



## TECHNICAL MEMORANDUM

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**Project No.** 19117255

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### AIR QUALITY IMPACT OF 160,000 TPA WASTE AT DURHAM YORK ENERGY CENTRE

#### EXECUTIVE SUMMARY

Golder Associates Limited (Golder) completed an air quality dispersion modelling assessment of the Durham York Energy Centre (DYEC) at a municipal solid waste throughput of 160,000 tonnes per annum (TPA) to assess the impact of a 20,000 TPA step change increase on predicted air quality concentrations. The results are subsequently compared to the original 140,000 TPA as found in the 2011 Emission Summary and Dispersion Modelling (ESDM) Report (dated March, 2011) which supports the Environmental Compliance Approval (ECA) for DYEC (#7306-8FDKNX).

Emission rates for the 160,000 TPA scenario were calculated using the same emission factors as the 140,000 TPA scenario but the flow rate was adjusted according to recent source testing data. Modelling was completed for the 160,000 TPA using the same model (CALPUFF), meteorological data set (2003-2007) and modelling methodology as used for the ESDM Report.

The predicted concentrations of each scenario were compared to the relevant air quality standards listed in Ontario Regulation (O.Reg.) 419/05 (MECP limits). In each scenario, predicted Point of Impingement (POI) concentrations of all contaminants were significantly lower than the corresponding MECP limits. For the 140,000 TPA scenario, the contaminant with the highest predicted concentration relative to O.Reg. 419/05 standards is Nitrogen Oxides at 7% of the relevant MECP limit ( $400 \mu\text{g}/\text{m}^3$ ) over a 1 hour averaging period. Comparatively, for the 160,000 TPA scenario, Nitrogen Oxides is also the highest predicted concentration relative to O.Reg. 419/05 standard but at 8% of the relevant MECP limit ( $400 \mu\text{g}/\text{m}^3$ ) over a 1 hour averaging period.

Background air quality concentrations from the ESDM were added to the predicted concentrations from the facility to estimate cumulative concentrations. The cumulative concentrations of all contaminants were compared to the MECP limits and are still below the relevant MECP limits for both modelled scenarios, with the exception of Benzo(a)pyrene over an annual averaging period. The background concentration of Benzo(a)pyrene is greater than the MECP limit before any contribution from DYEC is included and emissions from DYEC contribute less than 1% to the total ambient Benzo(a)pyrene concentration. O.Reg. 419/05 standards are not typically applied to cumulative concentrations, they are compliance points for predicted concentrations from individual facilities only. Cumulative concentrations are typically compared to the MECP ambient air quality criteria (AAQC) to provide an indicator of good air quality. The cumulative concentration of Benzo(a) pyrene is below the relevant AAQC for both scenarios, over an annual averaging period.

Overall, the air quality modelling results for the two scenarios result in predicted concentrations that vary by less than 8%, with some contaminants showing a decrease in predicted concentration and some contaminants showing a slight increase in concentration, depending on the averaging period. This result is caused by the combination of higher emission rates with increased flow rate and temperature, which would result in improved dispersion characteristics for some meteorological conditions and reduce the concentration of some contaminants.

In summary, the results of the 160,000 TPA scenario demonstrate that the DYEC is in compliance with O.Reg. 419/05 and the step change of 20,000 TPA results in minor changes to the theoretical maximums with 102 of the modelled concentrations decreasing from the 140,000 TPA scenario and 19 of the modelled concentrations increasing, depending on the time averaging period. Only 1 hour averaged NO<sub>x</sub> and SO<sub>2</sub> contribute an increased level of concentration (2%) at the POI with background.

## **1.0 INTRODUCTION**

Covanta Durham York Renewable Energy LP (Covanta) operates the Durham York Energy Centre (DYEC) under the multi-media Environmental Compliance Approval (ECA) 7306-8FDKNX, as amended. The ECA application was supported with an Emission Summary and Dispersion Modelling (ESDM) Report prepared by Golder Associates Ltd (Golder) using the CALPUFF dispersion model version 6.263, with results compared to Ministry of Environment, Conservation and Parks (MECP) Point of Impingement (POI) standards listed in Schedule 3 of Ontario Regulation (O.Reg.) 419/05, as of 2011.

The current ECA permits the processing of a maximum of 140,000 tonnes per annum of municipal solid waste (MSW). It is understood that DYEC are currently proposing a step change increase of 20,000 tonnes to allow for processing of up to 160,000 tonnes per annum of MSW.

This memorandum summarizes the air quality modelling results for the step change increase compared to the air quality modelling results for the existing approved quantity. All modelling was completed using the same CALPUFF model and other input data sets used in the ESDM Report that supports the current ECA application, however, the results are compared to O.Reg. 419/05 limits last updated in April 2018. In addition, the same background data was used to assess the cumulative effects.

## 2.0 FACILITY DESCRIPTION

DYEC operates two identical combustion trains, each of which are designed to process a nominal 218 tonnes per day of MSW referenced at 13 MJ/kg specific energy content. This amounts to a total heat release of approximately 118 GJ/hour or 33.64 tonnes/hour of steam. This is defined as the maximum continuous rating (MCR) of the units. However, since the refuse will have continuously varying characteristics, the control system adjusts throughput to maintain the heat release necessary to attain a target steam production rate. The mass and heat input range of each grate is represented in the Solid Waste Refuse Firing Diagram below (Figure 1).

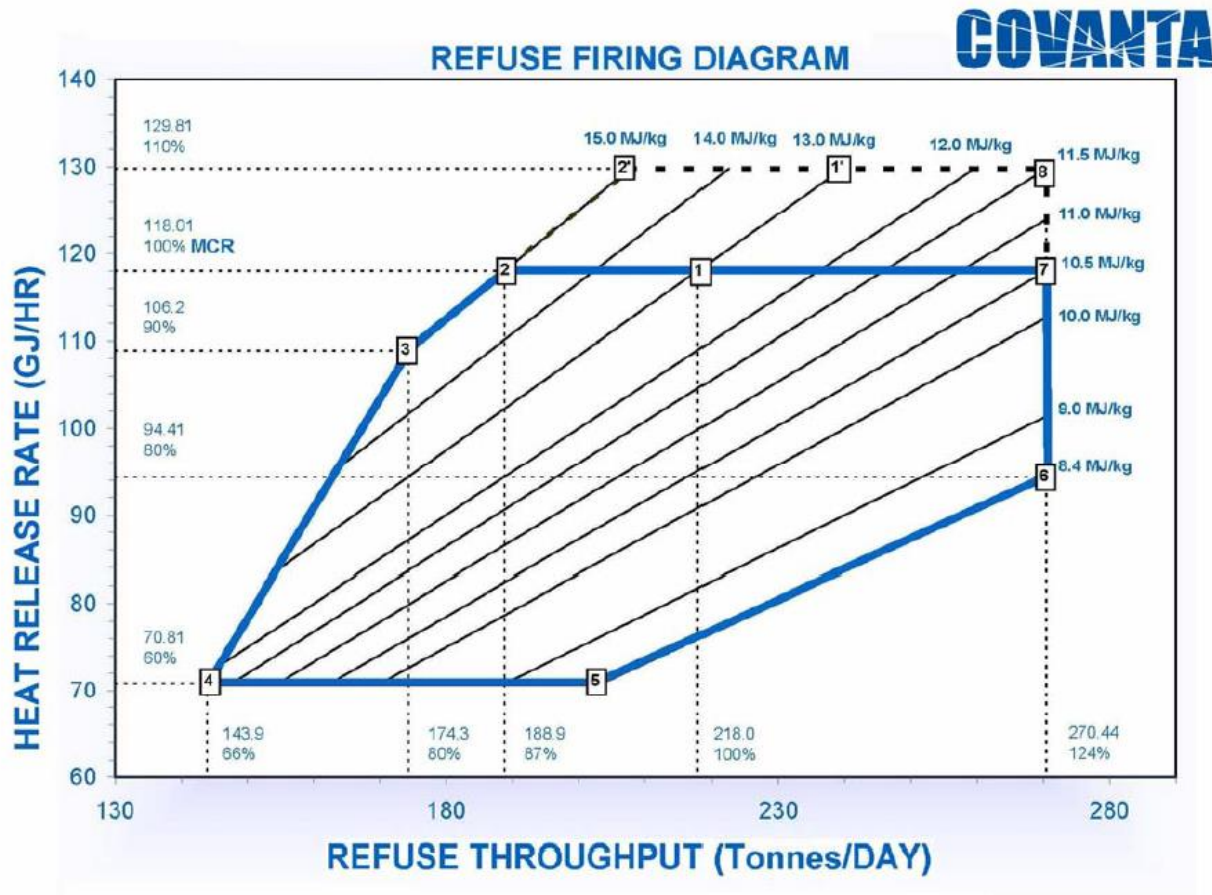


Figure 1: Base facility Refuse Diagram

For the ECA application, DYEC was modelled operating at reference point 2' as this results in the highest concentration possible for each contaminant modelled. Reference point 2' equates to the facility operating at a waste throughput of 216 tonnes per day, per unit, of MSW. This would occur for approximately 325 days per year to achieve an annual throughput of 140,000 tonnes per year. This is defined as the 140,000 TPA Scenario.

The waste processing rate of 216 tonnes per unit, per day which occurs at reference point 2' is not sufficient to achieve an annual throughput of 160,000 tonnes. To achieve this MSW processing rate, DYEC would have to be operating at 110% MCR at reference point 1' to process approximately 232 tonnes per day per unit of MSW and produce 37 tonnes per hour of steam. This would occur for approximately 345 days per year to achieve an annual throughput of 160,000 tonnes per year. This is defined as the 160,000 TPA Scenario.

### 3.0 EMISSION RATES

For the 140,000 TPA Scenario, emission rates for contaminants with averaging periods of 30 days or less were taken from the ESDM Report which supports the current ECA. When the ESDM Report was initially prepared in March 2011, O.Reg. 419/05 did not contain any standards with annual averaging periods. As a result, annual emission results were not required to be calculated. Annual standards were introduced by the MECP in 2016 for contaminants identified as potentially having long term exposure risks. Therefore, to assess compliance against these standards for the 140,000 TPA Scenario, annual emission rates were calculated using the 1 hour emission rates and multiplying by the ratio of the maximum operating hours per year to the total number of hours per year.

For the 160,000 TPA Scenario, emission rates for contaminants with averaging periods of 30 days or less were calculated using the in-stack emission limits listed in the current ECA, where applicable, or using the emission factors listed in the ESDM Report, which are provided on a mass per flow basis at reference conditions. As the facility is now operational, the flow rate for this scenario was calculated using observed data. During source testing completed in October 2017, DYEC processed 205 tonnes per day per unit of MSW and produced 32.75 tonnes per hour of steam. As a result, the measured exhaust flow rate during source testing (corrected to reference conditions) was multiplied by the ratio of the steam production at 110% MCR to the steam production during source testing to calculate the exhaust flow rate at 110% MCR (at reference conditions). Annual emission rates were calculated using the 1 hour emission rates and multiplying by the ratio of the maximum operating hours per year to the total number of hours per year.

Emission rates for each scenario were converted to grams per second (g/s) and are provided in Appendix A – Emission Calculations. Emissions from ancillary activities such as silo filling and diesel generator testing were not included in this assessment as they will not be impacted by the proposed increase in throughput.

### 4.0 MODELLING

As part of the ECA application, the MECP approved the use of the CALPUFF modelling software and CALMET meteorological data to demonstrate compliance with O. Reg. 419/05 Schedule 3 standards at the DYEC. As a result, the same modelling approach has been taken for this assessment. The following models and pre- and post-processors were used in the assessment:

- CALMET diagnostic meteorological model (v. 5.8, level 070623);
- CALPUFF dispersion model (v. 6.263, level 080827);
- CALPOST post processor (v. 6.221, Level 080724);
- BPIP building downwash pre-processor (v. 04274); and
- POSTUTIL post processor (v.1.64, Level 101025).

These model versions are consistent with those used in the original ESDM Report. Dispersion Modelling inputs are described in the following subsections.

## 4.1 Model Domain

The CALPUFF Model domain used in this assessment is the same as the domain used in the previous Environmental Assessment (EA) and ESDM Report. It extends 40 km by 30 Km and is centred approximately 5 km north of the Site. This domain covers more than the air quality study area but will ensure that plumes are tracked beyond the furthest receptor locations to ensure the worst-case ground level concentrations are considered at all receptors.

## 4.2 Meteorology, Land Use and Terrain Data

The meteorology and terrain data used in this assessment is the same as the meteorology and terrain data used in the EA and ESDM Report.

## 4.3 Receptors

The receptors used in this assessment are the same as the receptors used in the ESDM Report. They include gridded ground level receptors to meet the requirements of O.Reg. 419/05 in addition to 400 discrete receptors to represent locations of interest. They include hospitals, nursing homes, schools, daycares, Senior citizen centres, the nearest residential receptors, specific watersheds and water bodies and parks.

## 4.4 Building Downwash

The buildings used in this assessment to represent building downwash are the same as the buildings used in the ESDM Report. Building wake effects were considered in this assessment using the U.S. EPA's Building Profile Input Program (BPIP-ISC). The inputs into this pre-processor include the coordinates and heights of the buildings and stacks. The output data from BPIP is used in the building wake effect calculations. No changes were made to the BPIP input or output file for this assessment.

## 4.5 Deposition

CALPUFF has the capability to account for wet and dry deposition of substances that would reduce ground level concentrations at Points of Impingement (POIs). However, the deposition algorithm has not been implemented for conservatism and to maintain consistency with the ESDM report and previous EA for maximum POI predictions.

## 4.6 Thermal Internal Boundary Layer

CALPUFF contains an option to account for sub-grid coastal influences on plume dispersion such as the development of a thermal internal boundary layer (TIBL). Given the proximity of the proposed Facility to Lake Ontario (approximately 500m) and the grid size (250m), variations in coastline location within the grid cells near the proposed facility were accounted for in the dispersion modelling. To achieve this, a digitized sub-grid coastline, extending to the boundaries of the air quality study area was included as an additional input. This is consistent with the approach used in the ESDM report.

## 4.7 Averaging Times and Conversions

CALPUFF can predict 1-hour average values. Many of the relevant Schedule 3 standards are based on a 24-hour averaging time, which is also provided by CALPUFF. Several of the modelled contaminants have averaging periods less than 1 hour. For these contaminants, the 1 hour average concentration was converted using the conversion factors listed in Table 4-1 of Air Dispersion Modelling Guidance for Ontario (ADMGO). For example,

the hourly concentrations can be converted to a 10-min average by multiplying the hour value by 1.65. This is consistent with the approach used in the ESDM Report.

In 2016, a number of O.Reg 419/05 standards were updated or modified to include Point of Impingement (POI) limits based on an annual averaging period. CALPUFF can predict annual average values, therefore the CALPOST input file was modified to provide this output in addition to outputs for the 1 hour, 24 hour and 30 day averaging periods already provided.

#### 4.8 Chemical Transformation

For the purposes of assessing project contributions to Secondary Particulate Matter (SPM) formation, chemical transformation was considered in the CALPUFF modelling of particulate matter. To model the chemical transformation of emitted NO, NO<sub>2</sub> and SO<sub>2</sub> into HNO<sub>3</sub>, NO<sub>3</sub> and SO<sub>4</sub>, CALPUFFs RIVAD/ARM3 mechanism was used. The flag MCHM is set to 3 for model runs used to produce concentrations of particulate matter. This setting requires the input of monthly background ozone concentrations. The monthly background ozone data used in the modelling of secondary particulate matter for the 140,000 TPA Scenario differ slightly from the background ozone concentrations used in the 160,000 TPA as they were updated in 2017 to correct an inconsistency between the ESDM Report and the EA. This difference is not expected to significantly impact results as this data is only used in the calculation of secondary particulate matter formulation, which accounts for less than 10% of total particulate concentration. A comparison of the two sets of ozone data is provided in Table 1, below.

**Table 1: Background Ozone Concentrations used for Chemical Transformation Modelling**

Month	Ozone Concentrations used in 140,000 TPA Scenario (ppb)	Ozone Concentrations used in 160,000 TPA (ppb)
January	17.30	13.70
February	14.80	18.50
March	32.70	24.22
April	33.50	11.09
May	32.90	32.29
June	37.70	33.63
July	36.50	16.32
August	33.10	21.33
September	30.10	12.63
October	21.20	15.39
November	19.10	17.10
December	16.20	20.91

Chemical transformations were only modelled to calculate additional concentrations of particulate matter that is created as part of secondary transformations. Reported concentrations of NO<sub>2</sub> and SO<sub>2</sub> do not include the effects of depletion due to chemical transformation. The flag MCHEM is set to 0 for model runs used to produce concentrations of all other contaminants. This is consistent with the approach used in the ESDM Report

## 4.9 Dispersion Modelling Options

The options used in the CALPUFF dispersion model are identical to those used in the ESDM Report.

## 4.10 Source Parameters

For the 140,000 TPA Scenario, stack exhaust temperature and flow rate were unchanged from the modelling completed for the ECA application.

For the 160,000 TPA Scenario, exhaust flow rate and stack exhaust temperature were calculated using observed data from recent stack testing campaigns. The exhaust temperature was taken from the October stack testing data and the exhaust flow rate was calculated by multiplying the measured exhaust flow rate by the ratio of steam production at 110%MCR to steam production at the time of source testing (approximately 1.13).

All other source parameters are consistent with those used in the ESDM Report. A comparison of the source parameters modelled are provided in Table 2, below:

**Table 2: Comparison of Modelled Source Parameters**

Scenario	Stack Height [m]	Stack Diameter [m]	Exit velocity [m/s]	Exhaust Temperature [K]
140,000 TPA	87.6	1.7	23.02	405.37
160,000 TPA	87.6	1.7	26.18	413.5

## 5.0 MODELLING RESULTS

The modelled POI concentrations for each scenario were compared to the Schedule 3 standards listed in O.Reg. 419/05 (MECP POI limits) and in the case of PM<sub>2.5</sub> and PM<sub>10</sub>, the MECP ambient air quality criteria (AAQC). Meteorological anomalies were removed in accordance with ADMGO.

The MECP has recently updated the list of standards and guidelines for facilities to assess their emissions against, namely the Air Contaminants Benchmark (ACB) List, dated April 2018, which includes standards and guidelines (Benchmark 1) and screening levels (Benchmark 2). The ACB List is required to be used to assess point of impingement (POI) concentrations of contaminants released into the air.

Contaminants released by the Facility that do not have Benchmark 1 standards or guidelines in the ACB List are 'Contaminants with No MECP POI Limits'. Where applicable, predicted POI concentrations of Contaminants with No MECP POI Limits were screened against the Benchmark 2 screening levels in the ACB List or the de minimus limit.

The modelled concentrations of all compounds assessed were below their relevant MECP limits. A copy of the Emission Summary Table for each scenario is provided in Appendix B.

For the 140,000 TPA scenario, the contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 7% of the relevant limit ( $400 \mu\text{g}/\text{m}^3$ ) over a 1 hour averaging period.

For the 160,000 TPA scenario, the contaminant with the highest predicted concentration relative to O.Reg. 419/05 standard is Nitrogen Oxides at 8% of the relevant limit ( $400 \mu\text{g}/\text{m}^3$ ) over a 1 hour averaging period.

## **6.0 BACKGROUND AMBIENT AIR QUALITY AND CUMULATIVE EFFECTS**

As part of the Environmental Assessment, local air quality monitoring was conducted in the vicinity of the Site between September 2007 and December 2008. The monitoring station was located on the west side of Courtice Road, approximately 1.5 km south of Highway 401 and within the fenced area of the project office for the water pollution control plant. In addition to the ambient data taken from this station, data was also collected from monitoring networks operated under the National Air Pollution Surveillance (NAPS) Network by Environment Canada and used to characterize regional air quality. Further details about how this data was collected can be found in the Environmental Assessment (Durham-York Residual Waste Study– Appendix C-1 - Air Quality Assessment Technical Study report– pp 31-40).

Background concentrations have been added to the results of the dispersion modelling to represent the cumulative effects of other emission sources surrounding the site. The background concentrations used in this assessment are the same as those used in the ECA and EA, to allow for a like-to-like comparison. More recent air quality monitoring has been completed as part of the EA requirements for DYEC, however, this would already include contributions from DYEC and therefore may lead to double counting of contributions from DYEC.

The relevant cumulative concentrations were compared against the MECP POI limits and in the case of  $\text{PM}_{2.5}$  and  $\text{PM}_{10}$ , the MECP AAQC. The cumulative concentrations of all contaminants (with background added) are still below the relevant MECP limits, with the exception of Benzo(a)pyrene over an annual averaging period, for both modelled scenarios. The background concentration of Benzo(a)pyrene is greater than the MECP limit before any contribution from DYEC is included and emissions from DYEC contribute less than 1% to the total ambient benzo(a)pyrene concentration. O.Reg. 419/05 standards are not typically applied to cumulative concentrations, they are compliance points for predicted concentrations from individual facilities only. Cumulative concentrations are typically compared to the MECP ambient air quality criteria (AAQC) to provide an indicator of good air quality. The cumulative concentration of Benzo(a)pyrene is below the relevant AAQC for both scenarios, over an annual averaging period.

## **7.0 COMPARISON OF MODELLED SCENARIOS**

A comparison of the modelling results from the two scenarios is presented in Appendix C. The results indicate that the change in predicted concentrations between the two scenarios is small. All predicted concentrations vary by less than 8% with some contaminants showing a decrease in predicted concentration and some contaminants showing a slight increase in concentration, depending on the averaging period. This fluctuation is anticipated to be a result of higher emission rates for the 160,000 TPA combined with the increased flow rate and temperature which would improve dispersion for some meteorological conditions.



Once background concentrations are added to the predicted concentrations from DYEC, the resultant cumulative concentrations vary by even less, due to the high contribution of background concentrations. The majority of the predicted concentrations with background for the 160,000 TPA a maximum change 2% for all contaminants for which background data was available. Only two contaminants (SO<sub>2</sub> and NO<sub>x</sub>) show an increase in cumulative concentrations from the 140,000 TPA scenario by about 2%.

## **8.0 CONCLUSIONS**

Overall, the results of the modelling assessment indicate that the 160,000 TPA would result in a small overall change in the maximum predicted concentrations for all contaminants and the change in cumulative concentrations would be even less significant. DYEC would still be able to demonstrate compliance with MECP limits listed in Ontario Regulation 419/05 and cumulative concentrations of all contaminants would be below the relevant AAQC.

## **9.0 CLOSURE**

We trust this memorandum meets your needs at this time. Should you have any questions please contact the undersigned.

*original signed by*

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[https://golderassociates.sharepoint.com/sites/104166/project files/6 deliverables/final/19117255-tm-rev0 19feb2019 covanta updated modelling memo.docx](https://golderassociates.sharepoint.com/sites/104166/project%20files/6%20deliverables/final/19117255-tm-rev0%2019feb2019%20covanta%20updated%20modelling%20memo.docx)

**APPENDIX A**

# Emission Calculations by Scenario

**Main Stack - 160,000 TPA**

**Source Description:** Emissions from the main stack under Current Maximum Operating Scenario

**Operating Rate:** Both boilers are operating at 110% MCR at operating point 2'.

**Methodology:** Engineering calculations  
**Source:** All emission concentrations are guaranteed from Covanta where available or have been taken from the Environmental Assessment

<b>Train Parameters:</b>	Volumetric flow rate per train (At operating point 2')	21.31	m <sup>3</sup> /s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
		26.13	m <sup>3</sup> /s at operational conditions
	Total Volumetric flow rate	52.26	m <sup>3</sup> /s at operational conditions
	Waste Processing Rate per unit	215.77	Mg/day
	Annual Hours Required to Process 140, 000 tonnes per annum	7785.93	Hours

**Sample Calculation 1:** Particulate matter emission per train

**Emission Rate [g/s]** = Concentration[mg/dscm] x volumetric flow rate [dm<sup>3</sup>/s] x 1/1000 [mg/g]

$$= \frac{22.41 \text{ ug}}{\text{m}^3} \times \frac{21 \text{ m}^3}{\text{s}} \times \frac{1}{1,000} \frac{\text{mol}}{\text{m}^3}$$

$$= \frac{4.78\text{E-}01 \text{ g}}{\text{s}}$$

**Sample Calculation 2:** Bromodichloromethane emission per train

**Emission Rate [g/s]** = Concentration[kg/Mg] x Processing Rate [Mg/day] x 1000 [kg/g] x 1/86400 [day/s]

$$= \frac{1.50\text{E-}03 \text{ kg}}{\text{Mg}} \times \frac{216 \text{ Mg}}{\text{day}} \times \frac{1000 \text{ Kg}}{1 \text{ g}} \times \frac{1 \text{ day}}{86400 \text{ s}}$$

$$= \frac{3.75\text{E-}03 \text{ g}}{\text{s}}$$

**Sample Calculation 3:** Benzene Annual Emission Rate

**Emission Rate [g/s]** = Hourly Emission Rate [g/s] x Annual Processing Hours [Hours/year] / Total Hours per Year [Hours/year]

$$= \frac{1.32\text{E-}03 \text{ g}}{\text{s}} \times \frac{7,786 \text{ Hours}}{\text{Year}} \times \frac{1 \text{ Year}}{8,760 \text{ Hours}}$$

$$= \frac{1.17\text{E-}03 \text{ g}}{\text{s}}$$

## Source Emissions:

Contaminant	CAS Number	Concentration per train	Units <sup>(1)</sup>	Concentration Reference	Emission Rate per Train [g/s]	Total Emission Rate [g/s]	Annual Emission Rate [g/s]
Carbon Monoxide	630-08-0	4.50E+01	mg/Rm3	ESDM Report	9.59E-01	1.92E+00	—
Sulphur Dioxide	7446-09-5	3.50E+01	mg/Rm3	ECA Limit	7.47E-01	1.49E+00	1.33E+00
Total Particulate Matter	N/A -1	2.24E+01	mg/Rm3	ESDM Report	4.78E-01	9.55E-01	—
Filterable TSP	N/A -2	9.00E+00	mg/Rm3	ECA Limit	1.92E-01	3.84E-01	—
PM10	N/A -3	2.24E+01	mg/Rm3	ESDM Report	4.78E-01	9.55E-01	—
PM2.5	N/A -4	2.10E+01	mg/Rm3	ESDM Report	4.48E-01	8.95E-01	—
VOCs as CH4	N/A -5	4.90E+01	mg/Rm3	ESDM Report	1.04E+00	2.09E+00	—
Lead	7439-92-1	5.00E-02	mg/Rm3	ECA Limit	1.07E-03	2.13E-03	—
Cadmium	7440-43-9	7.00E-03	mg/Rm3	ECA Limit	1.49E-04	2.98E-04	—
Mercury	7439-97-6	1.50E-02	mg/Rm3	ECA Limit	3.20E-04	6.39E-04	—
Hydrogen Fluoride	7664-39-3	9.00E-01	mg/Rm3	ESDM Report	1.92E-02	3.84E-02	—
PCDD (I-TEQ)	N/A -6	6.00E-08	mg/Rm3	ECA Limit	0.0013 µg TEQ/s	0.0026 µg TEQ/s	—
Hydrogen Chloride	7647-01-0	9.00E+00	mg/Rm3	ECA Limit	1.92E-01	3.84E-01	—
Ammonia	7664-41-7	9.90E+00	mg/Rm3	ESDM Report	2.11E-01	4.22E-01	—
Nitrogen Oxides	10102-44-0	1.21E+02	mg/Rm3	ECA Limit	2.57E+00	5.14E+00	—
Polychlorinated Biphenyls (PCB)	N/A -7	7.22E-05	mg/Rm3	ESDM Report	1.54E-06	3.08E-06	—
Aluminum	7429-90-5	3.98E-02	mg/Rm3	ESDM Report	8.47E-04	1.69E-03	—
Antimony	7440-36-0	2.74E-03	mg/Rm3	ESDM Report	5.84E-05	1.17E-04	—
Arsenic	7440-38-2	4.20E-04	mg/Rm3	ESDM Report	8.95E-06	1.79E-05	—
Barium	7440-39-3	2.11E-03	mg/Rm3	ESDM Report	4.51E-05	9.01E-05	—
Beryllium	7440-41-7	3.33E-04	mg/Rm3	ESDM Report	7.10E-06	1.42E-05	—
Boron	7440-42-8	1.53E-01	mg/Rm3	ESDM Report	3.26E-03	6.52E-03	—
Chromium (hexavalent)	18540-29-9	3.20E-04	mg/Rm3	ESDM Report	6.82E-06	1.36E-05	1.21E-05
Total Chromium (and compounds)	7440-47-3	2.25E-03	mg/Rm3	ESDM Report	4.79E-05	9.59E-05	—
Cobalt	7440-48-4	5.79E-03	mg/Rm3	ESDM Report	1.23E-04	2.47E-04	—
Nickel	7440-02-0	8.71E-02	mg/Rm3	ESDM Report	1.86E-03	3.71E-03	3.30E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm3	ESDM Report	9.81E-04	1.96E-03	—
Silver	7440-22-4	3.35E-03	mg/Rm3	ESDM Report	7.14E-05	1.43E-04	—
Selenium	7782-49-2	4.80E-04	mg/Rm3	ESDM Report	1.02E-05	2.05E-05	—
Thallium	7440-28-0	3.90E-02	mg/Rm3	ESDM Report	8.31E-04	1.66E-03	—
Tin	7440-31-5	1.76E-02	mg/Rm3	ESDM Report	3.75E-04	7.50E-04	—
Vanadium	7440-62-2	1.16E-03	mg/Rm3	ESDM Report	2.48E-05	4.96E-05	—
Zinc	7440-66-6	2.00E-01	mg/Rm3	ESDM Report	4.25E-03	8.50E-03	—
1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm3	ESDM Report	4.36E-05	8.72E-05	—
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm3	ESDM Report	1.10E-06	2.19E-06	—
1,2,4-Trichlorobenzene	120-82-1	5.15E-05	mg/Rm3	ESDM Report	1.10E-06	2.19E-06	—
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm3	ESDM Report	3.70E-06	7.41E-06	—
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm3	ESDM Report	1.12E-06	2.23E-06	—
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm3	ESDM Report	2.19E-06	4.39E-06	—
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm3	ESDM Report	4.39E-06	8.79E-06	—
Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm3	ESDM Report	1.10E-06	2.19E-06	—
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm3	ESDM Report	2.88E-06	5.77E-06	—
Acenaphthylene	208-96-8	1.45E-05	mg/Rm3	ESDM Report	3.09E-07	6.18E-07	—
Acenaphthene	83-32-9	1.86E-05	mg/Rm3	ESDM Report	3.96E-07	7.93E-07	—
Anthracene	120-12-7	4.07E-06	mg/Rm3	ESDM Report	8.67E-08	1.73E-07	—

Benzo(a)anthracene	56-55-3	1.50E-06	mg/Rm3	ESDM Report	3.20E-08	6.39E-08	—
Benzo(b)fluoranthene	205-99-2	3.83E-06	mg/Rm3	ESDM Report	8.16E-08	1.63E-07	—
Benzo(k)fluoranthene	207-08-9	1.01E-06	mg/Rm3	ESDM Report	2.15E-08	4.30E-08	—
Benzo(a)fluorene	238-84-6	2.76E-05	mg/Rm3	ESDM Report	5.89E-07	1.18E-06	—
Benzo(b)fluorene	243-17-4	1.89E-05	mg/Rm3	ESDM Report	4.03E-07	8.06E-07	—
Benzo(ghi)perylene	191-24-2	4.13E-05	mg/Rm3	ESDM Report	8.80E-07	1.76E-06	—
Benzo(a)pyrene	50-32-8	3.44E-06	mg/Rm3	ESDM Report	7.33E-08	1.47E-07	1.30E-07
Benzo(e)pyrene	192-97-2	8.71E-06	mg/Rm3	ESDM Report	1.86E-07	3.71E-07	—
Biphenyl	92-51-3	2.98E-03	mg/Rm3	ESDM Report	6.36E-05	1.27E-04	—
Chrysene	218-01-9	3.77E-06	mg/Rm3	ESDM Report	8.03E-08	1.61E-07	—
Dibenzo(a,c)anthracene	215-58-7	2.68E-05	mg/Rm3	ESDM Report	5.71E-07	1.14E-06	—
Dibenzo(a,h)anthracene	53-70-3	1.21E-06	mg/Rm3	ESDM Report	2.58E-08	5.16E-08	—
Fluoranthene	206-44-0	4.16E-05	mg/Rm3	ESDM Report	8.86E-07	1.77E-06	—
Fluorine	86-73-7	3.13E-05	mg/Rm3	ESDM Report	6.67E-07	1.33E-06	—
Indeno(1,2,3-cd)pyrene	193-39-5	7.54E-06	mg/Rm3	ESDM Report	1.61E-07	3.21E-07	—
1-methylnaphthalene	90-12-0	9.82E-05	mg/Rm3	ESDM Report	2.09E-06	4.18E-06	—
2-methylnaphthalene	91-57-6	5.44E-04	mg/Rm3	ESDM Report	1.16E-05	2.32E-05	—
Naphthalene	91-20-3	4.23E-04	mg/Rm3	ESDM Report	9.01E-06	1.80E-05	—
Perylene	198-55-0	1.51E-06	mg/Rm3	ESDM Report	3.22E-08	6.44E-08	—
Phenanthrene	85-01-8	9.46E-05	mg/Rm3	ESDM Report	2.02E-06	4.03E-06	—
Pyrene	129-00-0	5.02E-05	mg/Rm3	ESDM Report	1.07E-06	2.14E-06	—
Tetralin	119-64-2	4.99E-04	mg/Rm3	ESDM Report	1.06E-05	2.12E-05	—
O-terphenyl	84-15-1	8.18E-05	mg/Rm3	ESDM Report	1.74E-06	3.49E-06	—
Acetaldehyde	75-07-0	4.30E-09	kg/Mg	ESDM Report	1.07E-08	2.15E-08	—
Benzene	71-43-2	3.10E-02	mg/Rm3	ESDM Report	6.61E-04	1.32E-03	1.17E-03
Bromodichloromethane	75-27-4	1.50E-03	kg/Mg	ESDM Report	3.75E-03	7.50E-03	—
Bromoform	75-25-2	4.11E-04	kg/Mg	ESDM Report	1.03E-03	2.05E-03	—
Bromomethane	74-83-9	3.60E-02	mg/Rm3	ESDM Report	7.67E-04	1.53E-03	—
Carbon tetrachloride	56-23-5	2.56E-06	kg/Mg	ESDM Report	6.39E-06	1.28E-05	—
Chloroform	67-66-3	5.10E-04	mg/Rm3	ESDM Report	1.09E-05	2.17E-05	—
Dichlorodifluoromethane	75-71-8	8.71E-02	mg/Rm3	ESDM Report	1.86E-03	3.71E-03	—
Dichloroethene, 1,1-	75-34-3	5.65E-04	mg/Rm3	ESDM Report	1.20E-05	2.41E-05	—
Dichloromethane	75-09-2	1.76E-01	mg/Rm3	ESDM Report	3.75E-03	7.50E-03	—
Ethylbenzene	100-41-4	1.04E-03	mg/Rm3	ESDM Report	2.21E-05	4.42E-05	—
Ethylene Dibromide	106-93-4	2.41E-06	kg/Mg	ESDM Report	6.02E-06	1.20E-05	—
Formaldehyde	50-00-0	4.75E-02	mg/Rm3	ESDM Report	1.01E-03	2.02E-03	—
Tetrachloroethene	127-18-4	5.67E-03	mg/Rm3	ESDM Report	1.21E-04	2.42E-04	—
Toluene	108-88-3	5.03E-02	mg/Rm3	ESDM Report	1.07E-03	2.14E-03	—
Trichloroethane, 1,1,1-	71-55-6	1.43E-03	mg/Rm3	ESDM Report	3.04E-05	6.08E-05	—
Trichloroethene	86-42-0	4.92E-04	mg/Rm3	ESDM Report	1.05E-05	2.10E-05	—
Trichloroethylene, 1,1,2-	79-01-6	4.92E-04	mg/Rm3	ESDM Report	1.05E-05	2.10E-05	—
Trichlorofluoromethane	75-69-4	1.72E-01	mg/Rm3	ESDM Report	3.67E-03	7.34E-03	—
Vinyl chloride	75-01-4	4.36E-02	mg/Rm3	ESDM Report	9.29E-04	1.86E-03	—
Xylenes, m-, p- and o-	1330-20-7	6.04E-01	mg/Rm3	ESDM Report	1.29E-02	2.57E-02	—

1. Concentrations are at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature

**Main Stack - 160,000 TPA**

**Source Description:** Emissions from the main stack under Proposed Future Operating Scenario with both boilers operational.

**Operating Rate:** Both boilers are operating at 110% MCR at operating point 1`.

**Methodology:** Engineering calculations  
**Source:** All emission concentrations are guarantees from Covanta where available or have been taken from the Environmental Assessment

**Train Parameters:**

Volumetric flow rate per train (At operating point 1')	22.37	m <sup>3</sup> /s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
	26.18	m <sup>3</sup> /s at operational conditions
Total Volumetric flow rate	52.36	m <sup>3</sup> /s at operational conditions
Waste Processing Rate	231.65	Mg/day
Annual Hours Required to Process 160, 000 tonnes per annum	8288.37	Hours

**Sample Calculation 1:** Particulate matter emission per train

**Emission Rate [g/s]** = Concentration[mg/dscm] x volumetric flow rate [dm<sup>3</sup>/s] x 1/1000 [mg/g]

$$= \frac{22.41 \text{ mg}}{\text{m}^3} \times \frac{22 \text{ m}^3}{\text{s}} \times \frac{1}{1,000} \frac{\text{g}}{\text{mg}}$$

$$= \frac{5.01\text{E-}01 \text{ g}}{\text{s}}$$

**Sample Calculation 2:** Bromodichloromethane emission per train

**Emission Rate [g/s]** = Concentration[kg/Mg] x Processing Rate [Mg/day] x 1000 [kg/g] x 1/86400 [day/s]

$$= \frac{1.50\text{E-}03 \text{ kg}}{\text{Mg}} \times \frac{232 \text{ Mg}}{\text{day}} \times \frac{1000 \text{ Kg}}{1 \text{ g}} \times \frac{1 \text{ day}}{86400 \text{ s}}$$

$$= \frac{4.03\text{E-}03 \text{ g}}{\text{s}}$$

**Sample Calculation 3:** Benzene Annual Emission Rate

**Emission Rate [g/s]** = Hourly Emission Rate [g/s] x Annual Processing Hours [Hours/year] / Total Hours per Year [Hours/year]

$$= \frac{8.05\text{E-}03 \text{ g}}{\text{s}} \times \frac{8,288 \text{ Hours}}{\text{Year}} \times \frac{1 \text{ Year}}{8,760 \text{ Hours}}$$

$$= \frac{7.62\text{E-}03 \text{ g}}{\text{s}}$$

## Source Emissions:

Contaminant	CAS Number	Concentration per train	Units <sup>(1)</sup>	Concentration Reference	Emission Rate per Train [g/s]	Total Emission Rate [g/s]	Annual Emission Rate [g/s]
Carbon Monoxide	630-08-0	4.50E+01	mg/Rm3	ESDM Report	1.01E+00	2.01E+00	—
Sulphur Dioxide	7446-09-5	3.50E+01	mg/Rm3	ECA Limit	7.84E-01	1.57E+00	1.48E+00
Total Particulate Matter	N/A -1	2.24E+01	mg/Rm3	ESDM Report	5.01E-01	1.00E+00	—
Filterable TSP	N/A -2	9.00E+00	mg/Rm3	ECA Limit	2.01E-01	4.03E-01	—
PM10	N/A -3	2.24E+01	mg/Rm3	ESDM Report	5.01E-01	1.00E+00	—
PM2.5	N/A -4	2.10E+01	mg/Rm3	ESDM Report	4.70E-01	9.40E-01	—
VOCs as CH4	N/A -5	4.90E+01	mg/Rm3	ESDM Report	1.10E+00	2.19E+00	—
Lead	7439-92-1	5.00E-02	mg/Rm3	ECA Limit	1.12E-03	2.24E-03	—
Cadmium	7440-43-9	7.00E-03	mg/Rm3	ECA Limit	1.57E-04	3.13E-04	—
Mercury	7439-97-6	1.50E-02	mg/Rm3	ECA Limit	3.36E-04	6.71E-04	—
Hydrogen Fluoride	7664-39-3	9.00E-01	mg/Rm3	ESDM Report	2.01E-02	4.03E-02	—
PCDD (I-TEQ)	N/A -6	6.00E-02	mg/Rm3	ECA Limit	0.0013 µg TEQ/s	0.0027 µg TEQ/s	—
Hydrogen Chloride	7647-01-0	9.00E+00	mg/Rm3	ECA Limit	2.01E-01	4.03E-01	—
Ammonia	7664-41-7	9.90E+00	mg/Rm3	ESDM Report	2.22E-01	4.43E-01	—
Nitrogen Oxides	10102-44-0	1.21E+02	mg/Rm3	ECA Limit	2.71E+00	5.41E+00	—
Polychlorinated Biphenyls (PCB)	N/A -7	7.22E-05	mg/Rm3	ESDM Report	1.62E-06	3.23E-06	—
Aluminum	7429-90-5	3.98E-02	mg/Rm3	ESDM Report	8.89E-04	1.78E-03	—
Antimony	7440-36-0	2.74E-03	mg/Rm3	ESDM Report	6.13E-05	1.23E-04	—
Arsenic	7440-38-2	4.20E-04	mg/Rm3	ESDM Report	9.40E-06	1.88E-05	—
Barium	7440-39-3	2.11E-03	mg/Rm3	ESDM Report	4.73E-05	9.46E-05	—
Beryllium	7440-41-7	3.33E-04	mg/Rm3	ESDM Report	7.45E-06	1.49E-05	—
Boron	7440-42-8	1.53E-01	mg/Rm3	ESDM Report	3.42E-03	6.85E-03	—
Chromium (hexavalent)	18540-29-9	3.20E-04	mg/Rm3	ESDM Report	7.16E-06	1.43E-05	1.35E-05
Total Chromium (and compounds)	7440-47-3	2.25E-03	mg/Rm3	ESDM Report	5.03E-05	1.01E-04	—
Cobalt	7440-48-4	5.79E-03	mg/Rm3	ESDM Report	1.30E-04	2.59E-04	—
Nickel	7440-02-0	8.71E-02	mg/Rm3	ESDM Report	1.95E-03	3.90E-03	3.69E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm3	ESDM Report	1.03E-03	2.06E-03	—
Silver	7440-22-4	3.35E-03	mg/Rm3	ESDM Report	7.50E-05	1.50E-04	—
Selenium	7782-49-2	4.80E-04	mg/Rm3	ESDM Report	1.07E-05	2.15E-05	—
Thallium	7440-28-0	3.90E-02	mg/Rm3	ESDM Report	8.73E-04	1.75E-03	—
Tin	7440-31-5	1.76E-02	mg/Rm3	ESDM Report	3.94E-04	7.87E-04	—
Vanadium	7440-62-2	1.16E-03	mg/Rm3	ESDM Report	2.60E-05	5.20E-05	—
Zinc	7440-66-6	2.00E-01	mg/Rm3	ESDM Report	4.46E-03	8.93E-03	—
1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm3	ESDM Report	4.58E-05	9.15E-05	—
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm3	ESDM Report	1.15E-06	2.30E-06	—
1,2,4 – Trichlorobenzene	120-82-1	5.15E-05	mg/Rm3	ESDM Report	1.15E-06	2.30E-06	—
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm3	ESDM Report	3.89E-06	7.78E-06	—
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm3	ESDM Report	1.17E-06	2.34E-06	—
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm3	ESDM Report	2.30E-06	4.61E-06	—
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm3	ESDM Report	4.61E-06	9.23E-06	—
Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm3	ESDM Report	1.15E-06	2.30E-06	—
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm3	ESDM Report	3.03E-06	6.05E-06	—
Acenaphthylene	208-96-8	1.45E-05	mg/Rm3	ESDM Report	3.24E-07	6.49E-07	—
Acenaphthene	83-32-9	1.86E-05	mg/Rm3	ESDM Report	4.16E-07	8.32E-07	—
Anthracene	120-12-7	4.07E-06	mg/Rm3	ESDM Report	9.11E-08	1.82E-07	—

Benzo(a)anthracene	56-55-3	1.50E-06	mg/Rm3	ESDM Report	3.36E-08	6.71E-08	—
Benzo(b)fluoranthene	205-99-2	3.83E-06	mg/Rm3	ESDM Report	8.57E-08	1.71E-07	—
Benzo(k)fluoranthene	207-08-9	1.01E-06	mg/Rm3	ESDM Report	2.26E-08	4.52E-08	—
Benzo(a)fluorene	238-84-6	2.76E-05	mg/Rm3	ESDM Report	6.18E-07	1.24E-06	—
Benzo(b)fluorene	243-17-4	1.89E-05	mg/Rm3	ESDM Report	4.23E-07	8.46E-07	—
Benzo(ghi)perylene	191-24-2	4.13E-05	mg/Rm3	ESDM Report	9.24E-07	1.85E-06	—
Benzo(a)pyrene	50-32-8	3.44E-06	mg/Rm3	ESDM Report	7.70E-08	1.54E-07	1.46E-07
Benzo(e)pyrene	192-97-2	8.71E-06	mg/Rm3	ESDM Report	1.95E-07	3.90E-07	—
Biphenyl	92-51-3	2.98E-03	mg/Rm3	ESDM Report	6.67E-05	1.33E-04	—
Chrysene	218-01-9	3.77E-06	mg/Rm3	ESDM Report	8.43E-08	1.69E-07	—
Dibenzo(a,c)anthracene	215-58-7	2.68E-05	mg/Rm3	ESDM Report	6.00E-07	1.20E-06	—
Dibenzo(a,h)anthracene	53-70-3	1.21E-06	mg/Rm3	ESDM Report	2.71E-08	5.41E-08	—
Fluoranthene	206-44-0	4.16E-05	mg/Rm3	ESDM Report	9.31E-07	1.86E-06	—
Fluorine	86-73-7	3.13E-05	mg/Rm3	ESDM Report	7.00E-07	1.40E-06	—
Indeno(1,2,3 - cd)pyrene	193-39-5	7.54E-06	mg/Rm3	ESDM Report	1.69E-07	3.37E-07	—
1 - methylnaphthalene	90-12-0	9.82E-05	mg/Rm3	ESDM Report	2.20E-06	4.39E-06	—
2 - methylnaphthalene	91-57-6	5.44E-04	mg/Rm3	ESDM Report	1.22E-05	2.43E-05	—
Naphthalene	91-20-3	4.23E-04	mg/Rm3	ESDM Report	9.46E-06	1.89E-05	—
Perylene	198-55-0	1.51E-06	mg/Rm3	ESDM Report	3.38E-08	6.76E-08	—
Phenanthrene	85-01-8	9.46E-05	mg/Rm3	ESDM Report	2.12E-06	4.23E-06	—
Pyrene	129-00-0	5.02E-05	mg/Rm3	ESDM Report	1.12E-06	2.25E-06	—
Tetralin	119-64-2	4.99E-04	mg/Rm3	ESDM Report	1.12E-05	2.23E-05	—
O-terphenyl	84-15-1	8.18E-05	mg/Rm3	ESDM Report	1.83E-06	3.66E-06	—
Acetaldehyde	75-07-0	4.30E-09	kg/Mg	ESDM Report	1.15E-08	2.31E-08	—
Benzene	71-43-2	3.10E-02	mg/Rm3	ESDM Report	6.94E-04	1.39E-03	1.31E-03
Bromodichloromethane	75-27-4	1.50E-03	kg/Mg	ESDM Report	4.03E-03	8.05E-03	—
Bromoform	75-25-2	4.11E-04	kg/Mg	ESDM Report	1.10E-03	2.20E-03	—
Bromomethane	74-83-9	3.60E-02	mg/Rm3	ESDM Report	8.05E-04	1.61E-03	—
Carbon tetrachloride	56-23-5	2.56E-06	kg/Mg	ESDM Report	6.86E-06	1.37E-05	—
Chloroform	67-66-3	5.10E-04	mg/Rm3	ESDM Report	1.14E-05	2.28E-05	—
Dichlorodifluoromethane	75-71-8	8.71E-02	mg/Rm3	ESDM Report	1.95E-03	3.90E-03	—
Dichloroethene, 1,1 -	75-34-3	5.65E-04	mg/Rm3	ESDM Report	1.27E-05	2.53E-05	—
Dichloromethane	75-09-2	1.76E-01	mg/Rm3	ESDM Report	3.94E-03	7.88E-03	—
Ethylbenzene	100-41-4	1.04E-03	mg/Rm3	ESDM Report	2.32E-05	4.64E-05	—
Ethylene Dibromide	106-93-4	2.41E-06	kg/Mg	ESDM Report	6.46E-06	1.29E-05	—
Formaldehyde	50-00-0	4.75E-02	mg/Rm3	ESDM Report	1.06E-03	2.13E-03	—
Tetrachloroethene	127-18-4	5.67E-03	mg/Rm3	ESDM Report	1.27E-04	2.54E-04	—
Toluene	108-88-3	5.03E-02	mg/Rm3	ESDM Report	1.12E-03	2.25E-03	—
Trichloroethane, 1,1,1 -	71-55-6	1.43E-03	mg/Rm3	ESDM Report	3.19E-05	6.39E-05	—
Trichloroethene	86-42-0	4.92E-04	mg/Rm3	ESDM Report	1.10E-05	2.20E-05	—
Trichloroethylene, 1,1,2 -	79-01-6	4.92E-04	mg/Rm3	ESDM Report	1.10E-05	2.20E-05	—
Trichlorofluoromethane	75-69-4	1.72E-01	mg/Rm3	ESDM Report	3.85E-03	7.71E-03	—
Vinyl chloride	75-01-4	4.36E-02	mg/Rm3	ESDM Report	9.76E-04	1.95E-03	—
Xylenes, m-, p- and o-	1330-20-7	6.04E-01	mg/Rm3	ESDM Report	1.35E-02	2.70E-02	—

1. Concentrations are at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature



# Attachment #1 to Report #2019-WR-4

Amanda Huxter  
Covanta Durham York Renewable Energy LP

Project No. 19117255  
February 19, 2019

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## APPENDIX B

# Emission Summary Table by Scenario

Appendix B - 140,000 TPA  
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Maximum POI Concentration [µg/m³]	Percentage of MECP Limit [%]	Background Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MECP Limit [%]
1 – Methylanthalene	90-12-0	4.18E-06	24-hour	35.5	Health	Sch. 3	SL-JSL	B2	4.10E-06	Below B2	1.30E-03	1.30E-03	Below B2
1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	24-hour	400	Health	Sch. 3	Guideline	B1	2.15E-06	<1%	5.00E-02	5.00E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	2.19E-06	24-hour	1	Health	Sch. 3	SL-JSL	B2	2.15E-06	Below B2	—	2.15E-06	Below B2
1,2-Dichlorobenzene	95-50-1	8.72E-05	1-hour	30500	Health	Sch. 3	Guideline	B1	5.03E-04	<1%	3.00E-02	3.05E-02	<1%
2 – Methylanthalene	91-57-6	2.32E-05	24-hour	0.1	—	—	De Minimus	—	2.27E-05	Below De Minimus	2.19E-03	2.21E-03	Below De Minimus
2,3,4,6-Tetrachlorophenol	58-90-2	7.41E-06	24-hour	0.75	Health	Sch. 3	SL-JSL	B2	7.26E-06	Below B2	—	7.26E-06	Below B2
2,4,6-Trichlorophenol	88-06-2	2.23E-06	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	2.19E-06	Below B2	—	2.19E-06	Below B2
2,4-Dichlorophenol	120-83-2	4.39E-06	24-hour	33.5	Health	Sch. 3	SL-JSL	B2	4.30E-06	Below B2	—	4.30E-06	Below B2
Acenaphthene	83-32-9	7.93E-07	24-hour	0.1	—	—	De Minimus	—	7.77E-07	Below De Minimus	1.25E-03	1.25E-03	Below De Minimus
Acenaphthylene	208-96-8	6.18E-07	24-hour	0.1	—	—	De Minimus	—	6.06E-07	Below De Minimus	3.09E-04	3.10E-04	Below De Minimus
Acetaldehyde	75-07-0	2.15E-08	24-hour	500	Health	Sch. 3	Standard	B1	2.11E-08	<1%	1.76E+00	1.76E+00	<1%
Acetaldehyde	75-07-0	2.15E-08	1/2-hour	500	Health	Sch. 3	Standard	B1	1.49E-07	<1%	5.21E+00	5.21E+00	1%
Acetaldehyde	75-07-0	2.15E-08	24-hour	5000	—	Sch. 6	URT	—	2.11E-08	Below URT	1.76E+00	1.76E+00	Below URT
Aluminum	7429-90-5	1.69E-03	24-hour	12	Health	Sch. 3	SL-JSL	B2	1.66E-03	Below B2	2.10E-01	2.12E-01	Below B2
Ammonia	7664-41-7	4.22E-01	24-hour	100	Health	Sch. 3	Standard	B1	4.13E-01	<1%	—	4.13E-01	<1%
Ammonia	7664-41-7	4.22E-01	24-hour	1000	—	Sch. 6	URT	—	4.13E-01	Below URT	—	4.13E-01	Below URT
Anthracene	120-12-7	1.73E-07	24-hour	0.1	—	—	De Minimus	—	1.70E-07	Below De Minimus	1.63E-04	1.63E-04	Below De Minimus
Antimony	7440-36-0	1.17E-04	24-hour	25	Health	Sch. 3	Standard	B1	1.14E-04	<1%	3.02E-03	3.13E-03	<1%
Arsenic	7440-38-2	1.79E-05	24-hour	0.3	Health	Sch. 3	Guideline	B1	1.75E-05	<1%	1.81E-03	1.83E-03	<1%
Barium	7440-39-3	9.01E-05	24-hour	10	Health	Sch. 3	Guideline	B1	8.83E-05	<1%	8.18E-03	8.27E-03	<1%
Benzene	71-43-2	1.17E-03	Annual	0.45	Health	Sch. 3	Standard	B1	3.71E-05	<1%	4.00E-02	4.00E-02	9%
Benzene	71-43-2	1.32E-03	24-hour	100	—	Sch. 6	URT	—	1.29E-03	Below URT	1.18E+01	1.18E+01	Below URT
Benzene	71-43-2	1.17E-03	Annual	4.5	—	—	AAV	—	3.71E-05	<1%	4.00E-02	4.00E-02	1%
Benzo(a)anthracene	56-55-3	6.39E-08	24-hour	0.1	—	—	De Minimus	—	6.26E-08	Below De Minimus	6.77E-05	6.78E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	1.18E-06	24-hour	0.1	—	—	De Minimus	—	1.15E-06	Below De Minimus	1.35E-04	1.36E-04	Below De Minimus
Benzo(a)pyrene	50-32-8	1.30E-07	Annual	0.00001	Health	Sch. 3	Standard	B1	4.12E-09	<1%	5.63E-05	5.63E-05	563%
Benzo(a)pyrene	50-32-8	1.47E-07	24-hour	0.005	—	Sch. 6	URT	—	1.44E-07	Below URT	6.77E-05	6.78E-05	Below URT
Benzo(a)pyrene	50-32-8	1.30E-07	Annual	0.0001	—	—	AAV	—	4.12E-09	<1%	5.63E-05	5.63E-05	56%
Benzo(b)fluoranthene	205-99-2	1.63E-07	24-hour	0.1	—	—	De Minimus	—	1.60E-07	Below De Minimus	1.42E-04	1.42E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	8.06E-07	24-hour	0.1	—	—	De Minimus	—	7.90E-07	Below De Minimus	1.35E-04	1.36E-04	Below De Minimus
Benzo(e)pyrene	192-97-2	3.71E-07	24-hour	0.1	—	—	De Minimus	—	3.64E-07	Below De Minimus	1.35E-04	1.35E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	1.76E-06	24-hour	0.1	—	—	De Minimus	—	1.72E-06	Below De Minimus	7.07E-05	7.24E-05	Below De Minimus
Benzo(k)fluoranthene	207-08-9	4.30E-08	24-hour	0.1	—	—	De Minimus	—	4.22E-08	Below De Minimus	6.77E-05	6.77E-05	Below De Minimus
Beryllium	7440-41-7	1.42E-05	24-hour	0.01	Health	Sch. 3	Standard	B1	1.39E-05	<1%	3.02E-04	3.16E-04	3%
Biphenyl	92-51-3	1.27E-04	24-hour	175	Health	Sch. 3	SL-JSL	B2	1.25E-04	Below B2	1.36E-03	1.48E-03	Below B2
Boron	7440-42-8	6.52E-03	24-hour	120	Particulate	Sch. 3	Standard	B1	6.39E-03	<1%	8.00E-02	8.64E-02	<1%
Bromodichloromethane	75-27-4	7.50E-03	24-hour	350	Health	Sch. 3	SL-JSL	B2	7.35E-03	Below B2	2.00E-02	2.73E-02	Below B2
Bromoform	75-25-2	2.05E-03	24-hour	55	Health	Sch. 3	Guideline	B1	2.01E-03	<1%	3.00E-02	3.20E-02	<1%
Bromomethane	74-83-9	1.53E-03	24-hour	1350	Health	Sch. 3	Guideline	B1	1.50E-03	<1%	9.00E-02	9.15E-02	<1%
Cadmium	7440-43-9	2.98E-04	24-hour	0.025	Health	Sch. 3	Standard	B1	2.92E-04	1%	6.04E-04	8.96E-04	4%
Cadmium	7440-43-9	2.98E-04	24-hour	0.25	—	Sch. 6	URT	—	2.92E-04	Below URT	6.04E-04	8.96E-04	Below URT
Carbon Monoxide	630-08-0	1.92E+00	1/2-hour	6000	Health	Sch. 3	Standard	B1	1.33E+01	<1%	1.26E+03	1.27E+03	21%
Carbon tetrachloride	56-23-5	1.28E-05	24-hour	2.4	Health	Sch. 3	Standard	B1	1.25E-05	<1%	7.40E-01	7.40E-01	31%
Carbon tetrachloride	56-23-5	1.28E-05	24-hour	24	—	Sch. 6	URT	—	1.25E-05	Below URT	7.40E-01	7.40E-01	Below URT
Chloroform	67-66-3	2.17E-05	24-hour	1	Health	Sch. 3	Standard	B1	2.13E-05	<1%	2.30E-01	2.30E-01	23%
Chloroform	67-66-3	2.17E-05	24-hour	100	—	Sch. 6	URT	—	2.13E-05	Below URT	2.30E-01	2.30E-01	Below URT
Chromium (hexavalent)	18540-29-9	1.21E-05	Annual	0.00014	Health	Sch. 3	Standard	B1	3.83E-07	<1%	—	3.83E-07	<1%
Chromium (hexavalent)	18540-29-9	1.36E-05	24-hour	0.07	—	Sch. 6	URT	—	1.34E-05	Below URT	—	1.34E-05	Below URT
Chromium (hexavalent)	18540-29-9	1.21E-05	Annual	0.0014	—	—	AAV	—	3.83E-07	0%	—	3.83E-07	0%

Appendix B - 140,000 TPA  
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Maximum POI Concentration [µg/m³]	Percentage of MECP Limit [%]	Background Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MECP Limit [%]
Chrysene	218-01-9	1.61E-07	24-hour	0.1	—	—	De Minimus	—	1.57E-07	Below De Minimus	9.64E-05	9.66E-05	Below De Minimus
Cobalt	7440-48-4	2.47E-04	24-hour	0.1	Health	Sch. 3	Guideline	B1	2.42E-04	<1%	6.04E-04	8.46E-04	<1%
Dibenzo(a,c)anthracene	215-58-7	1.14E-06	24-hour	0.1	—	—	De Minimus	—	1.12E-06	Below De Minimus	—	1.12E-06	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	5.16E-08	24-hour	0.1	—	—	De Minimus	—	5.05E-08	Below De Minimus	6.77E-05	6.78E-05	Below De Minimus
Dichlorodifluoromethane	75-71-8	3.71E-03	24-hour	500000	Health	Sch. 3	Guideline	B1	3.64E-03	<1%	3.23E+00	3.23E+00	<1%
Dichloroethene, 1,1 -	75-34-3	2.41E-05	24-hour	165	Health	Sch. 3	Standard	B1	2.36E-05	<1%	1.00E-02	1.00E-02	<1%
Dichloroethene, 1,1 -	75-34-3	2.41E-05	24-hour	1650	—	Sch. 6	URT	—	2.36E-05	Below URT	1.00E-02	1.00E-02	Below URT
Dichloromethane	75-09-2	7.50E-03	24-hour	220	Health	Sch. 3	Standard	B1	7.35E-03	<1%	1.27E+00	1.28E+00	<1%
Dichloromethane	75-09-2	7.50E-03	24-hour	22000	—	Sch. 6	URT	—	7.35E-03	Below URT	1.27E+00	1.28E+00	Below URT
Dioxins, Furans and Dioxin- like PCBs	N/A -6	0.0026 µg TEQ/s	24-hour	0.1 pg TEQ/m³	Health	Sch. 3	Guideline	B1	0.0025 pg TEQ/m³	3%	0.0237 pg TEQ/m³	0.0262 pg TEQ/m³	26%
Ethylbenzene	100-41-4	4.42E-05	24-hour	1000	Health	Sch. 3	Standard	B1	4.33E-05	<1%	1.24E+00	1.24E+00	<1%
Ethylbenzene	100-41-4	4.42E-05	10-minute	1900	Odour	Sch. 3	Guideline	B1	4.21E-04	<1%	5.00E+00	5.00E+00	<1%
Ethylbenzene	100-41-4	4.42E-05	24-hour	10000	—	Sch. 6	URT	—	4.33E-05	Below URT	1.24E+00	1.24E+00	Below URT
Ethylene Dibromide	106-93-4	1.20E-05	24-hour	3	Health	Sch. 3	Guideline	B1	1.18E-05	<1%	5.20E-03	5.21E-03	<1%
Fluoranthene	206-44-0	1.77E-06	24-hour	0.1	—	—	De Minimus	—	1.74E-06	Below De Minimus	6.01E-04	6.03E-04	Below De Minimus
Fluorine	86-73-7	1.33E-06	24-hour	0.1	—	—	De Minimus	—	1.31E-06	Below De Minimus	—	1.31E-06	Below De Minimus
Formaldehyde	50-00-0	2.02E-03	24-hour	65	Health	Sch. 3	Standard	B1	1.98E-03	<1%	3.38E+00	3.38E+00	5%
Hexachlorobenzene	118-74-1	2.19E-06	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	2.15E-06	Below B2	6.25E-05	6.47E-05	Below B2
Hydrogen Chloride	7647-01-0	3.84E-01	24-hour	20	Health	Sch. 3	Standard	B1	3.76E-01	2%	—	3.76E-01	2%
Hydrogen Chloride	7647-01-0	3.84E-01	24-hour	200	—	Sch. 6	URT	—	3.76E-01	Below URT	—	3.76E-01	Below URT
Hydrogen Fluoride	7664-39-3	3.84E-02	24-hour	1.72	Vegetation	Sch. 3	Standard	B1	3.76E-02	2%	—	3.76E-02	2%
Hydrogen Fluoride	7664-39-3	3.84E-02	30-day	0.69	Vegetation	Sch. 3	Standard	B1	4.53E-03	<1%	—	4.53E-03	<1%
Indeno(1,2,3 - cd)pyrene	193-39-5	3.21E-07	24-hour	0.1	—	—	De Minimus	—	3.15E-07	Below De Minimus	6.77E-05	6.80E-05	Below De Minimus
Lead	7439-92-1	2.13E-03	24-hour	0.5	Health	Sch. 3	Standard	B1	2.09E-03	<1%	4.98E-03	7.07E-03	1%
Lead	7439-92-1	2.13E-03	30-day	0.2	Health	Sch. 3	Standard	B1	2.52E-04	<1%	1.92E-03	2.17E-03	1%
Lead	7439-92-1	2.13E-03	24-hour	2	—	Sch. 6	URT	—	2.09E-03	Below URT	4.98E-03	7.07E-03	Below URT
Mercury	7439-97-6	6.39E-04	24-hour	2	Health	Sch. 3	Standard	B1	6.26E-04	<1%	—	6.26E-04	<1%
Naphthalene	91-20-3	1.80E-05	24-hour	22.5	Health	Sch. 3	Guideline	B1	1.77E-05	<1%	2.43E-03	2.45E-03	<1%
Naphthalene	91-20-3	1.80E-05	10-minute	50	Odour	Sch. 3	Guideline	B1	1.72E-04	<1%	9.77E-03	9.94E-03	<1%
Nickel	7440-02-0	3.30E-03	Annual	0.04	Health	Sch. 3	Standard	B1	1.04E-04	<1%	8.59E-04	9.63E-04	2%
Nickel	7440-02-0	3.71E-03	24-hour	2	—	Sch. 6	URT	—	3.64E-03	Below URT	4.49E-03	8.13E-03	Below URT
Nickel	7440-02-0	3.30E-03	Annual	0.4	—	—	AAV	—	1.04E-04	0%	2.24E-03	2.34E-03	1%
Nitrogen Oxides	10102-44-0	5.14E+00	24-hour	200	Health	Sch. 3	Standard	B1	5.04E+00	3%	5.82E+01	6.32E+01	32%
Nitrogen Oxides	10102-44-0	5.14E+00	1-hour	400	Health	Sch. 3	Standard	B1	2.97E+01	7%	6.46E+01	9.43E+01	24%
O-terphenyl	84-15-1	3.49E-06	24-hour	0.1	—	—	De Minimus	—	3.42E-06	Below De Minimus	1.35E-04	1.38E-04	Below De Minimus
Pentachlorobenzene	608-93-5	5.77E-06	24-hour	80	Health	Sch. 3	SL-JSL	B2	5.65E-06	Below B2	—	5.65E-06	Below B2
Pentachlorophenol	87-86-5	8.79E-06	24-hour	20	Health	Sch. 3	Guideline	B1	8.61E-06	<1%	8.76E-04	8.85E-04	<1%
Perylene	198-55-0	6.44E-08	24-hour	0.1	—	—	De Minimus	—	6.31E-08	Below De Minimus	1.35E-04	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	4.03E-06	24-hour	0.1	—	—	De Minimus	—	3.95E-06	Below De Minimus	2.57E-03	2.57E-03	Below De Minimus
Phosphorus	7723-14-0	1.96E-03	24-hour	0.5	Health	Sch. 3	SL-MD	B2	1.92E-03	Below B2	7.00E-02	7.19E-02	Below B2
PM <sub>10</sub>	N/A -3	9.55E-01	24-hour	50	Particulate	—	AAQC	—	1.05E+00	2%	—	1.05E+00	2%
PM <sub>2.5</sub>	N/A -4	8.95E-01	24-hour	30	Particulate	—	AAQC	—	9.87E-01	3%	2.04E+01	2.14E+01	71%
Polychlorinated Biphenyls (PCB)	N/A -7	3.08E-06	24-hour	0.1	—	—	De Minimus	—	3.02E-06	Below De Minimus	4.20E-05	4.50E-05	Below De Minimus
Pyrene	129-00-0	2.14E-06	24-hour	0.1	—	—	De Minimus	—	2.10E-06	Below De Minimus	2.83E-04	2.85E-04	Below De Minimus
Selenium	7782-49-2	2.05E-05	24-hour	10	Health	Sch. 3	Guideline	B1	2.00E-05	<1%	3.02E-03	3.04E-03	<1%
Silver	7440-22-4	1.43E-04	24-hour	1	Health	Sch. 3	Standard	B1	1.40E-04	<1%	3.42E-04	4.82E-04	<1%
Sulphur Dioxide	7446-09-5	1.49E+00	24-hour	275	Health & Vegetation	Sch. 3	Standard	B1	1.46E+00	<1%	1.93E+01	2.08E+01	8%
Sulphur Dioxide	7446-09-5	1.49E+00	1-hour	690	Health & Vegetation	Sch. 3	Standard	B1	8.62E+00	1%	1.95E+01	2.81E+01	4%
Sulphur Dioxide	7446-09-5	1.49E+00	1-hour	100	Health & Vegetation	Sch. 3	Standard	B1	8.62E+00	9%	1.95E+01	2.81E+01	28%

Appendix B - 140,000 TPA  
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	MECP POI Limit [ $\mu\text{g}/\text{m}^3$ ]	Limiting Effect	Schedule	Source	Benchmark	Maximum POI Concentration [ $\mu\text{g}/\text{m}^3$ ]	Percentage of MECP Limit [%]	Background Concentration [ $\mu\text{g}/\text{m}^3$ ]	Maximum POI Concentration (Including Background) [ $\mu\text{g}/\text{m}^3$ ]	Percentage of MECP Limit [%]
Sulphur Dioxide	7446-09-5	1.33E+00	Annual	10	Health & Vegetation	Sch. 3	Standard	B1	4.20E-02	<1%	6.03E+00	6.07E+00	61%
Sulphur Dioxide	7446-09-5	1.49E+00	1-hour	690	—	Sch. 6	URT	—	8.62E+00	Below URT	1.95E+01	2.81E+01	Below URT
Tetrachloroethene	127-18-4	2.42E-04	24-hour	360	Health	Sch. 3	Standard	B1	2.37E-04	<1%	4.90E-01	4.90E-01	<1%
Tetrachloroethene	127-18-4	2.42E-04	24-hour	3600	—	Sch. 6	URT	—	2.37E-04	Below URT	4.90E-01	4.90E-01	Below URT
Tetralin	119-64-2	2.12E-05	24-hour	151.5	Health	Sch. 3	SL-JSL	B2	2.08E-05	Below B2	1.35E-04	1.56E-04	Below B2
Thallium	7440-28-0	1.66E-03	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	1.63E-03	Below B2	—	1.63E-03	Below B2
Tin	7440-31-5	7.50E-04	24-hour	10	Health	Sch. 3	Standard	B1	7.35E-04	<1%	3.02E-03	3.75E-03	<1%
Toluene	108-88-3	2.14E-03	24-hour	2000	Odour	Sch. 3	Guideline	B1	2.10E-03	<1%	9.47E+00	9.47E+00	<1%
Total Chromium (and compounds)	7440-47-3	9.59E-05	24-hour	0.5	Health	Sch. 3	Standard	B1	9.40E-05	<1%	2.76E-03	2.85E-03	<1%
Total Chromium (and compounds)	7440-47-3	9.59E-05	24-hour	5	—	Sch. 6	URT	—	9.40E-05	Below URT	2.76E-03	2.85E-03	Below URT
Total Particulate Matter	N/A -1	9.55E-01	24-hour	120	Particulate	Sch. 3	Guideline	B1	1.05E+00	<1%	3.54E+01	3.64E+01	30%
Trichloroethane, 1,1,1 -	71-55-6	6.08E-05	24-hour	115000	Health	Sch. 3	Standard	B1	5.96E-05	<1%	1.10E-01	1.10E-01	<1%
Trichloroethene	86-42-0	2.10E-05	24-hour	0.1	—	—	De Minimus	—	2.05E-05	Below De Minimus	5.40E-01	5.40E-01	Above De Minimus
Trichloroethylene, 1,1,2 -	79-01-6	2.10E-05	24-hour	12	Health	Sch. 3	Standard	B1	2.05E-05	<1%	—	2.05E-05	<1%
Trichloroethylene, 1,1,2 -	79-01-6	2.10E-05	24-hour	1200	—	Sch. 6	URT	—	2.05E-05	Below URT	—	2.05E-05	Below URT
Trichlorofluoromethane	75-69-4	7.34E-03	24-hour	6000	Health	Sch. 3	Guideline	B1	7.19E-03	<1%	2.15E+00	2.16E+00	<1%
Vanadium	7440-62-2	4.96E-05	24-hour	2	Health	Sch. 3	Standard	B1	4.86E-05	<1%	1.55E-03	1.60E-03	<1%
Vinyl chloride	75-01-4	1.86E-03	24-hour	1	Health	Sch. 3	Standard	B1	1.82E-03	<1%	5.88E-03	7.70E-03	<1%
Vinyl chloride	75-01-4	1.86E-03	24-hour	100	—	Sch. 6	URT	—	1.82E-03	Below URT	5.88E-03	7.70E-03	Below URT
Xylenes, m-, p- and o-	1330-20-7	2.57E-02	24-hour	730	Health	Sch. 3	Standard	B1	2.52E-02	<1%	4.83E+00	4.86E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	2.57E-02	10-minute	3000	Odour	Sch. 3	Guideline	B1	2.45E-01	<1%	1.94E+01	1.96E+01	<1%
Xylenes, m-, p- and o-	1330-20-7	2.57E-02	24-hour	7300	—	Sch. 6	URT	—	2.52E-02	Below URT	4.83E+00	4.86E+00	Below URT
Zinc	7440-66-6	8.50E-03	24-hour	120	Particulate	Sch. 3	Standard	B1	8.33E-03	<1%	4.00E-02	4.83E-02	<1%

Appendix B - 160,000 TPA  
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Maximum POI Concentration [µg/m³]	Percentage of MECP Limit [%]	Background Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MECP Limit [%]
1 – Methylanthalene	90-12-0	4.39E-06	24-hour	35.5	Health	Sch. 3	SL-JSL	B2	3.78E-06	Below B2	1.30E-03	1.30E-03	Below B2
1,2,4 – Trichlorobenzene	120-82-1	2.30E-06	24-hour	400	Health	Sch. 3	Guideline	B1	1.98E-06	<1%	5.00E-02	5.00E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	2.30E-06	24-hour	1	Health	Sch. 3	SL-JSL	B2	1.98E-06	Below B2	—	1.98E-06	Below B2
1,2-Dichlorobenzene	95-50-1	9.15E-05	1-hour	30500	Health	Sch. 3	Guideline	B1	5.28E-04	<1%	3.00E-02	3.05E-02	<1%
2 – Methylanthalene	91-57-6	2.43E-05	24-hour	0.1	—	—	De Minimus	—	2.10E-05	Below De Minimus	2.19E-03	2.21E-03	Below De Minimus
2,3,4,6-Tetrachlorophenol	58-90-2	7.78E-06	24-hour	0.75	Health	Sch. 3	SL-JSL	B2	6.70E-06	Below B2	—	6.70E-06	Below B2
2,4,6-Trichlorophenol	88-06-2	2.34E-06	24-hour	1.5	Health	Sch. 3	SL-JSL	B2	2.02E-06	Below B2	—	2.02E-06	Below B2
2,4-Dichlorophenol	120-83-2	4.61E-06	24-hour	33.5	Health	Sch. 3	SL-JSL	B2	3.97E-06	Below B2	—	3.97E-06	Below B2
Acenaphthene	83-32-9	8.32E-07	24-hour	0.1	—	—	De Minimus	—	7.17E-07	Below De Minimus	1.25E-03	1.25E-03	Below De Minimus
Acenaphthylene	208-96-8	6.49E-07	24-hour	0.1	—	—	De Minimus	—	5.59E-07	Below De Minimus	3.09E-04	3.10E-04	Below De Minimus
Acetaldehyde	75-07-0	2.31E-08	24-hour	500	Health	Sch. 3	Standard	B1	1.99E-08	<1%	1.76E+00	1.76E+00	<1%
Acetaldehyde	75-07-0	2.31E-08	1/2-hour	500	Health	Sch. 3	Standard	B1	1.60E-07	<1%	5.21E+00	5.21E+00	1%
Acetaldehyde	75-07-0	2.31E-08	24-hour	5000	—	Sch. 6	URT	—	1.99E-08	Below URT	1.76E+00	1.76E+00	Below URT
Aluminum	7429-90-5	1.78E-03	24-hour	12	Health	Sch. 3	SL-JSL	B2	1.53E-03	Below B2	2.10E-01	2.12E-01	Below B2
Ammonia	7664-41-7	4.43E-01	24-hour	100	Health	Sch. 3	Standard	B1	3.82E-01	<1%	—	3.82E-01	<1%
Ammonia	7664-41-7	4.43E-01	24-hour	1000	—	Sch. 6	URT	—	3.82E-01	Below URT	—	3.82E-01	Below URT
Anthracene	120-12-7	1.82E-07	24-hour	0.1	—	—	De Minimus	—	1.57E-07	Below De Minimus	1.63E-04	1.63E-04	Below De Minimus
Antimony	7440-36-0	1.23E-04	24-hour	25	Health	Sch. 3	Standard	B1	1.06E-04	<1%	3.02E-03	3.13E-03	<1%
Arsenic	7440-38-2	1.88E-05	24-hour	0.3	Health	Sch. 3	Guideline	B1	1.62E-05	<1%	1.81E-03	1.83E-03	<1%
Barium	7440-39-3	9.46E-05	24-hour	10	Health	Sch. 3	Guideline	B1	8.15E-05	<1%	8.18E-03	8.26E-03	<1%
Benzene	71-43-2	1.31E-03	Annual	0.45	Health	Sch. 3	Standard	B1	3.77E-05	<1%	4.00E-02	4.00E-02	9%
Benzene	71-43-2	1.39E-03	24-hour	100	—	Sch. 6	URT	—	1.19E-03	Below URT	1.18E+01	1.18E+01	Below URT
Benzene	71-43-2	1.31E-03	Annual	4.5	—	—	AAV	—	3.77E-05	<1%	4.00E-02	4.00E-02	1%
Benzo(a)anthracene	56-55-3	6.71E-08	24-hour	0.1	—	—	De Minimus	—	5.78E-08	Below De Minimus	6.77E-05	6.78E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	1.24E-06	24-hour	0.1	—	—	De Minimus	—	1.07E-06	Below De Minimus	1.35E-04	1.36E-04	Below De Minimus
Benzo(a)pyrene	50-32-8	1.46E-07	Annual	0.00001	Health	Sch. 3	Standard	B1	4.18E-09	<1%	5.63E-05	5.63E-05	563%
Benzo(a)pyrene	50-32-8	1.54E-07	24-hour	0.005	—	Sch. 6	URT	—	1.33E-07	Below URT	6.77E-05	6.78E-05	Below URT
Benzo(a)pyrene	50-32-8	1.46E-07	Annual	0.0001	—	—	AAV	—	4.18E-09	<1%	5.63E-05	5.63E-05	56%
Benzo(b)fluoranthene	205-99-2	1.71E-07	24-hour	0.1	—	—	De Minimus	—	1.48E-07	Below De Minimus	1.42E-04	1.42E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	8.46E-07	24-hour	0.1	—	—	De Minimus	—	7.29E-07	Below De Minimus	1.35E-04	1.36E-04	Below De Minimus
Benzo(e)pyrene	192-97-2	3.90E-07	24-hour	0.1	—	—	De Minimus	—	3.36E-07	Below De Minimus	1.35E-04	1.35E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	1.85E-06	24-hour	0.1	—	—	De Minimus	—	1.59E-06	Below De Minimus	7.07E-05	7.23E-05	Below De Minimus
Benzo(k)fluoranthene	207-08-9	4.52E-08	24-hour	0.1	—	—	De Minimus	—	3.89E-08	Below De Minimus	6.77E-05	6.77E-05	Below De Minimus
Beryllium	7440-41-7	1.49E-05	24-hour	0.01	Health	Sch. 3	Standard	B1	1.28E-05	<1%	3.02E-04	3.15E-04	3%
Biphenyl	92-51-3	1.33E-04	24-hour	175	Health	Sch. 3	SL-JSL	B2	1.15E-04	Below B2	1.36E-03	1.47E-03	Below B2
Boron	7440-42-8	6.85E-03	24-hour	120	Particulate	Sch. 3	Standard	B1	5.90E-03	<1%	8.00E-02	8.59E-02	<1%
Bromodichloromethane	75-27-4	8.05E-03	24-hour	350	Health	Sch. 3	SL-JSL	B2	6.93E-03	Below B2	2.00E-02	2.69E-02	Below B2
Bromoform	75-25-2	2.20E-03	24-hour	55	Health	Sch. 3	Guideline	B1	1.90E-03	<1%	3.00E-02	3.19E-02	<1%
Bromomethane	74-83-9	1.61E-03	24-hour	1350	Health	Sch. 3	Guideline	B1	1.39E-03	<1%	9.00E-02	9.14E-02	<1%
Cadmium	7440-43-9	3.13E-04	24-hour	0.025	Health	Sch. 3	Standard	B1	2.70E-04	1%	6.04E-04	8.74E-04	3%
Cadmium	7440-43-9	3.13E-04	24-hour	0.25	—	Sch. 6	URT	—	2.70E-04	Below URT	6.04E-04	8.74E-04	Below URT
Carbon Monoxide	630-08-0	2.01E+00	1/2-hour	6000	Health	Sch. 3	Standard	B1	1.39E+01	<1%	1.26E+03	1.27E+03	21%
Carbon tetrachloride	56-23-5	1.37E-05	24-hour	2.4	Health	Sch. 3	Standard	B1	1.18E-05	<1%	7.40E-01	7.40E-01	31%
Carbon tetrachloride	56-23-5	1.37E-05	24-hour	24	—	Sch. 6	URT	—	1.18E-05	Below URT	7.40E-01	7.40E-01	Below URT
Chloroform	67-66-3	2.28E-05	24-hour	1	Health	Sch. 3	Standard	B1	1.97E-05	<1%	2.30E-01	2.30E-01	23%
Chloroform	67-66-3	2.28E-05	24-hour	100	—	Sch. 6	URT	—	1.97E-05	Below URT	2.30E-01	2.30E-01	Below URT
Chromium (hexavalent)	18540-29-9	1.35E-05	Annual	0.00014	Health	Sch. 3	Standard	B1	3.89E-07	<1%	—	3.89E-07	<1%
Chromium (hexavalent)	18540-29-9	1.43E-05	24-hour	0.07	—	Sch. 6	URT	—	1.23E-05	Below URT	—	1.23E-05	Below URT

Appendix B - 160,000 TPA  
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	MECP POI Limit [µg/m³]	Limiting Effect	Schedule	Source	Benchmark	Maximum POI Concentration [µg/m³]	Percentage of MECP Limit [%]	Background Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MECP Limit [%]
Chromium (hexavalent)	18540-29-9	1.35E-05	Annual	0.0014	—	—	AAV	—	3.89E-07	0%	—	3.89E-07	0%
Chrysene	218-01-9	1.69E-07	24-hour	0.1	—	—	De Minimus	—	1.45E-07	Below De Minimus	9.64E-05	9.65E-05	Below De Minimus
Cobalt	7440-48-4	2.59E-04	24-hour	0.1	Health	Sch. 3	Guideline	B1	2.23E-04	<1%	6.04E-04	8.27E-04	<1%
Dibenzo(a,c)anthracene	215-58-7	1.20E-06	24-hour	0.1	—	—	De Minimus	—	1.03E-06	Below De Minimus	—	1.03E-06	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	5.41E-08	24-hour	0.1	—	—	De Minimus	—	4.66E-08	Below De Minimus	6.77E-05	6.77E-05	Below De Minimus
Dichlorodifluoromethane	75-71-8	3.90E-03	24-hour	500000	Health	Sch. 3	Guideline	B1	3.36E-03	<1%	3.23E+00	3.23E+00	<1%
Dichloroethene, 1,1 -	75-34-3	2.53E-05	24-hour	165	Health	Sch. 3	Standard	B1	2.18E-05	<1%	1.00E-02	1.00E-02	<1%
Dichloroethene, 1,1 -	75-34-3	2.53E-05	24-hour	1650	—	Sch. 6	URT	—	2.18E-05	Below URT	1.00E-02	1.00E-02	Below URT
Dichloromethane	75-09-2	7.88E-03	24-hour	220	Health	Sch. 3	Standard	B1	6.78E-03	<1%	1.27E+00	1.28E+00	<1%
Dichloromethane	75-09-2	7.88E-03	24-hour	22000	—	Sch. 6	URT	—	6.78E-03	Below URT	1.27E+00	1.28E+00	Below URT
Dioxins, Furans and Dioxin- like PCBs	N/A -6	2.68E-03	24-hour	0.1 pg TEQ/m³	Health	Sch. 3	Guideline	B1	0.0023 pg TEQ/m³	2%	0.0237 pg TEQ/m³	0.026 pg TEQ/m³	26%
Ethylbenzene	100-41-4	4.64E-05	24-hour	1000	Health	Sch. 3	Standard	B1	3.99E-05	<1%	1.24E+00	1.24E+00	<1%
Ethylbenzene	100-41-4	4.64E-05	10-minute	1900	Odour	Sch. 3	Guideline	B1	4.42E-04	<1%	5.00E+00	5.00E+00	<1%
Ethylbenzene	100-41-4	4.64E-05	24-hour	10000	—	Sch. 6	URT	—	3.99E-05	Below URT	1.24E+00	1.24E+00	Below URT
Ethylene Dibromide	106-93-4	1.29E-05	24-hour	3	Health	Sch. 3	Guideline	B1	1.11E-05	<1%	5.20E-03	5.21E-03	<1%
Fluoranthene	206-44-0	1.86E-06	24-hour	0.1	—	—	De Minimus	—	1.60E-06	Below De Minimus	6.01E-04	6.03E-04	Below De Minimus
Fluorine	86-73-7	1.40E-06	24-hour	0.1	—	—	De Minimus	—	1.21E-06	Below De Minimus	—	1.21E-06	Below De Minimus
Formaldehyde	50-00-0	2.13E-03	24-hour	65	Health	Sch. 3	Standard	B1	1.83E-03	<1%	3.38E+00	3.38E+00	5%
Hexachlorobenzene	118-74-1	2.30E-06	24-hour	0.011	Health	Sch. 3	SL-JSL	B2	1.98E-06	Below B2	6.25E-05	6.45E-05	Below B2
Hydrogen Chloride	7647-01-0	4.03E-01	24-hour	20	Health	Sch. 3	Standard	B1	3.47E-01	2%	—	3.47E-01	2%
Hydrogen Chloride	7647-01-0	4.03E-01	24-hour	200	—	Sch. 6	URT	—	3.47E-01	Below URT	—	3.47E-01	Below URT
Hydrogen Fluoride	7664-39-3	4.03E-02	24-hour	1.72	Vegetation	Sch. 3	Standard	B1	3.47E-02	2%	—	3.47E-02	2%
Hydrogen Fluoride	7664-39-3	4.03E-02	30-day	0.69	Vegetation	Sch. 3	Standard	B1	4.32E-03	<1%	—	4.32E-03	<1%
Indeno(1,2,3 - cd)pyrene	193-39-5	3.37E-07	24-hour	0.1	—	—	De Minimus	—	2.91E-07	Below De Minimus	6.77E-05	6.80E-05	Below De Minimus
Lead	7439-92-1	2.24E-03	24-hour	0.5	Health	Sch. 3	Standard	B1	1.93E-03	<1%	4.98E-03	6.91E-03	1%
Lead	7439-92-1	2.24E-03	30-day	0.2	Health	Sch. 3	Standard	B1	2.40E-04	<1%	1.92E-03	2.16E-03	1%
Lead	7439-92-1	2.24E-03	24-hour	2	—	Sch. 6	URT	—	1.93E-03	Below URT	4.98E-03	6.91E-03	Below URT
Mercury	7439-97-6	6.71E-04	24-hour	2	Health	Sch. 3	Standard	B1	5.78E-04	<1%	—	5.78E-04	<1%
Naphthalene	91-20-3	1.89E-05	24-hour	22.5	Health	Sch. 3	Guideline	B1	1.63E-05	<1%	2.43E-03	2.45E-03	<1%
Naphthalene	91-20-3	1.89E-05	10-minute	50	Odour	Sch. 3	Guideline	B1	1.80E-04	<1%	9.77E-03	9.95E-03	<1%
Nickel	7440-02-0	3.69E-03	Annual	0.04	Health	Sch. 3	Standard	B1	1.06E-04	<1%	8.59E-04	9.65E-04	2%
Nickel	7440-02-0	3.90E-03	24-hour	2	—	Sch. 6	URT	—	3.36E-03	Below URT	4.49E-03	7.85E-03	Below URT
Nickel	7440-02-0	3.69E-03	Annual	0.4	—	—	AAV	—	1.06E-04	<1%	2.24E-03	2.35E-03	1%
Nitrogen Oxides	10102-44-0	5.41E+00	24-hour	200	Health	Sch. 3	Standard	B1	4.66E+00	2%	5.82E+01	6.29E+01	31%
Nitrogen Oxides	10102-44-0	5.41E+00	1-hour	400	Health	Sch. 3	Standard	B1	3.13E+01	8%	6.46E+01	9.59E+01	24%
O-terphenyl	84-15-1	3.66E-06	24-hour	0.1	—	—	De Minimus	—	3.15E-06	Below De Minimus	1.35E-04	1.38E-04	Below De Minimus
Pentachlorobenzene	608-93-5	6.05E-06	24-hour	80	Health	Sch. 3	SL-JSL	B2	5.21E-06	Below B2	—	5.21E-06	Below B2
Pentachlorophenol	87-86-5	9.23E-06	24-hour	20	Health	Sch. 3	Guideline	B1	7.95E-06	<1%	8.76E-04	8.84E-04	<1%
Perylene	198-55-0	6.76E-08	24-hour	0.1	—	—	De Minimus	—	5.82E-08	Below De Minimus	1.35E-04	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	4.23E-06	24-hour	0.1	—	—	De Minimus	—	3.65E-06	Below De Minimus	2.57E-03	2.57E-03	Below De Minimus
Phosphorus	7723-14-0	2.06E-03	24-hour	0.5	Health	Sch. 3	SL-MD	B2	1.77E-03	Below B2	7.00E-02	7.18E-02	Below B2
PM <sub>10</sub>	N/A -3	1.00E+00	24-hour	50	Particulate	—	AAQC	—	9.74E-01	2%	—	9.74E-01	2%
PM <sub>2.5</sub>	N/A -4	9.40E-01	24-hour	30	Particulate	—	AAQC	—	9.20E-01	3%	2.04E+01	2.13E+01	71%
Polychlorinated Biphenyls (PCB)	N/A -7	3.23E-06	24-hour	0.1	—	—	De Minimus	—	2.78E-06	Below De Minimus	4.20E-05	4.48E-05	Below De Minimus
Pyrene	129-00-0	2.25E-06	24-hour	0.1	—	—	De Minimus	—	1.93E-06	Below De Minimus	2.83E-04	2.85E-04	Below De Minimus
Selenium	7782-49-2	2.15E-05	24-hour	10	Health	Sch. 3	Guideline	B1	1.85E-05	<1%	3.02E-03	3.04E-03	<1%
Silver	7440-22-4	1.50E-04	24-hour	1	Health	Sch. 3	Standard	B1	1.29E-04	<1%	3.42E-04	4.71E-04	<1%
Sulphur Dioxide	7446-09-5	1.57E+00	24-hour	275	Health & Vegetation	Sch. 3	Standard	B1	1.35E+00	<1%	1.93E+01	2.07E+01	8%

Appendix B - 160,000 TPA  
Emission Summary Table

Contaminant	CAS No.	Total Facility Emission Rate [g/s]	Averaging Period	MECP POI Limit [ $\mu\text{g}/\text{m}^3$ ]	Limiting Effect	Schedule	Source	Benchmark	Maximum POI Concentration [ $\mu\text{g}/\text{m}^3$ ]	Percentage of MECP Limit [%]	Background Concentration [ $\mu\text{g}/\text{m}^3$ ]	Maximum POI Concentration (Including Background) [ $\mu\text{g}/\text{m}^3$ ]	Percentage of MECP Limit [%]
Sulphur Dioxide	7446-09-5	1.57E+00	1-hour	690	Health & Vegetation	Sch. 3	Standard	B1	9.05E+00	1%	1.95E+01	2.86E+01	4%
Sulphur Dioxide	7446-09-5	1.57E+00	1-hour	100	Health & Vegetation	Sch. 3	Standard	B1	9.05E+00	9%	1.95E+01	2.86E+01	29%
Sulphur Dioxide	7446-09-5	1.48E+00	Annual	10	Health & Vegetation	Sch. 3	Standard	B1	4.26E-02	<1%	6.03E+00	6.07E+00	61%
Sulphur Dioxide	7446-09-5	1.57E+00	1-hour	690	—	Sch. 6	URT	—	9.05E+00	Below URT	1.95E+01	2.86E+01	Below URT
Tetrachloroethene	127-18-4	2.54E-04	24-hour	360	Health	Sch. 3	Standard	B1	2.19E-04	<1%	4.90E-01	4.90E-01	<1%
Tetrachloroethene	127-18-4	2.54E-04	24-hour	3600	—	Sch. 6	URT	—	2.19E-04	Below URT	4.90E-01	4.90E-01	Below URT
Tetralin	119-64-2	2.23E-05	24-hour	151.5	Health	Sch. 3	SL-JSL	B2	1.92E-05	Below B2	1.35E-04	1.54E-04	Below B2
Thallium	7440-28-0	1.75E-03	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	1.50E-03	Below B2	—	1.50E-03	Below B2
Tin	7440-31-5	7.87E-04	24-hour	10	Health	Sch. 3	Standard	B1	6.78E-04	<1%	3.02E-03	3.70E-03	<1%
Toluene	108-88-3	2.25E-03	24-hour	2000	Odour	Sch. 3	Guideline	B1	1.94E-03	<1%	9.47E+00	9.47E+00	<1%
Total Chromium (and compounds)	7440-47-3	1.01E-04	24-hour	0.5	Health	Sch. 3	Standard	B1	8.67E-05	<1%	2.76E-03	2.85E-03	<1%
Total Chromium (and compounds)	7440-47-3	1.01E-04	24-hour	5	—	Sch. 6	URT	—	8.67E-05	Below URT	2.76E-03	2.85E-03	Below URT
Total Particulate Matter	N/A -1	1.00E+00	24-hour	120	Particulate	Sch. 3	Guideline	B1	9.74E-01	<1%	3.54E+01	3.64E+01	30%
Trichloroethane, 1,1,1 -	71-55-6	6.39E-05	24-hour	115000	Health	Sch. 3	Standard	B1	5.50E-05	<1%	1.10E-01	1.10E-01	<1%
Trichloroethene	86-42-0	2.20E-05	24-hour	0.1	—	—	De Minimus	—	1.89E-05	Below De Minimus	5.40E-01	5.40E-01	Above De Minimus
Trichloroethylene, 1,1,2 -	79-01-6	2.20E-05	24-hour	12	Health	Sch. 3	Standard	B1	1.89E-05	<1%	—	1.89E-05	<1%
Trichloroethylene, 1,1,2 -	79-01-6	2.20E-05	24-hour	1200	—	Sch. 6	URT	—	1.89E-05	Below URT	—	1.89E-05	Below URT
Trichlorofluoromethane	75-69-4	7.71E-03	24-hour	6000	Health	Sch. 3	Guideline	B1	6.64E-03	<1%	2.15E+00	2.16E+00	<1%
Vanadium	7440-62-2	5.20E-05	24-hour	2	Health	Sch. 3	Standard	B1	4.48E-05	<1%	1.55E-03	1.59E-03	<1%
Vinyl chloride	75-01-4	1.95E-03	24-hour	1	Health	Sch. 3	Standard	B1	1.68E-03	<1%	5.88E-03	7.56E-03	<1%
Vinyl chloride	75-01-4	1.95E-03	24-hour	100	—	Sch. 6	URT	—	1.68E-03	Below URT	5.88E-03	7.56E-03	Below URT
Xylenes, m-, p- and o-	1330-20-7	2.70E-02	24-hour	730	Health	Sch. 3	Standard	B1	2.33E-02	<1%	4.83E+00	4.85E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	2.70E-02	10-minute	3000	Odour	Sch. 3	Guideline	B1	2.57E-01	<1%	1.94E+01	1.97E+01	<1%
Xylenes, m-, p- and o-	1330-20-7	2.70E-02	24-hour	7300	—	Sch. 6	URT	—	2.33E-02	Below URT	4.83E+00	4.85E+00	Below URT
Zinc	7440-66-6	8.93E-03	24-hour	120	Particulate	Sch. 3	Standard	B1	7.69E-03	<1%	4.00E-02	4.77E-02	<1%

**APPENDIX C**

Comparison of Predicted  
Concentrations



Appendix C  
Comparison of Predicted Concentrations

Contaminant	CAS No.	Averaging Period	Background Concentration [µg/m³]	140,000 TPA			160,000 TPA			Percentage Change of Maximum POI Concentration [%]	Percentage Change of Maximum POI Concentration (Including Background) [%]
				Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]		
1 – Methylanthalene	90-12-0	24-hour	1.30E-03	4.18E-06	4.10E-06	1.30E-03	4.39E-06	3.78E-06	1.30E-03	-8%	0%
1,2,4 – Trichlorobenzene	120-82-1	24-hour	5.00E-02	2.19E-06	2.15E-06	5.00E-02	2.30E-06	1.98E-06	5.00E-02	-8%	0%
1,2,4,5-Tetrachlorobenzene	95-94-3	24-hour	—	2.19E-06	2.15E-06	2.15E-06	2.30E-06	1.98E-06	1.98E-06	-8%	—
1,2-Dichlorobenzene	95-50-1	1-hour	3.00E-02	8.72E-05	5.03E-04	3.05E-02	9.15E-05	5.28E-04	3.05E-02	5%	0%
2 – Methylanthalene	91-57-6	24-hour	2.19E-03	2.32E-05	2.27E-05	2.21E-03	2.43E-05	2.10E-05	2.21E-03	-8%	0%
2,3,4,6-Tetrachlorophenol	58-90-2	24-hour	—	7.41E-06	7.26E-06	7.26E-06	7.78E-06	6.70E-06	6.70E-06	-8%	—
2,4,6-Trichlorophenol	88-06-2	24-hour	—	2.23E-06	2.19E-06	2.19E-06	2.34E-06	2.02E-06	2.02E-06	-8%	—
2,4-Dichlorophenol	120-83-2	24-hour	—	4.39E-06	4.30E-06	4.30E-06	4.61E-06	3.97E-06	3.97E-06	-8%	—
Acenaphthene	83-32-9	24-hour	1.25E-03	7.93E-07	7.77E-07	1.25E-03	8.32E-07	7.17E-07	1.25E-03	-8%	0%
Acenaphthylene	208-96-8	24-hour	3.09E-04	6.18E-07	6.06E-07	3.10E-04	6.49E-07	5.59E-07	3.10E-04	-8%	0%
Acetaldehyde	75-07-0	24-hour	1.76E+00	2.15E-08	2.11E-08	1.76E+00	2.31E-08	1.99E-08	1.76E+00	-6%	0%
Acetaldehyde	75-07-0	1/2-hour	5.21E+00	2.15E-08	1.49E-07	5.21E+00	2.31E-08	1.60E-07	5.21E+00	7%	0%
Acetaldehyde	75-07-0	24-hour	1.76E+00	2.15E-08	2.11E-08	1.76E+00	2.31E-08	1.99E-08	1.76E+00	-6%	0%
Aluminum	7429-90-5	24-hour	2.10E-01	1.69E-03	1.66E-03	2.12E-01	1.78E-03	1.53E-03	2.12E-01	-8%	0%
Ammonia	7664-41-7	24-hour	—	4.22E-01	4.13E-01	4.13E-01	4.43E-01	3.82E-01	3.82E-01	-8%	—
Ammonia	7664-41-7	24-hour	—	4.22E-01	4.13E-01	4.13E-01	4.43E-01	3.82E-01	3.82E-01	-8%	—
Anthracene	120-12-7	24-hour	1.63E-04	1.73E-07	1.70E-07	1.63E-04	1.82E-07	1.57E-07	1.63E-04	-8%	0%
Antimony	7440-36-0	24-hour	3.02E-03	1.17E-04	1.14E-04	3.13E-03	1.23E-04	1.06E-04	3.13E-03	-8%	0%
Arsenic	7440-38-2	24-hour	1.81E-03	1.79E-05	1.75E-05	1.83E-03	1.88E-05	1.62E-05	1.83E-03	-8%	0%
Barium	7440-39-3	24-hour	8.18E-03	9.01E-05	8.83E-05	8.27E-03	9.46E-05	8.15E-05	8.26E-03	-8%	0%
Benzene	71-43-2	Annual	4.00E-02	1.17E-03	3.71E-05	4.00E-02	1.31E-03	3.77E-05	4.00E-02	2%	0%
Benzene	71-43-2	24-hour	1.18E+01	1.32E-03	1.29E-03	1.18E+01	1.39E-03	1.19E-03	1.18E+01	-8%	0%
Benzene	71-43-2	Annual	4.00E-02	1.17E-03	3.71E-05	4.00E-02	1.31E-03	3.77E-05	4.00E-02	2%	0%
Benzo(a)anthracene	56-55-3	24-hour	6.77E-05	6.39E-08	6.26E-08	6.78E-05	6.71E-08	5.78E-08	6.78E-05	-8%	0%
Benzo(a)fluorene	238-84-6	24-hour	1.35E-04	1.18E-06	1.15E-06	1.36E-04	1.24E-06	1.07E-06	1.36E-04	-8%	0%
Benzo(a)pyrene	50-32-8	Annual	5.63E-05	1.30E-07	4.12E-09	5.63E-05	1.46E-07	4.18E-09	5.63E-05	2%	0%
Benzo(a)pyrene	50-32-8	24-hour	6.77E-05	1.47E-07	1.44E-07	6.78E-05	1.54E-07	1.33E-07	6.78E-05	-8%	0%
Benzo(a)pyrene	50-32-8	Annual	5.63E-05	1.30E-07	4.12E-09	5.63E-05	1.46E-07	4.18E-09	5.63E-05	2%	0%
Benzo(b)fluoranthene	205-99-2	24-hour	1.42E-04	1.63E-07	1.60E-07	1.42E-04	1.71E-07	1.48E-07	1.42E-04	-8%	0%
Benzo(b)fluorene	243-17-4	24-hour	1.35E-04	8.06E-07	7.90E-07	1.36E-04	8.46E-07	7.29E-07	1.36E-04	-8%	0%
Benzo(e)pyrene	192-97-2	24-hour	1.35E-04	3.71E-07	3.64E-07	1.35E-04	3.90E-07	3.36E-07	1.35E-04	-8%	0%
Benzo(ghi)perylene	191-24-2	24-hour	7.07E-05	1.76E-06	1.72E-06	7.24E-05	1.85E-06	1.59E-06	7.23E-05	-8%	0%
Benzo(k)fluoranthene	207-08-9	24-hour	6.77E-05	4.30E-08	4.22E-08	6.77E-05	4.52E-08	3.89E-08	6.77E-05	-8%	0%
Beryllium	7440-41-7	24-hour	3.02E-04	1.42E-05	1.39E-05	3.16E-04	1.49E-05	1.28E-05	3.15E-04	-8%	0%
Biphenyl	92-51-3	24-hour	1.36E-03	1.27E-04	1.25E-04	1.48E-03	1.33E-04	1.15E-04	1.47E-03	-8%	-1%
Boron	7440-42-8	24-hour	8.00E-02	6.52E-03	6.39E-03	8.64E-02	6.85E-03	5.90E-03	8.59E-02	-8%	-1%
Bromodichloromethane	75-27-4	24-hour	2.00E-02	7.50E-03	7.35E-03	2.73E-02	8.05E-03	6.93E-03	2.69E-02	-6%	-2%
Bromoform	75-25-2	24-hour	3.00E-02	2.05E-03	2.01E-03	3.20E-02	2.20E-03	1.90E-03	3.19E-02	-6%	0%
Bromomethane	74-83-9	24-hour	9.00E-02	1.53E-03	1.50E-03	9.15E-02	1.61E-03	1.39E-03	9.14E-02	-8%	0%
Cadmium	7440-43-9	24-hour	6.04E-04	2.98E-04	2.92E-04	8.96E-04	3.13E-04	2.70E-04	8.74E-04	-8%	-3%
Cadmium	7440-43-9	24-hour	6.04E-04	2.98E-04	2.92E-04	8.96E-04	3.13E-04	2.70E-04	8.74E-04	-8%	-3%
Carbon Monoxide	630-08-0	1/2-hour	1.26E+03	1.92E+00	1.33E+01	1.27E+03	2.01E+00	1.39E+01	1.27E+03	5%	0%

Attachment #1 to Report #2019-WR-4

Appendix C  
Comparison of Predicted Concentrations

Contaminant	CAS No.	Averaging Period	Background Concentration [µg/m³]	140,000 TPA			160,000 TPA			Percentage Change of Maximum POI Concentration [%]	Percentage Change of Maximum POI Concentration (Including Background) [%]
				Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]		
Carbon tetrachloride	56-23-5	24-hour	7.40E-01	1.28E-05	1.25E-05	7.40E-01	1.37E-05	1.18E-05	7.40E-01	-6%	0%
Carbon tetrachloride	56-23-5	24-hour	7.40E-01	1.28E-05	1.25E-05	7.40E-01	1.37E-05	1.18E-05	7.40E-01	-6%	0%
Chloroform	67-66-3	24-hour	2.30E-01	2.17E-05	2.13E-05	2.30E-01	2.28E-05	1.97E-05	2.30E-01	-8%	0%
Chloroform	67-66-3	24-hour	2.30E-01	2.17E-05	2.13E-05	2.30E-01	2.28E-05	1.97E-05	2.30E-01	-8%	0%
Chromium (hexavalent)	18540-29-9	Annual	—	1.21E-05	3.83E-07	3.83E-07	1.35E-05	3.89E-07	3.89E-07	2%	—
Chromium (hexavalent)	18540-29-9	24-hour	—	1.36E-05	1.34E-05	1.34E-05	1.43E-05	1.23E-05	1.23E-05	-8%	—
Chromium (hexavalent)	18540-29-9	Annual	—	1.21E-05	3.83E-07	3.83E-07	1.35E-05	3.89E-07	3.89E-07	2%	—
Chrysene	218-01-9	24-hour	9.64E-05	1.61E-07	1.57E-07	9.66E-05	1.69E-07	1.45E-07	9.65E-05	-8%	0%
Cobalt	7440-48-4	24-hour	6.04E-04	2.47E-04	2.42E-04	8.46E-04	2.59E-04	2.23E-04	8.27E-04	-8%	-2%
Dibenzo(a,c)anthracene	215-58-7	24-hour	—	1.14E-06	1.12E-06	1.12E-06	1.20E-06	1.03E-06	1.03E-06	-8%	—
Dibenzo(a,h)anthracene	53-70-3	24-hour	6.77E-05	5.16E-08	5.05E-08	6.78E-05	5.41E-08	4.66E-08	6.77E-05	-8%	0%
Dichlorodifluoromethane	75-71-8	24-hour	3.23E+00	3.71E-03	3.64E-03	3.23E+00	3.90E-03	3.36E-03	3.23E+00	-8%	0%
Dichloroethene, 1,1 -	75-34-3	24-hour	1.00E-02	2.41E-05	2.36E-05	1.00E-02	2.53E-05	2.18E-05	1.00E-02	-8%	0%
Dichloroethene, 1,1 -	75-34-3	24-hour	1.00E-02	2.41E-05	2.36E-05	1.00E-02	2.53E-05	2.18E-05	1.00E-02	-8%	0%
Dichloromethane	75-09-2	24-hour	1.27E+00	7.50E-03	7.35E-03	1.28E+00	7.88E-03	6.78E-03	1.28E+00	-8%	0%
Dichloromethane	75-09-2	24-hour	1.27E+00	7.50E-03	7.35E-03	1.28E+00	7.88E-03	6.78E-03	1.28E+00	-8%	0%
Dioxins, Furans and Dioxin- like PCBs	N/A -6	24-hour	2.37E-02	2.56E-03	2.51E-03	2.62E-02	2.68E-03	2.31E-03	2.60E-02	-8%	-1%
Ethylbenzene	100-41-4	24-hour	1.24E+00	4.42E-05	4.33E-05	1.24E+00	4.64E-05	3.99E-05	1.24E+00	-8%	0%
Ethylbenzene	100-41-4	10-minute	5.00E+00	4.42E-05	4.21E-04	5.00E+00	4.64E-05	4.42E-04	5.00E+00	5%	0%
Ethylbenzene	100-41-4	24-hour	1.24E+00	4.42E-05	4.33E-05	1.24E+00	4.64E-05	3.99E-05	1.24E+00	-8%	0%
Ethylene Dibromide	106-93-4	24-hour	5.20E-03	1.20E-05	1.18E-05	5.21E-03	1.29E-05	1.11E-05	5.21E-03	-6%	0%
Fluoranthene	206-44-0	24-hour	6.01E-04	1.77E-06	1.74E-06	6.03E-04	1.86E-06	1.60E-06	6.03E-04	-8%	0%
Fluorine	86-73-7	24-hour	—	1.33E-06	1.31E-06	1.31E-06	1.40E-06	1.21E-06	1.21E-06	-8%	—
Formaldehyde	50-00-0	24-hour	3.38E+00	2.02E-03	1.98E-03	3.38E+00	2.13E-03	1.83E-03	3.38E+00	-8%	0%
Hexachlorobenzene	118-74-1	24-hour	6.25E-05	2.19E-06	2.15E-06	6.47E-05	2.30E-06	1.98E-06	6.45E-05	-8%	0%
Hydrogen Chloride	7647-01-0	24-hour	—	3.84E-01	3.76E-01	3.76E-01	4.03E-01	3.47E-01	3.47E-01	-8%	—
Hydrogen Chloride	7647-01-0	24-hour	—	3.84E-01	3.76E-01	3.76E-01	4.03E-01	3.47E-01	3.47E-01	-8%	—
Hydrogen Fluoride	7664-39-3	24-hour	—	3.84E-02	3.76E-02	3.76E-02	4.03E-02	3.47E-02	3.47E-02	-8%	—
Hydrogen Fluoride	7664-39-3	30-day	—	3.84E-02	4.53E-03	4.53E-03	4.03E-02	4.32E-03	4.32E-03	-5%	—
Indeno(1,2,3 - cd)pyrene	193-39-5	24-hour	6.77E-05	3.21E-07	3.15E-07	6.80E-05	3.37E-07	2.91E-07	6.80E-05	-8%	0%
Lead	7439-92-1	24-hour	4.98E-03	2.13E-03	2.09E-03	7.07E-03	2.24E-03	1.93E-03	6.91E-03	-8%	-2%
Lead	7439-92-1	30-day	1.92E-03	2.13E-03	2.52E-04	2.17E-03	2.24E-03	2.40E-04	2.16E-03	-5%	-1%
Lead	7439-92-1	24-hour	4.98E-03	2.13E-03	2.09E-03	7.07E-03	2.24E-03	1.93E-03	6.91E-03	-8%	-2%
Mercury	7439-97-6	24-hour	—	6.39E-04	6.26E-04	6.26E-04	6.71E-04	5.78E-04	5.78E-04	-8%	—
Naphthalene	91-20-3	24-hour	2.43E-03	1.80E-05	1.77E-05	2.45E-03	1.89E-05	1.63E-05	2.45E-03	-8%	0%
Naphthalene	91-20-3	10-minute	9.77E-03	1.80E-05	1.72E-04	9.94E-03	1.89E-05	1.80E-04	9.95E-03	5%	0%
Nickel	7440-02-0	Annual	8.59E-04	3.30E-03	1.04E-04	9.63E-04	3.69E-03	1.06E-04	9.65E-04	2%	0%
Nickel	7440-02-0	24-hour	4.49E-03	3.71E-03	3.64E-03	8.13E-03	3.90E-03	3.36E-03	7.85E-03	-8%	-3%
Nickel	7440-02-0	Annual	2.24E-03	3.30E-03	1.04E-04	2.34E-03	3.69E-03	1.06E-04	2.35E-03	2%	0%
Nitrogen Oxides	10102-44-0	24-hour	5.82E+01	5.14E+00	5.04E+00	6.32E+01	5.41E+00	4.66E+00	6.29E+01	-7%	-1%
Nitrogen Oxides	10102-44-0	1-hour	6.46E+01	5.14E+00	2.97E+01	9.43E+01	5.41E+00	3.13E+01	9.59E+01	5%	2%

Appendix C  
Comparison of Predicted Concentrations

Contaminant	CAS No.	Averaging Period	Background Concentration [µg/m³]	140,000 TPA			160,000 TPA			Percentage Change of Maximum POI Concentration [%]	Percentage Change of Maximum POI Concentration (Including Background) [%]
				Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]	Total Facility Emission Rate [g/s]	Maximum POI Concentration [µg/m³]	Maximum POI Concentration (Including Background) [µg/m³]		
O-terphenyl	84-15-1	24-hour	1.35E-04	3.49E-06	3.42E-06	1.38E-04	3.66E-06	3.15E-06	1.38E-04	-8%	0%
Pentachlorobenzene	608-93-5	24-hour	—	5.77E-06	5.65E-06	5.65E-06	6.05E-06	5.21E-06	5.21E-06	-8%	—
Pentachlorophenol	87-86-5	24-hour	8.76E-04	8.79E-06	8.61E-06	8.85E-04	9.23E-06	7.95E-06	8.84E-04	-8%	0%
Perylene	198-55-0	24-hour	1.35E-04	6.44E-08	6.31E-08	1.35E-04	6.76E-08	5.82E-08	1.35E-04	-8%	0%
Phenanthrene	85-01-8	24-hour	2.57E-03	4.03E-06	3.95E-06	2.57E-03	4.23E-06	3.65E-06	2.57E-03	-8%	0%
Phosphorus	7723-14-0	24-hour	7.00E-02	1.96E-03	1.92E-03	7.19E-02	2.06E-03	1.77E-03	7.18E-02	-8%	0%
PM <sub>10</sub>	N/A -3	24-hour	—	9.55E-01	1.05E+00	1.05E+00	1.00E+00	9.74E-01	9.74E-01	-7%	—
PM <sub>2.5</sub>	N/A -4	24-hour	2.04E+01	8.95E-01	9.87E-01	2.14E+01	9.40E-01	9.20E-01	2.13E+01	-7%	0%
Polychlorinated Biphenyls (PCB)	N/A -7	24-hour	4.20E-05	3.08E-06	3.02E-06	4.50E-05	3.23E-06	2.78E-06	4.48E-05	-8%	-1%
Pyrene	129-00-0	24-hour	2.83E-04	2.14E-06	2.10E-06	2.85E-04	2.25E-06	1.93E-06	2.85E-04	-8%	0%
Selenium	7782-49-2	24-hour	3.02E-03	2.05E-05	2.00E-05	3.04E-03	2.15E-05	1.85E-05	3.04E-03	-8%	0%
Silver	7440-22-4	24-hour	3.42E-04	1.43E-04	1.40E-04	4.82E-04	1.50E-04	1.29E-04	4.71E-04	-8%	-2%
Sulphur Dioxide	7446-09-5	24-hour	1.93E+01	1.49E+00	1.46E+00	2.08E+01	1.57E+00	1.35E+00	2.07E+01	-8%	-1%
Sulphur Dioxide	7446-09-5	1-hour	1.95E+01	1.49E+00	8.62E+00	2.81E+01	1.57E+00	9.05E+00	2.86E+01	5%	2%
Sulphur Dioxide	7446-09-5	1-hour	1.95E+01	1.49E+00	8.62E+00	2.81E+01	1.57E+00	9.05E+00	2.86E+01	5%	2%
Sulphur Dioxide	7446-09-5	Annual	6.03E+00	1.33E+00	4.20E-02	6.07E+00	1.48E+00	4.26E-02	6.07E+00	2%	0%
Sulphur Dioxide	7446-09-5	1-hour	1.95E+01	1.49E+00	8.62E+00	2.81E+01	1.57E+00	9.05E+00	2.86E+01	5%	2%
Tetrachloroethene	127-18-4	24-hour	4.90E-01	2.42E-04	2.37E-04	4.90E-01	2.54E-04	2.19E-04	4.90E-01	-8%	0%
Tetrachloroethene	127-18-4	24-hour	4.90E-01	2.42E-04	2.37E-04	4.90E-01	2.54E-04	2.19E-04	4.90E-01	-8%	0%
Tetralin	119-64-2	24-hour	1.35E-04	2.12E-05	2.08E-05	1.56E-04	2.23E-05	1.92E-05	1.54E-04	-8%	-1%
Thallium	7440-28-0	24-hour	—	1.66E-03	1.63E-03	1.63E-03	1.75E-03	1.50E-03	1.50E-03	-8%	—
Tin	7440-31-5	24-hour	3.02E-03	7.50E-04	7.35E-04	3.75E-03	7.87E-04	6.78E-04	3.70E-03	-8%	-2%
Toluene	108-88-3	24-hour	9.47E+00	2.14E-03	2.10E-03	9.47E+00	2.25E-03	1.94E-03	9.47E+00	-8%	0%
Total Chromium (and compounds)	7440-47-3	24-hour	2.76E-03	9.59E-05	9.40E-05	2.85E-03	1.01E-04	8.67E-05	2.85E-03	-8%	0%
Total Chromium (and compounds)	7440-47-3	24-hour	2.76E-03	9.59E-05	9.40E-05	2.85E-03	1.01E-04	8.67E-05	2.85E-03	-8%	0%
Total Particulate Matter	N/A -1	24-hour	3.54E+01	9.55E-01	1.05E+00	3.64E+01	1.00E+00	9.74E-01	3.64E+01	-7%	0%
Trichloroethane, 1,1,1 -	71-55-6	24-hour	1.10E-01	6.08E-05	5.96E-05	1.10E-01	6.39E-05	5.50E-05	1.10E-01	-8%	0%
Trichloroethene	86-42-0	24-hour	5.40E-01	2.10E-05	2.05E-05	5.40E-01	2.20E-05	1.89E-05	5.40E-01	-8%	0%
Trichloroethylene, 1,1,2 -	79-01-6	24-hour	—	2.10E-05	2.05E-05	2.05E-05	2.20E-05	1.89E-05	1.89E-05	-8%	—
Trichloroethylene, 1,1,2 -	79-01-6	24-hour	—	2.10E-05	2.05E-05	2.05E-05	2.20E-05	1.89E-05	1.89E-05	-8%	—
Trichlorofluoromethane	75-69-4	24-hour	2.15E+00	7.34E-03	7.19E-03	2.16E+00	7.71E-03	6.64E-03	2.16E+00	-8%	0%
Vanadium	7440-62-2	24-hour	1.55E-03	4.96E-05	4.86E-05	1.60E-03	5.20E-05	4.48E-05	1.59E-03	-8%	0%
Vinyl chloride	75-01-4	24-hour	5.88E-03	1.86E-03	1.82E-03	7.70E-03	1.95E-03	1.68E-03	7.56E-03	-8%	-2%
Vinyl chloride	75-01-4	24-hour	5.88E-03	1.86E-03	1.82E-03	7.70E-03	1.95E-03	1.68E-03	7.56E-03	-8%	-2%
Xylenes, m-, p- and o-	1330-20-7	24-hour	4.83E+00	2.57E-02	2.52E-02	4.86E+00	2.70E-02	2.33E-02	4.85E+00	-8%	0%
Xylenes, m-, p- and o-	1330-20-7	10-minute	1.94E+01	2.57E-02	2.45E-01	1.96E+01	2.70E-02	2.57E-01	1.97E+01	5%	0%
Xylenes, m-, p- and o-	1330-20-7	24-hour	4.83E+00	2.57E-02	2.52E-02	4.86E+00	2.70E-02	2.33E-02	4.85E+00	-8%	0%
Zinc	7440-66-6	24-hour	4.00E-02	8.50E-03	8.33E-03	4.83E-02	8.93E-03	7.69E-03	4.77E-02	-8%	-1%