

## Bottom Ash Data

2018 Week 44

---

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on November 14, 2018. The data represents bottom ash composite results for week 44 of 2018 (October 28, 2018 to November 3, 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.



Covanta Burnaby R.E., ULC  
ATTN: Steve McKinney  
5150 Riverbend Drive  
Burnaby BC V3N 4V3

Date Received: 06-NOV-18  
Report Date: 14-NOV-18 12:14 (MT)  
Version: FINAL

Client Phone: 604-521-1025

## Certificate of Analysis

Lab Work Order #: L2192711  
Project P.O. #: VANCO-0000047506  
Job Reference:  
C of C Numbers:  
Legal Site Desc:

---

Brent Mack, B.Sc.  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2192711-1	L2192711-2	L2192711-3	L2192711-4	L2192711-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	31-OCT-18	31-OCT-18	31-OCT-18	31-OCT-18	31-OCT-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1844-A-1	BA1844-A-2	BA1844-A-3	BA1844-A-4	BA1844-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>Physical Tests</b>	Moisture (%)		22.8	23.0	22.0	21.8	23.2
	pH (1:2 soil:water) (pH)		10.46	10.64	10.84	10.66	10.29
<b>Metals</b>	Aluminum (Al) (mg/kg)		47900	40100	36000	44800	35100
	Antimony (Sb) (mg/kg)		184	164	120	129	130
	Arsenic (As) (mg/kg)		31.3	33.5	27.8	30.4	32.3
	Barium (Ba) (mg/kg)		679	603	643	713	645
	Beryllium (Be) (mg/kg)		0.43	0.41	0.40	0.38	0.39
	Bismuth (Bi) (mg/kg)		13.7	8.27	8.01	7.25	9.73
	Boron (B) (mg/kg)		272	300	245	293	309
	Cadmium (Cd) (mg/kg)		8.92	10.8	10.9	10.9	10.2
	Calcium (Ca) (mg/kg)		130000	139000	131000	133000	136000
	Chromium (Cr) (mg/kg)		260	145	187	142	156
	Cobalt (Co) (mg/kg)		86.6	31.4	30.2	25.7	25.0
	Copper (Cu) (mg/kg)		9830	2300	1330	3860	3350
	Iron (Fe) (mg/kg)		49800	68300	54100	71400	79000
	Lead (Pb) (mg/kg)		3230	482	453	462	1030
	Lithium (Li) (mg/kg)		18.3	21.0	16.9	17.7	17.2
	Magnesium (Mg) (mg/kg)		12400	10500	11600	11500	10900
	Manganese (Mn) (mg/kg)		778	838	809	916	1040
	Mercury (Hg) (mg/kg)		<0.050	<0.050	<0.050	<0.050	<0.050
	Molybdenum (Mo) (mg/kg)		98.3	75.8	73.7	71.7	87.3
	Nickel (Ni) (mg/kg)		128	293	326	119	144
	Phosphorus (P) (mg/kg)		11100	11300	13000	12700	12000
	Potassium (K) (mg/kg)		5590	5270	5130	5390	5200
	Selenium (Se) (mg/kg)		0.60	0.46	0.43	0.41	0.38
	Silver (Ag) (mg/kg)		4.17	4.79	7.99	9.72	4.76
	Sodium (Na) (mg/kg)		16800	14500	14900	14900	14700
	Strontium (Sr) (mg/kg)		297	303	297	297	310
	Sulfur (S) (mg/kg)		11800	13200	12200	12800	12900
Thallium (Tl) (mg/kg)		0.076	0.072	0.070	0.072	0.071	
Tin (Sn) (mg/kg)		167	144	157	125	177	
Titanium (Ti) (mg/kg)		850	678	497	699	568	
Tungsten (W) (mg/kg)		3.63	5.96	4.72	5.89	4.14	
Uranium (U) (mg/kg)		4.57	5.17	6.02	5.30	5.28	
Vanadium (V) (mg/kg)		57.2	51.4	52.2	54.6	54.1	
Zinc (Zn) (mg/kg)		7800	7180	3790	5680	4000	
Zirconium (Zr) (mg/kg)		1.3	1.4	1.2	1.5	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		L2192711-6 Soil 31-OCT-18 09:00 BA1844-A-6	L2192711-7 Soil 31-OCT-18 09:00 BA1844-A-7	L2192711-8 Soil 31-OCT-18 09:00 BA1844-A-8	L2192711-9 Soil 31-OCT-18 09:00 BA1844-A-9	L2192711-10 Soil 31-OCT-18 09:00 BA1844-A-10
Grouping	Analyte					
<b>SOIL</b>						
<b>Physical Tests</b>	Moisture (%)	22.2	22.6	21.2	22.4	23.4
	pH (1:2 soil:water) (pH)	10.66	10.66	10.64	10.94	10.89
<b>Metals</b>	Aluminum (Al) (mg/kg)	39300	50900	35400	33800	32200
	Antimony (Sb) (mg/kg)	133	127	149	146	123
	Arsenic (As) (mg/kg)	33.3	30.1	34.8	32.8	33.4
	Barium (Ba) (mg/kg)	640	539	469	513	544
	Beryllium (Be) (mg/kg)	0.40	0.37	0.42	0.41	0.44
	Bismuth (Bi) (mg/kg)	7.65	14.0	9.68	8.77	7.97
	Boron (B) (mg/kg)	301	404	311	324	266
	Cadmium (Cd) (mg/kg)	12.4	11.4	14.3	12.7	29.8
	Calcium (Ca) (mg/kg)	135000	125000	145000	136000	122000
	Chromium (Cr) (mg/kg)	172	167	157	164	744
	Cobalt (Co) (mg/kg)	29.8	101	396	38.4	79.4
	Copper (Cu) (mg/kg)	2160	1500	3610	3180	2180
	Iron (Fe) (mg/kg)	60500	52100	54900	76200	106000
	Lead (Pb) (mg/kg)	783	701	553	767	572
	Lithium (Li) (mg/kg)	27.7	19.9	60.6	17.5	17.7
	Magnesium (Mg) (mg/kg)	12200	10400	11400	11000	10400
	Manganese (Mn) (mg/kg)	809	849	1210	806	973
	Mercury (Hg) (mg/kg)	<0.050	<0.050	0.054	<0.050	0.057
	Molybdenum (Mo) (mg/kg)	81.4	81.6	287	80.1	152
	Nickel (Ni) (mg/kg)	161	125	428	304	193
	Phosphorus (P) (mg/kg)	11600	12300	13400	11900	10900
	Potassium (K) (mg/kg)	5340	5090	5790	5330	4880
	Selenium (Se) (mg/kg)	0.44	0.47	0.70	0.46	0.51
	Silver (Ag) (mg/kg)	4.18	5.73	5.79	8.36	5.76
	Sodium (Na) (mg/kg)	16300	14200	15000	14700	14300
	Strontium (Sr) (mg/kg)	309	300	336	353	297
	Sulfur (S) (mg/kg)	14100	14300	16900	15000	13100
	Thallium (Tl) (mg/kg)	0.066	0.079	0.087	0.084	0.071
	Tin (Sn) (mg/kg)	179	132	149	189	151
	Titanium (Ti) (mg/kg)	733	788	578	574	618
	Tungsten (W) (mg/kg)	4.08	4.38	5.58	5.23	4.19
	Uranium (U) (mg/kg)	4.76	5.15	6.74	5.63	5.27
	Vanadium (V) (mg/kg)	51.4	52.9	55.2	50.6	52.9
	Zinc (Zn) (mg/kg)	6920	4230	5410	6270	4080
	Zirconium (Zr) (mg/kg)	1.3	3.2	1.5	1.6	1.4

\* 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	L2192711-11 Soil 31-OCT-18 09:00 BA1844-A-11	L2192711-12 Soil 31-OCT-18 09:00 BA1844-A-12		
Grouping	Analyte				
<b>SOIL</b>					
<b>Physical Tests</b>	Moisture (%)	22.8	22.0		
	pH (1:2 soil:water) (pH)	10.66	10.60		
<b>Metals</b>	Aluminum (Al) (mg/kg)	36700	43400		
	Antimony (Sb) (mg/kg)	128	132		
	Arsenic (As) (mg/kg)	27.9	27.2		
	Barium (Ba) (mg/kg)	552	628		
	Beryllium (Be) (mg/kg)	0.97	0.40		
	Bismuth (Bi) (mg/kg)	10.5	8.34		
	Boron (B) (mg/kg)	279	308		
	Cadmium (Cd) (mg/kg)	12.8	11.2		
	Calcium (Ca) (mg/kg)	129000	127000		
	Chromium (Cr) (mg/kg)	136	133		
	Cobalt (Co) (mg/kg)	31.4	30.5		
	Copper (Cu) (mg/kg)	3290	4220		
	Iron (Fe) (mg/kg)	68500	58300		
	Lead (Pb) (mg/kg)	479	771		
	Lithium (Li) (mg/kg)	20.3	16.2		
	Magnesium (Mg) (mg/kg)	9330	11900		
	Manganese (Mn) (mg/kg)	784	887		
	Mercury (Hg) (mg/kg)	<0.050	<0.050		
	Molybdenum (Mo) (mg/kg)	72.1	65.3		
	Nickel (Ni) (mg/kg)	90.0	110		
	Phosphorus (P) (mg/kg)	11600	12600		
	Potassium (K) (mg/kg)	5000	4960		
	Selenium (Se) (mg/kg)	0.37	0.35		
	Silver (Ag) (mg/kg)	4.99	6.06		
	Sodium (Na) (mg/kg)	14300	14300		
	Strontium (Sr) (mg/kg)	292	305		
	Sulfur (S) (mg/kg)	12800	12100		
	Thallium (Tl) (mg/kg)	0.069	0.111		
	Tin (Sn) (mg/kg)	153	263		
	Titanium (Ti) (mg/kg)	619	613		
	Tungsten (W) (mg/kg)	4.14	3.98		
	Uranium (U) (mg/kg)	5.49	5.55		
	Vanadium (V) (mg/kg)	56.9	51.5		
	Zinc (Zn) (mg/kg)	3910	18000		
	Zirconium (Zr) (mg/kg)	1.4	1.7		

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2192711-1	L2192711-2	L2192711-3	L2192711-4	L2192711-5
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	31-OCT-18	31-OCT-18	31-OCT-18	31-OCT-18	31-OCT-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1844-A-1	BA1844-A-2	BA1844-A-3	BA1844-A-4	BA1844-A-5
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.31	11.36	11.39	11.47	11.42
	2nd Preliminary pH (pH)		8.95	8.94	8.66	8.82	8.75
	Final pH (pH)		6.06	6.08	6.01	6.18	6.05
	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)		3.52	3.87	4.32	4.96	4.40
	Cadmium (Cd)-Leachable (mg/L)		0.148	0.160	0.159	0.165	0.184
	Calcium (Ca)-Leachable (mg/L)		1980	1970	1970	1970	1960
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.564	0.447	0.777	0.391	0.429
	Copper (Cu)-Leachable (mg/L)		1.15	0.821	0.857	0.986	0.764
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		0.48	0.33	0.75	0.26	<0.25
	Magnesium (Mg)-Leachable (mg/L)		116	116	118	118	117
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.43	0.57	0.46	0.47	0.41
	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)		60.4	87.0	56.1	61.7	72.6

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

## ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2192711-6	L2192711-7	L2192711-8	L2192711-9	L2192711-10
		Description	Soil	Soil	Soil	Soil	Soil
		Sampled Date	31-OCT-18	31-OCT-18	31-OCT-18	31-OCT-18	31-OCT-18
		Sampled Time	09:00	09:00	09:00	09:00	09:00
		Client ID	BA1844-A-6	BA1844-A-7	BA1844-A-8	BA1844-A-9	BA1844-A-10
Grouping	Analyte						
<b>SOIL</b>							
<b>TCLP Metals</b>	1st Preliminary pH (pH)		11.37	11.45	11.39	11.55	11.49
	2nd Preliminary pH (pH)		8.91	8.63	8.72	8.81	9.42
	Final pH (pH)		6.22	5.99	6.08	6.17	6.05
	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)		3.92	4.35	3.84	4.11	4.56
	Cadmium (Cd)-Leachable (mg/L)		0.151	0.158	0.170	0.132	0.149
	Calcium (Ca)-Leachable (mg/L)		2030	1940	2000	2020	1980
	Chromium (Cr)-Leachable (mg/L)		<0.25	<0.25	<0.25	<0.25	<0.25
	Cobalt (Co)-Leachable (mg/L)		0.470	0.969	0.350	0.388	0.430
	Copper (Cu)-Leachable (mg/L)		0.498	1.15	1.39	0.883	1.20
	Iron (Fe)-Leachable (mg/L)		<5.0	<5.0	<5.0	<5.0	<5.0
	Lead (Pb)-Leachable (mg/L)		<0.25	<0.25	1.94	0.28	0.28
	Magnesium (Mg)-Leachable (mg/L)		121	115	120	119	120
	Mercury (Hg)-Leachable (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Leachable (mg/L)		0.51	0.59	0.42	0.54	0.50
	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)		41.2	50.3	74.2	52.8	54.3

\* 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	L2192711-11 Soil 31-OCT-18 09:00 BA1844-A-11	L2192711-12 Soil 31-OCT-18 09:00 BA1844-A-12		
Grouping	Analyte				
<b>SOIL</b>					
<b>TCLP Metals</b>	1st Preliminary pH (pH)	11.46	11.51		
	2nd Preliminary pH (pH)	8.99	8.83		
	Final pH (pH)	5.88	5.87		
	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)	4.50	5.06		
	Cadmium (Cd)-Leachable (mg/L)	0.152	0.202		
	Calcium (Ca)-Leachable (mg/L)	1970	1960		
	Chromium (Cr)-Leachable (mg/L)	<0.25	<0.25		
	Cobalt (Co)-Leachable (mg/L)	0.659	0.435		
	Copper (Cu)-Leachable (mg/L)	1.12	1.00		
	Iron (Fe)-Leachable (mg/L)	<5.0	<5.0		
	Lead (Pb)-Leachable (mg/L)	<0.25	0.47		
	Magnesium (Mg)-Leachable (mg/L)	115	115		
	Mercury (Hg)-Leachable (mg/L)	<0.0010	<0.0010		
	Nickel (Ni)-Leachable (mg/L)	0.46	0.80		
	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)	59.8	46.6		

\* 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	Antimony (Sb)	DUP-H	L2192711-1, -2, -3, -4, -5, -6
Duplicate	Bismuth (Bi)	DUP-H	L2192711-10, -11, -12, -7, -8, -9
Duplicate	Cobalt (Co)	DUP-H	L2192711-10, -11, -12, -7, -8, -9
Duplicate	Copper (Cu)	DUP-H	L2192711-1, -2, -3, -4, -5, -6
Duplicate	Lithium (Li)	DUP-H	L2192711-10, -11, -12, -7, -8, -9
Duplicate	Nickel (Ni)	DUP-H	L2192711-1, -2, -3, -4, -5, -6
Duplicate	Nickel (Ni)	DUP-H	L2192711-10, -11, -12, -7, -8, -9
Duplicate	Tin (Sn)	DUP-H	L2192711-1, -2, -3, -4, -5, -6
Duplicate	Tungsten (W)	DUP-H	L2192711-10, -11, -12, -7, -8, -9
Matrix Spike	Calcium (Ca)-Leachable	MS-B	L2192711-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Leachable	MS-B	L2192711-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Leachable	MS-B	L2192711-1, -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>AG-200.2-A-CCMS-VA</b>	Soil	Elevated Ag in Soil by CRC ICPMS	EPA 200.2/6020A
		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.	
<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, 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	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:*

## Reference Information

---

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

---

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

---

### Chain of Custody Numbers:

---

#### 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.*



L2192711-COFC

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

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

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

<b>Invoice To</b> Same as Report?		<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:		ALS Contact:	Sampler:		
Lab Work Order # (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
BA1844-A-1		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-2		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-3		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-4		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-5		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-6		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-7		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-8		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-9		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-10		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-11		31-Oct-18	9:00	Soil	X	X		X	1
BA1844-A-12		31-Oct-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-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations:
<i>[Signature]</i>	6-NOV-18	07:00	HA	11/6	11:40am	19 °C				Yes / No ? If Yes add SIF