APPENDIX B

Emission Inventory

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1.0 INTRODUCTION

The emissions sources in the Proposed Thermal Treatment Facility (the Facility) are identified and characterized in this appendix. The Facility emissions are presented for Maximum Continuous Rating (MCR) and Minimum Continuous Turn Down (MCTD) scenarios. The emissions from these scenarios have been assessed for both the initial design capacity (140,000 tonnes per year (tpy)) and a projected maximum design capacity of 400,000 tpy option.

1.1 General Considerations

The preparation of a source and emission inventory involves the systematic identification of sources that discharge gaseous or particulate emissions into the atmosphere, and the characterization of these emission sources in terms of emission type, source type and emission magnitude.

The following items provide an overview of the approach that was adopted for estimating emissions for the Facility:

- At the time this assessment was conducted, the Facility was in a conceptual design phase. Therefore, detailed data on process unit designs, equipment types, process stream compositions, etc., were typically not available. Where manufacturer guarantees on specific CoPCs were not available, reliance was put on applying emissions factors from other incineration facilities which were considered to be conservative surrogates of the expected Facility emissions;
- This assessment focused only on chemical compounds or chemical compound groups that are expected to be emitted in meaningful quantities from the Facility;
- In some cases, there can be a considerable difference between normal emissions and maximum approved emissions for a given facility. This assessment had the primary focus to evaluate the implication of the Facility on local and regional air quality. For this reason, reasonable worst case emission profiles specific to the Facility were evaluated.
- All spatial information characterizing the locations of the emission sources are referenced to the UTM NAD 83 coordinate system.

2.0 PROCESS DESCRIPTION AND SOURCE IDENTIFICATION

In order to quantify the emissions from the Facility, an understanding of the processes and potential emissions sources within the facility is required.

2.1 Process Description

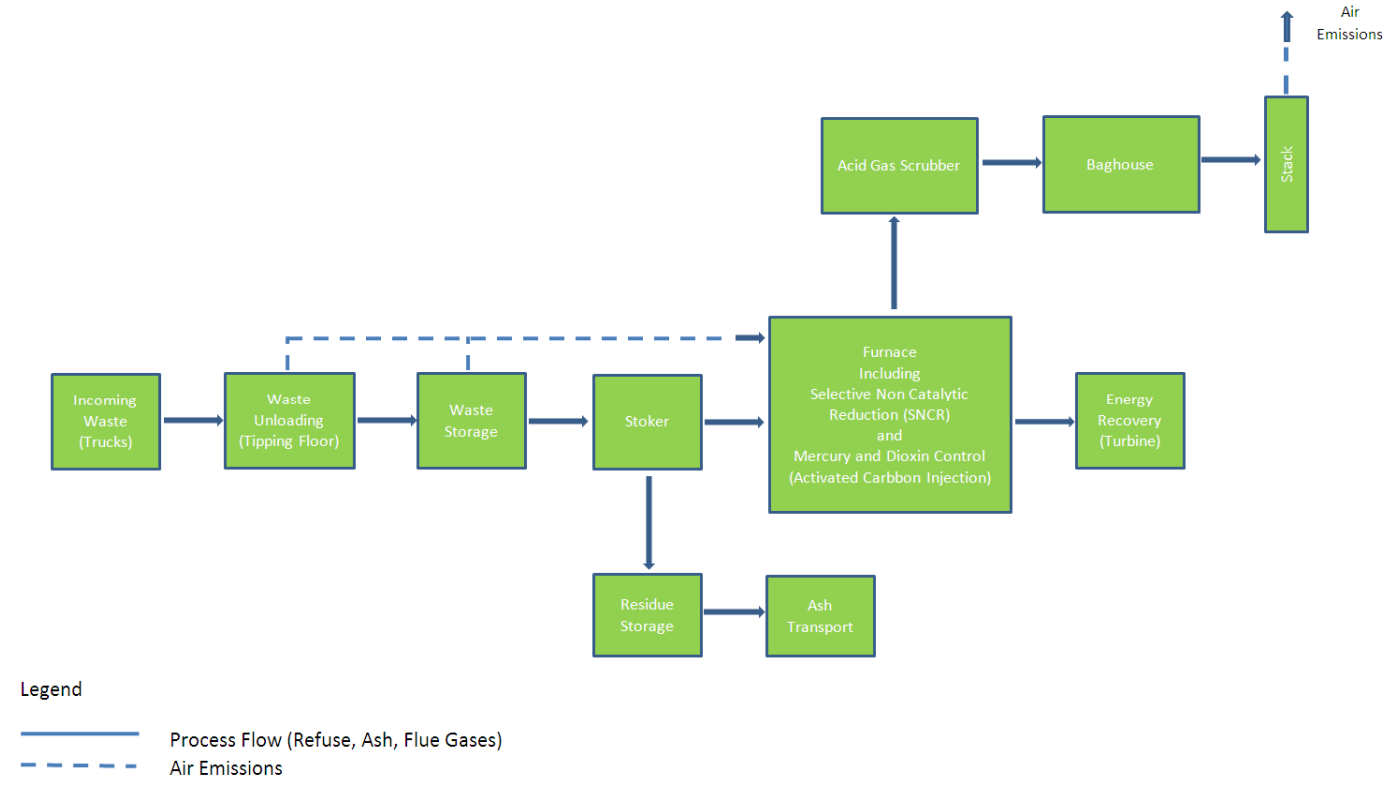
The proposed EFW Facility will process about 140,000 tonnes of municipal solid waste annually during the initial design capacity (140,000 tpy scenario). There will be two completely independent waste processing trains at the Facility. Each train will consist of a feed chute, stoker, integrated furnace/boiler,

acid gas scrubber, a fabric filter baghouse and associated ash and residue collection systems. Steam produced in the boilers will drive a turbine-generator to produce electricity for delivery to the grid, for in-plant use and potentially to provide district heating to the neighbouring Courtice Water Pollution Control Plant and Clarington Energy Park. A detailed process description is provided in Section 4.1 of the main body of this Report.

During the Phase I of the expansion (from the 140,000 tpy scenario to the 250,000 tpy scenario) a second set of boiler and APC equipment along with a third train will be added to the plant. The added boiler will utilize a second flue in the original stack as an exhaust. The final phase of the expansion (Phase II) will increase the capacity from the 250,000 tpy scenario to the 400,000 tpy scenario. Phase II will add a third set of boiler and APC equipment, a tipping building, a refuse building and two additional trains along with a new turbine building to the plant.

Site plans showing the layout of the proposed 140,000 tpy scenario and 400,000 tpy scenario Facility are presented in Figures 4-1 and 4-2 in the main body of this Report. A simplified process flow diagram for the proposed EFW facility is presented in Figure B2-1.

Figure B2-1 Process Flow Diagram of the Proposed EFW Facility



2.2 Source Identification and Significant Sources

Potential emissions sources that were considered in the emissions inventory included the following:

- A conventional stack associated with air pollution control equipment on the waste processing trains which is defined by location, base elevation, stack height, stack diameter, gas exit velocity, gas exit temperature, and contaminant emission rates (the stack typically operates on a continuous basis with relatively constant emission rates);
- One 200-300 kW emergency diesel generator;
- Two 130 kW emergency diesel fire pumps;
- Diesel tanks for the emergency generator and fire pumps;
- On-site vehicle traffic;
- Comfort heating of the administration and support buildings;
- A welding station in the storage and maintenance shop; and,
- Fugitive emissions associated with refuse, fly ash and bottom ash transport and handling.

Of these sources, the following were considered negligible and not included in the modelling:

- Comfort heating – The comfort heating of the support buildings has not been confirmed as to whether it will be natural gas fired or electric. The total number of personnel required to operate the facility is about 32 and the approximate area of administration/maintenance buildings is about 1022 m^2. Based on this number of people and area, the size of the comfort heating of the facility is not expected to exceed the 20-million kJ threshold specified by MOE Guideline A-10 (Table B-3) required for comfort heating to be considered a significant source.
- Welding station – A per MOE Guideline A-10, Table B-3, maintenance welding stations are considered to emit contaminants in negligible amounts.
- Diesel storage tanks - These tanks would be expected to be relatively small and similar in operation and emissions to on-site storage tanks used for fuelling on-site vehicles, which are considered negligible by MOE Guideline A-10 (Table B-3).
- Fugitive emissions - Fugitive emissions (particulate and odour) from material handling will be controlled by:
  - The tipping area will be totally enclosed with two motor operated entrance/exit doors. The doors will remain closed except for when vehicles are entering or exiting the tipping building. Combustion air will be drawn from above the storage pit, which will maintain a negative pressure in the tipping building and help prevent the escape of dust and odour from the Facility. Therefore fugitive emissions from the tipping building are expected to be negligible.
  - The residue storage building and all conveyors external to buildings will be completely enclosed and filtration ventilated.
  - Residue containers or trucks will be loaded in an enclosed building. Residue containers will be enclosed, watertight and covered to avoid emissions while residue is being loaded and transported to the landfill.

- Between the furnace and the residue storage building the residue handling systems will be fully automatic. Sensors will be provided with alarms for readout and recorded on the DCS in the Central Control Room for any system failure.

Although the detailed designs of these mitigation measures were not available at the time of the air quality assessment, it was expected that given the level of mitigation specified above, any PM emissions from fugitive sources would represent less than 5% of total property-wide PM emissions and could therefore be considered insignificant as per Section 7.2.2 of MOE Guideline A-10. Therefore, fugitive emissions were considered negligible.

The following emission sources will be added to the plant during Phase I and II of the expansion:

- A second flue in the first stack for Phase I and a second conventional stack for Phase II associated with air pollution control equipment on the waste processing trains which is defined by location, base elevation, stack height, stack diameter, gas exit velocity, gas exit temperature, and contaminant emission rates;
- A second 200-300 kW emergency diesel generator;

It should be noted that this approach is consistent with the modeling conducted by the MOE in their study “Environmental Risks of Municipal non-Hazardous Waste Landfilling and Incineration” (MOE, 1999). In this study, emissions from only the incinerator stacks were considered.

The Scenarios defined below are considered throughout the rest of this Appendix and the main document:

- Scenario 1 –Facility operating at 100% capacity (MCR);
- Scenario 2 –Facility operating at a reduced rate (75% of full load, MCTD); and,
- Scenario 3 – Routine testing of the emergency diesel generator or emergency diesel fire pumps.

Emissions from both the 140,000 and 400,000 tpy scenario Facility options were estimated for all three scenarios. The nomenclature used to refer to these facility design options in this Report are A and B, respectively. For example, emissions from the 140,000 tpy scenario Facility operating at MCR would be denoted 1A.

3.0 FACILITY EMISSION INVENTORY

The following sections describe the methodologies applied to estimate the proposed Thermal Treatment Facility emissions.

3.1 APC Stack Emissions

Emissions from the stacks due to waste processing would result in emissions of the following contaminants:

- Criteria Air Contaminants (SO_2, NO_2, CO, PM, PM_{10} and $PM_{2.5}$);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Polycyclic Organic Matter (POM);
- Volatile Organic Compounds (VOCs);
- Polycyclic Organic Hydrocarbons (PAHs); and,
- Metals.

The following sections describe the general methodologies and assumptions used to calculate stack emissions for the Facility under normal operating conditions. Process upset emissions are discussed in Section 4.2.3 of the main AQ technical study report.

Data used to estimate emissions from the APC stack were taken from three primary data sources:

1) Manufacturer's guarantees provided by the proponent. The guarantees are the maximum emissions level of a contaminant allowed to be emitted by the proponent.
2) Manufacturer data provided by the proponent. These are emission levels of contaminants measured by the proponent (at maximum load) at one or more of their existing facilities which utilise similar technologies and are therefore expected to be representative of emissions from the proposed facility.
3) Literature data sources for other facilities including U.S. EPA emissions factors and published emissions data from other facilities.

The emissions from the future stack (phase II) are expected to have the same characteristics with regards to the species and concentration of the contaminants as the initial planned stack. The emission methodologies are discussed in detail in the following sections.

3.1.1 Stack Parameters

A summary of the stack parameters is provided in Table B3-1 below. These data were taken from specifications provided by the proponent in their facility and equipment description (Form 5) of the Request for Proposal (RFP) response.

Table B3-1 Summary of Stack Parameters

Scenario	Description	Stack #	Stack Description	Stack Coordinates		Stack Gas Flow Rate (Am^3/s) [2]	Stack Gas Flow Rate (Rm^3/s) [3]	Stack Velocity (Am/s)	Stack Diameter (m)	Stack Height (m)	Stack Temp (C)	Waste Processing Rate (tonne/hour)
				UTM E (m)	UTM N (m)							
Scenario 1 - MCR												
1A	140,000 tpy Facility	1	Main Stack (single flue)	680530.1	4860380.2	40.9	41.3	18	1.7	87.6	132	18.2
1B	400,000 tpy Facility	1	Main Stack (with 2nd flue)	680530.1	4860380.2	73.3	72.9	18	2.3	87.6	132	32.5
		2	Phase II Stack	680443.9	4860349.8	45.3	44.1	18	1.8	87.6	132	19.5
Scenario 2 - MCTD[1]												
2A	140,000 tpy Facility	1	Main Stack (single flue)	680530.1	4860380.2	32.7	33	14.4	1.7	87.6	132	14.6
2B	400,000 tpy Facility	1	Main Stack (with 2nd flue)	680530.1	4860380.2	58.7	58.3	14.4	2.3	87.6	132	26
		2	Phase II Stack	680443.9	4860349.8	36.2	35.2	14.4	1.8	87.6	132	15.6
Scenario 3 – MCR with Emergency Generator Testing												
3A	140,000 tpy Facility	1	Main Stack (single flue)	680530.1	4860380.2	40.9	41.3	18	1.7	87.6	132	18.2
		3	Generator	680472.0	4860456.0	1.2	1.2	1.5	1	2	539	-
3B	400,000 tpy Facility	1	Main Stack (with 2nd flue)	680530.1	4860380.2	73.3	72.9	18	2.3	87.6	132	32.5
		2	Phase II Stack	680443.9	4860349.8	45.3	44.1	18	1.8	87.6	132	19.5
		3	Generator	680472.0	4860456.0	1.2	1.2	1.5	1	2	539	-

Notes:
1. MCTD based on hourly throughput multiplied by number of units and operating time.
2. Am^3/s at 132°C, 101.3 kPa, actual oxygen content.
3. Rm^3/s at 25°C, 101.3 kPa, 11 % O_2, dry basis.

3.1.2 Manufacturer Guarantees

Emissions of contaminants calculated based on manufacturer guarantees of the exhaust emission concentrations are summarized in Table B3-2. The data quality rating of these factors is 'Above Average' as the emission factors provided are based on reference data from similar facilities. These values are the maximum allowable emissions rates of these contaminants and are expected to be conservative as the Facility would be expected to normally operate as emissions levels below the maximum permissible.

The contaminant emission rates presented in Table B3-2 were conservatively calculated using the manufacturer guarantees presented in Table B3-2 and the maximum stack flow rate for each operating Scenario (MCR or MCTD) presented in Table B3-1. A sample calculation is presented below.

Sample Calculation – SO_2 Emissions – Scenario 1 (MCR)

MCR Stack Flow Rate: 41.3 Rm^3/s

Emission Rate (g/s) = SO_2 Emission Factor (mg/Rm^3) x MCR Stack Flow Rate (Rm^3/s) ÷ 1000 (mg/g)

= 35 (mg/Rm^3) x 41.3 (Rm^3/s) ÷ 1000 (mg/g)

= 1.45 g/s

3.1.3 Manufacturer Data

Emissions of contaminants calculated based on manufacturer supplied data for other similar facilities (from source testing) operated by the proponent are summarized in Table B3-3. The data quality rating of these factors is rated as 'Above Average' as the data is based on emissions sampling of other similar facilities operated by the proponent.

Table B3-2 Summary of APC Stack Emissions Based on Manufacturer Guarantees - Scenarios 1 and 2.

Contaminant	CAS	Manufacturer Guarantee		Scenario 1A - MCR 140,000 tpy option		Scenario 2A - MCTD 140,000 tpy option[1]	Scenario 1B – MCR 400,000 tpy option				Scenario 2B – MCTD 400,000 tpy option [1]		
		Emission Factor	Units	Stack 1 (g/s)	Stack 1 (tonne/year)[2]	Stack 1 (g/s)	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)	Stack 1 & 2 (tonne/year)[2]	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)
Sulphur Dioxide (SO_2)	7446-09-5	3.50E+01	mg/Rm^3	1.45	43.70	1.16	2.55	1.54	4.09	123.78	2.04	1.23	3.27
Hydrogen Chloride (HCl)	7647-01-0	9.00E+00	mg/Rm^3	0.37	11.20	0.30	0.66	0.40	1.05	31.83	0.52	0.32	0.84
Hydrogen Fluoride (HF)	7664-39-3	9.00E-01	mg/Rm^3	0.04	1.12	0.03	0.07	0.04	0.11	3.18	0.05	0.03	0.08
Oxides of Nitrogen (NO_x)	10102-44-0	1.21E+02	mg/Rm^3	5.00	151.00	4.00	8.82	5.33	14.15	427.93	7.06	4.26	11.32
Carbon Monoxide (CO)	630-08-0	4.50E+01	mg/Rm^3	1.86	56.20	1.49	3.28	1.98	5.26	159.15	2.62	1.59	4.21
Total Particulate Matter	n/a	9.00E+00	mg/Rm^3	0.37	11.20	0.30	0.66	0.40	1.05	31.83	0.52	0.32	0.84
Organic Matter (as CH_4)	n/a	4.90E+01	mg/Rm^3	2.02	61.20	1.62	3.57	2.16	5.73	173.29	2.86	1.73	4.58
Dioxins (as TEQ Toxic Equivalents)	n/a	6.00E-08	mg/Rm^3	2.48E-09	7.49E-08	1.98E-09	4.37E-09	2.64E-09	7.02E-09	2.12E-07	3.50E-09	2.11E-09	5.61E-09
Cadmium (Cd)	7440-43-9	7.00E-03	mg/Rm^3	2.89E-04	8.74E-03	2.31E-04	5.10E-04	3.08E-04	8.19E-04	0.02	4.08E-04	2.47E-04	6.55E-04
Cadmium and Thallium (Cd + Th)	n/a	4.60E-02	mg/Rm^3	1.90E-03	0.06	1.52E-03	3.35E-03	2.03E-03	5.38E-03	0.16	2.68E-03	1.62E-03	4.30E-03
Lead (Pb)	7439-92-1	5.00E-02	mg/Rm^3	2.06E-03	0.06	1.65E-03	3.64E-03	2.20E-03	5.85E-03	0.18	2.92E-03	1.76E-03	4.68E-03
Mercury (Hg) - Vapour/Particulate phase	7439-97-6	1.50E-02	mg/Rm^3	6.19E-04	0.02	4.96E-04	1.09E-03	6.61E-04	1.75E-03	0.05	8.75E-04	5.29E-04	1.40E-03
Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	4.60E-01	mg/Rm^3	0.02	0.57	0.02	0.03	0.02	0.05	1.63	0.03	0.02	0.04

Notes: 1 – Operation at MCTD would be expected to occur infrequently and for relatively short duration, therefore annual emissions were not calculated for this scenario.

2 – Annual emissions were calculated based on 24 hours per day, 7 days per week and 50 weeks per year operation.

3 – Rm^3 at 25^oC, 101.3 kPa, 11% O_2, dry basis.

Table B3-3 Summary of APC Stack Emissions Based on Manufacturer Data - Scenarios 1 and 2

Contaminant	CAS	Manufacturer Data		Scenario 1A – MCR 140,000 tpy option		Scenario 2A – MCTD 140,000 tpy option[1]	Scenario 1B – MCR 400,000 tpy option				Scenario 2B – MCTD 400,000 tpy option[1]		
		Emission Factor	Units	Stack 1 (g/s)	Stack 1 (tonne/year)[2]	Stack 1 (g/s)	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)	Stack 1 & 2 (tonne/year)[2]	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)
Ammonia (Slip at stack)	n/a	5.40E+03	µg/dscm	2.23E-01	6.74E+00	1.78E-01	0.39	0.24	0.63	19.10	0.31	0.19	0.51
Arsenic	7440-38-2	4.20E-01	µg/dscm	1.73E-05	5.24E-04	1.39E-05	3.06E-05	1.85E-05	4.91E-05	1.49E-03	2.45E-05	1.48E-05	3.93E-05
Chromium (hexavalent)	n/a	3.20E-01	µg/dscm	1.32E-05	4.00E-04	1.06E-05	2.33E-05	1.41E-05	3.74E-05	1.13E-03	1.87E-05	1.13E-05	2.99E-05
Total Chromium (and compounds)	7440-47-3	2.25E+00	µg/dscm	9.29E-05	2.81E-03	7.43E-05	1.64E-04	9.91E-05	2.63E-04	7.96E-03	1.31E-04	7.93E-05	2.11E-04
Selenium	7782-49-2	4.80E-01	µg/dscm	1.98E-05	5.99E-04	1.59E-05	3.50E-05	2.11E-05	5.61E-05	1.70E-03	2.80E-05	1.69E-05	4.49E-05
Acenaphthylene	208-96-8	1.45E-02	µg/dscm	5.99E-07	1.81E-05	4.79E-07	1.06E-06	6.39E-07	1.70E-06	5.13E-05	8.46E-07	5.11E-07	1.36E-06
Acenaphthene	83-32-9	1.86E-02	µg/dscm	7.68E-07	2.32E-05	6.15E-07	1.36E-06	8.20E-07	2.18E-06	6.58E-05	1.08E-06	6.56E-07	1.74E-06
Anthracene	120-12-7	4.07E-03	µg/dscm	1.68E-07	5.08E-06	1.34E-07	2.97E-07	1.79E-07	4.76E-07	1.44E-05	2.37E-07	1.43E-07	3.81E-07
Benzo(a)anthracene	56-55-3	1.50E-03	µg/dscm	6.19E-08	1.87E-06	4.96E-08	1.09E-07	6.61E-08	1.75E-07	5.30E-06	8.75E-08	5.29E-08	1.40E-07
Benzo(b)fluoranthene	205-99-2	3.83E-03	µg/dscm	1.58E-07	4.78E-06	1.27E-07	2.79E-07	1.69E-07	4.48E-07	1.35E-05	2.23E-07	1.35E-07	3.58E-07
Benzo(k)fluoranthene	207-08-9	1.01E-03	µg/dscm	4.17E-08	1.26E-06	3.34E-08	7.36E-08	4.45E-08	1.18E-07	3.57E-06	5.89E-08	3.56E-08	9.45E-08
Benzo(ghi)perylene	191-24-2	4.13E-02	µg/dscm	1.71E-06	5.16E-05	1.36E-06	3.01E-06	1.82E-06	4.83E-06	1.46E-04	2.41E-06	1.46E-06	3.86E-06
Benzo(a)pyrene	50-32-8	3.44E-03	µg/dscm	1.42E-07	4.30E-06	1.14E-07	2.51E-07	1.52E-07	4.02E-07	1.22E-05	2.01E-07	1.21E-07	3.22E-07
Benzo(e)pyrene	192-97-2	8.71E-03	µg/dscm	3.60E-07	1.09E-05	2.88E-07	6.35E-07	3.84E-07	1.02E-06	3.08E-05	5.08E-07	3.07E-07	8.15E-07
Chrysene	218-01-9	3.77E-03	µg/dscm	1.56E-07	4.71E-06	1.25E-07	2.75E-07	1.66E-07	4.41E-07	1.33E-05	2.20E-07	1.33E-07	3.53E-07
Dibenzo(a,h)anthracene	53-70-3	1.21E-03	µg/dscm	5.00E-08	1.51E-06	4.00E-08	8.82E-08	5.33E-08	1.42E-07	4.28E-06	7.06E-08	4.26E-08	1.13E-07
Fluoranthene	206-44-0	4.16E-02	µg/dscm	1.72E-06	5.19E-05	1.37E-06	3.03E-06	1.83E-06	4.87E-06	1.47E-04	2.43E-06	1.47E-06	3.89E-06
Fluorine	7782-41-4	3.13E-02	µg/dscm	1.29E-06	3.91E-05	1.03E-06	2.28E-06	1.38E-06	3.66E-06	1.11E-04	1.83E-06	1.10E-06	2.93E-06
Indeno(1,2,3 – cd)pyrene	193-39-5	7.54E-03	µg/dscm	3.11E-07	9.41E-06	2.49E-07	5.50E-07	3.32E-07	8.82E-07	2.67E-05	4.40E-07	2.66E-07	7.05E-07
2 – methylnaphthalene	91-57-6	5.44E-01	µg/dscm	2.25E-05	6.79E-04	1.80E-05	3.97E-05	2.40E-05	6.36E-05	1.92E-03	3.17E-05	1.92E-05	5.09E-05
Naphthalene	91-20-3	4.23E-01	µg/dscm	1.75E-05	5.28E-04	1.40E-05	3.08E-05	1.86E-05	4.95E-05	1.50E-03	2.47E-05	1.49E-05	3.96E-05
Perylene	198-55-0	1.51E-03	µg/dscm	6.23E-08	1.89E-06	4.99E-08	1.10E-07	6.65E-08	1.77E-07	5.34E-06	8.81E-08	5.32E-08	1.41E-07
Phenanthrene	85-01-8	9.46E-02	µg/dscm	3.91E-06	1.18E-04	3.13E-06	6.90E-06	4.17E-06	1.11E-05	3.35E-04	5.52E-06	3.33E-06	8.85E-06
Pyrene	129-00-0	5.02E-02	µg/dscm	2.07E-06	6.27E-05	1.66E-06	3.66E-06	2.21E-06	5.87E-06	1.78E-04	2.93E-06	1.77E-06	4.70E-06
Benzene	71-43-2	3.10E+01	µg/dscm	1.28E-03	3.87E-02	1.02E-03	2.26E-03	1.37E-03	3.63E-03	0.11	1.81E-03	1.09E-03	2.90E-03

Notes: 1 – Operation at MCTD would be expected to occur infrequently and for relatively short duration, therefore annual emissions were not calculated for this scenario.

2 – Annual emissions were calculated based on 24 hours per day, 7 days per week and 50 weeks per year operation.

3 – dscm at 21^{o}C, 101.3 kPa, 11% O_2, dry basis.

The contaminant emission rates presented in Table B3-3 were conservatively calculated using the manufacturer data presented in Table B3-3 and the maximum stack flow rate for each operating Scenario (MCR or MCTD) presented in Table B3-1. A sample calculation is presented below.

Sample Calculation – Arsenic Emissions – Scenario 1 (MCR)

MCR Stack Flow Rate: 41.3 Rm^3/s

Emission Rate (g/s) = Arsenic Emission Factor (µg/dscm) x [Standard Temp (K)/Reference Temp (K)] x MCR Stack Flow Rate (Rm^3/s) ÷ 1,000,000 (µg/g)

= 0.42 (µg/dscm) x [(273+21) / (273+25)] x 41.3 (Rm^3/s) ÷ 1000000 (µg/g)

= $1.73x10^{-5}$ g/s

3.1.4 Literature Data

Emissions of other CoPCs (primarily trace VOC, CMA, POM and metals) from waste processing were estimated based on available emissions factors from published literature sources. A thorough literature search was conducted, however there is limited publically available data on trace contaminant emissions from municipal waste incinerators. Emissions factors were identified from the following data sources:

- "Durham/York Residual Waste Study – Report on Air Dispersion Modelling", (Genivar and Jacques Whitford, 2007) – based on stack testing at the Algonquin Power EFW plant in Ontario between 2003 and 2005;
- "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration", (MOE, 1999); and,
- Factor Information Retrieval (FIRE) Database (U.S. EPA, 2005d) for municipal waste incinerators.

A summary of the emissions utilized in this study is presented in Table B3-4. As some of the contaminants listed in Table B3-4 had multiple emission factors available in different references, a priority for selecting the emission factor to use was established based on the literature sources in the order listed above. If data was available from the Genivar/Jacques Whitford report or the MOE report, the largest reported emission factor for a particular CoPC from these two sources was utilised. If no data was available from these sources, an emission factor was taken from the US EPA FIRE database if available.

A summary of the emissions estimates calculated from the emissions factors listed in Table B3-4 is presented in Table B3-5.

Table B3-4 Summary of Emissions Factors Taken from Literature Sources

CoPC	Emission Factor	Units	Data Quality	Source
Combustion Gases				
Particulate Matter PM_{10}	9.0	mg/Rm^3	Average	4
Particulate Matter $PM_{2.5}$	9.0	mg/Rm^3	Average	4
Chlorinated Polycyclic Aromatics				
Polychlorinated Biphenyls (PCB)	7.22E-05	mg/Rm^3	Average	1
Metals				
Aluminum	3.98E-02	mg/Rm^3	Average	2
Antimony	2.74E-03	mg/Rm^3	Average	1
Barium	2.11E-03	mg/Rm^3	Average	2
Beryllium	3.33E-04	mg/Rm^3	Average	2
Boron	1.53E-01	mg/Rm^3	Average	1
Cobalt	5.79E-03	mg/Rm^3	Average	2
Nickel	8.71E-02	mg/Rm^3	Average	2
Phosphorus	4.60E-02	mg/Rm^3	Average	2
Silver	3.35E-03	mg/Rm^3	Average	2
Thallium	3.90E-02	mg/Rm^3	Average	5
Tin	1.76E-02	mg/Rm^3	Average	2
Vanadium	1.16E-03	mg/Rm^3	Average	2
Zinc	2.00E-01	mg/Rm^3	Average	2
Chlorinated Monocyclic Aromatics				
1,2-Dichlorobenzene	2.05E-03	mg/Rm^3	Average	2
1,2,4,5-Tetrachlorobenzene	5.15E-05	mg/Rm^3	Average	1
1,2,4 – Trichlorobenzene	5.15E-05	mg/Rm^3	Average	1
2,3,4,6-Tetrachlorophenol	1.74E-04	mg/Rm^3	Average	2
2,4,6-Trichlorophenol	5.23E-05	mg/Rm^3	Average	2
2,4-Dichlorophenol	1.03E-04	mg/Rm^3	Average	1
Pentachlorophenol	2.06E-04	mg/Rm^3	Average	2
Hexachlorobenzene	5.15E-05	mg/Rm^3	Average	1
Pentachlorobenzene	1.35E-04	mg/Rm^3	Average	2

Table B3-4 Summary of Emissions Factors Taken from Literature Sources

CoPC	Emission Factor	Units	Data Quality	Source
Polycyclic Organic Matter				
Benzo(a)fluorene	2.76E-05	mg/Rm^3	Average	2
Benzo(b)fluorene	1.89E-05	mg/Rm^3	Average	2
Biphenyl	2.98E-03	mg/Rm^3	Average	2
Dibenzo(a,c)anthracene	2.68E-05	mg/Rm^3	Average	1
1 – methylnaphthalene	9.82E-05	mg/Rm^3	Average	2
Tetralin	4.99E-04	mg/Rm^3	Average	2
O-terphenyl	8.18E-05	mg/Rm^3	Average	2
Volatile Organic Chemicals (VOC)				
Acetaldehyde	4.30E-09	kg/Mg	Average	3
Bromodichloromethane	1.50E-03	kg/Mg	Average	3
Bromoform	4.11E-04	kg/Mg	Average	3
Bromomethane	3.60E-02	mg/Rm^3	Average	2
Carbon tetrachloride	2.56E-06	kg/Mg	Average	3
Chloroform	5.10E-04	mg/Rm^3	Average	1
Dichlorodifluoromethane	8.71E-02	mg/Rm^3	Average	2
Dichloroethene, 1,1 -	5.65E-04	mg/Rm^3	Average	2
Dichloromethane	1.76E-01	mg/Rm^3	Average	1
Ethylbenzene	1.04E-03	mg/Rm^3	Average	2
Ethylene Dibromide	2.41E-06	kg/Mg	Average	3
Formaldehyde	4.75E-02	mg/Rm^3	Average	1
Tetrachloroethene	5.67E-03	mg/Rm^3	Average	1
Toluene	5.03E-02	mg/Rm^3	Average	2
Trichloroethane, 1,1,1 -	1.43E-03	mg/Rm^3	Average	2
Trichloroethene	4.92E-04	mg/Rm^3	Average	2
Trichloroethylene, 1,1,2 -	4.92E-04	mg/Rm^3	Average	2
Trichlorofluoromethane	1.72E-01	mg/Rm^3	Average	2
Vinyl chloride	4.36E-02	mg/Rm^3	Average	2
Xylenes, m-, p- and o-	6.04E-01	mg/Rm^3	Average	2

Source: 1 – York-Durham Generic Risk Assessment (Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005).
2 – MOE report "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)".
3 – US EPA FIRE Database.
4 – Conservative Assumption that all PM is in the $PM_{2.5}$ size range and using the manufacturer guarantee on filterable PM.
5 – Engineering Calculation.
6 – R/m^3 at 25^{o}C, 101.3 kPa, 11% O_2, dry basis.

Table B3-5 Summary of APC Stack Emissions Based on Emission Factors - Scenarios 1 and 2

Contaminant	CAS	Emission Factor		Scenario 1A - MCR 140,000 tpy option		Scenario 2A – MCTD 140,000 tpy option [1]	Scenario 1B – MCR 400,000 tpy option				Scenario 2B – MCTD 400,000 tpy option[1]		
		Emission Factor	Units	Stack 1 (g/s)	Stack 1 (tonne/year)[2]	Stack 1 (g/s)	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)	Stack 1 & 2 (tonne/year)[2]	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)
Combustion Gases													
Particulate Matter PM_{10}	n/a	9.0	mg/Rm^3	0.37	11.24	0.30	0.66	0.40	1.05	31.83	0.52	0.32	0.84
Particulate Matter $PM_{2.5}$	n/a	9.0	mg/Rm^3	0.37	11.24	0.30	0.66	0.40	1.05	31.83	0.52	0.32	0.84
Chlorinated Polycyclic Aromatics													
Polychlorinated Biphenyls (PCB)	n/a	7.22E-05	mg/Rm^3	2.98E-06	9.01E-05	2.39E-06	5.26E-06	3.18E-06	8.44E-06	2.55E-04	4.21E-06	2.54E-06	6.76E-06
Metals													
Aluminum	7429-90-5	3.98E-02	mg/Rm^3	1.64E-03	0.05	1.31E-03	2.90E-03	1.75E-03	4.65E-03	0.14	2.32E-03	1.40E-03	3.72E-03
Antimony	7440-36-0	2.74E-03	mg/Rm^3	1.13E-04	3.42E-03	9.05E-05	2.00E-04	1.21E-04	3.20E-04	9.69E-03	1.60E-04	9.66E-05	2.56E-04
Barium	7440-39-3	2.11E-03	mg/Rm^3	8.73E-05	2.64E-03	6.99E-05	1.54E-04	9.32E-05	2.47E-04	7.48E-03	1.23E-04	7.45E-05	1.98E-04
Beryllium	7440-41-7	3.33E-04	mg/Rm^3	1.38E-05	4.16E-04	1.10E-05	2.43E-05	1.47E-05	3.90E-05	1.18E-03	1.94E-05	1.17E-05	3.12E-05
Boron	7440-42-8	1.53E-01	mg/Rm^3	6.32E-03	0.19	5.06E-03	0.01	6.74E-03	0.02	0.54	8.92E-03	5.39E-03	0.01
Cobalt	7440-48-4	5.79E-03	mg/Rm^3	2.39E-04	7.23E-03	1.91E-04	4.22E-04	2.55E-04	6.78E-04	0.02	3.38E-04	2.04E-04	5.42E-04
Nickel	7440-02-0	8.71E-02	mg/Rm^3	3.60E-03	0.11	2.88E-03	6.35E-03	3.84E-03	0.01	0.31	5.08E-03	3.07E-03	8.15E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm^3	1.90E-03	0.06	1.52E-03	3.36E-03	2.03E-03	5.38E-03	0.16	2.68E-03	1.62E-03	4.31E-03
Silver	7440-22-4	3.35E-03	mg/Rm^3	1.38E-04	4.18E-03	1.11E-04	2.44E-04	1.48E-04	3.92E-04	0.01	1.95E-04	1.18E-04	3.14E-04
Thallium	7440-28-0	3.90E-02	mg/Rm^3	1.61E-03	0.05	1.29E-03	2.84E-03	1.72E-03	4.56E-03	0.14	2.27E-03	1.37E-03	3.65E-03
Tin	7440-31-5	1.76E-02	mg/Rm^3	7.27E-04	0.02	5.81E-04	1.28E-03	7.75E-04	2.06E-03	0.06	1.03E-03	6.20E-04	1.65E-03
Vanadium	7440-62-2	1.16E-03	mg/Rm^3	4.80E-05	1.45E-03	3.84E-05	8.48E-05	5.12E-05	1.36E-04	4.11E-03	6.78E-05	4.10E-05	1.09E-04
Zinc	7440-66-6	2.00E-01	mg/Rm^3	8.24E-03	0.25	6.59E-03	0.01	8.79E-03	0.02	0.71	0.01	7.03E-03	0.02
Chlorinated Monocyclic Aromatics													
1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm^3	8.45E-05	2.55E-03	6.76E-05	1.49E-04	9.01E-05	2.39E-04	7.23E-03	1.19E-04	7.21E-05	1.91E-04
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm^3	2.13E-06	6.43E-05	1.70E-06	3.75E-06	2.27E-06	6.02E-06	1.82E-04	3.00E-06	1.82E-06	4.82E-06
1,2,4 – Trichlorobenzene	120-82-1	5.15E-05	mg/Rm^3	2.13E-06	6.43E-05	1.70E-06	3.75E-06	2.27E-06	6.02E-06	1.82E-04	3.00E-06	1.82E-06	4.82E-06
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm^3	7.18E-06	2.17E-04	5.74E-06	1.27E-05	7.66E-06	2.03E-05	6.15E-04	1.01E-05	6.13E-06	1.63E-05
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm^3	2.16E-06	6.53E-05	1.73E-06	3.81E-06	2.31E-06	6.12E-06	1.85E-04	3.05E-06	1.84E-06	4.90E-06
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm^3	4.25E-06	1.29E-04	3.40E-06	7.51E-06	4.54E-06	1.20E-05	3.64E-04	6.01E-06	3.63E-06	9.64E-06
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm^3	8.51E-06	2.57E-04	6.81E-06	1.50E-05	9.08E-06	2.41E-05	7.29E-04	1.20E-05	7.27E-06	1.93E-05
Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm^3	2.13E-06	6.43E-05	1.70E-06	3.75E-06	2.27E-06	6.02E-06	1.82E-04	3.00E-06	1.82E-06	4.82E-06
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm^3	5.59E-06	1.69E-04	4.47E-06	9.86E-06	5.96E-06	1.58E-05	4.78E-04	7.89E-06	4.77E-06	1.27E-05

Table B3-5 Summary of APC Stack Emissions Based on Emission Factors - Scenarios 1 and 2

Contaminant	CAS	Emission Factor		Scenario 1A - MCR 140,000 tpy option		Scenario 2A – MCTD 140,000 tpy option [1]	Scenario 1B – MCR 400,000 tpy option				Scenario 2B – MCTD 400,000 tpy option[1]		
		Emission Factor	Units	Stack 1 (g/s)	Stack 1 (tonne/year)[2]	Stack 1 (g/s)	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)	Stack 1 & 2 (tonne/year)[2]	Stack 1 (g/s)	Stack 2 (g/s)	Stack 1 & 2 (g/s)
Polycyclic Organic Matter													
Benzo(a)fluorene	238-84-6	2.76E-05	mg/Rm3	1.14E-06	3.45E-05	9.13E-07	2.01E-06	1.22E-06	3.23E-06	9.77E-05	1.61E-06	9.74E-07	2.59E-06
Benzo(b)fluorene	243-17-4	1.89E-05	mg/Rm3	7.81E-07	2.36E-05	6.25E-07	1.38E-06	8.33E-07	2.21E-06	6.69E-05	1.10E-06	6.67E-07	1.77E-06
Biphenyl	92-52-4	2.98E-03	mg/Rm3	1.23E-04	3.72E-03	9.86E-05	2.17E-04	1.31E-04	3.49E-04	0.01	1.74E-04	1.05E-04	2.79E-04
Dibenzo(a,c)anthracene	215-58-7	2.68E-05	mg/Rm3	1.11E-06	3.35E-05	8.85E-07	1.95E-06	1.18E-06	3.13E-06	9.48E-05	1.56E-06	9.45E-07	2.51E-06
1 – methylnaphthalene	90-12-0	9.82E-05	mg/Rm3	4.05E-06	1.23E-04	3.24E-06	7.16E-06	4.33E-06	1.15E-05	3.47E-04	5.73E-06	3.46E-06	9.19E-06
Tetralin	119-64-2	4.99E-04	mg/Rm3	2.06E-05	6.23E-04	1.65E-05	3.63E-05	2.20E-05	5.83E-05	1.76E-03	2.91E-05	1.76E-05	4.66E-05
O-terphenyl	84-15-1	8.18E-05	mg/Rm3	3.38E-06	1.02E-04	2.70E-06	5.96E-06	3.61E-06	9.57E-06	2.89E-04	4.77E-06	2.88E-06	7.66E-06
Volatile Organic Compounds (VOC)													
Acetaldehyde	75-07-0	4.30E-09	kg/Mg	2.18E-08	6.58E-07	1.75E-08	3.89E-08	2.33E-08	6.22E-08	1.88E-06	3.11E-08	1.86E-08	4.97E-08
Bromodichloromethane	75-27-4	1.50E-03	kg/Mg	7.59E-03	0.23	6.09E-03	0.01	8.13E-03	0.02	0.66	0.01	6.51E-03	0.02
Bromoform	75-25-2	4.11E-04	kg/Mg	2.08E-03	0.06	1.67E-03	3.71E-03	2.22E-03	5.93E-03	0.18	2.97E-03	1.78E-03	4.74E-03
Bromomethane	74-83-9	3.60E-02	mg/Rm^3	1.49E-03	0.04	1.19E-03	2.62E-03	1.59E-03	4.21E-03	0.13	2.10E-03	1.27E-03	3.37E-03
Carbon tetrachloride	56-23-5	2.56E-06	kg/Mg	1.29E-05	3.91E-04	1.04E-05	2.31E-05	1.39E-05	3.70E-05	1.12E-03	1.85E-05	1.11E-05	2.96E-05
Chloroform	67-66-3	5.10E-04	mg/Rm^3	2.11E-05	6.37E-04	1.69E-05	3.72E-05	2.25E-05	5.96E-05	1.80E-03	2.97E-05	1.80E-05	4.77E-05
Dichlorodifluoromethane	75-71-8	8.71E-02	mg/Rm^3	3.59E-03	0.11	2.88E-03	6.35E-03	3.84E-03	0.01	0.31	5.08E-03	3.07E-03	8.15E-03
Dichloroethene, 1,1 -	75-35-4	5.65E-04	mg/Rm^3	2.33E-05	7.06E-04	1.87E-05	4.12E-05	2.49E-05	6.61E-05	2.00E-03	3.30E-05	1.99E-05	5.29E-05
Dichloromethane	75-09-2	1.76E-01	mg/Rm^3	7.27E-03	0.22	5.82E-03	0.01	7.75E-03	0.02	0.62	0.01	6.20E-03	0.02
Ethylbenzene	100-41-4	1.04E-03	mg/Rm^3	4.28E-05	1.29E-03	3.42E-05	7.55E-05	4.56E-05	1.21E-04	3.66E-03	6.04E-05	3.65E-05	9.69E-05
Ethylene Dibromide	106-93-4	2.41E-06	kg/Mg	1.22E-05	3.68E-04	9.77E-06	2.18E-05	1.31E-05	3.48E-05	1.05E-03	1.74E-05	1.04E-05	2.78E-05
Formaldehyde	50-00-0	4.75E-02	mg/Rm^3	1.96E-03	0.06	1.57E-03	3.46E-03	2.09E-03	5.55E-03	0.17	2.77E-03	1.67E-03	4.44E-03
Tetrachloroethene	127-18-4	5.67E-03	mg/Rm^3	2.34E-04	7.08E-03	1.87E-04	4.13E-04	2.50E-04	6.63E-04	0.02	3.31E-04	2.00E-04	5.30E-04
Toluene	108-88-3	5.03E-02	mg/Rm^3	2.08E-03	0.06	1.66E-03	3.66E-03	2.21E-03	5.88E-03	0.18	2.93E-03	1.77E-03	4.70E-03
Trichloroethane, 1,1,1 -	71-55-6	1.43E-03	mg/Rm^3	5.89E-05	1.78E-03	4.72E-05	1.04E-04	6.29E-05	1.67E-04	5.05E-03	8.32E-05	5.03E-05	1.34E-04
Trichloroethene	79-01-6	4.92E-04	mg/Rm^3	2.03E-05	6.14E-04	1.62E-05	3.58E-05	2.17E-05	5.75E-05	1.74E-03	2.87E-05	1.73E-05	4.60E-05
Trichloroethylene, 1,1,2	79-01-6	4.92E-04	mg/Rm^3	2.03E-05	6.14E-04	1.62E-05	3.58E-05	2.17E-05	5.75E-05	1.74E-03	2.87E-05	1.73E-05	4.60E-05
Trichlorofluoromethane	75-69-4	1.72E-01	mg/Rm^3	7.11E-03	0.22	5.69E-03	0.01	7.59E-03	0.02	0.61	0.01	6.07E-03	0.02
Vinyl chloride	75-01-4	4.36E-02	mg/Rm^3	1.80E-03	0.05	1.44E-03	3.18E-03	1.92E-03	5.10E-03	0.15	2.54E-03	1.54E-03	4.08E-03
Xylenes, m-, p- and o-	n/a	6.04E-01	mg/Rm^3	0.02	0.75	0.02	0.04	0.03	0.07	2.14	0.04	0.02	0.06

Notes: 1 – Operation at MCTD would be expected to occur infrequently and for relatively short duration, therefore annual emissions were not calculated for this scenario.
2 – Annual emissions were calculated based on 24 hours per day, 7 days per week and 50 weeks per year operation.
3 – R/m^3 at 25^{o}C, 101.3 kPa, 11% O_2, dry basis.

The contaminant emission rates presented in Table B3-5 were calculated using the emission factors presented in Table B3-4 and the maximum stack flow rate or processing rate for each operating Scenario (MCR or MCTD) presented in Table B3-1. A sample calculation is presented below.

Sample Calculation – Aluminum Emissions – Scenario 1 (MCR)

MCR Stack Flow rate: 41.3 Rm^3/s

Emission Rate (g/s) = Aluminum Emission Factor (mg/Rm^3) x MCR Stack Flow Rate (Rm^3/s) ÷ 1000 (mg/g)

= 0.039 (mg/Rm^3) x 41.3 (Rm^3/s) ÷ 1000 (mg/g)

= 1.64×10^{-3} g/s

It should be noted that when deriving emission factors from the literature references, if the actual percent oxygen of the flue gas was not provided, it was assumed to be 11% O_2. This is expected to be a conservative assumption as most combustion sources operate with flue gas oxygen percentages less than 11% and converting from a lower to a higher percent O_2 would reduce the contaminant concentration. Therefore, not including an O_2 conversion results in conservative (i.e. high) estimates of contaminant concentrations at reference conditions (11% O_2).

Of the 118 CoPCs initially identified as having a potential for being emitted from the EFW operations, no emissions data was identified in the literature for 28 contaminants. These contaminants are listed in Table B3-6.

Table B3-6 List of CoPCs without Emission Factors

CoPC	CAS #
Polycyclic Organic Matter	
2-chloronaphthalene	91-58-7
Coronene	191-07-1
Dibenzo(a,e)pyrene	192-65-4
9,10 – dimethylanthracene	781-43-1
7,12 – dimethylbenzo(a)anthracene	57-97-6
2 – methylanthracene	613-12-7
3 – methylcholanthrene	56-49-5
1 – methylphenanthrene	832-69-9
9 – methylphenanthrene	883-20-5
Picene	213-46-7
Quinoline	91-22-5
Triphenylene	217-59-4
M-terphenyl	92-06-8
P-terphenyl	92-94-4

Table B3-6 List of CoPCs without Emission Factors

CoPC	CAS #
Volatile Organic Chemicals (VOC)	
Acetone	67-64-1
Acrolein	107-02-8
Butadiene, 1,3 -	106-99-0
Butanone, 2 -	78-93-0
Cumene	98-82-8
Dibromochloromethane	124-48-1
Dichloroethane, 1,2 -	107-06-2
Dichloroethane, trans – 1,2 -	n/a
Dichloropropane, 1,2 -	78-87-5
Mesitylene	108-67-8
Styrene	100-42-5
Trichlorotrifluoroethane	76-13-1
Phthalates	
DEHP	117-81-7
Other	
Phosphorus Pentachloride	10026-13-8

3.1.4.1 Comparisons between Literature Data and Manufacturer's Data

Out the total of 90 CoPCs which were evaluated in this study, emissions of 38 were derived from manufacturer specifications or manufacturer supplied data from other similar facilities operated by their company. Emissions of the remaining 52 CoPCs were estimated based on emissions data available from literature sources. The literature data were for facilities which were of various capacities, incinerator types and older vintages, while the Facility will utilize the most recent APC technology. Emissions from the Facility are therefore expected to be lower than those for older vintage facilities, regardless of type and capacity.

This expectation was evaluated by comparing emissions factors for contaminants for which both manufacturer's data and literature emissions factors were available. This comparison can provide an indication of the level of conservatism expected for the CoPC emissions factors for which no manufacturer data was available and were therefore taken from literature.

The results of this comparison are summarized in Table B3-7. In this table, the manufacturer data and the emission factor that would be applied from the literature data sources (following the preference in data sources noted in Section 3.1.4). The comparison shows that for 24 of the 28 air contaminants

(85% of the contaminants), the emission factors from literature were at least 1.6 times higher than the manufacturer's emission factors. This comparison suggests that the literature data emissions factors utilised in this study were generally conservative.

Table B3-7 Comparison of Literature and Manufacturer Emissions Factors

Contaminant	EF Units	Manufacturer Emission Factor	Literature Emission Factor	Ratio of Literature Data to Manufacturer Data
Sulphur Dioxide (SO_2)	mg/Rm^3	35	56.0	160%
Hydrogen Chloride (HCl)	mg/Rm^3	9	436.7	4852%
Hydrogen Fluoride (HF)	mg/Rm^3	0.9	0.02	3%
Oxides of Nitrogen (NO_X)	mg/Rm^3	121	3606.7	2981%
Carbon Monoxide (CO)	mg/Rm^3	45	22.6	50%
Total Particulate Matter	mg/Rm^3	9	29.9	332%
Dioxins (as TEQ Toxic Equivalents)	mg/Rm^3	6E-08	3.64E-07	606%
Arsenic	mg/Rm^3	4.20E-04	7.93E-04	189%
Cadmium (Cd)	mg/Rm^3	0.007	0.01	200%
Chromium (hexavalent)	mg/Rm^3	3.20E-04	1.27E-03	397%
Lead (Pb)	mg/Rm^3	0.05	0.3	522%
Mercury (Hg) - Vapour/Particulate phase	mg/Rm^3	0.015	0.5	3062%
Selenium	mg/Rm^3	4.80E-04	1.90E-03	396%
Acenaphthylene	mg/Rm^3	1.50E-05	2.06E-04	1422%
Acenaphthene	mg/Rm^3	1.90E-05	9.53E-05	512%
Anthracene	mg/Rm^3	4.10E-06	2.68E-05	658%
Benzo(a)anthracene	mg/Rm^3	1.50E-06	2.68E-05	1787%
Benzo(b)fluoranthene	mg/Rm^3	3.80E-06	2.68E-05	700%
Benzo(k)fluoranthene	mg/Rm^3	1.00E-06	2.68E-05	2653%
Benzo(ghi)perylene	mg/Rm^3	4.10E-05	2.68E-05	65%
Benzo(a)pyrene	mg/Rm^3	3.40E-06	2.68E-05	779%
Chrysene	mg/Rm^3	3.80E-06	2.68E-05	711%
Indeno(1,2,3 – cd)pyrene	mg/Rm^3	7.50E-06	2.68E-05	355%
2 – methylnaphthalene	mg/Rm^3	5.40E-04	2.75E-04	51%
Naphthalene	mg/Rm^3	4.20E-04	1.40E-03	331%
Phenanthrene	mg/Rm^3	9.50E-05	6.13E-04	648%
Pyrene	mg/Rm^3	5.00E-05	3.81E-04	758%
Benzene	mg/Rm^3	3.10E-02	2.7	8759%

3.2 Emergency Diesel Equipment

The emergency equipment on the site will include an emergency diesel backup generator (with an additional one for the 400,000 tpy scenario) with an electrical power rating of 200-300 kW (0.2-0.3 MW) and two diesel fire water pumps with an electrical rating of 130 kW (0.13 MW). Stack parameters and emissions from this equipment are presented below.

3.2.1 Stack Parameters

The diesel fire water pumps are used to increase water pressure for firefighting purposes in the event of an emergency and will require routine maintenance testing for approximately 30 minutes each month. Based on information from the vendor, it is expected that two 130 kW units will be required for this facility.

The use of the fire water pumps, as well as the emergency generators, will be limited to emergencies and scheduled maintenance testing, with the testing of each piece of equipment occurring on different days. Since operation of all three units are not expected to occur simultaneously and since the 0.3 MW-rated emergency generator has a greater capacity than the 0.13 MW-rated fire water pumps, assessing the potential changes in air quality due to emissions from the emergency generator represented the potential worst-case scenario during routine plant operation. The emissions from the emergency generator provide a conservative envelope for potential emissions from the diesel fire water pumps, and, thus, emissions from the diesel fire water pumps were not modelled.

The emergency diesel generator specifications are shown in Table B3-8. A Caterpillar diesel generator with the same electrical power rating was selected to represent the one on site as this brand was provided as a potential supplier for the generator by the proponent.

Table B3-8 Stack Parameters for Diesel Generator Testing

Source[1]	Electrical Power Rating (kW)	Temperature (K)	Flow Rate (Am^3/s)	Exit Velocity (m/s)	Stack Diameter (m)	Stack Height above Ground (m)
Diesel-Powered Generator	300	539	1.16	36.8	0.2	2

1. Parameters based on Caterpillar 3406c 300 ekW 60 Hz standby diesel generator

The diesel generator was conservatively assumed to emit to the atmosphere through a horizontal stack, which will result in less dispersion than a vertical exhaust and therefore high ground level concentrations. Equivalent stack parameters for the dispersion modelling, including the exit velocity and stack diameter, were estimated using the methodology provided in the MOE Guideline A-11 “Air Dispersion Modelling Guideline for Ontario” (MOE, 2009a) and are provided in Table B3-9.

Table B3-9 Equivalent Stack Parameters for Diesel Generator Emissions Modelling

Source	Temperature (K)	Flow Rate (Am^3/s)	Exit Velocity (m/s)	Stack Diameter (m)	Stack Height above Ground (m)
Diesel-Powered Generator	539	1.16	1.47	1.0	2

3.2.2 Emission Rate Estimation

Emission rates for the main contaminants of concern from the diesel generator were estimated based on the US EPA AP-42 emission factors. A summary of the estimated emission rates is provided in Table B3-10.

Table B3-10 Emission Rates from Emergency Diesel Generator Testing

Source	Electrical Power Rating (kW)	Mechanical Power Rating (kW)	Contaminant	Emission Factor (kg/kW-h)	Data Quality Rating	Reference	Emission Rate (kg/hr)	Emission Rate (g/s)
Backup diesel generator	300	429	NO_x	1.88E-02	D	AP-42 Ch. 3.3-1	8.1	2.24
			CO	4.06E-03	D	AP-42 Ch. 3.3-1	1.7	0.48
			PM	1.34E-03	D	AP-42 Ch. 3.3-1	0.6	0.16
			SO_2	1.25E-03	D	AP-42 Ch. 3.3-1	0.5	0.15
			TOC	1.50E-03	D	AP-42 Ch. 3.3-1	0.6	0.18

A sample calculation is presented below.

Sample Calculation – NO_x Emissions – Emergency Diesel Generator Testing

Emission Rate (kg/hr) = NO_x Emission Factor (kg/kW-hr) x Mechanical Power Rating (kW)

= $1.88x10^{-2}$ (kg/kW-hr) x 429 (kW)

= 8.1 kg/hr

3.3 Vehicle Emissions

3.3.1 On-Site Vehicles

The vehicle operations on the site can be divided into two categories:

- Passenger cars; and,
- Waste trucks.

The number of vehicles and operating hours were developed using the same methodology as was used in the "*Traffic Assessment – Technical Study Report*", (URS, 2007) for a 400,000tpy scenario Facility. The report "*Application of Short-List Evaluation Criteria, Report on Estimate of Number of Additional Vehicles*", (Genivar and Jacques Whitford, 2007) also estimated vehicle traffic for several Thermal Treatment Facilities ranging from 150,000 tpy to 400,000 tpy, which were consistent with the values used in this assessment.

It was assumed that a total number of 77 waste trucks will be operating on the site between 8am and 4pm, with approximately half of deliveries occurring between the hours of 8am to 10am and 2pm to 4pm. Based on the provided data, it was assumed that 46 employee passenger vehicles will be driven onsite at different hours of the day corresponding to the beginning of each shift at the Facility. Since the operating hours and number and type of vehicles at each hour during the day was not constant, emission rates for each hour were estimated separately based on the number and type of the vehicles during that hour.

A table summarizing vehicle characteristics is presented below (Table B3-11).

Table B3-11 Vehicle Characteristics

Vehicle Description	MOBILE6.2C Vehicle Type	Vehicle Usage (days/wk)	Number of Vehicles (vehicles/ day)	Vehicle Width (m)	Vehicle Length (m)	Vehicle Height (m)	Release Height (m)	Average Speed (km/h)	Average Vehicle Weight (tonnes)
Waste Truck	Class 8A Heavy Duty Diesel Vehicle	7	77	2.5	21	4	2	15	30
Employee Vehicles	Light Duty Gasoline Vehicles	7	46	1	2.5	1	0.5	15	1.5

3.3.1.1 Vehicle Tailpipe Emissions

Emission rates for light passenger vehicles (Light Duty Gasoline Vehicle "LDGV") and trucks (Heavy Duty Diesel Vehicle "HDDV") were estimated using the MOBILE6.2C vehicle emissions software with the following assumptions:

- Onsite vehicle speed = 15 km/h.
- Fuel RVP = 62 kPa =9.0 psi.
- Max ave. temperature = 11.8 °C (from meteorological data)
- Min ave. temperature = 3.6 °C (from meteorological data)
- Absolute humidity = 48.7 grains/lb.

Emission rates from MOBILE6.2C for waste trucks (including while idling) and passenger vehicles are presented in Tables B3-12 to B3-14. It was assumed that approximately 52% of truck traffic occurred during the hours of 8-10am and 2-4pm.

Table B3-12 Emissions from the Waste Trucks Travelling on the Site

Waste Delivery Truck Emissions				Mon - Fri (8-10 & 14-16)		Mon - Fri (10-14)	
Pollutant	MOBILE6 Travelling Truck Exhaust Emissions	Truck Exhaust Emissions	Average Distance Travelled at Facility	Frequency of Trucks at Facility	Proposed Durham/ York EFW Facility	Frequency of Trucks at Facility	Proposed Durham/York EFW Facility
	(g/mi)	(g/km)	(km/truck)	(trucks/ second)	g/s	(trucks/ second)	g/s
Particulate Matter PM_{10}	0.19	0.12	1.6	2.78E-03	5.32E	2.57E-03	4.92E-04
Particulate Matter $PM_{2.5}$	0.15	0.096	1.6	2.78E-03	4.24E	2.57E-03	3.93E-04
Carbon Monoxide	4.2	2.61	1.6	2.78E-03	1.16E	2.57E-03	1.07E-02
Nitrogen Oxides (as NO_2)	7.9	4.90	1.6	2.78E-03	2.18E	2.57E-03	2.01E-02
Sulphur Dioxide	0.013	0.008	1.6	2.78E-03	3.65E	2.57E-03	3.37E-05

Sample Calculation – CO Emissions from Waste Truck Traffic During Peak Hours

CO Emission Rate = MOBILE6c Emission Rate [g/mi] x 0.621 [mi/km] x Average Distance Travelled [km/truck] x # of Trucks [truck] x Fraction of Traffic During Peak Hours ÷ # of Hours ÷ 3600 [second/hour]

= 4.199 [g/mi] x 0.621 [mi/km] x 1.6 [km/truck] x 77 [trucks] x 40/77 [trucks] ÷ 4 ÷ 3600 [second/hour]

= 1.6×10^{-2} g/s

Table B3-13 Emissions from the Waste Trucks Idling

Idling Emissions from Waste Trucks		Mon - Fri (8-10 & 14-16) *	Mon - Fri (10-14) *
Pollutant	MOBILE6c Idling Truck Exhaust Emissions	Proposed Durham/York EFW Facility	Proposed Durham/York EFW Facility
	(g/hr)	g/s	g/s
Particulate Matter PM_{10}	1.12	1.56E-03	1.56E-03
Particulate Matter $PM_{2.5}$	1.03	1.44E-03	1.44E-03

Notes:
* During both peak and non-peak traffic times, it is estimated that 5 waste delivery trucks are idling on-site

Passenger vehicle traffic was calculated by diving to the total vehicle traffic into two hours per day during shift changes (two shifts per day). A summary of passenger vehicle emissions is presented in Table B3-14.

Table B3-14 Emissions from the Passenger Vehicles

Employee Passenger Vehicles				Mon - Sun	
Pollutant	MOBILE6c Travelling Car Exhaust Emissions	Car Exhaust Emissions	Average Distance Travelled at Facility	Frequency of cars at Facility	Proposed Durham/York EFW Facility
	(g/mi)	(g/km)	(km/car)	(cars/second)	g/s (per shift)
Particulate Matter PM_{10}	0.02	1.55E-02	1.6	1.60E-03	1.58E-04
Particulate Matter $PM_{2.5}$	0.01	7.02E-03	1.6	1.60E-03	7.18E-05
Carbon Monoxide	15.65	9.72E+00	1.6	1.60E-03	9.94E-02
Nitrogen Oxides (as NO_2)	0.80	4.95E-01	1.6	1.60E-03	5.06E-03
Sulphur Dioxide	0.01	3.48E-03	1.6	1.60E-03	3.56E-05

Sample Calculation – CO Emissions from Passenger Vehicle Traffic

CO Emission Rate = MOBILE6c Emission Rate [g/mi] x 0.621 [mi/km] x Average Distance Travelled [km/car] x # of Cars [car/shift] ÷ # of Hours ÷ 3600 [second/hour]

= 15.65 [g/mi] x 0.621 [mi/km] x 1.6 [km/car] x 46 ÷ 2 [cars] ÷ 1 ÷ 3600 [second/hour]

= 9.9×10^{-2} g/s

3.3.1.2 On-Site Vehicle Road Dust Emissions

In addition to tailpipe emissions from the on-site traffic, road dust emissions were calculated based on the US EPA AP-42 Chapter 13.2-1 for paved roads using the following equation:

$$E = k\,(sL/2)^{0.65} \times (W/3)^{1.5} - C$$

where,

- k is the particle size multiplier for particle size range and units of interest;
- sL is the road surface silt loading (grams per square meter) (g/m^2);
- W is the average weight (tons) of the vehicles traveling the road; and,
- C is the emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

It was assumed that road dust emissions from passenger cars on the site were negligible. Table B3-15 summarizes the road dust calculations from truck traffic onsite.

Table B3-15 Road Dust Emissions from the On-Site Truck Traffic

Contaminant	Average Vehicle Weight	Emission Constants		Silt Content	Emission Factor	
	(Empty and Loaded Trucks)	k	C - Emission factor for exhaust brake wear and tire wear			
	(Tonnes)	(lb./VMT)	(lb./VMT)	(g/m^2)	(lb./VMT)	(g/VKT)
PM	19	0.082	0.00047	0.4	0.41	115
PM_{10}	19	0.016	0.00047	0.4	0.08	22
$PM_{2.5}$	19	0.0024	0.00036	0.4	0.01	3

Sample Calculation – PM Road Dust Emissions from Truck Traffic

PM Emission Rate = $k\ (sL/2)^{0.65} \times (W/3)^{1.5} - C$

= $0.082 \times (0.4/2)^{0.65} \times (19 \times 0.908\ [ton/tonne] \div 3)^{1.5} - 0.00047$

= 0.41 lb/VMT

= 115 g/VMT

In order to calculate the total emission from the roads including tailpipe and road dust for all onsite vehicles, the hourly emissions for each hour were added together. Table B3-16 summarizes the combined vehicle emissions.

Table B3-16 Total Facility Emissions (g/s) from the Onsite Traffic

Hour of Day	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_2	CO
24	0	0	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	1.58E-04	1.58E-04	7.18E-05	3.56E-05	5.06E-03	9.94E-02
8	2.57E-01	5.17E-02	9.12E-03	3.65E-05	2.18E-02	1.16E-02
9	2.57E-01	5.17E-02	9.12E-03	3.65E-05	2.18E-02	1.16E-02
10	2.38E-01	4.79E-02	8.54E-03	3.37E-05	2.01E-02	1.07E-02
11	2.38E-01	4.79E-02	8.54E-03	3.37E-05	2.01E-02	1.07E-02
12	2.38E-01	4.79E-02	8.54E-03	3.37E-05	2.01E-02	1.07E-02
13	2.38E-01	4.79E-02	8.54E-03	3.37E-05	2.01E-02	1.07E-02
14	2.57E-01	5.17E-02	9.12E-03	3.65E-05	2.18E-02	1.16E-02
15	2.58E-01	5.18E-02	9.19E-03	7.20E-05	2.68E-02	1.11E-01
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
22	0	0	0	0	0	0
23	0	0	0	0	0	0

3.3.2 Offsite Vehicles

The effects of increased offsite traffic from the Facility were estimated using the US EPA CAL3QHCR dispersion model. The methodology of this modelling is explained in detail in **Appendix E**. The emission rates used in CAL3QHCR modelling are discussed this section.

The increased truck and passenger vehicle traffic on the highway and local routes in the vicinity of the Facility are similar to the onsite traffic discussed in the previous subsection. Similar to onsite traffic it was assumed that a total number of 77 trucks along with 46 passenger cars will travel to the Site (Table B3-11). The hourly distribution of these vehicles would be the same as that for the onsite traffic.

Emission rates for light passenger vehicles (Light Duty Gasoline Truck "LDGT12" and Light Duty Gasoline Vehicle "LDGV") and trucks (Heavy Duty Diesel Vehicle "HDDV") were estimated using the MOBILE6.2C vehicle emissions software with the following assumptions:

- Vehicle speed - variable depending on posted speed limits;
- Fuel RVP = 62 kPa =9.0 psi.
- Max ave. temperature = 11.8 °C (from meteorological data)
- Min ave. temperature = 3.6 °C (from meteorological data)
- Absolute humidity = 48.7 grains/lb.

Offsite vehicle emission rates calculated using MOBILE6.2C are presented in Tables B3-17 to B3-19.

Table B3-17 Emissions from MOBILE6.2C for HDDV

Speed km/h	HDDV					
	g/veh-mile/vehicle					
	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	VOC
10	5.183	8.685	0.0132	0.1197	0.1537	0.949
50	1.403	5.397	0.0132	0.1926	0.1537	0.374
60	1.202	5.418	0.0132	0.1926	0.1537	0.322
100	1.362	10.635	0.0132	0.1926	0.1537	0.25

Table B3-18 Emissions from MOBILE6.2C for LDGV

Speed km/h	LDGV					
	g/veh-mile/vehicle					
	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	VOC
10	18.73	0.886	0.0056	0.0249	0.0113	1.433
50	11.92	0.572	0.0057	0.0248	0.0113	0.627
60	12.11	0.569	0.0057	0.0248	0.0113	0.601
100	14.41	0.64	0.0057	0.0248	0.0113	0.549

Table B3-19 Emissions from MOBILE6.2C for LDGT12

Speed km/h	LDGT12					
	g/veh-mile/vehicle					
	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	VOC
10	20.32	1.165	0.0073	0.0249	0.0113	1.573
50	13.41	0.771	0.0073	0.0249	0.0113	0.733
60	13.61	0.767	0.0073	0.0248	0.0113	0.706
100	16.03	0.846	0.0073	0.0248	0.0113	0.658

Current vehicle emission rates on the highway and local routes were estimated by combining the truck and passenger vehicle emissions based on an assumed 85% light duty (LDGT12) and 15% heavy duty (HDVV) traffic. The result of the combined emission rates are presented in Table B3-20.

Table B3-20 Combined Light and Heavy Duty Emissions (Current Conditions)

Speed km/h	Background Off Site Emissions - 85% LDGT12, 15% HDDV					
	g/veh-mile/vehicle					
	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	VOC
10	18.05	2.29	0.01	0.04	0.03	1.48
50	11.61	1.46	0.01	0.05	0.03	0.68
60	11.75	1.46	0.01	0.05	0.03	0.65
100	13.83	2.31	0.01	0.05	0.03	0.60

The increased emissions due to the Facility were estimated using LDGV and HDDV emission rates and the number of vehicles travelling to the Site at each hour in a fashion similar to the onsite traffic analysis.

3.4 Identification of Sources/Contaminants

The general types of emission sources and expected contaminants of concern for the Facility are presented in Table B3-21.

Table B3-21 Source and Contaminant Identification Table

Source Information		Expected Contaminant	Included in Modelling?	Rationale
Source Description	General Location[1]		Significant (Yes/No)	
Stack	Facility Site	Products of Combustion/VOCs/ PAHs/Metals/PCBs	Y	Main emissions source from the facility
Emergency Diesel-Fired Equipment	Facility Site	Products of Diesel combustion	Y	Potential for short-term NO_X
Onsite Traffic	Facility Site Roads	PM/CO/SO_2/NO_x	Y	Potential impacts uncertain therefore included
Diesel tanks for the emergency generator and fire pumps	Facility Site	Diesel fumes	N	Negligible as per Guideline A-10
Comfort heating of the administration and support buildings	Facility Site	Products of natural gas combustion	N	Negligible as per Guideline A-10
A welding station in the storage and maintenance shop	Facility Site	Particulate/metals	N	Negligible as per Guideline A-10
Refuse handling and storage fugitive emissions	Facility Site	PM/odour	N	Expected to be less than 5% of facility PM emissions, therefore negligible as per Guideline A-10

3.5 Maximum Emissions Scenario

The following conservative assumptions were utilised in developing the maximum emissions scenario modelled for the Baseline and Facility:

- Maximum hourly emission rates were used to predict daily and annual average ambient contaminant concentrations.
- The emission factors chosen to estimate emission rates of contaminants with no manufacturer data were the maximum of all references identified.

3.6 Source Summary Tables

Source summary tables following the requirements of MOE Guideline A-10 are presented in Attachments B2 to B4 for Operating Scenarios 1 to 3 respectively.

3.7 Lifetime Facility Emissions

The anticipated emissions emitted from Facility-related process and vehicle emissions over the approximate lifetime of the facility (30 years), is provided in Table B3-22 below.

Table B3-22 Source and Contaminant Identification Table

Air Contaminant	CAS Number	Facility Emissions (tonnes) over 30-Year Lifetime				
		Stack Emissions 140,000 tpy	Stack Emissions 400,000 tpy	On-site Vehicles	Total 140,000 tpy facility	Total 400,000 tpy facility
Sulfur Dioxide (SO_2)	7446-09-5	1311	3713	0.29	1311	3714
Hydrogen Chloride (HCl)	7647-01-0	337	955	-	337	955
Hydrogen Fluoride (HF)	7664-39-3	34	95	-	34	95
Oxides of Nitrogen (NO_X)	10102-44-0	4532	12838	161	4694	12999
Carbon Monoxide (CO)	630-08-0	1686	4774	155	1840	4929
Particulate Matter PM_{10}	n/a	337	955	475 [1]	812	1430
Particulate Matter $PM_{2.5}$	n/a	337	955	78 [1]	415	1033
Total Particulate Matter (PM)	n/a	337	955	2399 [1]	2736	3353
Ammonia (Slip at stack)	n/a	202	573	-	202	573
Organic Matter (as CH_4)	n/a	1835	5199	-	1835	5199
Dioxins (as TEQ Toxic Equivalents)	n/a	2.2E-06	6.37E-06	-	2.2E-06	6.37E-06
Polychlorinated Biphenyls (PCB)	n/a	2.7E-03	7.66E-03	-	2.7E-03	7.66E-03
Aluminum	7429-90-5	1.5	4	-	1.5	4
Antimony	7440-36-0	0.10	2.91E-01	-	0.10	2.91E-01
Arsenic	7440-38-2	0.016	4.46E-02	-	0.016	4.46E-02
Barium	7440-39-3	0.079	2.24E-01	-	0.079	2.24E-01
Beryllium	7440-41-7	0.012	3.53E-02	-	0.012	3.53E-02
Boron	7440-42-8	5.7	16	-	5.7	16
Cadmium (Cd)	7440-43-9	0.26	7.43E-01	-	0.26	7.43E-01
Cadmium and Thallium (Cd + Th)	n/a	1.7	5	-	1.7	5
Chromium (hexavalent)	7440-47-3	0.012	3.40E-02	-	0.012	3.40E-02

Table B3-22 Source and Contaminant Identification Table

Air Contaminant	CAS Number	Facility Emissions (tonnes) over 30-Year Lifetime				
		Stack Emissions 140,000 tpy	Stack Emissions 400,000 tpy	On-site Vehicles	Total 140,000 tpy facility	Total 400,000 tpy facility
Total Chromium (and compounds)	7440-47-3	0.084	2.39E-01	-	0.084	2.39E-01
Cobalt	7440-48-4	0.22	6.15E-01	-	0.22	6.15E-01
Lead (Pb)	7439-92-1	1.9	5	-	1.9	5
Mercury (Hg) - Vapour/Particulate phase	7439-97-6	0.56	2	-	0.56	2
Nickel	7440-02-0	3.3	9	-	3.3	9
Phosphorus	7723-14-0	1.7	5	-	1.7	5
Silver	7440-22-4	0.13	3.56E-01	-	0.13	3.56E-01
Selenium	7782-49-2	0.018	5.09E-02	-	0.018	5.09E-02
Thallium	7440-28-0	1.5	4	-	1.5	4
Tin	7440-31-5	0.66	2	-	0.66	2
Vanadium	7440-62-2	0.044	1.23E-01	-	0.044	1.23E-01
Zinc	7440-66-6	7.5	21	-	7.5	21
Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	17.2	49	-	17.2	49
1,2-Dichlorobenzene	95-50-1	7.7E-02	2.17E-01	-	7.7E-02	2.17E-01
1,2,4,5-Tetrachlorobenzene	95-94-3	1.9E-03	5.46E-03	-	1.9E-03	5.46E-03
1,2,4 – Trichlorobenzene	120-82-1	1.9E-03	5.46E-03	-	1.9E-03	5.46E-03
2,3,4,6-Tetrachlorophenol	58-90-2	6.5E-03	1.84E-02	-	6.5E-03	1.84E-02
2,4,6-Trichlorophenol	88-06-2	2.0E-03	5.55E-03	-	2.0E-03	5.55E-03
2,4-Dichlorophenol	120-83-2	3.9E-03	1.09E-02	-	3.9E-03	1.09E-02
Pentachlorophenol	87-86-5	7.7E-03	2.19E-02	-	7.7E-03	2.19E-02

Table B3-22 Source and Contaminant Identification Table

Air Contaminant	CAS Number	Facility Emissions (tonnes) over 30-Year Lifetime				
		Stack Emissions 140,000 tpy	Stack Emissions 400,000 tpy	On-site Vehicles	Total 140,000 tpy facility	Total 400,000 tpy facility
Hexachlorobenzene	118-74-1	1.9E-03	5.46E-03	-	1.9E-03	5.46E-03
Pentachlorobenzene	608-93-5	5.1E-03	1.44E-02	-	5.1E-03	1.44E-02
Acenaphthylene	208-96-8	5.4E-04	1.54E-03	-	5.4E-04	1.54E-03
Acenaphthene	83-32-9	7.0E-04	1.97E-03	-	7.0E-04	1.97E-03
Anthracene	120-12-7	1.5E-04	4.32E-04	-	1.5E-04	4.32E-04
Benzo(a)anthracene	56-55-3	5.6E-05	1.59E-04	-	5.6E-05	1.59E-04
Benzo(b)fluoranthene	205-99-2	1.4E-04	4.06E-04	-	1.4E-04	4.06E-04
Benzo(k)fluoranthene	207-08-9	3.8E-05	1.07E-04	-	3.8E-05	1.07E-04
Benzo(a)fluorene	238-84-6	1.0E-03	2.93E-03	-	1.0E-03	2.93E-03
Benzo(b)fluorene	243-17-4	7.1E-04	2.01E-03	-	7.1E-04	2.01E-03
Benzo(ghi)perylene	191-24-2	1.5E-03	4.38E-03	-	1.5E-03	4.38E-03
Benzo(a)pyrene	50-32-8	1.3E-04	3.65E-04	-	1.3E-04	3.65E-04
Benzo(e)pyrene	192-97-2	3.3E-04	9.24E-04	-	3.3E-04	9.24E-04
Biphenyl	92-52-4	1.1E-01	3.16E-01	-	1.1E-01	3.16E-01
Chrysene	218-01-9	1.4E-04	4.00E-04	-	1.4E-04	4.00E-04
Dibenzo(a,c)anthracene	215-58-7	1.0E-03	2.84E-03	-	1.0E-03	2.84E-03
Dibenzo(a,h)anthracene	53-70-3	4.5E-05	1.28E-04	-	4.5E-05	1.28E-04
Fluoranthene	206-44-0	1.6E-03	4.41E-03	-	1.6E-03	4.41E-03
Fluorine	7782-41-4	1.2E-03	3.32E-03	-	1.2E-03	3.32E-03
Indeno(1,2,3 – cd)pyrene	193-39-5	2.8E-04	8.00E-04	-	2.8E-04	8.00E-04

Table B3-22 Source and Contaminant Identification Table

Air Contaminant	CAS Number	Facility Emissions (tonnes) over 30-Year Lifetime				
		Stack Emissions 140,000 tpy	Stack Emissions 400,000 tpy	On-site Vehicles	Total 140,000 tpy facility	Total 400,000 tpy facility
1 – methylnaphthalene	90-12-0	3.7E-03	1.04E-02	-	3.7E-03	1.04E-02
2 – methylnaphthalene	91-57-6	2.0E-02	5.77E-02	-	2.0E-02	5.77E-02
Naphthalene	91-20-3	1.6E-02	4.49E-02	-	1.6E-02	4.49E-02
Perylene	198-55-0	5.7E-05	1.60E-04	-	5.7E-05	1.60E-04
Phenanthrene	85-01-8	3.5E-03	1.00E-02	-	3.5E-03	1.00E-02
Pyrene	129-00-0	1.9E-03	5.33E-03	-	1.9E-03	5.33E-03
Tetralin	119-64-2	1.9E-02	5.29E-02	-	1.9E-02	5.29E-02
O-terphenyl	84-15-1	3.1E-03	8.68E-03	-	3.1E-03	8.68E-03
Acetaldehyde	75-07-0	2.0E-05	5.64E-05	-	2.0E-05	5.64E-05
Benzene	71-43-2	1.2	3	-	1.2	3
Bromodichloromethane	75-27-4	6.9	20	-	6.9	20
Bromoform	75-25-2	1.9	5	-	1.9	5
Bromomethane	74-83-9	1.3	4	-	1.3	4
Carbon tetrachloride	56-23-5	0.012	3.35E-02	-	0.012	3.35E-02
Chloroform	67-66-3	0.019	5.41E-02	-	0.019	5.41E-02
Dichlorodifluoromethane	75-71-8	3.3	9	-	3.3	9
Dichloroethene, 1,1 -	75-35-4	0.021	6.00E-02	-	0.021	6.00E-02
Dichloromethane	75-09-2	6.6	19	-	6.6	19
Ethylbenzene	100-41-4	0.039	1.10E-01	-	0.039	1.10E-01
Ethylene Dibromide	106-93-4	0.011	3.16E-02	-	0.011	3.16E-02
Formaldehyde	50-00-0	1.8	5	-	1.8	5
Tetrachloroethene	127-18-4	0.21	6.02E-01	-	0.21	6.02E-01

Table B3-22 Source and Contaminant Identification Table

Air Contaminant	CAS Number	Facility Emissions (tonnes) over 30-Year Lifetime				
		Stack Emissions 140,000 tpy	Stack Emissions 400,000 tpy	On-site Vehicles	Total 140,000 tpy facility	Total 400,000 tpy facility
Toluene	108-88-3	1.9	5	-	1.9	5
Trichloroethane, 1,1,1 -	71-55-6	0.053	1.51E-01	-	0.053	1.51E-01
Trichloroethene	79-01-6	0.018	5.22E-02	-	0.018	5.22E-02
Trichloroethylene, 1,1,2 -	79-01-6	0.018	5.22E-02	-	0.018	5.22E-02
Trichlorofluoromethane	75-69-4	6.5	18	-	6.5	18
Vinyl chloride	75-01-4	1.6	5	-	1.6	5
Xylenes, m-, p- and o-	n/a	22.6	64	-	22.6	64

Notes:
1. PM, PM_{10}, $PM_{2.5}$ estimates include conservative estimates of road dust emissions (no controls assumed on on-site roads).

ATTACHMENT B-1

Sample MOBILE 6.2C Input and Output File

```
MOBILE6 INPUT FILE

PARTICULATES       :
POLLUTANTS         : HC CO NOX
SPREADSHEET        :
DATABASE VEHICLES  : 11111 11111111 1 111 11112111 111

*Traffic Mobile sources -All M6.2 Pollutant Types (15 km/hr speed)

RUN DATA
EXPRESS HC AS VOC  :
EXPAND EVAP        :
IDLE PM EMISSIONS  :

SCENARIO REC       : Scenario Title Text - PM2.5

CALENDAR YEAR      : 2011
AVERAGE SPEED      : 9.3 arterial 0.0 100.0 0.0 0.0

SULFUR CONTENT     : 30.0
ABSOLUTE HUMIDITY  : 48.7
MIN/MAX TEMP       : 38.5   53.2
FUEL RVP           : 9.0

PARTICLE SIZE      : 2.5
PARTICULATE EF     : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV
PMDDR2.CSV
DIESEL SULFUR      : 15.0

END OF RUN         :
```

```
*****************************************************************************
* MOBILE6C 6.2ETOH (27-May-2005)                                            *
* Input file: WASTETRUCKS.IN (file 1, run 1).                               *
*****************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* Scenario Title Text - PM2.5

* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  9.3
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

          User supplied gasoline sulfur content =  30.0 ppm.


* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D

                    Calendar Year:  2011
                            Month:  Jan.
                         Altitude:  Low
              Minimum Temperature:  38.5 (F)
              Maximum Temperature:  53.2 (F)
                Absolute Humidity:   49. grains/lb
                 Nominal Fuel RVP:   9.0 psi
                    Weathered RVP:   9.0 psi
              Fuel Sulfur Content:   25. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  No
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV
 LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
```

WASTETRUCKS

VMT Distribution:	0.3425	0.3941	0.1344			0.0357	0.0003	0.0020	0.0856	0.0053	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	1.061	1.200	2.627	1.563	1.796	0.283	0.719	0.829	2.81	1.341	
Composite CO :	15.65	17.25	31.18	20.79	24.54	1.694	1.371	4.199	35.25	17.777	
Composite NOX :	0.796	1.052	1.886	1.264	1.731	0.440	0.819	7.881	0.76	1.683	

Non-Exhaust Emissions (g/mi):

Hot Soak Loss:	0.079	0.067	0.132	0.084	0.122	0.000	0.000	0.000	0.019	0.076	
Diurnal Loss:	0.008	0.008	0.016	0.010	0.014	0.000	0.000	0.000	0.001	0.009	
Resting Loss:	0.055	0.062	0.134	0.081	0.106	0.000	0.000	0.000	0.139	0.066	
Running Loss:	0.292	0.246	0.439	0.295	0.390	0.000	0.000	0.000	0.000	0.270	
Crankcase Loss:	0.008	0.010	0.010	0.010	0.010	0.000	0.000	0.000	0.000	0.008	
Refueling Loss:	0.021	0.039	0.084	0.050	0.153	0.000	0.000	0.000	0.000	0.039	
Total Non-Exhaust:	0.463	0.433	0.815	0.533	0.794	0.000	0.000	0.159	0.468		

ATTACHMENT B-2

Source Summary Table – Operating Scenario 1A

Scenario 1A

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Stack	Main Stack	30.1	132	1.7	87.6	-	680530	4760380	Sulfur Dioxide (SO2)	7446-09-5	1.45E+00	1-Hour	average	EF	100%
									Hydrogen Chloride (HCl)	7647-01-0	3.72E-01	1-Hour	average	EF	100%
									Hydrogen Fluoride (HF)	7664-39-3	3.72E-02	1-Hour	average	EF	100%
									Oxides of Nitrogen (NOx)	10102-44-0	5.00E+00	1-Hour	average	EF	100%
									Carbon Monoxide (CO)	630-08-0	1.86E+00	1-Hour	average	EF	100%
									Particulate Matter PM10	n/a	3.72E-01	1-Hour	average	EF	100%
									Particulate Matter PM2.5	n/a	3.72E-01	1-Hour	average	EF	100%
									Total Particulate Matter	n/a	3.72E-01	1-Hour	average	EF	100%
									Ammonia (Slip at stack)	n/a	2.23E-01	1-Hour	average	EF	100%
									Organic Matter (as CH4)	n/a	2.02E+00	1-Hour	average	EF	100%
									Dioxins (as TEQ Toxic Equivalents)	n/a	2.48E-09	1-Hour	average	EF	100%
									Polychlorinated Biphenyls (PCB)	n/a	2.98E-06	1-Hour	average	EF	100%
									Aluminum	7429-90-5	1.64E-03	1-Hour	average	EF	100%
									Antimony	7440-36-0	1.13E-04	1-Hour	average	EF	100%
									Arsenic	7440-38-2	1.73E-05	1-Hour	average	EF	100%
									Barium	7440-39-3	8.73E-05	1-Hour	average	EF	100%
									Beryllium	7440-41-7	1.38E-05	1-Hour	average	EF	100%
									Boron	7440-42-8	6.32E-03	1-Hour	average	EF	100%
									Cadmium (Cd)	7440-43-9	2.89E-04	1-Hour	average	EF	100%
									Cadmium and Thallium (Cd + Th)	n/a	1.90E-03	1-Hour	average	EF	100%
									Chromium (hexavalent)	7440-47-3	1.32E-05	1-Hour	average	EF	100%
									Total Chromium (and compounds)	7440-47-3	9.29E-05	1-Hour	average	EF	100%
									Cobalt	7440-48-4	2.39E-04	1-Hour	average	EF	100%
									Lead (Pb)	7439-92-1	2.06E-03	1-Hour	average	EF	100%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	6.19E-04	1-Hour	average	EF	100%
									Nickel	7440-02-0	3.60E-03	1-Hour	average	EF	100%
									Phosphorus	7723-14-0	1.90E-03	1-Hour	average	EF	100%
									Silver	7440-22-4	1.38E-04	1-Hour	average	EF	100%
									Selenium	7782-49-2	1.98E-05	1-Hour	average	EF	100%
									Thallium	7440-28-0	1.61E-03	1-Hour	average	EF	100%
									Tin	7440-31-5	7.27E-04	1-Hour	average	EF	100%
									Vanadium	7440-62-2	4.80E-05	1-Hour	average	EF	100%
									Zinc	7440-66-6	8.24E-03	1-Hour	average	EF	100%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	1.90E-02	1-Hour	average	EF	100%
									1,2-Dichlorobenzene	95-50-1	8.45E-05	1-Hour	average	EF	100%
									1,2,4,5-Tetrachlorobenzene	95-94-3	2.13E-06	1-Hour	average	EF	100%
									1,2,4 – Trichlorobenzene	120-82-1	2.13E-06	1-Hour	average	EF	100%
									2,3,4,6-Tetrachlorophenol	58-90-2	7.18E-06	1-Hour	average	EF	100%
									2,4,6-Trichlorophenol	88-06-2	2.16E-06	1-Hour	average	EF	100%
									2,4-Dichlorophenol	120-83-2	4.25E-06	1-Hour	average	EF	100%
									Pentachlorophenol	87-86-5	8.51E-06	1-Hour	average	EF	100%
									Hexachlorobenzene	118-74-1	2.13E-06	1-Hour	average	EF	100%
									Pentachlorobenzene	608-93-5	5.59E-06	1-Hour	average	EF	100%
									Acenaphthylene	208-96-8	5.99E-07	1-Hour	average	EF	100%
									Acenaphthene	83-32-9	7.68E-07	1-Hour	average	EF	100%
									Anthracene	120-12-7	1.68E-07	1-Hour	average	EF	100%

Scenario 1A

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Benzo(a)anthracene	56-55-3	6.19E-08	1-Hour	average	EF	100%
									Benzo(b)fluoranthene	205-99-2	1.58E-07	1-Hour	average	EF	100%
									Benzo(k)fluoranthene	207-08-9	4.17E-08	1-Hour	average	EF	100%
									Benzo(a)fluorene	238-84-6	1.14E-06	1-Hour	average	EF	100%
									Benzo(b)fluorene	243-17-4	7.81E-07	1-Hour	average	EF	100%
									Benzo(ghi)perylene	191-24-2	1.71E-06	1-Hour	average	EF	100%
									Benzo(a)pyrene	50-32-8	1.42E-07	1-Hour	average	EF	100%
									Benzo(e)pyrene	192-97-2	3.60E-07	1-Hour	average	EF	100%
									Biphenyl	92-52-4	1.23E-04	1-Hour	average	EF	100%
									Chrysene	218-01-9	1.56E-07	1-Hour	average	EF	100%
									Dibenzo(a,c)anthracene	215-58-7	1.11E-06	1-Hour	average	EF	100%
									Dibenzo(a,h)anthracene	53-70-3	5.00E-08	1-Hour	average	EF	100%
									Fluoranthene	206-44-0	1.72E-06	1-Hour	average	EF	100%
									Fluorine	7782-41-4	1.29E-06	1-Hour	average	EF	100%
									Indeno(1,2,3 – cd)pyrene	193-39-5	3.11E-07	1-Hour	average	EF	100%
									1 – methylnaphthalene	90-12-0	4.05E-06	1-Hour	average	EF	100%
									2 – methylnaphthalene	91-57-6	2.25E-05	1-Hour	average	EF	100%
									Naphthalene	91-20-3	1.75E-05	1-Hour	average	EF	100%
									Perylene	198-55-0	6.23E-08	1-Hour	average	EF	100%
									Phenanthrene	85-01-8	3.91E-06	1-Hour	average	EF	100%
									Pyrene	129-00-0	2.07E-06	1-Hour	average	EF	100%
									Tetralin	119-64-2	2.06E-05	1-Hour	average	EF	100%
									O-terphenyl	84-15-1	3.38E-06	1-Hour	average	EF	100%
									Acetaldehyde	75-07-0	2.18E-08	1-Hour	average	EF	100%
									Benzene	71-43-2	1.28E-03	1-Hour	average	EF	100%
									Bromodichloromethane	75-27-4	7.59E-03	1-Hour	average	EF	100%
									Bromoform	75-25-2	2.08E-03	1-Hour	average	EF	100%
									Bromomethane	74-83-9	1.49E-03	1-Hour	average	EF	100%
									Carbon tetrachloride	56-23-5	1.29E-05	1-Hour	average	EF	100%
									Chloroform	67-66-3	2.11E-05	1-Hour	average	EF	100%
									Dichlorodifluoromethane	75-71-8	3.59E-03	1-Hour	average	EF	100%
									Dichloroethene, 1,1 -	75-35-4	2.33E-05	1-Hour	average	EF	100%
									Dichloromethane	75-09-2	7.27E-03	1-Hour	average	EF	100%
									Ethylbenzene	100-41-4	4.28E-05	1-Hour	average	EF	100%
									Ethylene Dibromide	106-93-4	1.22E-05	1-Hour	average	EF	100%
									Formaldehyde	50-00-0	1.96E-03	1-Hour	average	EF	100%
									Tetrachloroethene	127-18-4	2.34E-04	1-Hour	average	EF	100%
									Toluene	108-88-3	2.08E-03	1-Hour	average	EF	100%
									Trichloroethane, 1,1,1 -	71-55-6	5.89E-05	1-Hour	average	EF	100%
									Trichloroethene	79-01-6	2.03E-05	1-Hour	average	EF	100%
									Trichlorofluoromethane	75-69-4	7.11E-03	1-Hour	average	EF	100%
									Vinyl chloride	75-01-4	1.80E-03	1-Hour	average	EF	100%
									Xylenes, m-, p- and o-	n/a	2.49E-02	1-Hour	average	EF	100%

ATTACHMENT B-3

Source Summary Table – Operating Scenario 2A

Scenario 2A

Description	Source Data					Stack Coordinates		Emission Data						
	Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Main Stack	24.1	132	1.7	87.6	-	680530	4760380	Sulfur Dioxide (SO2)	7446-09-5	1.16E+00	1-Hour	average	EF	100%
								Hydrogen Chloride (HCl)	7647-01-0	2.97E-01	1-Hour	average	EF	100%
								Hydrogen Fluoride (HF)	7664-39-3	2.97E-02	1-Hour	average	EF	100%
								Oxides of Nitrogen (NOx)	10102-44-0	4.00E+00	1-Hour	average	EF	100%
								Carbon Monoxide (CO)	630-08-0	1.49E+00	1-Hour	average	EF	100%
								Particulate Matter PM10	n/a	2.97E-01	1-Hour	average	EF	100%
								Particulate Matter PM2.5	n/a	2.97E-01	1-Hour	average	EF	100%
								Total Particulate Matter	n/a	2.97E-01	1-Hour	average	EF	100%
								Ammonia (Slip at stack)	n/a	1.78E-01	1-Hour	average	EF	100%
								Organic Matter (as CH4)	n/a	1.62E+00	1-Hour	average	EF	100%
								Dioxins (as TEQ Toxic Equivalents)	n/a	1.98E-09	1-Hour	average	EF	100%
								Polychlorinated Biphenyls (PCB)	n/a	2.39E-06	1-Hour	average	EF	100%
								Aluminum	7429-90-5	1.31E-03	1-Hour	average	EF	100%
								Antimony	7440-36-0	9.05E-05	1-Hour	average	EF	100%
								Arsenic	7440-38-2	1.39E-05	1-Hour	average	EF	100%
								Barium	7440-39-3	6.99E-05	1-Hour	average	EF	100%
								Beryllium	7440-41-7	1.10E-05	1-Hour	average	EF	100%
								Boron	7440-42-8	5.06E-03	1-Hour	average	EF	100%
								Cadmium (Cd)	7440-43-9	2.31E-04	1-Hour	average	EF	100%
								Cadmium and Thallium (Cd + Th)	n/a	1.52E-03	1-Hour	average	EF	100%
								Chromium (hexavalent)	7440-47-3	1.06E-05	1-Hour	average	EF	100%
								Total Chromium (and compounds)	7440-47-3	7.43E-05	1-Hour	average	EF	100%
								Cobalt	7440-48-4	1.91E-04	1-Hour	average	EF	100%
								Lead (Pb)	7439-92-1	1.65E-03	1-Hour	average	EF	100%
								Mercury (Hg) - Vapour/Particulate phase	7439-97-6	4.96E-04	1-Hour	average	EF	100%
								Nickel	7440-02-0	2.88E-03	1-Hour	average	EF	100%
								Phosphorus	7723-14-0	1.52E-03	1-Hour	average	EF	100%
								Silver	7440-22-4	1.11E-04	1-Hour	average	EF	100%
								Selenium	7782-49-2	1.59E-05	1-Hour	average	EF	100%
								Thallium	7440-28-0	1.29E-03	1-Hour	average	EF	100%
								Tin	7440-31-5	5.81E-04	1-Hour	average	EF	100%
								Vanadium	7440-62-2	3.84E-05	1-Hour	average	EF	100%
								Zinc	7440-66-6	6.59E-03	1-Hour	average	EF	100%
								Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	1.52E-02	1-Hour	average	EF	100%
								1,2-Dichlorobenzene	95-50-1	6.76E-05	1-Hour	average	EF	100%
								1,2,4,5-Tetrachlorobenzene	95-94-3	1.70E-06	1-Hour	average	EF	100%
								1,2,4 – Trichlorobenzene	120-82-1	1.70E-06	1-Hour	average	EF	100%
								2,3,4,6-Tetrachlorophenol	58-90-2	5.74E-06	1-Hour	average	EF	100%

Scenario 2A

Description	Source Data					Stack Coordinates		Emission Data						
	Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°C)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
								2,4,6-Trichlorophenol	88-06-2	1.73E-06	1-Hour	average	EF	100%
								2,4-Dichlorophenol	120-83-2	3.40E-06	1-Hour	average	EF	100%
								Pentachlorophenol	87-86-5	6.81E-06	1-Hour	average	EF	100%
								Hexachlorobenzene	118-74-1	1.70E-06	1-Hour	average	EF	100%
								Pentachlorobenzene	608-93-5	4.47E-06	1-Hour	average	EF	100%
								Acenaphthylene	208-96-8	4.79E-07	1-Hour	average	EF	100%
								Acenaphthene	83-32-9	6.15E-07	1-Hour	average	EF	100%
								Anthracene	120-12-7	1.34E-07	1-Hour	average	EF	100%
								Benzo(a)anthracene	56-55-3	4.96E-08	1-Hour	average	EF	100%
								Benzo(b)fluoranthene	205-99-2	1.27E-07	1-Hour	average	EF	100%
								Benzo(k)fluoranthene	207-08-9	3.34E-08	1-Hour	average	EF	100%
								Benzo(a)fluorene	238-84-6	9.13E-07	1-Hour	average	EF	100%
								Benzo(b)fluorene	243-17-4	6.25E-07	1-Hour	average	EF	100%
								Benzo(ghi)perylene	191-24-2	1.36E-06	1-Hour	average	EF	100%
								Benzo(a)pyrene	50-32-8	1.14E-07	1-Hour	average	EF	100%
								Benzo(e)pyrene	192-97-2	2.88E-07	1-Hour	average	EF	100%
								Biphenyl	92-52-4	9.86E-05	1-Hour	average	EF	100%
								Chrysene	218-01-9	1.25E-07	1-Hour	average	EF	100%
								Dibenzo(a,c)anthracene	215-58-7	8.85E-07	1-Hour	average	EF	100%
								Dibenzo(a,h)anthracene	53-70-3	4.00E-08	1-Hour	average	EF	100%
								Fluoranthene	206-44-0	1.37E-06	1-Hour	average	EF	100%
								Fluorine	7782-41-4	1.03E-06	1-Hour	average	EF	100%
								Indeno(1,2,3 – cd)pyrene	193-39-5	2.49E-07	1-Hour	average	EF	100%
								1 – methylnaphthalene	90-12-0	3.24E-06	1-Hour	average	EF	100%
								2 – methylnaphthalene	91-57-6	1.80E-05	1-Hour	average	EF	100%
								Naphthalene	91-20-3	1.40E-05	1-Hour	average	EF	100%
								Perylene	198-55-0	4.99E-08	1-Hour	average	EF	100%
								Phenanthrene	85-01-8	3.13E-06	1-Hour	average	EF	100%
								Pyrene	129-00-0	1.66E-06	1-Hour	average	EF	100%
								Tetralin	119-64-2	1.65E-05	1-Hour	average	EF	100%
								O-terphenyl	84-15-1	2.70E-06	1-Hour	average	EF	100%
								Acetaldehyde	75-07-0	1.75E-08	1-Hour	average	EF	100%
								Benzene	71-43-2	1.02E-03	1-Hour	average	EF	100%
								Bromodichloromethane	75-27-4	6.09E-03	1-Hour	average	EF	100%
								Bromoform	75-25-2	1.67E-03	1-Hour	average	EF	100%
								Bromomethane	74-83-9	1.19E-03	1-Hour	average	EF	100%
								Carbon tetrachloride	56-23-5	1.04E-05	1-Hour	average	EF	100%
								Chloroform	67-66-3	1.69E-05	1-Hour	average	EF	100%

Scenario 2A

Description	Source Data					Stack Coordinates		Emission Data						
	Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°C)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
								Dichlorodifluoromethane	75-71-8	2.88E-03	1-Hour	average	EF	100%
								Dichloroethene, 1,1 -	75-35-4	1.87E-05	1-Hour	average	EF	100%
								Dichloromethane	75-09-2	5.82E-03	1-Hour	average	EF	100%
								Ethylbenzene	100-41-4	3.42E-05	1-Hour	average	EF	100%
								Ethylene Dibromide	106-93-4	9.77E-06	1-Hour	average	EF	100%
								Formaldehyde	50-00-0	1.57E-03	1-Hour	average	EF	100%
								Tetrachloroethene	127-18-4	1.87E-04	1-Hour	average	EF	100%
								Toluene	108-88-3	1.66E-03	1-Hour	average	EF	100%
								Trichloroethane, 1,1,1 -	71-55-6	4.72E-05	1-Hour	average	EF	100%
								Trichloroethene	79-01-6	1.62E-05	1-Hour	average	EF	100%
								Trichlorofluoromethane	75-69-4	0.00569	1-Hour	average	EF	100%
								Vinyl chloride	75-01-4	0.001441	1-Hour	average	EF	100%
								Xylenes, m-, p- and o-	n/a	0.019957	1-Hour	average	EF	100%

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Source Summary Table – Operating Scenario 3A

Scenario 3A

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Stack	Main Stack	30.1	132	1.7	87.6	-	680530	4760380	Sulfur Dioxide (SO2)	7446-09-5	1.45E+00	1-Hour	average	EF	91%
									Hydrogen Chloride (HCl)	7647-01-0	3.72E-01	1-Hour	average	EF	100%
									Hydrogen Fluoride (HF)	7664-39-3	3.72E-02	1-Hour	average	EF	100%
									Oxides of Nitrogen (NOx)	10102-44-0	5.00E+00	1-Hour	average	EF	69%
									Carbon Monoxide (CO)	630-08-0	1.86E+00	1-Hour	average	EF	79%
									Particulate Matter PM10	n/a	3.72E-01	1-Hour	average	EF	100%
									Particulate Matter PM2.5	n/a	3.72E-01	1-Hour	average	EF	100%
									Total Particulate Matter	n/a	3.72E-01	1-Hour	average	EF	70%
									Ammonia (Slip at stack)	n/a	2.23E-01	1-Hour	average	EF	100%
									Organic Matter (as CH4)	n/a	2.02E+00	1-Hour	average	EF	92%
									Dioxins (as TEQ Toxic Equivalents)	n/a	2.48E-09	1-Hour	average	EF	100%
									Polychlorinated Biphenyls (PCB)	n/a	2.98E-06	1-Hour	average	EF	100%
									Aluminum	7429-90-5	1.64E-03	1-Hour	average	EF	100%
									Antimony	7440-36-0	1.13E-04	1-Hour	average	EF	100%
									Arsenic	7440-38-2	1.73E-05	1-Hour	average	EF	100%
									Barium	7440-39-3	8.73E-05	1-Hour	average	EF	100%
									Beryllium	7440-41-7	1.38E-05	1-Hour	average	EF	100%
									Boron	7440-42-8	6.32E-03	1-Hour	average	EF	100%
									Cadmium (Cd)	7440-43-9	2.89E-04	1-Hour	average	EF	100%
									Cadmium and Thallium (Cd + Th)	n/a	1.90E-03	1-Hour	average	EF	100%
									Chromium (hexavalent)	7440-47-3	1.32E-05	1-Hour	average	EF	100%
									Total Chromium (and compounds)	7440-47-3	9.29E-05	1-Hour	average	EF	100%
									Cobalt	7440-48-4	2.39E-04	1-Hour	average	EF	100%
									Lead (Pb)	7439-92-1	2.06E-03	1-Hour	average	EF	100%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	6.19E-04	1-Hour	average	EF	100%
									Nickel	7440-02-0	3.60E-03	1-Hour	average	EF	100%
									Phosphorus	7723-14-0	1.90E-03	1-Hour	average	EF	100%
									Silver	7440-22-4	1.38E-04	1-Hour	average	EF	100%
									Selenium	7782-49-2	1.98E-05	1-Hour	average	EF	100%
									Thallium	7440-28-0	1.61E-03	1-Hour	average	EF	100%
									Tin	7440-31-5	7.27E-04	1-Hour	average	EF	100%
									Vanadium	7440-62-2	4.80E-05	1-Hour	average	EF	100%
									Zinc	7440-66-6	8.24E-03	1-Hour	average	EF	100%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	1.90E-02	1-Hour	average	EF	100%
									1,2-Dichlorobenzene	95-50-1	8.45E-05	1-Hour	average	EF	100%
									1,2,4,5-Tetrachlorobenzene	95-94-3	2.13E-06	1-Hour	average	EF	100%
									1,2,4 – Trichlorobenzene	120-82-1	2.13E-06	1-Hour	average	EF	100%
									2,3,4,6-Tetrachlorophenol	58-90-2	7.18E-06	1-Hour	average	EF	100%

Scenario 3A

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									2,4,6-Trichlorophenol	88-06-2	2.16E-06	1-Hour	average	EF	100%
									2,4-Dichlorophenol	120-83-2	4.25E-06	1-Hour	average	EF	100%
									Pentachlorophenol	87-86-5	8.51E-06	1-Hour	average	EF	100%
									Hexachlorobenzene	118-74-1	2.13E-06	1-Hour	average	EF	100%
									Pentachlorobenzene	608-93-5	5.59E-06	1-Hour	average	EF	100%
									Acenaphthylene	208-96-8	5.99E-07	1-Hour	average	EF	100%
									Acenaphthene	83-32-9	7.68E-07	1-Hour	average	EF	100%
									Anthracene	120-12-7	1.68E-07	1-Hour	average	EF	100%
									Benzo(a)anthracene	56-55-3	6.19E-08	1-Hour	average	EF	100%
									Benzo(b)fluoranthene	205-99-2	1.58E-07	1-Hour	average	EF	100%
									Benzo(k)fluoranthene	207-08-9	4.17E-08	1-Hour	average	EF	100%
									Benzo(a)fluorene	238-84-6	1.14E-06	1-Hour	average	EF	100%
									Benzo(b)fluorene	243-17-4	7.81E-07	1-Hour	average	EF	100%
									Benzo(ghi)perylene	191-24-2	1.71E-06	1-Hour	average	EF	100%
									Benzo(a)pyrene	50-32-8	1.42E-07	1-Hour	average	EF	100%
									Benzo(e)pyrene	192-97-2	3.60E-07	1-Hour	average	EF	100%
									Biphenyl	92-52-4	1.23E-04	1-Hour	average	EF	100%
									Chrysene	218-01-9	1.56E-07	1-Hour	average	EF	100%
									Dibenzo(a,c)anthracene	215-58-7	1.11E-06	1-Hour	average	EF	100%
									Dibenzo(a,h)anthracene	53-70-3	5.00E-08	1-Hour	average	EF	100%
									Fluoranthene	206-44-0	1.72E-06	1-Hour	average	EF	100%
									Fluorine	7782-41-4	1.29E-06	1-Hour	average	EF	100%
									Indeno(1,2,3 – cd)pyrene	193-39-5	3.11E-07	1-Hour	average	EF	100%
									1 – methylnaphthalene	90-12-0	4.05E-06	1-Hour	average	EF	100%
									2 – methylnaphthalene	91-57-6	2.25E-05	1-Hour	average	EF	100%
									Naphthalene	91-20-3	1.75E-05	1-Hour	average	EF	100%
									Perylene	198-55-0	6.23E-08	1-Hour	average	EF	100%
									Phenanthrene	85-01-8	3.91E-06	1-Hour	average	EF	100%
									Pyrene	129-00-0	2.07E-06	1-Hour	average	EF	100%
									Tetralin	119-64-2	2.06E-05	1-Hour	average	EF	100%
									O-terphenyl	84-15-1	3.38E-06	1-Hour	average	EF	100%
									Acetaldehyde	75-07-0	2.18E-08	1-Hour	average	EF	100%
									Benzene	71-43-2	1.28E-03	1-Hour	average	EF	100%
									Bromodichloromethane	75-27-4	7.59E-03	1-Hour	average	EF	100%
									Bromoform	75-25-2	2.08E-03	1-Hour	average	EF	100%
									Bromomethane	74-83-9	1.49E-03	1-Hour	average	EF	100%
									Carbon tetrachloride	56-23-5	1.29E-05	1-Hour	average	EF	100%
									Chloroform	67-66-3	2.11E-05	1-Hour	average	EF	100%

Scenario 3A

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Nm^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Dichlorodifluoromethane	75-71-8	3.59E-03	1-Hour	average	EF	100%
									Dichloroethene, 1,1 -	75-35-4	2.33E-05	1-Hour	average	EF	100%
									Dichloromethane	75-09-2	7.27E-03	1-Hour	average	EF	100%
									Ethylbenzene	100-41-4	4.28E-05	1-Hour	average	EF	100%
									Ethylene Dibromide	106-93-4	1.22E-05	1-Hour	average	EF	100%
									Formaldehyde	50-00-0	1.96E-03	1-Hour	average	EF	100%
									Tetrachloroethene	127-18-4	2.34E-04	1-Hour	average	EF	100%
									Toluene	108-88-3	2.08E-03	1-Hour	average	EF	100%
									Trichloroethane, 1,1,1 -	71-55-6	5.89E-05	1-Hour	average	EF	100%
									Trichloroethene	79-01-6	2.03E-05	1-Hour	average	EF	100%
									Trichlorofluoromethane	75-69-4	7.11E-03	1-Hour	average	EF	100%
									Vinyl chloride	75-01-4	1.80E-03	1-Hour	average	EF	100%
									Xylenes, m-, p- and o-	n/a	2.49E-02	1-Hour	average	EF	100%
Genset	Diesel Generator	1.2	539	1	2	-	680472	4860456	Oxides of Nitrogen (NOx)	10102-44-0	2.24	1-Hour	Marginal	EF	31%
									Carbon Monoxide (CO)	630-08-0	0.48	1-Hour	Marginal	EF	21%
									Total Particulate Matter	n/a	0.16	1-Hour	Marginal	EF	30%
									Sulfur Dioxide (SO2)	7446-09-5	0.15	1-Hour	Marginal	EF	9%
									TOC	n/a	0.18	1-Hour	Marginal	EF	8%

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Source Summary Table – Operating Scenario 1B

Scenario 1B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Stack 1	Main Stack	73.3	132	2.3	87.6	-	680530	4760380	Sulfur Dioxide (SO2)	7446-09-5	2.55E+00	1-Hour	average	EF	62%
									Hydrogen Chloride (HCl)	7647-01-0	6.56E-01	1-Hour	average	EF	62%
									Hydrogen Fluoride (HF)	7664-39-3	6.56E-02	1-Hour	average	EF	62%
									Oxides of Nitrogen (NOx)	10102-44-0	8.82E+00	1-Hour	average	EF	62%
									Carbon Monoxide (CO)	630-08-0	3.28E+00	1-Hour	average	EF	62%
									Particulate Matter PM10	n/a	6.56E-01	1-Hour	average	EF	62%
									Particulate Matter PM2.5	n/a	6.56E-01	1-Hour	average	EF	62%
									Total Particulate Matter	n/a	6.56E-01	1-Hour	average	EF	62%
									Ammonia (Slip at stack)	n/a	3.94E-01	1-Hour	average	EF	62%
									Organic Matter (as CH4)	n/a	3.57E+00	1-Hour	average	EF	62%
									Dioxins (as TEQ Toxic Equivalents)	n/a	4.37E-09	1-Hour	average	EF	62%
									Polychlorinated Biphenyls (PCB)	n/a	5.26E-06	1-Hour	average	EF	62%
									Aluminum	7429-90-5	2.90E-03	1-Hour	average	EF	62%
									Antimony	7440-36-0	2.00E-04	1-Hour	average	EF	62%
									Arsenic	7440-38-2	3.06E-05	1-Hour	average	EF	62%
									Barium	7440-39-3	1.54E-04	1-Hour	average	EF	62%
									Beryllium	7440-41-7	2.43E-05	1-Hour	average	EF	62%
									Boron	7440-42-8	1.12E-02	1-Hour	average	EF	62%
									Cadmium (Cd)	7440-43-9	5.10E-04	1-Hour	average	EF	62%
									Cadmium and Thallium (Cd + Th)	n/a	3.35E-03	1-Hour	average	EF	62%
									Chromium (hexavalent)	7440-47-3	2.33E-05	1-Hour	average	EF	62%
									Total Chromium (and compounds)	7440-47-3	1.64E-04	1-Hour	average	EF	62%
									Cobalt	7440-48-4	4.22E-04	1-Hour	average	EF	62%
									Lead (Pb)	7439-92-1	3.64E-03	1-Hour	average	EF	62%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	1.09E-03	1-Hour	average	EF	62%
									Nickel	7440-02-0	6.35E-03	1-Hour	average	EF	62%
									Phosphorus	7723-14-0	3.36E-03	1-Hour	average	EF	62%
									Silver	7440-22-4	2.44E-04	1-Hour	average	EF	62%
									Selenium	7782-49-2	3.50E-05	1-Hour	average	EF	62%
									Thallium	7440-28-0	2.84E-03	1-Hour	average	EF	62%
									Tin	7440-31-5	1.28E-03	1-Hour	average	EF	62%
									Vanadium	7440-62-2	8.48E-05	1-Hour	average	EF	62%
									Zinc	7440-66-6	1.45E-02	1-Hour	average	EF	62%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	3.35E-02	1-Hour	average	EF	62%
									1,2-Dichlorobenzene	95-50-1	1.49E-04	1-Hour	average	EF	62%
									1,2,4,5-Tetrachlorobenzene	95-94-3	3.75E-06	1-Hour	average	EF	62%
									1,2,4 – Trichlorobenzene	120-82-1	3.75E-06	1-Hour	average	EF	62%
									2,3,4,6-Tetrachlorophenol	58-90-2	1.27E-05	1-Hour	average	EF	62%

Scenario 1B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									2,4,6-Trichlorophenol	88-06-2	3.81E-06	1-Hour	average	EF	62%
									2,4-Dichlorophenol	120-83-2	7.51E-06	1-Hour	average	EF	62%
									Pentachlorophenol	87-86-5	1.50E-05	1-Hour	average	EF	62%
									Hexachlorobenzene	118-74-1	3.75E-06	1-Hour	average	EF	62%
									Pentachlorobenzene	608-93-5	9.86E-06	1-Hour	average	EF	62%
									Acenaphthylene	208-96-8	1.06E-06	1-Hour	average	EF	62%
									Acenaphthene	83-32-9	1.36E-06	1-Hour	average	EF	62%
									Anthracene	120-12-7	2.97E-07	1-Hour	average	EF	62%
									Benzo(a)anthracene	56-55-3	1.09E-07	1-Hour	average	EF	62%
									Benzo(b)fluoranthene	205-99-2	2.79E-07	1-Hour	average	EF	62%
									Benzo(k)fluoranthene	207-08-9	7.36E-08	1-Hour	average	EF	62%
									Benzo(a)fluorene	238-84-6	2.01E-06	1-Hour	average	EF	62%
									Benzo(b)fluorene	243-17-4	1.38E-06	1-Hour	average	EF	62%
									Benzo(ghi)perylene	191-24-2	3.01E-06	1-Hour	average	EF	62%
									Benzo(a)pyrene	50-32-8	2.51E-07	1-Hour	average	EF	62%
									Benzo(e)pyrene	192-97-2	6.35E-07	1-Hour	average	EF	62%
									Biphenyl	92-52-4	2.17E-04	1-Hour	average	EF	62%
									Chrysene	218-01-9	2.75E-07	1-Hour	average	EF	62%
									Dibenzo(a,c)anthracene	215-58-7	1.95E-06	1-Hour	average	EF	62%
									Dibenzo(a,h)anthracene	53-70-3	8.82E-08	1-Hour	average	EF	62%
									Fluoranthene	206-44-0	3.03E-06	1-Hour	average	EF	62%
									Fluorine	7782-41-4	2.28E-06	1-Hour	average	EF	62%
									Indeno(1,2,3 – cd)pyrene	193-39-5	5.50E-07	1-Hour	average	EF	62%
									1 – methylnaphthalene	90-12-0	7.16E-06	1-Hour	average	EF	62%
									2 – methylnaphthalene	91-57-6	3.97E-05	1-Hour	average	EF	62%
									Naphthalene	91-20-3	3.08E-05	1-Hour	average	EF	62%
									Perylene	198-55-0	1.10E-07	1-Hour	average	EF	62%
									Phenanthrene	85-01-8	6.90E-06	1-Hour	average	EF	62%
									Pyrene	129-00-0	3.66E-06	1-Hour	average	EF	62%
									Tetralin	119-64-2	3.63E-05	1-Hour	average	EF	62%
									O-terphenyl	84-15-1	5.96E-06	1-Hour	average	EF	62%
									Acetaldehyde	75-07-0	3.89E-08	1-Hour	average	EF	63%
									Benzene	71-43-2	2.26E-03	1-Hour	average	EF	62%
									Bromodichloromethane	75-27-4	1.36E-02	1-Hour	average	EF	63%
									Bromoform	75-25-2	3.71E-03	1-Hour	average	EF	63%
									Bromomethane	74-83-9	2.62E-03	1-Hour	average	EF	62%
									Carbon tetrachloride	56-23-5	2.31E-05	1-Hour	average	EF	63%
									Chloroform	67-66-3	3.72E-05	1-Hour	average	EF	62%

Scenario 1B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Dichlorodifluoromethane	75-71-8	6.35E-03	1-Hour	average	EF	62%
									Dichloroethene, 1,1 -	75-35-4	4.12E-05	1-Hour	average	EF	62%
									Dichloromethane	75-09-2	1.28E-02	1-Hour	average	EF	62%
									Ethylbenzene	100-41-4	7.55E-05	1-Hour	average	EF	62%
									Ethylene Dibromide	106-93-4	2.18E-05	1-Hour	average	EF	63%
									Formaldehyde	50-00-0	3.46E-03	1-Hour	average	EF	62%
									Tetrachloroethene	127-18-4	4.13E-04	1-Hour	average	EF	62%
									Toluene	108-88-3	3.66E-03	1-Hour	average	EF	62%
									Trichloroethane, 1,1,1 -	71-55-6	1.04E-04	1-Hour	average	EF	62%
									Trichloroethene	79-01-6	3.58E-05	1-Hour	average	EF	62%
									Trichlorofluoromethane	75-69-4	1.26E-02	1-Hour	average	EF	62%
									Vinyl chloride	75-01-4	3.18E-03	1-Hour	average	EF	62%
									Xylenes, m-, p- and o-	n/a	4.40E-02	1-Hour	average	EF	62%
Stack 2	Phase II Stack	45.3	132	1.80	87.6	-	680444	4860350	Sulfur Dioxide (SO2)	7446-09-5	1.54E+00	1-Hour	average	EF	38%
									Hydrogen Chloride (HCl)	7647-01-0	3.97E-01	1-Hour	average	EF	38%
									Hydrogen Fluoride (HF)	7664-39-3	3.97E-02	1-Hour	average	EF	38%
									Oxides of Nitrogen (NOx)	10102-44-0	5.33E+00	1-Hour	average	EF	38%
									Carbon Monoxide (CO)	630-08-0	1.98E+00	1-Hour	average	EF	38%
									Particulate Matter PM10	n/a	3.97E-01	1-Hour	average	EF	38%
									Particulate Matter PM2.5	n/a	3.97E-01	1-Hour	average	EF	38%
									Total Particulate Matter	n/a	3.97E-01	1-Hour	average	EF	38%
									Ammonia (Slip at stack)	n/a	2.38E-01	1-Hour	average	EF	38%
									Organic Matter (as CH4)	n/a	2.16E+00	1-Hour	average	EF	38%
									Dioxins (as TEQ Toxic Equivalents)	n/a	2.64E-09	1-Hour	average	EF	38%
									Polychlorinated Biphenyls (PCB)	n/a	3.18E-06	1-Hour	average	EF	38%
									Aluminum	7429-90-5	1.75E-03	1-Hour	average	EF	38%
									Antimony	7440-36-0	1.21E-04	1-Hour	average	EF	38%
									Arsenic	7440-38-2	1.85E-05	1-Hour	average	EF	38%
									Barium	7440-39-3	9.32E-05	1-Hour	average	EF	38%
									Beryllium	7440-41-7	1.47E-05	1-Hour	average	EF	38%
									Boron	7440-42-8	6.74E-03	1-Hour	average	EF	38%
									Cadmium (Cd)	7440-43-9	3.08E-04	1-Hour	average	EF	38%
									Cadmium and Thallium (Cd + Th)	n/a	2.03E-03	1-Hour	average	EF	38%
									Chromium (hexavalent)	7440-47-3	1.41E-05	1-Hour	average	EF	38%
									Total Chromium (and compounds)	7440-47-3	9.91E-05	1-Hour	average	EF	38%
									Cobalt	7440-48-4	2.55E-04	1-Hour	average	EF	38%
									Lead (Pb)	7439-92-1	2.20E-03	1-Hour	average	EF	38%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	6.61E-04	1-Hour	average	EF	38%

Scenario 1B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Nickel	7440-02-0	3.84E-03	1-Hour	average	EF	38%
									Phosphorus	7723-14-0	2.03E-03	1-Hour	average	EF	38%
									Silver	7440-22-4	1.48E-04	1-Hour	average	EF	38%
									Selenium	7782-49-2	2.11E-05	1-Hour	average	EF	38%
									Thallium	7440-28-0	1.72E-03	1-Hour	average	EF	38%
									Tin	7440-31-5	7.75E-04	1-Hour	average	EF	38%
									Vanadium	7440-62-2	5.12E-05	1-Hour	average	EF	38%
									Zinc	7440-66-6	8.79E-03	1-Hour	average	EF	38%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	2.03E-02	1-Hour	average	EF	38%
									1,2-Dichlorobenzene	95-50-1	9.01E-05	1-Hour	average	EF	38%
									1,2,4,5-Tetrachlorobenzene	95-94-3	2.27E-06	1-Hour	average	EF	38%
									1,2,4 – Trichlorobenzene	120-82-1	2.27E-06	1-Hour	average	EF	38%
									2,3,4,6-Tetrachlorophenol	58-90-2	7.66E-06	1-Hour	average	EF	38%
									2,4,6-Trichlorophenol	88-06-2	2.31E-06	1-Hour	average	EF	38%
									2,4-Dichlorophenol	120-83-2	4.54E-06	1-Hour	average	EF	38%
									Pentachlorophenol	87-86-5	9.08E-06	1-Hour	average	EF	38%
									Hexachlorobenzene	118-74-1	2.27E-06	1-Hour	average	EF	38%
									Pentachlorobenzene	608-93-5	5.96E-06	1-Hour	average	EF	38%
									Acenaphthylene	208-96-8	6.39E-07	1-Hour	average	EF	38%
									Acenaphthene	83-32-9	8.20E-07	1-Hour	average	EF	38%
									Anthracene	120-12-7	1.79E-07	1-Hour	average	EF	38%
									Benzo(a)anthracene	56-55-3	6.61E-08	1-Hour	average	EF	38%
									Benzo(b)fluoranthene	205-99-2	1.69E-07	1-Hour	average	EF	38%
									Benzo(k)fluoranthene	207-08-9	4.45E-08	1-Hour	average	EF	38%
									Benzo(a)fluorene	238-84-6	1.22E-06	1-Hour	average	EF	38%
									Benzo(b)fluorene	243-17-4	8.33E-07	1-Hour	average	EF	38%
									Benzo(ghi)perylene	191-24-2	1.82E-06	1-Hour	average	EF	38%
									Benzo(a)pyrene	50-32-8	1.52E-07	1-Hour	average	EF	38%
									Benzo(e)pyrene	192-97-2	3.84E-07	1-Hour	average	EF	38%
									Biphenyl	92-52-4	1.31E-04	1-Hour	average	EF	38%
									Chrysene	218-01-9	1.66E-07	1-Hour	average	EF	38%
									Dibenzo(a,c)anthracene	215-58-7	1.18E-06	1-Hour	average	EF	38%
									Dibenzo(a,h)anthracene	53-70-3	5.33E-08	1-Hour	average	EF	38%
									Fluoranthene	206-44-0	1.83E-06	1-Hour	average	EF	38%
									Fluorine	7782-41-4	1.38E-06	1-Hour	average	EF	38%
									Indeno(1,2,3 – cd)pyrene	193-39-5	3.32E-07	1-Hour	average	EF	38%
									1 – methylnaphthalene	90-12-0	4.33E-06	1-Hour	average	EF	38%
									2 – methylnaphthalene	91-57-6	2.40E-05	1-Hour	average	EF	38%

Scenario 1B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Naphthalene	91-20-3	1.86E-05	1-Hour	average	EF	38%
									Perylene	198-55-0	6.65E-08	1-Hour	average	EF	38%
									Phenanthrene	85-01-8	4.17E-06	1-Hour	average	EF	38%
									Pyrene	129-00-0	2.21E-06	1-Hour	average	EF	38%
									Tetralin	119-64-2	2.20E-05	1-Hour	average	EF	38%
									O-terphenyl	84-15-1	3.61E-06	1-Hour	average	EF	38%
									Acetaldehyde	75-07-0	2.33E-08	1-Hour	average	EF	38%
									Benzene	71-43-2	1.37E-03	1-Hour	average	EF	38%
									Bromodichloromethane	75-27-4	8.13E-03	1-Hour	average	EF	38%
									Bromoform	75-25-2	2.22E-03	1-Hour	average	EF	38%
									Bromomethane	74-83-9	1.59E-03	1-Hour	average	EF	38%
									Carbon tetrachloride	56-23-5	1.39E-05	1-Hour	average	EF	38%
									Chloroform	67-66-3	2.25E-05	1-Hour	average	EF	38%
									Dichlorodifluoromethane	75-71-8	3.84E-03	1-Hour	average	EF	38%
									Dichloroethene, 1,1 -	75-35-4	2.49E-05	1-Hour	average	EF	38%
									Dichloromethane	75-09-2	7.75E-03	1-Hour	average	EF	38%
									Ethylbenzene	100-41-4	4.56E-05	1-Hour	average	EF	38%
									Ethylene Dibromide	106-93-4	1.31E-05	1-Hour	average	EF	38%
									Formaldehyde	50-00-0	2.09E-03	1-Hour	average	EF	38%
									Tetrachloroethene	127-18-4	2.50E-04	1-Hour	average	EF	38%
									Toluene	108-88-3	2.21E-03	1-Hour	average	EF	38%
									Trichloroethane, 1,1,1 -	71-55-6	6.29E-05	1-Hour	average	EF	38%
									Trichloroethene	79-01-6	2.17E-05	1-Hour	average	EF	38%
									Trichlorofluoromethane	75-69-4	7.59E-03	1-Hour	average	EF	38%
									Vinyl chloride	75-01-4	1.92E-03	1-Hour	average	EF	38%
									Xylenes, m-, p- and o-	n/a	2.66E-02	1-Hour	average	EF	38%

ATTACHMENT B-6

Source Summary Table – Operating Scenario 2B

Scenario 2B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Stack 1	Main Stack	73.3	132	2.3	87.6	-	680530	4760380	Sulfur Dioxide (SO2)	7446-09-5	2.04E+00	1-Hour	average	EF	62%
									Hydrogen Chloride (HCl)	7647-01-0	5.25E-01	1-Hour	average	EF	62%
									Hydrogen Fluoride (HF)	7664-39-3	5.25E-02	1-Hour	average	EF	62%
									Oxides of Nitrogen (NOx)	10102-44-0	7.06E+00	1-Hour	average	EF	62%
									Carbon Monoxide (CO)	630-08-0	2.62E+00	1-Hour	average	EF	62%
									Particulate Matter PM10	n/a	5.25E-01	1-Hour	average	EF	62%
									Particulate Matter PM2.5	n/a	5.25E-01	1-Hour	average	EF	62%
									Total Particulate Matter	n/a	5.25E-01	1-Hour	average	EF	62%
									Ammonia (Slip at stack)	n/a	3.15E-01	1-Hour	average	EF	62%
									Organic Matter (as CH4)	n/a	2.86E+00	1-Hour	average	EF	62%
									Dioxins (as TEQ Toxic Equivalents)	n/a	3.50E-09	1-Hour	average	EF	62%
									Polychlorinated Biphenyls (PCB)	n/a	4.21E-06	1-Hour	average	EF	62%
									Aluminum	7429-90-5	2.32E-03	1-Hour	average	EF	62%
									Antimony	7440-36-0	1.60E-04	1-Hour	average	EF	62%
									Arsenic	7440-38-2	2.45E-05	1-Hour	average	EF	62%
									Barium	7440-39-3	1.23E-04	1-Hour	average	EF	62%
									Beryllium	7440-41-7	1.94E-05	1-Hour	average	EF	62%
									Boron	7440-42-8	8.92E-03	1-Hour	average	EF	62%
									Cadmium (Cd)	7440-43-9	4.08E-04	1-Hour	average	EF	62%
									Cadmium and Thallium (Cd + Th)	n/a	2.68E-03	1-Hour	average	EF	62%
									Chromium (hexavalent)	7440-47-3	1.87E-05	1-Hour	average	EF	62%
									Total Chromium (and compounds)	7440-47-3	1.31E-04	1-Hour	average	EF	62%
									Cobalt	7440-48-4	3.38E-04	1-Hour	average	EF	62%
									Lead (Pb)	7439-92-1	2.92E-03	1-Hour	average	EF	62%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	8.75E-04	1-Hour	average	EF	62%
									Nickel	7440-02-0	5.08E-03	1-Hour	average	EF	62%
									Phosphorus	7723-14-0	2.68E-03	1-Hour	average	EF	62%
									Silver	7440-22-4	1.95E-04	1-Hour	average	EF	62%
									Selenium	7782-49-2	2.80E-05	1-Hour	average	EF	62%
									Thallium	7440-28-0	2.27E-03	1-Hour	average	EF	62%
									Tin	7440-31-5	1.03E-03	1-Hour	average	EF	62%
									Vanadium	7440-62-2	6.78E-05	1-Hour	average	EF	62%
									Zinc	7440-66-6	1.16E-02	1-Hour	average	EF	62%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	2.68E-02	1-Hour	average	EF	62%
									1,2-Dichlorobenzene	95-50-1	1.19E-04	1-Hour	average	EF	62%
									1,2,4,5-Tetrachlorobenzene	95-94-3	3.00E-06	1-Hour	average	EF	62%
									1,2,4 – Trichlorobenzene	120-82-1	3.00E-06	1-Hour	average	EF	62%
									2,3,4,6-Tetrachlorophenol	58-90-2	1.01E-05	1-Hour	average	EF	62%

Scenario 2B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									2,4,6-Trichlorophenol	88-06-2	3.05E-06	1-Hour	average	EF	62%
									2,4-Dichlorophenol	120-83-2	6.01E-06	1-Hour	average	EF	62%
									Pentachlorophenol	87-86-5	1.20E-05	1-Hour	average	EF	62%
									Hexachlorobenzene	118-74-1	3.00E-06	1-Hour	average	EF	62%
									Pentachlorobenzene	608-93-5	7.89E-06	1-Hour	average	EF	62%
									Acenaphthylene	208-96-8	8.46E-07	1-Hour	average	EF	62%
									Acenaphthene	83-32-9	1.08E-06	1-Hour	average	EF	62%
									Anthracene	120-12-7	2.37E-07	1-Hour	average	EF	62%
									Benzo(a)anthracene	56-55-3	8.75E-08	1-Hour	average	EF	62%
									Benzo(b)fluoranthene	205-99-2	2.23E-07	1-Hour	average	EF	62%
									Benzo(k)fluoranthene	207-08-9	5.89E-08	1-Hour	average	EF	62%
									Benzo(a)fluorene	238-84-6	1.61E-06	1-Hour	average	EF	62%
									Benzo(b)fluorene	243-17-4	1.10E-06	1-Hour	average	EF	62%
									Benzo(ghi)perylene	191-24-2	2.41E-06	1-Hour	average	EF	62%
									Benzo(a)pyrene	50-32-8	2.01E-07	1-Hour	average	EF	62%
									Benzo(e)pyrene	192-97-2	5.08E-07	1-Hour	average	EF	62%
									Biphenyl	92-52-4	1.74E-04	1-Hour	average	EF	62%
									Chrysene	218-01-9	2.20E-07	1-Hour	average	EF	62%
									Dibenzo(a,c)anthracene	215-58-7	1.56E-06	1-Hour	average	EF	62%
									Dibenzo(a,h)anthracene	53-70-3	7.06E-08	1-Hour	average	EF	62%
									Fluoranthene	206-44-0	2.43E-06	1-Hour	average	EF	62%
									Fluorine	7782-41-4	1.83E-06	1-Hour	average	EF	62%
									Indeno(1,2,3 – cd)pyrene	193-39-5	4.40E-07	1-Hour	average	EF	62%
									1 – methylnaphthalene	90-12-0	5.73E-06	1-Hour	average	EF	62%
									2 – methylnaphthalene	91-57-6	3.17E-05	1-Hour	average	EF	62%
									Naphthalene	91-20-3	2.47E-05	1-Hour	average	EF	62%
									Perylene	198-55-0	8.81E-08	1-Hour	average	EF	62%
									Phenanthrene	85-01-8	5.52E-06	1-Hour	average	EF	62%
									Pyrene	129-00-0	2.93E-06	1-Hour	average	EF	62%
									Tetralin	119-64-2	2.91E-05	1-Hour	average	EF	62%
									O-terphenyl	84-15-1	4.77E-06	1-Hour	average	EF	62%
									Acetaldehyde	75-07-0	3.11E-08	1-Hour	average	EF	63%
									Benzene	71-43-2	1.81E-03	1-Hour	average	EF	62%
									Bromodichloromethane	75-27-4	1.08E-02	1-Hour	average	EF	63%
									Bromoform	75-25-2	2.97E-03	1-Hour	average	EF	63%
									Bromomethane	74-83-9	2.10E-03	1-Hour	average	EF	62%
									Carbon tetrachloride	56-23-5	1.85E-05	1-Hour	average	EF	63%
									Chloroform	67-66-3	2.97E-05	1-Hour	average	EF	62%

Scenario 2B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Dichlorodifluoromethane	75-71-8	5.08E-03	1-Hour	average	EF	62%
									Dichloroethene, 1,1 -	75-35-4	3.30E-05	1-Hour	average	EF	62%
									Dichloromethane	75-09-2	1.03E-02	1-Hour	average	EF	62%
									Ethylbenzene	100-41-4	6.04E-05	1-Hour	average	EF	62%
									Ethylene Dibromide	106-93-4	1.74E-05	1-Hour	average	EF	63%
									Formaldehyde	50-00-0	2.77E-03	1-Hour	average	EF	62%
									Tetrachloroethene	127-18-4	3.31E-04	1-Hour	average	EF	62%
									Toluene	108-88-3	2.93E-03	1-Hour	average	EF	62%
									Trichloroethane, 1,1,1 -	71-55-6	8.32E-05	1-Hour	average	EF	62%
									Trichloroethene	79-01-6	2.87E-05	1-Hour	average	EF	62%
									Trichlorofluoromethane	75-69-4	1.00E-02	1-Hour	average	EF	62%
									Vinyl chloride	75-01-4	2.54E-03	1-Hour	average	EF	62%
									Xylenes, m-, p- and o-	n/a	3.52E-02	1-Hour	average	EF	62%
Stack 2	Phase II Stack	45.3	132	1.8	87.6	-	680444	4860350	Sulfur Dioxide (SO2)	7446-09-5	1.23E+00	1-Hour	average	EF	38%
									Hydrogen Chloride (HCl)	7647-01-0	3.17E-01	1-Hour	average	EF	38%
									Hydrogen Fluoride (HF)	7664-39-3	3.17E-02	1-Hour	average	EF	38%
									Oxides of Nitrogen (NOx)	10102-44-0	4.26E+00	1-Hour	average	EF	38%
									Carbon Monoxide (CO)	630-08-0	1.59E+00	1-Hour	average	EF	38%
									Particulate Matter PM10	n/a	3.17E-01	1-Hour	average	EF	38%
									Particulate Matter PM2.5	n/a	3.17E-01	1-Hour	average	EF	38%
									Total Particulate Matter	n/a	3.17E-01	1-Hour	average	EF	38%
									Ammonia (Slip at stack)	n/a	1.90E-01	1-Hour	average	EF	38%
									Organic Matter (as CH4)	n/a	1.73E+00	1-Hour	average	EF	38%
									Dioxins (as TEQ Toxic Equivalents)	n/a	2.11E-09	1-Hour	average	EF	38%
									Polychlorinated Biphenyls (PCB)	n/a	2.54E-06	1-Hour	average	EF	38%
									Aluminum	7429-90-5	1.40E-03	1-Hour	average	EF	38%
									Antimony	7440-36-0	9.66E-05	1-Hour	average	EF	38%
									Arsenic	7440-38-2	1.48E-05	1-Hour	average	EF	38%
									Barium	7440-39-3	7.45E-05	1-Hour	average	EF	38%
									Beryllium	7440-41-7	1.17E-05	1-Hour	average	EF	38%
									Boron	7440-42-8	5.39E-03	1-Hour	average	EF	38%
									Cadmium (Cd)	7440-43-9	2.47E-04	1-Hour	average	EF	38%
									Cadmium and Thallium (Cd + Th)	n/a	1.62E-03	1-Hour	average	EF	38%
									Chromium (hexavalent)	7440-47-3	1.13E-05	1-Hour	average	EF	38%
									Total Chromium (and compounds)	7440-47-3	7.93E-05	1-Hour	average	EF	38%
									Cobalt	7440-48-4	2.04E-04	1-Hour	average	EF	38%
									Lead (Pb)	7439-92-1	1.76E-03	1-Hour	average	EF	38%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	5.29E-04	1-Hour	average	EF	38%

Scenario 2B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Nickel	7440-02-0	3.07E-03	1-Hour	average	EF	38%
									Phosphorus	7723-14-0	1.62E-03	1-Hour	average	EF	38%
									Silver	7440-22-4	1.18E-04	1-Hour	average	EF	38%
									Selenium	7782-49-2	1.69E-05	1-Hour	average	EF	38%
									Thallium	7440-28-0	1.37E-03	1-Hour	average	EF	38%
									Tin	7440-31-5	6.20E-04	1-Hour	average	EF	38%
									Vanadium	7440-62-2	4.10E-05	1-Hour	average	EF	38%
									Zinc	7440-66-6	7.03E-03	1-Hour	average	EF	38%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	1.62E-02	1-Hour	average	EF	38%
									1,2-Dichlorobenzene	95-50-1	7.21E-05	1-Hour	average	EF	38%
									1,2,4,5-Tetrachlorobenzene	95-94-3	1.82E-06	1-Hour	average	EF	38%
									1,2,4 – Trichlorobenzene	120-82-1	1.82E-06	1-Hour	average	EF	38%
									2,3,4,6-Tetrachlorophenol	58-90-2	6.13E-06	1-Hour	average	EF	38%
									2,4,6-Trichlorophenol	88-06-2	1.84E-06	1-Hour	average	EF	38%
									2,4-Dichlorophenol	120-83-2	3.63E-06	1-Hour	average	EF	38%
									Pentachlorophenol	87-86-5	7.27E-06	1-Hour	average	EF	38%
									Hexachlorobenzene	118-74-1	1.82E-06	1-Hour	average	EF	38%
									Pentachlorobenzene	608-93-5	4.77E-06	1-Hour	average	EF	38%
									Acenaphthylene	208-96-8	5.11E-07	1-Hour	average	EF	38%
									Acenaphthene	83-32-9	6.56E-07	1-Hour	average	EF	38%
									Anthracene	120-12-7	1.43E-07	1-Hour	average	EF	38%
									Benzo(a)anthracene	56-55-3	5.29E-08	1-Hour	average	EF	38%
									Benzo(b)fluoranthene	205-99-2	1.35E-07	1-Hour	average	EF	38%
									Benzo(k)fluoranthene	207-08-9	3.56E-08	1-Hour	average	EF	38%
									Benzo(a)fluorene	238-84-6	9.74E-07	1-Hour	average	EF	38%
									Benzo(b)fluorene	243-17-4	6.67E-07	1-Hour	average	EF	38%
									Benzo(ghi)perylene	191-24-2	1.46E-06	1-Hour	average	EF	38%
									Benzo(a)pyrene	50-32-8	1.21E-07	1-Hour	average	EF	38%
									Benzo(e)pyrene	192-97-2	3.07E-07	1-Hour	average	EF	38%
									Biphenyl	92-52-4	1.05E-04	1-Hour	average	EF	38%
									Chrysene	218-01-9	1.33E-07	1-Hour	average	EF	38%
									Dibenzo(a,c)anthracene	215-58-7	9.45E-07	1-Hour	average	EF	38%
									Dibenzo(a,h)anthracene	53-70-3	4.26E-08	1-Hour	average	EF	38%
									Fluoranthene	206-44-0	1.47E-06	1-Hour	average	EF	38%
									Fluorine	7782-41-4	1.10E-06	1-Hour	average	EF	38%
									Indeno(1,2,3 – cd)pyrene	193-39-5	2.66E-07	1-Hour	average	EF	38%
									1 – methylnaphthalene	90-12-0	3.46E-06	1-Hour	average	EF	38%
									2 – methylnaphthalene	91-57-6	1.92E-05	1-Hour	average	EF	38%

Scenario 2B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Naphthalene	91-20-3	1.49E-05	1-Hour	average	EF	38%
									Perylene	198-55-0	5.32E-08	1-Hour	average	EF	38%
									Phenanthrene	85-01-8	3.33E-06	1-Hour	average	EF	38%
									Pyrene	129-00-0	1.77E-06	1-Hour	average	EF	38%
									Tetralin	119-64-2	1.76E-05	1-Hour	average	EF	38%
									O-terphenyl	84-15-1	2.88E-06	1-Hour	average	EF	38%
									Acetaldehyde	75-07-0	1.86E-08	1-Hour	average	EF	38%
									Benzene	71-43-2	1.09E-03	1-Hour	average	EF	38%
									Bromodichloromethane	75-27-4	6.51E-03	1-Hour	average	EF	38%
									Bromoform	75-25-2	1.78E-03	1-Hour	average	EF	38%
									Bromomethane	74-83-9	1.27E-03	1-Hour	average	EF	38%
									Carbon tetrachloride	56-23-5	1.11E-05	1-Hour	average	EF	38%
									Chloroform	67-66-3	1.80E-05	1-Hour	average	EF	38%
									Dichlorodifluoromethane	75-71-8	3.07E-03	1-Hour	average	EF	38%
									Dichloroethene, 1,1 -	75-35-4	1.99E-05	1-Hour	average	EF	38%
									Dichloromethane	75-09-2	6.20E-03	1-Hour	average	EF	38%
									Ethylbenzene	100-41-4	3.65E-05	1-Hour	average	EF	38%
									Ethylene Dibromide	106-93-4	1.04E-05	1-Hour	average	EF	38%
									Formaldehyde	50-00-0	1.67E-03	1-Hour	average	EF	38%
									Tetrachloroethene	127-18-4	2.00E-04	1-Hour	average	EF	38%
									Toluene	108-88-3	1.77E-03	1-Hour	average	EF	38%
									Trichloroethane, 1,1,1 -	71-55-6	5.03E-05	1-Hour	average	EF	38%
									Trichloroethene	79-01-6	1.73E-05	1-Hour	average	EF	38%
									Trichlorofluoromethane	75-69-4	6.07E-03	1-Hour	average	EF	38%
									Vinyl chloride	75-01-4	1.54E-03	1-Hour	average	EF	38%
									Xylenes, m-, p- and o-	n/a	2.13E-02	1-Hour	average	EF	38%

ATTACHMENT B-7

Source Summary Table – Operating Scenario 3B

Scenario 3B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Stack 1	Main Stack	73.3	132	2.3	87.6	-	680530	4760380	Sulfur Dioxide (SO2)	7446-09-5	2.55E+00	1-Hour	average	EF	60%
									Hydrogen Chloride (HCl)	7647-01-0	6.56E-01	1-Hour	average	EF	62%
									Hydrogen Fluoride (HF)	7664-39-3	6.56E-02	1-Hour	average	EF	62%
									Oxides of Nitrogen (NOx)	10102-44-0	8.82E+00	1-Hour	average	EF	54%
									Carbon Monoxide (CO)	630-08-0	3.28E+00	1-Hour	average	EF	57%
									Particulate Matter PM10	n/a	6.56E-01	1-Hour	average	EF	62%
									Particulate Matter PM2.5	n/a	6.56E-01	1-Hour	average	EF	62%
									Total Particulate Matter	n/a	6.56E-01	1-Hour	average	EF	54%
									Ammonia (Slip at stack)	n/a	3.94E-01	1-Hour	average	EF	62%
									Organic Matter (as CH4)	n/a	3.57E+00	1-Hour	average	EF	60%
									Dioxins (as TEQ Toxic Equivalents)	n/a	4.37E-09	1-Hour	average	EF	62%
									Polychlorinated Biphenyls (PCB)	n/a	5.26E-06	1-Hour	average	EF	62%
									Aluminum	7429-90-5	2.90E-03	1-Hour	average	EF	62%
									Antimony	7440-36-0	2.00E-04	1-Hour	average	EF	62%
									Arsenic	7440-38-2	3.06E-05	1-Hour	average	EF	62%
									Barium	7440-39-3	1.54E-04	1-Hour	average	EF	62%
									Beryllium	7440-41-7	2.43E-05	1-Hour	average	EF	62%
									Boron	7440-42-8	1.12E-02	1-Hour	average	EF	62%
									Cadmium (Cd)	7440-43-9	5.10E-04	1-Hour	average	EF	62%
									Cadmium and Thallium (Cd + Th)	n/a	3.35E-03	1-Hour	average	EF	62%
									Chromium (hexavalent)	7440-47-3	2.33E-05	1-Hour	average	EF	62%
									Total Chromium (and compounds)	7440-47-3	1.64E-04	1-Hour	average	EF	62%
									Cobalt	7440-48-4	4.22E-04	1-Hour	average	EF	62%
									Lead (Pb)	7439-92-1	3.64E-03	1-Hour	average	EF	62%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	1.09E-03	1-Hour	average	EF	62%
									Nickel	7440-02-0	6.35E-03	1-Hour	average	EF	62%
									Phosphorus	7723-14-0	3.36E-03	1-Hour	average	EF	62%
									Silver	7440-22-4	2.44E-04	1-Hour	average	EF	62%
									Selenium	7782-49-2	3.50E-05	1-Hour	average	EF	62%
									Thallium	7440-28-0	2.84E-03	1-Hour	average	EF	62%
									Tin	7440-31-5	1.28E-03	1-Hour	average	EF	62%
									Vanadium	7440-62-2	8.48E-05	1-Hour	average	EF	62%
									Zinc	7440-66-6	1.45E-02	1-Hour	average	EF	62%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	3.35E-02	1-Hour	average	EF	62%
									1,2-Dichlorobenzene	95-50-1	1.49E-04	1-Hour	average	EF	62%
									1,2,4,5-Tetrachlorobenzene	95-94-3	3.75E-06	1-Hour	average	EF	62%
									1,2,4 – Trichlorobenzene	120-82-1	3.75E-06	1-Hour	average	EF	62%
									2,3,4,6-Tetrachlorophenol	58-90-2	1.27E-05	1-Hour	average	EF	62%

Scenario 3B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									2,4,6-Trichlorophenol	88-06-2	3.81E-06	1-Hour	average	EF	62%
									2,4-Dichlorophenol	120-83-2	7.51E-06	1-Hour	average	EF	62%
									Pentachlorophenol	87-86-5	1.50E-05	1-Hour	average	EF	62%
									Hexachlorobenzene	118-74-1	3.75E-06	1-Hour	average	EF	62%
									Pentachlorobenzene	608-93-5	9.86E-06	1-Hour	average	EF	62%
									Acenaphthylene	208-96-8	1.06E-06	1-Hour	average	EF	62%
									Acenaphthene	83-32-9	1.36E-06	1-Hour	average	EF	62%
									Anthracene	120-12-7	2.97E-07	1-Hour	average	EF	62%
									Benzo(a)anthracene	56-55-3	1.09E-07	1-Hour	average	EF	62%
									Benzo(b)fluoranthene	205-99-2	2.79E-07	1-Hour	average	EF	62%
									Benzo(k)fluoranthene	207-08-9	7.36E-08	1-Hour	average	EF	62%
									Benzo(a)fluorene	238-84-6	2.01E-06	1-Hour	average	EF	62%
									Benzo(b)fluorene	243-17-4	1.38E-06	1-Hour	average	EF	62%
									Benzo(ghi)perylene	191-24-2	3.01E-06	1-Hour	average	EF	62%
									Benzo(a)pyrene	50-32-8	2.51E-07	1-Hour	average	EF	62%
									Benzo(e)pyrene	192-97-2	6.35E-07	1-Hour	average	EF	62%
									Biphenyl	92-52-4	2.17E-04	1-Hour	average	EF	62%
									Chrysene	218-01-9	2.75E-07	1-Hour	average	EF	62%
									Dibenzo(a,c)anthracene	215-58-7	1.95E-06	1-Hour	average	EF	62%
									Dibenzo(a,h)anthracene	53-70-3	8.82E-08	1-Hour	average	EF	62%
									Fluoranthene	206-44-0	3.03E-06	1-Hour	average	EF	62%
									Fluorine	7782-41-4	2.28E-06	1-Hour	average	EF	62%
									Indeno(1,2,3 – cd)pyrene	193-39-5	5.50E-07	1-Hour	average	EF	62%
									1 – methylnaphthalene	90-12-0	7.16E-06	1-Hour	average	EF	62%
									2 – methylnaphthalene	91-57-6	3.97E-05	1-Hour	average	EF	62%
									Naphthalene	91-20-3	3.08E-05	1-Hour	average	EF	62%
									Perylene	198-55-0	1.10E-07	1-Hour	average	EF	62%
									Phenanthrene	85-01-8	6.90E-06	1-Hour	average	EF	62%
									Pyrene	129-00-0	3.66E-06	1-Hour	average	EF	62%
									Tetralin	119-64-2	3.63E-05	1-Hour	average	EF	62%
									O-terphenyl	84-15-1	5.96E-06	1-Hour	average	EF	62%
									Acetaldehyde	75-07-0	3.89E-08	1-Hour	average	EF	63%
									Benzene	71-43-2	2.26E-03	1-Hour	average	EF	62%
									Bromodichloromethane	75-27-4	1.36E-02	1-Hour	average	EF	63%
									Bromoform	75-25-2	3.71E-03	1-Hour	average	EF	63%
									Bromomethane	74-83-9	2.62E-03	1-Hour	average	EF	62%
									Carbon tetrachloride	56-23-5	2.31E-05	1-Hour	average	EF	63%
									Chloroform	67-66-3	3.72E-05	1-Hour	average	EF	62%

Scenario 3B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Dichlorodifluoromethane	75-71-8	6.35E-03	1-Hour	average	EF	62%
									Dichloroethene, 1,1 -	75-35-4	4.12E-05	1-Hour	average	EF	62%
									Dichloromethane	75-09-2	1.28E-02	1-Hour	average	EF	62%
									Ethylbenzene	100-41-4	7.55E-05	1-Hour	average	EF	62%
									Ethylene Dibromide	106-93-4	2.18E-05	1-Hour	average	EF	63%
									Formaldehyde	50-00-0	3.46E-03	1-Hour	average	EF	62%
									Tetrachloroethene	127-18-4	4.13E-04	1-Hour	average	EF	62%
									Toluene	108-88-3	3.66E-03	1-Hour	average	EF	62%
									Trichloroethane, 1,1,1 -	71-55-6	1.04E-04	1-Hour	average	EF	62%
									Trichloroethene	79-01-6	3.58E-05	1-Hour	average	EF	62%
									Trichlorofluoromethane	75-69-4	1.26E-02	1-Hour	average	EF	62%
									Vinyl chloride	75-01-4	3.18E-03	1-Hour	average	EF	62%
									Xylenes, m-, p- and o-	n/a	4.40E-02	1-Hour	average	EF	62%

Scenario 3B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
Stack 2	Phase II Stack	45.3	132	1.80	87.6	-	680444	4860350	Sulfur Dioxide (SO2)	7446-09-5	1.54E+00	1-Hour	average	EF	36%
									Hydrogen Chloride (HCl)	7647-01-0	3.97E-01	1-Hour	average	EF	38%
									Hydrogen Fluoride (HF)	7664-39-3	3.97E-02	1-Hour	average	EF	38%
									Oxides of Nitrogen (NOx)	10102-44-0	5.33E+00	1-Hour	average	EF	33%
									Carbon Monoxide (CO)	630-08-0	1.98E+00	1-Hour	average	EF	35%
									Particulate Matter PM10	n/a	3.97E-01	1-Hour	average	EF	38%
									Particulate Matter PM2.5	n/a	3.97E-01	1-Hour	average	EF	38%
									Total Particulate Matter	n/a	3.97E-01	1-Hour	average	EF	33%
									Ammonia (Slip at stack)	n/a	2.38E-01	1-Hour	average	EF	38%
									Organic Matter (as CH4)	n/a	2.16E+00	1-Hour	average	EF	37%
									Dioxins (as TEQ Toxic Equivalents)	n/a	2.64E-09	1-Hour	average	EF	38%
									Polychlorinated Biphenyls (PCB)	n/a	3.18E-06	1-Hour	average	EF	38%
									Aluminum	7429-90-5	1.75E-03	1-Hour	average	EF	38%
									Antimony	7440-36-0	1.21E-04	1-Hour	average	EF	38%
									Arsenic	7440-38-2	1.85E-05	1-Hour	average	EF	38%
									Barium	7440-39-3	9.32E-05	1-Hour	average	EF	38%
									Beryllium	7440-41-7	1.47E-05	1-Hour	average	EF	38%
									Boron	7440-42-8	6.74E-03	1-Hour	average	EF	38%
									Cadmium (Cd)	7440-43-9	3.08E-04	1-Hour	average	EF	38%
									Cadmium and Thallium (Cd + Th)	n/a	2.03E-03	1-Hour	average	EF	38%
									Chromium (hexavalent)	7440-47-3	1.41E-05	1-Hour	average	EF	38%
									Total Chromium (and compounds)	7440-47-3	9.91E-05	1-Hour	average	EF	38%
									Cobalt	7440-48-4	2.55E-04	1-Hour	average	EF	38%
									Lead (Pb)	7439-92-1	2.20E-03	1-Hour	average	EF	38%
									Mercury (Hg) - Vapour/Particulate phase	7439-97-6	6.61E-04	1-Hour	average	EF	38%
									Nickel	7440-02-0	3.84E-03	1-Hour	average	EF	38%
									Phosphorus	7723-14-0	2.03E-03	1-Hour	average	EF	38%
									Silver	7440-22-4	1.48E-04	1-Hour	average	EF	38%
									Selenium	7782-49-2	2.11E-05	1-Hour	average	EF	38%
									Thallium	7440-28-0	1.72E-03	1-Hour	average	EF	38%
									Tin	7440-31-5	7.75E-04	1-Hour	average	EF	38%
									Vanadium	7440-62-2	5.12E-05	1-Hour	average	EF	38%
									Zinc	7440-66-6	8.79E-03	1-Hour	average	EF	38%
									Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	n/a	2.03E-02	1-Hour	average	EF	38%
									1,2-Dichlorobenzene	95-50-1	9.01E-05	1-Hour	average	EF	38%
									1,2,4,5-Tetrachlorobenzene	95-94-3	2.27E-06	1-Hour	average	EF	38%
									1,2,4 – Trichlorobenzene	120-82-1	2.27E-06	1-Hour	average	EF	38%
									2,3,4,6-Tetrachlorophenol	58-90-2	7.66E-06	1-Hour	average	EF	38%

Scenario 3B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. ($°C$)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									2,4,6-Trichlorophenol	88-06-2	2.31E-06	1-Hour	average	EF	38%
									2,4-Dichlorophenol	120-83-2	4.54E-06	1-Hour	average	EF	38%
									Pentachlorophenol	87-86-5	9.08E-06	1-Hour	average	EF	38%
									Hexachlorobenzene	118-74-1	2.27E-06	1-Hour	average	EF	38%
									Pentachlorobenzene	608-93-5	5.96E-06	1-Hour	average	EF	38%
									Acenaphthylene	208-96-8	6.39E-07	1-Hour	average	EF	38%
									Acenaphthene	83-32-9	8.20E-07	1-Hour	average	EF	38%
									Anthracene	120-12-7	1.79E-07	1-Hour	average	EF	38%
									Benzo(a)anthracene	56-55-3	6.61E-08	1-Hour	average	EF	38%
									Benzo(b)fluoranthene	205-99-2	1.69E-07	1-Hour	average	EF	38%
									Benzo(k)fluoranthene	207-08-9	4.45E-08	1-Hour	average	EF	38%
									Benzo(a)fluorene	238-84-6	1.22E-06	1-Hour	average	EF	38%
									Benzo(b)fluorene	243-17-4	8.33E-07	1-Hour	average	EF	38%
									Benzo(ghi)perylene	191-24-2	1.82E-06	1-Hour	average	EF	38%
									Benzo(a)pyrene	50-32-8	1.52E-07	1-Hour	average	EF	38%
									Benzo(e)pyrene	192-97-2	3.84E-07	1-Hour	average	EF	38%
									Biphenyl	92-52-4	1.31E-04	1-Hour	average	EF	38%
									Chrysene	218-01-9	1.66E-07	1-Hour	average	EF	38%
									Dibenzo(a,c)anthracene	215-58-7	1.18E-06	1-Hour	average	EF	38%
									Dibenzo(a,h)anthracene	53-70-3	5.33E-08	1-Hour	average	EF	38%
									Fluoranthene	206-44-0	1.83E-06	1-Hour	average	EF	38%
									Fluorine	7782-41-4	1.38E-06	1-Hour	average	EF	38%
									Indeno(1,2,3 – cd)pyrene	193-39-5	3.32E-07	1-Hour	average	EF	38%
									1 – methylnaphthalene	90-12-0	4.33E-06	1-Hour	average	EF	38%
									2 – methylnaphthalene	91-57-6	2.40E-05	1-Hour	average	EF	38%
									Naphthalene	91-20-3	1.86E-05	1-Hour	average	EF	38%
									Perylene	198-55-0	6.65E-08	1-Hour	average	EF	38%
									Phenanthrene	85-01-8	4.17E-06	1-Hour	average	EF	38%
									Pyrene	129-00-0	2.21E-06	1-Hour	average	EF	38%
									Tetralin	119-64-2	2.20E-05	1-Hour	average	EF	38%
									O-terphenyl	84-15-1	3.61E-06	1-Hour	average	EF	38%
									Acetaldehyde	75-07-0	2.33E-08	1-Hour	average	EF	38%
									Benzene	71-43-2	1.37E-03	1-Hour	average	EF	38%
									Bromodichloromethane	75-27-4	8.13E-03	1-Hour	average	EF	38%
									Bromoform	75-25-2	2.22E-03	1-Hour	average	EF	38%
									Bromomethane	74-83-9	1.59E-03	1-Hour	average	EF	38%
									Carbon tetrachloride	56-23-5	1.39E-05	1-Hour	average	EF	38%
									Chloroform	67-66-3	2.25E-05	1-Hour	average	EF	38%

Scenario 3B

Source ID	Description	Source Data					Stack Coordinates		Emission Data						
		Flow rate (Am^3/s)	Stack Exit Gas Temp. (°c)	Diameter (m)	Height above grade (m)	Height above roof (m)	UTM (N)	UTM (E)	Contaminant	CAS #	Emission Rate (g/s)	Averaging Period (hour)	Data Quality	Estimation Technique	Percentage of Overall Emission
									Dichlorodifluoromethane	75-71-8	3.84E-03	1-Hour	average	EF	38%
									Dichloroethene, 1,1 -	75-35-4	2.49E-05	1-Hour	average	EF	38%
									Dichloromethane	75-09-2	7.75E-03	1-Hour	average	EF	38%
									Ethylbenzene	100-41-4	4.56E-05	1-Hour	average	EF	38%
									Ethylene Dibromide	106-93-4	1.31E-05	1-Hour	average	EF	38%
									Formaldehyde	50-00-0	2.09E-03	1-Hour	average	EF	38%
									Tetrachloroethene	127-18-4	2.50E-04	1-Hour	average	EF	38%
									Toluene	108-88-3	2.21E-03	1-Hour	average	EF	38%
									Trichloroethane, 1,1,1 -	71-55-6	6.29E-05	1-Hour	average	EF	38%
									Trichloroethene	79-01-6	2.17E-05	1-Hour	average	EF	38%
									Trichlorofluoromethane	75-69-4	7.59E-03	1-Hour	average	EF	38%
									Vinyl chloride	75-01-4	1.92E-03	1-Hour	average	EF	38%
									Xylenes, m-, p- and o-	n/a	2.66E-02	1-Hour	average	EF	38%
Genset	Diesel Generator	1.2	539	1	2	-	680472	4860456	Oxides of Nitrogen (NOx)	10102-44-0	2.24	1-Hour	Marginal	EF	14%
									Carbon Monoxide (CO)	630-08-0	0.48	1-Hour	Marginal	EF	8%
									Total Particulate Matter	n/a	0.16	1-Hour	Marginal	EF	13%
									Sulfur Dioxide (SO2)	7446-09-5	0.15	1-Hour	Marginal	EF	3%
									TOC	n/a	0.18	1-Hour	Marginal	EF	3%