kg	14.1	13.7	2.45%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	808	707	13.3%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.44	0.40	0.04	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	15.4	20.8	29.8%	30%	----
		boron	7440-42-8	E440	5.0	mg/kg	262	231	12.6%	30%	----
		cadmium	7440-43-9	E440	0.020	mg/kg	25.3	8.83	96.6%	30%	DUP-H
		calcium	7440-70-2	E440	50	mg/kg	159000	150000	6.02%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	154	165	6.66%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	158	70.0	77.1%	30%	DUP-H
		copper	7440-50-8	E440	0.50	mg/kg	8780	7730	12.8%	30%	----
		iron	7439-89-6	E440	50	mg/kg	73600	59400	21.4%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	1690	1560	7.92%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	41.2	24.8	49.4%	30%	DUP-H
		magnesium	7439-95-4	E440	20	mg/kg	14900	14400	2.92%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	1210	790	42.0%	30%	DUP-H
		molybdenum	7439-98-7	E440	0.10	mg/kg	38.7	36.2	6.78%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	182	216	16.9%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	14200	14000	0.906%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	5850	5030	14.9%	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: 394819) - continued											
VA22A0863-001	BA2202-A-1	selenium	7782-49-2	E440	0.20	mg/kg	0.35	0.33	0.03	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	9.27	13.1	34.6%	40%	----
		sodium	7440-23-5	E440	50	mg/kg	18500	16800	9.78%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	402	358	11.6%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	11900	11100	7.23%	30%	----
		thallium	7440-28-0	E440	0.050	mg/kg	0.064	0.067	0.003	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	246	1380	140%	40%	DUP-H
		titanium	7440-32-6	E440	1.0	mg/kg	571	454	23.0%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	14.9	22.8	42.1%	30%	DUP-H
		uranium	7440-61-1	E440	0.050	mg/kg	6.03	5.78	4.27%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	51.9	64.8	22.0%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	4190	4200	0.185%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	2.2	2.1	0.08	Diff <2x LOR	----
Metals (QC Lot: 394820)											
VA22A0863-001	BA2202-A-1	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: 394399)						
moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 394823)						
moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 394396)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 394397)						
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	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 394397) - 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: 394819)						
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: 394819) - 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: 394820)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 397044)						
silver	7440-22-4	E440.Ag	0.1	mg/kg	<0.10	----
TCLP Metals (QCLot: 394965)						
mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 394966)						
antimony, TCLP	7440-36-0	E444	1	mg/L	<1.0	----
arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	----
boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
uranium, TCLP	7440-61-1	E444	0.2	mg/L	<0.20	----
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----
zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 394398)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.7	95.0	105	----
Physical Tests (QCLot: 394399)									
moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Physical Tests (QCLot: 394821)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.8	95.0	105	----
Physical Tests (QCLot: 394823)									
moisture	----	E144	0.25	%	50 %	99.7	90.0	110	----
Metals (QCLot: 394396)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	99.6	80.0	120	----
Metals (QCLot: 394397)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	112	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	115	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	104	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	108	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	110	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	106	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	107	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	101	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	106	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	102	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	104	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	108	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	102	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	99.1	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	106	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	106	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	94.8	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 394397) - continued									
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	104	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	99.5	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	107	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	102	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	108	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	115	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	105	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	99.5	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	101	80.0	120	----
Metals (QCLot: 394819)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	111	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	119	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	106	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	98.9	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	101	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	101	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	102	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	99.9	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	98.0	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	97.6	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	97.7	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	98.9	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	106	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	94.9	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	101	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	104	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	98.2	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	93.1	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	101	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	102	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	92.0	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	97.4	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	110	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 394819) - continued									
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.6	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	104	80.0	120	----
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	104	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	94.6	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	102	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	95.7	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	104	80.0	120	----
Metals (QCLot: 394820)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	101	80.0	120	----
Metals (QCLot: 397044)									
silver	7440-22-4	E440.Ag	0.1	mg/kg	10 mg/kg	88.8	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: 394965)										
VA22A0863-001	BA2202-A-1	mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	102	50.0	140	----
TCLP Metals (QCLot: 394966)										
VA22A0863-001	BA2202-A-1	antimony, TCLP	7440-36-0	E444	5.6 mg/L	5 mg/L	113	50.0	140	----
		arsenic, TCLP	7440-38-2	E444	5.5 mg/L	5 mg/L	111	50.0	140	----
		barium, TCLP	7440-39-3	E444	12.7 mg/L	12.5 mg/L	101	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.258 mg/L	0.25 mg/L	103	50.0	140	----
		boron, TCLP	7440-42-8	E444	10.9 mg/L	10 mg/L	109	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	0.272 mg/L	0.25 mg/L	109	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	1.31 mg/L	1.25 mg/L	105	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	2.53 mg/L	2.5 mg/L	101	50.0	140	----
		iron, TCLP	7439-89-6	E444	259 mg/L	250 mg/L	103	50.0	140	----
		lead, TCLP	7439-92-1	E444	11.0 mg/L	10 mg/L	110	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	261 mg/L	250 mg/L	104	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.51 mg/L	2.5 mg/L	100	50.0	140	----
		selenium, TCLP	7782-49-2	E444	4.99 mg/L	5 mg/L	99.8	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.114 mg/L	0.1 mg/L	114	50.0	140	----
		thallium, TCLP	7440-28-0	E444	5.1 mg/L	5 mg/L	102	50.0	140	----
		uranium, TCLP	7440-61-1	E444	5.18 mg/L	5 mg/L	104	50.0	150	----
		vanadium, TCLP	7440-62-2	E444	0.80 mg/L	0.75 mg/L	107	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	105	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: **Soil/Solid**

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 394396)									
QC-394396-003	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	101	70.0	130	----
Metals (QCLot: 394397)									
QC-394397-003	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	104	70.0	130	----
QC-394397-003	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	106	70.0	130	----
QC-394397-003	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	103	70.0	130	----
QC-394397-003	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	95.4	70.0	130	----
QC-394397-003	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	112	70.0	130	----
QC-394397-003	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	124	40.0	160	----
QC-394397-003	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	95.4	70.0	130	----
QC-394397-003	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	102	70.0	130	----
QC-394397-003	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	98.8	70.0	130	----
QC-394397-003	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	95.7	70.0	130	----
QC-394397-003	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	95.4	70.0	130	----
QC-394397-003	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	95.5	70.0	130	----
QC-394397-003	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	97.5	70.0	130	----
QC-394397-003	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	102	70.0	130	----
QC-394397-003	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	94.0	70.0	130	----
QC-394397-003	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	97.7	70.0	130	----
QC-394397-003	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	98.4	70.0	130	----
QC-394397-003	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	97.8	70.0	130	----
QC-394397-003	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	85.1	70.0	130	----
QC-394397-003	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	106	70.0	130	----
QC-394397-003	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	96.8	70.0	130	----
QC-394397-003	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	99.1	70.0	130	----
QC-394397-003	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	100	40.0	160	----
QC-394397-003	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	105	70.0	130	----
QC-394397-003	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	106	70.0	130	----
QC-394397-003	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	105	70.0	130	----
QC-394397-003	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	99.1	70.0	130	----

Sub-Matrix: **Soil/Solid**

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 394397) - continued									
QC-394397-003	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	90.7	70.0	130	----
QC-394397-003	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	95.0	70.0	130	----
Metals (QCLot: 394819)									
QC-394819-003	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	111	70.0	130	----
QC-394819-003	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	114	70.0	130	----
QC-394819-003	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	114	70.0	130	----
QC-394819-003	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	104	70.0	130	----
QC-394819-003	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	110	70.0	130	----
QC-394819-003	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	121	40.0	160	----
QC-394819-003	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	107	70.0	130	----
QC-394819-003	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	111	70.0	130	----
QC-394819-003	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	106	70.0	130	----
QC-394819-003	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	102	70.0	130	----
QC-394819-003	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	102	70.0	130	----
QC-394819-003	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	104	70.0	130	----
QC-394819-003	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	104	70.0	130	----
QC-394819-003	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	104	70.0	130	----
QC-394819-003	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	107	70.0	130	----
QC-394819-003	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	108	70.0	130	----
QC-394819-003	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	110	70.0	130	----
QC-394819-003	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	103	70.0	130	----
QC-394819-003	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	94.7	70.0	130	----
QC-394819-003	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	107	70.0	130	----
QC-394819-003	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	101	70.0	130	----
QC-394819-003	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	108	70.0	130	----
QC-394819-003	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	99.5	40.0	160	----
QC-394819-003	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	105	70.0	130	----
QC-394819-003	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	107	70.0	130	----
QC-394819-003	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	108	70.0	130	----
QC-394819-003	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	107	70.0	130	----
QC-394819-003	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	98.7	70.0	130	----
QC-394819-003	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	97.6	70.0	130	----

Sub-Matrix: **Soil/Solid**

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 394820)									
QC-394820-003	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	100	70.0	130	----

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC #

Page ____ of ____

Report To				Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Covanta Energy			☐ Standard , ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Steve Mckinney / Dan Skrypnyk			☑ PDF / ☐ Excel ☐ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	5150 Riverbend Drive			Email 1:	smckinney@covanta.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Burnaby BC			Email 2:	rjohnson4@covanta.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-521-1025	Fax:		Email 3:	dskrypnyk@covanta.com	**Analysis Request**
		☐ Yes	☐ No		brent.kirkpatrick@metrovancouver.org	
					Sarah.Wellman@metrovancouver.org	
Invoice To	Same as Report ?			**Client / Project Information**		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?		☐ Yes	☐ No	Job #:		
Company:				PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite	
Contact:				LSD:	(includes 2:1 pH)	
Address:						
Phone:		Fax:		Quote #:		
Lab Work Order # (lab use only)		0863		ALS Contact:	Sampler:	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)	Number of Containers
	BA2202-A-1	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-2	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-3	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-4	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-5	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-6	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-7	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-8	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-9	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-10	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-11	12-Jan-22	9:00	Soil	X	X		X	1
	BA2202-A-12	12-Jan-22	9:00	Soil	X	X		X	1

Environmental Division
Vancouver
Work Order Reference
VA22A0863

Telephone : +1 604 253 4188

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

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.
Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	18-Jan-22	0900	JC	18 JAN 2022	1145AM	20 °C				

GENF 20.00 Front