

## Monthly Operating Reports

August 2021

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The following August 2021 operating report was sent to the Ministry of Environment and Climate Change Strategy on October 6, 2021.

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

August 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	40.0	37.0	36.4
SO <sub>2</sub>	200	24 hr	91.8	104.7	91.2
NO <sub>x</sub>	190	24 hr	132.1	136.8	143.6
THC	10	24 hr	0.17	0.14	0.45
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			0.42	0.90	0.39
CO			24.0	25.1	26.3
THC			0.02	0.05	0.25
SO <sub>2</sub>			51.1	69.0	62.3
NO <sub>x</sub>			125.5	129.2	132.9

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. SO<sub>2</sub> – 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
4-Aug 09:00	30 min	121.0	Adjusted airflow, modified feed rate.
4-Aug 15:30	30 min	106.9	Started gas burners, adjusted airflow, modified feed rate.
5-Aug 15:30	30 min	169.5	Adjusted airflow, modified feed rate.
12-Aug 09:00	30 min	164.3	Started gas burners, adjusted airflow, modified feed rate.
13-Aug 15:00	30 min	126.1	Started gas burners, adjusted airflow.
17-Aug 16:30	30 min	119.8	Started gas burners, adjusted airflow, modified feed rate.
18-Aug 04:00	30 min	103.6	Started gas burners, adjusted airflow, modified feed rate.
18-Aug 09:30	30 min	131.6	Started gas burners, adjusted airflow, modified feed rate.
18-Aug 13:00	30 min	129.9	Started gas burners, adjusted airflow, modified feed rate.
20-Aug 01:30	30 min	107.0	Started gas burners, adjusted airflow, modified feed rate.
20-Aug 10:30	30 min	813.8	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
24-Aug 12:30	30 min	115.4	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
24-Aug 17:30	30 min	114.6	Started gas burners, adjusted airflow, modified feed rate.
24-Aug 18:00	30 min	115.9	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
4-Aug 08:30	30 min	193.2	Adjusted airflow, modified feed rate.
4-Aug 09:00	30 min	126.2	Adjusted airflow, modified feed rate.
4-Aug 13:30	30 min	115.0	Started gas burners, adjusted airflow, modified feed rate.
16-Aug 23:00	30 min	101.8	Started gas burners, adjusted airflow, modified feed rate.
20-Aug 08:30	30 min	116.9	Started gas burners, adjusted airflow, modified feed rate.
24-Aug 10:00	30 min	202.8	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
24-Aug 10:30	30 min	147.7	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
24-Aug 17:30	30 min	106.0	Started gas burners, adjusted airflow, modified feed rate.
28-Aug 08:30	30 min	119.1	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
4-Aug 11:30	30 min	241.8	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
5-Aug 06:00	30 min	125.6	Adjusted airflow.
24-Aug 18:00	30 min	517.0	Started gas burners, adjusted airflow, modified feed rate.
30-Aug 09:30	30 min	121.4	Adjusted airflow, modified feed rate.

## 2.c. Transient Conditions

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

Unit	Duration	Date	Time	
#1	48 minutes	Aug 12-13, 2021	23:26-00:14	
<b>Cause</b>				
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 2021-08-12 at 23:20 due to a turbine trip caused by a faulty condensate valve which impacted all three boilers. 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 48 minutes between 2021-08-12 23:26 and 2021-08-13 00:14.				
<b>Action Taken to Restore Steady State Conditions</b>				
The induced draft fan was restarted at 2021-08-12 23:55 and the forced draft fan at 2021-08-12 23:57. Natural gas burners were online at 2021-08-13 00:14. The shutdown was complete at 2021-08-13 00:17.				
<b>Remedial Action Planned and/or Taken</b>				
The communications issue was resolved and the condensate valve repaired.				

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

Unit	Duration	Date	Time	
#2	49 minutes	Aug 12-13, 2021	23:26-00:15	
<b>Cause</b>				
Auxiliary burners on unit 2 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 2 was placed in shutdown mode at 2021-08-12 at 23:26 due to a turbine trip caused by a faulty condensate valve which impacted all three boilers. 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 48 minutes between 2021-08-12 23:26 and 2021-08-13 00:15.				
<b>Action Taken to Restore Steady State Conditions</b>				
The induced draft fan was restarted at 2021-08-12 23:45 and the forced draft fan at 2021-08-12 23:47. Natural gas burners were online at 2021-08-13 00:15. The shutdown was complete at 2021-08-13 00:20.				
<b>Remedial Action Planned and/or Taken</b>				
The communications issue was resolved and the condensate valve repaired.				

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

Unit	Duration	Date	Time	
#3	37 minutes	Aug 12-13, 2021	23:26-00:03	
<b>Cause</b>				
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 at 2021-08-12 at 23:26 due to a turbine trip caused by a faulty condensate valve which impacted all three boilers. 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 48 minutes between 2021-08-12 23:26 and 2021-08-13 00:03.				
<b>Action Taken to Restore Steady State Conditions</b>				
The induced draft fan was restarted at 2021-08-12 23:47 and the forced draft fan at 2021-08-12 23:49. Natural gas burners were online at 2021-08-13 00:03. The shutdown was complete at 2021-08-13 00:20.				
<b>Remedial Action Planned and/or Taken</b>				
The communications issue was resolved and the condensate valve 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	98	98
CO	90	Hour	98	98	98
SO <sub>2</sub>	90	Hour	98	98	98
NOx	90	Hour	98	98	98
THC	90	Hour	98	98	98
Stack Flow	90	Hour	97	99	99

## 4. Shutdown Report

### Unit 1

Duration in Hours	Reason	Date
5.85	Fabric filter baghouse bridged	August 3
0.32	BC Hydro power interruption	August 7
0.43	Fabric filter baghouse visual inspection	August 8
0.82	Delta V communications issue	August 12
0.93	Delta V communications issue	Aug 12-13
23.14	Second pass hopper cleanout	Aug 14-15
0.95	Ash discharger plug	August 16
0.15	High furnace pressure	August 20

### Unit 2

Duration in Hours	Reason	Date
0.68	Ash discharger plug	August 7
0.37	BC Hydro power interruption	August 7
18.90	Secondary Economizer tube leak	Aug 7-8
0.97	Delta V communications issue	August 12
0.95	Delta V communications issue	Aug 12-13
3.57	Poor refuse quality	August 24
0.60	Ash discharger plug	August 25
0.32	Induced draft fan trip	August 30

### Unit 3

Duration in Hours	Reason	Date
2.18	Poor refuse quality	August 2
2.63	Ash discharger plug	August 2
0.87	Fabric filter baghouse inspection	August 6
0.33	BC Hydro power interruption	August 7
0.98	Delta V communications issue	August 12
0.80	Delta V communications issue	Aug 12-13
0.13	Fabric filter baghouse inspection	August 14

## 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	21,343		
Waste Processed	tonnes/day	227	227	238
Maximum Waste Processed	tonnes/day	242	242	246
		Units 1, 2, and 3		
Natural Gas Consumed	m <sup>3</sup> /day	1,846		
	m <sup>3</sup> /month	57,220		
Fly ash disposed	tonnes	964		
Bottom ash disposed	tonnes	3,426		

## 7. Complaints and Responses

Date/Time	Complaint	Action Taken

# ATTACHMENT 2

## August 2021 - Monthly CEMS Data

	Boiler #1								Boiler #2								Boiler #3							
	Stack	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	THC	Opacity	Furnace	Stack	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	THC	Opacity	Furnace	Stack	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	THC	Opacity	Furnace
Date	Temp	(%)	(mg/m³)	(mg/m³)	(mg/m³)	(mg/m³)	(%)	Temp	Temp	(%)	(mg/m³)	(mg/m³)	(mg/m³)	(mg/m³)	(%)	Temp	Temp	(%)	(mg/m³)	(mg/m³)	(mg/m³)	(mg/m³)	(%)	Temp
8/1/21	159	8.6	58.8	128.9	22.2	0.00	0.41	926	157	8.8	80.3	128.5	26.1	0.04	1.41	950	157	8.5	69.5	134.6	23.9	0.22	0.45	919
8/2/21	160	8.9	57.1	131	17.6	0.17	0.40	907	157	8.7	81.4	132.6	20.9	0.05	1.33	940	161	8.7	85.1	133.8	25.8	0.26	0.43	904
8/3/21	157	9	47.2	128.8	20.4	0.00	0.40	924	157	8.8	64.1	130.7	33.3	0.03	1.28	958	159	8.6	58.3	137.4	20.7	0.23	0.40	915
8/4/21	156	9	37.5	132.1	24.7	0.00	0.42	912	156	8.9	42.6	136.8	36.6	0.14	1.46	955	158	8.8	54	143.6	27.6	0.19	0.37	919
8/5/21	154	8.9	45.6	129.5	20	0.03	0.40	919	154	8.6	52.2	129.8	18	0.04	1.72	968	155	8.9	67.7	136.8	25.7	0.19	0.34	924
8/6/21	152	8.8	36	124.8	22.8	0.00	0.36	930	152	8.3	50.6	129	22	0.04	1.99	975	155	8.8	62.2	132.9	33.4	0.30	0.36	923
8/7/21	153	8.9	41.7	130	21.9	0.00	0.42	915									152	8.5	59.6	132.8	36.4	0.25	0.40	923
8/8/21	154	9	44.4	127	23.8	0.00	0.49	918	158	8.6	104.7	125.7	24.3	0.04	0.49	943	155	8.6	62.9	130.4	28.4	0.26	0.41	921
8/9/21	155	8.9	59.4	128.7	20.7	0.00	0.44	916	155						0.04	960	155	8.7	68.2	133.8	25.1	0.23	0.38	901
8/10/21	156	9.2	74.8	131.4	21.3	0.00	0.39	924	156	8.6	88.7	128.3	18.8	0.01	0.22	969	155						0.37	927
8/11/21	154						0.38	941	152	8	82.8	128.4	25.5	0.04	0.78	990	153	8.3	50.5	135.2	28.7	0.28	0.38	930
8/12/21	151	9.4	32	127.7	28.5	0.00	0.36	922	156	9.4	65.8	132.8	22	0.07	0.34	958	154	8.6	51.8	137.3	28.3	0.21	0.33	923
8/13/21	151	9.1	40	128.8	22.3	0.00	0.44	930	154	8.8	65.8	128.4	31.4	0.06	1.63	967	154	8.8	58.2	135.9	28.7	0.25	0.37	922
8/14/21									154	8.9	96	128.4	22.7	0.04	1.19	962	150	8.8	78.2	133.6	22.6	0.45	0.40	922
8/15/21	157	8.9	91.8	127.5	17.5	0.00	0.50	928	154	8.6	100.6	129.1	15.6	0.02	0.99	962	153	8.5	91.2	131.1	24.6	0.23	0.45	940
8/16/21	155	8.9	70	128.4	17.3	0.00	0.41	937	156	8.6	74.4	125.9	19.4	0.08	1.66	963	155	8.4	68.3	131.3	25.4	0.16	0.43	924
8/17/21	154	9	60.4	125.5	23.3	0.00	0.48	949	155	9.1	83.5	129.9	19	0.03	1.80	955	153	9.3	57.9	135.1	23.6	0.21	0.42	921
8/18/21	155	9.1	51.2	129.6	38.6	0.01	0.53	922	156	9	65.6	127	21.1	0.12	1.05	955	152	8.6	58.6	132.4	26.1	0.32	0.39	926
8/19/21	154	8.8	43.6	125.3	29.6	0.00	0.49	924	156	8.5	57.3	128.8	21.8	0.03	0.75	964	153	8.5	49.6	129	26.1	0.21	0.42	921
8/20/21	156	9.3	48.6	128.1	40	0.09	0.43	928	155	9.1	59.1	127.5	30	0.06	0.93	961	155	8.9	58.4	132.2	29.1	0.30	0.40	916
8/21/21	156	9.2	50.7	122.9	16.7	0.00	0.44	936	154	9.2	58.5	131.9	31.8	0.03	0.65	965	155	8.8	58.7	131.1	19.6	0.27	0.39	927
8/22/21	155	9	43.4	119.4	20.4	0.00	0.56	945	154	8.8	51.1	129.6	23.2	0.02	0.48	959	155	8.6	51.7	131	17.4	0.29	0.37	931
8/23/21	155	9.2	51	122.1	26.3	0.01	0.88	928	154	8.7	61	126.2	26.6	0.02	0.88	974	153	8.5	62	127.7	25.6	0.25	0.34	943
8/24/21	153	9.1	50.6	118.5	37.2	0.08	0.79	926	154	8.8	71	126.6	37	0.05	1.21	974	153	8.5	55.4	129.5	30.3	0.23	0.21	923
8/25/21	157	9.6	58.1	123.1	20.5	0.07	0.28	924	154	9.3	55.6	130.7	29.2	0.09	1.00	956	155	8.6	65	128.9	26.5	0.21	0.32	931
8/26/21	157	9.5	44.4	121.8	17.1	0.01	0.22	932	154	9.3	60.5	128.1	20.6	0.06	0.06	972	155	9	53.3	132.5	22.5	0.26	0.44	927
8/27/21	157	9.4	42.3	118.8	25.6	0.00	0.27	928	153	8.9	59.4	126.3	27.2	0.08	0.05	976	155	8.3	58.2	131.4	26.9	0.26	0.46	938
8/28/21	155	9.6	47.7	121.5	26.5	0.00	0.28	939	157	9.1	69	130.9	34.7	0.05	0.17	976	155	8.5	65.3	132.2	22.3	0.26	0.41	940
8/29/21	154	9.2	47.9	118.4	25.5	0.01	0.28	910	157	9	68.4	130.2	28	0.09	0.46	974	153	8.2	61.5	129.5	30.2	0.25	0.42	943
8/30/21	152	9	37	119.4	26.5	0.00	0.25	916	158	8.8	60.3	127	21	0.02	0.35	961	158	8.3	60.8	132.6	34	0.34	0.43	924
8/31/21	152	8.8	67.4	121.1	20.1	0.00	0.27	937	156	8.9	70.3	131.4	19.9	0.04	0.59	953	154	8.3	68	132	23.5	0.15	0.41	943
Average	155	9.1	51.1	125.5	24.0	0.02	0.42	926	155.2	8.8	69.0	129.2	25.1	0.05	0.90	963.2	154.7	8.6	62.3	132.9	26.3	0.25	0.39	925.5
Min	151	8.6	32.0	118.4	16.7	0.00	0.22	907	152.0	8.0	42.6	125.7	15.6	0.01	0.04	940.0	150.0	8.2	49.6	127.7	17.4	0.15	0.21	901.0
Max	160	9.6	91.8	132.1	40.0	0.17	0.88	949	158.0	9.4	104.7	136.8	37.0	0.14	1.99	990.0	161.0	9.3	91.2	143.6	36.4	0.45	0.46	943.0
St Dev	2.2	0.25	12.94	4.33	6.12	0.04	0.14	10.2	1.62	0.30	15.39	2.45	5.86	0.03	0.57	10.60	2.20	0.24	9.56	3.21	4.15	0.06	0.05	10.08

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