Internet Publication Plan

For the proposed public website for Metro Vancouver's Waste-to-Energy Facility

June 15, 2017

1.0 Project Description

This Internet Publication Plan describes the proposed public website for Metro Vancouver's Waste-to-Energy Facility, including the website's structure, content and implementation timeline. This plan is required by Operational Certificate 107051 (the "Operational Certificate") issued by the BC Ministry of Environment on December 15, 2016. Specifically, Metro Vancouver must submit an Internet Publication Plan *"…to the Director within 6 months of the issuance of this Operational Certificate. The Plan should identify the minimum information and required timelines, retention etc. for publication and should consider the interests of the public, agencies and concerned stakeholders. The plan must be acceptable to and may be amended in writing by the Director, and must be implemented by the Operational Certificate Holder."* (Section 3.11.4)

In addition to satisfying regulatory requirements, the proposed website also aims to improve public understanding of the facility's role within the regional solid waste and recycling system, its operations and its environmental performance. We anticipate that the website will be used by the public, agencies, and interested stakeholders.

Key website elements will include a description of the Waste-to-Energy Facility; continuous emissions monitoring system information; manual stack testing information and reports; fly ash and bottom ash information and reports; monthly and annual operating reports submitted to the BC Ministry of Environment; management plans submitted to the BC Ministry of Environment as requirements of the Operational Certificate; and public feedback opportunities. Website requirements as per the Operational Certificate are included in the table in Appendix B.

The website is anticipated to be live by early 2018.

2.0 Website Structure and Content

The website will include a number of sections focused on the key elements described above. Information will be presented in a range of formats including descriptive text content, graphics, emissions monitoring data tables, monthly and annual operational reports (PDF format), historical daily averages (Excel format), links to management plans, and opportunities for public feedback.

2.1 Waste-to-Energy Facility Description

The website will include a description of Metro Vancouver's Waste-to-Energy Facility, including a location map, description of the mass-burn technology, facility capacity, and energy and metals recovery. This section will also describe and introduce the facility's environmental monitoring program and performance. Some content on Metro Vancouver's current Waste-to-Energy webpage will be imported to the new site. The current webpage will be removed and replaced by the new website, which will be housed at metrovancouver.org.

There will also be a link to the Operational Certificate and links to facility National Pollutant Release Inventory and federal and provincial greenhouse gas data reported to the associated regulatory agency.

2.2 Emissions Monitoring – Continuous and Manual Testing

Emissions from the Waste-to-Energy Facility are monitored using two methods as required by the Operational Certificate: continuous emissions monitoring and scheduled manual stack testing. The BC Ministry of Environment, through the Operational Certificate, identifies parameters required to be tested and their limits. The test methods, including continuous emissions monitoring and manual stack testing, are approved by the Ministry of Environment.

The continuous emissions monitoring system (CEMS) was established at the Waste-to-Energy Facility when the site opened in 1988. It uses stationary monitoring equipment installed onsite to monitor gas samples extracted from the stack prior to discharge to the atmosphere. Monitors can continuously monitor gaseous compounds (carbon monoxide, hydrogen chloride, sulphur dioxide, nitrogen oxides, and total hydrocarbons) and opacity/total particulate matter. Discharge limits identified in the Operational Certificate for continuously monitored parameters define the maximum discharge rates allowed for each parameter. Discharge values are presented as daily block averages, which are data averages over a 24 hour period; therefore, the value is updated once per day. This method of calculation is approved by the BC Ministry of Environment through the Operational Certificate. Response limits, also set in the Operational Certificate, specify the discharge rate for each parameter at which action is required to be taken to bring down the discharge levels to the applicable discharge limits. Response limit values are expressed as ½ hour block averages of values measured by continuous emission monitors, and are updated once every ½ hour.

Compounds that cannot be accurately and effectively monitored on a continuous basis using CEMS are monitored via periodic stack testing. These tests are typically referred to as manual stack tests and are performed by independent certified stack test technicians. Technicians follow strict test methodologies approved by the Ministry of Environment, to obtain a representative sample from the flue gas. The samples are then tested at accredited laboratories to obtain a discharge value. Discharge limits identified in the Operational Certificate for manually tested parameters define the maximum discharge rates allowed for each parameter.

A combination of continuous and manual stack testing is used to ensure the Waste-to-Energy Facility is operating effectively and maintaining high environmental standards, while complying with all regulatory requirements for facility emissions.

2.2.1 Continuous Emissions Monitoring

CEMS data will be published on the website in tabular format, alongside applicable discharge and response limits specified in the Operational Certificate. Table 1 on the next page provides a sample of the CEMS data table as it will appear on the website, including mock values. A value will be posted for all continuously monitored parameters specified in the Operational Certificate. Interim discharge limits until new ones become effective. Where interim discharge limits do not exist, the new discharge limit and response limit will be posted on the date when it becomes applicable; before that date the fields will display “N/A”. For example, certain parameters have discharge or response limits that are not effective until December 31, 2022, so while a value for each parameter will be published on the website, the discharge and response limit fields will read “N/A” until December 31, 2022.

Discharge values, presented as daily block averages of CEMS data over 24-hours, will be automatically updated on a daily basis. Response values, presented as ½-hour block averages of CEMS data, will be automatically updated every ½ hour. Discharge and response values and limits will be presented in milligrams per dry standard cubic metre (mg/dscm).

The CEMS data table will display the most recent value for each parameter. Historical data, starting from the date the website becomes live (anticipated for early 2018) will be summarized in the monthly and annual operating reports which will be posted as PDF documents on the website as they are submitted to the BC Ministry of Environment (Section 2.6). Daily averages of the CEMS data will also be provided in an *Excel* spreadsheet on the Metro Vancouver website, as described in Section 2.2.2.

Interim discharge limits convert to discharge limits at the date specified in the Operational Certificate. In the interim the discharge limit and response limit will display as "N/A" The most recent value will display even for parameters where the discharge or response limit displays as "N/A". If a boiler is offline, the table will show "Boiler Offline" for all parameters for that boiler.

Table 1. Sample CEMS data table to be published on the Metro Vancouver website.

		Discharge Limits		**Discharge Values**			**Response Limits**		**Response Values**		
				Boiler #1	Boiler #2	Boiler #3			Boiler #1	Boiler #2	Boiler #3
Parameter	Units	24-hr average	Date/Time	24-hr average	24-hr average	24-hr average	1/2-hr average	Date/Time	1/2-hr average	1/2-hr average	1/2-hr average
Opacity	%	N/A*	Feb 19/2018 11:59 pm	0.5	1.2	1.4	5	Feb 20/2016 1:00 pm	0.4	0.5	0.8
Carbon Monoxide (CO)	mg/dscm	50	Feb 19/2018 11:59 pm	23.6	23.1	19.7	N/A*	Apr 20/2016 1:00 pm	18.1	16.4	17.6
Hydrogen Chloride (HCl)	mg/dscm	55**	Feb 19/2018 11:59 pm	45	45	45	N/A*	Apr 20/2016 1:00 pm	45	45	45
Sulphur Dioxide (SO_2)	mg/dscm	200	Feb 19/2018 11:59 pm	70.4	103	49.4	N/A*	Apr 20/2016 1:00 pm	50.7	75.5	51.6
Nitrogen Oxides (NO_x)	mg/dscm	190	Feb 19/2018 11:59 pm	128.8	127.8	130.0	350	Apr 20/2016 1:00 pm	130.3	126.7	129.4
Total Hydrocarbons (THC)	mg/dscm	N/A*	Feb 19/2018 11:59 pm	1	1	1	N/A*	Apr 20/2016 1:00 pm	1	1	1

Note: the data displayed on this table is automatically populated with the most recent data measured at the Waste-to-Energy Facility. It has not yet undergone Quality Assurance and Quality Control.

* N/A denotes parameters where the discharge limit or response limit is not yet applicable according to the Operational Certificate.

** Interim Discharge Limit is a 1-hr average

2.2.2 Monthly CEMS Data – Historical Daily Averages

Daily averages of the monthly CEMS data will be provided in *Excel* spreadsheets on the Metro Vancouver website, on a monthly basis starting from the date the website becomes live. The spreadsheets will include daily averages, maximum daily averages, and 24-hr average Discharge Limits where appropriate for SO_2, HCl, NO_x, CO, Opacity and THC and will be updated on a monthly basis. The standard deviation for each value will be included. A sample of the table is included in Appendix A.

2.2.3 Manual stack testing

As required by the Operational Certificate, a range of parameters including total particulate matter, hydrogen fluoride, total hydrocarbons and trace metals (cadmium, mercury, lead, arsenic, and chromium) are measured manually four times per year in triplicate on each stack. Volatile organic compounds including total dioxins and furans, chlorophenols, chlorobenzenes, polycyclic aromatic hydrocarbons and polychlorinated biphenyls are measured manually in triplicate once per year, on one stack (rotating between stacks each year). The manual stack testing frequency is summarized in Section 3.3 Discharge Monitoring for Section 1.1 of the Operating Certificate.

Quarterly and annual manual stack test results are reported to the BC Ministry of Environment. Following submission to the Ministry of Environment, these reports will be posted on the website in PDF format. Test results for parameters measured quarterly will be submitted to the BC Ministry of Environment within 60 days of the completion of the source testing, and test results for parameters measured annually will be submitted within 90 days of the completion of source testing.

Historical manual stack testing reports will be available on the website, starting from the date the website becomes live.

In addition to PDF reports, the website will display a table of the most recent value for each parameter. Table 2 shows a sample of the data table with mock values. Discharge values and limits will be presented in milligrams, nanograms, or micrograms per dry standard cubic metre (mg/dscm, ng/dscm, µg/dscm).

Table 2. Sample manual stack testing data table to be published on the Metro Vancouver website.

Parameter	Testing Frequency	Units	Discharge limits	Date	Boiler #1	Boiler #2	Boiler #3
Total Particulate Matter	Four times per year	mg/dscm	9	Feb 19/2018	1.08	1.23	0.34
Hydrogen Fluoride (HF)		mg/dscm	1.0	Feb 19/2018	0.015	0.034	0.027
Total Hydrocarbons (THC)		mg/dscm	40	Feb 19/2018	5.0	5.0	5.0
Cadmium (Cd)		µg /dscm	7	Feb 19/2018	.0.0001	0.0010	0.0002
Mercury (Hg)		µg/dscm	20	Feb 19/2018	0.0004	0.0016	0.0009
Sum of Lead (Pb), Arsenic (As), Chromium (Cr)		µg/dscm	64	Feb 19/2018	0.0052	0.0059	
Total Dioxins and Furans (as PCDD/F TEQ)		ng/dscm	0.08	Feb 19/2018	0.0018		

Chlorophenols	Annually (once per year on one boiler)	µg/dscm	1	Feb 19/2018	0.012
Chlorobenzenes		µg/dscm	1	Feb 19/2018	0.0132
Polycyclic Aromatic Hydrocarbons (PAHs)		µg/dscm	5	Feb 19/2018	0.193
Polychlorinated Biphenyls (PCBs)		µg/dscm	1	Feb 19/2018	0.019

2.3 Fly Ash Management

Fly ash consists of fine particulates that are captured in the Waste-to-Energy Facility's air pollution control (APC) system. These particulates are a mixture of ash from the combustion process and lime and carbon which are added to capture acid gases and mercury. Prior to transport and disposal, the fly ash is treated using the WES-PHIX® process, which reduces the leaching potential of certain heavy metals by chemically binding the metals in the fly ash.

Fly ash is removed from the APC system and stored on site in a storage silo. The fly ash is periodically loaded from the silo to a trailer, from which a composite sample of fly ash is collected and tested for pH and leachable metals. Once the test results are received and the fly ash is confirmed to be non-hazardous municipal solid waste, the fly ash is disposed of at a landfill.

A summary of all fly ash analytical reports are submitted to the BC Ministry of Environment 4 times per year. These reports will be posted on the website in PDF format. Historical fly ash analytical reports will be available on the website, starting from the date the website becomes live.

The Fly Ash Management Plan, which is being developed as a requirement of the Operational Certificates, provides details on fly ash testing and reporting. The publication plan for fly ash analytical reports will be modified based on the Fly Ash Management Plan once it is complete and has been accepted by the BC Ministry of Environment.

2.4 Bottom Ash Management

Bottom ash is the non-combustible residue left after combustion of waste. Bottom ash is collected in the bottom of the boilers and is removed via a conveyor system. As the bottom ash travels along the conveyor, ferrous metal is removed utilizing a magnetic belt. The metal is sold into the local recycled metals market.

Bottom ash is sent to Vancouver Landfill for disposal. Prior to transport, weekly and daily bottom ash samples are collected by staff at the Waste-to-Energy Facility. Bottom ash is held in stockpiles at the landfill pending confirmation of weekly test results. Once the bottom ash test results confirm the ash meets all regulatory requirements, notice is provided to the landfill to dispose of the bottom ash. The bottom ash results will be posted on the website weekly in PDF format as they are submitted to the BC Ministry of Environment. Historical bottom ash analytical reports will be available on the website, starting from the date the website becomes live.

The Bottom Ash Management Plan, which is being developed as a requirement of the Operational Certificate, will provide more details on bottom ash testing and reporting. The publication plan for bottom

ash analytical reports will be modified based on the Bottom Ash Management Plan once it is complete and has been accepted by the BC Ministry of Environment.

2.5 Monthly and Annual Operating Reports

Monthly and annual operating reports will be submitted to the BC Ministry of Environment and published on the website as PDF reports. Historical monthly and annual operating reports will remain available on the website, starting from the date the website becomes live. Reports from 2017 or earlier can be requested by contacting the Metro Vancouver Info Center directly at icentre@metrovancouver.org.

Monthly operating reports will include CEMS data and performance, information responses to any discharge contaminant exceedances and response limits, instances and responses to combustion temperature falling below the required minimum, and other operational events and responses that occurred during the month. It will also summarize any complaints received and responses by Metro Vancouver. Monthly operating reports will be submitted to the BC Ministry of Environment within 45 days of each month end.

Annual operating reports will include general summaries of information contained in the monthly operating reports, summaries of CEMS and manual stack test emissions data, CEMS calibration data, compliance and complaints information, overview of plant performance, and operational information such as quantities of waste processed, amounts of fly ash and bottom ash and their processing or disposal method. Annual operating reports will be submitted to the BC Ministry of Environment by March 31 of the following year.

More details on these two reports are available in the Monthly Report Publication Plan and the Annual Report Publication Plan as required by the Ministry of Environment.

2.6 Facility Management Plans

The following plans and reports required by the BC Ministry of Environment as conditions of the Operational Certificate will be available as PDF reports on the website, once accepted by the Ministry of Environment. These reports will be amended as needed based on changing operational needs and conditions.

- *Fly Ash Management Plan*
  The Fly Ash Management Plan will include proposed sampling and analytical protocols, sampling frequency, results interpretation process, and protocols for interpreting anomalous data.

- *Bottom Ash Management Plan*
  The Bottom Ash Management Plan will include proposed sampling and analytical protocols, sampling frequency, results interpretation process, and protocols for interpreting anomalous data.

- *Start Up/Shut Down Evaluation*

This report will characterize contaminant emissions including emissions of trace organics, through emissions monitoring to evaluate and predict emissions that occur during facility start up and shut down events.

- *Evaluation of Contaminant Dispersion and Public Health Risk Assessment*
  This report, produced by an independent qualified professional, will evaluate the potential surface deposition of contaminants from the operation of the facility. It will include characterization of contaminant emissions, air dispersion modelling to evaluate potential impacts to air quality, a comprehensive public health risk assessment, assessment of the efficacy of the regional air quality monitoring network to assess potential impacts from facility emissions, an assessment of the effectiveness of monitoring requirements made in the Operational Certificate, and recommendations for sampling or evaluation of receptors such as soil, vegetation or other media.

  Input from the provincial health authorities will be solicited in the development of this report, and the final report will be provided to them for informational purposes.

- *Waste-to-Energy Facility Operational Certificate*

- *Waste-to-Energy Facility Internet Publication Plan*

2.7 Public Feedback and Response

The website will include a contact email and mailing address, so interested and affected parties can provide feedback to Metro Vancouver including questions or complaints about the facility's operation or information presented on the website. Feedback will be responded to in a timely manner. Metro Vancouver will track and consider all feedback received. The feedback and Metro Vancouver's response will be included in the monthly operating reports to the BC Ministry of Environment and will be posted on the website.

Metro Vancouver is committed to continuous improvement of its website based on public input and operational needs or changing conditions.

3.0 Project Timeline

The Waste-to-Energy Facility Internet Publication Plan is required to be submitted to the BC Ministry of Environment by June 15, 2017. The website is anticipated to be live by early 2018.

Figure 1. Internet Publication Plan implementation timeline.

Appendix A

Sample Monthly CEMS Data Table – Historical Daily Averages

The following sample table shows historical daily averages of continuous emissions monitoring system data for one month. This data will be available on the website in Excel format, as described in Section 2.2.2 of this Internet Publication Plan.

Monthly CEMS Data - Daily Averages
Month/Year

	Boiler #1							Boiler #2							Boiler #3						
	SO2	HCl	NOx	CO	Opacity	THC	Furnace	SO2	HCl	NOx	CO	Opacity	THC	Furnace	SO2	HCl	NOx	CO	Opacity	THC	Furnace
Day	(mg/dscm)	(mg/dscm)	(mg/dscm)	(mg/dscm)	(%)	(mg/dscm)	Temp (^{o}C)	(mg/dscm)	(mg/dscm)	(mg/dscm)	(mg/dscm)	(%)	(mg/dscm)	Temp (^{o}C)	(mg/dscm)	(mg/dscm)	(mg/dscm)	(mg/dscm)	(%)	(mg/dscm)	Temp (^{o}C)
1	54	68	126	30.1	0.70	0.01	964	65	73	136	20.9	0.81	0.24	942	66	70	139	29.2	1.30	0.71	909
2	52	71	124	25.3	0.65	0.13	982	65	67	138	21.8	1.57	0.04	977	72	67	129	30.8	1.27	0.72	911
3	58	72	126	31.8	0.68	0.56	970	65	71	145	15.4	1.31	0.06	998	72	73	128	38.4	1.26	0.71	907
4	52	108	123	27.1	0.77	0.68	992	82	83	129	26.9	1.28	0.04	992	93	71	130	28.1	1.24	0.72	937
5	74	57	127	29.1	0.76	0.41	995	70	72	132	22.3	1.29	0.19	991	75	68	132	24.6	1.31	0.75	948
6	37	57	125	15.6	0.66	0.34	1028	79	73	138	26.8	0.51	0.37	936	68	67	129	18.3	1.28	0.71	947
7	51	65	129	19.8	0.67	0.28	998	81	73	138	28.7	0.69	0.56	972	85	71	128	28.8	1.29	0.72	913
8	34	59	125	25.7	0.70	0.23	993	59	72	139	29.5	1.35	0.03	975	61	67	137	30.7	1.33	0.69	928
9	28	53	126	26.8	0.71	0.38	990	55	81	132	25.6	1.34	0.17	990	50	68	132	16.8	1.33	0.68	947
10	53	61	127	17.2	0.71	0.61	998	51	73	131	21.7	1.40	0.54	987	59	79	135	25.5	1.32	0.62	924
11	41	59	130	16.9	0.72	0.65	996	70	77	139	19.7	1.40	2.03	976	67	76	138	42.3	1.30	0.66	876
12	28	56	129	20.9	0.71	2.12	990	59	67	136	22.1	1.40	3.17	992	60	73	131	32.4	1.34	0.62	909
13	56	56	128	24.3	0.72	0.37	995	72	69	131	22.6	1.41	0.06	998	61	72	113	25.7	1.34	0.63	943
14	47	63	127	30.3	0.75	0.34	997	65	63	132	19.5	1.44	0.30	984	57	63	131	23.2	1.43	0.60	940
15	41	72	127	19.8	0.71	0.41	998	66	81	132	25.4	1.43	0.31	997	61	71	130	26.2	1.39	0.64	928
16	50	83	126	22.7	0.72	0.49	994	65	71	139	26.1	1.41	0.23	978	52	65	126	20.8	1.27	0.63	943
17	44	59	127	22.4	0.69	0.50	994	73	61	129	25.7	1.40	0.22	997	52	55	124	25.1	1.33	0.65	956
18	37	56	126	25.8	0.68	0.45	993	62	61	128	21.6	1.41	0.23	992	67	69	126	32.0	1.31	0.61	943
19	38	58	130	27.1	0.62	0.41	992	67	64	130	24.3	1.39	0.28	997	69	66	123	37.0	1.30	0.82	937
20	56	57	125	31.0	0.66	0.42	998	67	67	132	22.3	1.43	0.70	998	114	76	127	31.4	1.43	0.68	952
21	36	57	129	28.8	0.62	0.39	999	62	62	129	23.2	1.33	0.65	999	63	67	125	17.9	1.42	0.70	942
22	24	58	129	23.2	0.63	0.53	999	51	60	128	21.8	1.40	0.68	999	54	73	129	22.0	1.27	0.65	965
23	72	59	127	21.4	0.60	0.55	999	47	60	137	23.3	1.46	0.77	999	55	63	125	22.1	1.32	0.68	972
24	39	69	126	25.9	0.64	0.17	999	82	74	132	22.5	1.46	0.76	998	42	168	126	29.9	1.37	0.77	960
25	43	96	127	20.3	0.63	0.54	999	86	81	135	32.6	1.40	0.66	999	61	70	127	29.6	1.29	0.76	946
26	106	72	128	31.7	0.65	2.03	999	165	88	138	35.6	1.41	0.67	992	121	67	130	32.2	1.31	0.66	935
27	89	72	125	29.9	0.61	3.17	997	105	52	131	29.7	1.45	0.70	994	88	72	129	31.2	1.29	0.67	950
28	64	56	126	23.3	0.82	0.06	995	70	48	113	25.9	1.49	0.71	997	66	74	129	33.9	1.30	0.70	942
29	59	35	130	23.4	0.68	0.30	998	66	68	131	24.4	1.56	0.71	999	51	63	130	27.8	1.33	0.71	961
30	55	27	131	15.9	0.63	0.31	1009	68	60	130	24.6	1.58	0.72	999	62	60	130	23.6	1.32	0.99	970
Limit	200.0	N/A[2]	190.0	50.0	N/A[3]	N/A[1]	800	200.0	N/A[2]	190.0	50.0	N/A[3]	N/A[1]	800	200.0	N/A[2]	190.0	50.0	N/A[3]	N/A[1]	800
Average	50.5		127.0	24.5	0.7		995	71.3		133.0	24.4	1.3		988	67.4		128.9	27.9	1.3		938
Min	24.1		123.2	15.6	0.6		964	46.9		113.0	15.4	0.5		936	42.1		113.0	16.8	1.2		876
Max	105.6		130.6	31.8	0.8		1028	164.5		145.1	35.6	1.6		999	121.1		138.9	42.3	1.4		972
Std. Dev.	17.4	14.8	1.9	4.7	0.1	0.7	10	20.8	8.9	5.5	4.0	0.2	0.6	15	17.3	18.5	4.8	5.9	0.0	0.1	21

N/A[1] Limit not applicable until December 31, 2018

N/A[2] 1-hr Average until December 31, 2022, 24-hr Average and 1/2 hr Response limit thereafter

N/A[3] 1-hr Average until December 31, 2017, 1/2 hr Response limit thereafter

Appendix B

Website Requirements as per the Operational Certificate

The following table lists requirements for a public internet website as defined in Section 3.11.4 of the Operational Certificate, and outlines how each requirement is addressed by this Internet Publication Plan.

Operational Certificate Requirement	**Plan for Publication**
Manual stack test emissions data	✓ PDF reports
Real-time CEMS data relative to the emissions limits included in Section 1.1.3 of the Operational Certificate	✓Continuously updated data table
Fly ash and bottom ash analytical data	✓ PDF reports
Links to facility National Pollutant Release Inventory and Greenhouse Gas data published by the associated regulatory agency	✓ Web link
Compliance and complaints information and response	✓ Monthly and Annual PDF reports
Relevant operational and incident information and response	✓ Monthly and Annual PDF reports
Additional opportunities for dialogue with the community where appropriate	✓ Email and mailing address for submission of feedback, comments, or questions about the published information. Inclusion of feedback and Metro Vancouver responses in the monthly PDF operating reports.
Fly Ash Management Plan; Bottom Ash Management Plan; Start Up/Shut Down Evaluation; Contaminant Dispersion Evaluation and Health Risk Assessment	✓ PDF reports
Any other relevant additional information such as reports, documents, plans, links etc. concerning the facility	✓ PDF reports as required