

## Bottom Ash Data

2018 Week 29

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The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on August 1, 2018. The data represents bottom ash composite results for week 29 of 2018 (July 15, 2018 to July 21, 2018).

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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Date Received: 24-JUL-18  
Report Date: 31-JUL-18 18:15 (MT)  
Version: FINAL

Client Phone: 604-521-1025

## Certificate of Analysis

Lab Work Order #: L2134647  
Project P.O. #: VANCO-0000047506  
Job Reference:  
C of C Numbers:  
Legal Site Desc:

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Brent Mack, B.Sc.  
Account Manager

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## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2134647-1	L2134647-2	L2134647-3	L2134647-4	L2134647-5
		Description	soil	soil	soil	soil	soil
		Sampled Date	18-JUL-18	18-JUL-18	18-JUL-18	18-JUL-18	18-JUL-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1829-A-1	BA1829-A-2	BA1829-A-3	BA1829-A-4	BA1829-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>Physical Tests</b>	Moisture (%)		17.9	17.9	18.2	17.9	17.7
	pH (1:2 soil:water) (pH)		10.77	11.18	10.84	10.96	10.84
<b>Metals</b>	Aluminum (Al) (mg/kg)		40700	37100	33500	37500	26300
	Antimony (Sb) (mg/kg)		135	171	138	146	131
	Arsenic (As) (mg/kg)		42.4	49.4	38.6	47.5	45.7
	Barium (Ba) (mg/kg)		526	465	484	509	522
	Beryllium (Be) (mg/kg)		0.38	0.42	<0.50 <sup>DLA</sup>	0.43	0.38
	Bismuth (Bi) (mg/kg)		10.5	8.82	8.4	8.70	9.19
	Boron (B) (mg/kg)		270	274	244	366	264
	Cadmium (Cd) (mg/kg)		39.9	17.3	15.8	13.9	13.0
	Calcium (Ca) (mg/kg)		125000	140000	115000	131000	119000
	Chromium (Cr) (mg/kg)		168	232	151	224	172
	Cobalt (Co) (mg/kg)		31.6	47.1	176	44.2	187
	Copper (Cu) (mg/kg)		3600	3980	15900	6000	1870
	Iron (Fe) (mg/kg)		82000	76400	84400	69300	83800
	Lead (Pb) (mg/kg)		319	384	6460	403	832
	Lithium (Li) (mg/kg)		18.3	21.1	134	19.5	20.2
	Magnesium (Mg) (mg/kg)		9560	10800	10200	11000	9240
	Manganese (Mn) (mg/kg)		1060	1060	1780	1240	801
	Mercury (Hg) (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)		179	282	120	89.5	200
	Nickel (Ni) (mg/kg)		115	163	133	134	100
	Phosphorus (P) (mg/kg)		12500	12600	13000	12700	11800
	Potassium (K) (mg/kg)		5830	6040	5060	5590	5330
	Selenium (Se) (mg/kg)		0.40	0.45	<1.0 <sup>DLA</sup>	0.44	0.34
	Silver (Ag) (mg/kg)		8.13	5.03	20.8	14.8	3.54
	Sodium (Na) (mg/kg)		14900	15700	14600	16100	14500
	Strontium (Sr) (mg/kg)		280	351	1110	397	292
	Sulfur (S) (mg/kg)		14600	17800	13900	14400	12600
	Thallium (Tl) (mg/kg)		0.075	0.084	<0.25 <sup>DLA</sup>	0.067	0.067
Tin (Sn) (mg/kg)		108	155	4840	441	107	
Titanium (Ti) (mg/kg)		755	848	471	671	551	
Tungsten (W) (mg/kg)		7.14	5.95	3.1	6.68	3.34	
Uranium (U) (mg/kg)		6.65	7.41	5.72	6.41	5.92	
Vanadium (V) (mg/kg)		77.0	77.1	58.9	65.5	60.3	
Zinc (Zn) (mg/kg)		3660	4410	20800	4420	6430	
Zirconium (Zr) (mg/kg)		1.4	1.5	<5.0 <sup>DLA</sup>	1.5	1.1	

\* 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	L2134647-6 soil 18-JUL-18 09:00 BA1829-A-6	L2134647-7 soil 18-JUL-18 09:00 BA1829-A-7	L2134647-8 soil 18-JUL-18 09:00 BA1829-A-8	L2134647-9 soil 18-JUL-18 09:00 BA1829-A-9	L2134647-10 soil 18-JUL-18 09:00 BA1829-A-10	
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	18.8	18.6	18.0	18.4	18.6
	pH (1:2 soil:water) (pH)	10.78	10.77	10.90	10.82	10.73
<b>Metals</b>	Aluminum (Al) (mg/kg)	31700	39900	35700	49300	31200
	Antimony (Sb) (mg/kg)	139	140	144	217	140
	Arsenic (As) (mg/kg)	40.7	46.0	44.8	34.2	38.2
	Barium (Ba) (mg/kg)	540	576	489	607	584
	Beryllium (Be) (mg/kg)	0.40	0.44	0.41	<0.50 <sup>DLA</sup>	0.37
	Bismuth (Bi) (mg/kg)	8.68	8.78	7.28	23.9	6.48
	Boron (B) (mg/kg)	278	335	324	358	291
	Cadmium (Cd) (mg/kg)	21.1	26.0	20.6	15.0	19.4
	Calcium (Ca) (mg/kg)	129000	136000	135000	117000	128000
	Chromium (Cr) (mg/kg)	138	178	237	181	202
	Cobalt (Co) (mg/kg)	67.3	44.9	28.9	56.8	38.7
	Copper (Cu) (mg/kg)	7090	2260	5600	15400	6790
	Iron (Fe) (mg/kg)	52200	63400	52000	60500	83100
	Lead (Pb) (mg/kg)	644	437	456	1140	330
	Lithium (Li) (mg/kg)	18.1	21.9	18.8	19	18.1
	Magnesium (Mg) (mg/kg)	10500	11100	11400	10000	12100
	Manganese (Mn) (mg/kg)	795	999	841	758	1020
	Mercury (Hg) (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)	179	182	193	168	134
	Nickel (Ni) (mg/kg)	158	161	141	292	231
	Phosphorus (P) (mg/kg)	12300	12600	11800	11800	10300
	Potassium (K) (mg/kg)	5570	5690	6550	5340	5540
	Selenium (Se) (mg/kg)	0.43	0.34	0.42	<1.0 <sup>DLA</sup>	0.39
	Silver (Ag) (mg/kg)	4.87	4.15	5.40	7.72	15.9
	Sodium (Na) (mg/kg)	15400	16500	17300	16000	15300
	Strontium (Sr) (mg/kg)	303	325	343	314	584
	Sulfur (S) (mg/kg)	13700	12900	17300	12700	12900
	Thallium (Tl) (mg/kg)	0.091	0.071	0.071	<0.25 <sup>DLA</sup>	0.063
	Tin (Sn) (mg/kg)	221	107	119	1810	115
	Titanium (Ti) (mg/kg)	573	533	665	1100	938
	Tungsten (W) (mg/kg)	4.51	4.87	4.61	4.4	3.71
	Uranium (U) (mg/kg)	6.48	6.62	6.79	5.63	6.03
	Vanadium (V) (mg/kg)	62.2	70.4	82.2	62.7	62.9
	Zinc (Zn) (mg/kg)	4240	3240	4060	5260	4100
	Zirconium (Zr) (mg/kg)	1.0	1.2	1.2	<5.0 <sup>DLA</sup>	1.1

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2134647-11	L2134647-12		
		Description	soil	soil		
		Sampled Date	18-JUL-18	18-JUL-18		
		Sampled Time	09:00	09:00		
		Client ID	BA1829-A-11	BA1829-A-12		
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	17.6	17.0			
	pH (1:2 soil:water) (pH)	10.84	10.72			
<b>Metals</b>	Aluminum (Al) (mg/kg)	30800	39800			
	Antimony (Sb) (mg/kg)	143	130			
	Arsenic (As) (mg/kg)	41.1	38.9			
	Barium (Ba) (mg/kg)	444	483			
	Beryllium (Be) (mg/kg)	0.37	0.37			
	Bismuth (Bi) (mg/kg)	6.52	7.92			
	Boron (B) (mg/kg)	242	246			
	Cadmium (Cd) (mg/kg)	13.7	25.8			
	Calcium (Ca) (mg/kg)	124000	120000			
	Chromium (Cr) (mg/kg)	179	179			
	Cobalt (Co) (mg/kg)	33.2	28.6			
	Copper (Cu) (mg/kg)	2660	6000			
	Iron (Fe) (mg/kg)	71100	84800			
	Lead (Pb) (mg/kg)	1070	610			
	Lithium (Li) (mg/kg)	18.2	18.1			
	Magnesium (Mg) (mg/kg)	10700	10100			
	Manganese (Mn) (mg/kg)	888	1180			
	Mercury (Hg) (mg/kg)	<0.050	<0.050			
	Molybdenum (Mo) (mg/kg)	239	161			
	Nickel (Ni) (mg/kg)	253	135			
	Phosphorus (P) (mg/kg)	10400	11300			
	Potassium (K) (mg/kg)	5820	5650			
	Selenium (Se) (mg/kg)	0.28	0.38			
	Silver (Ag) (mg/kg)	3.65	3.63			
	Sodium (Na) (mg/kg)	15200	14700			
	Strontium (Sr) (mg/kg)	991	320			
	Sulfur (S) (mg/kg)	14300	13300			
	Thallium (Tl) (mg/kg)	0.074	0.072			
	Tin (Sn) (mg/kg)	113	120			
	Titanium (Ti) (mg/kg)	619	660			
	Tungsten (W) (mg/kg)	3.41	3.06			
	Uranium (U) (mg/kg)	6.15	6.20			
Vanadium (V) (mg/kg)	79.7	64.3				
Zinc (Zn) (mg/kg)	4030	5530				
Zirconium (Zr) (mg/kg)	1.3	1.6				

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2134647-1	L2134647-2	L2134647-3	L2134647-4	L2134647-5
		Description	soil	soil	soil	soil	soil
		Sampled Date	18-JUL-18	18-JUL-18	18-JUL-18	18-JUL-18	18-JUL-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1829-A-1	BA1829-A-2	BA1829-A-3	BA1829-A-4	BA1829-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.29	11.39	11.22	11.28	11.29
	2nd Preliminary pH (pH)		9.07	9.24	8.86	8.85	8.97
	Final pH (pH)		6.09	6.24	6.10	5.96	6.03
	Extraction Solution Initial pH (pH)		2.92	2.92	2.92	2.92	2.92
	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)		3.42	3.14	3.17	3.22	3.17
	Cadmium (Cd)-Leachable (mg/L)		0.184	0.203	0.167	0.171	0.189
	Calcium (Ca)-Leachable (mg/L)		1940	1910	1870	1850	1900
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.340	0.311	0.469	0.325	1.12
	Copper (Cu)-Leachable (mg/L)		1.39	0.678	1.05	1.38	1.56
	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	<0.25
	Magnesium (Mg)-Leachable (mg/L)		114	113	114	114	118
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.48	0.65	0.57	0.86	0.61
	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)		44.0	31.6	55.7	40.1	67.5

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2134647-6	L2134647-7	L2134647-8	L2134647-9	L2134647-10
		Description	soil	soil	soil	soil	soil
		Sampled Date	18-JUL-18	18-JUL-18	18-JUL-18	18-JUL-18	18-JUL-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1829-A-6	BA1829-A-7	BA1829-A-8	BA1829-A-9	BA1829-A-10
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.34	11.21	11.33	11.37	11.34
	2nd Preliminary pH (pH)		8.66	8.84	9.09	9.07	9.14
	Final pH (pH)		5.88	5.92	6.09	5.90	6.23
	Extraction Solution Initial pH (pH)		2.92	2.92	2.92	2.92	2.92
	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)		3.74	3.03	3.24	3.97	3.38
	Cadmium (Cd)-Leachable (mg/L)		0.209	0.214	0.194	0.159	0.183
	Calcium (Ca)-Leachable (mg/L)		2010	1930	1900	1790	1960
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.703	0.488	0.343	0.852	0.362
	Copper (Cu)-Leachable (mg/L)		1.94	1.45	1.27	0.357	1.18
	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	<0.25
	Magnesium (Mg)-Leachable (mg/L)		121	115	115	104	118
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.64	0.71	0.49	0.71	0.54
	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)		63.1	72.2	34.7	48.7	59.1

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2134647-11	L2134647-12		
		Description	soil	soil		
		Sampled Date	18-JUL-18	18-JUL-18		
		Sampled Time	09:00	09:00		
		Client ID	BA1829-A-11	BA1829-A-12		
Grouping	Analyte					
<b>SOIL</b>						
<b>TCLP Metals</b>	1st Preliminary pH (pH)	11.42	11.32			
	2nd Preliminary pH (pH)	9.21	9.03			
	Final pH (pH)	6.16	6.02			
	Extraction Solution Initial pH (pH)	2.92	2.92			
	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)	3.13	3.28			
	Cadmium (Cd)-Leachable (mg/L)	0.169	0.170			
	Calcium (Ca)-Leachable (mg/L)	1880	1900			
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25			
	Cobalt (Co)-Leachable (mg/L)	0.507	0.668			
	Copper (Cu)-Leachable (mg/L)	1.26	1.17			
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0			
	Lead (Pb)-Leachable (mg/L)	0.36	0.30			
	Magnesium (Mg)-Leachable (mg/L)	119	115			
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Leachable (mg/L)	0.48	0.73			
	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)	40.5	34.3			

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



## Reference Information

## QC Samples with Qualifiers &amp; Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Bismuth (Bi)	DUP-H	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cadmium (Cd)	DUP-H	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Molybdenum (Mo)	DUP-H	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tungsten (W)	DUP-H	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2134647-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9

## Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
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>AG-200.2-A-CCMS-VA</b>	Soil	Elevated Ag in Soil by CRC ICPMS	EPA 200.2/6020A
This method uses a heated strong acid digestion with HNO <sub>3</sub> and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Analysis is by Collision/Reaction Cell ICPMS.			
<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)
This method uses a heated strong acid digestion with HNO <sub>3</sub> and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.			
<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	CWS for PHC in Soil - Tier 1
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six 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.*



L2134647-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</b> (Rush for routine analysis subject to availability)		
Company:	Covanta Energy	<input type="checkbox"/> Standard	<input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)		
Contact:	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 checked="" type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
Phone:	604-521-1025	Email 2:	rjohnson4@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Fax:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Email 3:	dskrypnik@covanta.com		<input checked="" 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> Same as Report? <input type="checkbox"/> Yes <input type="checkbox"/> No		<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-mm-yy)	Time (hh:mm)	Sample Type	MET-TCLP-YA (all metals, Hg)	MOISTURE	Chrome 6	MET-CSR-FULL-YA (all metals)	Number of Containers
BA1829-A-1		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-2		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-3		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-4		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-5		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-6		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-7		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-8		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-9		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-10		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-11		18-Jul-18	9:00	Soil	X	X		X	1
BA1829-A-12		18-Jul-18	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
<i>[Signature]</i>	24-Jul-18	08:00	SC	7/24/18	11:20 AM	24°C				

GENF 20.00 Front