

2021 Annual Report

The 2021 Annual Report was sent to the Ministry of Environment and Climate Change Strategy on March 30, 2022.



Metro Vancouver - Waste-to-Energy Facility

CONTINUOUS EMISSION MONITORING SYSTEM

2021 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	48.1	37.3	43.4
Sulphur Dioxide (SO ₂)	200	24 hr ⁽¹⁾	179.9	155.4	166.6
Nitrogen Oxides (NO _x)	190	24 hr	144.0	144.6	155.7
			Annual Average (mg/m ³)		
			Unit 1	Unit 2	Unit 3
Opacity			0.8	0.7	0.4
Carbon Monoxide (CO)			25.5	21.9	29.3
Sulphur Dioxide (SO ₂)			71.5	70.0	74.7
Nitrogen Oxides (NO _x)			127.5	129.3	132.6

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

a. HCl – March 3, 2025

b. SO₂ – March 3, 2025

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	16	6	12
February	7	6	8
March	6	6	2
April	7	11	3
May	3	4	2
June	6	10	11
July	8	10	12
August	14	9	4
September	10	5	4
October	5	2	7
November	14	8	13
December	16	11	10
Total	112	88	88

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	1		
August			
September			
October			
November			
December			
Total	1	0	0

Opacity

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

2.c. Transient Conditions

Gas Burners unavailable during shutdown

Unit	Duration	Date	Time
#1	3 hrs 47 min	25-Jan-21	19:28-23:15
#2	2 hrs 41 min	25-Jan-21	19:28-22:09
#3	2 hrs 7 min	25-Jan-21	19:28-21:35
#1	6 min	9-Feb-21	03:55-04:01

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

Unit	Duration	Date	Time
#2	18 min	2-Feb-21	14:10-14:28
#3	16 min	2-Feb-21	14:10-14:26
#3	2 hrs 7 min	25-Jan-21	19:28-21:35
#2	16 min	3-Mar-21	08:05-08:21
#2	25 min	26-Mar-21	06:48-07:13
#3	48 min	26-Mar-21	06:48-07:36
#1	56 min	28-Mar-21	15:29-16:25
#2	29 min	28-Mar-21	15:29-15:58
#3	29 min	28-Mar-21	15:29-15:58
#2	20 min	8-Apr-21	09:40-10:00
#1	22 min	2-May-21	09:31-09:53
#2	39 min	2-May-21	22:13-22:52
#1	23 min	5-May-21	13:01-13:24
#1	38 min	5-May-21	13:47-14:25
#1	21 min	28-May-21	11:55-12:16
#2	21 min	28-May-21	11:55-12:16
#3	17 min	28-May-21	11:55-12:12
#1	35 min	29-May-21	21:10-21:45
#2	29 min	29-May-21	21:10-21:39
#3	47 min	29-May-21	21:10-21:57
#1	20 min	30-May-21	04:05-04:25
#2	18 min	30-May-21	04:05-04:23
#3	20 min	30-May-21	04:05-04:25
#1	57 min	2-Jun-21	00:50-01:47
#2	1 hr 9 min	2-Jun-21	00:50-01:59
#3	1 hr 50 min	2-Jun-21	00:50-02:40
#3	46 min	3-Jun-21	13:23-14:09
#1	53 min	4-Jul-21	11:25-12:18
#2	1 hr 1 min	4-Jul-21	11:25-12:26
#3	2 hr 56 min	4-Jul-21	11:25-14:21
#1	48 min	12-13-Aug-21	23:26-00:14
#2	49 min	12-13-Aug-21	23:26-00:15
#3	37 min	12-13-Aug-21	23:26-00:03
#3	29 min	5-Sep-21	03:51-04:20
#3	28 min	5-Sep-21	05:22-05:50
#3	19 min	5-Sep-21	06:47-08:06
#2	10 min	26-Sep-21	11:53-12:03
#2	14 min	26-Sep-21	13:58-14:12
#1	39 min	5-Oct-21	07:15-07:54
#2	1 hr 10 min	5-Oct-21	07:15-08:25
#2	19 min	14-Oct-21	14:15-14:34
#1	24 min	16-Nov-21	17:49-18:13
#3	1 hr 8 min	26-Nov-21	14:17-15:25

#1	31 min	28-Nov-21	08:14-08:45
#1	22 min	30-Nov-21	18:43-19:05
#1	14 min	6-Dec-21	14:12-14:26
#3	30 min	15-Dec-21	14:32-15:02

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	98.2%	98.6%	99.0%
Carbon Monoxide (CO)	95	Hour	98.2%	98.7%	99.0%
Sulphur Dioxide (SO ₂)	95	Hour	98.2%	98.7%	99.0%
Nitrogen Oxides (NO _x)	95	Hour	98.2%	98.6%	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	2.11	1.75	2.74
HF	mg/dscm	1	0.01	0.01	0.02
Hg	ug/dscm	20	2.33	1.20	1.42
Cd	ug/dscm	7	0.31	0.09	0.57
Sum of Lead (Pb), Arsenic (As), Chromium (Cr)	ug/dscm	64	5.59	2.48	6.07
Trace Organics Tests:					Unit 3
PCDD/PCDF	ng/dscm	0.08			0.002
Chlorophenols	ug/dscm	1			0.006
Chlorobenzenes	ug/dscm	1			0.310
PAH's	ug/dscm	5			0.104
PCB	ug/dscm	1			0.014
Manual Stack Tests:	Units		Annual Average		
			Unit 1	Unit 2	Unit 3
Particulate Matter	mg/dscm		1.34	0.61	1.42
HF	mg/dscm		0.01	0.01	0.01
Hg	ug/dscm		1.33	0.73	0.76
Cd	ug/dscm		0.22	0.08	0.28
Sum of Lead (Pb), Arsenic (As), Chromium (Cr)	ug/dscm		4.43	2.17	3.43

5. SHUTDOWN REPORT

Reason	Hours		
	Unit 1	Unit 2	Unit 3
Annual Scheduled Maintenance Outages	409	403	397
Unplanned Maintenance Outages	436	285	341
Waste Quality	6	9	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	51 transient condition exceedances reported in section 2. No other compliance issues reported.		
	No complaints were received.		
Status of Operations and Maintenance of Various Equipment	Scheduled outages were completed on all three boilers. The turbogenerator ran with an annual availability of 98.68%. There were a total of 28 turbogenerator outages resulting in 116.0 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 22-25, 2021, May 3-7, 2021, August 9-12, 2021, August 18-19, 2021 (semi-volatile organics) and November 18-23, 2021.		
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 utilized at the Coquitlam Landfill or 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. All fly ash loads met the disposal criteria and were released for disposal.</p>		
Overview of Plant Performance	Plant Availability	%	91.4%
	Waste Received	Tonnes	241,530
	Waste Processed	Tonnes	241,200
	Energy Generated	MWh	166,571
	Natural Gas Consumed	GJ	61,150
	Bottom Ash	Tonnes	38,698
	Fly Ash	Tonnes	10,699
	Ferrous Metal	Tonnes	5,121
	Non-Ferrous Metal	Tonnes	287

Summary of operation; performance, and maintenance of emissions control devices		
CEMS Calibration Data	Date Calibrated	Description of Calibration
Opacity	Daily	RATA tests on Units 1, 2, and 3 were completed May 12th to 14th, results were within the minimum requirements, but a second RATA was recommended. Analysers are calibrated daily against a zero value and a known reference value. A second RATA was conducted from November 29th to December 3rd. All parameters were within the required tolerance.
Oxygen	Daily	
CO	Daily	
SO2	Daily	
NOx	Daily	