

Metro Vancouver - Waste-to-Energy Facility CONTINUOUS EMISSION MONITORING SYSTEM

March 2022

1. Monthly Summary Report

Parameter	Compliance Limit (mg/dscm)	Compliance Period	Maximum Measurement (mg/dscm)		
			Unit 1	Unit 2	Unit 3
CO	50	24 hr	36.5	35.2	39.0
SO ₂	200	24 hr	168.4	106.1	95.4
NOx	190	24 hr	133.9	164.4	135.8
THC	10	24 hr	0.26	0.21	0.46
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			0.43	0.67	0.63
CO			26.9	23.4	30.6
THC			0.05	0.06	0.14
SO ₂			72.1	66.7	70.6
NOx			130.5	131.7	134.0

Interim Discharge Limits will apply until and including the following dates, at which point the Discharge Limits and Response Limits will apply

a. HCl – March 3, 2025

b. SO₂ – March 3, 2025

2. Monthly Exceedance Report

2.a. Discharge Limit Exceedances

Unit	Compliance Parameter	Discharge Limit (mg/dscm)	Date	Exceedance Level
	Reason/Action Taken			

2.b. Response Limit Exceedances

Compliance Parameter: Carbon Monoxide

Response Limit: 100 mg/dscm 1/2 hour average

Unit No. 1

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
12-Mar 21:00	30 min	105.7	Unit shut down, started gas burners.
24-Mar 23:00	30 min	158.4	Feed chute hang up, adjusted airflow, modified feed rate.
25-Mar 08:00	30 min	107.6	Started gas burners, adjusted airflow, modified feed rate.
26-Mar 14:30	30 min	166.6	Started gas burners, adjusted airflow, modified feed rate.
27-Mar 09:30	30 min	123.3	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
27-Mar 16:00	30 min	128.4	Boiler start up, started gas burners, adjusted airflow, modified feed rate.
28-Mar 05:30	30 min	223.9	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.

Compliance Parameter: Carbon Monoxide
Response Limit: 100 mg/dscm 1/2 hour average
Unit No. 2

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
25-Mar 17:00	30 min	148.1	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.

Compliance Parameter: Carbon Monoxide
Response Limit: 100 mg/dscm 1/2 hour average
Unit No. 3

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
1-Mar 03:00	30 min	168.9	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
2-Mar 08:30	30 min	127.2	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
2-Mar 12:00	30 min	104.2	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
2-Mar 22:30	30 min	102.5	Adjusted airflow, modified feed rate.
3-Mar 10:00	30 min	102.6	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
4-Mar 14:00	30 min	103.8	Started gas burners, adjusted airflow.
4-Mar 15:00	30 min	124.4	Started gas burners, adjusted airflow.
7-Mar 19:00	30 min	240.0	Started gas burners, adjusted airflow, modified feed rate.
14-Mar 14:00	30 min	124.7	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
14-Mar 15:00	30 min	138.0	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
23-Mar 06:00	30 min	131.8	Adjusted airflow.
25-Mar 06:00	30 min	106.2	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.
26-Mar 13:00	30 min	115.1	Started gas burners, adjusted airflow.

2.c. Transient Conditions

Gas burners unavailable during shutdown and furnace temperature average below 800C

Unit	Duration	Date	Time
#1	8 minutes	24-Mar-22	13:02-13:10

Cause

Auxiliary burners on unit 1 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.

Unit 1 was placed in shutdown mode at 2022-03-24 13:00 due to high steam flow as a result of volatile fuel. The auxiliary burners tripped at 13:02, and were unavailable for a period of 8 minutes between 2022-03-24 13:02 and 2022-03-24 13:10.

Action Taken to Restore Steady State Conditions

The natural gas burners were back online at 2022-03-24 13:10. The shutdown was completed at 2022-03-24 13:55.

Remedial Action Planned and/or Taken

The boiler had a failed oxygen probe, which assists with steam flow control. The probe was repaired on 2022-03-25.

Gas burners unavailable during shutdown and furnace temperature average below 800C

Unit	Duration	Date	Time
#1	20 minutes	24-Mar-22	17:44-18:04

Cause

Auxiliary burners on unit 1 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.

Unit 1 was placed in shutdown mode at 2022-03-24 17:44 due to an induced draft fan trip. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 20 minutes between 2022-03-24 17:44 and 2022-03-24 18:04.

Action Taken to Restore Steady State Conditions

Covanta restarted the induced draft fan and forced draft fan at 2022-03-24 17:47. The natural gas burners were back online at 2022-03-24 18:04. The shutdown was completed at 2022-03-24 18:49.

Remedial Action Planned and/or Taken

The cause of the induced draft fan trip is being investigated.

Gas burners unavailable during shutdown and furnace temperature average below 800C

Unit	Duration	Date	Time
#1	1 hr 2 min	27-Mar-22	14:55-15:57

Cause

Auxiliary burners on unit 1 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.

Unit 1 was placed in shutdown mode at 2022-03-27 14:55 due to an induced draft fan trip. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 1 hr 2 minutes between 2022-03-27 14:55 and 2022-03-27 15:57.

Action Taken to Restore Steady State Conditions

Covanta restarted the induced draft fan at 2022-03-27 15:47 and the forced draft fan at 15:48. Once the fans were operational, the waste burned freely and the gas burners were not required to bring the boiler back up to temperature. The shutdown was completed at 2022-03-27 15:57.

Remedial Action Planned and/or Taken

The cause of the induced draft fan trip is being investigated.

Gas burners unavailable during shutdown and furnace temperature average below 800C

Unit	Duration	Date	Time
#1	20 minutes	27-Mar-22	23:10-23:30

Cause

Auxiliary burners on unit 1 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.

Unit 1 was placed in shutdown mode at 2022-03-27 23:10 due to an induced draft fan trip. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 20 minutes between 2022-03-27 23:10 and 2022-03-27 23:30.

Action Taken to Restore Steady State Conditions

Covanta restarted the induced draft fan at 2022-03-27 23:14 and the forced draft fan at 23:15. The natural gas burners were back online at 2022-03-27 23:30. The shutdown was completed at 2022-03-27 23:39.

Remedial Action Planned and/or Taken

The cause of the induced draft fan trip is being investigated.

Gas burners unavailable during shutdown and furnace temperature average below 800C

Unit	Duration	Date	Time
#1	16 minutes	28-Mar-22	02:31-02:47

Cause

Auxiliary burners on unit 1 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.

Unit 1 was placed in shutdown mode at 2022-03-28 02:31 due to an induced draft fan trip. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 16 minutes between 2022-03-28 02:31 and 2022-03-28 02:47.

Action Taken to Restore Steady State Conditions

Covanta restarted the induced draft fan at 2022-03-28 02:34 and the forced draft fan at 02:35. The natural gas burners were back online at 2022-03-28 02:47. The shutdown was completed at 2022-03-28 02:49.

Remedial Action Planned and/or Taken

The cause of the induced draft fan trip is being investigated.

3. CEMS Availability

Analyzer	Required Availability (% hours per quarter)	Averaging Period	Monthly Availability		
			Unit 1	Unit 2	Unit 3
Opacity	90	Hour	100	100	100
Oxygen	90	Hour	99	99	100
CO	90	Hour	99	99	100
SO ₂	90	Hour	99	99	100
NOx	90	Hour	99	99	100
THC	90	Hour	99	99	100
Stack Flow	90	Hour	99	99	100

Note: The availability for the Unit #3 stack flow meter was 88.9% for Q1 2021. This has been reported to the Ministry of Environment and Climate Change Strategy. The meter failed and Covanta experienced delays in sourcing a replacement. A spare unit has been procured to ensure a timely repair in the future.

4. Shutdown Report

Unit 1

Duration in Hours	Reason	Date
77.57	Annual minor maintenance outage	March 21-24
0.92	Poor refuse quality	March 24
1.08	Induced draft fan trip	March 24
0.33	Induced draft fan trip	March 25
0.45	Induced draft fan trip	March 26
1.03	Induced draft fan trip	March 27
0.48	Induced draft fan trip	March 27
0.30	Induced draft fan trip	March 28
23.63	Primary economizer tube leak	March 29-30

Unit 2

Duration in Hours	Reason	Date

Unit 3

Duration in Hours	Reason	Date
1.00	Ash discharger plug	March 28

5. Facility Bypass and Emergency/spill Event Report

Date/Time	Cause	Duration
	Action Taken	

6. Other Data

		UNIT 1	UNIT 2	UNIT 3
Waste Received	tonnes/day	21,994		
Waste Processed	tonnes/day	215	239	248
Maximum Waste Processed	tonnes/day	260	250	258
		Units 1, 2, and 3		
Natural Gas Consumed	m ³ /day	3,617		
	m ³ /month	112,123		
Fly ash disposed	tonnes	1,004		
Bottom ash disposed	tonnes	3,523		

7. Complaints and Responses

Date/Time	Complaint	Action Taken

March 2022 - Monthly CEMS Data

Date	Boiler #1								Boiler #2								Boiler #3							
	Stack Temp	O ₂ (%)	SO ₂ (mg/m ³)	NO _x (mg/m ³)	CO (mg/m ³)	THC (mg/m ³)	Opacity (%)	Furnace Temp	Stack Temp	O ₂ (%)	SO ₂ (mg/m ³)	NO _x (mg/m ³)	CO (mg/m ³)	THC (mg/m ³)	Opacity (%)	Furnace Temp	Stack Temp	O ₂ (%)	SO ₂ (mg/m ³)	NO _x (mg/m ³)	CO (mg/m ³)	THC (mg/m ³)	Opacity (%)	Furnace Temp
3/1/22	158	9.4	64.5	129.5	23.4	0.00	0.60	940	143	10.1	96.6	131	32.4	0.00	0.78	919	156	8.6	75.7	131.4	34.2	0.15	0.40	936
3/2/22	156	9.3	64.3	130.9	22.1	0.00	0.62	945	144	10	78	131.6	35.2	0.04	0.68	906	155	9	84	135	39	0.15	0.47	913
3/3/22	155	9.4	52.1	128.5	24.5	0.00	0.59	952	143	10.1	72.7	131.9	25.7	0.09	1.19	913	155	8.9	68.1	134	37	0.16	0.47	918
3/4/22	155	9.3	50.8	130.1	25.5	0.00	0.61	962	143	10.3	60.5	134.4	23.9	0.05	0.42	902	151	8.6	62.4	134.3	36	0.13	0.47	922
3/5/22	155	9.2	59.3	128.9	21	0.00	0.64	958	143	10.4	72.7	129.6	27.7	0.08	0.57	904	153	8.8	69.8	132.6	30.3	0.12	0.52	926
3/6/22	157	9.4	68.1	130.1	18.2	0.00	0.75	956	141	10.1	74.5	129.3	21.9	0.03	1.07	913	152	8.3	74.3	131.5	25.9	0.13	0.55	927
3/7/22	156	9.5	56.8	129.1	30.6	0.00	0.88	940	142	10	74.5	130.7	22.9	0.02	0.11	911	155	8.8	72	132.5	33.2	0.10	0.55	920
3/8/22	156	9.6	74.7	130.7	27.9	0.00	1.11	959	142	10	106.1	131.4	19	0.04	0.38	932	154	8.8	80.7	133.7	28.9	0.09	0.54	915
3/9/22	157	9.3	62	130.8	28.7	0.04	0.83	967	142	10.3	71	135.6	15.7	0.06	0.28	916	155	9.1	73.7	135.4	33.3	0.13	0.67	917
3/10/22	157	9.6	58.8	129.8	33.7	0.02	0.84	952	143	10.3	68.7	132.5	22.1	0.21	1.00	918	155	9	73.8	134	34.7	0.19	0.72	925
3/11/22	157	9.5	60.3	131.5	24	0.00	0.99	951	144	10.1	89.8	130.6	18	0.05	0.94	934	154	9	79.4	133.5	30.1	0.09	0.72	924
3/12/22	155	9.5	67.5	131.7	18	0.01	0.05	967	143	10.1	95.4	131.5	17.5	0.04	0.80	938	153	8.9	89.1	133.4	27.4	0.12	0.63	938
3/13/22	157	9.7	78.7	130.4	19.9	0.00	0.04	958	144	10	105.3	132.1	17.8	0.06	0.79	936	153	8.7	95.4	134.1	27.3	0.10	0.61	938
3/14/22	156	9.6	48.1	130.9	30.2	0.00	0.04	950	142	10.2	67.4	164.4	29.1	0.07	0.37	922	151	8.6	58.5	132.9	33	0.08	0.63	945
3/15/22	156	9.3	47	132.4	24.8	0.01	0.01	944	142	10.4	61.2	132.3	30.2	0.04	0.74	902	151	8.5	45.3	134.1	29.3	0.06	0.57	935
3/16/22	156	9.1	33.4	130.6	34.7	0.00	0.08	948	144	10.5	40.7	134.5	26.2	0.08	0.84	891	152	8.6	42	132.9	32.6	0.12	0.63	927
3/17/22	157	9.1	45.8	129.7	31.1	0.00	0.08	942	143	10.2	54.3	131.8	22.9	0.10	0.69	902	154	8.5	53.3	135.8	28.4	0.11	0.58	929
3/18/22	156	9.6	47.4	130	36.5	0.01	0.04	934	143	10	46.5	128.3	23.5	0.08	0.85	914	155	8.5	59.7	135.7	28.6	0.11	0.58	932
3/19/22	158	9.6	58	129.9	31.7	0.00	0.05	941	143	10.5	39.7	128.8	20.6	0.05	0.30	911	154	8.5	67.1	134	27.6	0.07	0.62	933
3/20/22	159	9.8	66.5	133.1	20.9	0.00	0.18	952	142	10.2	74.6	128.7	22.6	0.06	0.88	916	154	8.7	74	134.2	24.2	0.12	0.65	948
3/21/22									143	10.1	63.7	128.9	18.9	0.03	0.92	908	156	8.6	85.9	134.7	28.1	0.14	0.69	930
3/22/22									144	10.2	76	129	20.3	0.06	0.80	912	155	8.9	90.3	135.4	27.3	0.15	0.68	935
3/23/22									144	10.4	66.1	130.2	27	0.06	0.53	899	155	8.8	77.2	133.9	33.8	0.13	0.67	935
3/24/22									144	10.5	61.3	129.4	25.3	0.08	0.56	893	156	8.9	76.3	134.2	31.2	0.16	0.73	917
3/25/22	151	9.7	117.1	131.8	27.8	0.24	0.00	898	142	10.3	48.7	128.5	24.8	0.05	0.81	915	155	8.8	74.8	134.3	32.9	0.11	0.81	931
3/26/22	153	9.7	168.4	133.9	22.5	0.19	0.25	930	142	10.5	53.2	127	24.6	0.04	0.74	913	155	9.1	68.7	134.6	25.9	0.16	0.77	935
3/27/22	153	10.2	140.7	128.7	35.5	0.23	0.72	916	145	10.1	74.6	129.9	23.2	0.08	0.64	922	156	9.4	75.9	133.4	28.7	0.27	0.69	918
3/28/22	150	9.4	93.6	127	35.9	0.26	0.78	917	145	9.8	41.5	129.5	25.6	0.06	1.31	912	155	9.1	50.4	134.8	29.8	0.13	0.66	908
3/29/22									142	10.1	36.4	130.3	22.2	0.03	0.41	909	154	8.8	65.8	133.8	28.7	0.08	0.69	933
3/30/22									142	10	41.7	130.3	19.2	0.03	0.23	926	153	10.9	55	134.5	29.4	0.46	0.71	943
3/31/22	154	9.8	118.6	132	23.7	0.13	0.00	944	142	10.1	53.3	128.7	20.7	0.04	0.21	921	155	11.6	69.9	135.1	31.4	0.28	0.74	944
Average	156	9.5	72.1	130.5	26.9	0.05	0.43	945	142.9	10.2	66.7	131.7	23.4	0.06	0.67	913.9	154.1	8.9	70.6	134.0	30.6	0.14	0.63	928.9
Min	150	9.1	33.4	127.0	18.0	0.00	0.00	898	141.0	9.8	36.4	127.0	15.7	0.00	0.11	891.0	151.0	8.3	42.0	131.4	24.2	0.06	0.40	908.0
Max	159	10.2	168.4	133.9	36.5	0.26	1.11	967	145.0	10.5	106.1	164.4	35.2	0.21	1.31	938.0	156.0	11.6	95.4	135.8	39.0	0.46	0.81	948.0
St Dev	2.1	0.25	32.11	1.53	5.72	0.09	0.38	16.3	1.00	0.18	18.96	6.37	4.47	0.04	0.30	11.60	1.49	0.66	12.81	1.08	3.49	0.08	0.10	10.08

Blank days have less than 18 hours of valid data due to unit shut downs or analyzer outage.
 According to standard guidelines used by Metro Vancouver Air Quality Policy and Environment Division, a minimum of 18 hours of valid data is required to generate a valid 24hr average.