metrovancouver

Bottom Ash Data

2023 Week 49

The following analytical report represents bottom ash composite results for week 49 of 2023 (December 3, 2023 to December 9 2023).

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

CERTIFICATE OF ANALYSIS

Work Order	: **VA23C9923**	Page	: 1 of 11
Client	: **Covanta Burnaby Renewable Energy, ULC**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 13-Dec-2023 10:20
PO	: VANCO0000051998	Date Analysis Commenced	: 17-Dec-2023
C-O-C number	: ----	Issue Date	: 21-Dec-2023 16:00
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*
Greg Pokocky	Manager - Inorganics	Metals, Waterloo, Ontario
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Rebecca Sit	Supervisor - Organics Extractions	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia
Sam Silveira	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).

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.

Qualifiers

Qualifier	*Description*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-1	BA2349-A-2	BA2349-A-3	BA2349-A-4	BA2349-A-5
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00
						VA23C9923-001	VA23C9923-002	VA23C9923-003	VA23C9923-004	VA23C9923-005
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/VA	0.25	%		31.5	30.4	30.3	30.3	32.2
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		10.3	10.4	10.4	10.4	10.4
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		42000	38600	40000	38900	36500
Antimony	7440-36-0	E440/VA	0.10	mg/kg		126	140	116	113	138
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		16.4	16.4	15.4	13.4	23.2
Barium	7440-39-3	E440/VA	0.50	mg/kg		432	409	549	509	399
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.43	0.41	0.42	0.42	0.39
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		7.52	9.48	8.69	7.50	10.8
Boron	7440-42-8	E440/VA	5.0	mg/kg		177	218	229	208	183
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		9.38	11.9	9.51	12.1	13.7
Calcium	7440-70-2	E440/VA	50	mg/kg		148000	153000	144000	125000	149000
Chromium	7440-47-3	E440/VA	0.50	mg/kg		198	157	122	132	169
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		40.8	57.9	200	112	199
Copper	7440-50-8	E440/VA	0.50	mg/kg		1610	2580	2410	6020	2580
Iron	7439-89-6	E440/VA	50	mg/kg		61800	40800	54200	58500	55800
Lead	7439-92-1	E440/VA	0.50	mg/kg		284	457	269	241	579
Lithium	7439-93-2	E440/VA	2.0	mg/kg		41.4	29.0	29.6	34.6	37.4
Magnesium	7439-95-4	E440/VA	20	mg/kg		12700	12900	13300	12000	13200
Manganese	7439-96-5	E440/VA	1.0	mg/kg		756	688	909	720	854
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		18.2	21.6	15.4	25.6	19.2
Nickel	7440-02-0	E440/VA	0.50	mg/kg		298	534	158	277	474
Phosphorus	7723-14-0	E440/VA	50	mg/kg		11000	12000	12500	10200	11400
Potassium	7440-09-7	E440/VA	100	mg/kg		6580	7050	6880	6590	6440
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.32	0.38	0.31	0.27	0.40
Silver	7440-22-4	E440/VA	0.10	mg/kg		4.38	4.20	3.36	4.08	16.4
Sodium	7440-23-5	E440/VA	50	mg/kg		19300	20300	19300	18400	18200
Strontium	7440-24-6	E440/VA	0.50	mg/kg		344	330	330	337	324

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-1	BA2349-A-2	BA2349-A-3	BA2349-A-4	BA2349-A-5
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00
						VA23C9923-001	VA23C9923-002	VA23C9923-003	VA23C9923-004	VA23C9923-005
						Result	Result	Result	Result	Result
Metals										
Sulfur	7704-34-9	E440/VA	1000	mg/kg		13100	15900	13100	11100	15700
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Tin	7440-31-5	E440/VA	2.0	mg/kg		108	137	118	93.6	143
Titanium	7440-32-6	E440/VA	1.0	mg/kg		228	321	241	250	249
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		5.81	7.30	6.23	9.68	7.55
Uranium	7440-61-1	E440/VA	0.050	mg/kg		4.14	4.69	4.79	3.80	4.66
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		65.9	46.9	56.5	41.1	49.1
Zinc	7440-66-6	E440/VA	2.0	mg/kg		4410	4160	3180	2830	4900
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		3.8	2.5	4.6	3.7	3.1
Speciated Metals										
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	0.10	mg/kg		0.69 DLM	----	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.2	11.3	11.2	11.3	11.3
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		6.35	7.76	7.34	6.76	6.42
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.87	2.87	2.87	2.87	2.87
pH, TCLP final	----	EPP444/VA	0.010	pH units		6.43	6.42	6.34	6.46	6.42
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L		<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L		<2.5	<2.5	<2.5	<2.5	<2.5
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L		<0.025	<0.025	<0.025	<0.025	<0.025
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L		1.78	1.84	1.82	2.40	1.86
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.132	0.242	0.143	0.178	0.417
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		1900	2000	2010	1960	1940
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L		1.04	1.03	1.19	0.967	1.36
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.924	1.46	1.23	1.07	1.11
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L		111	122	120	120	120
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-1	BA2349-A-2	BA2349-A-3	BA2349-A-4	BA2349-A-5
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00
						VA23C9923-001	VA23C9923-002	VA23C9923-003	VA23C9923-004	VA23C9923-005
						Result	Result	Result	Result	Result
TCLP Metals										
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L		0.36	0.34	0.40	0.34	0.34
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L		15.8	28.5	27.4	27.8	22.2
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L		<10	<10	<10	<10	<10

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

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

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-6	BA2349-A-7	BA2349-A-8	BA2349-A-9	BA2349-A-10
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00
						VA23C9923-006	VA23C9923-007	VA23C9923-008	VA23C9923-009	VA23C9923-010
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/VA	0.25	%		29.1	31.1	30.7	31.0	28.7
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		10.3	10.3	10.3	10.5	10.4
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		39700	43900	42700	47200	72200
Antimony	7440-36-0	E440/VA	0.10	mg/kg		107	90.6	111	102	121
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		13.0	12.9	14.1	14.1	15.4
Barium	7440-39-3	E440/VA	0.50	mg/kg		571	531	467	474	530
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.41	0.38	0.39	0.43	0.41
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		7.81	42.8	10.7	7.12	7.77
Boron	7440-42-8	E440/VA	5.0	mg/kg		168	210	166	203	197
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		9.34	8.88	13.8	9.56	11.1
Calcium	7440-70-2	E440/VA	50	mg/kg		140000	130000	138000	136000	145000
Chromium	7440-47-3	E440/VA	0.50	mg/kg		137	142	163	148	166
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		30.5	26.7	50.1	99.2	134
Copper	7440-50-8	E440/VA	0.50	mg/kg		2700	1960	1570	1840	10200
Iron	7439-89-6	E440/VA	50	mg/kg		59400	77500	50400	60300	44400
Lead	7439-92-1	E440/VA	0.50	mg/kg		272	426	290	266	321
Lithium	7439-93-2	E440/VA	2.0	mg/kg		27.3	31.2	33.0	27.8	39.4
Magnesium	7439-95-4	E440/VA	20	mg/kg		13800	11700	11200	12200	12800
Manganese	7439-96-5	E440/VA	1.0	mg/kg		794	871	844	804	893
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		16.5	16.8	15.4	63.6	66.2
Nickel	7440-02-0	E440/VA	0.50	mg/kg		110	381	820	188	146
Phosphorus	7723-14-0	E440/VA	50	mg/kg		9760	9540	9980	11600	11700
Potassium	7440-09-7	E440/VA	100	mg/kg		6530	6840	6540	6380	7110
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.30	0.25	0.32	0.23	0.25
Silver	7440-22-4	E440/VA	0.10	mg/kg		3.41	6.32	4.51	7.96	3.75
Sodium	7440-23-5	E440/VA	50	mg/kg		17600	17500	16800	18800	18700
Strontium	7440-24-6	E440/VA	0.50	mg/kg		310	306	277	302	324
Sulfur	7704-34-9	E440/VA	1000	mg/kg		12000	12300	12500	11800	13900

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-6	BA2349-A-7	BA2349-A-8	BA2349-A-9	BA2349-A-10
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00
						VA23C9923-006	VA23C9923-007	VA23C9923-008	VA23C9923-009	VA23C9923-010
						Result	Result	Result	Result	Result
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	0.057
Tin	7440-31-5	E440/VA	2.0	mg/kg		114	129	111	120	129
Titanium	7440-32-6	E440/VA	1.0	mg/kg		262	268	261	260	527
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		5.64	3.78	30.3	4.59	7.50
Uranium	7440-61-1	E440/VA	0.050	mg/kg		3.88	3.71	4.35	3.89	3.93
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		45.7	42.3	48.3	50.9	59.1
Zinc	7440-66-6	E440/VA	2.0	mg/kg		3160	2570	3260	2910	6660
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		3.2	6.3	4.1	3.6	6.1
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.4	11.3	11.3	11.4	11.4
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		6.69	7.36	7.17	7.28	8.02
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.87	2.87	2.87	2.87	2.87
pH, TCLP final	----	EPP444/VA	0.010	pH units		6.34	6.30	6.29	6.39	6.29
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L		<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L		<2.5	<2.5	<2.5	<2.5	<2.5
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L		<0.025	<0.025	<0.025	<0.025	<0.025
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L		1.84	1.93	1.89	1.74	1.89
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.463	0.135	0.136	1.10	0.150
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		1860	1960	2000	1920	1970
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L		<0.25	<0.25	<0.25	<0.25	<0.25
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L		1.12	0.977	1.17	0.745	0.935
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		0.945	1.20	1.04	1.07	0.864
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L		<0.25	0.45	<0.25	<0.25	<0.25
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L		119	119	121	128	116
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L		0.38	0.40	0.36	0.35	0.55
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-6	BA2349-A-7	BA2349-A-8	BA2349-A-9	BA2349-A-10
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00	06-Dec-2023 09:00
						VA23C9923-006	VA23C9923-007	VA23C9923-008	VA23C9923-009	VA23C9923-010
						Result	Result	Result	Result	Result
TCLP Metals										
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L		21.6	24.1	24.9	25.7	30.0
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L		<10	<10	<10	<10	<10

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

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

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BA2349-A-11	BA2349-A-12	----	----	----
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	----	----	----
						VA23C9923-011	VA23C9923-012	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Moisture	----	E144/VA	0.25	%		29.4	32.0	----	----	----
pH (1:2 soil:water)	----	E108/VA	0.10	pH units		10.5	10.5	----	----	----
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg		37500	39400	----	----	----
Antimony	7440-36-0	E440/VA	0.10	mg/kg		129	109	----	----	----
Arsenic	7440-38-2	E440/VA	0.10	mg/kg		15.8	13.6	----	----	----
Barium	7440-39-3	E440/VA	0.50	mg/kg		424	414	----	----	----
Beryllium	7440-41-7	E440/VA	0.10	mg/kg		0.44	0.44	----	----	----
Bismuth	7440-69-9	E440/VA	0.20	mg/kg		8.38	9.49	----	----	----
Boron	7440-42-8	E440/VA	5.0	mg/kg		211	160	----	----	----
Cadmium	7440-43-9	E440/VA	0.020	mg/kg		11.9	12.3	----	----	----
Calcium	7440-70-2	E440/VA	50	mg/kg		148000	134000	----	----	----
Chromium	7440-47-3	E440/VA	0.50	mg/kg		214	142	----	----	----
Cobalt	7440-48-4	E440/VA	0.10	mg/kg		44.3	32.8	----	----	----
Copper	7440-50-8	E440/VA	0.50	mg/kg		3020	1430	----	----	----
Iron	7439-89-6	E440/VA	50	mg/kg		44800	60600	----	----	----
Lead	7439-92-1	E440/VA	0.50	mg/kg		418	1330	----	----	----
Lithium	7439-93-2	E440/VA	2.0	mg/kg		32.9	27.6	----	----	----
Magnesium	7439-95-4	E440/VA	20	mg/kg		11900	11400	----	----	----
Manganese	7439-96-5	E440/VA	1.0	mg/kg		910	905	----	----	----
Mercury	7439-97-6	E510/VA	0.0500	mg/kg		<0.0500	<0.0500	----	----	----
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg		18.6	22.3	----	----	----
Nickel	7440-02-0	E440/VA	0.50	mg/kg		421	147	----	----	----
Phosphorus	7723-14-0	E440/VA	50	mg/kg		10500	9670	----	----	----
Potassium	7440-09-7	E440/VA	100	mg/kg		6430	6450	----	----	----
Selenium	7782-49-2	E440/VA	0.20	mg/kg		0.40	0.25	----	----	----
Silver	7440-22-4	E440/VA	0.10	mg/kg		3.66	6.70	----	----	----
Sodium	7440-23-5	E440/VA	50	mg/kg		17800	18500	----	----	----
Strontium	7440-24-6	E440/VA	0.50	mg/kg		306	276	----	----	----
Sulfur	7704-34-9	E440/VA	1000	mg/kg		13500	11900	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2349-A-11	BA2349-A-12	----	----	----
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23C9923-011	VA23C9923-012	--------	--------	--------
						Result	Result	----	----	----
Metals										
Thallium	7440-28-0	E440/VA	0.050	mg/kg		<0.050	<0.050	----	----	----
Tin	7440-31-5	E440/VA	2.0	mg/kg		324	157	----	----	----
Titanium	7440-32-6	E440/VA	1.0	mg/kg		327	269	----	----	----
Tungsten	7440-33-7	E440/VA	0.50	mg/kg		5.69	5.50	----	----	----
Uranium	7440-61-1	E440/VA	0.050	mg/kg		4.20	4.29	----	----	----
Vanadium	7440-62-2	E440/VA	0.20	mg/kg		46.1	48.2	----	----	----
Zinc	7440-66-6	E440/VA	2.0	mg/kg		3290	3200	----	----	----
Zirconium	7440-67-7	E440/VA	1.0	mg/kg		2.3	3.7	----	----	----
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units		11.4	11.4	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units		6.88	7.76	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units		2.87	2.87	----	----	----
pH, TCLP final	----	EPP444/VA	0.010	pH units		6.46	6.29	----	----	----
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L		<1.00	<1.00	----	----	----
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L		<1.0	<1.0	----	----	----
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L		<2.5	<2.5	----	----	----
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L		<0.025	<0.025	----	----	----
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L		1.88	1.79	----	----	----
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L		0.175	0.163	----	----	----
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L		1950	1960	----	----	----
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L		<0.25	<0.25	----	----	----
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L		1.24	1.33	----	----	----
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L		1.21	1.52	----	----	----
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L		<5.0	<5.0	----	----	----
Lead, TCLP	7439-92-1	E444/VA	0.25	mg/L		<0.25	<0.25	----	----	----
Magnesium, TCLP	7439-95-4	E444/VA	2.5	mg/L		122	118	----	----	----
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L		<0.0010	<0.0010	----	----	----
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L		0.38	0.34	----	----	----
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L		<0.10	<0.10	----	----	----
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L		<0.050	<0.050	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2349-A-11	BA2349-A-12	----	----	----
					Client sampling date / time	06-Dec-2023 09:00	06-Dec-2023 09:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23C9923-011	VA23C9923-012	--------	--------	--------
						Result	Result	----	----	----
TCLP Metals										
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L		<1.0	<1.0	----	----	----
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L		<0.20	<0.20	----	----	----
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L		<0.15	<0.15	----	----	----
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L		19.7	24.0	----	----	----
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L		<10	<10	----	----	----

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

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

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23C9923**	Page	: 1 of 16
Client	: **Covanta Burnaby Renewable Energy, ULC**	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 13-Dec-2023 10:20
PO	: VANCO0000051998	Issue Date	: 21-Dec-2023 16:03
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

- Reference Material (RM) Sample outliers occur - please see the following pages for full details.

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	VA23C9923-001	BA2349-A-1	Bismuth	7440-69-9	E440	40.4 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA23C9923-001	BA2349-A-1	Cobalt	7440-48-4	E440	132 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA23C9923-001	BA2349-A-1	Nickel	7440-02-0	E440	78.5 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA23C9923-001	BA2349-A-1	Silver	7440-22-4	E440	99.3 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA23C9923-001	BA2349-A-1	Tin	7440-31-5	E440	175 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA23C9923-001	BA2349-A-1	Titanium	7440-32-6	E440	52.7 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA23C9923-001	BA2349-A-1	Vanadium	7440-62-2	E440	36.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Speciated Metals	VA23C9923-001	BA2349-A-1	Chromium, hexavalent [Cr VI]	18540-29-9	E532	91.8 % DUP-H	35%	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.*

Reference Material (RM) Sample								
Metals	QC-MRG2-1281702 003	----	Titanium	7440-32-6	E440	131 % MES	70.0-130%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-1	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-10	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-11	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-12	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-2	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-3	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-4	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-5	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-6	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-7	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-8	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
LDPE bag BA2349-A-9	E510	06-Dec-2023	19-Dec-2023	28 days	13 days	✓	20-Dec-2023	28 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-1	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-10	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-11	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-12	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-2	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-3	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-4	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-5	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-6	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-7	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-8	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag BA2349-A-9	E440	06-Dec-2023	19-Dec-2023	180 days	13 days	✓	20-Dec-2023	180 days	14 days	✓
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-1	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-10	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-11	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-12	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-2	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-3	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-4	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-5	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-6	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-7	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-8	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2349-A-9	E144	06-Dec-2023	----	----	----		18-Dec-2023	----	13 days	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-1	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-10	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-11	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-12	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-2	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-3	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-4	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-5	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-6	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-7	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-8	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
LDPE bag BA2349-A-9	E108	06-Dec-2023	19-Dec-2023	30 days	13 days	✓	19-Dec-2023	30 days	13 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BA2349-A-1	E532	06-Dec-2023	18-Dec-2023	30 days	12 days	✓	19-Dec-2023	7 days	1 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-1	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-10	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-11	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-12	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-2	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-3	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-4	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-5	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-6	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-7	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-8	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2349-A-9	E512	17-Dec-2023	19-Dec-2023	39 days	13 days	✓	19-Dec-2023	39 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-1	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-10	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-11	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-12	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-2	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-3	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-4	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-5	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-6	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-7	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-8	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE - total (lab preserved) BA2349-A-9	E444	17-Dec-2023	19-Dec-2023	191 days	13 days	✓	19-Dec-2023	191 days	13 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-1	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-10	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-11	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-12	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-2	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-3	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-4	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-5	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-6	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-7	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-8	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2349-A-9	EPP444	06-Dec-2023	17-Dec-2023	----	----		----	28 days	11 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Hexavalent Chromium (Cr VI) by IC	E532	1280977	1	15	6.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1281702	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1281703	1	12	8.3	5.0	✓
Moisture Content by Gravimetry	E144	1281705	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1281704	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Hexavalent Chromium (Cr VI) by IC	E532	1280977	4	15	26.6	10.0	✓
Mercury in Soil/Solid by CVAAS	E510	1281702	2	12	16.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1281703	2	12	16.6	10.0	✓
Moisture Content by Gravimetry	E144	1281705	1	12	8.3	5.0	✓
pH by Meter (1:2 Soil:Water Extraction)	E108	1281704	1	12	8.3	5.0	✓
Method Blanks (MB)							
Hexavalent Chromium (Cr VI) by IC	E532	1280977	2	15	13.3	5.0	✓
Mercury by CVAAS (TCLP)	E512	1282410	1	12	8.3	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1281702	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1282411	1	12	8.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1281703	1	12	8.3	5.0	✓
Moisture Content by Gravimetry	E144	1281705	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1282410	1	12	8.3	5.0	✓
Metals by CRC ICPMS (TCLP)	E444	1282411	1	12	8.3	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108 ALS Environmental - Vancouver	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 ºC) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 ALS Environmental - Vancouver	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Vancouver	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Metals by CRC ICPMS (TCLP)	E444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311/6020B (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 ALS Environmental - Vancouver	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512 ALS Environmental - Vancouver	Soil/Solid	SW 846 -1311/245.1 CVAA ON TCLP LEACHATE	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.

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 ALS Environmental - Vancouver	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Digestion for Metals and Mercury	EP440 ALS Environmental - Vancouver	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.

QUALITY CONTROL REPORT

Work Order	: **VA23C9923**	Page	: 1 of 12
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Ian Chen
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 13-Dec-2023 10:20
PO	: VANCO0000051998	Date Analysis Commenced	: 17-Dec-2023
C-O-C number	: ----	Issue Date	: 21-Dec-2023 16:00
Sampler	: ---- ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
No. of samples received	: 12		
No. of samples analysed	: 12		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Rebecca Sit	Supervisor - Organics Extractions	Vancouver Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1281704)											
VA23C9923-001	BA2349-A-1	pH (1:2 soil:water)	----	E108	0.10	pH units	10.3	10.4	1.4%	5%	----
Physical Tests (QC Lot: 1281705)											
VA23C9923-001	BA2349-A-1	Moisture	----	E144	0.25	%	31.5	31.8	1.07%	20%	----
Metals (QC Lot: 1281702)											
VA23C9923-001	BA2349-A-1	Mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 1281703)											
VA23C9923-001	BA2349-A-1	Aluminum	7429-90-5	E440	50	mg/kg	42000	45300	7.58%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	126	120	4.47%	30%	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	16.4	13.4	19.9%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	432	598	32.3%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.43	0.46	0.03	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	7.52	11.3	40.4%	30%	DUP-H
		Boron	7440-42-8	E440	5.0	mg/kg	177	184	3.98%	30%	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	9.38	9.70	3.40%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	148000	142000	3.82%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	198	156	23.6%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	40.8	201	132%	30%	DUP-H
		Copper	7440-50-8	E440	0.50	mg/kg	1610	1800	11.1%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	61800	55400	10.8%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	284	345	19.5%	40%	----
		Lithium	7439-93-2	E440	2.0	mg/kg	41.4	44.3	6.67%	30%	----
		Magnesium	7439-95-4	E440	20	mg/kg	12700	11600	8.47%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	756	782	3.38%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	18.2	17.2	5.83%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	298	130	78.5%	30%	DUP-H
		Phosphorus	7723-14-0	E440	50	mg/kg	11000	9740	12.4%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	6580	6410	2.62%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.32	0.36	0.04	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	4.38	13.0	99.3%	40%	DUP-H
		Sodium	7440-23-5	E440	50	mg/kg	19300	19200	0.740%	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: 1281703) - continued											
VA23C9923-001	BA2349-A-1	Strontium	7440-24-6	E440	0.50	mg/kg	344	306	11.7%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	13100	13200	0.965%	30%	----
		Thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	108	1650	175%	40%	DUP-H
		Titanium	7440-32-6	E440	1.0	mg/kg	228	391	52.7%	40%	DUP-H
		Tungsten	7440-33-7	E440	0.50	mg/kg	5.81	7.15	20.6%	30%	----
		Uranium	7440-61-1	E440	0.050	mg/kg	4.14	4.02	2.73%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	65.9	45.8	36.0%	30%	DUP-H
		Zinc	7440-66-6	E440	2.0	mg/kg	4410	3870	13.2%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	3.8	2.8	0.9	Diff <2x LOR	----
Speciated Metals (QC Lot: 1280977)											
VA23C9923-001	BA2349-A-1	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.15	mg/kg	0.69	1.85	91.8%	35%	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
Physical Tests (QCLot: 1281705)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1281702)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1281703)						
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: 1281703) - 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	----
Speciated Metals (QCLot: 1280977)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Speciated Metals (QCLot: 1282123)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
TCLP Metals (QCLot: 1282410)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----
TCLP Metals (QCLot: 1282411)						
Antimony, TCLP	7440-36-0	E444	0.1	mg/L	<0.10	----
Arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	----
Boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
Cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
Calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
Cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
Copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
Iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
Nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
Selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
Silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
Thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
Uranium, TCLP	7440-61-1	E444	0.2	mg/L	<0.20	----
Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
Zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----
Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1281704)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	100	95.0	105	----
Physical Tests (QCLot: 1281705)									
Moisture	----	E144	0.25	%	50 %	99.5	90.0	110	----
Metals (QCLot: 1281702)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	100	80.0	120	----
Metals (QCLot: 1281703)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	107	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	111	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	115	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	102	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	98.1	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	103	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	104	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	102	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	104	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	105	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	107	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	106	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	107	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	104	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	93.8	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	106	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	109	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	99.7	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: 1281703) - continued									
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	102	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	104	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	107	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	101	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	107	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	108	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	106	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	107	80.0	120	----
Speciated Metals (QCLot: 1280977)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	100	80.0	120	----
Speciated Metals (QCLot: 1282123)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	95.3	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**

					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: 1282410)										
VA23C9923-001	BA2349-A-1	Mercury, TCLP	7439-97-6	E512	0.0011 mg/L	0.001 mg/L	110	50.0	140	----
TCLP Metals (QCLot: 1282411)										
VA23C9923-001	BA2349-A-1	Antimony, TCLP	7440-36-0	E444	4.35 mg/L	5 mg/L	87.0	50.0	140	----
		Arsenic, TCLP	7440-38-2	E444	4.5 mg/L	5 mg/L	89.7	50.0	140	----
		Barium, TCLP	7440-39-3	E444	11.3 mg/L	12.5 mg/L	90.5	50.0	140	----
		Beryllium, TCLP	7440-41-7	E444	0.214 mg/L	0.25 mg/L	85.8	50.0	140	----
		Boron, TCLP	7440-42-8	E444	8.14 mg/L	10 mg/L	81.4	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	0.220 mg/L	0.25 mg/L	88.2	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	1.07 mg/L	1.25 mg/L	85.8	50.0	140	----
		Cobalt, TCLP	7440-48-4	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		Copper, TCLP	7440-50-8	E444	2.02 mg/L	2.5 mg/L	81.0	50.0	140	----
		Iron, TCLP	7439-89-6	E444	216 mg/L	250 mg/L	86.6	50.0	140	----
		Lead, TCLP	7439-92-1	E444	8.60 mg/L	10 mg/L	86.0	50.0	140	----
		Magnesium, TCLP	7439-95-4	E444	218 mg/L	250 mg/L	87.3	50.0	140	----
		Nickel, TCLP	7440-02-0	E444	2.12 mg/L	2.5 mg/L	84.9	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	4.44 mg/L	5 mg/L	88.9	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.075 mg/L	0.1 mg/L	74.7	50.0	140	----
		Thallium, TCLP	7440-28-0	E444	4.3 mg/L	5 mg/L	86.0	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	4.44 mg/L	5 mg/L	88.8	50.0	150	----
		Vanadium, TCLP	7440-62-2	E444	0.65 mg/L	0.75 mg/L	86.9	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	0.7 mg/L	1 mg/L	73.3	50.0	150	----

Reference Material (RM) Report

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

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1281702)									
	SCP SS-2	Mercury	7439-97-6	E510	0.059 mg/kg	105	70.0	130	----
Metals (QCLot: 1281703)									
	SCP SS-2	Aluminum	7429-90-5	E440	9817 mg/kg	120	70.0	130	----
	SCP SS-2	Antimony	7440-36-0	E440	3.99 mg/kg	111	70.0	130	----
	SCP SS-2	Arsenic	7440-38-2	E440	3.73 mg/kg	117	70.0	130	----
	SCP SS-2	Barium	7440-39-3	E440	105 mg/kg	123	70.0	130	----
	SCP SS-2	Beryllium	7440-41-7	E440	0.349 mg/kg	114	70.0	130	----
	SCP SS-2	Boron	7440-42-8	E440	8.5 mg/kg	129	40.0	160	----
	SCP SS-2	Cadmium	7440-43-9	E440	0.91 mg/kg	104	70.0	130	----
	SCP SS-2	Calcium	7440-70-2	E440	31082 mg/kg	106	70.0	130	----
	SCP SS-2	Chromium	7440-47-3	E440	101 mg/kg	126	70.0	130	----
	SCP SS-2	Cobalt	7440-48-4	E440	6.9 mg/kg	115	70.0	130	----
	SCP SS-2	Copper	7440-50-8	E440	123 mg/kg	108	70.0	130	----
	SCP SS-2	Iron	7439-89-6	E440	23558 mg/kg	111	70.0	130	----
	SCP SS-2	Lead	7439-92-1	E440	267 mg/kg	103	70.0	130	----
	SCP SS-2	Lithium	7439-93-2	E440	9.5 mg/kg	112	70.0	130	----
	SCP SS-2	Magnesium	7439-95-4	E440	5509 mg/kg	114	70.0	130	----
	SCP SS-2	Manganese	7439-96-5	E440	269 mg/kg	120	70.0	130	----
	SCP SS-2	Molybdenum	7439-98-7	E440	1.03 mg/kg	111	70.0	130	----
	SCP SS-2	Nickel	7440-02-0	E440	26.7 mg/kg	115	70.0	130	----
	SCP SS-2	Phosphorus	7723-14-0	E440	752 mg/kg	112	70.0	130	----
	SCP SS-2	Potassium	7440-09-7	E440	1587 mg/kg	123	70.0	130	----
	SCP SS-2	Sodium	7440-23-5	E440	797 mg/kg	121	70.0	130	----
	SCP SS-2	Strontium	7440-24-6	E440	86.1 mg/kg	112	70.0	130	----
	SCP SS-2	Thallium	7440-28-0	E440	0.0786 mg/kg	112	40.0	160	----
	SCP SS-2	Tin	7440-31-5	E440	10.6 mg/kg	104	70.0	130	----
	SCP SS-2	Titanium	7440-32-6	E440	839 mg/kg	# 131	70.0	130	MES

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report: RM Target Concentration	Reference Material (RM) Report: Recovery (%) RM	Reference Material (RM) Report: Recovery Limits (%) Low	Reference Material (RM) Report: Recovery Limits (%) High	Reference Material (RM) Report: Qualifier
Metals (QCLot: 1281703) - continued									
	SCP SS-2	Uranium	7440-61-1	E440	0.52 mg/kg	114	70.0	130	----
	SCP SS-2	Vanadium	7440-62-2	E440	32.7 mg/kg	119	70.0	130	----
	SCP SS-2	Zinc	7440-66-6	E440	297 mg/kg	112	70.0	130	----
	SCP SS-2	Zirconium	7440-67-7	E440	5.73 mg/kg	115	70.0	130	----
Speciated Metals (QCLot: 1280977)									
	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	172 mg/kg	94.6	70.0	130	----
Speciated Metals (QCLot: 1282123)									
	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	172 mg/kg	88.8	70.0	130	----

Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

ALS Environmental

Chain of Custody / Analytical Request Form

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COC # _____

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Report To				Report Format / Distribution				Service Requested (Rush for routine analysis subject to availability)
Company:	Covanta Energy			☐ Standard ☐ Other				◉ Regular (Standard Turnaround Times - Business Days)
Contact:	Nicole Victor / Dan Skrypnyk			☑ PDF ☐ Excel ☐ Digital ☐ Fax				○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	5150 Riverbend Drive			Email 1:	nvictor@covanta.com			○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Burnaby BC			Email 2:	ofetherstonhaugh@covanta.com			○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-521-1025	Fax:		Email 3:	dskrypnyk@covanta.com			Analysis Request
		☐ Yes	☐ No		brent.kirkpatrick@metrovancouver.org			
					Sarah.Wellman@metrovancouver.org			
Invoice To	Same as Report ?			Client / Project Information				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?		☐ Yes	☐ No	Job #:				
Company:				PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite			
Contact:				LSD:	(includes 2:1 pH)			
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)	C9923			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
	BA2349-A-1	06-Dec-23	9:00	Soil	X	X		X		X						1
	BA2349-A-2	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-3	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-4	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-5	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-6	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-7	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-8	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-9	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-10	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-11	06-Dec-23	9:00	Soil	X	X				X						1
	BA2349-A-12	06-Dec-23	9:00	Soil	X	X				X						1

Environmental Division
Vancouver
Work Order Reference
VA23C9923

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
	13-Dec-23	0800	JC	13Dec23	1020am	20 °C				