

Monthly Operating Reports

December 2021

The following December 2021 operating report was sent to the Ministry of Environment and Climate Change Strategy on February 11, 2022.

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

December 2021

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	39.9	37.3	36.3
SO ₂	200	24 hr	150.8	102.0	100.6
NOx	190	24 hr	131.1	133.9	133.9
THC	10	24 hr	1.53	0.29	0.81
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			1.01	0.57	0.33
CO			27.9	24.9	29.5
THC			0.10	0.10	0.41
SO ₂			84.4	58.2	68.1
NOx			128.1	128.0	130.4

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: Opacity

Response Limit: 5% 1/2 hour average

Unit No. 1

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
19-Dec 05:00	30 min	14.2	Broken fabric filter bag, shut down and inspected compartment(s)

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

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
1-Dec 08:30	30 min	159.1	Started gas burners, adjusted airflow, modified feed rate.
2-Dec 00:30	30 min	133.9	Started gas burners, adjusted airflow, modified feed rate.
6-Dec 04:30	30 min	112.5	Started gas burners, adjusted airflow, modified feed rate.
6-Dec 08:30	30 min	103.8	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
7-Dec 04:00	30 min	241.6	Started gas burners, adjusted airflow, modified feed rate.
8-Dec 11:00	30 min	182.1	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
11-Dec 21:00	30 min	145.6	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
13-Dec 04:00	30 min	112.1	Started gas burners, adjusted airflow, modified feed rate.
13-Dec 14:30	30 min	106.4	Started gas burners, adjusted airflow, modified feed rate.
13-Dec 18:30	30 min	144.7	Started gas burners, adjusted airflow, modified feed rate.
13-Dec 19:00	30 min	159.9	Started gas burners, adjusted airflow, modified feed rate.
13-Dec 19:30	30 min	104.0	Started gas burners, adjusted airflow, modified feed rate.
21-Dec 05:30	30 min	108.5	Started gas burners, adjusted airflow, modified feed rate.
22-Dec 14:30	30 min	173.3	Started gas burners, adjusted airflow, modified feed rate.
24-Dec 04:00	30 min	110.2	Started gas burners, adjusted airflow, modified feed rate.
30-Dec 10:00	30 min	146.3	Started gas burners, adjusted airflow, modified feed rate.

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

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
1-Dec 10:00	30 min	110.2	Started gas burners, adjusted airflow, modified feed rate.
5-Dec 13:30	30 min	103.9	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
6-Dec 13:30	30 min	103.9	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
7-Dec 08:30	30 min	238.6	Started gas burners, adjusted airflow, modified feed rate.
9-Dec 12:00	30 min	201.9	Started gas burners, adjusted airflow, modified feed rate.
11-Dec 09:30	30 min	122.3	Started gas burners, adjusted airflow, modified feed rate.
12-Dec 09:00	30 min	155.4	No action required.
12-Dec 17:00	30 min	166.1	Started gas burners, adjusted airflow, modified feed rate.
14-Dec 04:30	30 min	105.7	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
19-Dec 09:00	30 min	195.5	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
26-Dec 08:00	30 min	107.7	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-Dec 04:00	30 min	128.6	Started gas burners, adjusted airflow, modified feed rate.
2-Dec 15:00	30 min	178.7	Started gas burners, adjusted airflow, modified feed rate.
5-Dec 18:00	30 min	108.3	Started gas burners, adjusted airflow, modified feed rate.
7-Dec 08:30	30 min	107.1	Started gas burners, adjusted airflow, modified feed rate,.
7-Dec 17:30	30 min	123.5	Started gas burners, adjusted airflow, modified feed rate,.
8-Dec 11:00	30 min	124.4	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
12-Dec 08:00	30 min	136.4	Started gas burners, adjusted airflow, modified feed rate.
19-Dec 01:30	30 min	107.5	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
22-Dec 12:00	30 min	125.2	Started gas burners, adjusted airflow, modified feed rate.
26-Dec 13:00	30 min	117.9	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.

2.c. Transient Conditions

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

Unit	Duration	Date	Time	
#1	14 minutes	6-Dec-21	14:12-14:26	
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 on 2021-12-06 at 14:12 due to a feed chute hang up. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge before starting the natural gas burners if the boiler temperature falls below 800C. The auxiliary burners were unavailable for a period of 14 minutes between 2021-12-06 14:12 and 14:26.				
Action Taken to Restore Steady State Conditions				
The boiler purge was started at 2021-12-06 14:15. Natural gas burners were online at 2021-12-06 14:26. The shutdown was complete at 2021-12-06 15:05.				
Remedial Action Planned and/or Taken				
Reminder to refuse crane operators to mix the refuse well.				

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

Unit	Duration	Date	Time	
#3	30 minutes	15-Dec-21	14:32-15:02	
Cause				
Auxiliary burners on unit 3 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 3 was placed in shutdown mode on 2021-12-15 at 14:32 due to a primary economizer tube leak. The refuse on the grate was extinguished within 30 minutes due to the lack of oxygen.				
Action Taken to Restore Steady State Conditions				
The boiler was secured, locked out, and the primary economizer tube leak was repaired. The boiler was toggled online on 2021-12-17 at 22:54.				
Remedial Action Planned and/or Taken				
The primary economizer tube leak was repaired.				

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	98	99	99
CO	90	Hour	98	99	99
SO ₂	90	Hour	98	99	99
NOx	90	Hour	98	99	99
THC	90	Hour	98	99	98
Stack Flow	90	Hour	98	99	99

4. Shutdown Report**Unit 1**

Duration in Hours	Reason	Date
15.40	Generating bank inlet plugged, water washed	December 3
0.88	Feed chute plugged	December 6
0.62	Forced draft fan trip	December 12
0.47	Fabric filter bag inspection, 4 bags changed	December 18
13.92	Fabric filter bag inspection, 62 bags changed	December 21
0.25	High furnace pressure trip	December 28

Unit 2

Duration in Hours	Reason	Date
21.26	Generating bank inlet plugged, water washed	December 2-3
0.42	Ash discharger plug	December 4
9.03	Baghouse compartment bridged	December 29
6.75	Baghouse compartment bridged	December 30

Unit 3

Duration in Hours	Reason	Date
0.30	Forced draft fan trip	December 1
20.13	Generating bank inlet plugged, water washed	December 1-2
0.43	Forced draft fan trip	December 2
18.75	Generating bank inlet plugged, water washed	December 14
56.35	Primary Economizer tube leak	December 15-17
0.63	High furnace pressure trip	December 19
0.30	BC Hydro power interruption	December 29

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	23,105		
Waste Processed	tonnes/day	244	230	225
Maximum Waste Processed	tonnes/day	276	262	280
		Units 1, 2, and 3		
Natural Gas Consumed	m ³ /day	10,982		
	m ³ /month	340,433		
Fly ash disposed	tonnes	920		
Bottom ash disposed	tonnes	3,218		

7. Complaints and Responses

Date/Time	Complaint	Action Taken

December 2021 - 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
12/1/21	154	8.8	76	129.6	24.5	0.01	1.36	918	147	10.5	27	124	19.6	0.08	0.14	870								
12/2/21	156	9.8	103.9	131.1	30.2	0.02	0.48	888									158						0.21	885
12/3/21									151	10.1	85.9	125.8	14.4	0.11	1.18	891	154	9.7	53	127.1	25.6	0.43	0.26	898
12/4/21	155	8.9	138.9	128.9	23.2	0.00	0.69	929	155	9.6	99.5	130.2	20.3	0.15	0.94	883	156	9.6	77.9	129.2	26.3	0.49	0.31	895
12/5/21	156	9.3	150.8	129.5	24.8	0.01	0.71	926	155	9.3	102	125.9	24.6	0.09	1.32	890	155	9.6	83.3	128.6	26.5	0.41	0.31	908
12/6/21	155	9.9	127.5	130.3	39.9	0.17	0.81	889	156	10	80.9	128.6	27	0.18	1.18	883	157	9.5	66.6	128.5	27.3	0.75	0.32	899
12/7/21	155	9.2	131.7	128.3	37.6	0.03	0.79	918	153	9	94.9	133.9	28.1	0.12	1.18	893	154	9.2	81.4	129.6	36.3	0.44	0.29	905
12/8/21	156	9.4	99.6	130.6	24	0.00	0.74	912	153	9.3	69	130.2	26.1	0.08	0.55	892	153	9.1	44.9	129.3	34.2	0.27	0.26	910
12/9/21	157	9.2	96.2	128.8	25.9	0.00	0.78	927	153	9.2	53.3	131.7	26.4	0.17	1.47	901	152	9	64.9	130.8	28.8	0.31	0.26	916
12/10/21	155	8.8	98.1	128.1	25.9	0.00	0.80	929	154	9.1	69.1	129.5	22	0.14	0.95	898	152	8.7	69.7	128.6	26.8	0.18	0.29	917
12/11/21	156	9.1	93.5	128.6	30.3	0.03	0.76	918	155	9.3	63.8	133.3	28.8	0.10	0.01	900	154	8.7	66.9	133.9	28.3	0.30	0.23	907
12/12/21	156	9.3	110.5	128.4	35.8	0.07	0.86	893	155	9.3	80.1	128.3	25.6	0.09	0.02	887	153	9	73.3	131.6	27.5	0.36	0.25	888
12/13/21	154	9.3	88.8	127.5	37.8	1.53	1.53	910	154	9.6	57.2	126.8	23.6	0.29	0.04	876	154	9	62	129.6	28.7	0.42	0.28	894
12/14/21	156	9	92.3	124.9	30.2	0.00	2.51	925	156	9.7	81.8	129.2	26.9	0.06	0.01	876								
12/15/21	155	9	92.1	126.4	31	0.02	1.58	919	154	9.3	76.2	124.5	25	0.11	0.07	888								
12/16/21	155	9.2	72	129.2	29.1	0.01	0.89	912	152	8.9	51.5	125	22.7	0.04	0.22	896								
12/17/21	155	9.5	65.1	126.6	23.6	0.01	2.13	920	153	9.1	40.5	126.6	28.1	0.04	0.08	901								
12/18/21	150	9.3	64.4	123.8	25	0.00	2.53	911	154	9.5	42.1	128.1	23.2	0.06	0.08	877	153	9	100.6	131.5	30.9	0.80	0.33	904
12/19/21	150	9.6	73.7	127.4	27	0.03	2.36	908	153	9.9	56.1	130.3	24.3	0.03	0.46	877	155	9.7	97.5	131.3	34.6	0.81	0.33	893
12/20/21	150	9.4	64.7	122.6	19.9	0.00	2.36	910	152	9.3	46.3	124.5	25	0.06	0.41	895	154	9	62.1	130	28.1	0.60	0.37	910
12/21/21									153	9.6	43.6	129.6	25.1	0.10	0.28	876	154	8.8	74.7	131.3	28.9	0.43	0.40	914
12/22/21	153	9.3	69.3	129.8	28.7	0.12	0.32	928	151	8.8	25.8	130.7	29.7	0.03	0.31	902	153	8.5	66.4	132.5	29.5	0.44	0.28	913
12/23/21	154	9.3	86	128.7	26.3	0.11	0.23	915	152	8.8	63.9	129.4	24.6	0.11	0.11	893	153	8.5	81.4	130.7	29	0.36	0.28	901
12/24/21	152	9.8	49.4	128.5	27.9	0.41	0.28	894	151	9.4	34.2	126.6	25.8	0.08	0.40	879	155	8.6	62.5	131.6	33.4	0.36	0.32	895
12/25/21	154	10.6	96.4	129.8	28.6	0.06	0.36	887	150	9.8	74	127	15.9	0.07	0.39	870	156	8.8	95	131.3	27.8	0.47	0.38	887
12/26/21	153	9.4	69.2	129.3	28.6	0.09	0.47	906	154	9.6	39.5	127.3	24.4	0.07	1.06	884	157	8.7	77.1	130.2	33.2	0.31	0.46	895
12/27/21	152	9.5	56.4	127.7	24.1	0.00	0.58	924	151	9.3	28.5	125.9	26.5	0.07	1.27	897	154	8.7	52.7	129.7	34	0.20	0.48	905
12/28/21	153	9.5	51	130.5	24.4	0.00	0.64	932	149	9.1	21.1	127.4	25.1	0.06	1.68	910	154	9	48.6	131	32.3	0.27	0.47	914
12/29/21	153	9.5	48.3	127.5	24	0.00	0.61	941									151	8.7	47.9	131	26	0.25	0.41	934
12/30/21	153	9.3	46.7	126.3	24.5	0.01	0.57	952									153	8.5	49.1	130.4	24.7	0.25	0.36	926
12/31/21	154	9.5	36.5	127.3	25.7	0.03	0.55	941	151	9.7	20.8	125	37.3	0.28	0.15	916	153	8.6	42.5	131.1	27.6	0.28	0.37	929
Average	154	9.4	84.4	128.1	27.9	0.10	1.01	917	152.8	9.4	58.2	128.0	24.9	0.10	0.57	889.3	154.1	9.0	68.1	130.4	29.5	0.41	0.33	905.5
Min	150	8.8	36.5	122.6	19.9	0.00	0.23	887	147.0	8.8	20.8	124.0	14.4	0.03	0.01	870.0	151.0	8.5	42.5	127.1	24.7	0.18	0.21	885.0
Max	157	10.6	150.8	131.1	39.9	1.53	2.53	952	156.0	10.5	102.0	133.9	37.3	0.29	1.68	916.0	158.0	9.7	100.6	133.9	36.3	0.81	0.48	934.0
St Dev	1.9	0.36	29.01	1.98	4.81	0.29	0.71	16.2	2.12	0.40	24.17	2.63	4.25	0.06	0.53	11.77	1.66	0.39	16.34	1.45	3.23	0.17	0.07	12.79

Blank days have less than 18 hours of valid data due to unit shut downs or analyzer outage/maintenance.

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.