

## Bottom Ash Data

2019 Week 3

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The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on January 30, 2019. The data represents bottom ash composite results for week 3 of 2019 (January 13, 2019 to January 19, 2019).

The bottom ash meets the requirements of Metro Vancouver's Bottom Ash Management Plan and is suitable for beneficial use during Coquitlam Landfill closure works.



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Burnaby BC V3N 4V3

Date Received: 22-JAN-19  
Report Date: 29-JAN-19 14:21 (MT)  
Version: FINAL

Client Phone: 604-521-1025

## Certificate of Analysis

Lab Work Order #: L2223412  
Project P.O. #: VANCO-0000048466  
Job Reference:  
C of C Numbers:  
Legal Site Desc: WEEKLY BOTTOM ASH/(Includes 2:1 pH)

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Brent Mack, B.Sc.  
Account Manager

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2223412-1	L2223412-2	L2223412-3	L2223412-4	L2223412-5
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	16-JAN-19	16-JAN-19	16-JAN-19	16-JAN-19	16-JAN-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1903-A-1	BA1903-A-2	BA1903-A-3	BA1903-A-4	BA1903-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>Physical Tests</b>	Moisture (%)		21.5	20.9	21.2	20.5	20.2
	pH (1:2 soil:water) (pH)		12.11	12.04	11.86	12.12	12.07
<b>Metals</b>	Aluminum (Al) (mg/kg)		43100	32100	39900	33000	30900
	Antimony (Sb) (mg/kg)		123	171	121	102	322
	Arsenic (As) (mg/kg)		30.3	24.6	22.2	26.4	24.2
	Barium (Ba) (mg/kg)		621	512	640	582	574
	Beryllium (Be) (mg/kg)		0.50	0.38	0.45	0.40	0.43
	Bismuth (Bi) (mg/kg)		11.2	10.3	8.09	13.5	8.31
	Boron (B) (mg/kg)		401	287	414	651	349
	Cadmium (Cd) (mg/kg)		13.0	12.4	11.8	13.1	11.7
	Calcium (Ca) (mg/kg)		143000	116000	133000	132000	133000
	Chromium (Cr) (mg/kg)		191	123	148	139	137
	Cobalt (Co) (mg/kg)		43.6	30.2	51.6	55.0	41.1
	Copper (Cu) (mg/kg)		3290	20100	9260	3250	16900
	Iron (Fe) (mg/kg)		55700	53400	55500	56700	54600
	Lead (Pb) (mg/kg)		493	471	510	526	646
	Lithium (Li) (mg/kg)		29.6	16.3	22.7	17.6	18.2
	Magnesium (Mg) (mg/kg)		11200	11100	10500	10800	10500
	Manganese (Mn) (mg/kg)		1240	926	942	846	1350
	Mercury (Hg) (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)		64.9	54.4	66.9	56.4	52.5
	Nickel (Ni) (mg/kg)		173	229	208	119	97.1
	Phosphorus (P) (mg/kg)		12100	10100	11000	10900	10500
	Potassium (K) (mg/kg)		4740	4350	4790	5070	4720
	Selenium (Se) (mg/kg)		0.37	0.37	0.30	0.33	0.29
	Silver (Ag) (mg/kg)		5.08	8.55	5.28	3.93	3.99
	Sodium (Na) (mg/kg)		14000	12800	13600	13300	14500
	Strontium (Sr) (mg/kg)		335	279	295	357	296
	Sulfur (S) (mg/kg)		15000	11900	13800	12800	13800
Thallium (Tl) (mg/kg)		0.094	0.069	0.086	0.079	0.077	
Tin (Sn) (mg/kg)		128	183	166	96.0	150	
Titanium (Ti) (mg/kg)		1250	736	1440	838	872	
Tungsten (W) (mg/kg)		9.19	10.3	10.4	11.8	8.20	
Uranium (U) (mg/kg)		6.52	5.17	6.03	5.79	5.62	
Vanadium (V) (mg/kg)		53.1	45.3	50.4	49.2	50.1	
Zinc (Zn) (mg/kg)		4930	3560	8800	5010	5200	
Zirconium (Zr) (mg/kg)		2.4	1.9	2.1	1.3	1.3	

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L2223412-6 SOIL 16-JAN-19 09:00 BA1903-A-6	L2223412-7 SOIL 16-JAN-19 09:00 BA1903-A-7	L2223412-8 SOIL 16-JAN-19 09:00 BA1903-A-8	L2223412-9 SOIL 16-JAN-19 09:00 BA1903-A-9	L2223412-10 SOIL 16-JAN-19 09:00 BA1903-A-10	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	20.5	20.7	18.9	20.6	21.1
	pH (1:2 soil:water) (pH)	12.15	12.10	12.23	11.89	11.90
<b>Metals</b>	Aluminum (Al) (mg/kg)	33800	47000	28200	31500	31100
	Antimony (Sb) (mg/kg)	109	95.4	101	85.3	99.2
	Arsenic (As) (mg/kg)	28.3	19.8	23.5	21.1	21.0
	Barium (Ba) (mg/kg)	571	583	582	571	483
	Beryllium (Be) (mg/kg)	0.40	0.39	0.41	0.40	0.40
	Bismuth (Bi) (mg/kg)	7.88	7.57	9.39	6.31	9.97
	Boron (B) (mg/kg)	334	303	401	367	330
	Cadmium (Cd) (mg/kg)	13.6	19.3	12.3	14.1	12.3
	Calcium (Ca) (mg/kg)	119000	125000	136000	117000	135000
	Chromium (Cr) (mg/kg)	132	119	153	176	161
	Cobalt (Co) (mg/kg)	183	56.0	31.4	30.3	21.1
	Copper (Cu) (mg/kg)	5010	5680	1460	1890	2480
	Iron (Fe) (mg/kg)	57700	41400	69500	54500	55000
	Lead (Pb) (mg/kg)	401	670	550	338	401
	Lithium (Li) (mg/kg)	17.9	17.8	25.9	27.1	17.2
	Magnesium (Mg) (mg/kg)	9590	10000	11100	10400	10400
	Manganese (Mn) (mg/kg)	963	872	1080	749	752
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	54.4	59.7	97.1	75.2	57.3
	Nickel (Ni) (mg/kg)	149	124	165	151	116
	Phosphorus (P) (mg/kg)	9920	12200	9770	8650	10900
	Potassium (K) (mg/kg)	4420	4500	4540	4510	4440
	Selenium (Se) (mg/kg)	0.42	0.33	0.34	0.31	0.33
	Silver (Ag) (mg/kg)	7.37	3.76	4.04	8.75	4.20
	Sodium (Na) (mg/kg)	12400	13200	13100	13200	12900
	Strontium (Sr) (mg/kg)	291	335	321	269	335
	Sulfur (S) (mg/kg)	13500	12800	12700	11000	12400
	Thallium (Tl) (mg/kg)	0.074	0.080	0.069	0.076	0.075
	Tin (Sn) (mg/kg)	104	185	134	94.1	138
	Titanium (Ti) (mg/kg)	962	1030	970	1470	660
	Tungsten (W) (mg/kg)	13.9	11.6	8.68	10.8	7.62
	Uranium (U) (mg/kg)	5.48	5.69	5.58	5.17	5.76
	Vanadium (V) (mg/kg)	47.5	48.5	49.1	49.2	48.0
	Zinc (Zn) (mg/kg)	6310	5350	4350	2920	5210
	Zirconium (Zr) (mg/kg)	1.2	1.7	1.1	1.9	1.6

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2223412-11	L2223412-12		
		Description	SOIL	SOIL		
		Sampled Date	16-JAN-19	16-JAN-19		
		Sampled Time	09:00	09:00		
		Client ID	BA1903-A-11	BA1903-A-12		
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	20.9	19.9			
	pH (1:2 soil:water) (pH)	11.90	11.93			
<b>Metals</b>	Aluminum (Al) (mg/kg)	33700	34400			
	Antimony (Sb) (mg/kg)	106	109			
	Arsenic (As) (mg/kg)	24.8	21.6			
	Barium (Ba) (mg/kg)	571	602			
	Beryllium (Be) (mg/kg)	0.40	0.48			
	Bismuth (Bi) (mg/kg)	9.23	12.3			
	Boron (B) (mg/kg)	333	389			
	Cadmium (Cd) (mg/kg)	11.4	12.4			
	Calcium (Ca) (mg/kg)	131000	135000			
	Chromium (Cr) (mg/kg)	345	139			
	Cobalt (Co) (mg/kg)	173	113			
	Copper (Cu) (mg/kg)	2790	1990			
	Iron (Fe) (mg/kg)	59700	64300			
	Lead (Pb) (mg/kg)	850	425			
	Lithium (Li) (mg/kg)	58.7	53.2			
	Magnesium (Mg) (mg/kg)	11000	12500			
	Manganese (Mn) (mg/kg)	940	846			
	Mercury (Hg) (mg/kg)	<0.050	<0.050			
	Molybdenum (Mo) (mg/kg)	56.2	80.7			
	Nickel (Ni) (mg/kg)	235	119			
	Phosphorus (P) (mg/kg)	10500	12300			
	Potassium (K) (mg/kg)	4600	4790			
	Selenium (Se) (mg/kg)	0.32	0.35			
	Silver (Ag) (mg/kg)	3.77	4.09			
	Sodium (Na) (mg/kg)	13600	13900			
	Strontium (Sr) (mg/kg)	292	340			
	Sulfur (S) (mg/kg)	13000	13400			
	Thallium (Tl) (mg/kg)	0.069	0.079			
	Tin (Sn) (mg/kg)	125	136			
	Titanium (Ti) (mg/kg)	931	771			
	Tungsten (W) (mg/kg)	7.05	10.0			
	Uranium (U) (mg/kg)	5.53	6.05			
Vanadium (V) (mg/kg)	47.5	56.4				
Zinc (Zn) (mg/kg)	4120	3460				
Zirconium (Zr) (mg/kg)	1.4	1.6				

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2223412-1	L2223412-2	L2223412-3	L2223412-4	L2223412-5
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	16-JAN-19	16-JAN-19	16-JAN-19	16-JAN-19	16-JAN-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1903-A-1	BA1903-A-2	BA1903-A-3	BA1903-A-4	BA1903-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.89	11.81	11.89	11.86	11.88
	2nd Preliminary pH (pH)		9.87	9.89	10.38	10.25	10.31
	Final pH (pH)		6.06	6.32	6.04	6.16	6.18
	Extraction Solution Initial pH (pH)		2.87	2.87	2.87	2.87	2.87
	Antimony (Sb)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba)-Leachable (mg/L)		<2.5	<2.5	<2.5	<2.5	<2.5
	Beryllium (Be)-Leachable (mg/L)		<0.025	<0.025	<0.025	<0.025	<0.025
	Boron (B)-Leachable (mg/L)		5.24	4.95	4.87	5.15	5.58
	Cadmium (Cd)-Leachable (mg/L)		0.181	0.188	0.181	0.264	0.156
	Calcium (Ca)-Leachable (mg/L)		2030	2050	1970	2030	2030
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.674	0.390	0.585	2.06	0.791
	Copper (Cu)-Leachable (mg/L)		1.32	0.871	0.491	0.876	1.05
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	0.32
	Magnesium (Mg)-Leachable (mg/L)		128	125	121	121	126
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.69	1.23	0.62	0.49	0.69
	Selenium (Se)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag)-Leachable (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Thallium (Tl)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Vanadium (V)-Leachable (mg/L)		<0.15	<0.15	<0.15	<0.15	<0.15
	Zinc (Zn)-Leachable (mg/L)		40.8	28.9	39.5	33.8	38.7

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2223412-6	L2223412-7	L2223412-8	L2223412-9	L2223412-10
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	16-JAN-19	16-JAN-19	16-JAN-19	16-JAN-19	16-JAN-19
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1903-A-6	BA1903-A-7	BA1903-A-8	BA1903-A-9	BA1903-A-10
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.92	11.98	11.93	11.84	11.79
	2nd Preliminary pH (pH)		10.52	10.59	10.47	10.30	10.05
	Final pH (pH)		6.23	6.10	6.13	6.38	6.26
	Extraction Solution Initial pH (pH)		2.87	2.87	2.87	2.87	2.87
	Antimony (Sb)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Arsenic (As)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Barium (Ba)-Leachable (mg/L)		<2.5	<2.5	<2.5	<2.5	<2.5
	Beryllium (Be)-Leachable (mg/L)		<0.025	<0.025	<0.025	<0.025	<0.025
	Boron (B)-Leachable (mg/L)		4.83	4.75	5.36	5.63	4.81
	Cadmium (Cd)-Leachable (mg/L)		0.179	0.350	0.162	0.164	0.176
	Calcium (Ca)-Leachable (mg/L)		2000	1990	2030	2050	2010
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.565	0.710	0.341	0.598	2.37
	Copper (Cu)-Leachable (mg/L)		1.34	0.823	0.611	0.794	0.943
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	0.30	<0.25	<0.25
	Magnesium (Mg)-Leachable (mg/L)		128	121	124	127	125
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.49	0.81	0.47	0.45	0.72
	Selenium (Se)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Silver (Ag)-Leachable (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Thallium (Tl)-Leachable (mg/L)		<1.0	<1.0	<1.0	<1.0	<1.0
	Vanadium (V)-Leachable (mg/L)		<0.15	<0.15	<0.15	<0.15	<0.15
	Zinc (Zn)-Leachable (mg/L)		39.4	50.3	41.7	31.4	39.6

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L2223412-11 SOIL 16-JAN-19 09:00 BA1903-A-11	L2223412-12 SOIL 16-JAN-19 09:00 BA1903-A-12		
Grouping	Analyte				
<b>SOIL</b>					
<b>TCLP Metals</b>	1st Preliminary pH (pH)	11.83	11.77		
	2nd Preliminary pH (pH)	10.37	10.15		
	Final pH (pH)	6.15	6.07		
	Extraction Solution Initial pH (pH)	2.87	2.87		
	Antimony (Sb)-Leachable (mg/L)	<1.0	<1.0		
	Arsenic (As)-Leachable (mg/L)	<1.0	<1.0		
	Barium (Ba)-Leachable (mg/L)	<2.5	<2.5		
	Beryllium (Be)-Leachable (mg/L)	<0.025	<0.025		
	Boron (B)-Leachable (mg/L)	4.95	4.84		
	Cadmium (Cd)-Leachable (mg/L)	0.290	0.259		
	Calcium (Ca)-Leachable (mg/L)	1960	2000		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.731	0.784		
	Copper (Cu)-Leachable (mg/L)	1.08	1.28		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	<0.25		
	Magnesium (Mg)-Leachable (mg/L)	121	125		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.53	1.04		
	Selenium (Se)-Leachable (mg/L)	<1.0	<1.0		
	Silver (Ag)-Leachable (mg/L)	<0.050	<0.050		
	Thallium (Tl)-Leachable (mg/L)	<1.0	<1.0		
	Vanadium (V)-Leachable (mg/L)	<0.15	<0.15		
	Zinc (Zn)-Leachable (mg/L)	38.0	46.5		

\* Please refer to the Reference Information section for an explanation of any qualifiers detected.



## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Bismuth (Bi)	DUP-H	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Copper (Cu)	DUP-H	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)	DUP-H	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lithium (Li)	DUP-H	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Manganese (Mn)	DUP-H	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Leachable	MS-B	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2223412-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9

### Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
<b>HG-200.2-CVAF-VA</b>	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
Soil samples are digested with hot nitric and hydrochloric acids, followed by CVAAS analysis. This method is fully compliant with the BC SALM strong acid leachable metals digestion method.			
<b>HG-TCLP-CVAFS-VA</b>	Soil	Mercury by CVAAS (TCLP)	EPA 1311/245.7
This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter and analysed using atomic absorption spectrophotometry (EPA 245.7).			
<b>MET-200.2-CCMS-VA</b>	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.			
Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H <sub>2</sub> S) may be excluded if lost during sampling, storage, or digestion.			
<b>MET-TCLP-ICP-VA</b>	Soil	Metals by ICPOES (TCLP)	EPA 1311/6010B
This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter and analysed using inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
<b>MOISTURE-VA</b>	Soil	Moisture content	CCME PHC in Soil - Tier 1 (mod)
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.			
<b>PH-1:2-VA</b>	Soil	pH in Soil (1:2 Soil:Water Extraction)	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. 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. The pH of the solution is then measured using a standard pH probe.			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

### Chain of Custody Numbers:

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour 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.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg wwt* - milligrams per kilogram based on wet weight of sample.

*mg/kg lwt* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*N/A* - Result not available. Refer to qualifier code and definition for explanation.

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

**UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.**

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



L2223412-COFC

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

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

Page \_\_\_\_ of \_\_\_\_

<b>Report To</b>		<b>Report Format / Distribution</b>		<b>Service Requested (Rush for routine analysis subject to availability)</b>		
Company:	Covanta Energy	<input type="checkbox"/> Standard	<input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)		
Contact:	Steve Mckinney / Dan Skrypnik	<input checked="" type="checkbox"/> PDF	<input type="checkbox"/> Excel	<input type="checkbox"/> Digital	<input type="checkbox"/> Fax	
Address:	5150 Riverbend Drive Burnaby BC	Email 1:	smckinney@covanta.com		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
Phone:	604-521-1025	Email 2:	riohanson4@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		<b>Analysis Request</b>	
			Sarah.Wellman@metrovancover.org			

<b>Invoice To</b>		<b>Client / Project Information</b>		Please indicate below Filtered, Preserved or both (F, P, F/P)							
Hardcopy of Invoice with Report?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Job #:									
Company:		PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite								
Contact:		LSD:	(includes 2:1 pH)								
Address:		Quote #:									
Phone:											

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
BA1903-A-1		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-2		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-3		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-4		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-5		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-6		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-7		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-8		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-9		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-10		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-11		16-Jan-19	9:00	Soil	X	X			X		1
BA1903-A-12		16-Jan-19	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-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<i>[Signature]</i>	22-Jan-19	07:00	<i>[Signature]</i>	JAN 22 2019	11am	18.5°C				