

Bottom Ash Data

2024 Week 42

The following analytical report represents bottom ash composite results for week 42 of 2024 (October 13, 2024 to October 19, 2024).

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



CERTIFICATE OF ANALYSIS

Work Order	: VA24C8571		
Client	: Reworld Renewable Burnaby, ULC	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Gulraj Dhanaua
Address	: 5150 Riverbend Drive Burnaby British Columbia 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	: 24-Oct-2024 09:39
PO	: PO#46693	Date Analysis Commenced	: 31-Oct-2024
C-O-C number	: ----	Issue Date	: 04-Nov-2024 16:45
Sampler	: ----		
Site	: (includes 2:1 ph)		
Quote number	: Covanta Burnaby Standing Offer 2024		
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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Wingyee Cheng	Analyst- General	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
mg/kg	milligrams per kilogram
%	percent
pH units	pH units
mg/L	milligrams per litre

<: 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.

Workorder Comments

Due to the adsorptive nature of VA24C8571-1 to 12 (BA2442-A-1 to 12), double the normal amounts of acids and water were required to conduct the BC SALM metals soil digestion. Test results are not adversely affected.

Work Order : VA24C8571
Client : Reworld Renewable Burnaby, ULC
Project : Weekly Bottom Ash - Suite





Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2442-A-1	BA2442-A-2	BA2442-A-3	BA2442-A-4	BA2442-A-5
Client sampling date / time					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-001	VA24C8571-002	VA24C8571-003	VA24C8571-004	VA24C8571-005	
					Result	Result	Result	Result	Result	
Physical Tests										
Moisture	----	E144/VA	0.25	%	25.2	28.8	25.2	27.5	27.7	
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	11.8	11.8	11.9	12.0	11.9	
Metals										
Aluminum	7429-90-5	E440/VA	50	mg/kg	47900	47000	33700	39500	42300	
Antimony	7440-36-0	E440/VA	0.10	mg/kg	86.0	97.8	115	99.4	107	
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	23.0	30.1	27.1	30.1	26.5	
Barium	7440-39-3	E440/VA	0.50	mg/kg	997	1040	748	913	946	
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.37	0.42	0.28	0.36	0.54	
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	8.26	5.31	11.2	5.63	7.80	
Boron	7440-42-8	E440/VA	5.0	mg/kg	242	195	271	178	191	
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	7.94	10.6	6.14	6.59	7.44	
Calcium	7440-70-2	E440/VA	50	mg/kg	135000	145000	120000	136000	136000	
Chromium	7440-47-3	E440/VA	0.50	mg/kg	192	180	3090	274	146	
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	38.9	56.4	1000	256	36.2	
Copper	7440-50-8	E440/VA	0.50	mg/kg	1450	1280	2460	3420	3320	
Iron	7439-89-6	E440/VA	50	mg/kg	79100	48100	96000	63200	73000	
Lead	7439-92-1	E440/VA	0.50	mg/kg	352	271	333	306	570	
Lithium	7439-93-2	E440/VA	2.0	mg/kg	30.7	31.9	63.5	59.7	33.5	
Magnesium	7439-95-4	E440/VA	20	mg/kg	11200	13400	10100	12300	12500	
Manganese	7439-96-5	E440/VA	1.0	mg/kg	864	835	1240	860	784	
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	



Analytical Results

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

					Client sample ID				
					BA2442-A-1	BA2442-A-2	BA2442-A-3	BA2442-A-4	BA2442-A-5
					Client sampling date / time				
					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-001	VA24C8571-002	VA24C8571-003	VA24C8571-004	VA24C8571-005
					Result	Result	Result	Result	Result
Metals									
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	19.7	19.2	396	15.4	17.6
Nickel	7440-02-0	E440/VA	0.50	mg/kg	98.7	176	1990	255	128
Phosphorus	7723-14-0	E440/VA	50	mg/kg	14100	14100	10900	11500	12200
Potassium	7440-09-7	E440/VA	100	mg/kg	5880	5740	4720	5280	5650
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.38	0.41	0.44	0.38	0.44
Silver	7440-22-4	E440/VA	0.10	mg/kg	3.70	9.16	4.53	4.69	5.12
Sodium	7440-23-5	E440/VA	50	mg/kg	17200	18300	15400	15800	16600
Strontium	7440-24-6	E440/VA	0.50	mg/kg	339	389	290	394	342
Sulfur	7704-34-9	E440/VA	1000	mg/kg	9800	11000	9200	11300	10900
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	98.4	94.4	130	100	245
Titanium	7440-32-6	E440/VA	1.0	mg/kg	3330	3250	2700	2840	3340
Tungsten	7440-33-7	E440/VA	0.50	mg/kg	14.8	16.7	20.3	25.6	22.7
Uranium	7440-61-1	E440/VA	0.050	mg/kg	2.58	2.61	2.46	2.89	2.86
Vanadium	7440-62-2	E440/VA	0.20	mg/kg	40.5	44.0	53.6	41.0	38.8
Zinc	7440-66-6	E440/VA	2.0	mg/kg	2730	3030	2480	3970	3870
Zirconium	7440-67-7	E440/VA	1.0	mg/kg	4.7	3.7	6.4	7.3	7.7
TCLP Metals									
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units	11.8	11.8	11.8	11.9	11.9
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units	6.27	6.55	8.85	7.73	8.19
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units	2.85	2.85	2.85	2.85	2.85



Analytical Results

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

					Client sample ID				
					BA2442-A-1	BA2442-A-2	BA2442-A-3	BA2442-A-4	BA2442-A-5
					Client sampling date / time				
					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-001	VA24C8571-002	VA24C8571-003	VA24C8571-004	VA24C8571-005
					Result	Result	Result	Result	Result
TCLP Metals									
pH, TCLP final	----	EPP444/VA	0.010	pH units	6.45	6.43	6.61	6.66	6.60
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L	2.16	2.19	2.27	2.21	2.28
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L	0.175	0.085	0.102	0.076	0.101
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L	1900	2050	1990	1990	2060
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	1.36	0.995	0.692	1.17
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L	1.67	1.29	1.36	1.16	1.16
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	119	134	131	132	132
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	0.45	0.38	0.33	0.51	0.38
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
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



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID				
					BA2442-A-1	BA2442-A-2	BA2442-A-3	BA2442-A-4	BA2442-A-5
Client sampling date / time					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-001	VA24C8571-002	VA24C8571-003	VA24C8571-004	VA24C8571-005
					Result	Result	Result	Result	Result
TCLP Metals									
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L	23.5	18.8	16.0	15.6	16.2
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)					Client sample ID				
					BA2442-A-6	BA2442-A-7	BA2442-A-8	BA2442-A-9	BA2442-A-10
Client sampling date / time					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-006	VA24C8571-007	VA24C8571-008	VA24C8571-009	VA24C8571-010
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/VA	0.25	%	27.7	26.8	26.1	26.0	26.8
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	11.9	12.2	12.1	12.0	12.2
Metals									
Aluminum	7429-90-5	E440/VA	50	mg/kg	55400	39300	41300	38700	51000
Antimony	7440-36-0	E440/VA	0.10	mg/kg	115	99.2	88.0	101	90.9
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	26.7	27.1	25.8	27.2	25.8
Barium	7440-39-3	E440/VA	0.50	mg/kg	903	923	890	2000	952
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.37	0.35	0.37	0.34	0.37
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	7.04	4.84	5.46	8.53	6.22
Boron	7440-42-8	E440/VA	5.0	mg/kg	162	370	256	269	296
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	7.05	6.20	6.29	8.18	6.44
Calcium	7440-70-2	E440/VA	50	mg/kg	142000	128000	139000	138000	134000



Analytical Results

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

					Client sample ID				
					BA2442-A-6	BA2442-A-7	BA2442-A-8	BA2442-A-9	BA2442-A-10
					Client sampling date / time				
					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-006	VA24C8571-007	VA24C8571-008	VA24C8571-009	VA24C8571-010
					Result	Result	Result	Result	Result
Metals									
Chromium	7440-47-3	E440/VA	0.50	mg/kg	133	176	202	291	248
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	252	291	81.9	51.2	79.1
Copper	7440-50-8	E440/VA	0.50	mg/kg	1890	1180	3510	5860	1750
Iron	7439-89-6	E440/VA	50	mg/kg	42400	64200	49200	61600	39200
Lead	7439-92-1	E440/VA	0.50	mg/kg	272	242	254	359	268
Lithium	7439-93-2	E440/VA	2.0	mg/kg	31.5	76.6	36.7	66.5	35.7
Magnesium	7439-95-4	E440/VA	20	mg/kg	11000	12500	11200	11600	10600
Manganese	7439-96-5	E440/VA	1.0	mg/kg	696	858	1290	939	709
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	13.9	16.3	46.7	39.2	13.1
Nickel	7440-02-0	E440/VA	0.50	mg/kg	137	171	138	376	118
Phosphorus	7723-14-0	E440/VA	50	mg/kg	16900	11000	11100	12200	9650
Potassium	7440-09-7	E440/VA	100	mg/kg	5300	5170	5320	5360	5500
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.39	0.46	0.35	0.47	0.36
Silver	7440-22-4	E440/VA	0.10	mg/kg	3.82	5.77	4.33	5.28	4.56
Sodium	7440-23-5	E440/VA	50	mg/kg	16400	16100	16800	15800	16200
Strontium	7440-24-6	E440/VA	0.50	mg/kg	362	348	475	366	339
Sulfur	7704-34-9	E440/VA	1000	mg/kg	10600	9200	10900	11800	11400
Thallium	7440-28-0	E440/VA	0.050	mg/kg	<0.050	<0.050	<0.050	0.077	<0.050
Tin	7440-31-5	E440/VA	2.0	mg/kg	175	112	110	139	166
Titanium	7440-32-6	E440/VA	1.0	mg/kg	2960	3480	2690	3070	3300



Analytical Results

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

					Client sample ID				
					BA2442-A-6	BA2442-A-7	BA2442-A-8	BA2442-A-9	BA2442-A-10
					Client sampling date / time				
					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-006	VA24C8571-007	VA24C8571-008	VA24C8571-009	VA24C8571-010
					Result	Result	Result	Result	Result
Metals									
Tungsten	7440-33-7	E440/VA	0.50	mg/kg	20.1	25.6	25.1	22.5	15.1
Uranium	7440-61-1	E440/VA	0.050	mg/kg	2.70	2.60	2.88	2.82	2.76
Vanadium	7440-62-2	E440/VA	0.20	mg/kg	37.5	41.7	37.8	39.0	36.4
Zinc	7440-66-6	E440/VA	2.0	mg/kg	2300	7310	4320	3280	4880
Zirconium	7440-67-7	E440/VA	1.0	mg/kg	9.4	6.8	5.4	4.7	8.6
TCLP Metals									
pH, TCLP 1st preliminary	---	EPP444/VA	0.010	pH units	12.0	11.9	11.9	12.0	12.0
pH, TCLP 2nd preliminary	---	EPP444/VA	0.010	pH units	8.53	8.45	8.31	7.92	6.83
pH, TCLP extraction fluid initial	---	EPP444/VA	0.010	pH units	2.85	2.85	2.85	2.85	2.85
pH, TCLP final	---	EPP444/VA	0.010	pH units	6.75	7.35	7.27	7.57	7.73
Antimony, TCLP	7440-36-0	E444/VA	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00
Arsenic, TCLP	7440-38-2	E444/VA	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L	2.20	1.93	2.03	2.08	1.84
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L	0.075	<0.050	<0.050	<0.050	<0.050
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L	1960	1800	1780	1800	1740
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	1.03	0.406	0.984	0.248	0.220
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L	1.23	1.16	1.04	0.962	0.951
Iron, TCLP	7439-89-6	E444/VA	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0



Analytical Results

					Client sample ID				
					BA2442-A-6	BA2442-A-7	BA2442-A-8	BA2442-A-9	BA2442-A-10
					Client sampling date / time				
					16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00	16-Oct-2024 09:00
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-006	VA24C8571-007	VA24C8571-008	VA24C8571-009	VA24C8571-010
					Result	Result	Result	Result	Result
TCLP Metals									
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	124	110	109	107	107
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	0.31	<0.25	0.34	<0.25	<0.25
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
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	9.83	1.83	2.51	0.68	<0.50
Zirconium, TCLP	7440-67-7	E444/VA	10	mg/L	<10	<10	<10	<10	<10

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

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

Analytical Results

					Client sample ID				
					BA2442-A-11	BA2442-A-12	----	----	----
					Client sampling date / time				
					16-Oct-2024 09:00	16-Oct-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-011	VA24C8571-012	----	----	----
					Result	Result	----	----	----
Physical Tests									
Moisture	----	E144/VA	0.25	%	28.7	25.9	----	----	----
pH (1:2 soil:water)	----	E108/VA	0.10	pH units	12.2	12.2	----	----	----



Analytical Results

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

					Client sample ID		BA2442-A-11	BA2442-A-12	----	----	----
					Client sampling date / time		16-Oct-2024 09:00	16-Oct-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-011	VA24C8571-012	----	----	----	----	----
					Result	Result	----	----	----	----	----
Metals											
Aluminum	7429-90-5	E440/VA	50	mg/kg	36400	41000	----	----	----	----	----
Antimony	7440-36-0	E440/VA	0.10	mg/kg	106	203	----	----	----	----	----
Arsenic	7440-38-2	E440/VA	0.10	mg/kg	26.5	29.2	----	----	----	----	----
Barium	7440-39-3	E440/VA	0.50	mg/kg	1080	972	----	----	----	----	----
Beryllium	7440-41-7	E440/VA	0.10	mg/kg	0.40	0.40	----	----	----	----	----
Bismuth	7440-69-9	E440/VA	0.20	mg/kg	5.88	8.41	----	----	----	----	----
Boron	7440-42-8	E440/VA	5.0	mg/kg	272	207	----	----	----	----	----
Cadmium	7440-43-9	E440/VA	0.020	mg/kg	6.98	7.81	----	----	----	----	----
Calcium	7440-70-2	E440/VA	50	mg/kg	139000	146000	----	----	----	----	----
Chromium	7440-47-3	E440/VA	0.50	mg/kg	171	170	----	----	----	----	----
Cobalt	7440-48-4	E440/VA	0.10	mg/kg	52.5	111	----	----	----	----	----
Copper	7440-50-8	E440/VA	0.50	mg/kg	4180	2030	----	----	----	----	----
Iron	7439-89-6	E440/VA	50	mg/kg	35500	54900	----	----	----	----	----
Lead	7439-92-1	E440/VA	0.50	mg/kg	392	424	----	----	----	----	----
Lithium	7439-93-2	E440/VA	2.0	mg/kg	31.0	33.4	----	----	----	----	----
Magnesium	7439-95-4	E440/VA	20	mg/kg	11600	12000	----	----	----	----	----
Manganese	7439-96-5	E440/VA	1.0	mg/kg	681	816	----	----	----	----	----
Mercury	7439-97-6	E510/VA	0.0500	mg/kg	<0.0500	<0.0500	----	----	----	----	----
Molybdenum	7439-98-7	E440/VA	0.10	mg/kg	17.2	17.8	----	----	----	----	----
Nickel	7440-02-0	E440/VA	0.50	mg/kg	185	148	----	----	----	----	----
Phosphorus	7723-14-0	E440/VA	50	mg/kg	10900	12400	----	----	----	----	----



Analytical Results

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

					Client sample ID		BA2442-A-11	BA2442-A-12	----	----	----
					Client sampling date / time		16-Oct-2024 09:00	16-Oct-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-011	VA24C8571-012	----	----	----	----	----
					Result	Result	----	----	----	----	----
Metals											
Potassium	7440-09-7	E440/VA	100	mg/kg	5500	5370	----	----	----	----	----
Selenium	7782-49-2	E440/VA	0.20	mg/kg	0.42	0.48	----	----	----	----	----
Silver	7440-22-4	E440/VA	0.10	mg/kg	7.75	4.86	----	----	----	----	----
Sodium	7440-23-5	E440/VA	50	mg/kg	16900	15600	----	----	----	----	----
Strontium	7440-24-6	E440/VA	0.50	mg/kg	359	348	----	----	----	----	----
Sulfur	7704-34-9	E440/VA	1000	mg/kg	11100	12300	----	----	----	----	----
Thallium	7440-28-0	E440/VA	0.050	mg/kg	<0.050	<0.050	----	----	----	----	----
Tin	7440-31-5	E440/VA	2.0	mg/kg	97.2	782	----	----	----	----	----
Titanium	7440-32-6	E440/VA	1.0	mg/kg	3220	3030	----	----	----	----	----
Tungsten	7440-33-7	E440/VA	0.50	mg/kg	19.1	27.0	----	----	----	----	----
Uranium	7440-61-1	E440/VA	0.050	mg/kg	2.98	3.07	----	----	----	----	----
Vanadium	7440-62-2	E440/VA	0.20	mg/kg	39.8	44.8	----	----	----	----	----
Zinc	7440-66-6	E440/VA	2.0	mg/kg	2570	6360	----	----	----	----	----
Zirconium	7440-67-7	E440/VA	1.0	mg/kg	6.0	8.2	----	----	----	----	----
TCLP Metals											
pH, TCLP 1st preliminary	----	EPP444/VA	0.010	pH units	12.0	11.9	----	----	----	----	----
pH, TCLP 2nd preliminary	----	EPP444/VA	0.010	pH units	8.88	8.45	----	----	----	----	----
pH, TCLP extraction fluid initial	----	EPP444/VA	0.010	pH units	2.85	2.85	----	----	----	----	----
pH, TCLP final	----	EPP444/VA	0.010	pH units	7.34	7.48	----	----	----	----	----
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	----	----	----	----	----



Analytical Results

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

					Client sample ID		BA2442-A-11	BA2442-A-12	----	----	----
					Client sampling date / time		16-Oct-2024 09:00	16-Oct-2024 09:00	----	----	----
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	VA24C8571-011	VA24C8571-012	----	----	----	----	----
					Result	Result	----	----	----	----	----
TCLP Metals											
Barium, TCLP	7440-39-3	E444/VA	2.5	mg/L	<2.5	<2.5	----	----	----	----	----
Beryllium, TCLP	7440-41-7	E444/VA	0.025	mg/L	<0.025	<0.025	----	----	----	----	----
Boron, TCLP	7440-42-8	E444/VA	0.50	mg/L	2.19	2.14	----	----	----	----	----
Cadmium, TCLP	7440-43-9	E444/VA	0.050	mg/L	<0.050	<0.050	----	----	----	----	----
Calcium, TCLP	7440-70-2	E444/VA	10	mg/L	1800	1870	----	----	----	----	----
Chromium, TCLP	7440-47-3	E444/VA	0.25	mg/L	<0.25	<0.25	----	----	----	----	----
Cobalt, TCLP	7440-48-4	E444/VA	0.050	mg/L	0.384	0.390	----	----	----	----	----
Copper, TCLP	7440-50-8	E444/VA	0.050	mg/L	0.946	1.10	----	----	----	----	----
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	109	113	----	----	----	----	----
Mercury, TCLP	7439-97-6	E512/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----	----	----
Nickel, TCLP	7440-02-0	E444/VA	0.25	mg/L	<0.25	<0.25	----	----	----	----	----
Selenium, TCLP	7782-49-2	E444/VA	0.10	mg/L	<0.10	<0.10	----	----	----	----	----
Silver, TCLP	7440-22-4	E444/VA	0.050	mg/L	<0.050	<0.050	----	----	----	----	----
Thallium, TCLP	7440-28-0	E444/VA	1.0	mg/L	<1.0	<1.0	----	----	----	----	----
Uranium, TCLP	7440-61-1	E444/VA	0.20	mg/L	<0.20	<0.20	----	----	----	----	----
Vanadium, TCLP	7440-62-2	E444/VA	0.15	mg/L	<0.15	<0.15	----	----	----	----	----
Zinc, TCLP	7440-66-6	E444/VA	0.50	mg/L	2.30	0.73	----	----	----	----	----
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.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA24C8571</p> <p>Client : Reworld Renewable Burnaby, ULC</p> <p>Contact : Nicole Victor</p> <p>Address : 5150 Riverbend Drive Burnaby BC Canada V3N 4V3</p> <p>Telephone : ----</p> <p>Project : Weekly Bottom Ash - Suite</p> <p>PO : PO#46693</p> <p>C-O-C number : ----</p> <p>Sampler : ----</p> <p>Site : (includes 2:1 ph)</p> <p>Quote number : Covanta Burnaby Standing Offer 2024</p> <p>No. of samples received : 12</p> <p>No. of samples analysed : 12</p>	<p>Page : 1 of 16</p> <p>Laboratory : ALS Environmental - Vancouver</p> <p>Account Manager : Gulraj Dhanaua</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 24-Oct-2024 09:39</p> <p>Issue Date : 04-Nov-2024 16:39</p>
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This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: Soil/Solid

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Metals	VA24C8571-001	BA2442-A-1	Antimony	7440-36-0	E440	30.4 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Barium	7440-39-3	E440	54.2 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Beryllium	7440-41-7	E440	89.3 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Bismuth	7440-69-9	E440	35.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Boron	7440-42-8	E440	47.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Chromium	7440-47-3	E440	78.4 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Cobalt	7440-48-4	E440	108 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Copper	7440-50-8	E440	164 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Nickel	7440-02-0	E440	73.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Tungsten	7440-33-7	E440	40.8 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Zinc	7440-66-6	E440	38.6 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	VA24C8571-001	BA2442-A-1	Zirconium	7440-67-7	E440	2.9 % DUP-H	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).

Result Qualifiers

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



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		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-1	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-10	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-11	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-12	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-2	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-3	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-4	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 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	
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-5	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-6	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-7	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-8	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap BA2442-A-9	E510	16-Oct-2024	01-Nov-2024	28 days	16 days	✔	03-Nov-2024	28 days	2 days	✔
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BA2442-A-1	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BA2442-A-10	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BA2442-A-11	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BA2442-A-12	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 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		
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-2	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-3	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-4	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-5	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-6	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-7	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-8	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
Glass soil jar/Teflon lined cap BA2442-A-9	E440	16-Oct-2024	01-Nov-2024	180 days	16 days	✔	04-Nov-2024	180 days	19 days	✔	
Physical Tests : Moisture Content by Gravimetry											
Glass soil jar/Teflon lined cap BA2442-A-1	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days		



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-10	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-11	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-12	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-2	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-3	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-4	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-5	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-6	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-7	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	



Matrix: Soil/Solid

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-8	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BA2442-A-9	E144	16-Oct-2024	----	----	----		31-Oct-2024	----	15 days	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-1	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-10	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-11	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-12	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-2	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-3	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-4	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 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)										
Glass soil jar/Teflon lined cap BA2442-A-5	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-6	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-7	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-8	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)										
Glass soil jar/Teflon lined cap BA2442-A-9	E108	16-Oct-2024	01-Nov-2024	30 days	16 days	✔	01-Nov-2024	30 days	17 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2442-A-1	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2442-A-10	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2442-A-11	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔
TCLP Metals : Mercury by CVAAS (TCLP)										
Glass vial - total (lab preserved) BA2442-A-12	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 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 : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-2	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-3	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-4	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-5	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-6	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-7	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-8	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2442-A-9	E512	31-Oct-2024	03-Nov-2024	43 days	18 days	✔	03-Nov-2024	43 days	18 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-1	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 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) BA2442-A-10	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-11	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-12	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-2	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-3	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-4	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-5	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-6	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-7	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 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) BA2442-A-8	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2442-A-9	E444	31-Oct-2024	03-Nov-2024	195 days	18 days	✔	04-Nov-2024	195 days	19 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-1	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-10	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-11	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-12	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-2	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-3	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)											
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-4	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔	



Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		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) BA2442-A-5	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-6	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-7	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-8	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 days	✔
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI, PFAS) BA2442-A-9	EPP444	16-Oct-2024	31-Oct-2024	----	----		----	28 days	15 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	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Mercury by CVAAS (TCLP)	E512	1747533	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	1743977	1	17	5.8	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1747532	1	12	8.3	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	1743978	1	17	5.8	5.0	✔
Moisture Content by Gravimetry	E144	1743979	1	12	8.3	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	1746155	1	17	5.8	5.0	✔
Laboratory Control Samples (LCS)							
Mercury in Soil/Solid by CVAAS	E510	1743977	2	17	11.7	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	1743978	2	17	11.7	10.0	✔
Moisture Content by Gravimetry	E144	1743979	1	12	8.3	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	1746155	1	17	5.8	5.0	✔
Method Blanks (MB)							
Mercury by CVAAS (TCLP)	E512	1747533	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	1743977	1	17	5.8	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1747532	1	12	8.3	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	1743978	1	17	5.8	5.0	✔
Moisture Content by Gravimetry	E144	1743979	1	12	8.3	5.0	✔
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	1747533	1	12	8.3	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	1747532	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 $20 \pm 5^{\circ}\text{C}$), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at $<60^{\circ}\text{C}$) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 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 HNO_3 and HCl . Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
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 HNO_3 and HCl , followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512 ALS Environmental - Vancouver	Soil/Solid	SW 846 -1311/245.1 CVAA ON TCLP LEACHATE	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Vancouver	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at $<60^{\circ}\text{C}$) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.

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 Client : Reworld Renewable Burnaby, ULC
 Project : Weekly Bottom Ash - Suite



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
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 HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 ALS Environmental - Vancouver	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.

QUALITY CONTROL REPORT

Work Order	: VA24C8571	Page	: 1 of 12
Client	: Reworld Renewable Burnaby, ULC	Laboratory	: ALS Environmental - Vancouver
Contact	: Nicole Victor	Account Manager	: Gulraj Dhanaua
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	: 24-Oct-2024 09:39
PO	: PO#46693	Date Analysis Commenced	: 31-Oct-2024
C-O-C number	: ----	Issue Date	: 04-Nov-2024 16:35
Sampler	: ----		
Site	: (includes 2:1 ph)		
Quote number	: Covanta Burnaby Standing Offer 2024		
No. of samples received	: 12		
No. of samples analysed	: 12		

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Wingyee Cheng	Analyst- General	Vancouver Metals, Burnaby, British Columbia

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Work Order : VA24C8571
Client : Reworld Renewable Burnaby, ULC
Project : Weekly Bottom Ash - Suite



General Comments

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

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: Soil/Solid

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1743979)											
VA24C8571-001	BA2442-A-1	Moisture	----	E144	0.25	%	25.2	25.9	3.00%	20%	----
Physical Tests (QC Lot: 1746155)											
VA24C8571-001	BA2442-A-1	pH (1:2 soil:water)	----	E108	0.10	pH units	11.8	11.7	0.6%	5%	----
Metals (QC Lot: 1743977)											
VA24C8571-001	BA2442-A-1	Mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	0	Diff <2x LOR	----
Metals (QC Lot: 1743978)											
VA24C8571-001	BA2442-A-1	Aluminum	7429-90-5	E440	50	mg/kg	47900	47800	0.247%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	86.0	117	30.4%	30%	DUP-H
		Arsenic	7440-38-2	E440	0.10	mg/kg	23.0	23.5	2.33%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	997	1740	54.2%	40%	DUP-H
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.37	0.97	89.3%	30%	DUP-H
		Bismuth	7440-69-9	E440	0.20	mg/kg	8.26	5.80	35.0%	30%	DUP-H
		Boron	7440-42-8	E440	5.0	mg/kg	242	149	47.2%	30%	DUP-H
		Cadmium	7440-43-9	E440	0.020	mg/kg	7.94	7.87	0.842%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	135000	127000	6.57%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	192	441	78.4%	30%	DUP-H
		Cobalt	7440-48-4	E440	0.10	mg/kg	38.9	131	108%	30%	DUP-H
		Copper	7440-50-8	E440	0.50	mg/kg	1450	14600	164%	30%	DUP-H
		Iron	7439-89-6	E440	50	mg/kg	79100	72300	9.07%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	352	281	22.6%	40%	----
		Lithium	7439-93-2	E440	2.0	mg/kg	30.7	26.7	14.2%	30%	----
		Magnesium	7439-95-4	E440	20	mg/kg	11200	11800	5.01%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	864	1150	28.3%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	19.7	15.2	25.7%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	98.7	212	73.0%	30%	DUP-H
		Phosphorus	7723-14-0	E440	50	mg/kg	14100	11600	19.6%	30%	----
		Potassium	7440-09-7	E440	100	mg/kg	5880	5380	8.77%	40%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.38	0.34	0.05	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	3.70	3.76	1.62%	40%	----
		Sodium	7440-23-5	E440	50	mg/kg	17200	16900	1.81%	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: 1743978) - continued											
VA24C8571-001	BA2442-A-1	Strontium	7440-24-6	E440	0.50	mg/kg	339	368	8.05%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	9800	11400	15.1%	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	98.4	146	39.2%	40%	----
		Titanium	7440-32-6	E440	1.0	mg/kg	3330	3330	0.0495%	40%	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	14.8	22.4	40.8%	30%	DUP-H
		Uranium	7440-61-1	E440	0.050	mg/kg	2.58	2.81	8.52%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	40.5	51.3	23.6%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	2730	4040	38.6%	30%	DUP-H
Zirconium	7440-67-7	E440	1.0	mg/kg	4.7	# 7.6	2.9	Diff <2x LOR	DUP-H		
TCLP Metals (QC Lot: 1747532)											
VA24C8571-001	BA2442-A-1	Antimony, TCLP	7440-36-0	E444	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		Arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	0	Diff <2x LOR	----
		Beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	0	Diff <2x LOR	----
		Boron, TCLP	7440-42-8	E444	0.50	mg/L	2.16	2.25	0.09	Diff <2x LOR	----
		Cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.175	0.182	0.008	Diff <2x LOR	----
		Calcium, TCLP	7440-70-2	E444	10	mg/L	1900	1990	4.96%	30%	----
		Chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	----
		Cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.04	1.08	4.10%	30%	----
		Copper, TCLP	7440-50-8	E444	0.050	mg/L	1.67	1.74	4.21%	30%	----
		Iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	0	Diff <2x LOR	----
		Magnesium, TCLP	7439-95-4	E444	2.5	mg/L	119	130	9.24%	30%	----
		Nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.45	0.47	0.02	Diff <2x LOR	----
		Selenium, TCLP	7782-49-2	E444	0.10	mg/L	<0.10	<0.10	0	Diff <2x LOR	----
		Silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Uranium, TCLP	7440-61-1	E444	0.20	mg/L	<0.20	<0.20	0	Diff <2x LOR	----
Vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	0	Diff <2x LOR	----		
Zinc, TCLP	7440-66-6	E444	0.50	mg/L	23.5	24.9	5.60%	30%	----		
Zirconium, TCLP	7440-67-7	E444	10	mg/L	<10	<10	0	Diff <2x LOR	----		
TCLP Metals (QC Lot: 1747533)											
VA24C8571-001	BA2442-A-1	Mercury, TCLP	7439-97-6	E512	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----



Qualifiers

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



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: 1743979)						
Moisture	---	E144	0.25	%	<0.25	---
Metals (QCLot: 1743977)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	---
Metals (QCLot: 1743978)						
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: 1743978) - continued						
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
TCLP Metals (QCLot: 1747532)						
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	----
TCLP Metals (QCLot: 1747533)						
Mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	----



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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1743979)									
Moisture	---	E144	0.25	%	50 %	100.0	90.0	110	---
Physical Tests (QCLot: 1746155)									
pH (1:2 soil:water)	---	E108	---	pH units	6 pH units	100	95.0	105	---
Metals (QCLot: 1743977)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	102	80.0	120	---
Metals (QCLot: 1743978)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	98.7	80.0	120	---
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	102	80.0	120	---
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	106	80.0	120	---
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	107	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	97.6	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	97.6	80.0	120	---
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	101	80.0	120	---
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	---
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	99.0	80.0	120	---
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	98.6	80.0	120	---
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	103	80.0	120	---
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	99.3	80.0	120	---
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	105	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	99.9	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	98.5	80.0	120	---
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	104	80.0	120	---
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	99.0	80.0	120	---
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	98.6	80.0	120	---
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	93.5	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	103	80.0	120	---
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.3	80.0	120	---



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1743978) - continued									
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	98.8	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	99.6	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	105	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	106	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	97.8	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	102	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: 1747532)										
VA24C8571-001	BA2442-A-1	Antimony, TCLP	7440-36-0	E444	5.12 mg/L	5 mg/L	102	50.0	140	----
		Arsenic, TCLP	7440-38-2	E444	4.8 mg/L	5 mg/L	96.1	50.0	140	----
		Barium, TCLP	7440-39-3	E444	11.8 mg/L	12.5 mg/L	94.7	50.0	140	----
		Beryllium, TCLP	7440-41-7	E444	0.239 mg/L	0.25 mg/L	95.6	50.0	140	----
		Boron, TCLP	7440-42-8	E444	9.99 mg/L	10 mg/L	99.9	50.0	140	----
		Cadmium, TCLP	7440-43-9	E444	0.234 mg/L	0.25 mg/L	93.6	50.0	140	----
		Calcium, TCLP	7440-70-2	E444	ND mg/L	----	ND	50.0	140	----
		Chromium, TCLP	7440-47-3	E444	1.16 mg/L	1.25 mg/L	92.6	50.0	140	----
		Cobalt, TCLP	7440-48-4	E444	ND mg/L	----	ND	50.0	140	----
		Copper, TCLP	7440-50-8	E444	2.23 mg/L	2.5 mg/L	89.4	50.0	140	----
		Iron, TCLP	7439-89-6	E444	226 mg/L	250 mg/L	90.5	50.0	140	----
		Lead, TCLP	7439-92-1	E444	9.64 mg/L	10 mg/L	96.4	50.0	140	----
		Magnesium, TCLP	7439-95-4	E444	239 mg/L	250 mg/L	95.5	50.0	140	----
		Nickel, TCLP	7440-02-0	E444	2.24 mg/L	2.5 mg/L	89.4	50.0	140	----
		Selenium, TCLP	7782-49-2	E444	4.86 mg/L	5 mg/L	97.3	50.0	140	----
		Silver, TCLP	7440-22-4	E444	0.080 mg/L	0.1 mg/L	79.6	50.0	140	----
		Thallium, TCLP	7440-28-0	E444	4.8 mg/L	5 mg/L	95.7	50.0	140	----
		Uranium, TCLP	7440-61-1	E444	4.82 mg/L	5 mg/L	96.3	50.0	150	----
		Vanadium, TCLP	7440-62-2	E444	0.68 mg/L	0.75 mg/L	91.1	50.0	140	----
		Zinc, TCLP	7440-66-6	E444	ND mg/L	----	ND	50.0	140	----
		Zirconium, TCLP	7440-67-7	E444	0.9 mg/L	1 mg/L	90.1	50.0	150	----
TCLP Metals (QCLot: 1747533)										
VA24C8571-001	BA2442-A-1	Mercury, TCLP	7439-97-6	E512	0.0009 mg/L	0.001 mg/L	93.0	50.0	140	----



Reference Material (RM) Report

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

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 1743977)									
QC-1743977-003	MRCA-21	Mercury	7439-97-6	E510	0.068 mg/kg	103	70.0	130	----
Metals (QCLot: 1743978)									
QC-1743978-003	MRCA-21	Aluminum	7429-90-5	E440	22500 mg/kg	108	70.0	130	----
QC-1743978-003	MRCA-21	Antimony	7440-36-0	E440	24.8 mg/kg	96.0	70.0	130	----
QC-1743978-003	MRCA-21	Arsenic	7440-38-2	E440	21.2 mg/kg	105	70.0	130	----
QC-1743978-003	MRCA-21	Barium	7440-39-3	E440	788 mg/kg	107	70.0	130	----
QC-1743978-003	MRCA-21	Beryllium	7440-41-7	E440	1.82 mg/kg	116	70.0	130	----
QC-1743978-003	MRCA-21	Bismuth	7440-69-9	E440	1.78 mg/kg	93.7	70.0	130	----
QC-1743978-003	MRCA-21	Cadmium	7440-43-9	E440	2.15 mg/kg	109	70.0	130	----
QC-1743978-003	MRCA-21	Calcium	7440-70-2	E440	4900 mg/kg	111	70.0	130	----
QC-1743978-003	MRCA-21	Chromium	7440-47-3	E440	56.9 mg/kg	106	70.0	130	----
QC-1743978-003	MRCA-21	Cobalt	7440-48-4	E440	32 mg/kg	103	70.0	130	----
QC-1743978-003	MRCA-21	Copper	7440-50-8	E440	969 mg/kg	104	70.0	130	----
QC-1743978-003	MRCA-21	Iron	7439-89-6	E440	32700 mg/kg	106	70.0	130	----
QC-1743978-003	MRCA-21	Lead	7439-92-1	E440	919 mg/kg	98.6	70.0	130	----
QC-1743978-003	MRCA-21	Lithium	7439-93-2	E440	47.3 mg/kg	117	70.0	130	----
QC-1743978-003	MRCA-21	Magnesium	7439-95-4	E440	7780 mg/kg	105	70.0	130	----
QC-1743978-003	MRCA-21	Manganese	7439-96-5	E440	8640 mg/kg	101	70.0	130	----
QC-1743978-003	MRCA-21	Molybdenum	7439-98-7	E440	25.1 mg/kg	105	70.0	130	----
QC-1743978-003	MRCA-21	Nickel	7440-02-0	E440	1000 mg/kg	105	70.0	130	----
QC-1743978-003	MRCA-21	Phosphorus	7723-14-0	E440	660 mg/kg	98.1	70.0	130	----
QC-1743978-003	MRCA-21	Potassium	7440-09-7	E440	10800 mg/kg	103	70.0	130	----
QC-1743978-003	MRCA-21	Selenium	7782-49-2	E440	1.04 mg/kg	86.8	60.0	140	----
QC-1743978-003	MRCA-21	Silver	7440-22-4	E440	8.98 mg/kg	99.3	70.0	130	----
QC-1743978-003	MRCA-21	Sodium	7440-23-5	E440	1770 mg/kg	124	70.0	130	----
QC-1743978-003	MRCA-21	Strontium	7440-24-6	E440	41 mg/kg	110	70.0	130	----
QC-1743978-003	MRCA-21	Sulfur	7704-34-9	E440	3940 mg/kg	95.3	50.0	150	----
QC-1743978-003	MRCA-21	Thallium	7440-28-0	E440	0.907 mg/kg	102	70.0	130	----
QC-1743978-003	MRCA-21	Tin	7440-31-5	E440	3.79 mg/kg	101	40.0	160	----
QC-1743978-003	MRCA-21	Titanium	7440-32-6	E440	2790 mg/kg	109	70.0	130	----
QC-1743978-003	MRCA-21	Tungsten	7440-33-7	E440	6.99 mg/kg	113	70.0	130	----
QC-1743978-003	MRCA-21	Uranium	7440-61-1	E440	3.97 mg/kg	99.0	70.0	130	----
QC-1743978-003	MRCA-21	Vanadium	7440-62-2	E440	66.2 mg/kg	104	70.0	130	----

Page : 12 of 12
 Work Order : VA24C8571
 Client : Reworld Renewable Burnaby, ULC
 Project : Weekly Bottom Ash - Suite



Sub-Matrix:

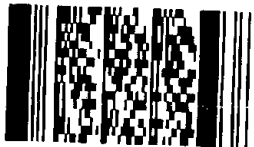
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 1743978) - continued									
QC-1743978-003	MRCA-21	Zinc	7440-66-6	E440	828 mg/kg	104	70.0	130	----
QC-1743978-003	MRCA-21	Zirconium	7440-67-7	E440	6.91 mg/kg	102	70.0	130	----



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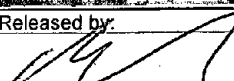
Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)	
Company:	Covanta Energy	<input type="checkbox"/> Standard	<input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)	
Contact:	Nicole Victor / Dan Skrypnik	<input checked="" type="checkbox"/> PDF	<input type="checkbox"/> Excel	<input type="checkbox"/> Digital	<input type="checkbox"/> Fax
Address:	5150 Riverbend Drive Burnaby BC	Email 1:	nvictor@covanta.com		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Phone:	604-521-1025	Fax:	rminchin@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	<input type="checkbox"/> Yes <input type="checkbox"/> No	Email 3:	dskrypnik@covanta.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT
			brent.kirkpatrick@metrovancover.org		
			Sarah.Wellman@metrovancover.org		

Invoice To Same as Report ?		Client / Project Information		Analysis Request											
Hardcopy of Invoice with Report?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Job #:				Please indicate below Filtered, Preserved or both (F, P, F/P)									
Company:		PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite			MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR-FULL-VA (all metals)						
Contact:		LSD:	(includes 2:1 pH)												
Address:		Quote #:													
Phone:															

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-VA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR-FULL-VA (all metals)	Number of Containers					
BA2442-A-1	Environmental Division Vancouver Work Order Reference VA24C8571  Telephone : +1 604 253 4188	16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-2		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-3		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-4		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-5		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-6		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-7		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-8		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-9		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-10		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-11		16-Oct-24	9:00	Soil	X	X		X						1
BA2442-A-12		16-Oct-24	9:00	Soil	X	X		X						1

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-mm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	23 Oct 2018	080	JL	24-10-24	9:30am	19, 19 °C				



ALS Environmental

C8571

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC #

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Report To			Report Format / Distribution			Service Requested (Rush for routine analysis subject to availability)					
Company:	Covanta Energy		<input type="checkbox"/> Standard	<input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)						
Contact:	Nicole Victor / Dan Skrypynk		<input checked="" type="checkbox"/> PDF	<input type="checkbox"/> Excel	<input type="checkbox"/> Digital	<input type="checkbox"/> Fax	<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT				
Address:	5150 Riverbend Drive Burnaby BC		Email 1:	nvictor@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT					
Phone:	604-521-1025	Fax:	Email 2:	rminchin@covanta.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT					
	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Email 3:	dskrypynk@covanta.com		Analysis Request					
				brent.kirkpatrick@metrovancover.org							
				Sarah.Wellman@metrovancover.org							

Invoice To Same as Report ?			Client / Project Information			Please indicate below Filtered, Preserved or both (F, P, F/P)					
Hardcopy of Invoice with Report? <input type="checkbox"/> Yes <input type="checkbox"/> No			Job #:								
Company:			PO / AFE:	PO# 46893 Weekly Bottom Ash - Suite							
Contact:			LSD:	(includes 2:1 pH)							
Address:											
Phone:			Quote #:								

Lab/Work Order #	ALS Contact:	Sampler:									
(lab use only)											

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			
BA2442-A-1		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-2		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-3		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-4		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-5		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-6		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-7		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-8		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-9		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-10		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-11		16-Oct-24	9:00	Soil	X	X		X				1
BA2442-A-12		16-Oct-24	9:00	Soil	X	X		X				1

Environmental Division
Vancouver
Work Order Reference
VA24C8571



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

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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
	23 Oct 2024	0800	JL	24-10-24	9:30am	19, 19 °C				