Monthly Operating Reports

September 2020

The following September 2020 operating report was sent to the Ministry of Environment and Climate Change Strategy on November 5, 2020.

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

September 2020

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	39.8	30.9	40.4
SO_2	200	24 hr	120.6	120.7	117.7
NOx	190	24 hr	128.3	132.1	131.3
THC	10	24 hr	0.24	0.21	0.41
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			0.44	0.72	1.33
CO			26.0	22.8	27.1
THC			0.13	0.07	0.21
SO_2			65.9	61.6	68.8
NOx			124.0	128.9	129.5

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

a. HCl – December 31, 2022

b. SO_2 – December 31, 2022

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
11-Sep 14:30	30 min	131.1	Started gas burners, adjusted airflow, modified feed rate.
28-Sep 10:00	30 min	136.5	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
3-Sep 12:30	30 min	187.3	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
4-Sep 08:30	30 min	103.6	Adjusted airflow, modified feed rate.
11-Sep 08:00	30 min	142.4	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
19-Sep 08:30	30 min	152.8	Online boiler wash, started gas burners, adjusted airflow, modified feed rate.
20-Sep 12:30	30 min	119.7	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-Sep 08:00	30 min	114.1	Feeder hang up, started gas burners, adjusted airflow, modified feed rate.
6-Sep 12:30	30 min	182.5	Feeder hang up, started gas burners, adjusted airflow, modified feed rate.
30-Sep 10:00	30 min	101.0	Started gas burners, adjusted airflow, modified feed rate.
30-Sep 12:00	30 min	138.1	Started gas burners, adjusted airflow, modified feed rate.
30-Sep 14:30	30 min	234.6	Started gas burners, adjusted airflow, modified feed rate.

2.c. Transient Conditions

Gas burners unavailable and unable to close feed chute damper during shutdown

Unit	Duration	Date	Time	
2	3 hr 57 min	Sept 13-14	22:50-02:47	

Cause

A lighting panel breaker failed at the facility and provided a false signal that incoming BC Hydro power was lost. Two boilers were shut down utilizing the emergency backup power, the third boiler was offline at the time. The facility automatically switches from BC Hydro power to emergency generator backup power following detection of a power outage. Auxiliary burners on unit 2 were unavailable as the induced draft fan and the forced draft fan which are required for operation, are not powered during an emergency shutdown. The operator was unable to close the feed chute damper during the shutdown as required.

Unit 2 was placed in shutdown mode at 2020-09-13 22:50 following the perceived BC Hydro power outage. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 1 hour and 2 minutes between 2020-09-13 22:50 and 2020-09-13 23:52.

Action Taken to Restore Steady State Conditions

Covanta isolated the failed lighting panel and switched back to BC Hydro Power at 2020-09-13 23:15. Isolating the lighting panel interrupted the communications with the facility control system which delayed the return to full operation. Covanta restarted the forced draft fan at 2020-09-13 23:43 and the induced draft fan at 2020-09-13 23:43. The lighting panel was repaired at 2020-09-14 01:35 which restored the lighting and communications with the control system. The natural gas burners were back online at 2020-09-13 23:52. The shutdown was completed at 2020-09-14 02:47.

Remedial Action Planned and/or Taken

None identified

Gas burners unavailable and unable to close feed chute damper during shutdown

Unit	Duration	Date	Time	
3	4 hr 45 min	Sept 13-14	22:50-03:35	

Cause

A lighting panel breaker failed at the facility and provided a false signal that incoming BC Hydro power was lost. Two boilers were shut down utilizing the emergency backup power, the third boiler was offline at the time. The facility automatically switches from BC Hydro power to emergency generator backup power following detection of a power outage. Auxiliary burners on unit 3 were unavailable as the induced draft fan and the forced draft fan which are required for operation, are not powered during an emergency shutdown. The operator was unable to close the feed chute damper during the shutdown as required.

Unit 3 was placed in shutdown mode at 2020-09-13 22:50 following the perceived BC Hydro power outage. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 2 hours and 3 minutes between 2020-09-13 22:50 and 2020-09-14 00:53.

Action Taken to Restore Steady State Conditions

Covanta isolated the failed lighting panel and switched back to BC Hydro Power at 2020-09-13 23:15. Isolating the lighting panel interrupted the communications with the facility control system which delayed the return to full operation. Covanta restarted the induced draft fan at 2020-09-14 00:41 and the forced draft fan at 2020-09-14 00:42. The lighting panel was repaired at 2020-09-14 01:35 which restored the lighting and communications with the control system. The natural gas burners were back online at 2020-09-14 00:53. The shutdown was completed at 2020-09-14 03:35.

Remedial Action Planned and/or Taken

None identified

Gas burners unavailable and unable to close feed chute damper during shutdown

Unit	Duration	Date	Time	
2	57 min	21-Sep-20	08:11 - 09:08	

Cause

Auxiliary burners on unit 2 were unavailable, due to a safety permissive, to maintain the secondary combustion zone temperature during a boiler shutdown period as required.

Unit 2 was placed in shutdown mode at 2020-09-21 08:11 following a low steam drum level trip. The operators were conducting daily tests of the boiler drum level safety device and a test switch became stuck which initiated the low steam drum level safety trip. This resulted in the induced draft fan and forced draft fan tripping at 2020-09-21 08:10. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 38 minutes between 2020-09-21 08:11 and 2020-09-21 08:49.

Action Taken to Restore Steady State Conditions

Covanta restarted the induced draft fan at 2020-09-21 08:19 and the forced draft fan at 2020-09-21 08:20. The natural gas burners were back online at 2020-09-21 08:49. The shutdown was completed at 2020-09-21 09:08.

Remedial Action Planned and/or Taken

None identified. Covanta's electrician rectified the issue with the low level test switch.

Gas burners unavailable and unable to close feed chute damper during shutdown

Unit	Duration	Date	Time	
1	1 hr 2 min	29-Sep-20	00:08 - 01:10	

Cause

Auxiliary burners on unit 1 were unavailable, due to a safety permissive, to maintain the secondary combustion zone temperature during a boiler shutdown period as required. The operator was unable to close the feed chute damper during the shutdown as required.

Unit 1 was placed in shutdown mode at 2020-09-29 00:08 following an induced draft fan and forced draft fan trip. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 18 minutes between 2020-09-29 00:08 and 2020-09-29 00:26.

Action Taken to Restore Steady State Conditions

Covanta restarted the induced draft fan at 2020-09-29 00:11 and the forced draft fan at 2020-09-29 00:12. The natural gas burners were back online at 2020-09-29 00:26. The shutdown was completed at 2020-09-29 01:10.

Remedial Action Planned and/or Taken

Metro Vancouver's facility operator Covanta determined refuse quality contributed to unstable combustion. Covanta's operators will continue to blend the refuse to ensure a more stable fuel quality.

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	100	100	100
CO	90	Hour	100	100	100
SO_2	90	Hour	100	100	100
NOx	90	Hour	100	100	100
THC	90	Hour	100	99	100
Stack Flow	90	Hour	100	98	99

4. Shutdown Report

Unit 1

Duration in Hours	Reason	Date
3.10	Fabric filter baghouse bag replacement	September 1
0.17	Induced draft fan trip	September 1
0.42	Turbine trip	September 1
3.35	Fabric filter bag replacement	September 3
1.87	Fabric filter bag replacement	September 4
0.08	Induced draft fan trip	September 11
302.07	Annual major maintenance outage	Sept 13 - 26
13.48	Both refuse cranes out of service	September 26
0.35	Induced draft fan trip	September 27
0.12	Induced draft fan trip	September 29
1.03	Induced draft fan trip	September 29

Unit 2

Duration in Hours	Reason	Date
0.42	Turbine trip	September 1
1.03	Steam drum safety valve issue	September 1
0.68	Poor refuse quality	September 1
0.70	Refuse crane power issue	September 13
4.05	Plant tripped due to failed lighting panel	Sept 13-14
0.97	Boiler trip due to jammed low water cut out switch	September 21
3.45	Ash discharger plug	September 25
13.27	Both refuse cranes out of service	September 26
1.77	Poor refuse quality	September 27
3.58	Poor refuse quality	September 27

Unit 3

Duration in Hours	Reason	Date
0.25	Feed chute hang up	September 6
4.85	Plant tripped due to failed lighting panel	Sept 13-14
3.14	Fabric filter bag replacement	September 19
0.35	BC Hydro power interruption	September 24
12.35	Both refuse cranes out of service	September 26

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	**17,653**		
Waste Processed	tonnes/day	**126**	**217**	**231**
Maximum Waste Processed	tonnes/day	**246**	**243**	**248**
		Units 1, 2, and 3		
Natural Gas Consumed	m^3/day	**6,250**		
	m^3/month	**187,515**		
Fly ash disposed	tonnes	**689**		
Bottom ash disposed	tonnes	**2,882**		

7. Complaints and Responses

Date/Time	Complaint	Action Taken
8/31/2020 12:10:00 PM (received Sept 2, 2020)	Odour Complaint - complainant identified Waste-to-Energy Facility as possible source	Plant Manager did a walk around the facility, detecting no odours. Working with the Metro Vancouver Environmental Regulation & Enforcement Department to determine the source of the odours.
9/1/2020	Odour Complaint - complainant identified Waste-to-Energy Facility as possible source	Plant Manager did a walk around the facility, detecting no odours. Working with the Metro Vancouver Environmental Regulation & Enforcement Department to determine the source of the odours.

September 2020 - Monthly CEMS Data

	Boiler #1								Boiler #2								Boiler #3							
	Stack	O_2	SO_2	NO_x	CO	THC	Opacity	Furnace	Stack	O_2	SO_2	NO_x	CO	THC	Opacity	Furnace	Stack	O_2	SO_2	NO_x	CO	THC	Opacity	Furnace
Date	Temp	(%)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(%)	Temp	Temp	(%)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(%)	Temp	Temp	(%)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(%)	Temp
9/1/20	157	10.5	61.7	127.6	29.8	0.06	0.42	915	149	9.8	55.5	128.7	22.1	0.03	0.48	911	151	10.1	73.1	128.9	22.4	0.13	0.88	902
9/2/20	154	10.1	59.9	123.7	24.4	0.06	0.35	944	148	9.3	53.5	131.9	22.3	0.02	0.75	928	146	10	78.8	128.4	29.3	0.17	0.88	899
9/3/20	156	10.3	54.5	125.8	31.2	0.10	0.61	899	150	9.4	51	129.4	24.7	0.10	0.78	925	148	10.3	58.4	129.1	34.5	0.16	0.85	892
9/4/20	157	10.4	55.6	124.8	27.7	0.08	0.57	921	150	9.2	48.9	130.2	23.5	0.07	0.62	928	151	9.9	71.5	129.9	27.8	0.18	0.85	915
9/5/20	158	10.6	56.7	125.9	18.2	0.10	0.37	929	148	9.3	58	129.4	20.2	0.02	0.54	937	152	9.8	77.6	130	22.3	0.17	0.82	932
9/6/20	158	10.8	57.9	126.1	23.5	0.12	0.35	921	149	9.4	63.3	129.7	18.1	0.08	0.56	933	150	9.8	69.6	129.1	21.1	0.19	0.84	926
9/7/20	155	10	75.4	123.8	18.9	0.13	0.38	946	150	9.7	57.4	130	21.2	0.10	0.47	921	150	9.7	57.2	128.8	21.2	0.31	0.88	920
9/8/20	157	10.4	61.5	124.7	18.4	0.05	0.44	933	151	9.9	57.8	130.3	21.9	0.05	0.93	917	151	9.7	64.9	128	18.2	0.12	0.93	922
9/9/20	159	10.5	45.1	124.1	20.4	0.10	0.48	926	154	9.6	50	129.3	20.6	0.02	1.30	928	154	9.7	63.6	129.8	20.1	0.12	0.98	919
9/10/20	159	10.5	44	119.3	25	0.12	0.45	945	153	9.8	49.8	129.4	26.6	0.08	0.94	912	154	9.7	65.2	128.9	23	0.13	0.97	913
9/11/20	157	11	46.7	121.9	36.3	0.17	0.44	939	153	9.6	45.5	127.7	23.6	0.05	1.10	930	154	9.6	57.2	128.7	23.7	0.12	0.95	921
9/12/20	151	11.9	44.4	117.8	39.8	0.24	0.50	903	152	9.9	47.7	127.7	26.6	0.04	1.38	929	153	9.4	60.4	130	20.2	0.12	1.05	922
9/13/20									150	9.9	46.8	127.6	20.7	0.02	0.73	930	152	10	51.7	130.1	21.9	0.25	1.07	899
9/14/20									151	10.1	35.3	127.7	30.9	0.05	0.68	897	153	9.5	56.8	129.3	28.1	0.13	1.19	914
9/15/20									150	10	75.3	129	27.6	0.09	0.14	900	150	9.6	78.6	128.1	34	0.14	1.26	906
9/16/20									153	9.8	120.7	127.2	21.8	0.06	0.29	920	155	9.5	115.2	128.4	23.9	0.20	1.26	930
9/17/20									151	9.9	94.7	128	23.6	0.16	0.08	915	154	9.5	104.4	129.7	25.3	0.36	1.27	922
9/18/20									151	10	67.5	129.5	21.6	0.07	0.16	909	153	9.5	78.8	131.3	32.8	0.18	1.39	921
9/19/20									152	9.8	58	132.1	26.4	0.21	0.67	927	152	9.6	59.5	129.1	33.8	0.21	2.17	912
9/20/20									153	9.4	119.6	127.2	24.7	0.12	0.53	939	153	9.1	117.7	128.4	25.6	0.21	2.22	937
9/21/20									154	9.3	89.3	128.6	25.5	0.06	0.67	915	155	9.3	81.9	129	27.3	0.29	1.97	909
9/22/20									150	9.3	85.1	130.4	23.6	0.08	0.44	924	154	9.4	98.5	130.2	28.5	0.17	2.15	924
9/23/20									151	9.4	57.2	129.7	23.8	0.05	0.54	915	152	9.4	45.4	130.2	32	0.19	2.27	914
9/24/20									150	9.6	41.6	127.7	20	0.12	1.12	896	151	9.3	45.9	130.3	28.5	0.19	1.92	891
9/25/20									153	9.9	44.2	128.1	18.3	0.04	1.45	867	155	9.8	45.6	129.1	26.7	0.33	1.91	877
9/26/20																								
9/27/20	144	10.3	73.6	115	24	0.20	0.41	901	156	10.8	44.5	129.2	16	0.08	1.31	866	155	10.1	57.1	130.6	28.8	0.32	1.40	883
9/28/20	152	9.7	79.3	127.5	31.1	0.15	0.39	882	154	9.6	49.4	127	24.2	0.08	1.03	901	154	9.9	45.2	131.1	35.7	0.41	1.41	883
9/29/20	148	9.6	117	128.3	24.3	0.19	0.42	902	153	9.4	53.6	126.6	21.1	0.06	0.85	908	156	9.8	57	130.1	27.8	0.27	1.43	877
9/30/20	149	10.1	120.6	128.3	22.6	0.14	0.44	897	152	9.5	66.2	128.9	20	0.10	0.44	915	154	10.7	58.1	130.7	40.4	0.41	1.46	897
Average	154	10.4	65.9	124.0	26.0	0.13	0.44	919	151.4	9.7	61.6	128.9	22.8	0.07	0.72	915.3	152.5	9.7	68.8	129.5	27.1	0.21	1.33	909.6
Min	144	9.6	44.0	115.0	18.2	0.05	0.35	882	148.0	9.2	35.3	126.6	16.0	0.02	0.08	866.0	146.0	9.1	45.2	128.0	18.2	0.12	0.82	877.0
Max	159	11.9	120.6	128.3	39.8	0.24	0.61	946	156.0	10.8	120.7	132.1	30.9	0.21	1.45	939.0	156.0	10.7	117.7	131.3	40.4	0.41	2.27	937.0
St Dev	4.4	0.54	23.29	3.84	6.30	0.05	0.07	19.9	1.96	0.34	21.40	1.37	3.16	0.04	0.37	17.77	2.28	0.33	19.68	0.89	5.45	0.09	0.48	16.69

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