

2020 Annual Report

The 2020 Annual Report was sent to the Ministry of Environment and Climate Change Strategy on March 24, 2021.



Metro Vancouver - Waste-to-Energy Facility
CONTINUOUS EMISSION MONITORING SYSTEM
2020 Annual Emission Report

1. ANNUAL SUMMARY REPORT

Parameter	Limit (mg/m ³)	Compliance Period	Maximum Measurement (mg/m ³)		
			Unit 1	Unit 2	Unit 3
Carbon Monoxide (CO)	50	24 hr	46.9	39.5	44.7
Sulphur Dioxide (SO ₂)	200	24 hr ⁽¹⁾	168.1	169.0	153.8
Nitrogen Oxides (NO _x)	190	24 hr	137.4	140.6	150.1
			Annual Average (mg/m ³)		
			Unit 1	Unit 2	Unit 3
Opacity			0.7	0.8	0.8
Carbon Monoxide (CO)			28.8	24.7	31.0
Sulphur Dioxide (SO ₂)			61.0	62.8	68.3
Nitrogen Oxides (NO _x)			126.2	129.8	130.6

1. Interim Discharge Limits will apply until and including the following dates, at which point the Discharge Limits will apply:

a. HCl – December 31, 2022

b. SO₂ – December 31, 2022

2. ANNUAL EXCEEDANCE REPORT

2.a. Discharge Limit Exceedances

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

2.b. 30 Minute Response Limit Exceedances Summary

Carbon Monoxide

	Unit 1	Unit 2	Unit 3
January	12	2	7
February	11	1	9
March	6	4	9
April	9	6	7
May	8	3	3
June	5	2	8
July	16	8	8
August	13	5	5
September	2	5	5
October	13	9	10
November	8	5	2
December	6	7	4
Total	109	57	77

Total Hydrocarbons

	Unit 1	Unit 2	Unit 3
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Total	0	0	0

Nitrogen Oxides

	Unit 1	Unit 2	Unit 3
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			2
Total	0	0	2

Opacity

	Unit 1	Unit 2	Unit 3
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Total	0	0	0

2.c. Transient Conditions

Gas Burners not available during shutdown

Unit	Duration	Date	Time
#1	2 hours 50 min	18-Apr-20	00:30-03:20
#1	1 hour 7 min	24-Apr-20	14:23-15:30
#2	59 minutes	21-May-20	02:28-03:27
#3	35 minutes	29-Jun-20	15:12-15:47

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

Unit	Duration	Date	Time
#3	16 minutes	7-Jan-20	14:50 - 15:06
#2	14 minutes	11-Jan-20	01:59- 02:13
#3	39 minutes	11-Jan-20	01:59-02:27
#2	28 minutes	3-Feb-20	14:30 - 14:58
#1	26 minutes	6-Feb-20	20:25 - 20:51
#2	31 minutes	6-Feb-20	20:21 - 20:52
#1	35 minutes	Feb 6-7, 2020	23:50 - 00:25
#2	23 minutes	18-Feb-20	8:35 - 8:58
#2	23 minutes	22-Feb-20	13:21 - 13:44
#3	4 h 55 m	26-Feb-20	12:25 - 17:20
#2	52 minutes	27-Mar-20	07:34 - 08:26
#2	20 minutes	27-Apr-20	04:27-4:47
#2	41 minutes	8-Jun-20	16:20-17:01
#3	4 hr 56 min	3-Jul-20	12:24 - 17:20
#1	2 hr 16 min	12-13 Jul-20	22:00 - 00:16
#2	1 hr 58 min	12-13 Jul-20	22:00 - 00:16
#3	3 hr 3 min	12-13 Jul-20	22:00 - 01:03
#2	59 min	29-Jul-20	10:04-11:03
#2	29 min	2-Aug-20	00:57-01:26
#1	1 hr 16 min	13-Aug-20	08:56-10:12
#2	1 hr 52 min	13-Aug-20	08:56-10:48
#2	3 hr 57 min	Sept 13-14	22:50-02:47
#3	4 hr 45 min	Sept 13-14	22:50-03:35
#2	57 min	21-Sep-20	08:11 - 09:08
#1	1 hr 2 min	29-Sep-20	00:08 - 01:10
#2	58 min	7-Oct-20	20:37-21:35
#3	2 hr 16 min	11-Oct-20	19:42-21:58
#2	2 hr 11 min	11-Oct-20	21:33-23:44
#2	3 hr 29 min	2-Nov-20	00:31-04:00
#2	46 min	4-Nov-20	21:11-21:57
#2	1 hr 4 min	20-Nov-20	13:20-14:24
#2	50 min	10-Dec-20	17:00-17:50

Shutdown extended beyond 5 hours, unable to close feed chute, gas burners unavailable during shutdown

#1	11 hr 26 min	30-Jun-20	9:35-21:01
#2	11 hr 5 min	30-Jun-20	9:36-20:41
#3	10 hr 35 min	30-Jun-20	9:37-20:12
#1	5 hr 20 min	3-Jul-20	12:24 - 17:44
#2	5 hr 31 min	3-Jul-20	12:24 - 17:55
#1	10 hr 29 min	23-Aug-20	05:29-15:58
#2	10 hr 14 min	23-Aug-20	05:29-15:43
#3	10 hr 23 min	23-Aug-20	05:29-15:52

3. ANALYZER AVAILABILITY

Analyzer	Required Availability (% hours per annum)	Averaging Period	Annual Availability		
			Unit 1	Unit 2	Unit 3
Opacity	95	Hour	99.9%	99.8%	99.9%
Oxygen	95	Hour	98.6%	98.9%	99.0%
Carbon Monoxide (CO)	95	Hour	98.6%	98.9%	99.0%
Sulphur Dioxide (SO ₂)	95	Hour	98.6%	98.9%	99.0%
Nitrogen Oxides (NO _x)	95	Hour	98.6%	98.9%	99.0%

4. ANNUAL MANUAL STACK TESTING SUMMARY

Manual Stack Tests:	Units	Discharge Regulatory Limit	Maximum Value		
			Unit 1	Unit 2	Unit 3
Particulate Matter	mg/dscm	9	0.78	1.41	0.55
HF	mg/dscm	1	0.02	0.03	0.04
Hg	ug/dscm	20	2.50	1.40	1.60
Cd	ug/dscm	7	1.10	0.13	0.10
Sum of Lead (Pb), Arsenic (As), Chromium (Cr)	ug/dscm	64	5.90	13.10	3.40
Trace Organics Tests:					Unit 2
PCDD/PCDF	ng/dscm	0.08			0.002
Chlorophenols	ug/dscm	1			0.006
Chlorobenzenes	ug/dscm	1			0.249
PAH's	ug/dscm	5			0.088
PCB	ug/dscm	1			0.003
Manual Stack Tests:	Units	Annual Average			
		Unit 1	Unit 2	Unit 3	
Particulate Matter	mg/dscm	0.52	0.58	0.46	
HF	mg/dscm	0.01	0.03	0.02	
Hg	ug/dscm	1.43	0.90	1.13	
Cd	ug/dscm	0.35	0.11	0.09	
Sum of Lead (Pb), Arsenic (As), Chromium (Cr)	ug/dscm	3.48	5.15	2.20	

5. SHUTDOWN REPORT

Reason	Hours		
	Unit 1	Unit 2	Unit 3
Annual Scheduled Maintenance Outages	362	383	439
Unplanned Maintenance Outages	428	314	312
Waste Quality	6	13	8

6. FACILITY BYPASS AND EMERGENCY/SPILL EVENT REPORT

Date/Time	Duration	Cause	Action Taken

7. OVERVIEW OF PLANT PERFORMANCE AND OPERATIONAL INFORMATION

Summaries/interpretation of compliance and complaints information	44 transient condition exceedances reported in section 2. No other compliance issues reported.		
	Odour complaints were received on August 31, 2020 and September 1, 2020. The Plant Manager did a walk around the facility, detecting no odours. Metro Vancouver Environmental Regulation & Enforcement Department were not able to determine the source of the odours.		
Status of Operations and Maintenance of Various Equipment	Scheduled outages were completed on all three boilers. The turbogenerator ran with an annual availability of 88.9%. There were a total of 21 turbogenerator outages resulting in 973.7 hours offline.		
Incidences of Emergencies and Response Measures Implemented	No incidents reported.		
Evaluation of monitoring programs	All monitoring programs were completed as per the Operational Certificate. Manual stack testing was completed on February 24-27, 2020, May 4-7, 2020, August 10-14, 2020, August 18-19, 2020 (semi-volatile organics) and November 16-19, 2020		
Bottom ash and fly ash disposal method	<p>Both bottom and fly ash are treated with a patented system used throughout the industry to inhibit metals leaching.</p> <p>Bottom ash was disposed at the Vancouver Landfill.</p> <p>Fly ash was disposed at the Columbia Ridge Landfill and Recycling Center located in Arlington, Oregon. Prior to hauling, each fly ash load is tested by an independent laboratory to confirm the material meets disposal criteria. Eighteen loads did not meet the criteria for disposal and were reprocessed on site. The failed loads resulted from an inconsistent fly ash flow which impacted the fly ash to phosphoric acid mixing ratio. The remaining fly ash loads were released for disposal.</p>		
Overview of Plant Performance	Plant Availability	%	91.6%
	Waste Received	Tonnes	244,362
	Waste Processed	Tonnes	244,576
	Energy Generated	MWh	150,625
	Natural Gas Consumed	GJ	70,259
	Bottom Ash	Tonnes	41,478
	Fly Ash	Tonnes	8,658
	Ferrous Metal	Tonnes	5,864
Non-Ferrous Metal	Tonnes	257	
Summary of operation, performance, and maintenance of emissions control devices			
CEMS Calibration Data	Date Calibrated	Description of Calibration	
Opacity	Daily	<p>RATA tests on Units 1, 2, and 3 were completed the week of May 25. Analysers are calibrated daily against a zero value and a known reference value.</p>	
Oxygen	Daily		
CO	Daily		
SO2	Daily		
NOx	Daily		