March 2011

DURHAM YORK ENERGY CENTRE

Application for a Basic Comprehensive Certificate of Approval (Air & Noise)

Submitted to:
Ontario Ministry of the Environment
Director Section 9
Environmental Assessment and Approvals Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

REPORT

Report Number: 10-1151-0343

Golder Associates

Table of Contents

1.0 SUMMARY

Golder Associates Ltd. (Golder) was retained by Covanta Energy Corporation (Covanta) to prepare an application for a Basic Comprehensive Certificate of Approval (Air & Noise) (CofA [Air & Noise]) (under Section 9 of the Ontario *Environmental Protection Act*) for the proposed Durham-York Energy from Waste (EfW) facility (the Facility).

The Regional Municipalities of Durham and York ("Durham-York") propose to develop an Energy from Waste (EfW) Facility located in an industrial zoned area, on the west side of Osbourne Road, south of Highway 401 and north of a CN Rail Corridor in the Municipality of Clarington. The facility will be a Thermal Treatment Facility, capable of processing post-diversion residual waste and recovering materials and energy to export to the marketplace. Durham-York will be designated as the owners of the EfW, to be named the Durham York Energy Centre.

Covanta Energy ("Covanta") will design, build and operate the Facility. Covanta and Durham-York are applying for a Certificate of Approval (CofA) to allow for the approval of emission generating activities and operations at the Facility. The Facility will use Martin GmbH® combustion technology to process up to 140,000 tonnes/year of municipal solid waste and will capture its energy content in the form of superheated steam used to generate electricity and potentially provide district heating to the neighbouring Courtice Waste Pollution Control Plant and Clarington Energy Park. The Facility will have a steam-turbine generator with a nameplate rating of approximately 20MW.

An Emission Summary and Dispersion Modelling (ESDM) Report was prepared to support the application for a Basic Comprehensive CofA (Air & Noise) and was prepared in accordance with s.26 of Ontario Regulation 419/05 (O. Reg. 419/05). In addition, guidance in the Ontario Ministry of the Environment (MOE) publication, "*Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report, Version 3.0"*, dated March 2009 (ESDM Procedure Document) PIBS 3614e03 was followed, as appropriate.

Dispersion modelling was performed using the MOE publication, *"Guideline A-11: Air Dispersion Modelling Guideline for Ontario, Version 2.0"*, dated March 2009 (ADMGO) PIBS 5165e02.

The point of impingement (POI) concentrations listed in the Emission Summary Table (see Attachment 3 Emission Summary and Dispersion Modelling Report) were compared against limits listed in the MOE publication, "*Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution - Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)",* dated February 2008 (MOE POI Limits).

All predicted impacts are in compliance with applicable ambient standards. Under Scenarios A-F, which represents normal and start-up emissions from the main stack, 1-hour averaged nitrogen oxides has the highest concentration relative to the MOE POI limit. Of these scenarios, Scenario A has the highest concentration of nitrogen oxides at 7% of the relevant limit. Scenario H represents a worst case operation and includes silo filling plus stand-by diesel generator operation in addition to normal operational emissions from the main stack. In this scenario, the concentration of nitrogen oxides was assessed against the ½ hour standard of 1880 µg/m^3. The relevant concentration of nitrogen oxides under Scenario H is 17% of this limit.

Under Scenario H, 24-hour averaged $PM_{2.5}$ has the highest concentration relative to the corresponding Ambient Air Quality Criteria (AAQC) at 18% of the limit. However, in this scenario, all four of the silos have been modelled

assuming 24/7 simultaneous filling. This is highly conservative as in reality; the silos will only be filled intermittently and one at a time.

The remaining contaminants that do not have MOE POI Limits were assessed and determined to be below the *de minimus* limit. Background concentrations were added to the predicted ambient concentrations of each contaminant. The resultant cumulative concentrations were still below relevant ambient standards for all contaminants.

An Acoustic Assessment Report (AAR) was completed for the Facility as part of this CofA (Air & Noise) application. Golder's database of similar sources and engineering calculations, based on data provided by Covanta from experience with similar projects, were used as inputs to a predictive acoustical model to quantify outdoor noise emissions associated with the Facility. Acoustic Assessment criteria were established in accordance with MOE publications NPC-205 and NPC-233. Due to the nature of the sources, the Facility will not be a significant source of vibration.

Three (3) locations have been identified as being representative of the most sensitive Point(s) of Reception (POR(s)) in the vicinity of the Facility.

Golder predicted sound levels from the Facility at identified PORs that are at or below the applicable sound level limits during the predictable worst case hour of the Facility during normal operation and during the periodic testing of the standby diesel generator or diesel fire pumps. Therefore the proposed Facility will operate in compliance with MOE noise guidelines as specified in NPC-205.

In summary, this CofA (Air & Noise) application demonstrates that the Facility is within the current MOE limits for air and noise emissions. Golder recommends that a Basic Comprehensive CofA (Air & Noise) be issued for the Facility.

KSA/PRN/ng

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APPLICATION FORM

Certificate of Approval (Air & Noise)

March 2011
Report No. 10-1151-0343

APPLICATION FORM

Certificate of Approval (Air & Noise)

The Regional Municipality of Durham

March 2011
Report No. 10-1151-0343

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Ontario

Ministry of the Environment

Application for Approval (Air & Noise)

Ce formulaire est disponible en français

For Office Use Only			
Reference Number	Payment Received $	Date *(y/m/d)*	Initials

General Information and Instructions

General:

Information requested in this form is collected under the authority of the *Environmental Protection Act,* R.S.O. 1990 (EPA) and the *Environmental Bill of Rights*, C. 28, Statutes of Ontario, 1993, (EBR) and will be used to evaluate applications for approval under Section 9 of the EPA. This form must be completed with respect to all requirements identified in the Guidance Material listed below in order for it to be considered an application for approval. **INCOMPLETE APPLICATIONS WILL BE RETURNED TO THE APPLICANT.** Even if the application is accepted as complete**, t**he Ministry of the Environment may require additional information during the technical review of the application.

Instructions:

1. **Applicants are responsible for ensuring that they complete the most recent application form.** When completing this form, please refer to the following Guidance Material: the "Guide to Applying for Approval (Air & Noise), Section 9, EPA" and the "Guide - Application Costs for Air Emissions, S. 9, EPA". Application forms and supporting documentation are available from the Environmental Assessment and Approvals Branch toll free at 1-800-461-6290 (locally at 416-314-8001), from your local District Office of the Ministry of the Environment, and in the "Publications" section of the Ministry of the Environment website at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir.

2. Questions regarding completion and submission of this application should be directed to the Environmental Assessment and Approvals Branch of the Ministry of the Environment at the address below or to the local District Office which has jurisdiction over the area where the facility is located. A list of these District Offices is available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/org/op.htm#Reg/Dist.

3. A complete application package consists of a completed, signed application form and all required supporting information required by O. Reg. 419/05, identified in this form and the Guidance Material.

4. Three application packages must be submitted to the Ministry of the Environment. Two application packages, the original and a copy must be sent to:

   Ministry of the Environment,
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   Email: EAABGen@ene.gov.on.ca

   These application packages should include a cheque, money order or credit card payment, in Canadian funds, made payable to the *Ontario Minister of Finance* for the applicable application fee. A third copy of the application package must be sent to the local District Office which has jurisdiction over the area where the facility is located.

5. Information contained in this application form is not considered confidential and will be made available to the public upon request. Information submitted as supporting information may be claimed as confidential but will be subject to the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *EBR*. If you do not claim confidentiality at the time of submitting the information, the Ministry of the Environment may make the information available to the public without further notice to you. For more information, please refer to Section 4.9 of the "Guide to Applying for Approval (Air & Noise), Section 9, EPA".

6. If the Applicant submits with the application a copy of their Master Business License (MBL) obtained from the Ministry of Government Services, the **shaded sections within this form do not need to be completed (provided the information required appears on the face of the MBL)**. For additional information on the MBL please refer to Section 4.1 of the "Guide to Applying for Approval (Air & Noise), Section 9, EPA".

1. Applicant Information *(Owner of works/facility)*

Applicant Name *(legal name of individual or organization as evidenced by legal documents)*

The Regional Municipality of Durham

Business Identification Number

Business Name *(the name under which the entity is operating or trading if different from the Applicant Name - also referred to as trade name)*

Applicant Type:

- ☐ Corporation
- ☐ Individual
- ☐ Partnership
- ☐ Sole Proprietor
- ☐ Federal Government
- ☒ Municipal Government
- ☐ Provincial Government
- ☐ Other *(describe):*

North American Industry Classification System (NAICS) Code

562210 - Waste Treatment and Disposal

Business Activity Description *(a description of the business endeavour, this may include products sold, services provided or machinery/equipment used, etc.)*

Waste Treatment and Disposal

2. Applicant Physical Address

Civic Address- Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
605 Rossland Road East	

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory. Not required if Street Information is provided)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan

Municipality/Unorganized Township	County/District	Province/State	Country	Postal Code
Whitby	Region of Durham	ON	Canada	L1N 6A3

3. Site Information - *(location where activity/works applied for is to take place)*

Is this an application for a mobile facility?	Site Name	MOE District Office
☐ Yes ☒ No	Durham York Energy Centre	York-Durham District Office

Address Information:

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide site address information below)

Site Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
72 Osbourne Road	

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan
27	Broken Front	1	40R - 26782

Non Address Information *(includes any additional information to clarify applicants' physical location)*

Municipality/Unorganized Township	County/District	Postal Code
Municipality of Clarington	Region of Durham	L1E 2R2

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD83	17	+/- 5m	Firstbase map	680425.041	4860195.229

Is the Site located in an area of development control as defined by the Niagara Escarpment Planning & Development Act (NEPDA)?

☐ Yes ***If yes, please attach a copy of the NEPDA permit for proposed activity/work***

☒ No

Is the Site located on the Oak Ridges Moraine Conservation Area as defined by the Oak Ridges Moraine Conservation Plan (ORMCP), a regulation made under the Oak Ridges Moraine Conservation Act (ORMCA)?

☐ Yes ***if yes, please attach proof of Municipal planning approval for the proposed activity/work***

☒ No

Is the Applicant the operating authority?

☐ Yes

☒ No ***If no, please attach the operating authority name, address and phone number***

Is the Applicant the owner of the land (site)?

☒ Yes

☐ No ***If no, please attach the owner's name, address and a signed letter granting consent for the installation and operation of the facilities***

Has this facility and one or more adjacent facilities been deemed to be one property under s.4 of O. Reg. 419/05?

☐ Yes ***If yes, please attach supporting information***

☒ No ***Note: all sources from the adjacent facility must be included in the Emission Summary and Dispersion Modelling Report.***

4. Project Technical Information Contact

Name	Company
Samuel S. Joshi	Covanta Energy Corporation

Address Information:

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide technical information contact address information below)

Civic Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
445 South Street	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)*

Municipality	Postal Station	Province/State	Country	Postal Code
Morristown		New Jersey	USA	07960

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(862)345-5064	(862)345-5210	sjoshi@covantaenergy.com

5. Project Information

Type of Application:

- [x] New Certificate of Approval for this Facility
  - Did construction of the facility begin after November 30, 2005? [x] Yes [ ] No
  - Does the NAICS Code for the facility fall into Schedule 4 or 5 of O. Reg. 419/05? [x] Yes [ ] No
- [ ] Amendment to current Certificate of Approval
- [ ] Basic Comprehensive Certificate of Approval
- [ ] Consolidated Certificate of Approval

Current Certificate of Approval Number	Current Certificate of Approval Date of Issue (yyyy/mm/dd)
N/A	N/A

Application Initiated by:

[x] Proponent [ ] Environmental Assessment and Approvals Branch [ ] Provincial Officer Order (attach copy) [ ] Other (specify): _____

List all other environmental approvals/permits applied or received in relation to this **project** under the *Environmental Protection Act*, the *Ontario Water Resources Act*, the *Safe Drinking Water Act*, *Environmental Assessment Act* or any other related legislation. (*Please attach a separate list if more space is required*).

Section 27 of the Environmental Protection Act for a Waste Disposal Site.	Section 53 of the Ontario Water Resources Act for Stormwater.

Project Description Summary *(If EBR is applicable, this summary will be used in the EBR posting notice)*

An Energy from Waste Facility is proposed to be constructed and operated on vacant land located on a 12.1 hectare property located in the Clarington Energy Business Park on the west side of Osbourne Road in the Regional Municipality of Durham. The facility will function to receive and thermally process municipal solid waste generated in the Regions of Durham and York. The energy content in the form of superheated steam will be used to generate electricity and potentially provide district heating. The hours of operation are 24 hours per day, 7 days per week, 365 days per year. The Facility meets all applicable air, noise waste and water environmental requirements under the Province of Ontario.

Project Name *(Project identifier to be used as a reference in correspondence)*

Durham York Energy Centre

Project Schedule

Estimated date for start of construction/installation (yyyy/mm/dd)	Estimated date for start of operation (yyyy/mm/dd)
2011/06/01	2014/01/01

6. O. Reg. 419/05 Requirements

Which of the following sections of O. Reg. 419/05 applies to the facility?

[ ] s.18 (Schedule 1) [ ] s.19 (Schedule 2) [x] s.20 (Schedule 3)

If s.20 of O. Reg. 419/05 applies to the facility, do all new sources of contaminant meet the Good Engineering Practice (GEP) stack height requirements of s.15?

[x] Yes [ ] No

Has the facility been issued a notice or an order under s 7(1), 8(2), 10(2), 11(2), 13(2), 14(4), 17(3), 20(4) or 20(5)?

[ ] Yes **If yes, please attach a copy of the notice, amended notice, revoked notice, order and/or additional supporting information**

[x] No

Has a request for approval for an alteration of a Schedule 3 standard under s. 32 of O. Reg. 419/05 been made for this facility?

[ ] Yes **If yes, please attach a copy of ministry acknowledgement letter (if available) or an overview of the request**

[x] No

Do you exceed any s.30 Upper Risk Thresholds (Schedule 6)?

[ ] Yes [x] No **If yes, please attach additional supporting information**

7. Other Air Approvals for Facility – *Please attach a separate list if more space is required*

Separate list attached? [ ] Yes [x] No

List all other environmental approvals issued to this facility under the Section 9 of the *Environmental Protection Act.*

8. *Environmental Assessment Act (EAA)* Requirements

Are the works for which this proposal is made subject to (or exempted from) the requirements of the EAA? ☒ Yes ☐ No

If "Yes," please check one of the following

☐ The works for which this application is made are exempt from the requirements of the EAA under:

☐ Section _____ of Ontario Regulation No. _____ **or**

☐ Declaration/Exemption Order Number _____

If Regulation, Declaration Order or Exemption Order does not refer directly to this facility, state in a covering letter or other document why it does apply to the facility – ***Please provide supporting information***

☐ The works for which this application is made have fulfilled all of the requirements of the EAA through the completion of the Municipal Class EA process in accordance with the procedures set out in:

☐ Schedule A ☐ Schedule B ☐ Schedule C

If Schedule A, was the project planned in accordance with section A.2.9 – Integration with the *Planning Act* of the Class EA?

☐ Yes ☐ No

If Yes, please submit a copy of the summary required by section A.2.9.3 of the Class EA and a copy of the Planning Act notice.

If Schedule B or C of the Municipal Class EA, please submit a copy of the Notice of Completion.

Were Part II Order requests received? ☐ Yes ☐ No

If Yes, please submit a copy of the Minister's decision letter.

☐ The works for which this application is made have fulfilled all of the requirements of the EAA through the completion of the requirements of another class EA process:

Name of Class EA: _____

Schedule/Group/Category (if applicable): _____

If applicable, please submit a copy of the Notice of Completion.

Were Part II Order requests received? ☐ Yes ☐ No

If Yes, please submit a copy of the Minister's decision letter.

☐ The works for which this application is made have fulfilled all of the requirements for the Environmental Screening Process pursuant to O. Reg. 116/01 of the EAA through:

☐ Completion of an Environmental Screening.

☐ Completion of an Environmental Review

Please submit the Statement of Completion, and indicate if any Elevation Request(s) were received.
If Elevation Request(s) were received, please submit a copy of the Director's decision letter.
If the Director's decision was appealed to the Minister, please submit a copy of the Minister's decision letter.

☒ The works for which this application is made have fulfilled all of the requirements of the EAA through the preparation of an environmental assessment.

Please submit a copy of the signed Notice of Approval.

Was this undertaking designated subject to the EAA by regulation? ☒ Yes ☐ No

If yes, please indicate the regulation: Individual Environmental Assessment

9. Environmental Bill of Rights Requirements (EBR) Requirements

Is this a proposal for a prescribed instrument under EBR? ☒ Yes ☐ No

If "Yes", is this proposal exempted from EBR requirements? ☒ Yes ☐ No

If "Yes," please check one of the following

☐ This proposal has been considered in a substantially equivalent process or by a decision of a tribunal. **Please provide supporting information**

☐ This proposal is for an amendment to or revocation of an existing Certificate of Approval that is not environmentally significant. **Please provide supporting information**

☐ This proposal is for an emergency situation. **Please provide supporting information**

☒ This proposal has been subject to or exempted from EAA Requirements. **Please provide supporting information**

10. Additional Public Consultation/Notification

Separate list attached? ☒ Yes ☐ No

Specify all public consultation/notification *(such as public hearings, notification of First Nations, request for an Alternative Standard under s.32 of O. Reg. 419/05, etc.)* related to the project that have been completed or are in the process of being completed. Please attach a separate list describing each of these consultation activities, the results achieved, and planned future consultation activities.

Extensive consultation was carried out as part of the Environmental Assessment. A copy of the Record of Consultation document is provided in Attachment 1.

11. List of Attachments - *This is a list of all supporting information to this application and is subject to the Freedom of Information and Privacy Protection Act and the Environmental Bill of Rights.*

Attachment	Attached	Reference	Can be disclosed
Information Required by Application Form			
Supporting Information Worksheet - Supplement to Application for Approval, EPA S.9 (PIBS 4873)	☒ Yes	Attachment 1	☒ Yes ☐ No
Costs for EPA S.9 Applications - Supplement to Application for Approval (PIBS 4108)	☒ Yes	Attachment 2	☒ Yes ☐ No
Application Fee (cheque or money order attached or credit card information provided)	☒ Yes	Attached	☒ Yes ☐ No
Information Supporting Compliance with O. Reg. 419/05			
Emission Summary and Dispersion Modelling (ESDM) Report prepared in accordance with s.22 of O. Reg. 419/05 (including signed checklist – PIBS 5357e)	☒ Yes ☐ No	If no, indicate why: ☐ Minor Amendment (no technical review) ☐ Equipment Subject to Streamlined Review ☐ Subsurface Approval	☒ Yes ☐ No
Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S.9 (PIBS 4872)	☐ Yes ☒ No		☐ Yes ☐ No
Information Supporting Compliance with Noise and Vibration Guidelines			
Noise Screening Process for S.9 Applications -Supplement to Application for Approval (PIBS 4871)	☒ Yes ☐ No		☐ Yes ☐ No
Does the Equipment/Facility meet minimum separation distance?	☐ Yes ☒ No		☐ Yes ☐ No
If the Equipment/Facility does not meet minimum separation distance, then attach:			
1. Acoustic Assessment Report including signed checklist (PIBS 5356e)	☒ Yes ☐ No	Attachment 4	☒ Yes ☐ No
2. Vibration Assessment Report	☐ Yes ☒ No		☐ Yes ☐ No
Other Information Supporting Compliance With Applicable Regulations and Guidelines or to Describe the Project (include separate list if required)			
Design and Operation Report	☒ Yes ☐ No	Submitted Separately	☒ Yes ☐ No
	☐ Yes ☐ No		☐ Yes ☐ No

12. Payment Information

Amount Enclosed: $ 5450 *Please attach completed "Costs for EPA s.9 Applications – Supplement to Application for Approval" (PIBS 4108).*

Method of Payment

☒ Cheque ☐ Money Order ☐ VISA ☐ MasterCard ☐ American Express

Credit Card Information *(if paying by VISA, MasterCard or American Express)**

Name on Card *(please print)*	Credit Card Number	Expiry Date (m/y)

Cardholder Signature	Date *(y/m/d)*

**NOTE: credit card accepted for payments UNDER $10,000.00 only.*

13. Statement of Applicant

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted in support of this application is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act*..
- The Project Technical Information Contact identified in section 5 of this form is authorized to act on my behalf for the purpose of obtaining approval under Section 9 of the EPA for the equipment/processes identified herein.
- I have used the most recent application form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or the Environmental Assessment and Approvals Branch at 1-800-461-6290) and I have included all necessary information required by O. Reg. 419/05, identified on this form and in the Guidance Material.

Name of Signing Authority *(please print)*	Title
Cliff Curtis	Commissioner of Works

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(905)668-7711		

Signature	Date *(y/m/d)*
Cliff Curtis	March 2, 2011

Address Information:

Same as Applicant Physical Address? ☒ Yes ☐ No (If no, please provide signing authority mailing address information below)

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- ☐ Federal Government
- ☒ Municipal Government
- ☐ Provincial Government
- ☐ Other *(describe):*

North American Industry Classification System (NAICS) Code

562210 - Waste Treatment and Disposal

Business Activity Description *(a description of the business endeavour, this may include products sold, services provided or machinery/equipment used, etc.)*

Waste Treatment and Disposal

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Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan

Municipality/Unorganized Township	County/District	Province/State	Country	Postal Code
Newmarket	York Region	ON	Canada	L3Y 6Z1

3. Site Information - *(location where activity/works applied for is to take place)*

Is this an application for a mobile facility?	Site Name	MOE District Office
☐ Yes ☒ No	Durham York Energy Centre	York-Durham District Office

Address Information:

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide site address information below)

Site Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
72 Osbourne Road	

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan
27	Broken Front	1	40R - 26782

Non Address Information *(includes any additional information to clarify applicants' physical location)*

Municipality/Unorganized Township	County/District	Postal Code
Municipality of Clarington	Region of Durham	L1E 2R2

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD83	17	+/- 5m	Firstbase map	680425.041	4860195.229

Is the Site located in an area of development control as defined by the Niagara Escarpment Planning & Development Act (NEPDA)?

☐ Yes ***If yes, please attach a copy of the NEPDA permit for proposed activity/work***

☒ No

Is the Site located on the Oak Ridges Moraine Conservation Area as defined by the Oak Ridges Moraine Conservation Plan (ORMCP), a regulation made under the Oak Ridges Moraine Conservation Act (ORMCA)?

☐ Yes ***if yes, please attach proof of Municipal planning approval for the proposed activity/work***

☒ No

Is the Applicant the operating authority?

☐ Yes

☒ No ***If no, please attach the operating authority name, address and phone number***

Is the Applicant the owner of the land (site)?

☐ Yes

☒ No ***If no, please attach the owner's name, address and a signed letter granting consent for the installation and operation of the facilities***

Has this facility and one or more adjacent facilities been deemed to be one property under s.4 of O. Reg. 419/05?

☐ Yes ***If yes, please attach supporting information***

☒ No ***Note: all sources from the adjacent facility must be included in the Emission Summary and Dispersion Modelling Report.***

4. Project Technical Information Contact

Name	Company
Samuel S. Joshi	Covanta Energy Corporation

Address Information:

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide technical information contact address information below)

Civic Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
445 South Street	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)*

Municipality	Postal Station	Province/State	Country	Postal Code
Morristown		New Jersey	USA	07960

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(862)345-5064	(862)345-5210	sjoshi@covantaenergy.com

5. Project Information

Type of Application:

- [x] New Certificate of Approval for this Facility
  - Did construction of the facility begin after November 30, 2005? [x] Yes [ ] No
  - Does the NAICS Code for the facility fall into Schedule 4 or 5 of O. Reg. 419/05? [x] Yes [ ] No
- [ ] Amendment to current Certificate of Approval
- [ ] Basic Comprehensive Certificate of Approval
- [ ] Consolidated Certificate of Approval

Current Certificate of Approval Number	Current Certificate of Approval Date of Issue (yyyy/mm/dd)
N/A	N/A

Application Initiated by:

[x] Proponent [ ] Environmental Assessment and Approvals Branch [ ] Provincial Officer Order (attach copy) [ ] Other (specify): _____

List all other environmental approvals/permits applied or received in relation to this **project** under the *Environmental Protection Act*, the *Ontario Water Resources Act*, the *Safe Drinking Water Act*, *Environmental Assessment Act* or any other related legislation. (*Please attach a separate list if more space is required*).

Section 27 of the Environmental Protection Act for a Waste Disposal Site.	Section 53 of the Ontario Water Resources Act for Stormwater.

Project Description Summary *(If EBR is applicable, this summary will be used in the EBR posting notice)*

An Energy from Waste Facility is proposed to be constructed and operated on vacant land located on a 12.1 hectare property located in the Clarington Energy Business Park on the west side of Osbourne Road in the Regional Municipality of Durham. The facility will function to receive and thermally process municipal solid waste generated in the Regions of Durham and York. The energy content in the form of superheated steam will be used to generate electricity and potentially provide district heating. The hours of operation are 24 hours per day, 7 days per week, 365 days per year. The Facility meets all applicable air, noise waste and water environmental requirements under the Province of Ontario.

Project Name *(Project identifier to be used as a reference in correspondence)*

Durham York Energy Centre

Project Schedule

Estimated date for start of construction/installation (yyyy/mm/dd)	Estimated date for start of operation (yyyy/mm/dd)
2011/06/01	2014/01/01

6. O. Reg. 419/05 Requirements

Which of the following sections of O. Reg. 419/05 applies to the facility?

[ ] s.18 (Schedule 1) [ ] s.19 (Schedule 2) [x] s.20 (Schedule 3)

If s.20 of O. Reg. 419/05 applies to the facility, do all new sources of contaminant meet the Good Engineering Practice (GEP) stack height requirements of s.15?

[x] Yes [ ] No

Has the facility been issued a notice or an order under s 7(1), 8(2), 10(2), 11(2), 13(2), 14(4), 17(3), 20(4) or 20(5)?

[ ] Yes **If yes, please attach a copy of the notice, amended notice, revoked notice, order and/or additional supporting information**

[x] No

Has a request for approval for an alteration of a Schedule 3 standard under s. 32 of O. Reg. 419/05 been made for this facility?

[ ] Yes **If yes, please attach a copy of ministry acknowledgement letter (if available) or an overview of the request**

[x] No

Do you exceed any s.30 Upper Risk Thresholds (Schedule 6)?

[ ] Yes [x] No **If yes, please attach additional supporting information**

7. Other Air Approvals for Facility – *Please attach a separate list if more space is required*

Separate list attached? [ ] Yes [x] No

List all other environmental approvals issued to this facility under the Section 9 of the *Environmental Protection Act*.

8. *Environmental Assessment Act (EAA)* Requirements

Are the works for which this proposal is made subject to (or exempted from) the requirements of the EAA? ☒ Yes ☐ No

If "Yes," please check one of the following

☐ The works for which this application is made are exempt from the requirements of the EAA under:

☐ Section _____ of Ontario Regulation No. _____ **or**

☐ Declaration/Exemption Order Number _____

If Regulation, Declaration Order or Exemption Order does not refer directly to this facility, state in a covering letter or other document why it does apply to the facility – ***Please provide supporting information***

☐ The works for which this application is made have fulfilled all of the requirements of the EAA through the completion of the Municipal Class EA process in accordance with the procedures set out in:

☐ Schedule A ☐ Schedule B ☐ Schedule C

If Schedule A, was the project planned in accordance with section A.2.9 – Integration with the *Planning Act* of the Class EA?

☐ Yes ☐ No

If Yes, please submit a copy of the summary required by section A.2.9.3 of the Class EA and a copy of the Planning Act notice.

If Schedule B or C of the Municipal Class EA, please submit a copy of the Notice of Completion.

Were Part II Order requests received? ☐ Yes ☐ No

If Yes, please submit a copy of the Minister's decision letter.

☐ The works for which this application is made have fulfilled all of the requirements of the EAA through the completion of the requirements of another class EA process:

Name of Class EA: _____

Schedule/Group/Category (if applicable): _____

If applicable, please submit a copy of the Notice of Completion.

Were Part II Order requests received? ☐ Yes ☐ No

If Yes, please submit a copy of the Minister's decision letter.

☐ The works for which this application is made have fulfilled all of the requirements for the Environmental Screening Process pursuant to O. Reg. 116/01 of the EAA through:

☐ Completion of an Environmental Screening.

☐ Completion of an Environmental Review

Please submit the Statement of Completion, and indicate if any Elevation Request(s) were received.
If Elevation Request(s) were received, please submit a copy of the Director's decision letter.
If the Director's decision was appealed to the Minister, please submit a copy of the Minister's decision letter.

☒ The works for which this application is made have fulfilled all of the requirements of the EAA through the preparation of an environmental assessment.

Please submit a copy of the signed Notice of Approval.

Was this undertaking designated subject to the EAA by regulation? ☒ Yes ☐ No

If yes, please indicate the regulation: Individual Environmental Assessment

9. Environmental Bill of Rights Requirements (EBR) Requirements

Is this a proposal for a prescribed instrument under EBR? ☒ Yes ☐ No

If "Yes", is this proposal exempted from EBR requirements? ☒ Yes ☐ No

If "Yes," please check one of the following

☐ This proposal has been considered in a substantially equivalent process or by a decision of a tribunal. **Please provide supporting information**

☐ This proposal is for an amendment to or revocation of an existing Certificate of Approval that is not environmentally significant. **Please provide supporting information**

☐ This proposal is for an emergency situation. **Please provide supporting information**

☒ This proposal has been subject to or exempted from EAA Requirements. **Please provide supporting information**

10. Additional Public Consultation/Notification

Separate list attached? ☒ Yes ☐ No

Specify all public consultation/notification *(such as public hearings, notification of First Nations, request for an Alternative Standard under s.32 of O. Reg. 419/05, etc.)* related to the project that have been completed or are in the process of being completed. Please attach a separate list describing each of these consultation activities, the results achieved, and planned future consultation activities.

Extensive consultation was carried out as part of the Environmental Assessment. A copy of the Record of Consultation document is provided in Attachment 1.

11. List of Attachments - *This is a list of all supporting information to this application and is subject to the Freedom of Information and Privacy Protection Act and the Environmental Bill of Rights.*

Attachment	Attached	Reference	Can be disclosed
Information Required by Application Form			
Supporting Information Worksheet - Supplement to Application for Approval, EPA S.9 (PIBS 4873)	☒ Yes	Attachment 1	☒ Yes ☐ No
Costs for EPA S.9 Applications - Supplement to Application for Approval (PIBS 4108)	☒ Yes	Attachment 2	☒ Yes ☐ No
Application Fee (cheque or money order attached or credit card information provided)	☒ Yes	Attached	☒ Yes ☐ No
Information Supporting Compliance with O. Reg. 419/05			
Emission Summary and Dispersion Modelling (ESDM) Report prepared in accordance with s.22 of O. Reg. 419/05 (including signed checklist – PIBS 5357e)	☒ Yes ☐ No	If no, indicate why: ☐ Minor Amendment (no technical review) ☐ Equipment Subject to Streamlined Review ☐ Subsurface Approval	☒ Yes ☐ No
Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S.9 (PIBS 4872)	☐ Yes ☒ No		☐ Yes ☐ No
Information Supporting Compliance with Noise and Vibration Guidelines			
Noise Screening Process for S.9 Applications -Supplement to Application for Approval (PIBS 4871)	☒ Yes ☐ No		☒ Yes ☐ No
Does the Equipment/Facility meet minimum separation distance?	☐ Yes ☒ No		☐ Yes ☐ No
If the Equipment/Facility does not meet minimum separation distance, then attach:			
1. Acoustic Assessment Report including signed checklist (PIBS 5356e)	☒ Yes ☐ No	Attachment 4	☒ Yes ☐ No
2. Vibration Assessment Report	☐ Yes ☒ No		☐ Yes ☐ No
Other Information Supporting Compliance With Applicable Regulations and Guidelines or to Describe the Project (include separate list if required)			
Design and Operation Report	☒ Yes ☐ No	Submitted Separately	☒ Yes ☐ No
	☐ Yes ☐ No		☐ Yes ☐ No

12. Payment Information

Amount Enclosed: $ 5450 *Please attach completed "Costs for EPA s.9 Applications – Supplement to Application for Approval" (PIBS 4108).*

Method of Payment

☒ Cheque ☐ Money Order ☐ VISA ☐ MasterCard ☐ American Express

Credit Card Information *(if paying by VISA, MasterCard or American Express)**

Name on Card *(please print)* | Credit Card Number | Expiry Date (m/y)

Cardholder Signature | Date *(y/m/d)*

**NOTE: credit card accepted for payments UNDER $10,000.00 only.*

13. Statement of Applicant

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted in support of this application is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act*..
- The Project Technical Information Contact identified in section 5 of this form is authorized to act on my behalf for the purpose of obtaining approval under Section 9 of the EPA for the equipment/processes identified herein.
- I have used the most recent application form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or the Environmental Assessment and Approvals Branch at 1-800-461-6290) and I have included all necessary information required by O. Reg. 419/05, identified on this form and in the Guidance Material.

Name of Signing Authority *(please print)*: Erin Mahoney | Title: Commissioner of Environmental Services

Telephone Number *(including area code & extension)*: (905)830-4444 x 5125 | Fax Number *(including area code)*: (905)895-0260 | E-mail Address: erin.mahoney@york.ca

Signature | Date *(y/m/d)*: 2011/03/02

Address Information:

Same as Applicant Physical Address? ☒ Yes ☐ No (If no, please provide signing authority mailing address information below)

Civic Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)* | Unit Identifier *(i.e. suite or apartment number)*

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)*

Municipality | Postal Station | Province/State | Country | Postal Code

APPLICATION FORM

Certificate of Approval (Air & Noise)

Covanta Durham York Renewable Energy Limited Partnership

March 2011
Report No. 10-1151-0343

Golder Associates

Ontario

Ministry of the Environment

Application for Approval (Air & Noise)

Ce formulaire est disponible en français

For Office Use Only			
Reference Number	Payment Received $	Date *(y/m/d)*	Initials

General Information and Instructions

General:

Information requested in this form is collected under the authority of the *Environmental Protection Act,* R.S.O. 1990 (EPA) and the *Environmental Bill of Rights*, C. 28, Statutes of Ontario, 1993, (EBR) and will be used to evaluate applications for approval under Section 9 of the EPA. This form must be completed with respect to all requirements identified in the Guidance Material listed below in order for it to be considered an application for approval. **INCOMPLETE APPLICATIONS WILL BE RETURNED TO THE APPLICANT.** Even if the application is accepted as complete**, t**he Ministry of the Environment may require additional information during the technical review of the application.

Instructions:

1. **Applicants are responsible for ensuring that they complete the most recent application form.** When completing this form, please refer to the following Guidance Material: the "Guide to Applying for Approval (Air & Noise), Section 9, EPA" and the "Guide - Application Costs for Air Emissions, S. 9, EPA". Application forms and supporting documentation are available from the Environmental Assessment and Approvals Branch toll free at 1-800-461-6290 (locally at 416-314-8001), from your local District Office of the Ministry of the Environment, and in the "Publications" section of the Ministry of the Environment website at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir.

2. Questions regarding completion and submission of this application should be directed to the Environmental Assessment and Approvals Branch of the Ministry of the Environment at the address below or to the local District Office which has jurisdiction over the area where the facility is located. A list of these District Offices is available on the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/org/op.htm#Reg/Dist.

3. A complete application package consists of a completed, signed application form and all required supporting information required by O. Reg. 419/05, identified in this form and the Guidance Material.

4. Three application packages must be submitted to the Ministry of the Environment. Two application packages, the original and a copy must be sent to:

   Ministry of the Environment,
   Director, Environmental Assessment and Approvals Branch,
   2 St. Clair Avenue West, Floor 12A
   Toronto, Ontario, M4V 1L5
   Phone: 416-314-8001
   Toll Free: 1-800-461-6290
   Email: EAABGen@ene.gov.on.ca

   These application packages should include a cheque, money order or credit card payment, in Canadian funds, made payable to the *Ontario Minister of Finance* for the applicable application fee. A third copy of the application package must be sent to the local District Office which has jurisdiction over the area where the facility is located.

5. Information contained in this application form is not considered confidential and will be made available to the public upon request. Information submitted as supporting information may be claimed as confidential but will be subject to the *Freedom of Information and Protection of Privacy Act* (FOIPPA) and the *EBR*. If you do not claim confidentiality at the time of submitting the information, the Ministry of the Environment may make the information available to the public without further notice to you. For more information, please refer to Section 4.9 of the "Guide to Applying for Approval (Air & Noise), Section 9, EPA".

6. If the Applicant submits with the application a copy of their Master Business License (MBL) obtained from the Ministry of Government Services, the **shaded sections within this form do not need to be completed (provided the information required appears on the face of the MBL)**. For additional information on the MBL please refer to Section 4.1 of the "Guide to Applying for Approval (Air & Noise), Section 9, EPA".

1. Applicant Information *(Owner of works/facility)*

Applicant Name *(legal name of individual or organization as evidenced by legal documents)*

Covanta Durham York Renewable Energy Limited Partnership

Business Identification Number

Business Name *(the name under which the entity is operating or trading if different from the Applicant Name - also referred to as trade name)*

Applicant Type:

- ☐ Corporation
- ☐ Individual
- ☒ Partnership
- ☐ Sole Proprietor
- ☐ Federal Government
- ☐ Municipal Government
- ☐ Provincial Government
- ☐ Other *(describe):*

North American Industry Classification System (NAICS) Code

562210 - Waste Treatment and Disposal

Business Activity Description *(a description of the business endeavour, this may include products sold, services provided or machinery/equipment used, etc.)*

Waste Treatment and Disposal

2. Applicant Physical Address

Civic Address- Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
445 South Street	

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory. Not required if Street Information is provided)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan

Municipality/Unorganized Township	County/District	Province/State	Country	Postal Code
Morristown		New Jersey	USA	07960

3. Site Information - *(location where activity/works applied for is to take place)*

Is this an application for a mobile facility?	Site Name	MOE District Office
☐ Yes ☒ No	Durham York Energy Centre	York-Durham District Office

Address Information:

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide site address information below)

Site Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
72 Osbourne Road	

Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number		Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan	
Lot	Conc.	Part	Reference Plan
27	Broken Front	1	40R - 26782

Non Address Information *(includes any additional information to clarify applicants' physical location)*

Municipality/Unorganized Township	County/District	Postal Code
Municipality of Clarington	Region of Durham	L1E 2R2

Geo Reference

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD83	17	+/- 5m	Firstbase map	680425.041	4860195.229

Is the Site located in an area of development control as defined by the Niagara Escarpment Planning & Development Act (NEPDA)?

☐ Yes ***If yes, please attach a copy of the NEPDA permit for proposed activity/work***

☒ No

Is the Site located on the Oak Ridges Moraine Conservation Area as defined by the Oak Ridges Moraine Conservation Plan (ORMCP), a regulation made under the Oak Ridges Moraine Conservation Act (ORMCA)?

☐ Yes ***if yes, please attach proof of Municipal planning approval for the proposed activity/work***

☒ No

Is the Applicant the operating authority?

☒ Yes

☐ No ***If no, please attach the operating authority name, address and phone number***

Is the Applicant the owner of the land (site)?

☐ Yes

☒ No ***If no, please attach the owner's name, address and a signed letter granting consent for the installation and operation of the facilities***

Has this facility and one or more adjacent facilities been deemed to be one property under s.4 of O. Reg. 419/05?

☐ Yes ***If yes, please attach supporting information***

☒ No ***Note: all sources from the adjacent facility must be included in the Emission Summary and Dispersion Modelling Report.***

4. Project Technical Information Contact

Name	Company
Samuel S. Joshi	Covanta Energy Corporation

Address Information:

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide technical information contact address information below)

Civic Address - Street information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*
445 South Street	

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)*

Municipality	Postal Station	Province/State	Country	Postal Code
Morristown		New Jersey	USA	07960

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(862)345-5064	(862)345-5210	sjoshi@covantaenergy.com

5. Project Information

Type of Application:

- [x] New Certificate of Approval for this Facility
  - Did construction of the facility begin after November 30, 2005? [x] Yes [ ] No
  - Does the NAICS Code for the facility fall into Schedule 4 or 5 of O. Reg. 419/05? [x] Yes [ ] No
- [ ] Amendment to current Certificate of Approval
- [ ] Basic Comprehensive Certificate of Approval
- [ ] Consolidated Certificate of Approval

Current Certificate of Approval Number	Current Certificate of Approval Date of Issue (yyyy/mm/dd)
N/A	N/A

Application Initiated by:

[x] Proponent [ ] Environmental Assessment and Approvals Branch [ ] Provincial Officer Order (attach copy) [ ] Other (specify): _____

List all other environmental approvals/permits applied or received in relation to this **project** under the *Environmental Protection Act*, the *Ontario Water Resources Act*, the *Safe Drinking Water Act*, *Environmental Assessment Act* or any other related legislation. (*Please attach a separate list if more space is required*).

Section 27 of the Environmental Protection Act for a Waste Disposal Site.	Section 53 of the Ontario Water Resources Act for Stormwater.

Project Description Summary *(If EBR is applicable, this summary will be used in the EBR posting notice)*

An Energy from Waste Facility is proposed to be constructed and operated on vacant land located on a 12.1 hectare property located in the Clarington Energy Business Park on the west side of Osbourne Road in the Regional Municipality of Durham. The facility will function to receive and thermally process municipal solid waste generated in the Regions of Durham and York. The energy content in the form of superheated steam will be used to generate electricity and potentially provide district heating. The hours of operation are 24 hours per day, 7 days per week, 365 days per year. The Facility meets all applicable air, noise waste and water environmental requirements under the Province of Ontario.

Project Name *(Project identifier to be used as a reference in correspondence)*

Durham York Energy Centre

Project Schedule

Estimated date for start of construction/installation (yyyy/mm/dd)	Estimated date for start of operation (yyyy/mm/dd)
2011/06/01	2014/01/01

6. O. Reg. 419/05 Requirements

Which of the following sections of O. Reg. 419/05 applies to the facility?

[ ] s.18 (Schedule 1) [ ] s.19 (Schedule 2) [x] s.20 (Schedule 3)

If s.20 of O. Reg. 419/05 applies to the facility, do all new sources of contaminant meet the Good Engineering Practice (GEP) stack height requirements of s.15?

[x] Yes [ ] No

Has the facility been issued a notice or an order under s 7(1), 8(2), 10(2), 11(2), 13(2), 14(4), 17(3), 20(4) or 20(5)?

[ ] Yes **If yes, please attach a copy of the notice, amended notice, revoked notice, order and/or additional supporting information**

[x] No

Has a request for approval for an alteration of a Schedule 3 standard under s. 32 of O. Reg. 419/05 been made for this facility?

[ ] Yes **If yes, please attach a copy of ministry acknowledgement letter (if available) or an overview of the request**

[x] No

Do you exceed any s.30 Upper Risk Thresholds (Schedule 6)?

[ ] Yes [x] No **If yes, please attach additional supporting information**

7. Other Air Approvals for Facility – *Please attach a separate list if more space is required*

Separate list attached? [ ] Yes [x] No

List all other environmental approvals issued to this facility under the Section 9 of the *Environmental Protection Act.*

8. *Environmental Assessment Act (EAA)* Requirements

Are the works for which this proposal is made subject to (or exempted from) the requirements of the EAA? ☒ Yes ☐ No

If "Yes," please check one of the following

☐ The works for which this application is made are exempt from the requirements of the EAA under:

☐ Section _____ of Ontario Regulation No. _____ **or**

☐ Declaration/Exemption Order Number _____

If Regulation, Declaration Order or Exemption Order does not refer directly to this facility, state in a covering letter or other document why it does apply to the facility – ***Please provide supporting information***

☐ The works for which this application is made have fulfilled all of the requirements of the EAA through the completion of the Municipal Class EA process in accordance with the procedures set out in:

☐ Schedule A ☐ Schedule B ☐ Schedule C

If Schedule A, was the project planned in accordance with section A.2.9 – Integration with the *Planning Act* of the Class EA?

☐ Yes ☐ No

If Yes, please submit a copy of the summary required by section A.2.9.3 of the Class EA and a copy of the Planning Act notice.

If Schedule B or C of the Municipal Class EA, please submit a copy of the Notice of Completion.

Were Part II Order requests received? ☐ Yes ☐ No

If Yes, please submit a copy of the Minister's decision letter.

☐ The works for which this application is made have fulfilled all of the requirements of the EAA through the completion of the requirements of another class EA process:

Name of Class EA: _____

Schedule/Group/Category (if applicable): _____

If applicable, please submit a copy of the Notice of Completion.

Were Part II Order requests received? ☐ Yes ☐ No

If Yes, please submit a copy of the Minister's decision letter.

☐ The works for which this application is made have fulfilled all of the requirements for the Environmental Screening Process pursuant to O. Reg. 116/01 of the EAA through:

☐ Completion of an Environmental Screening.

☐ Completion of an Environmental Review

Please submit the Statement of Completion, and indicate if any Elevation Request(s) were received.
If Elevation Request(s) were received, please submit a copy of the Director's decision letter.
If the Director's decision was appealed to the Minister, please submit a copy of the Minister's decision letter.

☒ The works for which this application is made have fulfilled all of the requirements of the EAA through the preparation of an environmental assessment.

Please submit a copy of the signed Notice of Approval.

Was this undertaking designated subject to the EAA by regulation? ☒ Yes ☐ No

If yes, please indicate the regulation: Individual Environmental Assessment

9. Environmental Bill of Rights Requirements (EBR) Requirements

Is this a proposal for a prescribed instrument under EBR? ☒ Yes ☐ No

If "Yes", is this proposal exempted from EBR requirements? ☒ Yes ☐ No

If "Yes," please check one of the following

☐ This proposal has been considered in a substantially equivalent process or by a decision of a tribunal. **Please provide supporting information**

☐ This proposal is for an amendment to or revocation of an existing Certificate of Approval that is not environmentally significant. **Please provide supporting information**

☐ This proposal is for an emergency situation. **Please provide supporting information**

☒ This proposal has been subject to or exempted from EAA Requirements. **Please provide supporting information**

10. Additional Public Consultation/Notification

Separate list attached? ☒ Yes ☐ No

Specify all public consultation/notification *(such as public hearings, notification of First Nations, request for an Alternative Standard under s.32 of O. Reg. 419/05, etc.)* related to the project that have been completed or are in the process of being completed. Please attach a separate list describing each of these consultation activities, the results achieved, and planned future consultation activities.

Extensive consultation was carried out as part of the Environmental Assessment. A copy of the Record of Consultation document is provided in Attachment 1.

11. List of Attachments - *This is a list of all supporting information to this application and is subject to the Freedom of Information and Privacy Protection Act and the Environmental Bill of Rights.*

Attachment	Attached	Reference	Can be disclosed
Information Required by Application Form			
Supporting Information Worksheet - Supplement to Application for Approval, EPA S.9 (PIBS 4873)	☒ Yes	Attachment 1	☒ Yes ☐ No
Costs for EPA S.9 Applications - Supplement to Application for Approval (PIBS 4108)	☒ Yes	Attachment 2	☒ Yes ☐ No
Application Fee (cheque or money order attached or credit card information provided)	☒ Yes	Attached	☒ Yes ☐ No
Information Supporting Compliance with O. Reg. 419/05			
Emission Summary and Dispersion Modelling (ESDM) Report prepared in accordance with s.22 of O. Reg. 419/05 (including signed checklist – PIBS 5357e)	☒ Yes ☐ No	If no, indicate why: ☐ Minor Amendment (no technical review) ☐ Equipment Subject to Streamlined Review ☐ Subsurface Approval	☒ Yes ☐ No
Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S.9 (PIBS 4872)	☐ Yes ☒ No		☐ Yes ☐ No
Information Supporting Compliance with Noise and Vibration Guidelines			
Noise Screening Process for S.9 Applications -Supplement to Application for Approval (PIBS 4871)	☒ Yes ☐ No		☒ Yes ☐ No
Does the Equipment/Facility meet minimum separation distance?	☐ Yes ☒ No		☐ Yes ☐ No
If the Equipment/Facility does not meet minimum separation distance, then attach:			
1. Acoustic Assessment Report including signed checklist (PIBS 5356e)	☒ Yes ☐ No	Attachment 4	☒ Yes ☐ No
2. Vibration Assessment Report	☐ Yes ☒ No		☐ Yes ☐ No
Other Information Supporting Compliance With Applicable Regulations and Guidelines or to Describe the Project (include separate list if required)			
Design and Operation Report	☒ Yes ☐ No	Submitted Separately	☒ Yes ☐ No
	☐ Yes ☐ No		☐ Yes ☐ No

12. Payment Information

Amount Enclosed: $ 5450 *Please attach completed "Costs for EPA s.9 Applications – Supplement to Application for Approval" (PIBS 4108).*

Method of Payment

☒ Cheque ☐ Money Order ☐ VISA ☐ MasterCard ☐ American Express

Credit Card Information *(if paying by VISA, MasterCard or American Express)**

Name on Card *(please print)*	Credit Card Number	Expiry Date (m/y)

Cardholder Signature	Date *(y/m/d)*

**NOTE: credit card accepted for payments UNDER $10,000.00 only.*

13. Statement of Applicant

I, the undersigned hereby declare that, to the best of my knowledge:

- The information contained herein and the information submitted in support of this application is complete and accurate in every way and I am aware of the penalties against providing false information as per s.184(2) of the *Environmental Protection Act*..
- The Project Technical Information Contact identified in section 5 of this form is authorized to act on my behalf for the purpose of obtaining approval under Section 9 of the EPA for the equipment/processes identified herein.
- I have used the most recent application form (as obtained from the Ministry of the Environment Internet site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or the Environmental Assessment and Approvals Branch at 1-800-461-6290) and I have included all necessary information required by O. Reg. 419/05, identified on this form and in the Guidance Material.

Name of Signing Authority *(please print)*	Title
Matthew R. Mulcahy	Senior Vice President, Business Development

Telephone Number *(including area code & extension)*	Fax Number *(including area code)*	E-mail Address
(862) 345-5445	(862) 345-5064	mmulcahy@covantaenergy.com

Signature	Date *(y/m/d)*
Matthew R. Mulcahy	March 2, 2011

Address Information:

Same as Applicant Physical Address? ☒ Yes ☐ No (If no, please provide signing authority mailing address information below)

Civic Address - Street Information *(address that has civic numbering and street information includes street number, name, type and direction)*	Unit Identifier *(i.e. suite or apartment number)*

Delivery Designator:
If signing authority mailing address is a Rural Route, Suburban Service, Mobile Route or General Delivery *(i.e., RR#3)*

Municipality	Postal Station	Province/State	Country	Postal Code

ATTACHMENT 1

Supporting Information Worksheet, Supplement to Application for Approval, EPA S.9 and Supporting Information

Including:

- Environmental Assessment Notice of Approval;
- Host Community Agreement;
- Record of Public Consultation;
- Legal Survey Plan;
- Proof of Legal Name Documentation; and
- Canada/ U.S. Air Quality Agreement Transboundary Notification Form.

Ministry of the Environment | Ministère de l'Environnement

Ontario

SUPPORTING INFORMATION WORKSHEET
SUPPLEMENT TO APPLICATION FOR APPROVAL, EPA S.9

This document lists the attachments to the Section 9 Application Form that may be required from an applicant. This worksheet is intended to assist applicants in completing the Application Form and should be read in conjunction with the Guide to Applying for Approval (Air and Noise) dated February, 2005.

This worksheet must be attached to a Section 9 Application Form to be considered complete

	Attachment	Guide to Applying Reference	Required if…	Included	Reference	Confidential
1.	Proof of Legal Name of Applicant	Section 4.1	Always Required unless Master Business Licence is submitted	☐ Yes ☒ N/A		Not Applicable
2.	Copy of Master Business Licence	Section 4.2	Applicant is an Ontario Company and wishes to simplify the application process	☐ Yes ☒ N/A		Not Applicable
3.	Legal Survey	Section 4.3	If survey address is provided	☒ Yes ☐ N/A	Attach. 1	
4.	Copy of NEDPA Permit	Section 4.3	Facility is within an area of development control as defined by the Niagara Escarpment Planning and Development Act	☐ Yes ☒ N/A		☐ Yes ☐ No
5.	Copy of Municipal Planning Approval (ORMCA)	Section 4.3	Facility is within the Oak Ridges Moraine Conservation Area	☐ Yes ☒ N/A		☐ Yes ☐ No
6.	Name, Address and Phone Number of the Operating Authority	Section 4.3	Equipment will be operated not by the applicant but by an Operating Authority	☒ Yes ☐ N/A	App form	☐ Yes ☐ No
7.	Name, Address and consent of the land/site owner for the installation/construction and operation of the equipment/facility	Section 4.3	Applicant is not the owner of the site where the facility is located	☐ Yes ☒ N/A		☐ Yes ☐ No

	Attachment	Guide to Applying Reference	Required if…	Included	Reference	Confidential
8.	Copy of current Certificate of Approval	Section 4.5	Application is for an amendment to a current CofA	☐ Yes ☒ N/A		Not Applicable
9.	List of all environmental approvals/permits applied for relating to this project or received in relation to this project.	Section 4.5	Other environmental approvals/permits have been applied for or issued under the EPA or OWRA in relation to this project only	☒ Yes ☐ N/A	App Form	Not Applicable
10.	Copy of Provincial Officer's Order requiring submission of application	Section 4.5	Application is a result of a Provincial Officer's Order	☐ Yes ☒ N/A		Not Applicable
11.	List of all approvals issued to this facility under Section 9 of the *Environmental Protection Act*	Section 4.6	Previous Section 9 approvals have been issued to the facility	☐ Yes ☒ N/A		Not Applicable
12.	Supporting information that proposal is not a Prescribed instrument under the EBR	Section 4.6	Application meets the requirements of O. Reg 681/94	☐ Yes ☒ N/A	Attach 1.	☐ Yes ☐ No
13.	Supporting information relating to exemption from the public participation requirements of the *Environmental Bill of Rights.*	Section 4.7	Applicant is requesting that the proposal is exempt from posting on the Environmental Registry	☒ Yes ☐ N/A	Attach 1.	☐ Yes ☐ No
14.	Supporting information relating to exemption from or fulfilment of requirements under the *Environmental Assessment Act.*	Section 4.7	Application is part of an undertaking subject to the EAA	☒ Yes ☐ N/A	Attach. 1	☐ Yes ☐ No
15.	List describing public consultation activities related to this project	Section 4.7,8	Applicant is involved in any public consultation / notification activities in addition to EBR / EAA	☒ Yes ☐ N/A	Attach. 1	☐ Yes ☐ No
16.	Application Fee	Section 4.10	Always Required	☒ Yes ☐ N/A	Attached	Not Applicable
17.	Financial Assurance	Section 2	If The Section 9 Director determines that Financial Assurance is necessary based on the nature of the Application (Waste Disposal Site or Remediation for example)	☐ Yes ☒ N/A		☐ Yes ☐ No
18.	Applicant Fee Worksheet	Section 4.9	Always Required	☒ Yes ☐ N/A	Attach. 2	Not Applicable

Please note: the release of information contained in application forms and documentation submitted in support of applications for approval is subject to the provisions of the *Freedom of Information and Protection of Privacy Act*. This Act defines what may and may not be disclosed to the public, and is used to assess all requests for information contained in the documents on file with an application for approval.

The information submitted with an application for approval may also be subject to the *Environmental Bill of Rights*. In those situations, the application and the associated non-confidential supporting documentation is made available for review by members of the public.

The applicants should therefore identify all documents as noted above which are to be considered confidential and must provide detailed evidence in support of this claim. This evidence will be one of the factors the ministry would consider when making a decision regarding disclosure of specific documents on file.

SUPPORTING INFORMATION

Environmental Assessment Notice of Approval

March 2011
Report No. 10-1151-0343

Golder Associates

ENVIRONMENTAL ASSESSMENT ACT

SECTION 9

NOTICE OF APPROVAL TO PROCEED WITH THE UNDERTAKING

RE: The Amended Environmental Assessment for Durham and York Residual Waste Study

Proponent: The Regional Municipalities of Durham and York

EA File No.: 04-EA-02-08

TAKE NOTICE that the period for requiring a hearing, provided for in the Notice of Completion of the Review for the above-noted undertaking, expired on April 2, 2010. I received 185 submissions requesting a hearing by the Environmental Review Tribunal before the expiration date.

I consider a hearing to be unnecessary in this case. Having considered the purpose of the *Environmental Assessment Act*, the approved terms of reference, the environmental assessment, the ministry Review of the environmental assessment and submissions received, I hereby give approval to proceed with the undertaking, subject to the conditions set out below.

REASONS

My reasons for giving approval are:

(1) The proponent has complied with the requirements of the *Environmental Assessment Act*.

(2) The environmental assessment has been prepared in accordance with the approved Terms of Reference.

(3) On the basis of the proponent's environmental assessment and the ministry Review, the proponent's conclusion that, on balance, the advantages of this undertaking outweigh its disadvantages appears to be valid.

(4) No other beneficial alternative method of implementing the undertaking was identified.

(5) The proponent has demonstrated that the environmental effects of the undertaking can be appropriately prevented, changed, mitigated or remedied.

(6) On the basis of the proponent's environmental assessment, the ministry Review and the conditions of approval, the construction, operation and maintenance of the undertaking will be consistent with the purpose of the *Environmental Assessment Act* (section 2).

(7) The ministry's review of: the government, public and Aboriginal community submissions on the environmental assessment; the environmental assessment; and the ministry Review has indicated no outstanding concerns that have not been addressed or that cannot be addressed through commitments made during the environmental assessment process, through the conditions set out below or through future approvals that will be required.

(8) The submissions received after the Notice of Completion of ministry Review was published are being addressed through commitments made during the environmental assessment process, through the conditions set out below or through future approvals that will be required, where appropriate. I am not aware of any significant outstanding issues with respect to this undertaking which suggest that a hearing should be required.

CONDITIONS

The approval is subject to the following conditions:

1. Definitions

For the purposes of these conditions:

"advisory committee" means the committee established pursuant to Condition 8 of this Notice of Approval.

"CEM" means an air emissions monitoring system which continually monitors concentrations of certain contaminants emitted by the facility.

"date of approval" means the date on which the Order in Council was approved by the Lieutenant Governor in Council.

"Director" means the Director of the Environmental Assessment and Approvals Branch.

"District Manager" means the Manager of the Ministry of the Environment's York-Durham Office.

"EAAB" means the Environmental Assessment and Approvals Branch of the Ministry of the Environment.

"environmental assessment" means the document titled Durham/York Residual Waste Study Environmental Assessment Study Document (As Amended November 27, 2009).

"ministry" means the Ontario Ministry of the Environment, or successor, unless specific reference is made to another Ministry.

"non-hazardous municipal solid waste" means the waste that is generated within the municipalities of Durham and York and collected as part of the proponents municipal collection process.

"proponent" means the Regional Municipality of Durham and the Regional Municipality of York.

"Qualified, Independent Professional Engineer" means a person who holds a licence, limited licence or temporary licence under the *Professional Engineers Act* who is not an employee of the Regional Municipality of Durham, the Regional Municipality of York, the operator of the undertaking, or the ministry, who has not been involved in the design of the undertaking or preparation of documentation as part of an application for approval of the undertaking but who is knowledgeable about the *Environmental Protection Act*, Regulation 347 and Ontario Regulation 419/05, ministry guidelines affecting thermal treatment facilities, any other ministry approval issued for the undertaking as well as being experienced at assessing compliance with environmental legislation and requirements of certificates of approval issued under the *Environmental Protection Act*.

"receipt" means the arrival and acceptance of waste at the site, whether remaining in the vehicles used to transport the waste to the site or unloaded from the vehicles used to transport the waste to the site.

"Regional Director" means the Director of the ministry's Central Regional Office.

"site" means the 12.1 hectare parcel of land referred to as Clarington 01 in the environmental assessment and is located south of Highway 401 on the west side of Osbourne Road and north of the CN Rail corridor in the Municipality of Clarington.

"start of construction" means physical construction activities including, site preparation works, but does not include the tendering of contracts.

"undertaking" means the construction and operation of a thermal treatment waste management facility on the site, as set out in the environmental assessment.

2. General Requirements

2.1 The proponent shall comply with the provisions in the environmental assessment which are hereby incorporated in this Notice of Approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site or the undertaking.

2.2 These conditions do not prevent more restrictive conditions being imposed under other statutes.

2.3 A statement must accompany the submission of any documents, reporting requirements or written notices required by this Notice of Approval to be submitted to the Director or Regional Director identifying which conditions the submission is intended to address in this Notice of Approval.

3. Public Record

3.1 Where a document, plan or report is required to be submitted to the ministry, the proponent shall provide two copies of the final document, plan or report to the Director: a copy for filing in the specific public record file maintained for the undertaking and a copy for staff use.

3.2 The proponent shall provide additional copies of the documents required for the public record file to the following for access by the public:

a) Regional Director;

b) District Manager;

c) Clerks of the Regional Municipality of Durham, the Regional Municipality of York, and the Municipality of Clarington; and,

d) Advisory Committee (as required in Condition 8 of this Notice of Approval).

3.3 The EAAB file number EA-08-02 shall be quoted on all documents submitted by the proponent pursuant to this Condition.

4. Compliance Monitoring Program

4.1 The proponent shall prepare and submit to the Director a Compliance Monitoring Program outlining how it will comply with conditions in the Notice of Approval and other commitments made in the environmental assessment.

4.2 A statement shall accompany the submission of the Compliance Monitoring Program indicating that the submission is intended to fulfil Condition 4 of this Notice of Approval.

4.3 The Compliance Monitoring Program shall be submitted within one year from the date of approval, or a minimum of 60 days prior to the start of construction, whichever is earlier.

4.4 The Compliance Monitoring Program shall describe how the proponent will monitor its fulfilment of the provisions of the environmental assessment pertaining to mitigation measures, public consultation, and additional studies and work to be carried out; the fulfilment of all other commitments made by the proponent during the environmental assessment process; and the conditions included in this Notice of Approval.

4.5 The Compliance Monitoring Program shall contain an implementation schedule.

4.6 The Director may require amendments to the Compliance Monitoring Program, including the implementation schedule. If any amendments are required by the Director, the Director will notify the proponent of the required amendments in writing.

4.7 The proponent shall implement the Compliance Monitoring Program, as it may be amended by the Director.

4.8 The proponent shall make the documentation pertaining to the Compliance Monitoring Program available to the ministry or its designate in a timely manner when requested to do so by the ministry.

5. Compliance Reporting

5.1 The proponent shall prepare an annual Compliance Report which describes its compliance with the conditions of approval set out in this Notice of Approval and which describes the results of the proponent's environmental assessment Compliance Monitoring Program required by Condition 4.

5.2 The annual Compliance Report shall be submitted to the Director within one year from the date of approval, with the first report being due in 2011, and shall cover all activities of the previous 12 month period.

5.3 Subsequent compliance reports shall be submitted to the Director on or before the anniversary of the date of approval each year thereafter. Each Compliance Report shall cover all activities of the previous 12 month period.

5.4 The proponent shall submit annual Compliance Reports until all conditions in this Notice of Approval and the commitments in the environmental assessment are satisfied.

5.5 Once all conditions in this Notice of Approval have been satisfied, or have been incorporated into any other ministry approval, the proponent shall indicate in its annual Compliance Report that the Compliance Report is its final Compliance Report and that all conditions in this Notice of Approval have been satisfied.

5.6 The proponent shall retain either on site or in another location approved by the Director, a copy of each of the annual Compliance Reports and any associated documentation of compliance monitoring activities.

5.7 The proponent shall make the Compliance Reports and associated documentation available to the ministry or its designate in a timely manner when requested to do so by the ministry.

6. Complaint Protocol

6.1 The proponent shall prepare and implement a Complaint Protocol setting out how it will deal with and respond to inquiries and complaints received during the design, construction and operation of the undertaking.

6.2 The Complaint Protocol shall be provided to the advisory committee for review prior to submission to the Director.

6.3 The proponent shall submit the Complaint Protocol to the Director within one year from the date of approval or a minimum of 60 days prior to the start of construction, whichever is earlier.

6.4 The Director may require the proponent to amend the Complaint Protocol at any time. Should an amendment be required, the Director will notify the proponent in writing of the required amendment and date by which the amendment must be completed.

6.5 The proponent shall submit the amended Complaint Protocol to the Director within the time period specified by the Director in the notice.

7. Community Involvement

7.1 The proponent shall prepare and implement a Community Communications Plan. The plan shall be prepared, in consultation with the EAAB and to the satisfaction of the Director.

7.2 The proponent shall finalize and submit the Community Communications Plan to the Director prior to the initial receipt of non-hazardous municipal solid waste at the site.

7.3 The Community Communications Plan shall include at a minimum details on:

a) How the proponent plans to disseminate information to interested members of the public and any Aboriginal communities;

b) How interested members of the public and any Aboriginal communities will be notified and kept informed about site operations; and,

c) The procedures for keeping interested members of the public and Aboriginal communities informed about information on documents related to the undertaking, and when and how the information will be made available.

7.4 The proponent shall give notice of and provide information about the undertaking to interested members of the public and Aboriginal communities through an internet web site and by other means. Such information shall include:

a) Activities that are part of the undertaking, including monitoring activities;

b) Reports and records related to the undertaking that are required to be submitted under this Notice of Approval or under any other ministry approvals that apply to the undertaking; and,

c) Information on the Complaint Protocol required by Condition 6 of this Notice of Approval.

7.5 The proponent shall hold public meetings to discuss the design, construction and operation of the undertaking, including, but not limited to:

a) At least one meeting prior to the start of construction;

b) At least one meeting prior to the receipt of non-hazardous municipal solid waste on site; and,

c) At least one meeting a minimum of six months but not later than 12 months after the initial receipt of non-hazardous municipal solid waste on the site.

7.6 The proponent shall provide notice of the public meetings a minimum of 15 days prior to the meeting.

7.7 The proponent shall give the Director written notice of the time, date and location of each of the required community meetings a minimum of 15 days prior to the meeting.

8. Advisory Committee

8.1 The proponent shall establish an advisory committee to ensure that concerns about the design, construction and operation of the undertaking are considered and mitigation measures are implemented where appropriate.

8.2 The proponent shall provide administrative support for the advisory committee including, at a minimum:

a) Providing a meeting space for advisory committee meetings;

b) Recording and distributing minutes of each meeting;

c) Preparing and distributing meeting notices; and,

d) Preparing an annual report about the advisory committee's activities to be submitted as part of the Compliance Reports required by Condition 5 of this Notice of Approval.

8.3 The proponent shall invite one representative from each of the following to participate on the advisory committee:

a) Each of the lower tier municipalities in the Regional Municipality of Durham; and,

b) Each of the lower tier municipalities in the Regional Municipality of York.

8.4 The proponent shall invite one representative from Central Lake Ontario Conservation Authority, and any other local conservation authorities that may have an interest in the undertaking to participate on the advisory committee.

8.5 The proponent shall invite one representative from each of the following local community groups to participate on the advisory committee:

a) DurhamCLEAR;

b) Durham Environmental Watch; and,

c) Zero Waste 4 Zero Burning.

8.6 The proponent may also invite other stakeholders to participate in the advisory committee, including, but not limited to, interested members of the public, Aboriginal communities, and other federal or provincial agencies.

8.7 A representative from the ministry shall be invited to attend meetings as an observer.

8.8 The advisory committee shall be provided with a copy of the documents listed below for information and may review the documents as appropriate and provide comments to the proponent about the documents, including the:

a) Compliance Monitoring Program required by Condition 4;

b) Annual Compliance Report required by Condition 5;

c) Complaint Protocol required by Condition 6;

d) Community Communications Plan required by Condition 7;

e) The annual reports required by Condition 10;

f) Ambient Air Monitoring and Reporting Plan and the results of the ambient air monitoring program required by Condition 11;

g) Air Emissions Monitoring Plan required by Condition 12;

h) Written report prepared and signed by the qualified professional required by Condition 16.5;

i) Spill Contingency and Emergency Response Plan required by Condition 17;

j) Odour Management and Mitigation Plan and the Odour Management and Mitigation Monitoring Reports required by Condition 18;

k) Noise Monitoring and Reporting Plan as required by Condition 19;

l) Groundwater and Surface Water Monitoring Plan, the results of the groundwater and surface water monitoring program, and the annual report on the results of the groundwater and surface water monitoring program required by Condition 20; and,

m) Notice in writing of the date that municipal solid waste is first received as required by Condition 23.

8.9 The proponent shall hold the first advisory committee meeting within three months of the date of approval. At the first meeting, the advisory committee shall develop a Terms of Reference outlining the governance and function of the advisory committee.

8.10 The Terms of Reference shall, at a minimum, include:

a) Roles and responsibilities of the advisory committee members;

b) Frequency of meetings;

c) Member code of conduct;

d) Protocol for dissemination and review of information including timing; and,

e) Protocol for dissolution of the advisory committee.

8.11 The proponent shall submit the advisory committee's Terms of Reference to the Director and Regional Director.

9. Consultation With Aboriginal Communities

9.1 The proponent shall continue to consult with any interested Aboriginal communities during the detailed design and implementation of the undertaking.

10. Waste Diversion

10.1 The proponent shall make a reasonable effort to work cooperatively with all lower tier municipalities to ensure that waste diversion programs, policies and targets set by the Regional Municipalities are being met.

10.2 The proponent shall prepare and implement a Waste Diversion Program Monitoring Plan.

10.3 The Waste Diversion Program Monitoring Plan shall provide a description of monitoring and reporting which shall at minimum include:

a) Results of at source diversion programs and policies to determine the waste diversion rates and practices at both the regional and lower tier municipal level within the Regional Municipalities of Durham and York.

b) Progress in the diversion programs, policies, practices and targets described in the environmental assessment, at both the regional and lower tier municipal level within the Regional Municipalities of Durham and York.

c) Monitoring results for any additional diversion programs, policies, practices and targets carried out within the Regional Municipalities of Durham and York, which are not described in the environmental assessment.

10.4 The proponent shall prepare and submit to the Director and Regional Director, commencing one year after the approval of the undertaking, annual reports detailing the results of the Waste Diversion Program Monitoring Plan.

10.5 The proponent shall post the Waste Diversion Program Monitoring Plan and the annual reports required on the proponent's web site for the undertaking.

11. Ambient Air Monitoring and Reporting

11.1 The proponent shall prepare, in consultation with the ministry's Central Region Office and to the satisfaction of the Regional Director, an Ambient Air Monitoring and Reporting Plan for the undertaking.

11.2 The proponent shall submit the Ambient Air Monitoring and Reporting Plan to the Director and Regional Director a minimum of nine months prior to the start of construction or by such other date as agreed to in writing by the Regional Director.

11.3 The proponent shall establish a working group that will provide advice on the development of the Ambient Air Monitoring and Reporting Plan. The Regions will, at a minimum, extend an invitation to Health Canada, the Durham Region Health Department, York Region Public Health Services, one participant from the advisory committee, and any other relevant federal or provincial government agencies including the ministry.

11.4 The Ambient Air Monitoring and Reporting Plan shall include at minimum:

a) An ambient air monitoring program which includes an appropriate number of sampling locations. Siting of the sampling locations shall be done in accordance with the Ministry of the Environment's Operations Manual for Air Quality Monitoring in Ontario, March 2008, as amended from time to time;

b) The proposed start date for and frequency of the ambient air monitoring and reporting to be carried out;

c) The contaminants that shall be monitored as part of the Ambient Air Monitoring and Reporting Plan; and,

d) At least one meeting on an annual basis between the proponent and the Regional Director to discuss the plan, the results of the ambient air monitoring program and any changes that are required to be made to the plan by the Regional Director.

11.5 The proponent shall implement the ambient air monitoring program prior to the receipt of non-hazardous municipal solid waste on the site or at such other time that may be determined by the Regional Director and communicated to the proponent in writing and shall continue the monitoring until such time as the Regional Director notifies the proponent in writing that the Ambient Air Monitoring Program is no longer required.

11.6 The Regional Director may require changes to be made to the Ambient Air Monitoring and Reporting Plan and the proponents shall implement the plan in accordance with the required changes.

11.7 The proponent shall report the results of the ambient air monitoring program to the Regional Director in accordance with the Ambient Air Monitoring and Reporting Plan.

11.8 Audits will be conducted by the ministry, as outlined in the Ministry of the Environment's Audit Manual for Air Quality Monitoring in Ontario, March 2008 to confirm that siting and performance criteria outlined in the Operations Manual are met. The proponent shall implement any recommendations set out in the audit report regarding siting of the sampling locations and performance criteria. The proponent shall implement the recommendations in the audit report within three months of the receipt of an audit report from the ministry.

11.9 The proponent shall post the Ambient Air Monitoring and Reporting Plan and the results of the ambient air monitoring program on the proponent's web site for the undertaking upon submission of the plan or results of the program to the ministry.

12. Emissions Monitoring

12.1 The proponent shall install, operate and maintain air emissions monitoring systems that will record the concentrations of the contaminants arising from the incineration of waste.

12.2 The air emissions monitoring systems shall be installed and operational prior to the receipt of non-hazardous municipal solid waste at the site.

12.3 The proponent shall prepare and implement an Air Emissions Monitoring Plan. The Plan shall be prepared, in consultation with the ministry and to the satisfaction of the Director.

12.4 The Air Emissions Monitoring Plan shall include, at a minimum:

a) Identification of all sources of air emissions at the site to be monitored;

b) Identification of which contaminants will be monitored by continuous emissions monitoring and which by stack testing;

c) The proposed start date for and frequency of air emissions monitoring;

d) The frequency of and format for reporting the results of air emissions monitoring;

e) The contaminants that shall be monitored, which shall include at a minimum those contaminants set out in Schedule 1 to this Notice of Approval; and,

f) A notification, investigation and reporting protocol to be used in the event that the concentration(s) of one or more of the contaminants released from an emission source that requires approval under Section 9 of the *Environmental Protection Act* exceed the relevant limits.

12.5 The proponent shall submit the Air Emissions Monitoring Plan to the Director, a minimum of six months prior to the start of construction or by such other date as agreed to in writing by the Director

12.6 The proponent shall implement the Air Emissions Monitoring Plan such that the monitoring commences when the first discharges are emitted from the facility to the air or at such other time as the Director may agree to in writing and shall continue until such time as the Director notifies the proponent in writing that the Air Emissions Monitoring Plan is no longer required.

12.7 The proponent shall post the reports of the air emissions monitoring systems on the proponent's web site for the undertaking.

12.8 For those contaminants that are monitored on a continuous basis, the proponent shall post on the proponent's website for the undertaking the results of the monitoring for each of those contaminants in real time.

13. Air Emissions Operational Requirements

13.1 The proponent is expected to operate the undertaking in accordance with Schedule 1 of this Notice of Approval. If the facility is not operating in accordance with Schedule 1, the operator is required to take steps to bring the facility back within these operational requirements.

13.2 Schedule 1 sets out the operational requirements the ministry expects the facility to meet during the normal operating conditions of the facility when operating under a steady state but does not include start up, shut down, or malfunction.

13.3 The timing and frequency of monitoring for a contaminant in Schedule 1 shall be as required by the approval granted to the facility under the *Environmental Protection Act*, should approval be granted.

14. Daily Site Inspection

14.1 The proponent shall conduct a daily inspection of the site including the non-hazardous municipal solid waste received at the site, each day the undertaking is in operation to confirm that:

a) The site is secure;

b) The operation of the undertaking is not causing any nuisance impacts;

c) The operation of the undertaking is not causing any adverse effects on the environment;

d) The undertaking is being operated in compliance with the conditions in this Notice of Approval and any other ministry approvals issued for the undertaking; and,

e) Only non-hazardous waste is being received at the site.

14.2 If, as a result of the daily inspection, any deficiencies are noted by the employee in regard to the factors set out in Condition 14.1 above, the deficiency shall be remedied immediately by the proponent. If necessary to remedy the deficiency, the proponent shall cease operations at the site until the deficiency has been remedied.

14.3 A record of the daily inspections shall be kept in the daily log book required in Condition 15. The information below must be recorded in the daily log book by the person completing the inspection and includes the following information:

a) The name and signature of the person that conducted the daily inspection;

b) The date and time of the daily inspection;

c) A list of any deficiencies discovered during the daily inspection;

d) Any recommendations for action; and,

e) The date, time and description of actions taken.

14.4 The proponent shall retain either on site or in another location approved by the District Manager, a copy of the daily log book and any associated documentation regarding the daily site inspections.

15. Daily Record Keeping

15.1 The proponent shall maintain a written daily log which shall include the following information:

a) Date;

b) Types, quantities and source of non-hazardous municipal solid waste received;

c) Quantity of unprocessed, processed and residual non-hazardous municipal solid waste on the site;

d) Quantities and destination of each type of residual material shipped from the site;

e) The record of daily site inspections required to be maintained by Condition 14.3;

f) A record of any spills or process upsets at the site, the nature of the spill or process upset and the action taken for the clean up or correction of the spill or process upset, the time and date of the spill or process upset, and for spills, the time that the ministry and other persons were notified of the spill pursuant to the reporting requirements of the *Environmental Protection Act*;

g) A record of any waste that was refused at the site, including: amounts, reasons for refusal and actions taken; and,

h) The name and signature of the person completing the report.

15.2 The proponent shall retain, either on site or in another location approved by the District Manager, a copy of the daily log book and any associated documentation.

15.3 The proponent shall make the daily log book and any associated documentation available to the ministry or its designate in a timely manner when requested to do so by the ministry.

16. Third Party Audits

16.1 The proponent shall retain the services of a Qualified, Independent Professional Engineer to carry out an independent audit of the undertaking.

16.2 Within six months from the date of approval or other such date as agreed to in writing by the Regional Director, the proponent shall submit to the Director and the Regional Director, the name of the Qualified, Independent Professional Engineer and the name of the company where he/she is employed.

16.3 The proponent shall submit an audit plan to the satisfaction of the Regional Director that sets out the timing of and frequency for the audits, as well as the manner in which the audits are to be carried out.

16.4 The audit shall include, at a minimum, the following:

a) A detailed walkthrough of the entire site;

b) A review of all operations used in connection with the undertaking; and,

c) A detailed review of all records required to be kept by this Notice of Approval or under any other ministry approvals for the undertaking.

d) The proponent shall obtain from the Qualified, Independent Professional Engineer, a written report of the audit prepared and signed by the Qualified, Independent Professional Engineer that summarizes the results of the audit.

16.5 The proponent shall submit the written report summarizing the result of the audit to the Regional Director no later than 10 business days following the completion of the audit.

16.6 The proponent shall retain either on site or in another location approved by the Regional Director, a copy of the written audit report and any associated documentation.

16.7 The proponent shall make the written audit report and any associated documentation available to the ministry or its designate in a timely manner when requested to do so by the ministry.

16.8 The proponent shall post the written audit report on the proponent's web site for the undertaking following submission of the report to the ministry.

17. Spill Contingency and Emergency Response Plan

17.1 The proponent shall prepare and implement a Spill Contingency and Emergency Response Plan.

17.2 The proponent shall submit to the Director, the Spill Contingency and Emergency Response Plan a minimum of 60 days prior to the receipt of non-hazardous municipal solid waste at the site or such other date as agreed to in writing by the Director.

17.3 The Spill Contingency and Emergency Response Plan shall include, but is not limited to:

a) Emergency response procedures, including notification procedures in case of a spill, fires, explosions or other disruptions to the operations of the facility;

b) Cell and business phone numbers and work locations for all person(s) responsible for the management of the site;

c) Emergency phone numbers for the local ministry office, the ministry's Spills Action Centre, and the local Fire Department;

d) Measures to prevent spills, fires and explosions;

e) Procedures for use in the event of a fire;

f) Details regarding equipment for spill clean-up and all control and safety devices;

g) Shut down procedures for all operations associated with the undertaking including alternative waste disposal site locations;

h) Maintenance and testing program for spill clean-up equipment and fire fighting equipment;

i) Training for site operators and emergency response personnel; and,

j) A plan, identifying the location and nature of wastes on site.

17.4 The proponent shall provide the Spill Contingency and Emergency Response Plan to the District Manager, the local Municipality of Clarington and the local Municipality of Clarington Fire Department a minimum of 30 days prior to the initial receipt of non-hazardous municipal solid waste at the site or such other date as agreed to in writing by the Director.

17.5 The proponent shall take all necessary steps to contain and clean up a spill on the site. A spill or upset shall be reported immediately to the ministry's Spills Action Centre at (416) 325-3000 or 1-800-268-6060.

18. Odour Management and Mitigation

18.1 The proponent shall prepare, in consultation with the ministry's Central Region Office and to the satisfaction of the Regional Director, and implement an Odour Management and Mitigation Plan for the undertaking.

18.2 The proponent shall submit the Odour Management and Mitigation Plan to the Regional Director a minimum of six months prior to the start of construction or at such other time as agreed to in writing by the Regional Director.

18.3 The Odour Management and Mitigation Plan shall include at a minimum:

a) Standard operating and shut down procedures;

b) Maintenance schedules;

c) Ongoing monitoring for and reporting of odour;

d) Corrective action measures and other best management practices for ongoing odour control and for potential operational malfunctions;

e) A schedule for odour testing at sensitive receptors; and,

f) A section that specifically addresses odour control measures should operation of the undertaking be disrupted or cease.

18.4 The proponent shall prepare and submit the Odour Management and Mitigation Monitoring Reports annually to the Regional Director with the first report submitted beginning six months following the initial receipt of non-hazardous municipal solid waste at the site or such other date as agreed to in writing by the Regional Director.

18.5 The Odour Management and Mitigation Monitoring Reports shall be submitted every 12 months from the date of the submission of the first report or until such time as the Regional Director notifies the proponent in writing that the Odour Management and Mitigation Monitoring Reports are no longer required.

18.6 The proponent shall post the Odour Management and Mitigation Monitoring Reports on the proponent's web site for the undertaking following submission of the reports to the Regional Director.

19. Noise Monitoring and Reporting

19.1 The proponent shall prepare and implement a Noise Monitoring and Reporting Plan for the undertaking.

19.2 The proponent shall submit the Noise Monitoring and Reporting Plan to the Director a minimum of 90 days prior to the start of construction or such other date as agreed to in writing by the Director.

19.3 The Noise Monitoring and Reporting Plan shall include a protocol to ensure that the noise emissions from the facility comply with the limits set out in the Ministry of the Environment's Publication NPC-205 "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)", October 1995, as amended from time to time.

19.4 The proponent shall post the Noise Monitoring and Reporting Plan and on the proponent's web site for the undertaking following submission of the plan to the Director.

20. Groundwater and Surface Water Monitoring and Reporting

20.1 Prior to the start of construction, the proponent shall identify any areas where the undertaking may affect groundwater or surface water. For those areas, the proponent shall prepare and implement, in consultation with the ministry's

Central Region Office and to the satisfaction of the Regional Director, a Groundwater and Surface Water Monitoring Plan.

20.2 The proponent shall provide the Groundwater and Surface Water Monitoring Plan to other any government agencies for review and comment, as may be appropriate.

20.3 The Groundwater and Surface Water Monitoring Plan shall include at a minimum:

a) A groundwater and surface water monitoring program;

b) The proposed start date and frequency of groundwater and surface water monitoring;

c) The contaminants that shall be monitored as part of the groundwater and surface water monitoring program; and,

d) At least one meeting each year between the proponent and the Regional Director to discuss the plan, the results of the monitoring program and any changes that are required to be made to plan by the Regional Director.

20.4 The proponent shall submit the Groundwater and Surface Water Monitoring Plan to the Regional Director a minimum of 90 days prior to the start of construction or such other date as agreed to in writing by the Regional Director.

20.5 The Regional Director may require changes to be made to the Groundwater and Surface Water Monitoring Plan and the proponent shall implement the plan in accordance with the required changes.

20.6 The groundwater and surface water monitoring program shall commence prior to the receipt of non-hazardous municipal solid waste at the site or such other time as agreed to in writing by the Regional Director, and shall continue until such time as the Regional Director notifies the proponent in writing that the groundwater and surface water monitoring program is no longer required.

20.7 Thirty days after waste is first received on site, the proponent shall prepare and submit to the Director and Regional Director, a report containing all of the results of the groundwater and surface water monitoring program.

20.8 The proponent shall prepare and submit to the Director and Regional Director, an annual report containing the results of the groundwater and surface water monitoring program. The first report shall be submitted 12 months from the start of the monitoring program and every year thereafter.

20.9 The proponent shall prepare and submit to the Director and Regional Director, a report containing the results of the groundwater and surface water monitoring program within 30 days of any of the following events:

a) A spill occurs on site;

b) A fire or explosion occurs on site;

c) A process upset; or

d) Any disruption to normal operations that may directly or indirectly have an impact on groundwater or surface water.

20.10 The proponent shall post the Groundwater and Surface Water Monitoring Plan and all reports required by this condition on the proponent's web site for the undertaking following submission of the plan and reports to the ministry.

21. Types of Waste and Service Area

21.1 Only non-hazardous municipal solid waste from municipal collection within the jurisdictional boundaries of the Regional Municipality of Durham and the Regional Municipality of York may be accepted at the site.

21.2 Materials which have been source separated for the purposes of diversion shall not be accepted at this site. This prohibition does not apply to the non-recyclable residual waste remaining after the separation of the recyclable materials from the non-recyclable materials at a materials recycling facility or other processing facility.

21.3 The proponent shall ensure that all incoming waste is inspected prior to being accepted at the site to ensure that only non-hazardous municipal solid waste is being accepted.

21.4 If any materials other than non-hazardous municipal solid waste are found during inspection or operation, the proponent shall ensure that management and disposal of the material is consistent with ministry guidelines and legislation.

22. Amount of Waste

22.1 The maximum amount of non-hazardous municipal solid waste that may be processed at the site is 140,000 tonnes per year.

23. Notice of the Date Waste First Received

23.1 Within 15 days of the receipt of the first shipment of waste on site, the proponent shall give the Director and Regional Director written notice that the waste has been received.

24. Construction and Operation Contracts

24.1 In carrying out the undertaking, the proponent shall require that its contractors, subcontractors and employees:

a) fulfil the commitments made by the proponent in the environmental assessment process, including those made in the environmental assessment and in the proponent's responses to comments received during the environmental assessment comment periods;

b) meet applicable regulatory standards, regarding the construction and operation of the undertaking;

c) obtain any necessary approvals, permits or licenses; and,

d) have the appropriate training to perform the requirements of their position.

25. Amending procedures

25.1 Prior to implementing any proposed changes to the undertaking, the proponent shall determine what *Environmental Assessment Act* requirements are applicable to the proposed changes and shall fulfill those *Environmental Assessment Act* requirements.

Dated the 21ST day of October 2010 at TORONTO.

Minister of the Environment
77 Wellesley Street West
11th Floor, Ferguson Block
Toronto, Ontario
M7A 2T5

Approved by O.C. No. 1514/2010

Date O.C. Approved NOVEMBER 3, 2010

Schedule 1 –Air Emissions Operational Requirements

Item	Contaminant	Operational Requirements
1.	Particulate Matter	9 mg/Rm3
2.	Cadmium	7 ug/Rm3
3.	Lead	50 ug/Rm3
4.	Mercury	15 ug/Rm3
5.	Dioxins & Furans	60 pg/Rm3
6.	Hydrogen Chloride	9 mg/Rm3
7.	Sulphur Dioxide	35 mg/Rm3
8.	Nitrogen Oxides	121 mg/Rm3
9.	Organic Matter .	50 ppmdv (33 mg/Rm3)
10.	Carbon Monoxide	35 ppmdv (40 mg/Rm3)
11.	Opacity	5% (2-hour average) 10% (6-minute average)

Notes:
mg/Rm^3-milligrams per reference cubic metre; µg/Rm^3-micrograms per reference cubic metre; pg/Rm^3-picograms per reference cubic metre; ppmdv-parts per million by dry volume

SUPPORTING INFORMATION

Host Community Agreement

March 2011
Report No. 10-1151-0343

Golder Associates

'10FEB19 PM 4:28:08

February 19, 2010

Ms. Patti Barrie
Clerk
Municipality of Clarington
40 Temperance Street
Bowmanville, Ontario
L1C 3A6

The Regional Municipality of Durham

Office of the C.A.O.

605 ROSSLAND ROAD E.
PO BOX 623
WHITBY ON L1N 6A3
CANADA
905-668-7711
1-800-372-1102
Fax: 905-668-1567
Email: garry.cubitt@durham.ca

www.durham.ca

Garry H. Cubitt, M.S.W., C.S.W.
Chief Administrative Officer

Dear Ms. Barrie:

Re: Host Community Agreement

As the official record keeper for the Municipality of Clarington, I am forwarding to you one original signed copy of the Host Community Agreement between the Municipality of Clarington and the Regional Municipality of Durham for your records and files.

Yours truly,

Garry H. Cubitt, M.S.W.
Chief Administrative Officer

Attachment

c: F. Wu, Chief Administrative Officer, Municipality of Clarington

DISTRIBUTION
REVIEWED BY
ORIGINAL TO:
☐ COUNCIL DIRECTION ☐ COUNCIL INFORMATION ☐ FILE
COPY TO:
☐ MAYOR ☐ MEMBERS OF COUNCIL ☐ CAO
☐ COMMUNITY SERVICES ☐ CORPORATE SERVICES ☐ EMERGENCY SERVICES
☐ ENGINEERING SERVICES ☐ MUNICIPAL CLERK'S ☐ OPERATIONS
☐ PLANNING SERVICES ☐ SOLICITOR ☐ TREASURY
☐ OTHER
MUNICIPAL CLERK'S FILE L04 RE

This Host Community Agreement dated the 18th, day of February, 2010 is made,

BETWEEN:

THE REGIONAL MUNICIPALITY OF DURHAM

("Durham")

-and-

THE CORPORATION OF THE MUNICIPALITY OF CLARINGTON

("Clarington")

WHEREAS:

(a) Durham jointly with The Regional Municipality of York, is in the midst of a procurement process designed to identify a preferred vendor capable of designing, building and operating an energy from waste ("EFW Facility") sufficient to meet their needs, as identified through an individual environmental assessment (the "EA") undertaken to identify a preferred method of processing post-diversion waste;

(b) The EA process has resulted in the approval by Durham Regional Council of a preferred site for the EFW Facility within the Municipality of Clarington ("Clarington'), more particularly described in Schedule "A" hereto.

(c) Durham is completing its requirements to finalize the EA for submission to the Minister of the Environment and to make application under the Environmental Protection Act for one or more Certificates of Approval.

(d) Clarington will be the host community of the EFW Facility to the benefit of communities in Durham, York, the industrial/commercial/institutional sector, and potentially municipal waste from other municipalities identified in the EA.

(e) Durham and Clarington wish to enter into this agreement in order to set forth their respective rights, duties, obligations and commitments regarding the development, construction and operation of the EFW Facility.

NOW THEREFORE the parties agree as follows:

1. Term

1.1 This agreement shall commence upon the date that it is last signed and shall last for the operational lifespan of the EFW Facility.

1.2 In the event that the facility is expanded beyond 400,000 tonnes per year and the expanded portions of the EFW Facility have a twenty five (25) year operating period, Durham and Clarington either shall extend the term of this agreement or enter into a new Host Community Agreement.

2. Community Consultation and Communications

2.1 Durham shall support the development and operation of an EFW Site Liaison Committee (SLC) for the purpose of facilitating input from the community and the distribution of relevant information in regards to the construction, operation and monitoring of the EFW facility.

2.2 The scope for a Terms of Reference for a new SLC shall be agreed upon by Durham and Clarington at the conclusion of the mandate of the initial SLC, which terms shall otherwise be generally analogous to the current committee.

2.3 Durham shall present to Clarington Council and hold one community information meeting prior to the submission of the final EA documentation to the Ministry of the Environment for approval. In addition, Durham shall make a presentation to Clarington Council and shall hold one community information meeting before the Site Liaison Committee regarding the terms of the Certificate of Approval for the EFW Facility subsequent to its issuance.

3. Protection of Human Health and the Environment

3.1 Durham shall ensure that the EFW Facility incorporates and utilizes modern, state of the art, emission control technologies that meet or exceed the Ontario A7 air emission guidelines and European Union standards as identified below:

THE REGIONS' AIR EMISSION CRITERIA BASED UPON THE PROVINCE OF ONTARIO AND EUROPEAN UNION AIR EMISSION REQUIREMENTS

Total Particulate Matter	mg/Rm3	9	(2)
Sulphur Dioxide (SO2)	mg/Rm3	35	(3)
Hydrogen Chloride (HCl)	mg/Rm3	9	(4)
Hydrogen Flouride (HF)	mg/Rm3	0.92	(4)
Nitrogen Oxides (NOx)	mg/Rm3	180	(4)
Carbon Monoxide (CO)	mg/Rm3	45	(4)
Mercury (Hg)	µγ/Pµ3	15	(2)
Cadmium (Cd)	µγ/Pµ3	7	(2)
Cadmium + Thallium (Cd + Th)	µγ/Pµ3	46	(2)
Lead (Pb)	µγ/Pµ3	50	(2)
Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, [illegible])	µγ/Pµ3	460	(2)
Dioxins	pg/Rm3	60	(2)
Organic Matter (as CH4)	mg/Rm3	49	(2)

NOTES:

(1) = All units corrected to 11% O2 and adjusted to Reference Temperature and Pressure

mg/Rm3 = Milligrams per Reference Cubic Metre (25oC, 101.3 kPa)

*g/Rm3 = Micrograms per Reference Cubic Metre (25°C, 101.3 kPa)

pg/Rm3 = Picograms per Reference Cubic Metre (25oC, 101.3 kPa)

(2) Calculated as the arithmetic average of 3 stack tests conducted in accordance with standard methods

(3) Calculated as the geometric average of 24 hours of data from a continuous emission monitoring syster

(4) Calculated as the arithmetic average of 24 hours of data from a continuous emission monitoring syster

3.2 Durham shall ensure that the EFW Facility utilizes maximum achievable control technology (MACT) for emissions control and monitoring systems. Durham and the operator shall seek to achieve normal operating levels significantly better than the emission limits identified in Section 3.1.

3.3 Durham shall ensure that, where technically possible, the EFW Facility utilizes 24/7 monitoring systems for such parameters as are deemed appropriate by the Ministry of the Environment. The results of such monitoring systems shall be made accessible to the public on a website or programmable display board designed for such purpose. In addition, Durham shall ensure that the operator monitors the ambient air in the immediate vicinity of the EFW Facility for a three year term commencing upon the commencement of operations.

4. Facility Size

4.1 Durham is seeking approval from the Ministry of the Environment to construct and operate an EFW Facility with a total processing capacity of up to 400,000 tonnes per year of municipal solid waste.

4.2 The parties hereto acknowledge and agree that EFW Facility will not immediately be constructed to the ultimate capacity. Durham will be seeking an initial Certificate of Approval for the construction and operation of a facility for approximately 140,000 tonnes per year. The capacity of the EFW Facility may be expanded, as required by Durham and York, up to the maximum permissible capacity set forth by the Ministry of the Environment in the Certificate of Approval which may be amended from time to time. The EFW Facility may not be expanded in excess of 400,000 tonnes per year.

4.3 At the time of any expansion, Durham will give consideration to improvements to the emission control system to meet the then current MACT standards and shall apply for a new or amended Certificate of Approval if required by the Province of Ontario.

4.4 Durham will not construct a transfer station for ICI waste in Clarington without the agreement of Clarington.

5. Architectural/Site Plan Considerations

5.1 Clarington shall be consulted with respect to the architectural and site plan requirements section(s) of the Request for Proposals.

5.2 Clarington and Durham shall negotiate in good faith the terms of a site plan agreement for the development of the EFW Facility site which shall include the lands required for the private truck access lane referred to in paragraph 9.5. Durham shall comply with normal site plan and building code permit requirements and shall construct Energy Drive through their lands identified on Schedule "A".

5.3 Durham shall incorporate a cash allowance of no less than Nine Million Dollars ($9,000,000) in the Request for Proposals ("RFP") for the provision of architectural treatments and upgrades to the EFW Facility. Durham shall consult with Clarington on the proposed architectural treatments received from the preferred bidder and prior to submitting their site plan application to Clarington for approval.

5.4 At the time of any expansion, Durham will include similar and consistent architectural treatments and upgrades to any new portions of the EFW Facility. Durham shall consult with Clarington on the proposed architectural treatments during the finalization of the arrangements with the Operator for the expansion and prior to submitting their site plan application to Clarington for approval of the expansion.

6. Commitment to a Comprehensive Waste Management Strategy

6.1 Durham shall continue to implement and support an aggressive residual waste diversion and recycling program to achieve and/or exceed a 70% diversion recycling rate for the entire Region.

6.2 Durham shall establish a hazardous waste depot to serve the residents of Clarington within one (1) year of commissioning of the EFW Facility.

7. EFW Facility Waste Sources

7.1 Durham shall ensure that the source of the waste processed at the EFW Facility is consistent with that identified in the EA Terms of Reference and supporting documentation.

7.2 The Parties agree that Industrial, Commercial and Institutional ("ICI") Waste, with a similar composition to municipal solid waste, may be processed at the EFW Facility provided that said ICI Waste is first screened at a transfer station to ensure the removal of any undesirable and hazardous materials.

7.3 The EFW Facility may be utilized to process biosolid wastes generated from water pollution control plants located within Durham Region on an emergency basis in order to support Durham's other operations provided that biosolid wastes do not comprise more than 10% of the total annual tonnage of waste processed at the EFW Facility in a calendar year.

7.4 Notwithstanding the provisions of 7.1 hereof, in the event that the source of waste processed at the EFW Facility at any subsequent time includes the City of Toronto, then Clarington shall be paid the sum of Ten Dollars ($10.00) per tonne for each tonne of waste from that source.

8. Payments in Lieu of Taxes

8.1 Durham shall not structure the ownership of the EFW Facility in any way designed to attain tax exempt status or to avoid the Payments in Lieu of Taxes (PIL's).

8.2 Durham acknowledges that the PIL will be in the vicinity of $650,000 per year. However Durham cannot guarantee the exact amount as that is a matter outside of its direct control.

9. Economic Development

9.1 Durham shall acquire title by way of agreement or expropriation to the properties described in Schedule "B". Upon the properties described in Schedule "B" being determined by Durham Regional Council to be surplus to the present or future requirements of the Regional Municipality of Durham, then Durham shall convey, at nominal consideration, some part of the lands described in Schedule "B" to The Municipality of Clarington.

9.2 Prior to the commissioning of the EFW Facility, Durham shall complete construction of Energy Drive from Courtice Road to Osbourne Road as a Type "C" Arterial road, complete with

all applicable services including: sanitary sewerage, watermains, storm drainage, district heating, and street lighting and shall dedicate Energy Drive to Clarington as a public highway.

9.3 Durham shall construct a storm water management facility of a sufficient size to accommodate development of the Energy Park and Clarington shall execute a front-ending agreement in order to receive and reimburse Durham for the proportional costs of same from any benefiting landowners within the Energy Park. Provided approval to cross the CN Railway line with the necessary drainage works can be reasonably obtained from the Canadian National Railway, then Durham shall construct the storm water management facility on the lands described in 9.7 hereof.

9.4 Durham shall commence an environmental assessment process to support the provision of municipal services to the east Bowmanville science park which is located north of Highway 401.

9.5 Durham shall construct a private truck access lane with landscaping or other screening on its lands on the north side of the Canadian National Railway line connecting with Courtice Road to be utilized, where possible, for all deliveries of waste to the EFW Facility.

9.7 Durham shall convey to Clarington at a nominal cost the lands on the west side of Courtice Road identified in Schedule "C".

9.8 Concurrent with the construction of the EFW Facility, Durham shall construct a segment of a paved asphalt waterfront trail on a mutually agreed upon alignment from Courtice Road to the eastern limits of Durham's lands south of the Courtice Water Pollution Control Plant.

10. Operational Issues

10.1 Durham shall require the operator of the EFW Facility (the "Operator") to have the EFW Facility compliant with the International Standards Organization 14001:2004 Environmental Management Standard (ISO 14001) within thirty six (36) months of its commencing operations and to maintain such compliance thereafter.

10.2 Durham shall ensure that the Operator prepares, maintains and adheres to an Emergency Management Plan (including spills) for the EFW Facility which Plan shall be reviewed and approved by the Clarington Emergency and Fire Services Department.

10.3 Deleted

10.4 Durham shall ensure that the bottom and fly ash generated at the EFW Facility are dealt with in a manner which complies with all applicable legal and regulatory requirements and approvals. Bottom ash can be stored outside if fully screened. Fly ash shall be stored internally in a building until the time of transfer to a disposal site. No bottom ash or fly ash shall be disposed of in a landfill site in Clarington.

10.5 Durham will require the Operator of the EFW Facility to provide a certificate of insurance showing the Municipality of Clarington as an additional insured thereon.

10.6 Durham hereby agrees to indemnify and hold Clarington harmless from all manner of actions, causes of action, suits, demands, and claims whatsoever in connection with any and all injuries up to and including death, or damages to its property, which may occur as a result of the design, construction or operation of the EFW Facility save and except when such injury, loss or

damage is occasioned by the negligent acts or omissions or willful misconduct of Clarington, or those for whom it is at law responsible..

10.7 Durham shall ensure that all waste haulage vehicles accessing and egressing the EFW Facility site will use the truck access routes.

10.8 In addition to all public information, the Operator shall on or before March 31st in each calendar year provide the Clerk of Clarington with a report related to the emissions output from the EFW Facility for the previous calendar year.

11. End Use Plan

11.1 Durham shall decommission and dismantle the EFW Facility within five (5) years of its ceasing of operations to a standard suitable for re-use as an industrial/commercial site.

12. Issue Resolution

12.1 In the event of any dispute, disagreement, or claim arising under or in connection with this Agreement, then the parties hereto shall, upon written notice from either party, meet as soon as reasonably possible in order to resolve said dispute.

12.2 In the event that informal discussions are not effective in resolving any disputes or differences of opinion arising between the parties which concern or touch upon the validity, construction, meaning, performance or effect of this Agreement, then said dispute shall first be mediated within a sixty (60) day time period prior to any dispute proceeding to arbitration. The parties shall determine a mutually agreeable location for the mediation to occur. The parties shall make all reasonable efforts to resolve their disputes by amicable negotiations and agree to provide, without prejudice, frank, candid, and timely disclosure of relevant facts, information, and documents to facilitate these negotiations. Any resolution of the dispute in mediation shall be kept confidential by all parties.

12.3 By giving a notice in writing to the other party, not later than ten (10) working days after the date of termination of the mediated negotiations, all matters remaining in difference between the parties in relation to this Agreement shall then be referred to the arbitration of a single arbitrator, if the parties agree upon one, otherwise to three arbitrators, one to be appointed by each party and a third to be chosen by the first two named before they enter upon the business of arbitration. The award and determination of the arbitrator or arbitrators or two of the three arbitrators shall be binding upon the parties and their respective heirs, executors, successors, administrators and assigns.

13. Clarington's Commitments

13.1 Clarington agrees, in consideration of the aforementioned commitments on the part of Durham, to be a willing host to the EFW Facility and to acknowledge that willingness as follows:

.1 It shall not oppose the development or operation of the EFW Facility;

.2 It acknowledges that, provided that there is public ownership of the EFW Facility and the site by one or more municipalities, it will be considered a "public use" for the purposes of the Zoning By-law and that is not necessary to amend the Clarington Official Plan or Zoning By-law;

.3 It shall expedite the review of all applications for approval submitted by, or on behalf of, the Operator or Durham related to the construction, maintenance and operation of the EFW Facility; and,

.4 Should the existing South Service Road ever be deemed to be surplus due to the construction of Energy Park Drive, the South Service Road shall be closed and conveyed to Durham for nominal consideration; and,

.5 It shall strongly encourage and promote development within the Clarington Energy Business Park and other areas of Clarington to utilize district heating and cooling provided by the EFW Facility.

14. Miscellaneous

14.1 This agreement is entered into solely between Durham and Clarington and is not intended or designed, and in fact it explicitly excludes the creation of any rights or beneficial interests in any third party save and except the Regional Municipality of York in so far as its interest exists in the EFW Facility, from time to time.

15. Further Assurances

The parties hereby covenant and agree, after a request in writing by one party to the other parties, to forthwith execute and provide all further documents, instruments and assurances as may be necessary or required in order to carry out (and give effect to) the true intent of this Agreement, and to effect the registration against and release from title to the lands subject to this Agreement of such notices or other instruments in accordance with the provision of this Agreement.

16. Enurement

This Agreement shall enure to the benefit of and bind the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF Durham and Clarington have executed this Host Community Agreement.

THE REGIONAL MUNICIPALITY OF DURHAM

Per: _____
Roger Anderson, Regional Chair - CEO

Per: _____
Pat Madill, Regional Clerk

THE CORPORATION OF THE MUNICIPALITY OF CLARINGTON

Per: _____
Jim Abernethy, Mayor

Per: _____
Patti L. Barrie, Clerk

Schedule "A"

Legal Description of Proposed Site of EFW Facility

Part of Lot 27, Concession Broken Front, Darlington, designated as Parts 1 and 2 on 40R-19984, save and except Parts 1 and 2 on 40R-20362, Municipality of Clarington, Regional Municipality of Durham, being all of PIN 26605-0082(LT)

Schedule "B"

Legal Description of Lands Proposed to be acquired

FIRSTLY: PT LTS 27 & 28 BROKEN FRONT CONCESSION, DARLINGTON, AS IN N41298 SAVE & EXCEPT PART 1 PL 40R21517 NORTH OF THE CANADIAN NATIONAL RAILWAY; MUNICIPALITY OF CLARINGTON, REGIONAL MUNICIPALITY OF DURHAM, being all of PIN 26605-0086 (LT)

SECONDLY: PT LT 28 BROKEN FRONT CONCESSION, DARLINGTON BEING PTS 2 & 3 on 10R2689; MUNICIPALITY OF CLARINGTON, REGIONAL MUNICIPALITY OF DURHAM, being all of PIN 26605-0030 (LT)

THIRDLY: PT LT 28 BROKEN FRONT CONCESSION, DARLINGTON being PT 1, 10R2689; MUNICIPALITY OF CLARINGTON, REGIONAL MUNICIPALITY OF DURHAM, being all of PIN 26605–0031 (LT)

Schedule "C"

Legal Description of Lands to be Transferred to Clarington

FIRSTLY: PT LT 29 AND 30 BROKEN FRONT CONCESSION, DARLINGTON being PTS 1, 2, AND 3, 40R20750; MUNICIPALITY OF CLARINGTON, REGIONAL MUNICIPALITY OF DURHAM, being all of PIN 26604-0017 (LT)

SECONDLY: PT LT 29 BROKEN FRONT CONCESSION, DARLINGTON being PT 1 on 10R571; MUNICIPALITY OF CLARINGTON, REGIONAL MUNICIPALITY OF DURHAM, being all of PIN 26604-0016 (LT)

SUPPORTING INFORMATION

Record of Public Consultation

March 2011
Report No. 10-1151-0343

Golder Associates

Memorandum

To:
From:
Cc:
Date: January 30, 2011
Re: Durham York Energy Centre
Application for a Certificate of Approval Waste Disposal Site
Section 5.4 – Additional Public Consultation/Notification

1.0 INTRODUCTION

The following memorandum has been prepared to document the communications and consultation activities undertaken by the Regions of Durham and York as part of the development of Certificates of Approval required for the operation of the Durham York Energy Centre.

2.0 Consultation Background

On November 19, 2010, the Regions of Durham and York received approval under the Environmental Assessment Act to implement the Durham/York Residual Waste Study EFW undertaking. Throughout the EA process, a considerable level of effort has been expended on consultation. The EA consultation summary (Section 16 of the Approved EA Study Document[1]) provides an overview of all consultation activities undertaken during the EA Study. It documents the consultation activities conducted during the EA process, in accordance with the requirements of the EAA, the Approved Terms of Reference, and the Consultation Code of Practice. Consultation completed as part of the EA process includes input received from interested parties including the general public, government agencies, nongovernmental organizations (NGOs) and First Nations, all of which have provided feedback that has been, and will continue to be, considered as the Project continues forward.

As part of the Communications Strategy developed by the Regions, consultation was undertaken through the development of public liaison committees such as the Joint Waste Management Group and the Site Liaison Committee, consultation with Government Agencies, First Nations, the public and other interested parties (e.g., non-governmental organizations).

Notification and dissemination of information was undertaken through newspaper, radio and TV advertising, a mailing list, and an EA Study website (www.durhamyorkwaste.ca) maintained throughout the course of the EA Study. Consultation included public polling, consultation events such as public information centres, and opportunities for delegations at Regional Committee and Council meetings.

Although opportunities for public input were available throughout the EA Study, consultation events typically took place during major milestones such as upon the identification of the preferred technology, Short-list of sites, and the preferred site; and for the results of the draft EA Study document and draft site-specific studies.

These consultation events have been summarized in the EA Study document, and are described in more detail in the Record of Consultation (RoC). The RoC has been submitted as a separate document to the EA Study.

[1] Durham/York Residual Waste Study, Environmental Assessment Study Document (As Amended November 27, 2009).

In the Notice of Approval to Proceed with the Undertaking, the Minster of the Environment praised the EA Study for its completeness and transparency stating in the accompanying cover letter:

> *"The Regions have evaluated a sufficient range of alternatives, using criteria that consider the Environmental Assessment Act's (EAA) broad definition of the environment (e.g. including natural, socio-economic, and cultural environments), while taking into consideration the purpose of the proposed undertaking (problem or opportunity being addressed). The amended EA assessed the potential environmental effects of the alternatives and the proposed undertaking, and provided sufficient mitigation and monitoring measures to ensure that the potential negative environmental impacts will be appropriately managed and minimized. I have also concluded that there was sufficient time and opportunities for interested members of the public, the government agencies and Aboriginal communities to comment during the EA process."*

3.0 Pre-Application Submission Consultation

Following receipt of EAA approval, the Regions and their project partner Covanta Energy Corporation initiated pre-application submission consultation. This consultation included dialogue between the Applicant, the Ministry, and other stakeholders in advance of the submission of the applications for Certificates of Approval. This pre-application consultation was completed to assist the applicants in determining what would be required to ensure the acceptability of the application to the Ministry upon submission.

3.1 Consultation with the MOE

A significant amount of consultation has been undertaken with MOE representatives both from the EAAB as well as local and district offices. Given, that this application is relatively unique, it was thought important by all parties, to ensure that the each component of the applications, and the level of detail to be included, was clearly understood.

Discussions with MOE staff included:

- Consultation requirements and expectations;
- Level of design and operating detail to be included in the applications;
- Specific requirements with respect to air emission limits, monitoring requirements, etc.;
- Concordance with commitments and conditions of the approved EA; and,
- Schedule.

3.2 Consultation with Local Municipality

On February 18, 2010 the Regions of Durham and York and the Municipality of Clarington entered into a Host Community Agreement (HCA). The HCA defined, among other things, Clarington's opportunity for input and the matters on which they would be consulted. The HCA also confirmed that no Official Plan amendments or Re-zoning would be required to develop the proposed facility.

Since EA approval has been granted, the Regions have continued consultation with Clarington, in accordance with the HCA. Topics for consultation and discussion have included:

- Facility Architectural Design;
- Site Servicing; and,
- Aspects related to site plan, including roadways, stormwater management, etc.

The Municipality of Clarington has also been provided a seat on the newly formed EA Advisory Committee to provide an additional opportunity for their input to the process.

3.3 Consultation with Other Agencies

Consultation with other agencies where additional approvals or authorizations will be required, such as stormwater clearance from the Central Lake Ontario Conservation Authority has also been initiated.

3.4 Consultation/Communications with Public Stakeholders and Representatives

The following describes public consultation and communications activities, categorized by medium, that have occurred post EA approval and in advance of the submission of the applications for Certificates of Approval.

Media

The following media activity has occurred since the EA approval:

- Public announcements propagated by corporate and works communications on EA approval and conditions. Picked up by newspapers, radio and TV news.
- Newspaper interviews on EFW and the way ahead.
- EFW rated as Durham new item of the year by "Metroland"
- CHEX TV - 5 part series on Durham Region Integrated Waste Management System
- Ask Katherine: Questions and Answers – on EFW

Meetings open to the Public

The following meetings have been held, open to the public for both observation and delegation, since the EA approval:

A. Regional Committee and Council:
    a. Durham Region: February 3rd and 16th, 2011. Topics for discussion included: EFW updates; Project Agreement; EA conditions implementation; Co-owners agreement; Architectural Concepts; and, Advisory committees. These meetings included several delegations from the public on EFW
    b. York Region: December 16th, 2010 and January 19th and 27th, 2011. Topics for discussion included: EFW updates; Project Agreement; EA conditions implementation; Co-owners agreement; Architectural Concepts; and, Advisory committees.
B. Area Municipalities: Committees and Councils
C. Area Municipalities Waste Director Meetings with EFW updates
D. Specific meetings with Clarington staff and councillors. A series of meetings have been held and will continue for the main issues such as architectural concept, HCA obligations, site servicing, permits and advisory committee Terms of Reference.
E. EFW Advisory Committee (pursuant to EA Approval Condition 8): First meeting January 20, 2011 in Durham with subsequent meetings to be scheduled.
F. Integrated Waste Management Advisory Committee: The draft Terms of Reference presented to Durham Region Works Committee and Council February 3rd and 16th, 2011. The Terms of Reference has also been forwarded to Clarington for approval.

Website

The study website http://www.durhamyorkwaste.ca/ remains active and will continue to remain active in the future. The CofA applications will be posted on the website once officially submitted to the MOE. Formal comments on the application will not be solicited, however, any interested party will have the opportunity to review these applications and provide comment to the project team.

Committees

The technical aspect of the Certificate of Approval application has created the requirement to institute an EFW Advisory Committee composed primarily of staff representatives. An Integrated Waste Management Advisory Committee will also be established and will be composed primarily of public representatives as it will review a broader suite of local issues. The documents reviewed and minutes of meetings for these committees will be posted on the EFW website.

Special Events

The following special events will also be utilized to communicate and consult on the project:

- Region of Durham Waste Fair: March 5, 2011 will include EFW displays and staff available to answer questions; and,
- Home and Garden Shows: March 2011, Pickering and Oshawa: Waste Booth with EFW displays and comment sheets provided by Region of Durham.

Public Presentations

In accordance with the EA conditions of approval, public presentations will be given:

- Prior to start of construction;
- Prior to the receipt of non-hazardous municipal solid waste; and,
- During operations (between 6 to 12 months from start of operations).

In accordance with the Host Community Agreement:

> "*Durham shall make a presentation to Clarington Council and shall hold one community information meeting before the Site Liaison Committee regarding the terms of the Certificate of Approval for the EFW Facility subsequent to its issuance.*"[2]

Conferences

Several EFW presentations at technical conferences and seminars are being planned by York and Durham and their consultants, including:

- February 2011: MOE professional development day;
- March 2011: Canadian Institute conference in Toronto;
- May 2011: NAWTEC: Philadelphia, PA; and,
- August 2011: SWANA: Nashville, TN.

Aboriginal Consultation

The Métis Nation of Ontario (MNO) have contacted project staff and a meeting is being scheduled for February 2011 to discuss the project and how best the MNO can continue their engagement and involvement.

First Nations groups identified in the EA are also in the process of being contacted to determine their interest in being consulted through the facility design and operation process.

4.0 Future Consultation and Communications Related Activities

[2] Durham Region, York Region and Municipality of Clarington Host Community Agreement, February 18, 2010.

The Regions and Covanta are in the process of developing the appropriate long-term communications and consultation plans to facilitate ongoing communication with interested stakeholders throughout the duration of the facility operation. The plans are being prepared in accordance with:

- The EA Conditions of Approval;
- The Host Community Agreement;
- Direction from Regional Councils; and,
- Recommendations from the established Advisory Committees.

Specific to the EA conditions of approval, a Complaints Protocol is currently being developed pursuant to EA Condition 6 and has been circulated to the EA Advisory Committee for review and comment. As well, a call centre is being established as part of the protocol to respond to, or forward requests to, the appropriate staff.

The Regions' will continue to utilize multi-media approaches for public service announcements at major project milestones. Public meetings will be held as specified in the EA Approval Conditions prior to: construction, receipt of waste and during initial operation. In addition, a waste fair will be held in Clarington on March 5, 2011 and in accordance with the HCA, a presentation will be made to Clarington Council and the Integrated Waste Management advisory committee regarding the terms of the Certificate of Approval subsequent to its issuance.

A specific consultation plan is in the process of being developed, in consultation with and to address, the consultation requirements of aboriginal communities.

SUPPORTING INFORMATION

Legal Survey Plan

March 2011
Report No. 10-1151-0343

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE Dec. 1, 2010

G.C. Laframboise

G.C. LAFRAMBOISE
ONTARIO LAND SURVEYOR

PLAN 40R-26782

RECEIVED AND DEPOSITED

DATE Dec. 1/10

"P. Johnstone" AOLR

LAND REGISTRAR FOR THE LAND TITLES DIVISION OF DURHAM (No 40)

SCHEDULE

PART	PART OF LOT	CONCESSION	ALL OF PIN	AREA ha.
1	27	BROKEN FRONT CONCESSION	26605-0082	13.220

PLAN OF SURVEY OF

PART OF LOT 27
BROKEN FRONT CONCESSION
(GEOGRAPHIC TOWNSHIP OF DARLINGTON)
NOW IN THE
MUNICIPALITY OF CLARINGTON
REGIONAL MUNICIPALITY OF DURHAM

SCALE 1 : 1000

0 20 0 20 40 60 metres

J. D. BARNES LIMITED

METRIC DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

BEARINGS ARE GRID, DERIVED FROM SPECIFIED CONTROL POINTS (SCPs) 00891860597 AND 00891860598, UTM ZONE 17, NAD83 (ORIGINAL).

DISTANCES ON THIS PLAN ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9999955.

INTEGRATION DATA

SPECIFIED CONTROL POINTS (SCPs): UTM ZONE 17, NAD83 (ORIGINAL).

COORDINATE VALUES ARE TO AN URBAN ACCURACY IN ACCORDANCE WITH SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
SCP 00891860597	680 826.940	4 861 038.345
SCP 00891860598	681 188.771	4 861 114.772

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
△	DENOTES	CONTROL MONUMENT FOUND
SIB	DENOTES	STANDARD IRON BAR
IB	DENOTES	IRON BAR
SCP	DENOTES	SPECIFIED CONTROL POINT
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
J.D.B.	DENOTES	J.D. BARNES LIMITED
7790	DENOTES	A.V. FLIM, O.L.S.
C&F	DENOTES	COUTTS & FLIM SURVEYING INC., O.L.S.
P1	DENOTES	PLAN 40R-19984
P2	DENOTES	PLAN 40R-2067
P3	DENOTES	PLAN 40R-20094
P4	DENOTES	PLAN 40R-20055
P5	DENOTES	PLAN 40R-26342
P6	DENOTES	PLAN OF SURVEY BY COUTTS & FLIM SURVEYING INC. DATED APRIL 28, 2010.
P7	DENOTES	PLAN 40R-20362

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON NOVEMBER 23, 2010.

DATE Nov. 26, 2010

G.C. Laframboise

G.C. LAFRAMBOISE
ONTARIO LAND SURVEYOR

J.D. BARNES LIMITED — SURVEYING PLANNING MAPPING GIS
LAND INFORMATION SPECIALISTS
110 SCOTIA COURT, #40 WHITBY, ON L1N 8Y7
T: (905) 723-1212 F: (905) 723-4314 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
F.B.J.	G.C.L.	07-25-015-08
FILE: g:/72501508/72501508-rpl.dgn		DATED: NOVEMBER 26, 2010

PLOTTED: 01 DEC 2010

SUPPORTING INFORMATION

Proof of Legal Name Documentation

March 2011
Report No. 10-1151-0343

Nova Scotia

CERTIFICATE OF REGISTRATION

Limited Partnerships Act

Registry Number

3246299

Name of Registration

COVANTA DURHAM YORK RENEWABLE ENERGY LIMITED PARTNERSHIP

I hereby certify that the above-mentioned limited partnership is registered under the provisions of the Limited Partnerships Act.

Registrar of Joint Stock Companies

June 7, 2010

Date of Registration

CERTIFICATE OF LIMITED PARTNERSHIP

Pursuant to the *Limited Partnerships Act*, R.S.N.S. 1989, c.259, as amended

A. Name:

Covanta Durham York Renewable Energy Limited Partnership

B. Nature of Business:

The Partnership will carry on the business of operating energy from waste facilities, including, without limitation, owning, developing, financing, managing, leasing and selling in whole or in part, the energy produced therefrom.

C. Name and Place of Residence of Each Partner:

(i) Limited Partner: Covanta Burnaby Renewable Energy, Inc., c/o Covanta Energy Corporation, 40 Lane Road, Fairfield, New Jersey, USA 07004

(ii) General Partner: TransRiver Canada Incorporated, c/o Covanta Energy Corporation, 40 Lane Road, Fairfield, New Jersey, USA 07004

D. Term of Limited Partnership:

The Limited Partnership is to continue until dissolved by agreement of both Partners in accordance with any written agreement, including a partnership agreement, which may be entered into between the partners either before or after the execution of this Certificate.

E. Amount of Cash and Nature and Fair Value of Other Property, if any, Contributed by Each Limited Partner:

To subscribe for units in the Limited Partnership, a Partner must acquire at least one (1) investment unit at $0.01 each. The Partner shall pay $0.01 per unit upon the signing of a subscription for a unit and the Limited Partnership shall be entitled to the said subscription price on the date of acceptance of the subscription by the General Partner.

The following cash or property in lieu of cash has been contributed to date:

Name	# of Units	Paid by Cash	Property at Fair Market Value
TransRiver Canada Incorporated	1	$0.01	N/A
Covanta Burnaby Renewable Energy, Inc.	99	$0.99	N/A

F. Amount of Additional Contributions, if any, Agreed to be Made by Each Limited Partner and the Times at which or Events or the Happening of Which an Additional Contribution Needs to be Made:

There is no requirement for an existing Limited Partner to make additional contributions or purchase additional Units. The General Partner may issue additional units to raise additional capital only if the same is agreed to in writing by the parties hereto.

G. Time When Contributions Will be Returned to Members:

Capital contributions shall be returned upon dissolution; however, the General Partner, in its sole discretion, may determine when capital may be returned in whole or in part to the Limited Partners.

H. The Share of the Profits or Other Compensation by Way of Income Which Each Limited Partner is Entitled to by Reason of his Contribution:

Allocations of the net income and net loss are made on the basis of one percent (1%) to the General Partner and ninety-nine percent (99%) to the Limited Partner.

I. Can the Interest of a Limited Partner be Assigned:

The interest of a Limited Partner can be assigned only with the consent of the General Partner, which may not be unreasonably withheld.

J. Can Additional Limited Partners be Admitted:

Additional Limited Partners can be admitted only with the prior consent of the General Partner and all Limited Partners at the time.

K. Priorities, If Any, on Return of Contributions or Income to Limited Partners:

No unit shall have a preference or right over any other unit.

L. Right of General Partner to Continue Business:

A corporate successor to the General Partner may continue the business of the Limited Partnership.

M. Other Right, If Any, of Limited Partner to Receive Property Other Than Cash in Return for its Contribution:

A Limited Partner is not entitled to receive property other than cash in return for its contribution.

DATED this 20th day of May, 2010.

TRANSRIVER CANADA INCORPORATED

Per: Kirkland J. Bily
Kirkland J. Bily,
Ass't Secretary

COVANTA BURNABY RENEWABLE ENERGY, INC.

Per: Kirkland J. Bily
Kirkland J. Bily
Ass't Secretary

SUPPORTING INFORMATION

Canada/U.S. Air Quality Agreement Transboundary Notification Form

March 2011
Report No. 10-1151-0343

Golder Associates

Environment Canada Environnement Canada

Canada

Home > Air > Pollution Issues > Transboundary Air > Transboundary Notification > Transboundary Notification Form

The Canada/U.S. Air Quality Agreement Transboundary Notification Under Article V

Under Article V of the Canada/U.S. Air Quality Agreement, Canada is obligated to notify the U.S. of any proposed actions, activities or projects which, if carried out, would be likely to cause significant transboundary air pollution. At present, we are providing only notification of such actions under within 100km of the Canada-U.S. border.

This form provides the information to fulfil Canada's obligation under Article V of the Canada/U.S. Air Quality Agreement. The form needs to be completed for any new air pollution source located within 100 km of the Canada/U.S. border that is expected to emit greater than 90 tons per year of any one of the common air pollutants: sulphur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO), total suspended particulates (TSP) and volatile organic compounds (VOC), where VOCs are defined as compounds containing at least one carbon atom, excluding carbon monoxide, carbon dioxide, methane and chlorofluorocarbons. Notification is also required for major modifications of existing facilities which would result in an increase of 40 or more tons per year of one or more common pollutants. With respect to hazardous air pollutants, Notification is required if a new source, or a modification of an existing source, results in a release of greater than 1 tonne per year of any one hazardous air pollutant. For the purposes of Notification, a hazardous air pollutant is any substance in the National Pollutant Release Inventory.

If the proposed facility does not meet the Notification criteria, there is no requirement to complete and return the form to Environment Canada.

Transboundary Notification Form

First name: Matthew

Last name: Mulcahy

Address 1: 445 South Street

Address 2: Morristown, NJ USA

Telephone: (862) 345-5445

Fax: (862) 345-5064

Brief description of the proposed project. (major products, process, capacity, etc):

An Energy from Waste Facility is proposed to be constructed and operated on vacant land located on a 12.1 hectare property located in the Clarington Energy Business Park on the west side of Osbourne Road in the Regional Municipality of Durham. The facility will function to receive and thermally process municipal solid waste generated in the Regions of Durham and York. The energy content in the form of superheated steam will be used to generate electricity and potentially provide district heating. The hours of operation are 24 hours per day, 7 days per week, 365 days per year. The Facility meets all applicable air, noise waste and water environmental requirements under the Province of Ontario.

Latitude and Longitude of proposed facility:

43.874119406675966 'N

78.75294486265932 'W

Distance to the Canada/U.S. border (to the nearest kilometre):

27 km

For combustion processes, list capacity (tons/year), fuel type and grade.

Capacity: 154,324 tons/year

Fuel Type: MSW/Natural Gas

Fuel Grade: N/A

What are the estimated annual quantities of the following pollutants released to the atmosphere (tons per year)?

SO_2: 51.9 tons/year

PM: 33.2 tons/year

VOCs: 49.3 tons/year

CO: 59.2 tons/year

NO_x: 178.6 tons/year
(equivalent to NO_2)

List hazardous air pollutants with emissions estimate (tons/year) for any hazardous pollutants with expected annual emission rates of greater than 1 tonne per year:

Fluorides = 1.2 tons per year
Hydrogen Chloride = 13.4 tons per year
Ammonia = 14.7 tons per year

Date Submitted: March 3, 2011

Forward completed forms to:

Transboundary Air Issues Branch
Environmental Protection Service
Environment Canada
Ottawa, Ontario
K1A 0H3

Clear Data

Printer-friendly version
Full Web Page Print

Date Modified: 2010-05-25

ATTACHMENT 2

Costs for EPA S.9 Applications, Supplement to Application for Approval

March 2011
Report No. 10-1151-0343

Ministry of the Environment | Ministère de l'Environnement

Ontario

COSTS FOR EPA s.9 APPLICATIONS
SUPPLEMENT TO APPLICATION FOR APPROVAL

Information requested in this form is collected under the authority of the Environmental Protection Act, R.S.O. 1990 (EPA) and the Environmental Bill of Rights, c. 28, Statutes of Ontario, 1993, (EBR) and will be used to evaluate applications for approval under Section 9 of the EPA. This form is a supplement to the Application for Approval (Air & Noise) and should be submitted with all applications for approval under Section 9 of the ***EPA.***

O.Reg. 363/98 "Fees – Certificates of Approval" requires applicants for a certificate of approval under Section 9 of the EPA to pay a fee at the time of submitting the application. This fee must be calculated in accordance with the Fees Regulation. ***Applications that do not include the correct fee amount will not be processed by the EAAB.*** *This form is intended to assist applicants in calculating the correct fee amount in accordance with the Fees Regulation. For instructions/assistance completing this form, please refer to the publication titled: "Guide: Application Costs for Air Emissions, s.9 Environmental Protection Act". This form and associated publications are available on the Ministry of the Environment web site at http://www.ene.gov.on.ca/envision/gp/index.htm#PartAir or by contacting the Environmental Assessment and Approvals Branch at 1-800-461-6290 or (416) 314-8001.*

Company Name	Site Name	
Regional Municipality of Durham	Durham York Energy Centre	
Site Address - Street information *(includes street number, name, type and direction)*		Unit Identifier *(unit, suite, apt, etc)*
72 Osbourne Road		
Survey Address *(used for a rural location specified for a subdivided township, an unsubdivided township or unsurveyed territory)*		
Part of Lot 27, Broken Front Concession, Municipality of Clarington, ON		
Non Address Information *(includes any additional information to clarify clients' physical location)*		
Municipality/Unorganized Township	County/District	Postal Code
Municipality of Clarington	Region of Durham	L1E 2R2

Application Type: ***Indicate the applicable aspect(s) of the application and complete the corresponding section(s) of this form.***

☒ Application that requires technical review (Section 1)
Applications for a Greenfield facility, an existing facility that does not have any approvals, amendment to an existing CofA to add new equipment or to consolidate existing equipment into one CofA or for a Basic Comprehensive Certificate of Approval

☐ Revocation of an existing approval that requires technical review (Section 2)
This application is to revoke an existing approval or condition on a certificate of approval that requires a technical review such as a groundwater remediation system, air pollution control equipment (cyclone, dust collector); noise control measures (silencer, barrier)

☐ Administrative amendment of an existing approval (Section 3)
This application is for a minor amendment to an existing approval such as a minor technical correction, etc, that does not require a technical review

☐ Fee exempted amendment or revocation of an existing approval that does not require technical review (Section 4)
This application is required by a condition on a Certificate of Approval, or to revoke a CofA for equipment/facility that is no longer in operation and does not require technical review

Note: If you are seeking a Preliminary Review as defined by the Fee Regulation please contact the EAAB to discuss prior to proceeding with the application.

SECTION 1: Application that Requires Technical Review
Complete tables 1, 2 & 3 and enter your information in the summary table below.

(√)		Description	Cost
☒	A	Administrative processing (always required for all applications)	$ 200
☒	B	Fixed Cost Review for Equipment (Table 1)	$ 2000
☐	C	Emission Summary and Dispersion Modelling Report Review (Table 2)	$
☒	D	Noise Assessment Review (Table 3)	$ 3250
		TOTAL COST:	$ 5450

TABLE 1: *Fixed Cost Review for Equipment*

This table is to be used for new applications or for amendments or revocation to an existing approval. Applicants must identify all equipment that is the subject of the application and include the equipment in the appropriate category on the table. Sections used should be indicated in the left hand column. Equipment that has been previously approved does not have to be included on the table provided that the existing approved equipment is not being modified by the application.

Table 1.1 Equipment subject to Site-wide Fees

(√)		Description	Equipment Specification	Cost	Applicable Fee
☒	1.1.1	Combustion Equipment that uses natural gas, propane, no. 2 oil, landfill gas or sewage treatment gas for fuel for the purpose of providing comfort heating or emergency power, producing hot water or steam, or heating material in a system that does not discharge to the atmosphere	Total Heat input of all units ≤ 50,000,000 kJ/hr	$ 400	$ 400
☐	1.1.2	Storage tanks	N/A	$ 400	$
☐	1.1.3	Welding operations that use a maximum of 10 kilograms of welding rod per hour	N/A	$ 400	$
☐	1.1.4	The application is for an amendment to an existing approval which will not result in an increase in the discharge of any contaminant that was reviewed by the Director for the purpose of issuing the existing certificate	N/A	$400	$

Applicable Fee is based on the type of equipment, if the equipment does not meet the description or specification then use table 1.3

Table 1.2 Equipment Subject to Individual Fees

(√)		Description	Quantity of Equipment		Cost	Applicable Fee
			Formula to Calculate A	A		
☐	1.2.1	Combustion Equipment that uses waste derived fuel for the purpose of providing comfort heating, burning ≤ 15 litres per hour	# of pieces of combustion equipment		x $400 =	$
☐	1.2.2	Heat cleaning ovens used for parts cleaning, and associated parts washers or degreasing equipment, other than solvent degreasing equipment	# of heat cleaning ovens		x $400 =	$
☐	1.2.3	Cooling towers	# of cooling towers divided by two, rounded up to the next whole number		x $400 =	$
☒	1.2.4	Equipment used to control emissions of contaminants, other than a fume incinerator.	# of pieces of pollution control equipment	1	x $400 =	$ 400
☐	1.2.5	Laboratory fume hoods	# of laboratory fume hoods divided by 5, rounded up to the next whole number		x $400 =	$
☐	1.2.6	Paint spray booths and associated equipment that have a design capacity of up to 8 litres per hour of paint	# of paint spray booths		x $400 =	$
☐	1.2.7	Grain dryers	# of grain dryers		x $400 =	$

Applicable Fee is calculated based on the quantity of equipment, calculated using the formula specific for the equipment. Note the formula provides whole numbers only.

Table 1.3		Equipment not otherwise specified in the table			
(√)		Description	Number of Sources	Cost	Applicable Fee
☐	1.3.1	Equipment with a flow rate of less than or equal to 1.5 m^3/second		x $ 400 =	$
☒	1.3.2	Equipment with a flow rate of greater than 1.5 m^3/second	1	x $1,200 =	$ 1200
☐	1.3.3	If one or more of the contaminants to which the application relates is not represented in the Ministry of the Environment publication titled "Summary of Point Impingement Standards, Point of Impingement Guidelines and Ambient Air Quality Criteria (AAQCs)" dated, September 2001 as amended from time to time.	N/A	$300	$

TOTAL COST TABLE 1	$ 2000

Equipment (any plant, structure, apparatus, mechanism or thing that will discharge air and contaminants) that is the subject of the application that is not directly specified by Table 1.1 or 1.2 must be placed in one of the two categories in Table 1.3.

For equipment contained in this section of the table, multiple points of emission which satisfy specifically defined conditions of similarity will be considered equivalent to a single source when determining the application fee for a Certificate of Approval (Air).

The term “source” is defined in *Ontario Reg. 363/98, Fees – Certificates of Approval* as follows:

> “source” means an individual point of emission or a distinct process or area from which emissions may originate, and,
>
> (a) if more than one stack or vent arises from a common process, that process is a source and the individual points or emission are not sources, and
> (b) if two or more separate processes, each of which discharges a distinct mixture of contaminants, are discharged to a common stack, each of the separate processes is a source.

Points of emission are considered “similar” if they satisfy the following conditions:

(a) equivalent process activity;
(b) common contaminant emissions;
(c) emissions estimates are calculated using equivalent methods or formulas (with an allowance for modified process parameters); and
(d) dispersion calculations are performed according to equivalent methods (with an allowance for modified process parameters) and considering equivalent Points of Impingement.

TABLE 2: *Emission Summary and Dispersion Modelling Report Review*

This table is to be used for new equipment applications at existing facilities or for amendments to existing approvals. Applicants must identify the number of sources described in the ESDM Report with contaminants common to the equipment forming the subject of the application to determine the cost as outlined in the table. Sources that have been approved and do not emit common contaminants do not have to be included in the determination of the number of sources.

(√)	Number of Sources	Previously Reviewed?	Cost
☐	5 or less	No	$ 0
☐		Yes	$ 0
☐	6 to 10	No	$ 1,000
☐		Yes	$ 800
☐	11 to 20	No	$ 2,000
☐		Yes	$ 1,600
☐	More than 20	No	$ 3,000
☐		Yes	$ 2,400
		TOTAL COST TABLE 2	$

A “source” may include multiple points of emission, provided the points of emission are “similar”.

Points of emission are considered "similar" if they satisfy the following conditions:

(a) equivalent process activity;
(b) common contaminant emissions;
(c) emissions estimates are based on equivalent methods or formulas (with an allowance for modified process parameters); and
(d) dispersion calculations are performed according to equivalent methods (with an allowance for modified process parameters) and considering equivalent Points of Impingement

When the ESDM Report is only for new sources, not previously approved, there is no cost for this review; it is included in the fixed cost for the particular discharge or equipment calculated under Table 1.

An ESDM Report may be considered previously reviewed when the equipment specified in the ESDM Report has been used to obtain a Certificate of Approval (Air) for that equipment in the past.

TABLE 3: *Noise Assessment Review*

This table is to be used for new applications or for amendments or revocation to an existing approval. Applicants must complete the Noise Screening Procedure included as an appendix in the ministry Document “Guide to Applying for Approval (Air and Noise)" dated January, 2005. If an applicant meets the screening requirements then no fee is required under this table. If the applicant does not meet the screening requirements and an Acoustic Assessment Report is required then the Applicants must identify all equipment that is included as a noise source in the Acoustic Assessment Report in the appropriate category on the following table. Sections used should be indicated within the left hand column. Equipment that has been previously approved does not have to be included on the table provided that the existing approved equipment is not being modified by the application.

Table 3.1 Equipment Subject to Individual Fees

(√)	Description		Quantity of Equipment		Cost	Applicable Fee
			Formula to Calculate A	A		
☐	3.1.1	Arc Furnaces	# of pieces		x $2,250 =	$
☐	3.1.2	Asphalt Plants	# of pieces		x $2,250 =	$
☐	3.1.3	Blow Down Devices	# of pieces		x $2,250 =	$
☐	3.1.4	Co-generation Facilities	# of pieces		x $2,250 =	$
☐	3.1.5	Crushing Operations	# of pieces		x $2,250 =	$
☐	3.1.6	Flares	# of pieces		x $2,250 =	$
☐	3.1.7	Gas Turbines	# of pieces		x $2,250 =	$
☒	3.1.8	Pressure Blowers or Large Induced Draft Fans (flow rate > 47m^3/second or static pressure > 1.25 kilopascals)	# of pieces	1	x $2,250 =	$ 2250

Table 3.2 Equipment Not Otherwise Specified in the Table

(√)	Description		First 5 Pieces of Equipment	Additional Equipment	Cost
☒	3.2.1	Equipment that has not previously been reviewed by the Section 9 Director in connection with an application for a certificate of approval with respect to the facility	$400	$100 x 6	$ 1000
☐	3.2.2	Equipment is identical to equipment for which a noise assessment was previously reviewed by the Section 9 Director in connection with an application for a certificate of approval with respect to the facility	$200	$50 x _____	$

TOTAL COST TABLE 3	$ 3250

SECTION 2: Revocation of an Existing Approval that Requires Technical Review
Complete tables 1, 2 & 3 and enter your information in the summary table below

(√)		Category	Cost
☐	A	Administrative processing (always required for all applications)	$ 200
☐	B	Fixed Cost Review for Equipment (Table 1)	$
☐	C	Emission Summary and Dispersion Modelling Report Review (Table 2)	$
☐	D	Noise Assessment Review (Table 3)	$
		TOTAL COST:	$

SECTION 3: *Administrative Amendment of an Existing Approval*

(√)	Description	Cost
☐	Administrative amendment (no technical review involved)	$ 100
	TOTAL COST:	$

SECTION 4: *Fee Exempted Amendment or Revocation of an Existing Approval that does not require technical review*

(√)	Description	Cost
☐	Administrative revocation (no technical review involved)	$ 0
☐	Any revocation requested as a result of requirements imposed by conditions of an existing approval	$ 0
☐	Any amendment requested as a result of requirements imposed by conditions of an existing approval	$ 0
	TOTAL COST:	$

ATTACHMENT 3

Emission Summary and Dispersion Modelling Report

March 2011
Report No. 10-1151-0343

Golder Associates

March 2011

DURHAM YORK ENERGY CENTRE

Emission Summary and Dispersion Modelling Report Version 1.0

Submitted to:

Ontario Ministry of the Environment
Director Section 9
Environmental Assessment and Approvals Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

REPORT

Report Number: 10-1151-0343 (3000)

Golder Associates

FOREWORD

This Emission Summary and Dispersion Modelling (ESDM) Report was prepared to support an application for a Basic Comprehensive Certificate of Approval (Air & Noise) (CofA [Air & Noise]) and was prepared in accordance with s.26 of Ontario Regulation 419/05 (O. Reg. 419/05). The Report is a living document and should be kept up-to-date at all times and therefore, it is necessary to have appropriate version control. This Version Control system will allow facility personnel, compliance auditors, or the Ontario Ministry of the Environment to track and monitor ESDM Report changes over time.

As facility operations change and sources are added or removed to the facility, this ESDM Report will be updated as required. These changes are to be documented by facility personnel in the Modification Log. Copies of the facility Modification Log are included in Appendix A.

To maintain version control all pages in the ESDM Report have been dated and documented with a version number. This ESDM Report is Version 1.0. The version number will change if the entire report is reissued; if individual pages are provided to update tables, figure or text then they will be issued with a .X subversion number and the updated pages will be listed in the following Version Control table.

VERSION CONTROL

Version	Date	Revision Description	Prepared By	Reviewed By (Facility Contact)
1.0	March 2011	Original ESDM Report to support the Basic Comprehensive Certificate of Approval (Air & Noise)	AC/KA	JN/SJ/JH/BB

EXECUTIVE SUMMARY

This Emission Summary and Dispersion Modelling (ESDM) Report was prepared to support an application for a Basic Comprehensive Certificate of Approval (Air & Noise) (CofA [Air & Noise]) and was prepared in accordance with s.26 of Ontario Regulation 419/05 (O. Reg. 419/05). In addition, guidance in the Ontario Ministry of the Environment (MOE) publication "*Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report, Version 3.0"*, dated March 2009 (ESDM Procedure Document) PIBS 3614e03 was followed, as appropriate.

The Regional Municipalities of Durham and York ("Durham-York") propose to develop an Energy from Waste (EfW) Facility located in an industrial zoned area, on the west side of Osbourne Road, south of Highway 401 and north of a CN Rail Corridor in the Municipality of Clarington. The facility will be a Thermal Treatment Facility, capable of processing post-diversion residual waste and recovering materials and energy to export to the marketplace. Durham-York will be designated as the owners of the EfW, to be named the Durham York Energy Centre.

Covanta Energy ("Covanta") will design, build and operate the Facility. Covanta and Durham-York are applying for a Certificate of Approval (CofA) to allow for the approval of emission generating activities and operations at the Facility. The Facility will use Martin GmbH® combustion technology to process up to 140,000 tonnes/year of municipal solid waste and will capture its energy content in the form of superheated steam used to generate electricity and potentially provide district heating to the neighbouring Courtice Waste Pollution Control Plant and Clarington Energy Park. The Facility will have a steam-turbine generator with a nameplate rating of approximately 20MW.

Emissions from the Facility will be limited in accordance with Provincial standards with ambient impacts being compliant with ambient standards. The North American Industry Classification System (NAICS) code that best applies to the Facility is Waste Treatment and Disposal, which is part of NAICS code 5622 and is listed in Schedule 5 of O.Reg. 419/05.

An Environmental Assessment was completed, submitted and approved in accordance with the Ontario Environmental Assessment Act (EAA). The EA included an Air Quality Assessment which demonstrated compliance with Ontario air quality standards at a throughput of 140,000 tonnes/year. The MOE has issued a Notice to Proceed with conditions which include emission monitoring and odour management and mitigation. Since the EA approval, there have been minor modifications to the Facility and these design changes have been incorporated into this ESDM. The ESDM follows the same technical approach as the EA to ensure consistency is maintained.

In accordance with consultation with the MOE and to be consistent with the Environmental Assessment, compliance was assessed using the CALPUFF dispersion model. A request for use of a specified dispersion model and use of site specific meteorological data has already been completed and was granted by the MOE on August 24, 2010 (See Appendix F).

The maximum Point of Impingement (POI) concentrations were derived from eight (8) potential operating scenarios (Scenarios A-H) including two trains operating, one train operating and start-up. In addition, the operation of a standby diesel generator was also assessed as well as the particulate emissions from the filling of four (4) on-site silos. The maximum emission rates for each significant contaminant emitted from the significant

sources were calculated in accordance with s.11 of O. Reg. 419/05 and the data quality assessment follows the process outlined in the requirements of the ESDM Procedure Document. In accordance with s.8 of O.Reg.419/05, some of the sources and contaminants were considered negligible such as road dust from 1.5 km of paved roads and 98 m of unpaved roads, respectively. Similarly for fly ash and bottom ash which are quenched, conveyed in a covered conveyor system to the Residual Building and disposed of in covered trucks or containers,.

A POI concentration for each significant contaminant emitted from the Facility was estimated in accordance s.26 of O. Reg. 419/05 with results, results presented Emission Summary Tables (Tables i and ii). Table i reflects normal operating conditions (e.g., Scenario A) while Table ii presents maximum number of sources operating concurrently (e.g., Scenario H). The POI is an estimated maximum value reflective of meteorological conditions and stack emissions at the maximum allowable discharge rate. The POI concentrations listed in the Emission Summary Table were compared against criteria listed in the MOE publication "*Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution - Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)*", dated February 2008 (MOE POI Limits the MOE publication *"Jurisdictional Screening Level (JSL) List a Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality"*, dated February 2008.

All predicted impacts are in compliance with applicable ambient standards. Under Scenarios A-F, which represents normal operations and start-up/shut-down emissions from the main stack, 1-hour averaged nitrogen oxides has the highest concentration relative to the MOE POI limit. Of these scenarios, Scenario A has the highest concentration of nitrogen oxides at 7% of the relevant limit. Scenario H represents a worst case operation and includes silo filling plus stand-by diesel generator operation in addition to normal operational emissions from the main stack. In this scenario, the concentration of nitrogen oxides was assessed against the ½ hour standard of 1880 µg/m^3. The relevant concentration of nitrogen oxides under Scenario H is 17% of this limit.

Under Scenario H, 24-hour averaged $PM_{2.5}$ has the highest concentration relative to the corresponding AAQC at 18% of the limit. However, in this scenario, all four of the silos have been modelled assuming 24/7 simultaneous filling. This is highly conservative as in reality; the silos will only be filled one at a time.

The remaining contaminants that do not have MOE POI Limits were assessed and determined to be below the *de minimus* limit. Background concentrations were added to the predicted ambient concentrations of each contaminant. The resultant cumulative concentrations were still below relevant ambient air quality standards for all contaminants.

Potential odour emissions from the facility were also assessed following the MOE *Technical Bulletin Methodology for Modelling Assessments of Contaminants with 10-minute Average Standards and Guidelines under O. Reg 419/05 (April 2008)*. The odour scenario assumed that both combustion units were off-line. The Induced Draft fans would continue to operate and draw air from the tipping floor through the system and release the odours from the top of the stack. Odour samples from the Covanta Onondaga facility in Syracuse, New York were used to represent odours at the Facility during normal full load operating conditions. The results of odour modelling were well below the 1 ou/m^3 guideline at all off-property locations.

This ESDM Report demonstrates that the predicted emissions from the Facility will comply with s.20 of O. Reg. 419/05.

Table I: Emission Summary Table – Maximum Emissions under Scenario A (Two Units Operating at 110% MCR)

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	1.92E+00	Calpuff	1.26E+03	½	6000	Health	Schedule 3	1.33E+01	<1%	1.27E+03	21.17%
Sulphur Dioxide	7446-09-5	1.49E+00	Calpuff	1.93E+01	24	275	Health & Vegetation	Schedule 3	1.46E+00	<1%	2.08E+01	7.55%
Sulphur Dioxide	7446-09-5	1.49E+00	Calpuff	1.95E+01	1	690	Health & Vegetation	Schedule 3	8.62E+00	1.25%	2.81E+01	4.08%
Total Particulate Matter	N/A	9.55E-01	Calpuff	3.54E+01	24	120	Visibility	Schedule 3	1.05E+00	<1%	3.64E+01	30.37%
PM10	N/A	9.55E-01	Calpuff	—	24	50	—	Ontario AAQC	1.05E+00	2.09%	1.05E+00	2.09%
PM2.5	N/A	8.95E-01	Calpuff	2.04E+01	24	30	—	Ontario AAQC	9.87E-01	3.29%	2.14E+01	71.29%
Lead	7439-92-1	2.13E-03	Calpuff	4.98E-03	24	0.5	Health	Schedule 3	2.09E-03	<1%	7.07E-03	1.41%
Lead	7439-92-1	2.13E-03	Calpuff	1.92E-03	30-day	0.2	Health	Schedule 3	2.52E-04	<1%	2.17E-03	1.09%
Cadmium	7440-43-9	2.89E-04	Calpuff	6.04E-04	24	0.25	Upper Risk Threshold	Schedule 6	2.84E-04	Below URT	8.88E-04	Below URT
Cadmium	7440-43-9	2.89E-04	Calpuff	1.76E-03	½	0.75	Upper Risk Threshold	Schedule 6	2.01E-03	Below URT	3.77E-03	Below URT
Mercury	7439-97-6	6.39E-04	Calpuff	—	24	2	Health	Schedule 3	6.26E-04	<1%	6.26E-04	<1%
Fluorides	7664-39-3	3.84E-02	Calpuff	—	24	0.86	Vegetation	Schedule 3	3.76E-02	4.37%	3.76E-02	4.37%
Fluorides	7664-39-3	3.84E-02	Calpuff	—	30-day	0.34	Vegetation	Schedule 3	4.53E-03	1.33%	4.53E-03	1.33%
PCDD	N/A	2.49E-09	Calpuff	2.37E-08	24	5.00E-06	—	Guideline	2.44E-09	<1%	2.61E-08	<1%
Hydrogen Chloride	7647-01-0	3.84E-01	Calpuff	—	24	20	Health	Schedule 3	3.76E-01	1.88%	3.76E-01	1.88%
Ammonia	7664-41-7	4.22E-01	Calpuff	—	24	100	Health	Schedule 3	4.13E-01	<1%	4.13E-01	<1%
Nitrogen Oxides	10102-44-0	5.14E+00	Calpuff	5.82E+01	24	200	Health	Schedule 3	5.04E+00	2.52%	6.32E+01	31.62%
Nitrogen Oxides	10102-44-0	5.14E+00	Calpuff	6.46E+01	1	400	Health	Schedule 3	2.97E+01	7.42%	9.43E+01	23.57%
Polychlorinated Biphenyls (PCB)	N/A	3.08E-06	Calpuff	4.20E-05	24	0.15	Health	Point-of-Impingement	3.02E-06	<1%	4.50E-05	<1%
Aluminum	7429-90-5	1.69E-03	Calpuff	2.10E-01	24	4.8	—	JSL	1.66E-03	Below JSL	2.12E-01	Below JSL
Antimony	7440-36-0	1.17E-04	Calpuff	3.02E-03	24	25	Health	Schedule 3	1.14E-04	<1%	3.13E-03	<1%
Arsenic	7440-38-2	1.79E-05	Calpuff	1.81E-03	24	0.3	Health	Guideline	1.75E-05	<1%	1.83E-03	<1%
Arsenic	7440-38-2	1.79E-05	Calpuff	5.29E-03	½	1	Health	Guideline	1.24E-04	<1%	5.42E-03	<1%
Barium	7440-39-3	9.01E-05	Calpuff	8.18E-03	24	10	Health	Guideline	8.83E-05	<1%	8.27E-03	<1%
Barium	7440-39-3	9.01E-05	Calpuff	2.40E-02	½	30	Health	Guideline	6.24E-04	<1%	2.46E-02	<1%
Beryllium	7440-41-7	1.42E-05	Calpuff	3.02E-04	24	0.01	Health	Schedule 3	1.39E-05	<1%	3.16E-04	3.16%
Boron	7440-42-8	6.52E-03	Calpuff	8.00E-02	24	120	Particulate	Schedule 3	6.39E-03	<1%	8.64E-02	<1%
Chromium (hexavalent)	18540-29-9	1.36E-05	Calpuff	—	24	0.00035	—	Guideline	1.34E-05	<1%	1.34E-05	<1%
Total Chromium (and compounds)	7440-47-3	9.59E-05	Calpuff	2.76E-03	24	0.5	Health	Guideline	9.40E-05	<1%	2.85E-03	<1%

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Total Chromium (and compounds)	7440-47-3	9.59E-05	Calpuff	8.06E-03	½	5	Health	Guideline	6.64E-04	<1%	8.73E-03	<1%
Cobalt	7440-48-4	2.47E-04	Calpuff	6.04E-04	24	0.1	Health	Guideline	2.42E-04	<1%	8.46E-04	<1%
Cobalt	7440-48-4	2.47E-04	Calpuff	1.76E-03	½	0.3	Health	Guideline	1.71E-03	<1%	3.47E-03	1.16%
Nickel	7440-02-0	3.71E-03	Calpuff	4.49E-03	24	0.1	Vegetation	Schedule 3	3.64E-03	3.64%	8.13E-03	8.13%
Phosphorus	7723-14-0	1.96E-03	Calpuff	7.00E-02	24	0.35	—	JSL	1.92E-03	Below JSL	7.19E-02	Below JSL
Silver	7440-22-4	1.43E-04	Calpuff	3.42E-04	24	1	Health	Schedule 3	1.40E-04	<1%	4.82E-04	<1%
Selenium	7782-49-2	2.05E-05	Calpuff	3.02E-03	24	10	Health	Guideline	2.00E-05	<1%	3.04E-03	<1%
Selenium	7782-49-2	2.05E-05	Calpuff	8.82E-03	½	20	Health	Guideline	1.42E-04	<1%	8.96E-03	<1%
Thallium	7440-28-0	1.66E-03	Calpuff	—	24	0.24	—	JSL	1.63E-03	Below JSL	1.63E-03	Below JSL
Tin	7440-31-5	7.50E-04	Calpuff	3.02E-03	24	10	Health	Schedule 3	7.35E-04	<1%	3.75E-03	<1%
Vanadium	7440-62-2	4.96E-05	Calpuff	1.55E-03	24	2	Health	Schedule 3	4.86E-05	<1%	1.60E-03	<1%
Zinc	7440-66-6	8.50E-03	Calpuff	4.00E-02	24	120	Particulate	Schedule 3	8.33E-03	<1%	4.83E-02	<1%
1,2-Dichlorobenzene	95-50-1	8.72E-05	Calpuff	3.60E-02	½	37000	Health	Guideline	6.04E-04	<1%	3.66E-02	<1%
1,2-Dichlorobenzene	95-50-1	8.72E-05	Calpuff	3.00E-02	1	30500	Health	Point-of-Impingement	5.03E-04	<1%	3.05E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	2.19E-06	Calpuff	—	24	1	—	JSL	2.15E-06	Below JSL	2.15E-06	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	Calpuff	5.00E-02	24	400	Health	Guideline	2.15E-06	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	Calpuff	1.32E-01	½	100	Particulate	Guideline	1.52E-05	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	7.41E-06	Calpuff	—	24	0.1	—	De Minimus	7.26E-06	Below De Minimus	7.26E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	2.23E-06	Calpuff	—	24	1.5	—	JSL	2.19E-06	Below JSL	2.19E-06	Below JSL
2,4-Dichlorophenol	120-83-2	4.39E-06	Calpuff	—	24	77	—	JSL	4.30E-06	Below JSL	4.30E-06	Below JSL
Pentachlorophenol	87-86-5	8.79E-06	Calpuff	8.76E-04	24	20	Health	Guideline	8.61E-06	<1%	8.85E-04	<1%
Pentachlorophenol	87-86-5	8.79E-06	Calpuff	2.56E-03	½	60	Health	Guideline	6.09E-05	<1%	2.62E-03	<1%
Hexachlorobenzene	118-74-1	2.19E-06	Calpuff	6.25E-05	24	0.011*	—	JSL	2.15E-06	Below JSL	6.47E-05	Below JSL
Pentachlorobenzene	608-93-5	5.77E-06	Calpuff	—	24	3	—	JSL	5.65E-06	Below JSL	5.65E-06	Below JSL
Acenaphthylene	208-96-8	6.18E-07	Calpuff	3.09E-04	24	3.5	—	JSL	6.06E-07	Below JSL	3.10E-04	Below JSL
Acenaphthene	83-32-9	7.93E-07	Calpuff	1.25E-03	24	0.1	—	De Minimus	7.77E-07	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	1.73E-07	Calpuff	1.63E-04	24	0.2	—	JSL	1.70E-07	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	6.39E-08	Calpuff	6.77E-05	24	0.1	—	De Minimus	6.26E-08	Below De Minimus	6.78E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	1.63E-07	Calpuff	1.42E-04	24	0.1	—	De Minimus	1.60E-07	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	4.30E-08	Calpuff	6.77E-05	24	0.1	—	De Minimus	4.22E-08	Below De Minimus	6.77E-05	Below De Minimus

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Benzo(a)fluorene	238-84-6	1.18E-06	Calpuff	1.35E-04	24	0.1	—	De Minimus	1.15E-06	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	8.06E-07	Calpuff	1.35E-04	24	0.1	—	De Minimus	7.90E-07	Below De Minimus	1.36E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	1.76E-06	Calpuff	7.07E-05	24	1.2	—	JSL	1.72E-06	Below JSL	7.24E-05	Below JSL
Benzo(a)pyrene	50-32-8	1.47E-07	Calpuff	6.77E-05	24	0.0011	Health	Guideline	1.44E-07	<1%	6.78E-05	6.17%
Benzo(a)pyrene	50-32-8	1.47E-07	Calpuff	1.98E-04	½	0.0033	Health	Guideline	1.02E-06	<1%	1.99E-04	6.03%
Benzo(e)pyrene	192-97-2	3.71E-07	Calpuff	1.35E-04	24	0.1	—	De Minimus	3.64E-07	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	1.27E-04	Calpuff	1.36E-03	24	0.1	—	De Minimus	1.25E-04	Below De Minimus	1.48E-03	Below De Minimus
Chrysene	218-01-9	1.61E-07	Calpuff	9.64E-05	24	0.1	—	De Minimus	1.57E-07	Below De Minimus	9.66E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	1.14E-06	Calpuff	—	24	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	Calpuff	6.77E-05	24	0.1	—	De Minimus	5.05E-08	Below De Minimus	6.78E-05	Below De Minimus
Fluoranthene	206-44-0	1.77E-06	Calpuff	6.01E-04	24	140	—	JSL	1.74E-06	Below JSL	6.03E-04	Below JSL
Fluorine	86-73-7	1.33E-06	Calpuff	—	24	0.1	—	De Minimus	1.31E-06	Below De Minimus	1.31E-06	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	3.21E-07	Calpuff	6.77E-05	24	0.1	—	De Minimus	3.15E-07	Below De Minimus	6.80E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	4.18E-06	Calpuff	1.30E-03	24	12	—	JSL	4.10E-06	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	2.32E-05	Calpuff	2.19E-03	24	10	—	JSL	2.27E-05	Below JSL	2.21E-03	Below JSL
Naphthalene	91-20-3	1.80E-05	Calpuff	2.43E-03	24	22.5	Health	Guideline	1.77E-05	<1%	2.45E-03	<1%
Naphthalene	91-20-3	1.80E-05	Calpuff	7.09E-03	½	36	Odour	Guideline	1.25E-04	<1%	7.22E-03	<1%
Naphthalene	91-20-3	1.80E-05	Calpuff	9.77E-03	10-min	50	Odour	Guideline	1.72E-04	<1%	9.94E-03	<1%
Perylene	198-55-0	6.44E-08	Calpuff	1.35E-04	24	0.1	—	De Minimus	6.31E-08	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	4.03E-06	Calpuff	2.57E-03	24	0.1	—	De Minimus	3.95E-06	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	2.14E-06	Calpuff	2.83E-04	24	0.2	—	JSL	2.10E-06	Below JSL	2.85E-04	Below JSL
Tetralin	119-64-2	2.12E-05	Calpuff	1.35E-04	24	1200	—	JSL	2.08E-05	Below JSL	1.56E-04	Below JSL
O-terphenyl	84-15-1	3.49E-06	Calpuff	1.35E-04	24	0.1	—	De Minimus	3.42E-06	Below De Minimus	1.38E-04	Below De Minimus
Acetaldehyde	75-07-0	2.15E-08	Calpuff	1.76E+00	24	500	Health	Schedule 3	2.11E-08	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	2.15E-08	Calpuff	5.21E+00	½	500	Health	Schedule 3	1.49E-07	<1%	5.21E+00	1.04%
Benzene	71-43-2	1.32E-03	Calpuff	1.18E+01	24	N/A	—	N/A	1.29E-03	N/A	1.18E+01	N/A

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Bromodichloromethane	75-27-4	7.50E-03	Calpuff	2.00E-02	24	0.1	—	De Minimus	7.35E-03	Below De Minimus	2.73E-02	Below De Minimus
Bromoform	75-25-2	2.05E-03	Calpuff	3.00E-02	24	55	Health	Guideline	2.01E-03	<1%	3.20E-02	<1%
Bromoform	75-25-2	2.05E-03	Calpuff	8.40E-02	½	165	Health	Guideline	1.42E-02	<1%	9.82E-02	<1%
Bromomethane	74-83-9	1.53E-03	Calpuff	9.00E-02	24	1350	Health	Guideline	1.50E-03	<1%	9.15E-02	<1%
Bromomethane	74-83-9	1.53E-03	Calpuff	2.64E-01	½	4000	Health	Guideline	1.06E-02	<1%	2.75E-01	<1%
Carbon tetrachloride	56-23-5	1.28E-05	Calpuff	7.40E-01	24	2.4	Health	Schedule 3	1.25E-05	<1%	7.40E-01	30.83%
Chloroform	67-66-3	2.17E-05	Calpuff	2.30E-01	24	1	Health	Schedule 3	2.13E-05	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	3.71E-03	Calpuff	3.23E+00	24	500000	Health	Guideline	3.64E-03	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	3.71E-03	Calpuff	9.44E+00	½	1500000	Health	Guideline	2.57E-02	<1%	9.47E+00	<1%
Dichloroethene, 1,1 -	75-34-3	2.41E-05	Calpuff	7.31E-03	½	600	Health	Guideline	1.67E-04	<1%	7.47E-03	<1%
Dichloromethane	75-09-2	7.50E-03	Calpuff	1.27E+00	24	220	Health	Schedule 3	7.35E-03	<1%	1.28E+00	<1%
Ethylbenzene	100-41-4	4.42E-05	Calpuff	1.24E+00	24	1000	Health	Schedule 3	4.33E-05	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	4.42E-05	Calpuff	5.00E+00	10-min	1900	Odour	Guideline	4.21E-04	<1%	5.00E+00	<1%
Ethylene Dibromide	106-93-4	1.20E-05	Calpuff	5.20E-03	24	3	Health	Guideline	1.18E-05	<1%	5.21E-03	<1%
Ethylene Dibromide	106-93-4	1.20E-05	Calpuff	1.20E-02	½	9	Health	Guideline	8.34E-05	<1%	1.21E-02	<1%
Formaldehyde	50-00-0	2.02E-03	Calpuff	3.38E+00	24	65	Health	Schedule 3	1.98E-03	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	2.42E-04	Calpuff	4.90E-01	24	360	Health	Schedule 3	2.37E-04	<1%	4.90E-01	<1%
Toluene	108-88-3	2.14E-03	Calpuff	9.47E+00	24	2000	Odour	Guideline	2.10E-03	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	6.08E-05	Calpuff	1.10E-01	24	115000	Health	Schedule 3	5.96E-05	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	2.10E-05	Calpuff	5.40E-01	24	12	—	Guideline	2.05E-05	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	2.10E-05	Calpuff	—	24	12	Health	Schedule 3	2.05E-05	<1%	2.05E-05	<1%
Trichlorofluoromethane	75-69-4	7.34E-03	Calpuff	2.15E+00	24	6000	Health	Guideline	7.19E-03	<1%	2.16E+00	<1%
Trichlorofluoromethane	75-69-4	7.34E-03	Calpuff	6.28E+00	½	18000	Health	Guideline	5.08E-02	<1%	6.33E+00	<1%
Vinyl chloride	75-01-4	1.86E-03	Calpuff	5.88E-03	24	1	Health	Schedule 3	1.82E-03	<1%	7.70E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	2.57E-02	Calpuff	4.83E+00	24	730	Health	Schedule 3	2.52E-02	<1%	4.86E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	2.57E-02	Calpuff	1.94E+01	10-min	3000	Odour	Guideline	2.45E-01	<1%	1.96E+01	<1%

Table II: Emission Summary Table – Maximum Emissions under Scenario H (Two Units Operating at 110% MCR with Silo Filling and Stand-By Generator Operation)

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	2.17E+00	Calpuff	1.26E+03	½	6000	Health	Schedule 3	6.97E+01	1.16%	1.33E+03	22.11%
Sulphur Dioxide	7446-09-5	1.51E+00	Calpuff	1.93E+01	24	275	Health & Vegetation	Schedule 3	1.79E+00	<1%	2.11E+01	7.67%
Sulphur Dioxide	7446-09-5	1.51E+00	Calpuff	1.95E+01	1	690	Health & Vegetation	Schedule 3	9.33E+00	1.35%	2.88E+01	4.18%
Total Particulate Matter	N/A	1.03E+00	Calpuff	3.54E+01	24	120	Visibility	Schedule 3	6.39E+00	5.32%	4.18E+01	34.82%
PM10	N/A	1.02E+00	Calpuff	—	24	50	—	Ontario AAQC	5.45E+00	10.90%	5.45E+00	10.90%
PM2.5	N/A	9.57E-01	Calpuff	2.04E+01	24	30	—	Ontario AAQC	5.45E+00	18.17%	2.59E+01	86.17%
Lead	7439-92-1	2.13E-03	Calpuff	4.98E-03	24	0.5	Health	Schedule 3	2.09E-03	<1%	7.07E-03	1.41%
Lead	7439-92-1	2.13E-03	Calpuff	1.92E-03	30-day	0.2	Health	Schedule 3	2.52E-04	<1%	2.17E-03	1.09%
Cadmium	7440-43-9	2.89E-04	Calpuff	6.04E-04	24	0.25	Upper Risk Threshold	Schedule 6	2.84E-04	Below URT	8.88E-04	Below URT
Cadmium	7440-43-9	2.89E-04	Calpuff	1.76E-03	½	0.75	Upper Risk Threshold	Schedule 6	2.01E-03	Below URT	3.77E-03	Below URT
Mercury	7439-97-6	6.39E-04	Calpuff	—	24	2	Health	Schedule 3	6.26E-04	<1%	6.26E-04	<1%
Fluorides	7664-39-3	3.84E-02	Calpuff	—	24	0.86	Vegetation	Schedule 3	3.76E-02	4.37%	3.76E-02	4.37%
Fluorides	7664-39-3	3.84E-02	Calpuff	—	30-day	0.34	Vegetation	Schedule 3	4.53E-03	1.33%	4.53E-03	1.33%
PCDD	N/A	2.49E-09	Calpuff	2.37E-08	24	5.00E-06	—	Guideline	2.44E-09	<1%	2.61E-08	<1%
Hydrogen Chloride	7647-01-0	3.84E-01	Calpuff	—	24	20	Health	Schedule 3	3.76E-01	1.88%	3.76E-01	1.88%
Ammonia	7664-41-7	4.22E-01	Calpuff	—	24	100	Health	Schedule 3	4.13E-01	<1%	4.13E-01	<1%
Nitrogen Oxides	10102-44-0	6.26E+00	Calpuff	6.98E+01	½	1880	—	Generator Testing	3.24E+02	17.25%	3.94E+02	20.96%
Polychlorinated Biphenyls (PCB)	N/A	3.08E-06	Calpuff	4.20E-05	24	0.15	Health	Point-of-Impingement	3.02E-06	<1%	4.50E-05	<1%
Aluminum	7429-90-5	1.69E-03	Calpuff	2.10E-01	24	4.8	—	JSL	1.66E-03	Below JSL	2.12E-01	Below JSL
Antimony	7440-36-0	1.17E-04	Calpuff	3.02E-03	24	25	Health	Schedule 3	1.14E-04	<1%	3.13E-03	<1%
Arsenic	7440-38-2	1.79E-05	Calpuff	1.81E-03	24	0.3	Health	Guideline	1.75E-05	<1%	1.83E-03	<1%
Arsenic	7440-38-2	1.79E-05	Calpuff	5.29E-03	½	1	Health	Guideline	1.24E-04	<1%	5.42E-03	<1%
Barium	7440-39-3	9.01E-05	Calpuff	8.18E-03	24	10	Health	Guideline	8.83E-05	<1%	8.27E-03	<1%
Barium	7440-39-3	9.01E-05	Calpuff	2.40E-02	½	30	Health	Guideline	6.24E-04	<1%	2.46E-02	<1%
Beryllium	7440-41-7	1.42E-05	Calpuff	3.02E-04	24	0.01	Health	Schedule 3	1.39E-05	<1%	3.16E-04	3.16%
Boron	7440-42-8	6.52E-03	Calpuff	8.00E-02	24	120	Particulate	Schedule 3	6.39E-03	<1%	8.64E-02	<1%
Chromium (hexavalent)	18540-29-9	1.36E-05	Calpuff	—	24	0.00035	—	Guideline	1.34E-05	<1%	1.34E-05	<1%
Total Chromium (and compounds)	7440-47-3	9.59E-05	Calpuff	2.76E-03	24	0.5	Health	Guideline	9.40E-05	<1%	2.85E-03	<1%

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Total Chromium (and compounds)	7440-47-3	9.59E-05	Calpuff	8.06E-03	½	5	Health	Guideline	6.64E-04	<1%	8.73E-03	<1%
Cobalt	7440-48-4	2.47E-04	Calpuff	6.04E-04	24	0.1	Health	Guideline	2.42E-04	<1%	8.46E-04	<1%
Cobalt	7440-48-4	2.47E-04	Calpuff	1.76E-03	½	0.3	Health	Guideline	1.71E-03	<1%	3.47E-03	1.16%
Nickel	7440-02-0	3.71E-03	Calpuff	4.49E-03	24	0.1	Vegetation	Schedule 3	3.64E-03	3.64%	8.13E-03	8.13%
Phosphorus	7723-14-0	1.96E-03	Calpuff	7.00E-02	24	0.35	—	JSL	1.92E-03	Below JSL	7.19E-02	Below JSL
Silver	7440-22-4	1.43E-04	Calpuff	3.42E-04	24	1	Health	Schedule 3	1.40E-04	<1%	4.82E-04	<1%
Selenium	7782-49-2	2.05E-05	Calpuff	3.02E-03	24	10	Health	Guideline	2.00E-05	<1%	3.04E-03	<1%
Selenium	7782-49-2	2.05E-05	Calpuff	8.82E-03	½	20	Health	Guideline	1.42E-04	<1%	8.96E-03	<1%
Thallium	7440-28-0	1.66E-03	Calpuff	—	24	0.24	—	JSL	1.63E-03	Below JSL	1.63E-03	Below JSL
Tin	7440-31-5	7.50E-04	Calpuff	3.02E-03	24	10	Health	Schedule 3	7.35E-04	<1%	3.75E-03	<1%
Vanadium	7440-62-2	4.96E-05	Calpuff	1.55E-03	24	2	Health	Schedule 3	4.86E-05	<1%	1.60E-03	<1%
Zinc	7440-66-6	8.50E-03	Calpuff	4.00E-02	24	120	Particulate	Schedule 3	8.33E-03	<1%	4.83E-02	<1%
1,2-Dichlorobenzene	95-50-1	8.72E-05	Calpuff	3.60E-02	½	37000	Health	Guideline	6.04E-04	<1%	3.66E-02	<1%
1,2-Dichlorobenzene	95-50-1	8.72E-05	Calpuff	3.00E-02	1	30500	Health	Point-of-Impingement	5.03E-04	<1%	3.05E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	2.19E-06	Calpuff	—	24	1	—	JSL	2.15E-06	Below JSL	2.15E-06	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	Calpuff	5.00E-02	24	400	Health	Guideline	2.15E-06	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	Calpuff	1.32E-01	½	100	Particulate	Guideline	1.52E-05	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	7.41E-06	Calpuff	—	24	0.1	—	De Minimus	7.26E-06	Below De Minimus	7.26E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	2.23E-06	Calpuff	—	24	1.5	—	JSL	2.19E-06	Below JSL	2.19E-06	Below JSL
2,4-Dichlorophenol	120-83-2	4.39E-06	Calpuff	—	24	77	—	JSL	4.30E-06	Below JSL	4.30E-06	Below JSL
Pentachlorophenol	87-86-5	8.79E-06	Calpuff	8.76E-04	24	20	Health	Guideline	8.61E-06	<1%	8.85E-04	<1%
Pentachlorophenol	87-86-5	8.79E-06	Calpuff	2.56E-03	½	60	Health	Guideline	6.09E-05	<1%	2.62E-03	<1%
Hexachlorobenzene	118-74-1	2.19E-06	Calpuff	6.25E-05	24	0.011*	—	JSL	2.15E-06	Below JSL	6.47E-05	Below JSL
Pentachlorobenzene	608-93-5	5.77E-06	Calpuff	—	24	3	—	JSL	5.65E-06	Below JSL	5.65E-06	Below JSL
Acenaphthylene	208-96-8	3.64E-06	Calpuff	3.09E-04	24	3.5	—	JSL	2.77E-04	Below JSL	5.86E-04	Below JSL
Acenaphthene	83-32-9	2.33E-06	Calpuff	1.25E-03	24	0.1	—	De Minimus	1.40E-04	Below De Minimus	1.39E-03	Below De Minimus
Anthracene	120-12-7	5.76E-07	Calpuff	1.63E-04	24	0.2	—	JSL	3.69E-05	Below JSL	2.00E-04	Below JSL
Benzo(a)anthracene	56-55-3	2.68E-07	Calpuff	6.77E-05	24	0.1	—	De Minimus	1.87E-05	Below De Minimus	8.64E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	5.27E-07	Calpuff	1.42E-04	24	0.1	—	De Minimus	3.33E-05	Below De Minimus	1.75E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	1.14E-07	Calpuff	6.77E-05	24	0.1	—	De Minimus	6.54E-06	Below De Minimus	7.42E-05	Below De Minimus

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Benzo(a)fluorene	238-84-6	1.18E-06	Calpuff	1.35E-04	24	0.1	—	De Minimus	1.15E-06	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	8.06E-07	Calpuff	1.35E-04	24	0.1	—	De Minimus	7.90E-07	Below De Minimus	1.36E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	1.94E-06	Calpuff	7.07E-05	24	1.2	—	JSL	1.67E-05	Below JSL	8.74E-05	Below JSL
Benzo(a)pyrene	50-32-8	2.31E-07	Calpuff	6.77E-05	24	0.0011	Health	Guideline	7.71E-06	<1%	7.54E-05	6.86%
Benzo(a)pyrene	50-32-8	2.31E-07	Calpuff	1.98E-04	½	0.0033	Health	Guideline	2.44E-05	<1%	2.22E-04	6.74%
Benzo(e)pyrene	192-97-2	3.71E-07	Calpuff	1.35E-04	24	0.1	—	De Minimus	3.64E-07	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	1.27E-04	Calpuff	1.36E-03	24	0.1	—	De Minimus	1.25E-04	Below De Minimus	1.48E-03	Below De Minimus
Chrysene	218-01-9	6.62E-07	Calpuff	9.64E-05	24	0.1	—	De Minimus	4.59E-05	Below De Minimus	1.42E-04	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	1.14E-06	Calpuff	—	24	0.1	—	De Minimus	1.12E-06	Below De Minimus	1.12E-06	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	1.65E-07	Calpuff	6.77E-05	24	0.1	—	De Minimus	1.03E-05	Below De Minimus	7.80E-05	Below De Minimus
Fluoranthene	206-44-0	3.09E-06	Calpuff	6.01E-04	24	140	—	JSL	1.21E-04	Below JSL	7.22E-04	Below JSL
Fluorine	86-73-7	1.33E-06	Calpuff	—	24	0.1	—	De Minimus	1.31E-06	Below De Minimus	1.31E-06	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	4.57E-07	Calpuff	6.77E-05	24	0.1	—	De Minimus	1.25E-05	Below De Minimus	8.02E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	4.18E-06	Calpuff	1.30E-03	24	12	—	JSL	4.10E-06	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	2.32E-05	Calpuff	2.19E-03	24	10	—	JSL	2.27E-05	Below JSL	2.21E-03	Below JSL
Naphthalene	91-20-3	6.06E-05	Calpuff	2.43E-03	24	22.5	Health	Guideline	3.90E-03	<1%	6.33E-03	<1%
Naphthalene	91-20-3	6.06E-05	Calpuff	7.09E-03	½	36	Odour	Guideline	1.23E-02	<1%	1.94E-02	<1%
Naphthalene	91-20-3	6.06E-05	Calpuff	9.77E-03	10-min	50	Odour	Guideline	1.70E-02	<1%	2.67E-02	<1%
Perylene	198-55-0	6.44E-08	Calpuff	1.35E-04	24	0.1	—	De Minimus	6.31E-08	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	1.74E-05	Calpuff	2.57E-03	24	0.1	—	De Minimus	1.23E-03	Below De Minimus	3.80E-03	Below De Minimus
Pyrene	129-00-0	3.35E-06	Calpuff	2.83E-04	24	0.2	—	JSL	1.12E-04	Below JSL	3.95E-04	Below JSL
Tetralin	119-64-2	2.12E-05	Calpuff	1.35E-04	24	1200	—	JSL	2.08E-05	Below JSL	1.56E-04	Below JSL
O-terphenyl	84-15-1	3.49E-06	Calpuff	1.35E-04	24	0.1	—	De Minimus	3.42E-06	Below De Minimus	1.38E-04	Below De Minimus
Acetaldehyde	75-07-0	8.28E-06	Calpuff	1.76E+00	24	500	Health	Schedule 3	7.57E-04	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	8.28E-06	Calpuff	5.21E+00	½	500	Health	Schedule 3	2.39E-03	<1%	5.21E+00	1.04%
Benzene	71-43-2	1.58E-03	Calpuff	1.18E+01	24	N/A	—	N/A	2.33E-02	N/A	1.19E+01	N/A

Contaminant	CAS No.	Maximum Facility Emission Rate [g/s]	Air Dispersion Model Used	Background Concentration [µg/m³]	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Maximum POI Concentration [µg/m³]	Percentage of MOE Limit [%]	Maximum POI Concentration Including Background [µg/m³]	Percentage of MOE Limit [%]
Bromodichloromethane	75-27-4	7.50E-03	Calpuff	2.00E-02	24	0.1	—	De Minimus	7.35E-03	Below De Minimus	2.73E-02	Below De Minimus
Bromoform	75-25-2	2.05E-03	Calpuff	3.00E-02	24	55	Health	Guideline	2.01E-03	<1%	3.20E-02	<1%
Bromoform	75-25-2	2.05E-03	Calpuff	8.40E-02	½	165	Health	Guideline	1.42E-02	<1%	9.82E-02	<1%
Bromomethane	74-83-9	1.53E-03	Calpuff	9.00E-02	24	1350	Health	Guideline	1.50E-03	<1%	9.15E-02	<1%
Bromomethane	74-83-9	1.53E-03	Calpuff	2.64E-01	½	4000	Health	Guideline	1.06E-02	<1%	2.75E-01	<1%
Carbon tetrachloride	56-23-5	1.28E-05	Calpuff	7.40E-01	24	2.4	Health	Schedule 3	1.25E-05	<1%	7.40E-01	30.83%
Chloroform	67-66-3	2.17E-05	Calpuff	2.30E-01	24	1	Health	Schedule 3	2.13E-05	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	3.71E-03	Calpuff	3.23E+00	24	500000	Health	Guideline	3.64E-03	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	3.71E-03	Calpuff	9.44E+00	½	1500000	Health	Guideline	2.57E-02	<1%	9.47E+00	<1%
Dichloroethene, 1,1 -	75-34-3	2.41E-05	Calpuff	7.31E-03	½	600	Health	Guideline	1.67E-04	<1%	7.47E-03	<1%
Dichloromethane	75-09-2	7.50E-03	Calpuff	1.27E+00	24	220	Health	Schedule 3	7.35E-03	<1%	1.28E+00	<1%
Ethylbenzene	100-41-4	4.42E-05	Calpuff	1.24E+00	24	1000	Health	Schedule 3	4.33E-05	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	4.42E-05	Calpuff	5.00E+00	10-min	1900	Odour	Guideline	4.21E-04	<1%	5.00E+00	<1%
Ethylene Dibromide	106-93-4	1.20E-05	Calpuff	5.20E-03	24	3	Health	Guideline	1.18E-05	<1%	5.21E-03	<1%
Ethylene Dibromide	106-93-4	1.20E-05	Calpuff	1.20E-02	½	9	Health	Guideline	8.34E-05	<1%	1.21E-02	<1%
Formaldehyde	50-00-0	2.05E-03	Calpuff	3.38E+00	24	65	Health	Schedule 3	2.45E-03	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	2.42E-04	Calpuff	4.90E-01	24	360	Health	Schedule 3	2.37E-04	<1%	4.90E-01	<1%
Toluene	108-88-3	2.23E-03	Calpuff	9.47E+00	24	2000	Odour	Guideline	8.44E-03	<1%	9.48E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	6.08E-05	Calpuff	1.10E-01	24	115000	Health	Schedule 3	5.96E-05	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	2.10E-05	Calpuff	5.40E-01	24	12	—	Guideline	2.05E-05	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	2.10E-05	Calpuff	—	24	12	Health	Schedule 3	2.05E-05	<1%	2.05E-05	<1%
Trichlorofluoromethane	75-69-4	7.34E-03	Calpuff	2.15E+00	24	6000	Health	Guideline	7.19E-03	<1%	2.16E+00	<1%
Trichlorofluoromethane	75-69-4	7.34E-03	Calpuff	6.28E+00	½	18000	Health	Guideline	5.08E-02	<1%	6.33E+00	<1%
Vinyl chloride	75-01-4	1.86E-03	Calpuff	5.88E-03	24	1	Health	Schedule 3	1.82E-03	<1%	7.70E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	2.58E-02	Calpuff	4.83E+00	24	730	Health	Schedule 3	2.44E-02	<1%	4.85E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	2.58E-02	Calpuff	1.94E+01	10-min	3000	Odour	Guideline	2.46E-01	<1%	1.96E+01	<1%
Fluorene	86-73-7	4.19E-06	Calpuff	—	24	0.1	—	De Minimus	4.11E-06	Below De Minimus	4.11E-06	Below De Minimus

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Ontario

EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

Company Name: The Regional Municipality of Durham

Company Address: 605 Rossland Road East
Whitby, ON, L1N 6A3

Location of Facility: Lot 27, Broken Front Concession, Part 1
Clarington, ON

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with s.26 of O. Reg. 419/05 and the guidance in the MOE document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July, 2005 and "Air Dispersion Modelling Guideline for Ontario" dated July 2005 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

Name: Cliff Curtis

Title: Comissioner of Works

Phone Number: (905) 668-7711

Signature:

Date: 2011/02/22

Technical Contact:

Name: Anthony Ciccone

Representing: Golder Associates Ltd.

Phone Number: (416) 366-6999

Signature:

Date: March 2, 2011

 * This checklist is taken from the document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July, 2005

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Ontario

EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

Company Name: The Regional Municipality of York

Company Address: 17250 Yonge Street
Newmarket, ON L3Y 6Z1

Location of Facility: Lot 27, Broken Front Concession, Part 1
Clarington, ON

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with s.26 of O. Reg. 419/05 and the guidance in the MOE document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July, 2005 and "Air Dispersion Modelling Guideline for Ontario" dated July 2005 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

Name: Erin Mahoney

Title: Comissioner of Environmental Services

Phone Number: (905) 830-4444 x 1525

Signature:

Date: March 3, 2011

Technical Contact:

Name: Anthony Ciccone

Representing: Golder Associates Ltd.

Phone Number: (416) 366-6999

Signature:

Date: March 2, 2011

 * This checklist is taken from the document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July, 2005

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Ontario

EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

Company Name: Covanta Durham York Renewable Energy Limited Partnership

Company Address: 445 South Street
Morristown, New Jersey, USA 07960

Location of Facility: Lot 27, Broken Front Concession, Part 1
Clarington, ON

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with s.26 of O. Reg. 419/05 and the guidance in the MOE document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July, 2005 and "Air Dispersion Modelling Guideline for Ontario" dated July 2005 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

Name: Matthew R. Mulcahy

Title: Senior Vice President, Business Development

Phone Number: (862) 345-5445

Signature: Matthew R. Mulcahy

Date: March 2, 2011

Technical Contact:

Name: Anthony Ciccone

Representing: Golder Associates Ltd.

Phone Number: (416) 366-6999

Signature:

Date: March 2, 2011

EMISSION SUMMARY AND DISPERSION MODELLING REPORT CHECKLIST

	Required Information			
			Submitted	Explanation/Reference
	Executive Summary and Emission Summary Table			
	1.1	Overview of ESDM Report	☒ Yes	Executive Summary
	1.2	Emission Summary Table	☒ Yes	Executive Summary
1.0	**Introduction and Facility Description**			
	1.1	Purpose and Scope of ESDM Report (when report only represents a portion of facility)	☒ Yes	Section 1.0
	1.2	Description of Processes and NAICS code(s)	☒ Yes	Section 1.0
	1.3	Description of Products and Raw Materials	☒ Yes	Section 1.0
	1.4	Process Flow Diagram	☒ Yes	Section 1.0, Figure 2
	1.5	Operating Schedule	☒ Yes	Section 1.0
2.0	**Initial Identification of Sources and Contaminants**			
	2.1	Sources and Contaminants Identification Table	☒ Yes	Section 2.0, Table 1
3.0	**Assessment of the Significance of Contaminants and Sources**		☒ Yes	
	3.1	Identification of Negligible Contaminants and Sources	☒ Yes	Section 3.0
	3.2	Rationale for Assessment	☒ Yes	Section 3.0
4.0	**Operating Conditions, Emission Estimating and Data Quality**			
	4.1	Description of operating conditions, for each significant contaminant that results in the maximum POI concentration for that contaminant	☒ Yes	Section 4.0, Appendix D
	4.2	Explanation of Method used to calculate the emission rate for each contaminant	☒ Yes	Section 4.0, Appendix D
	4.3	Sample calculation for each method	☒ Yes	Appendix D
	4.4	Assessment of Data Quality for each emission rate	☒ Yes	Section 4.0, Table 2
5.0	**Source Summary Table and Property Plan**			
	5.1	Source Summary Table	☒ Yes	Table 2
	5.2	Site Plan (scalable)	☒ Yes	Figure 1
6.0	**Dispersion Modelling**			
	6.1	Dispersion Modelling Input Summary Table	☒ Yes	Table 3
	6.2	Land Use Zoning Designation Plan	☒ Yes	Section 6.0, Figure 4
	6.3	Dispersion Modelling Input and Output Files	☒ Yes	Section 6.0, Appendix G
7.0	**Emission Summary Table and Conclusions**			
	7.1	Emission Summary Table	☒ Yes	Table 5
	7.2	Assessment of Contaminants with no MOE POI Limits	☒ Yes	Section 7.0
	7.3	Conclusions	☒ Yes	Section 8.0
	Appendices (Provide supporting information or details such as…)			
	Appendix A - Modification Log		☒ Yes	
	Appendix B - Project Description		☒ Yes	
	Appendix C - Emission Rate Calculations		☒ Yes	
	Appendix D - Summary of Emission Factors Taken From EA		☒ Yes	
	Appendix E - Technical Memo Regarding Odour		☒ Yes	
	Appendix F - MOE Correspondence		☒ Yes	
	Appendix G - Dispersion Modelling Files		☒ Yes	

 * This checklist is taken from the document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July, 2005

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FIGURES

APPENDICES

List of Abbreviations

A-7	MOE Guideline A-7 Air Pollution Control, Design and Operation Guidelines for Municipal Waste Thermal Treatment Facilities
A-9	MOE Guideline A-9: NO_x Emissions from Boilers and Heaters
AAQC	Ambient Air Quality Criteria
ADMGO	Guideline A-11: Air Dispersion Modelling Guideline for Ontario
Am^3/s	Flow rate at actual conditions in cubic metres per second
AP-42	USEPA Air Pollutant Emission Factors (http://www.epa.gov/ttnchie1/ap42/)
APC	Air Pollution Control
BPIP	Building Profile Input Program
°C	Degrees centigrade (temperature)
Cd	Cadmium
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CofA	Certificate of Approval
Covanta	Covanta Energy Corporation
CWS	Canada Wide Standard
DCS	Distributed Control System
Durham-York	The Regional Municipalities of Durham and York
DYEC	Durham-York Energy Centre
EA	Environmental Assessment
EAA	Environmental Assessment Act
ESDM	Emission Summary and Dispersion Modelling
EfW	Energy from Waste
°F	Degrees fahrenheit (temperature)
Facility	The proposed Durham-York Energy Centre
GJ	Gigajoule (energy)
HCl	Hydrogen chloride
HF	Hydrogen fluoride
HHV	Higher Heating Value
HNO3	Nitric acid
HP	Horsepower (power)
Hr	Hour
HVAC	Heating, Ventilating and Air conditioning
IC&I	Institutional, Commercial and Industrial
ID	Induced Draft
IGR	Internal Gas Recirculation
ISC	Industrial Source Complex
JSL	Jurisdictional Screening Level
Kg	Kilogram (mass)
Km	Kilometre (distance)
Kw	Kilowatt (energy)

M^3	Cubic metre (volume)
MCR	Maximum Continuous Rating
MOE	Ministry of Environment
µg	Microgram (mass)
$\mu g/Rm^3$	Concentration at reference conditions in micrograms per cubic metre
µm	Micron (distance)
MJ	Mega joule (energy)
MSW	Municipal Solid Waste
MW	Megawatt (power)
NAD 83	North American Datum (1983)
NAICS	North American Industry Classification
NAPS	National Air Pollution Surveillance
NG	Natural Gas
NH_3	Ammonia
NO	Nitrogen Oxide
NO_2	Nitrogen dioxide
NO_3	Nitrate
NO_x	Nitrogen oxides
O_2	Oxygen
O.Reg	Ontario Regulation
Ou	Odour unit
Pb	Lead
PCDD	Polychlorinated Dibenzodioxins
PG/7	Environment Canada Publication “Protocol and Performance Specifications EPS1/PG/7”
PM_{10}	Particulate matter with diameter less than or equal to 10 µm
$PM_{2.5}$	Particulate matter with diameter less than or equal to 2.5 µm
POI	Point of Impingement
PPM	Parts per million
PRIME	Plume Rise Model Enhancements
Mg/Rm^3	Concentration at reference conditions in milligrams per cubic metre
SNCR	Selective Non Catalytic Reduction
SO_2	Sulphur dioxide
SO_4	Sulphate
SPM	Secondary Particulate Matter
THC	Total hydrocarbons
TIBL	Thermal Internal Boundary Layer
URT	Upper Risk Threshold
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
VLN	Covanta’s Very Low NO_x System

1.0 INTRODUCTION AND FACILITY DESCRIPTION

This section provides a description of the proposed Durham York Energy Centre, an Energy from Waste (EfW) Facility (Facility) as required by sub paragraph 1 of s.26(1) of Ontario Regulation (O. Reg.) 419/05.

1.1 Purpose and Scope of ESDM Report

The Regional Municipalities of Durham and York ("Durham-York") propose to develop an EfW located on the west side of Osbourne Road, south of Highway 401 and north of a CN Rail Corridor in the Municipality of Clarington. The Durham York Energy Centre will be a Thermal Treatment Facility, capable of recovering materials and energy from post-diversion residual waste with energy being exported to the marketplace. The location of the proposed Facility is presented in Figure 1 – Site Location Plan.

Covanta Energy Corporation ("Covanta") will design, build and operate the Facility, and is applying for a Certificate of Approval (CofA) to allow for the approval of the EfW Facility. The Facility will use Martin GmbH® combustion technology to process up to 140,000 tonnes/year of municipal solid waste and will capture its energy content in the form of superheated steam used to generate electricity and potentially provide district heating to the neighbouring Courtice Waste Pollution Control Plant and Clarington Energy Park. The Facility will have a steam-turbine generator with a nameplate rating of approximately 20MW.

This Emission Summary and Dispersion Modelling (ESDM) Report was prepared to support an application for a Basic Comprehensive Certificate of Approval (Air & Noise) (CofA [Air & Noise]) for all sources at the Facility.

This ESDM Report was prepared in accordance with s.26 of O. Reg. 419/05. In addition, guidance in the Ontario Ministry of the Environment (MOE) publication "*Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report, Version 3.0"*, dated March 2009 (ESDM Procedure Document) PIBS 3614e03 was followed, as appropriate.

For ease of review and to promote clarity this ESDM Report is structured to correspond to each of the items listed in the MOE publication *"2005 Emission Summary and Dispersion Modelling Check-List"* PIBS 5357e.

1.2 Summary of Modifications

Appendix A will contain the summary of changes that the ESDM Report has undergone through the various versions of the report. As this is the first version of the Report, this Appendix serves as a placeholder only.

Appendix A provides copies of the Modifications Logs for the Facility, as required by the Basic Comprehensive CofA (Air & Noise).

1.3 Description of Processes and NAICS Code(s)

1.3.1 Description of Processes (including Raw Materials and Products)

The EfW Facility will accept Municipal Solid Waste (MSW) from the Regions of Durham and York. The sources of waste are post-diversion residual waste collected at curbside as well as any residual waste materials collected at public drop-off centers and transfers stations. The only institutional, commercial, and industrial (IC&I) waste to be managed at the Facility will be MSW from facilities managed by Durham-York. The facility will process up to 140,000 tonnes/year of waste, with MSW delivered to the facility six (6) days per week.

The Facility will consist of two (2) identical combustion trains, each designed to handle up to 218 tonnes/day of MSW referenced at 13MJ/kg. Each train will have identical boilers/furnaces and air pollution control equipment such as carbon injection, dry scrubbers and fabric filters. The treated exhaust gases are vented to a common 87.6 m stack and released into the atmosphere.

Waste will only be accepted from MOE approved haulers that have valid waste licences or municipal vehicles or other exempt vehicles as per Section 16(2) (a) of Regulation 347 *General – Waste Management*, made under the *Environmental Protection Act*, R.S.O. 1990. Vehicles will either enter from an entrance on Osbourne Road or Courtice Road. Where detailed site plans are illustrated in this report, both entrances have been provided denoted Figures 3a and 3b, respectively. The variation between the two entrances does not affect the analysis conducted in this report. If the Osbourne Road entrance is used, the Facility will have 1.4 km of paved roads, as compared to 1.5 km if the Courtice Road entrance is used. In either case, the Facility will have 98 m of unpaved road which will be used periodically by maintenance vehicles (See Figures 3a and 3b).

All incoming waste vehicles must proceed to a weigh scale to allow the vehicle weight, waste type and source to be recorded by the scale operator. Radiation detection equipment is permanently mounted on the weigh scale in order to measure any potential radiation in incoming or outgoing loads. Additionally, refuse trucks will be evaluated periodically by visual examination of its contents for the presence of hazardous waste and unacceptable waste. The refuse storage pit will be sized to allow for continuous operation of the system. Seven (7) days of storage at 436 Mg/day will be provided.

The combustion air will be drawn through the tipping hall by inlet ducts above the storage pit. This will maintain a negative pressure in the tipping building and help prevent the escape of dust and odour from the Facility. When the entrance/exit doors are closed during non-delivery hours, combustion air will be admitted to the tipping area from outside the building through manually operable louvers in the tipping building walls.

The following is a summary of the combustion process and combustion equipment. A simplified process flow diagram is presented in Figure 2. A detailed project description can be found in Appendix B.

1.3.1.1 Waste Combustion Process

MSW delivered to the facility will be deposited in the storage pit. Facility operators will manage MSW by moving and mixing MSW within the storage pit with overhead grapple cranes. Operators will use the grapples to transfer MSW from the bunker to the charging hoppers that are located at an elevation above the Martin® grate. The charging hopper will be pyramidal in shape with the entrance being rectangular and the front edge overhanging

the bunker. Grapple loads of MSW are loaded along the front edge to allow the MSW to slide down into the hopper and the chute that connects the hopper to the charging table. The residue from the combustion process that remains on the grate, referred to as bottom ash, is removed from the grate and quenched with water in an ash discharger. Bottom ash is removed from the ash discharger by a hydraulic ram that moves the bottom ash up an inclined surface that promotes dewatering of the bottom ash. The result is a cooled and moist residue with a nominal 20 to 25 % by weight water content that prevents generation of fugitive dust. The bottom ash is conveyed to the Residual Building by covered conveyers.

The combustion process will be monitored by a distributed control system (DCS) that provides continuous automatic control of the combustion process and other facility processes. The combustion process includes three primary control routines that are integrated together to ensure continuous compliance with all operating requirements:

1. Fuel firing;
2. Combustion air; and
3. Auxiliary burner (intermittent operation only, see Section 1.3.1.5.1 for details).

Trained operators will provide a fourth routine by monitoring information provided by the distributed control system and through direct observation, making adjustments as necessary.

The general control logic begins with the fuel firing routine which receives input from the O_2 analyzer, steam load and furnace temperature and is used to adjust the fuel firing rate to maintain desired setpoints. The combustion air logic receives input from the O_2 analyzer, steam flow, and NOx control system and is used to adjust the amount and distribution of combustion air introduced through the primary and secondary air systems. The natural-gas-fired auxiliary burner will be available to maintain flue gas temperature in the furnace region during operating conditions and as required during start-up and shutdown conditions.

1.3.1.1.1 Fuel Firing Process

After being charged into the feed chute hopper, the refuse will be metered onto the surface of the Martin® stoker from the bottom of the feed chute by hydraulic feed rams. The feed rams will be designed to provide an even distribution of refuse over the entire width of the grate. The proprietary reverse reciprocating action of the Martin® stoker grate agitates the fuel bed in a manner which continually mixes the combusting refuse, resulting in thorough burnout of combustible matter.

The grate will be inclined downward toward the discharge end. Burning refuse will be pushed back underneath the freshly fed refuse to achieve continuous drying, volatilization, ignition and combustion. A series of plenum air chambers is provided along the length of each grate run to admit primary combustion air. There are five zones with air rates admitted to each being precisely controlled to suit the combustion conditions of each burning zone as the refuse moves from feed end to discharge. Dampers control the air rate. These dampers will be designed to individually regulate the amount of air fed into the various zones of each grate run. Consistently low emissions of hydrocarbons, carbon monoxide and organic compounds are achieved through a combination of grate design and operation.

1.3.1.1.2 Combustion Air Process

Each boiler will be equipped with the Martin® /Covanta Very Low NOx (VLN™) system, a type of internal gas recirculation, referred to as VLN Gas. This technology is an integral component of all new Covanta Martin® stokers. VLN is a refinement of the standard combustion process offered in Martin® stokers that reduces the NOx generated in the furnace as well as increases the overall boiler efficiency (Exhibit 1).

The secondary air system will consist of two rows of closely spaced secondary air nozzles, one row in the front wall above the stoker feeder ram(s) and the second row in the rear wall above the rear arch. The VLN Gas system re-circulates gas drawn from the lower stoker area to the overhead nozzles. The secondary air and the VLN Gas nozzle design is such that complete penetration of the gas stream above the stoker is achieved for flame shaping and thorough burnout of combustible material.

Drawing combustion air from above the refuse pit eliminates ambient odour problems. The VLN Gas will be taken from above the stoker's clinker roller and directed to the VLN fan inlet. To ensure maximum burnout of refuse with low heating value and high moisture content, steam heated combustion air heaters will be provided to pre-heat primary air (undergrate) to 95 to 150 °C.

This permits the maximum burnout of non aqueous condensable matter and eliminates odours. The temperature in the furnace ranges from 1100 to 1400°C in the lower furnace, and over 900°C at the chamber exit, which will be sufficiently high to complete the combustion of all organic vapours. At the lower furnace throat, secondary air nozzles provide additional oxygen to combust unburned gases such as carbon monoxide and hydrocarbons and shape the flames. Flue gases will be recirculated from above the clinker roll into high velocity flue gas jets located near the boiler's nose on the furnace side walls, causing intense turbulence. This assures complete combustion of all organic material before the gases pass into the boiler convection section, superheater and economizer.

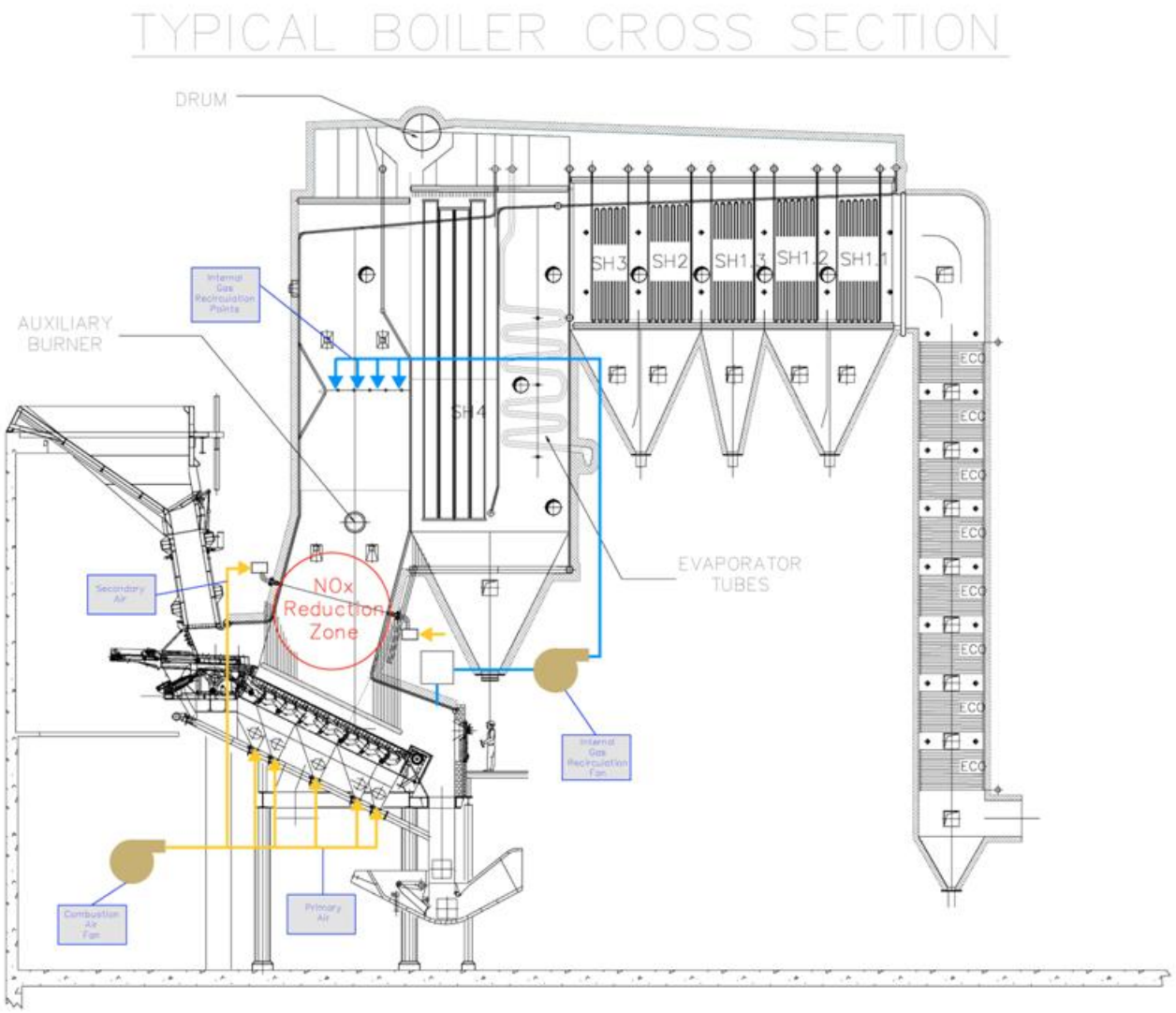
Following combustion in the furnace, the products of combustion (flue gases) will pass through screen tubes at the outlet of the furnace and flow downward through the second boiler pass radiating heat to superheater platens and the membrane water wall enclosure, thereby lowering gas temperature. At the bottom of this pass, the flue gas will be turned upward and flow through convection heat transfer surface and evaporators. The flue gas temperature will thus be further reduced as it passes its heat to the water in these tubes.

The change in direction or flow reversal of the gases at the end of the second gas pass will be provided to "throw out" the larger fly ash particles in the gas stream to reduce the particulate load on the downstream convective heat transfer surfaces. As the flue gas leaves the convection surface, it enters and flows across the superheaters. This transfer of heat continues to lower flue gas temperature. Finally, the flue gas passes across the boiler economizer tube surfaces to lower its temperature to the design temperature for entry to the air pollution control system.

The furnace will be designed and operated to minimize the concentration of combustion-related pollutants such as carbon monoxide and hydrocarbons. The boiler design will incorporate state of the art features including combustion air distribution and control, location and sizing of heating surfaces, and appropriate cleaning methods during operations.

Strategically located and automatically sequenced rotary and retractable type soot blowers will be provided to enable gas side cleaning of the boiler, primary superheater and economizer tubes. Retractable soot blowers constructed of suitable alloy material will be used in the high temperature zones.

Exhibit 1: Typical Boiler Cross-Section



1.3.1.2 Air Pollution Control Processes

Information on post combustion air pollution control processes is organized into two groups;

- NOx Control System; and
- Other Post combustion processes.

Control of NOx is integral to the combustion process and is separate from other processes downstream of the economizer.

The Facility design does not include any mechanical or structural equipment for flue gas bypass. All flue gas will be processed during all phases of operation. Additionally, major systems and equipment are conservatively designed and include spare equipment to enable on-line transfer from one component to another should there be a need to do so.

All air pollution control processes are integrated with the Facility's distributed control system (DCS). The DCS includes annunciation to inform control room operators if a system is not achieving a specific setpoint.

1.3.1.2.1 NOx Reduction System

The NOx reduction process consists of two processes that are integrated together through the distributed control system and process control logic, namely;

- VLN™ system; and
- Selective Non Catalytic Reduction (SNCR) System.

1.3.1.2.1.1 VLN™ System

The VLN™ process employs a unique combustion air system design featuring an internal gas recirculation (IGR) injection system located in the upper furnace (Exhibit 1). This internal gas stream is drawn from the rear of the combustor, above the burnout zone of the grate. This flue gas most often contains elevated levels of oxygen because very little combustion occurs in the burnout zone and the gas is not well mixed with other combustion gases near the NOx reduction zone of Exhibit 1. A single fan supplies the primary and secondary air streams, while a separate and dedicated fan is provided for the internal VLN gas.

Similar to a conventional energy from waste process, the quantity of primary air in the Covanta VLN™ process is adjusted to minimize excess air during the combustion of the waste on the grate; however, secondary air flow in the VLN™ process is significantly less than that of a conventional energy from waste facility. The distribution of flows between the primary air, secondary air and IGR gas streams is controlled to yield the optimal combustion gas composition and temperature profile to minimize NOx and control combustion. The control methodology takes into account the heating value of the waste and the fouling condition of the furnace. The flow of IGR is set to achieve complete coverage of the furnace cross-section to ensure good mixing with the combustion gases. IGR ensures high combustion efficiency and yields uniform flue gas temperature and velocity profiles, which improves the performance and reliability of downstream boiler equipment. The IGR nozzles are located on the

side waterwalls of the upper furnace; their positioning in the furnace is critical to the VLN™ process performance. Further details can be found in Appendix B.

1.3.1.2.1.2 Selective Non-Catalytic Reduction System

A Selective Non-Catalytic Reduction (SNCR) system will be provided with each of the two units. The system will be designed to maintain continuous compliance with NOx emission by adjusting the injection rate and location of aqueous ammonia. Multiple levels are available, and nozzles can be manually moved to accommodate different conditions of flue gas temperatures during varying conditions. The stack NOx analyzer provides information to the DCS to assure continuous compliance.

Aqueous ammonia in a water solution of approximately 19% ammonia by weight will be delivered and stored at the Facility. The system consists of an aqueous ammonia storage tank, aqueous ammonia feed pumps, carrier water supply from the boiler make-up water system, a nozzle purge air system, aqueous ammonia injection nozzles and an automatic control system.

1.3.1.3 Post Combustion Air Pollution Control Systems

The post combustion air pollution control systems will include several major components:

- A vessel (s) for reducing flue gas temperature and mixing of flue gas with lime, carbon and recirculated residue are mixed with flue gas
- A baghouse (fabric filter) that provides abatement for solid and gas phase emissions
- A continuous emission monitoring system that monitors stack emissions with certain output being used in the process control system

Each combustion unit will be provided with a dedicated dry recirculation system that will be operated independent from the other unit. The two units will be located inside the facility enclosure and will share a common reagent system for storage of lime and carbon. The storage silo(s) for lime will be located inside the Facility enclosure. The carbon silo will be located adjacent to the APC building.

1.3.1.3.1 Dry Recirculation Reactor - Scrubber

Each dry recirculation scrubber includes two main components:

1. a vessel(s) that reduce flue gas temperature through the evaporation of water and for mixing flue gas with fresh lime and carbon and recirculated residue from the baghouse and/or residue storage silo, and
2. mechanical equipment that provides for the management and injection of the reagents. The specific equipment for these devices is manufacturer specific however certain features are common to most suppliers.

The mechanism for reducing flue gas temperature can occur in one of two ways, either in the same vessel (reactor) as the reagent injection or a separate vessel (evaporative tower), with the final design being dependent

on manufacturer options. Both designs are commercially demonstrated and can achieve the permit emission limit values.

If an evaporative tower is used, the evaporative tower is a cylindrical vessel that will be designed for the effective mixing of flue gas with atomized water. The reactor will be fabricated of carbon steel with stiffeners and supports as required. The reactor will be insulated and lagged to avoid cold spots where condensation and corrosion could occur. Atomization of water will be by two-fluid nozzles where compressed air is used to atomize water. Several lances with one nozzle per lance, will be used to mix atomized water with flue gas. The lance and nozzle assemblies can be serviced by one person. The amount of atomized water is managed by a process control loop that uses temperature measurements at the tower outlet. The amount of water atomized is modulated by control valves to maintain a desired setpoint. The evaporative tower would be followed by a reactor where flue gas is mixed with reagent including fresh lime, carbon and recirculated residue.

The reactor vessel is a custom section of ductwork fabricated of carbon steel. It will be insulated and lagged to prevent temperature loss and cold spots where condensation and corrosion could occur. It is designed to promote effective mixing between flue gas and three reagents; fresh lime hydrate, fresh carbon and recirculated residue that includes unreacted lime and carbon. The reagents are typically of consistent size and easily mixed in the flue gas. Effective reduction of acid gases (HCl, SO_2, HF, SO_3, etc.), mercury, dioxins and other pollutants is facilitated through the large contact area provided by many small particles.

The injection rate of fresh lime will be adjusted to maintain a preset stack concentration for acid gases (SO_2 and HCl) with carbon being injected at a constant rate. The recirculation rate of residue is also adjusted to minimize usage of fresh lime while maximizing the effectiveness of recirculated residue. Certain manufacturers may also humidify the recirculated residue to maximize its reactivity with pollutants when mixed in the reactor. The specific design and operation of mechanical and/or pneumatic conveying equipment for reagent transport and injection is manufacturer specific and not available at the time of this application.

The mechanical lime feed equipment is sized to deliver excess amounts of reagent based on design margins on both the inlet acid gas concentrations as well as the flue gas flow rate.

The carbon injection rate is based primarily on operating experience instead of direct chemical relationships. Experience indicates that a carbon injection rate between 0.25 and 0.75 kg/tonne of MSW is required with the actual rate to be determined during optimization testing of the facility, prior to commisioning.

1.3.1.3.2 Fabric Filters (Baghouse)

The treated and cooled flue gas then flows to the high efficiency baghouse where the solid phase materials (fly ash, scrubber reaction products and unreacted lime and carbon) will be collected and removed from the gas. These solids form a filter cake, on the surface of each bag, allowing additional reaction between flue gas and regants for further reduction of acid gases, mercury dioxin and other pollutants.

The baghouse design will include multiple modules with each module having its own filter bags and filter bag cleaning system. The filter bags will be either a felt or woven fibreglass with a laminate. The final materials of construction will be selected after a final manufacturer is selected. The baghouse will have enough filter bags and associated filtration area such that the flue gas velocity through the bags will average approximately 1 meter

per minute. The cleaning frequency will be determined by a pre-set pressure drop set point coupled with actual operating conditions including filtration speed, recirculation rate of residue and injection rate of reagents.

The baghouse will use pulse jet cleaning system to maintain a preset pressure drop range across the entire baghouse. This approach creates steady-state operating conditions and a stable filter cake that provides reliable performance. The filter bags are cleaned with a pulse of compressed air that dislodges filter cake from the bags surface along the entire length and circumference of the bag. The normal operating temperature will be between approximately 135°C and 145°C.

The filter cake dislodged from the bags and collected in the hopper of the baghouse will be removed by a residue conveying system. A fraction of the residue will be recirculated to the dry recirculation reactor to improve the reduction of air emissions while also improving reagent utilization.

1.3.1.3.3 Reagent Management System

One common reagent management system is provided for both dry recirculation systems and will include storage and process control for the two reagents used in the dry recirculation system; hydrated lime, and carbon. Dedicated silos are provided for hydrated lime and carbon to enable direct unloading of reagent from bulk carriers to the silos. Each silo is equipped with a bin vent or equal to control fugitive emissions during the loading process.

A dedicated carbon transport system will be provided to enable delivery of carbon to each dry recirculation scrubber and may use either a mechanical or pnrematic system. Each transport system will include a gravimetric feeder, piping, wiring, process controls and other accessories needed for a complete, operational system.

A dedicated lime transport system will be provided to enable delivery of lime to each dry recirculation scrubber. The system may be either a mechanical, pneumatic or combination of equipment and will include all required conveying equipment, a process control system including a method to weigh lime usage and to make adjustments according to the process control system.

1.3.1.4 Ash Handling

Covered conveyors will be used to transport residue from each unit to the residue building. Only a single train of bottom ash equipment will be provided. The bottom ash will be transported via front end loader if a system component must be taken out of service. The system proposed will separately collect air pollution control residue (fly ash and spent salts of reaction) and boiler fly ash. The fly ash will be mixed with Portland cement, pozzolan and water for micro encapsulation (chelation) prior to truck loading and subsequent transportation.

All residue mixing and/or handling areas will be fully enclosed and sufficiently protected from extreme weather conditions (e.g. freezing conditions, etc.). In addition, all conveyors handling residue that are located outside will be fully enclosed.

To minimize any dust escaping to the environment during the conveying, separating, and truck loading process, the residue building will be totally enclosed and have a filtered ventilation system complete with a filtration unit. The ventilation system will also draw air from the grizzly area along the enclosed conveyor gallery.

1.3.1.5 Continuous Emission Monitoring and Operations Reporting System

1.3.1.5.1 Continuous Emission Monitoring

A continuous emission monitoring system (CEMS) provided with each of the two combustion units will provide continuous monitoring of the following parameters:

- Baghouse outlet: opacity, moisture, O_2, NOx, SO_2, HCl, HF, & NH_3; and
- Economizer outlet: O_2, SO_2, CO.

The dedicated CEMS will be based upon separate flue gas sample and transport systems for the economizer and ID fan inlet or outlet sample points, each of which will transport the sample to a free-standing CEMS enclosure. The CEMS will be configured to provide all necessary reports that document emissions from the Facility. The system installation and calibration will follow the requirements of *EPS 1/PG/7 - Protocols And Performance Specifications For Continuous Monitoring Of Gaseous Emissions From Thermal Power Generation (December 2005).* The monitoring and reporting will meet the requirement of the EA Condition 12 – Emissions Monitoring. An emissions monitoring plan will be submitted to the District Director for approval as required under Condition 12.

1.3.1.5.2 Continuous Operations Reporting System

As part of the Facility operations, the following operational monitoring equipment will be provided as feedback on the combustion units' operations;

- Temperature measurements of combustion zone or a surrogate;
- Long-term Integrated continuous dioxins sampling device;
- Flue gas stack exit temperature;
- Temperature and pressure of the steam for each boiler; and
- Mass flow rate of steam for each boiler.

1.3.1.6 Ancillary Equipment/Process

1.3.1.6.1 Natural Gas Fired Auxiliary Burners

Natural gas shall be used for one (1) auxiliary burner in each furnace during start-up conditions to raise the temperature in the furnace to above 1000°C. This process (Phase 1 – Start-up) will take about 6 hours prior to MSW being fed into the system. Each burner will have a maximum thermal input rating of 56 MMBtu/hr and will meet the NOx limits of MOE *A-9 Guideline - NOx Emissions from Boilers and Heaters* of 46.9 ppmv @ 3% O_2 for natural gas fired heaters above 10 MMBTU/hr. Further, the burners will be run for less than 500 hrs per year

and would be exempt from MOE Guideline A-9. Similarly, during shut down conditions, the natural gas burners will be used to maintain elevated temperatures in the furnace to consume the waste.

1.3.1.6.2 Stand-by Diesel Generator and Fire Pumps

The Facility will utilize one (1) 250 kW diesel generator for stand-by power and two (2) 300 HP (224 kW) diesel fire pumps. Based on guidance provided in the ESDM Procedure Document (Table B-3), the fire pumps would be exempt from assessment. For the purposes of this assessment, the emissions from the stand-by diesel generator have been included in the inventory and modelling.

1.3.1.6.3 Silos and Tanks

As discussed above, dry reagents are used to reduce emissions of various contaminants. These dry reagents will be stored in silos while ammonia will be stored in an outdoor tank. The Facility will include silos for storage of dry material and tanks for storage of ammonia as shown below.

- Indoor Silos – dry materials;
  - Lime;
- Outdoor Silos – dry materials;
  - Carbon, cement, pozzolan;
- Outdoor Tanks – solutions;
  - Aqueous ammonia.

The silos will be equipped with filter vents to capture particulate emissions during the filling processes while ammonia vapour displaced from the receiving tank will vent back to the delivery truck to prevent the release of ammonia vapour during the loading process.

1.3.1.6.4 Steam Turbine

The Facility will consist of two (2) waste steam generators and one (1) steam turbine generator with a maximum gross output of approximately 20 MW. The turbine generator set will be designed to accept 72,000 kg/hr of steam.

The turbine will exhaust to the direct air cooled condenser package including condenser complete with duct from turbine, isolation valves, blanking plate, steam jet air ejectors, relief valves and other required accessories. Condenser shall be designed to accept full turbine bypass flow and must be isolatable from the turbine under this mode of operation.

1.3.2 Description of NAICS Code(s)

The North American Industry Classification System (NAICS) code that best applies to the Facility is waste treatment and disposal, which is part of NAICS code 5622 and is listed in Schedule 5 of O.Reg. 419/05.

1.4 Operating Schedule

The Facility's operating schedule will be on a continuous basis; 24 hours/day, 7 days/week. MSW will be delivered six (6) days a week between 7:00am to 7:00pm.

1.5 Facility Production Limit

The facility will process up to 140,000 tonnes/year of MSW. The design condition for Maximum Continuous Rating (MCR) is nominally 218 tonnes/day per unit of MSW with a calorific value of 13 MJ/kg, which allows for shut down time for scheduled maintenance.

2.0 IDENTIFICATION OF SOURCES AND CONTAMINANTS

This section provides an identification of all of the sources and contaminants emitted at the Facility, as required by subparagraphs 2 to 4 of s.26(1) of O. Reg. 419/05. General ventilation that does not discharge process emissions is considered to be negligible and is not identified as a significant source of contamination from the Facility.

2.1 Sources and Contaminants Identification Table

Table 1 – Sources and Contaminants Identification Table tabulates all the emission sources at the Facility; for example, the Main Stack is identified as a source.

The expected contaminants emitted from each source are also identified in Table 1; for example, the expected contaminants emitted from the Main Stack are identified as products of combustion. Each of the identified sources has been assigned a source reference number; for example, the Main Stack has been designated S-1.

2.2 Description and Mitigation of Processes with Potential Odour Emissions

All waste handling activities will take place in enclosed buildings. The refuse storage pit is segregated from the tipping hall by a wall open to the tipping hall only through the tipping bays.

Under normal operating conditions both trains will be on line. The tipping hall and refuse storage pit will continue to be maintained under negative pressure by drawing primary combustion air from these areas. This potentially malodorous air will be drawn into the furnace and destroyed. The primary air will be introduced into the furnaces thereby subjecting these pollutants to direct flame and high temperature oxidation.

In addition, the louvers on the outside wall will be closed during truck deliveries. The truck entrance and exit doors will remain closed when trucks are not delivering MSW. This effectively creates an enclosed area from which to draw combustion air. All MSW trucks are enclosed which reduces the potential for off-site odour.

A potential odour emission scenario could occur if both units are off-line for an extend period of time and the pit contains MSW. This would be an outage condition but all doors and louvers would be closed. Under this scenario, the induced draft fans could still be in operation, drawing odourous air through the combustion system and releasing the uncombusted odourous air into the atmosphere from the 87.6 m stack. The internal tipping and refuse storage building odour levels are not expected to fluctuate as Durham-York have significant and aggressive organic separation and diversion programs which will reduce the quantity of odour generating waste.

The odour emission rate was determined from measurements taken at the Covanta Onondaga Waste-to Energy facility, near Syracuse New York. Odour data can be found in Appendix E including measurement procedures and laboratory results. The Odondaga facility accepts organic wastes which would make the odour emissions conservative.

A preliminary Odour Management and Mitigation Plan is also provided in Appendix E. The plan will be finalized after consultation with the Central Region and the Regional Director prior to implementing the plan.

3.0 ASSESSMENT OF THE SIGNIFICANCE OF CONTAMINANTS AND SOURCES

This section provides an explanation for each source and contaminant identified as negligible (i.e., not significant) in Table 1 – Sources and Contaminants Identification Table, as required by sub paragraph 5 of s.26(1) of O. Reg. 419/05.

3.1 Identification of Negligible Contaminants and Sources

Of the 5 sources listed in Table 1 – Sources and Contaminants Identification Table, three (3) sources; residual ash building exhaust fans, stand-by fire pumps and HVAC equipment, have been identified as negligible accordance with Ontario Regulation 524/98 (Certificate of Approval Exemptions - Air). The remaining sources are significant and are included in the dispersion modelling for the Facility.

3.2 Rationale for Assessment

For each source that has been deemed negligible, the technical information required to substantiate the argument that each of the identified sources is negligible is presented in Table 1.

For each contaminant that has been deemed negligible, the technical information required to substantiate this conclusion is presented in is presented in Table 1.

In accordance with s.8 of O Reg. 419/05, emission rate calculations and dispersion modelling does not have to be performed for emissions from negligible sources. The emissions of negligible contaminants are included in the emission rate calculations; however, are excluded from the dispersion modelling assessment.

4.0 OPERATING CONDITIONS, EMISSION ESTIMATING AND DATA QUALITY

This section provides a description of the operating conditions used in the calculation of the emission estimates and an assessment of the data quality of the emission estimates for each significant contaminant from the Facility, as required by sub paragraphs 6 and 7 of s.26(1) of O. Reg. 419/05.

4.1 Description of Operation Conditions

Section 10 of O.Reg.419/05 states that an acceptable operating condition is a scenario in which operating conditions for the Facility would result, for the relevant contaminant, in the highest concentration of the contaminant possible at the point of impingement (POI). The operating conditions described in this ESDM Report meets this requirement.

Exhibit 2 identifies the eight different Facility operational scenarios evaluated with dispersion modeling and primary variables considered in each:

The grate is designed for a specific heat input and mass loading of refuse. The design heat input of a thermal treatment unit is the product of a specific flow of refuse with a specific energy content or heating value. These conditions set the Maximum Continuous Rating of a unit. The Facility's thermal treatment units are designed to process a nominal 218 tonnes/day with a nominal HHV of 13MJ/kg which amounts to a total heat release of approximately 118 GJ/hr. Since the refuse will have continuously varying characteristics, the grate's control system adjusts throughput to maintain the heat release necessary to attain a target steam production rate. The mass and heat input range of the grate is represented in the Solid Waste Refuse Firing Diagram below (Exhibit 3). The thermal treatment unit is designed for solid waste with higher heating values ranging from 8.4 MJ/kg to 15 MJ/kg as represented in the firing diagram. The "envelope" (Area 4-5-6-8-2'-3-4) is the rated continuous operating range of a thermal treatment unit. 100% of the MCR heat input is represented by any operating condition with heat input of 118 GJ/hr (e.g. points 2, 1 and 7); 110% of the MCR heat input is represented by any operating condition with heat input of 130 GJ/hr (e.g. points 2', 1' and 8); and 60% of the MCR heat input is represented by any operating condition with heat input of 71 GJ/hr (e.g. points 4 and 5).

Each combustion unit is capable of continuous operation at 110 % MCR. The normal operating condition for the two combustion units is 100% MCR @ 13 MJ/kg (HHV) (Reference Point 1 on Exhibit 3). The potential range of emissions for the firing diagram (Exhibit 3) was completed with results provided as Exhibit 4. Potential emissions are a function of the generated exhaust flow rate from the combustion calculation and maximum allowable stack concentration. The highest potential emissions are generated for all combustion reference points associated with 110% MCR;

a) Reference Point 1': 110% MCR @ 13.0 MJ/kg,

b) Reference Point 2': 110% MCR @ 15 MJ/kg and

c) Reference Point 8: 110% MCR @ 11.5 MJ/kg.

Exhibit 2: Durham York Energy Centre Emission Scenarios

Emission Scenario	Unit 1	Unit 2	Silo	Standby Diesel Generator	Comments
A	110% MCR	110% MCR	Not Filling	Off-line	Maximum Emissions at Reference Point 2' on Firing Diagram - Exhibit 3
B	Off-line	110% MCR	Not Filling	Off-line	Single Unit at Reference Point 2' on Firing Diagram - Exhibit 3
C	Phase 2 – Start-up	Phase 2 – Start-up	Not Filling	Off-line	60% MSW/40% NG Extreme Case
D	Phase 2 – Start-up	Off-line	Not Filling	Off-line	60% MSW/40% NG Most Likely Start-up condition
E	Phase 1 – Start-up	Phase 1 – Start-up	Not Filling	Off-line	Natural Gas Firing only Extreme Case
F	Phase 1 – Start-up	Off-line	Not Filling	Off-line	Natural Gas Firing only Most likely Case
G	ID Fans on	ID Fans on	N/A	Off-line	Used for Odour modeling only
H	110% MCR	110% MCR	Filling	Testing	Maximum Emissions at Reference Point 2' on Firing Diagram - Exhibit 3 Extreme Case

Exhibit 3: Base Facility Refuse Firing Diagram

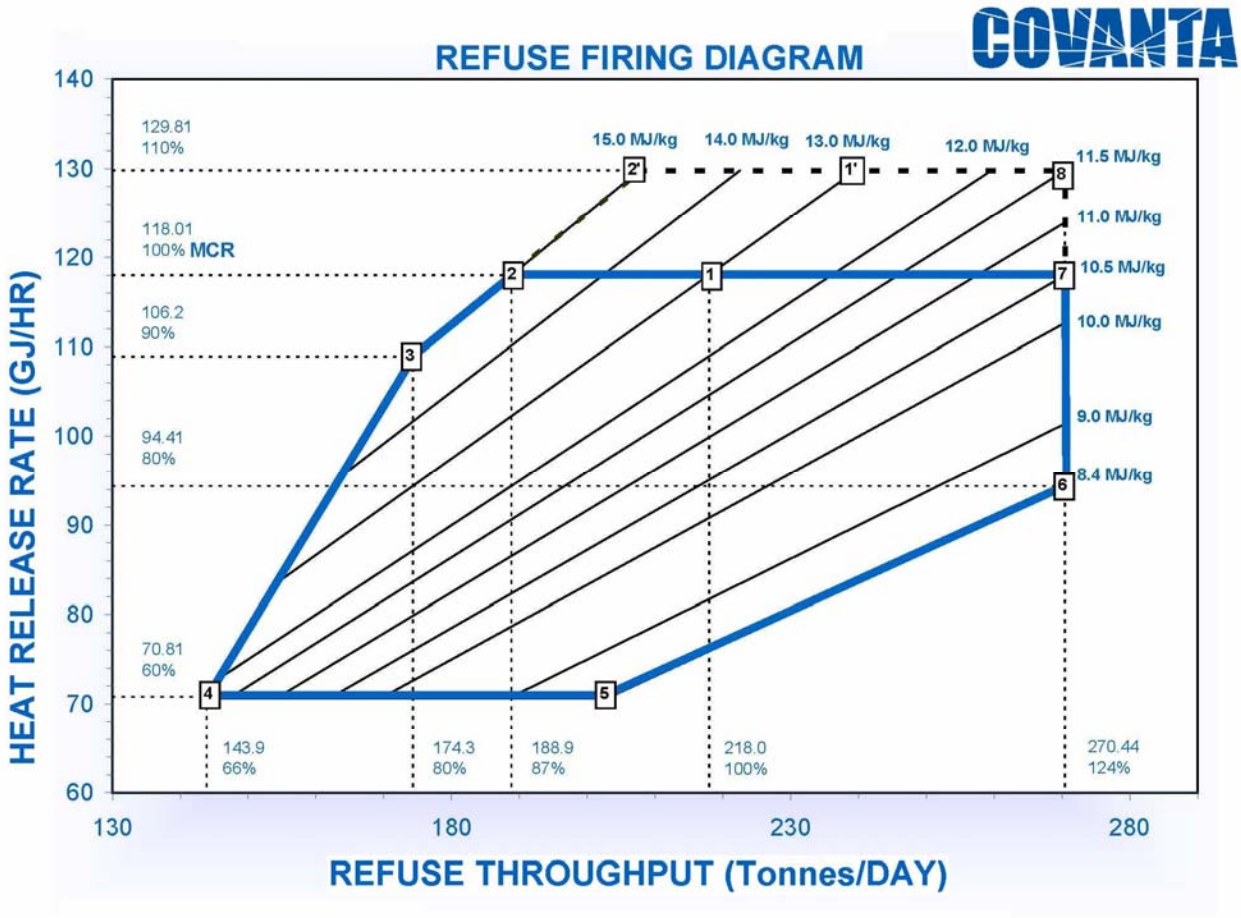


Exhibit 4: Base Facility Refuse Emissions

Reference Point (1)	MCR	Flue Am^3/s (2)	Emission Rate (kg/hr)												
			CO	NOx	SO_2	PM (Filterable)	PM_{10}	$PM_{2.5}$	VOCs as CH_4	Lead	Cadmium	Mercury	Fluoride	PCDD (mg/hr)	HCl
1	100%	23.0	2.7	8.2	2.4	0.59	1.5	1.4	2.3	0.0033	0.00046	0.0010	0.05	0.0039	0.59
1 Prime	110%	25.3	3.0	8.9	2.6	0.64	1.7	1.5	2.5	0.0036	0.00050	0.0011	0.06	0.0043	0.68
2	100%	23.8	2.8	8.4	2.5	0.59	1.5	1.5	2.3	0.0034	0.00047	0.0010	0.06	0.0041	0.64
2 Prime	110%	26.1	3.1	9.3	2.7	0.68	1.7	1.6	2.5	0.0037	0.00052	0.0011	0.06	0.0045	0.68
3	90%	21.4	2.5	7.6	2.2	0.54	1.4	1.3	2.1	0.0030	0.00043	0.0009	0.05	0.0037	0.59
4	60%	13.9	1.6	4.9	1.5	0.36	0.9	0.9	1.4	0.0020	0.00028	0.0006	0.03	0.0024	0.36
5	60%	12.0	1.4	4.3	1.2	0.32	0.8	0.7	1.2	0.0017	0.00024	0.0005	0.03	0.0021	0.32
6	80%	19.9	2.4	7.1	2.0	0.50	1.3	1.2	2.0	0.0028	0.00040	0.0008	0.05	0.0034	0.54
7	100%	24.2	2.9	8.6	2.5	0.64	1.6	1.5	2.4	0.0034	0.00048	0.0010	0.06	0.0041	0.64
8	110%	26.3	3.1	9.3	2.7	0.68	1.7	1.6	2.6	0.0037	0.00052	0.0011	0.06	0.0045	0.68

1. Reference Point refer to Base Facility Refuse Firing Diagram
2. Flue Am^3/s is the actual volumetric flow rate in cubic metres per second at 132°C, 8% oxygen and 16.3% moisture content.

In accordance with Section 10 of O.Reg.419/05, the reference point which would result in the highest concentration of the contaminant possible at the POI was selected; namely Reference Point 2-Prime. This reference point was selected because it represents the maximum potential ambient impacts. Long term operation of the Facility at these reference operating points is possible according to Facility design however the maximum annual processing limitation of 140,000 tonnes established by the EA would limit actual throughput

Start-up was considered according to two different phases. Phase 1 only includes emissions from the firing of natural gas during furnace warm up operations. Furnace warm up is required to ensure combustion zone temperature to spontaneously combust MSW when it is fed on the grate. Phase 2 is the transition period when MSW (60% of heat input) is initially charged to the grate and auxiliary burners (40% of heat input) are in operation until stable steady state combustion is achieved.

Other operations include the coincident filling of the lime, carbon, cement and pozzolan silos and firing of the standby diesel generators. While this is not a likely scenario, it is considered to be a conservative approach.

In addition, TSP emissions from the baghouses on the combustion train are assumed to be equivalent to PM10 emissions which are greater than PM2.5 emission. Further, filterable PM emission were assess separately for consistency with the EA. Similarly, for the CO emissions, which were modelled with an in-stack concentration of 45 mg /Rm3, which is equivalent to the EA emission, limit.

The MOE has established standards and guidelines for over 300 contaminants, as documented in the publication *"Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution - Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)"*, dated February 2008 (MOE POI Limit[s]). The averaging time for the operating condition is dependent on the averaging time for the MOE POI Limit. The operating condition used for this Facility that results in the maximum concentration at a POI is the scenario where all significant sources are operating simultaneously at their individual maximum rates of production for the relevant averaging times, as described in Appendix C of this ESDM Report. The individual maximum rates of production for each significant source of emissions correspond to the maximum emission rate for the averaging time.

4.2 Explanation of the Methods Used to Calculate Emission Rates

The maximum emission rates for each significant contaminant emitted from the significant sources were estimated and the methodology for the calculation is documented in Table 2 – Source Summary Table. All emission rates were calculated in accordance with requirements of the ESDM Procedure Document.

The emission rate for each significant contaminant emitted from a significant source was estimated and the methodology for the calculation is clearly documented in Table 2 – Source Summary Table.

4.3 Sample Calculations

The technical rationale, including sample calculations, required to substantiate the emission rates presented in Table 2 - Source Summary Table is documented in Appendix C – Emission Rate Calculations. All emission rates were calculated using manufacturer specifications, the emission factors taken from the EA (where

available) or alternatively from the USEPA AP-42 documentation (Natural gas auxiliary burners and diesel generator). All of the emission factor data used for the emission rate calculations is provided in Appendix C.

4.4 Assessment of Data Quality

This section provides a description of the assessment of the data quality of the emission estimates for each significant contaminant from the Facility, in accordance with the requirements of sub paragraph 7iii of s 26(1) of the O. Reg. 419/05.

For each contaminant, the emission rate was estimated and the data quality of the estimate is documented in Table 2 – Source Summary Table. The assessment of data quality for each source listed in Table 2 is documented in Appendix C – Emission Rate Calculations.

4.5 Conservatism of Emission Estimates and Operating Condition

The following assumptions were included in the development of the emission estimates and operating condition for the Facility:

- The highest emission rate that each source is capable of (i.e., maximum usage rates or throughputs) was used to characterize the emissions.
- All sources are assumed to be operating simultaneously at the corresponding maximum emission rate for the averaging period.
- All fuel-fired combustion equipment (i.e., auxiliary burners and stand-by power) emission rates were determined using the highest emission factor, combined with the maximum thermal heat input or engine rating for each piece of equipment.

Based on the conservative assumptions summarized above and detailed in Appendix C – Emission Rate Calculations, the emission rates listed in Table 2 are likely to be an overestimate of the actual emission rates.

4.6 Guideline A-7 Emission and Combustion Requirements

4.6.1 Emission Limits

The *Guideline A-7 Air Pollution Control, Design and Operation Guidelines for Municipal Waste Thermal Treatment Facilities* provides guidance on addressing combustion, continuous monitoring and operation of air pollution control systems. The following sections provide general design information and how the A-7 Guidelines are being addressed by proposed Facility design and operating procedures. Exhibit 5 presents proposed CofA Compliance Standards and verification methods for the operation of the facility, excluding periods of start-up and shutdown. Compliance Standards are enforceable conditions that are not to be exceeded. .

Exhibit 5 Proposed Compliance Standards and Verification Method

Pollutant	Parameter	Environmental Assessment Notice to Proceed Conditions (1)	Proposed CofA Compliance Standard (1)
Organic Matter as CH_4	Limit	33 mg/Rm^3	33 mg/Rm^3
	Compliance Verification		EPA Method 25A stack test
CO	Limit	40 mg/Rm^3	40 mg/Rm^3
	Compliance Verification		24-hr average CEM
Combustion Temperature (2)	Limit	None	Minimum 1000 C
	Compliance Verification	None	1-hour average
Oxygen	Limit	None	Minimum 5 %, dry gas basis
	Compliance Verification	None	4 hour rolling average
Opacity	Limit	10%	10%
	Compliance Verification	6 min	6 min rolling
	Limit	5%	5 %
	Compliance Verification	2 hr Rolling	2 hour rolling
HCl (3)	Limit	9 mg/Rm^3	9 mg/Rm^3
	Compliance Verification		24-hr CEM
SO_2	Limit	35 mg/Rm^3	35 mg/Rm^3
	Compliance Verification		24-hr CEM
NOx as NO_2	Limit	121 mg/Rm^3	121 mg/Rm3
	Compliance Verification		24-hr CEM
PM (4)	Limit	9 mg/Rm^3	9 mg/Rm3
	Compliance Verification		EPA Method 5 stack test
Cd	Limit	7 µg/Rm^3	7 µg/Rm^3
	Compliance Verification		EPA Method 29 stack test
Pb	Limit	50 µg/Rm^3	50 µg/Rm^3
	Compliance Verification		EPA Method 29 stack test
Hg	Limit	15 µg/Rm^3	15 µg/Rm^3
	Compliance Verification		EPA Method 29 stack test
Dioxins & Furans	Limit	60 pg/Rm3	60 pg/Rm3
	Compliance Verification		EPA Method 23 stack test

1. All emission limits are stated at reference conditions of 298.15K, 1.013 bar, 11% oxygen and 0% moisture.
2. Compliance with flue gas temperature requirements would be determined either through direct measurement in the furnace or through a correlation between furnace temperature and temperature measurements downstream of the combustion zone .In either case residence time is determined from the point of secondary air injection.
3. Or removal efficiency of not less than 95%
4. Filterable particulate matter

4.6.2 Guideline A-7 Combustion Related Parameters

4.6.2.1 Continuous Emission Monitoring

Two regulatory references were reviewed to determine the appropriate parameters that are direct indicators of combustion efficiency, namely organic matter and carbon monoxide (CO);

3. The Environmental Assessment Notice to Proceed (EA), and
4. Guideline A-7: Air Pollution Control, Design and Operation Guidelines for Municipal Waste Thermal Treatment Facilities.

The specific emission limits for each are summarized below in Exhibit 6.

Exhibit 6: References for Organic Matter and Carbon Monoxide

Pollutant	Parameter	EA (1)	Guideline A-7 (1)
CO	Limit	40 mg/Rm^3	40 mg/Rm^3
Organic Matter	Limit	33 mg/Rm^3	33 mg/Rm^3

1. All emission limits are stated at reference conditions of 298.15K, 1.013 bar, 11% oxygen and 0% moisture.

Exhibit 5 and Exhibit 6 propose that the stack limit of 40 mg/Rm^3 at 11 % O_2 for CO in the EA and A-7 is appropriate with compliance being demonstrated by a continuous emission monitor with a 24-hour block average reporting period. Ambient impacts of CO were determined through dispersion modeling with all results demonstrating compliance with applicable ambient air quality standards. The CO 4-hour rolling average will also be reported for information purposes. Exhibit 6 also proposes that the stack limit of 33 mg/Rm^3 at 11 % O_2 for organic matter in the EA and A-7 is appropriate with compliance being demonstrated by an annual stack test per A-7.

The continuous measurements of carbon monoxide will provide evidence that the combustion process is being operated in a manner consistent with best operating practices. Continuous measurement of CO is the most reliable information and the best parameter for demonstrating that the combustion process has provided a high conversion of CO to CO_2 and that other pollutants of interest have also been destroyed.

Section 5.1 of A-7 “Recommendations for Combustion” includes several sections that individually address combustion specific parameters including flue gas residence time, temperature, mixing and oxygen content. Of these four parameters, flue gas temperature and oxygen can be continuously measured and are proposed herein as Compliance Standards. Compliance with the flue gas temperature condition (minimum of 1000 C for one second) will be demonstrated by determination of flue gas temperature at a point one second downstream of secondary air injection by either continuous measurement in the furnace or through a correlation between the one second temperature and a downstream measurement location.

This application presents the recommended A-7 values for flue gas temperature as a Compliance Standard. The minimum oxygen concentration is proposed as 5 % for several reasons:

1. The Guidelines state that different values can be used with different designs.
2. The proposed design requires lower excess air levels that correspond to lower oxygen levels relative to other mass burn technologies with the result being an improvement in boiler efficiency.

3. The Guideline values for temperature and O2 do not consider that complete combustion can be attained by a combination of values and not only the recommended values.
4. A recommended value by itself is not a compliance standard and without flue gas temperature or O2 being correlated to an emission, a variation from the recommended value does not mean an emission limit has been exceeded.
5. The condition would not include or provide for an increase of emission limit values.

The following sections address how the proposed design complies with A-7 recommended conditions and also provides monitoring conditions for each.

4.6.2.2 Demonstration of Flue Gas Time, Temperature and Oxygen Content

The furnace design and operating conditions of the proposed combustion unit were evaluated at a full scale unit (Covanta Bristol, Inc) rated at a nominal 325 tons per day (295 tonne per day) for comparison with *Guideline A-7* conditions for flue gas time, temperature and oxygen content.

Exhibit 7 illustrates the general location of primary air injection, secondary air injection and injection of re-circulated flue gas and the zones used to determine flue gas temperature and residence time. Exhibit 8 provides results from field measurements at a full scale facility with the resulting heat and mass balance demonstrating that the proposed design meets or exceeds the A-7 Guidelines for residence time and temperature. Zone 1 is where volatile gases are combusted at very high temperatures. Flue gas operating conditions for the Design case will average about 1,200°C for 2 to 3 seconds in this zone. The VLN nozzles provide a turbulent mixing zone and additional oxygen from the IGR gas. The flue gas operating condition in Zone 2 is a typically two seconds above 850 °C. When Zone 1 and 2 are considered together, flue gas will be exposed to temperatures above 850°C for 4 to 5 seconds after secondary air injection. This analysis demonstrates that facility design conforms to Guideline A-7 recommendations of combustion temperature, combustion gas residence time, and oxygen availability

The flue gas temperatures in Exhibit 8 are from a temporary test program at the facility operating in Bristol, Connecticut where flue gas temperature in the high temperature zone were correlated to flue gas measurements at a downstream location. Continuous and reliable measurements of flue gas temperature in both Zone 1 and 2 are not practical on a continuous basis due to the aggressive environment created by the high temperatures and flue gas chemistry. Direct and accurate measurement of flue gas residence time is difficult due to the dynamic nature of the combustion process itself and varying volumetric flow rates.

Exhibit 7: Combustion Zones

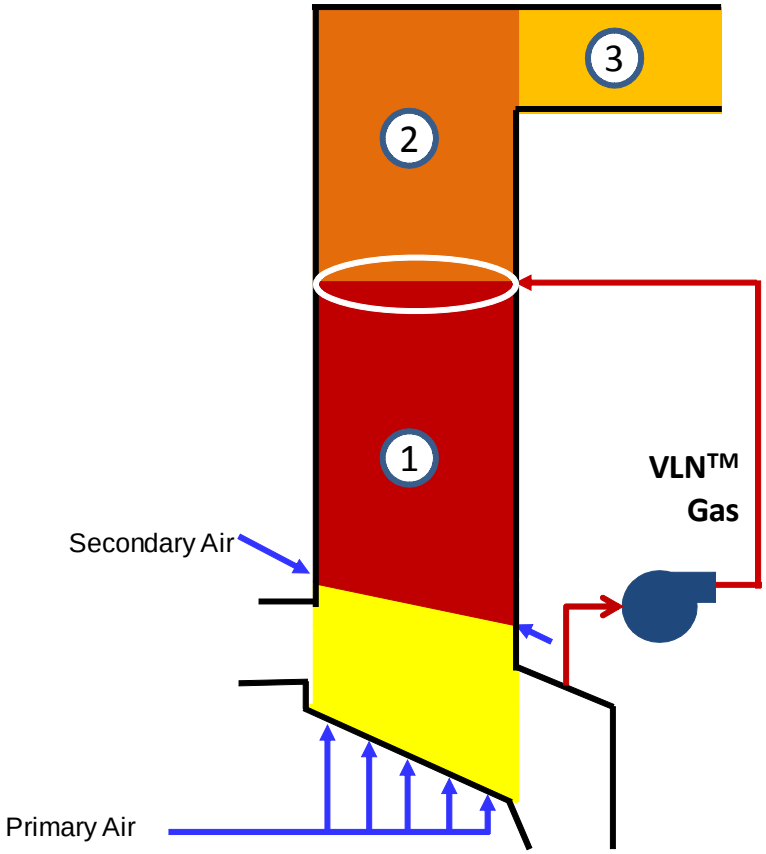


Exhibit 8: Nominal operating values at Design Condition of 218 Tonne per day per unit

Parameter	Unit	Gas in Zone 1	Gas in Zone 2
Average Temperature	°C	1200	948
Flow	m^3/hr (actual)	202,800	225,600
	Nm^3/hr	37,600	48,400
Residence time	seconds	2 to 3 seconds above 1000°C	2 seconds (1) above 900°C
Oxygen Content			
O_2	% wet basis	2.40%	6.40%
	% dry basis	3.0%	7.4%
Approx. temperature at 1 second residence time (°C)		1274	952

1. Note that residence time in Zones 2 and 3, downstream of VLN gas injection, is > 2 sec above 850 °C

4.6.2.2.1 Flue Gas Time and Temperature Monitoring

Compliance with the flue gas temperature condition (minimum of 1000 C for one second from point of secondary air injection) will be demonstrated by either a continuous measurement in the furnace or through a correlation between the one second temperature and a downstream measurement location.

Continuous and reliable measurement of flue gas temperature in the combustion zone of the furnace is preferred however it may not be practical due to the aggressive environment where flue gas temperatures are well above 1000 C. While the viability of that option will be evaluated, compliance can demonstrated through a correlation between actual flue gas temperature at the one second residence point in the furnace combustion zone (measured from the secondary air injection elevation) and the furnace gas temperature measured by a downstream device. This approach has been used in the EfW industry and is proposed as an alternative method for demonstrating compliance with the A-7 Guideline of maintaining flue gas at a minimum of 1000 C for one second. The actual correlation will be determined through field testing with special instruments and procedures after unit commissioning. In either case field measurements will be reported as a 1-hour block average.

4.6.2.3 Oxygen Monitoring

The VLN Boiler Design proposed for this project incorporates a lower excess air than other mass burn combustion units for similar fuels. Therefore this application proposes that the Compliance Standard for oxygen should be 5 %, dry gas basis, reported as a 4-hour rolling average. This condition is proposed to avoid an unnecessary change to Facility operations that could have an unintentional and adverse impact on direct combustion parameters. As an example, the combustion process could be providing consistent and stable combustion conditions with low CO and organic matter values with a flue gas temperature above 1000 C however if the oxygen level drops below 6 %, the Facility would have to increase the amount excess air to remain above 6 %. This could cause a shift in combustion conditions with changes to emission levels of CO and organic matter.

5.0 SOURCE SUMMARY TABLE AND SITE PLAN

This section provides the table required by sub paragraph 8 and the site plan required by sub paragraph 9 of s.26(1) O. Reg. 419/05.

5.1 Source Summary Table

The emission rates for each source of significant contaminants are documented in Table 2 – Source Summary Table in accordance with requirements of sub paragraph 8 of s.26(1) of O. Reg. 419/05.

5.2 Site Plan

The locations of the emission sources listed in Table 2 – Source Summary Table are presented in Figure 3a & 3b – Dispersion modelling plan; the location of each of the sources is specified with the source reference number. The location of the property line is indicated on Figure 3. UTM coordinates (NAD 83) are provided for each source in Table 2 – Source Summary Table.

6.0 DISPERSION MODELLING

This section provides a description of how the dispersion modelling was conducted for the Facility to calculate the maximum concentration at a point of impingement (POI), as required by sub paragraphs 10 to 13 of s.26(1) of O. Reg. 419/05.

The Facility is subject to s.20 of O. Reg. 419/05, consequently it would typically be assessed using the US EPA AERMOD model. However a request was submitted to the MOE to allow the use of an alternative model. The request was granted in August 2010 (Appendix F). The assessment of compliance with Schedule 3 standards was, therefore, carried out with the aid of the U.S. EPA CALPUFF atmospheric dispersion model (CALPUFF).

There are a number of advantages of using CALPUFF relative to the MOE approved dispersion model AERMOD. These benefits include:

- CALPUFF allows for more accurate treatment of effects due to complex terrain features, non-uniform land use, plus the effect of time and space-varying meteorological conditions on pollutant transport, transformation and removal.
- CALPUFF has the ability to treat the combined effects of multiple processes (e.g., building downwash effects in complex terrain; dry deposition and chemical transformation, etc.).
- CALPUFF allows more accurate treatment of calm wind conditions which are often associated with high POI concentrations.
- CALPUFF is the model that was used by Durham/York in the Environmental Assessment conducted for the Facility.

Therefore, the proper implementation of CALPUFF will assess concentrations of contaminants discharged from the facility as least as accurately as AERMOD and given the specifics of the facility it will likely produce more accurate results.

CALPUFF modelling system is made up of three main components: CALMET meteorological model (which generates hourly wind and temperature fields on a three dimensional gridded modelling domain), CALPUFF transport and dispersion model (which advects “puffs” of material emitted from sources to calculate hourly concentration/fluxes at receptors of interest), and CALPOST post processor (used to extract the data of interest from CALPUFF binary output files).

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);
- POSTUTIL post processor (v.1.64, Level 101025).

The dispersion modelling was conducted in accordance with the MOE *publication "Guideline A-11: Air Dispersion Modelling Guideline for Ontario, Version, 2.0"*, dated March 2009 (ADMGO) PIBS 5165e02.

The emission rates used in the dispersion model meet the requirements of s.11(1)1 of O. Reg. 419/05, which requires that the emission rate used in the dispersion model be at least as high as the maximum emission rate that the source of contaminant is reasonably capable of for the relevant contaminant. These emission rates are further described in Appendix C – Emission Rate Calculations.

6.1 Dispersion Modelling Input Summary Table

A description of the way in which the approved dispersion model was performed is included as Table 3 – Dispersion Modelling Input Summary Table. This table meets both the requirements of s.26(1)11 and sections 8-17 of O. Reg. 419/05 and follows the format provided in the ESDM Procedure Document. Furthermore, the dispersion modelling input parameters are summarized in Table 4 – Dispersion Modelling Source Summary Table. Although not required by s.26 of O. Reg. 419/05, this table simplifies the data presentation.

All sources have been modelled as point sources. The location of each source is shown on Figure 3a and b.

6.2 Coordinate System

The Universal Transverse Mercator (UTM) coordinate system, as per Section 5.2.2 of the ADMGO, was used to specify model object sources, buildings and receptors. All coordinates were defined in the North American Datum of 1983 (NAD83).

6.3 Model Domain

The CALPUFF Model domain used in this assessment is the same as the domain used in the Environmental Assessment. It extends 40 km by 30Km 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.

6.4 Meteorology, Land Use and Terrain Data

Sub paragraph 10 of s.26(1) of O. Reg. 419/05 requires a description of the local land use conditions if meteorological data, as described in paragraph 2 of s.13(l) of O. Reg. 419/05, was used. The land use surrounding the Facility is characterized as industrial, as illustrated in Figure 4 - Land Use Zoning Designation plan and Figure 5 – 3 Kilometre Boundary Buffer.

To use the full capabilities of CALPUFF described above CALMET diagnostic meteorological model is required. CALMET produces three-dimensional wind and temperature fields and two-dimensional fields of mixing heights and other meteorological variables. Such meteorological data set is site-specific and it is obtained by a

computation method that is at least as accurate as data obtained by local or site specific meteorological monitoring.

Development of CALMET meteorological data set, which takes into account effects such as slope flow and terrain channelling of winds, requires the use of both meteorological and geophysical type of input data. The input data used to generate a 5-year (2003-2007) meteorological data set is described in detail in the Environmental Assessment. (Durham-York Residual Waste Study– Appendix C-1 - Air Quality Assessment Technical Study report– Appendix D). No changes were made to this data to maintain consistency. Additionally, terrain data was also taken from the Environmental Assessment, it is illustrated in Figure 6 – Terrain Elevations.

6.5 Receptors

Receptors were chosen based on recommendations provided in Section 7.1 of the ADMGO, which is in accordance with s.14 of O.Reg.419/05. Specifically, a nested receptor grid, centered around the outer edges of all the sources, was placed as follows:

a) 20 m spacing, within an area of 200 m by 200 m;

b) 50 m spacing, within an area surrounding the area described in (a) with a boundary at 300 m by 300 m outside the boundary of the area described in (a);

c) 100 m spacing, within an area surrounding the area described in (b) with a boundary at 800 m by 800 m outside the boundary of the area described in (a);

d) 200 m spacing, within an area surrounding the area described in (c) with a boundary at 1,800 m by 1,800 m outside the boundary of the area described in (a);

e) 500 m spacing, within an area surrounding the area described in (d) with a boundary at 4,800 m by 4,800 m outside the boundary of the area described in (a); and

f) 1,000 m spacing beyond the area described in (e) out to 20,000 m to the North, West and East and 10, 000 m to the South.

In addition to using the nested receptor grid, receptors were also placed every 10 m along the property line. The area of modeling coverage is illustrated on Figure 7 – Dispersion Modelling Gridded Receptors.

Discrete Receptors were also placed at approximately 400 locations 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. These receptors are all consistent with those taken from the EA and are illustrated in Figure 8 – Dispersion Modelling Sensitive Receptors.

6.6 Building Downwash

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.

CALPUFF has an option to model building wake effect using PRIME or ISC algorithm. In most cases the newer PRIME model is considered to more accurately predict concentrations within the building wake zone since it takes into account the effect of vertical wind shear and the variation in wind speed deficit with downwind distance. For this assessment, the PRIME algorithm was used.

The building obstacles as used in the BPIP program are shown in Figure 9.

6.7 Deposition

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

6.8 Chemical Transformation

For the purposes of assessing project contributions to Secondary particulate Matter (SPM) formation, chemical transformation was considered in the CALPUFF modelling. To model the chemical transformation of emitted NO, NO_2 and SO_2 into HNO_3, NO_3 and SO_4, CALPUFFs RIVAD/ARM3 mechanism was used.

6.9 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

6.10 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 easily 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 ADMGO. For example, for odour, the hourly odour concentration was converted to a 10-min average by multiplying the hour value by 1.65.

6.11 Dispersion Modelling Options

The options used in the CALPUFF dispersion model are summarized in the table below.

Exhibit 9 CALPUFF Options and Flags

Flag	Default	Used Value	Comments
MGAUSS	1	1	Vertical distribution used in the near field
MCTADJ	3	3	Terrain adjustment method (3 used for partial plume path adjustment)
MCTSG	0	0	Subgrid-Scale complex terrain flag
MSLUG	0	0	Near-field puffs modelled as elongated
MTRANS	1	1	Transitional Plume Rise modelled
MTIP	1	1	Stack-tip downwash
MBDW	1	2	Method used to simulate building downwash 1 = ISC method; 2 = PRIME method
MSHEAR	0	0	Vertical wind shear modelled above stack top
MSPLIT	0	1	Puff splitting allowed 0 = NO; 1 = Yes
MCHEM	1	0	Chemical Transformation Scheme 0 = chemical transformation not modeled 1 = transformation rates computed internally (MESOPUFF II scheme)
MAQCHEM	0	0	Aqueous phase transformation flag (only used if MCHEM =1 or 3)
MWET	1	0	Wet removal modelled 0 = NO; 1 = Yes
MDRY	1	0	Dry deposition modelled 0 = NO; 1 = Yes
MTILT	0	0	Gravitational settling (plume tilt) modelled
MDISP	3	2	Methods used to compute dispersion coefficients 2 = (dispersion coefficients from internally calculated sigma v, sigma w using micrometeorological variables (u*, w*, L, etc.) 3 = PG dispersion coefficient for RURAL areas (computed using the ISCST multi-segment approximation) and MP coefficients in urban areas)
MTURBVW	3	3	Sigma measurements used (Used only if MDISP = 1or 5)
MDISP2	3	3	Back-up method used to compute dispersion when measured turbulence data are missing (Used only if MDISP=1 or 5)
MTAULY	0	0	[DIAGNOSTIC FEATURE] Method used for Lagrangian timescale for Sigma-y (used only if MDISP=1,2 or MSIDP2=1,2)
MTAUADV	0	0	[DIAGNOSTIC FEATURE] Method used for Advective-Decay timescale for Turbulence (used only if MDISP=2 or MDISP2=2)
MCTURB	1	1	Method used to compute turbulence sigma-v & sigma-w using micrometeorological variables (Used only if MDISP = 2 or MDISP2 = 2)

Flag	Default	Used Value	Comments
MROUGH	0	0	PG sigma y,z adjusted for roughness
MPARTL	1	1	Partial plume penetration of elevated inversion
MTINV	0	0	Strength of temp inversion provided in PROFILE.DAT extended records
MPDF	0	1	Probability Distribution Function used for dispersion under convective conditions 0 = NO; 1 = Yes
MSGTIBL	0	1	Sub-grid TIBL module used for shore line
MBCON	0	0	Boundary conditions (concentration) modeled
MFOG	0	0	Configure for FOG Model output
MREG	1	0	Test options specified to see if they conform to regulatory values

6.12 Dispersion Modelling Input and Output Files

The dispersion model source input data are summarized in the Dispersion Modelling Input Summary Table (Table 3).

Sample input and output files are also provided in Appendix G.

7.0 EMISSION SUMMARY TABLE

This section provides the table required by sub paragraph 14 of s.26(1) of O. Reg. 419/05 and provides an interpretation of the results, as required by the ESDM Procedure Document.

7.1 Emission Summary Table

A POI concentration for each significant contaminant emitted from the Facility was calculated based on the emission rates listed in Table 2 – Source Summary Table and the output from the approved dispersion model. The results are presented in Table 5 – Emission Summary Table. This table follows the format provided in the ESDM Procedure Document.

The POI concentrations listed in Table 5 were compared against the MOE POI Limits, or in the case of $PM_{2.5}$ and PM_{10}, the MOE AAQC. Under Scenarios A-F, which represents normal and start-up emissions from the main stack, 1-hour averaged nitrogen oxides has the highest concentration relative to the MOE POI limit. Of these scenarios, Scenario A has the highest concentration of nitrogen oxides at 7% of the relevant limit. Scenario H represents a worst case operation and includes silo filling plus stand-by diesel generator operation in addition to normal operational emissions from the main stack. In this scenario, the concentration of nitrogen oxides was assessed against the ½ hour standard of 1880 $\mu g/m^3$. The relevant concentration of nitrogen oxides under Scenario H is 17% of this limit.

Under Scenario H, 24-hour averaged $PM_{2.5}$ has the highest concentration relative to the corresponding MOE AAQC at 18% of the standard. However, in this scenario, all four of the silos have been modelled assuming 24/7 simultaneous filling. This is highly conservative as in reality; the silos will only be filled intermittently and one at a time.

Note that under start-up conditions, a worst-case assumption was made that the one or two units would be operating under these conditions for 24 hrs per day. Similarly, silo filling and diesel generator operation would also be occurring 24/7.

7.2 Assessment of Contaminants with no MOE POI Limits

Sub paragraph 14 subsection viii of s.26(1) O. Reg. 419/05 requires an indication of the likelihood, nature and location of any adverse effect if the contaminant is not listed in any of Schedules 1, 2 and 3.

Contaminants at the Facility that do not have MOE POI Limits were screened against the Jurisdictional Screening Limits (JSLs) listed in the MOE publication "*Jurisdictional Screening Level (JSL) List a Screening Tool for Ontario Regulation 419: Air Pollution – Local Air Quality*" dated February 2008.

For those contaminants that have neither a MOE POI Limit nor JSL, the *de minimis* limit was used for the assessment.

7.3 Odour Concentrations

Odour modelling was completed following the MOE *Technical Bulletin Methodology for Modelling Assessments of Contaminants with 10-minute Average Standards and Guidelines under O. Reg 419/05 (April 2008)*. The maximum 10 min odour concentration was calculated to be 0.11 ou/m^3 which an order of magnitude less than the guideline value of 1 ou/m^3.

7.4 Summary of Assessment

All the compounds assessed were below their relevant MOE standards. The location of the maximum POI concentrations under each scenario is listed in Table 5 and illustrated on Figure 10. For each scenario, most of the maximum POI concentrations for averaging times less than or equal to 1 hour occurred within 1km of the main stack. Maximum POI concentrations with averaging periods of greater than or equal to 24 hours generally occurred further away from the site at distances of up to 2.25 km from the main stack.

8.0 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) and is included in Appendix H.

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 Environmental Assessment. The relevant concentrations are listed in Table 5.

The relevant cumulative concentrations were compared against the MOE POI limits and in the case of $PM_{2.5}$ and PM_{10}, the MOE AAQC. The cumulative concentrations of all contaminants (with background added) are still below the relevant MOE POI limits.

Under the Notice to Proceed Condition 11, an Ambient Air Monitoring and Reporting plan will be prepared and submitted to Central Region for approval.

9.0 CONCLUSIONS

This ESDM Report was prepared in accordance with s.26 of O. Reg. 419/05. In addition, guidance in the ESDM Procedure Document was followed, as appropriate.

The Facility is subject to s. 20 of O. Reg. 419/05, contaminant emissions are assessed using the CALPUFF modelling software.

All the emission rates listed in Table 2 correspond to the operating scenario where all significant sources are operating simultaneously at their individual maximum rates of production. Therefore, the emission rates listed in Table 2 are likely to overestimate of the actual emission rates.

A POI concentration for each significant contaminant emitted from the Facility was calculated based on the calculated emission rates and the output from the CALPUFF model. The results are presented in Table 5 - Emission Summary Table and were compared against the respective MOE POI Limits.

Contaminants that do not have MOE POI Limits were screened against the JSL and *de minimis* limits. The concentrations of these contaminants were all below their relevant limits. Of the remaining contaminants assessed with MOE POI Limits; all the predicted POI concentrations are below the corresponding limits. Under Scenarios A-F, which represent normal and start-up emissions from the main stack, 1-hour averaged nitrogen oxides has the highest concentration relative to the MOE POI limit. Of these scenarios, Scenario A has the highest concentration of nitrogen oxides at 7% of the relevant limit. Scenario H represents a worst case operation and includes silo filling plus stand-by diesel generator operation in addition to normal operational emissions from the main stack. In this scenario, the concentration of nitrogen oxides was assessed against the ½ hour standard of 1880 µg/m^3. The relevant concentration of nitrogen oxides under Scenario H is 17% of this limit.

Under Scenario H, 24-hour averaged $PM_{2.5}$ has the highest concentration relative to the corresponding the MOE AAQC at 18% of the limit. However, in this scenario, all four of the silos have been modelled assuming 24/7 simultaneous filling. This is highly conservative as in reality; the silos will only be filled intermittently and one at a time.

Odour was modelled during potential outage situation when all combustion equipment is off-line and the tipping floor air would be vented out the stack. The worst case odour concentration would be an order of magnitude below the MOE POI limit of 1 ou/m^3 (10 min avg).

The conservative emission rates, when combined with the conservative operating conditions and conservative dispersion modelling assumptions, are likely to overestimate the concentrations at a POI. This assessment demonstrates that the Facility can operate in compliance with s.20 of O. Reg. 419/05.

Report Signature Page

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TABLES

Table 1

Sources and Contaminants Identification Table

Source Information			Expected Contaminants	Significant (Yes or No)?	Modelled (Yes or No)?	Rationale
Source ID	Source Description or Title	General Location				
1A	Main Stack - Normal Operation - Two Trains	Main Plant	Products of combustion, particulate matter and metals	Yes	Yes (Scenarios A and H)	N/A
1B	Main Stack - Normal Operation - One Train Only	Main Plant	Products of combustion, particulate matter and metals	Yes	Yes (Scenario B)	N/A
1C	Main Stack - Start Up - Phase 2 - Two Trains	Main Plant	Products of combustion, particulate matter and metals	Yes	Yes (Scenario C)	N/A
1D	Main Stack - Start Up - Phase 2 - One Train Only	Main Plant	Products of combustion, particulate matter and metals	Yes	Yes (Scenario D)	N/A
1E	Main Stack - Start Up - Phase 1 - Two Trains	Main Plant	Products of combustion, particulate matter and metals	Yes	Yes (Scenario E)	N/A
1F	Main Stack - Start Up - Phase 1 - One Train Only	Main Plant	Products of combustion, particulate matter and metals	Yes	Yes (Scenario F)	N/A
1G	Main Stack - fans only	Main Plant	Odour	Yes	Yes (Scenario G)	N/A
2	Silo Filling	Main Plant	Particulate matter	Yes	Yes (Scenario H)	N/A
3	Stand-by generator	Main Plant	Products of combustion	Yes	Yes (Scenario H)	N/A
4	Residual Ash Building Exhaust Fans	Main Plant	Particulate matter	No	No	Emissions from the exhaust fans represent less than 5% fo the total site-wide emissions of particulate matter and have therefore been considered negligible as per section 7.2.2 of the ESDM Procedure Document.
5	HVAC	Main Plant	Products of combustion	No	No	Contaminants emitted in negligible amounts as per section 7.2.1 of the ESDM Procedure Document.
6	Emergency Fire Pumps	Main Plant	Products of combustion	Yes	No	The use of the emergency fire pumps and generator will be limited to emergencies and scheduled maintenance testing, with the testing of each piece of equipment occuring on different days. The stand-by generator has the greatest capacity of these pieces of equipment, consequently only emissions from the emergency generator have been assessed.

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
1A	Main Stack - Normal Operation - Two Trains	52.26	132	1.7	87.6	(680538, 4860346)	Carbon Monoxide	630-08-0	1.92E+00	1	EC	Above-Average	88%
							Sulphur Dioxide	7446-09-5	1.49E+00	1, 24	EC	Above-Average	99%
							Total Particulate Matter	N/A	9.55E-01	24	EC	Above-Average	93%
							Filterable TSP	N/A	3.84E-01	24	EC	Above-Average	95%
							PM10	N/A	9.55E-01	24	EC	Above-Average	94%
							PM2.5	N/A	8.95E-01	24	EC	Above-Average	94%
							VOCs as CH4	N/A	2.09E+00	24	EC	Above-Average	100%
							Lead	7439-92-1	2.13E-03	24, 30 days	EC	Above-Average	100%
							Cadmium	7440-43-9	2.98E-04	24	EC	Above-Average	100%
							Mercury	7439-97-6	6.39E-04	24	EC	Above-Average	100%
							Hydrogen Fluoride	7664-39-3	3.84E-02	24, 30 days	EC	Above-Average	100%
							PCDD (I-TEQ)	N/A	2.56E-09	1, 24	EC	Above-Average	100%
							Hydrogen Chloride	7647-01-0	3.84E-01	24	EC	Above-Average	100%
							Ammonia	7664-41-7	4.22E-01	24	EC	Above-Average	100%
							Nitrogen Oxides	10102-44-0	5.14E+00	1, 24	EC	Above-Average	82%
							Polychlorinated Biphenyls (PCB)	N/A	3.08E-06	1, 24	EF	Average	100%
							Aluminum	7429-90-5	1.69E-03	24	EF	Average	100%
							Antimony	7440-36-0	1.17E-04	24	EF	Average	100%
							Arsenic	7440-38-2	1.79E-05	24	EF	Average	100%
							Barium	7440-39-3	9.01E-05	24	EF	Average	100%
							Beryllium	7440-41-7	1.42E-05	24	EF	Average	100%
							Boron	7440-42-8	6.52E-03	24	EF	Average	100%
							Chromium (hexavalent)	18540-29-9	1.36E-05	24	EF	Average	100%
							Total Chromium (and compounds)	7440-47-3	9.59E-05	24	EF	Average	100%
							Cobalt	7440-48-4	2.47E-04	24	EF	Average	100%
							Nickel	7440-02-0	3.71E-03	24	EF	Average	100%
							Phosphorus	7723-14-0	1.96E-03	24	EF	Average	100%
							Silver	7440-22-4	1.43E-04	24	EF	Average	100%
							Selenium	7782-49-2	2.05E-05	24	EF	Average	100%
							Thallium	7440-28-0	1.66E-03	24	EF	Average	100%
							Tin	7440-31-5	7.50E-04	24	EF	Average	100%
							Vanadium	7440-62-2	4.96E-05	24	EF	Average	100%
							Zinc	7440-66-6	8.50E-03	24	EF	Average	100%
							1,2-Dichlorobenzene	95-50-1	8.72E-05	1	EF	Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	2.19E-06	24	EF	Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	24	EF	Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	7.41E-06	24	EF	Average	100%
							2,4,6-Trichlorophenol	88-06-2	2.23E-06	24	EF	Average	100%
							2,4-Dichlorophenol	120-83-2	4.39E-06	24	EF	Average	100%
							Pentachlorophenol	87-86-5	8.79E-06	24	EF	Average	100%
							Hexachlorobenzene	118-74-1	2.19E-06	24	EF	Average	100%
							Pentachlorobenzene	608-93-5	5.77E-06	24	EF	Average	100%
							Acenaphthylene	208-96-8	6.18E-07	24	EF	Average	17%
							Acenaphthene	83-32-9	7.93E-07	24	EF	Average	34%
							Anthracene	120-12-7	1.73E-07	24	EF	Average	30%
							Benzo(a)anthracene	56-55-3	6.39E-08	24	EF	Average	24%
							Benzo(b)fluoranthene	205-99-2	1.63E-07	24	EF	Average	31%
							Benzo(k)fluoranthene	207-08-9	4.30E-08	24	EF	Average	38%
							Benzo(a)fluorene	238-84-6	1.18E-06	24	EF	Average	100%

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Benzo(b)fluorene	243-17-4	8.06E-07	24	EF	Average	100%
							Benzo(ghi)perylene	191-24-2	1.76E-06	24	EF	Average	91%
							Benzo(a)pyrene	50-32-8	1.47E-07	24	EF	Average	64%
							Benzo(e)pyrene	192-97-2	3.71E-07	24	EF	Average	100%
							Biphenyl	92-51-3	1.27E-04	1	EF	Average	100%
							Chrysene	218-01-9	1.61E-07	24	EF	Average	24%
							Dibenzo(a,c)anthracene	215-58-7	1.14E-06	24	EF	Average	100%
							Dibenzo(a,h)anthracene	53-70-3	5.16E-08	24	EF	Average	31%
							Fluoranthene	206-44-0	1.77E-06	24	EF	Average	57%
							Fluorine	86-73-7	1.33E-06	24	EF	Average	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	3.21E-07	24	EF	Average	70%
							1 – methylnaphthalene	90-12-0	4.18E-06	24	EF	Average	100%
							2 – methylnaphthalene	91-57-6	2.32E-05	24	EF	Average	100%
							Naphthalene	91-20-3	1.80E-05	24, 10 min	EF	Average	30%
							Perylene	198-55-0	6.44E-08	24	EF	Average	100%
							Phenanthrene	85-01-8	4.03E-06	24	EF	Average	23%
							Pyrene	129-00-0	2.14E-06	24	EF	Average	64%
							Tetralin	119-64-2	2.12E-05	24	EF	Average	100%
							O-terphenyl	84-15-1	3.49E-06	24	EF	Average	100%
							Acetaldehyde	75-07-0	2.15E-08	½, 24	EF	Average	<1%
							Benzene	71-43-2	1.32E-03	24	EF	Average	84%
							Bromodichloromethane	75-27-4	7.50E-03	24	EF	Average	100%
							Bromoform	75-25-2	2.05E-03	24	EF	Average	100%
							Bromomethane	74-83-9	1.53E-03	24	EF	Average	100%
							Carbon tetrachloride	56-23-5	1.28E-05	24	EF	Average	100%
							Chloroform	67-66-3	2.17E-05	24	EF	Average	100%
							Dichlorodifluoromethane	75-71-8	3.71E-03	24	EF	Average	100%
							Dichloroethene, 1,1 -	75-34-3	2.41E-05	24	EF	Average	100%
							Dichloromethane	75-09-2	7.50E-03	24	EF	Average	100%
							Ethylbenzene	100-41-4	4.42E-05	24	EF	Average	100%
							Ethylene Dibromide	106-93-4	1.20E-05	24	EF	Average	100%
							Formaldehyde	50-00-0	2.02E-03	24	EF	Average	99%
							Tetrachloroethene	127-18-4	2.42E-04	24	EF	Average	100%
							Toluene	108-88-3	2.14E-03	24	EF	Average	96%
							Trichloroethane, 1,1,1 -	71-55-6	6.08E-05	24	EF	Average	100%
							Trichloroethene	86-42-0	2.10E-05	24	EF	Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	2.10E-05	24	EF	Average	100%
							Trichlorofluoromethane	75-69-4	7.34E-03	24	EF	Average	100%
							Vinyl chloride	75-01-4	1.86E-03	24	EF	Average	100%
							Xylenes, m-, p- and o-	1330-20-7	2.57E-02	24, 10 min	EF	Average	100%
1B	Main Stack - Normal Operation - One Train Only	26.13	132.2	1.7	87.6	(680538, 4860346)	Carbon Monoxide	630-08-0	9.59E-01	1	EC	Above-Average	100%
							Sulphur Dioxide	7446-09-5	7.47E-01	1, 24	EC	Above-Average	100%
							Total Particulate Matter	N/A	4.78E-01	24	EC	Above-Average	100%
							Filterable TSP	N/A	1.92E-01	24	EC	Above-Average	100%
							PM10	N/A	4.78E-01	24	EC	Above-Average	100%
							PM2.5	N/A	4.48E-01	24	EC	Above-Average	100%
							VOCs as CH4	N/A	1.04E+00	24	EC	Above-Average	100%
							Lead	7439-92-1	1.07E-03	24, 30 days	EC	Above-Average	100%
							Cadmium	7440-43-9	1.49E-04	24	EC	Above-Average	100%
							Mercury	7439-97-6	3.20E-04	24	EC	Above-Average	100%
							Hydrogen Fluoride	7664-39-3	1.92E-02	24, 30 days	EC	Above-Average	100%

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Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							PCDD (I-TEQ)	N/A	1.28E-09	1, 24	EC	Above-Average	100%
							Hydrogen Chloride	7647-01-0	1.92E-01	24	EC	Above-Average	100%
							Ammonia	7664-41-7	2.11E-01	24	EC	Above-Average	100%
							Nitrogen Oxides	10102-44-0	2.57E+00	1, 24	EC	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	1.54E-06	1, 24	EF	Average	100%
							Aluminum	7429-90-5	8.47E-04	24	EF	Average	100%
							Antimony	7440-36-0	5.84E-05	24	EF	Average	100%
							Arsenic	7440-38-2	8.95E-06	24	EF	Average	100%
							Barium	7440-39-3	4.51E-05	24	EF	Average	100%
							Beryllium	7440-41-7	7.10E-06	24	EF	Average	100%
							Boron	7440-42-8	3.26E-03	24	EF	Average	100%
							Chromium (hexavalent)	18540-29-9	6.82E-06	24	EF	Average	100%
							Total Chromium (and compounds)	7440-47-3	4.79E-05	24	EF	Average	100%
							Cobalt	7440-48-4	1.23E-04	24	EF	Average	100%
							Nickel	7440-02-0	1.86E-03	24	EF	Average	100%
							Phosphorus	7723-14-0	9.81E-04	24	EF	Average	100%
							Silver	7440-22-4	7.14E-05	24	EF	Average	100%
							Selenium	7782-49-2	1.02E-05	24	EF	Average	100%
							Thallium	7440-28-0	8.31E-04	24	EF	Average	100%
							Tin	7440-31-5	3.75E-04	24	EF	Average	100%
							Vanadium	7440-62-2	2.48E-05	24	EF	Average	100%
							Zinc	7440-66-6	4.25E-03	24	EF	Average	100%
							1,2-Dichlorobenzene	95-50-1	4.36E-05	1	EF	Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	1.10E-06	24	EF	Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	1.10E-06	24	EF	Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	3.70E-06	24	EF	Average	100%
							2,4,6-Trichlorophenol	88-06-2	1.12E-06	24	EF	Average	100%
							2,4-Dichlorophenol	120-83-2	2.19E-06	24	EF	Average	100%
							Pentachlorophenol	87-86-5	4.39E-06	24	EF	Average	100%
							Hexachlorobenzene	118-74-1	1.10E-06	24	EF	Average	100%
							Pentachlorobenzene	608-93-5	2.88E-06	24	EF	Average	100%
							Acenaphthylene	208-96-8	3.09E-07	24	EF	Average	100%
							Acenaphthene	83-32-9	3.96E-07	24	EF	Average	100%
							Anthracene	120-12-7	8.67E-08	24	EF	Average	100%
							Benzo(a)anthracene	56-55-3	3.20E-08	24	EF	Average	100%
							Benzo(b)fluoranthene	205-99-2	8.16E-08	24	EF	Average	100%
							Benzo(k)fluoranthene	207-08-9	2.15E-08	24	EF	Average	100%
							Benzo(a)fluorene	238-84-6	5.89E-07	24	EF	Average	100%
							Benzo(b)fluorene	243-17-4	4.03E-07	24	EF	Average	100%
							Benzo(ghi)perylene	191-24-2	8.80E-07	24	EF	Average	100%
							Benzo(a)pyrene	50-32-8	7.33E-08	24	EF	Average	100%
							Benzo(e)pyrene	192-97-2	1.86E-07	24	EF	Average	100%
							Biphenyl	92-51-3	6.36E-05	1	EF	Average	100%
							Chrysene	218-01-9	8.03E-08	24	EF	Average	100%
							Dibenzo(a,c)anthracene	215-58-7	5.71E-07	24	EF	Average	100%
							Dibenzo(a,h)anthracene	53-70-3	2.58E-08	24	EF	Average	100%
							Fluoranthene	206-44-0	8.86E-07	24	EF	Average	100%
							Fluorine	86-73-7	6.67E-07	24	EF	Average	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.61E-07	24	EF	Average	100%
							1 – methylnaphthalene	90-12-0	2.09E-06	24	EF	Average	100%
							2 – methylnaphthalene	91-57-6	1.16E-05	24	EF	Average	100%

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Naphthalene	91-20-3	9.01E-06	24, 10 min	EF	Average	100%
							Perylene	198-55-0	3.22E-08	24	EF	Average	100%
							Phenanthrene	85-01-8	2.02E-06	24	EF	Average	100%
							Pyrene	129-00-0	1.07E-06	24	EF	Average	100%
							Tetralin	119-64-2	1.06E-05	24	EF	Average	100%
							O-terphenyl	84-15-1	1.74E-06	24	EF	Average	100%
							Acetaldehyde	75-07-0	1.07E-08	½, 24	EF	Average	100%
							Benzene	71-43-2	6.61E-04	24	EF	Average	100%
							Bromodichloromethane	75-27-4	3.75E-03	24	EF	Average	100%
							Bromoform	75-25-2	1.03E-03	24	EF	Average	100%
							Bromomethane	74-83-9	7.67E-04	24	EF	Average	100%
							Carbon tetrachloride	56-23-5	6.39E-06	24	EF	Average	100%
							Chloroform	67-66-3	1.09E-05	24	EF	Average	100%
							Dichlorodifluoromethane	75-71-8	1.86E-03	24	EF	Average	100%
							Dichloroethene, 1,1 -	75-34-3	1.20E-05	24	EF	Average	100%
							Dichloromethane	75-09-2	3.75E-03	24	EF	Average	100%
							Ethylbenzene	100-41-4	2.21E-05	24	EF	Average	100%
							Ethylene Dibromide	106-93-4	6.02E-06	24	EF	Average	100%
							Formaldehyde	50-00-0	1.01E-03	24	EF	Average	100%
							Tetrachloroethene	127-18-4	1.21E-04	24	EF	Average	100%
							Toluene	108-88-3	1.07E-03	24	EF	Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	3.04E-05	24	EF	Average	100%
							Trichloroethene	86-42-0	1.05E-05	24	EF	Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	1.05E-05	24	EF	Average	100%
							Trichlorofluoromethane	75-69-4	3.67E-03	24	EF	Average	100%
							Vinyl chloride	75-01-4	9.29E-04	24	EF	Average	100%
							Xylenes, m-, p- and o-	1330-20-7	1.29E-02	24, 10 min	EF	Average	100%
1C	Main Stack - Start Up - Phase 2 - Two Trains	39.08	132	1.7	87.6	(680538, 4860346)	Carbon Monoxide	630-08-0	1.95E+00	½	EC, EF	Above-Average	100%
							Sulphur Dioxide	7446-09-5	8.99E-01	1, 24	EC, EF	Above-Average	100%
							Total Particulate Matter	N/A	5.93E-01	24	EC, EF	Marginal	100%
							Filterable TSP	N/A	2.25E-01	24	EC, EF	Above-Average	100%
							PM10	N/A	5.93E-01	24	EC, EF	Marginal	100%
							PM2.5	N/A	5.61E-01	24	EC, EF	Marginal	100%
							VOCs as CH4	N/A	1.17E+00	24	EC, EF	Average	100%
							Lead	7439-92-1	1.14E-03	24, 30 days	EC, EF	Marginal	100%
							Cadmium	7440-43-9	1.71E-04	24	EC, EF	Marginal	100%
							Mercury	7439-97-6	3.44E-04	24	EC, EF	Marginal	100%
							Hydrogen Fluoride	7664-39-3	2.04E-02	24, 30 days	EC, EF	Average	100%
							PCDD	N/A	1.36E-09	1, 24	EC, EF	Average	100%
							Hydrogen Chloride	7647-01-0	2.04E-01	24	EC, EF	Average	100%
							Ammonia	7664-41-7	2.25E-01	24	EC, EF	Average	100%
							Nitrogen Oxides	10102-44-0	3.16E+00	1, 24	EC, EF	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	1.64E-06	1, 24	EF	Average	100%
							Aluminum	7429-90-5	9.03E-04	24	EF	Average	100%
							Arsenic	7440-36-0	6.45E-05	24	EF	Marginal	100%
							Antimony	7440-38-2	9.54E-06	24	EF	Average	100%
							Barium	7440-39-3	9.67E-05	24	EF	Marginal	100%
							Beryllium	7440-41-7	7.70E-06	24	EF	Marginal	100%
							Boron	7440-42-8	3.48E-03	24	EF	Average	100%
							Chromium (hexavalent)	18540-29-9	2.28E-05	24	EF	Above-Average	100%

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Total Chromium (and compounds)	7440-47-3	6.66E-05	24	EF	Marginal	100%
							Cobalt	7440-48-4	1.33E-04	24	EF	Marginal	100%
							Nickel	7440-02-0	2.00E-03	24	EF	Average	100%
							Phosphorus	7723-14-0	1.05E-03	24	EF	Average	100%
							Silver	7440-22-4	7.61E-05	24	EF	Average	100%
							Selenium	7782-49-2	1.12E-05	24	EF	Marginal	100%
							Thallium	7440-28-0	8.86E-04	24	EF	Average	100%
							Tin	7440-31-5	4.00E-04	24	EF	Average	100%
							Vanadium	7440-62-2	5.19E-05	24	EF	Marginal	100%
							Zinc	7440-66-6	4.85E-03	24	EF	Marginal	100%
							1,2-Dichlorobenzene	95-50-1	4.65E-05	1	EF	Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	1.17E-06	24	EF	Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	1.17E-06	24	EF	Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	3.95E-06	24	EF	Average	100%
							2,4,6-Trichlorophenol	88-06-2	1.19E-06	24	EF	Average	100%
							2,4-Dichlorophenol	120-83-2	2.34E-06	24	EF	Average	100%
							Pentachlorophenol	87-86-5	4.68E-06	24	EF	Average	100%
							Hexachlorobenzene	118-74-1	1.17E-06	24	EF	Average	100%
							Pentachlorobenzene	608-93-5	3.07E-06	24	EF	Average	100%
							Acenaphthylene	208-96-8	3.49E-07	24	EF	Marginal	100%
							Acenaphthene	83-32-9	4.42E-07	24	EF	Marginal	100%
							Anthracene	120-12-7	1.19E-07	24	EF	Marginal	100%
							Benzo(a)anthracene	56-55-3	5.40E-08	24	EF	Marginal	100%
							Benzo(b)fluoranthene	205-99-2	1.07E-07	24	EF	Marginal	100%
							Benzo(k)fluoranthene	207-08-9	4.29E-08	24	EF	Marginal	100%
							Benzo(a)fluorene	238-84-6	6.28E-07	24	EF	Average	100%
							Benzo(b)fluorene	243-17-4	4.30E-07	24	EF	Average	100%
							Benzo(ghi)perylene	191-24-2	9.51E-07	24	EF	Marginal	100%
							Benzo(a)pyrene	50-32-8	9.14E-08	24	EF	Marginal	100%
							Benzo(e)pyrene	192-97-2	1.98E-07	24	EF	Average	100%
							Biphenyl	92-51-3	6.78E-05	1	EF	Average	100%
							Chrysene	218-01-9	1.06E-07	24	EF	Marginal	100%
							Dibenzo(a,c)anthracene	215-58-7	6.09E-07	24	EF	Average	100%
							Dibenzo(a,h)anthracene	53-70-3	4.08E-08	24	EF	Marginal	100%
							Fluoranthene	206-44-0	9.78E-07	24	EF	Marginal	100%
							Fluorine	86-73-7	7.11E-07	24	EF	Marginal	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.91E-07	24	EF	Marginal	100%
							1 – Methylnaphthalene	90-12-0	2.23E-06	24	EF	Average	100%
							2 – Methylnaphthalene	91-57-6	1.26E-05	24	EF	Marginal	100%
							Naphthalene	91-20-3	1.64E-05	24, 10 min	EF	Marginal	100%
							Perylene	198-55-0	3.43E-08	24	EF	Average	100%
							Phenanthrene	85-01-8	2.34E-06	24	EF	Marginal	100%
							Pyrene	129-00-0	1.20E-06	24	EF	Marginal	100%
							Tetralin	119-64-2	1.13E-05	24	EF	Average	100%
							O-terphenyl	84-15-1	1.86E-06	24	EF	Average	100%
							Acetaldehyde	75-07-0	1.43E-08	½, 24	EF	Average	100%
							Benzene	71-43-2	7.27E-04	24	EF	Average	100%
							Bromodichloromethane	75-27-4	5.00E-03	24	EF	Average	100%
							Bromoform	75-25-2	1.37E-03	24	EF	Average	100%
							Bromomethane	74-83-9	8.18E-04	24	EF	Average	100%
							Carbon tetrachloride	56-23-5	8.52E-06	24	EF	Average	100%
							Chloroform	67-66-3	1.16E-05	24	EF	Average	100%

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Dichlorodifluoromethane	75-71-8	1.98E-03	24	EF	Average	100%
							Dichloroethene, 1,1 -	75-34-3	1.28E-05	24	EF	Average	100%
							Dichloromethane	75-09-2	4.00E-03	24	EF	Average	100%
							Ethylbenzene	100-41-4	2.35E-05	24	EF	Average	100%
							Ethylene Dibromide	106-93-4	8.02E-06	24	EF	Average	100%
							Formaldehyde	50-00-0	1.91E-03	24	EF	Average	100%
							Tetrachloroethene	127-18-4	1.29E-04	24	EF	Average	100%
							Toluene	108-88-3	1.18E-03	24	EF	Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	3.24E-05	24	EF	Average	100%
							Trichloroethene	86-42-0	1.12E-05	24	EF	Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	1.12E-05	24	EF	Average	100%
							Trichlorofluoromethane	75-69-4	3.91E-03	24	EF	Average	100%
							Vinyl chloride	75-01-4	9.91E-04	24	EF	Average	100%
							Xylenes, m-, p- and o-	1330-20-7	1.37E-02	24, 10 min	EF	Average	100%
							Nitrous Oxides	10024-97-2	8.85E-03	24	EF	Marginal	100%
							3-Methylchloranthene	56-49-5	1.99E-08	24	EF	Marginal	100%
							7,12-Dimethylbenz(a)anthracene	57-97-6	1.77E-07	24	EF	Marginal	100%
							Butane	106-97-8	2.32E-02	24	EF	Marginal	100%
							Dichlorobenzene	25321-22-6	1.33E-05	24	EF	Marginal	100%
							Ethane	74-84-0	3.43E-02	24	EF	Marginal	100%
							Fluorene	86-73-7	3.10E-08	24	EF	Marginal	100%
							Hexane	110-54-3	1.99E-02	24	EF	Marginal	100%
							Pentane	109-66-0	2.88E-02	24	EF	Marginal	100%
							Propane	74-98-6	1.77E-02	24	EF	Marginal	100%
							Copper	7440-50-8	9.41E-06	24	EF	Marginal	100%
							Manganese	7439-96-5	4.21E-06	24	EF	Marginal	100%
							Molybdenum	7439-98-7	1.22E-05	24	EF	Marginal	100%
1D	Main Stack - Start Up - Phase 2 - One Train Only	19.54	132	1.7	87.6	(680538, 4860346)	Carbon Monoxide	630-08-0	9.76E-01	½	EC, EF	Above-Average	100%
							Sulphur Dioxide	7446-09-5	4.49E-01	1, 24	EC, EF	Above-Average	100%
							Total Particulate Matter	N/A	2.97E-01	24	EC, EF	Marginal	100%
							Filterable TSP	N/A	1.13E-01	24	EC, EF	Above-Average	100%
							PM10	N/A	2.97E-01	24	EC, EF	Marginal	100%
							PM2.5	N/A	2.81E-01	24	EC, EF	Marginal	100%
							VOCs as CH4	N/A	5.87E-01	24	EC, EF	Average	100%
							Lead	7439-92-1	5.71E-04	24, 30 days	EC, EF	Marginal	100%
							Cadmium	7440-43-9	8.56E-05	24	EC, EF	Marginal	100%
							Mercury	7439-97-6	1.72E-04	24	EC, EF	Marginal	100%
							Hydrogen Fluoride	7664-39-3	1.02E-02	24, 30 days	EC, EF	Average	100%
							PCDD	N/A	6.81E-10	1, 24	EC, EF	Average	100%
							Hydrogen Chloride	7647-01-0	1.02E-01	24	EC, EF	Average	100%
							Ammonia	7664-41-7	1.12E-01	24	EC, EF	Average	100%
							Nitrogen Oxides	10102-44-0	1.58E+00	1, 24	EC, EF	Above-Average	100%
							Polychlorinated Biphenyls (PCB)	N/A	8.20E-07	1, 24	EF	Average	100%
							Aluminum	7429-90-5	4.51E-04	24	EF	Average	100%
							Arsenic	7440-36-0	3.22E-05	24	EF	Marginal	100%
							Antimony	7440-38-2	4.77E-06	24	EF	Average	100%
							Barium	7440-39-3	4.84E-05	24	EF	Marginal	100%
							Beryllium	7440-41-7	3.85E-06	24	EF	Marginal	100%
							Boron	7440-42-8	1.74E-03	24	EF	Average	100%

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Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Chromium (hexavalent)	18540-29-9	1.14E-05	24	EF	Above-Average	100%
							Total Chromium (and compounds)	7440-47-3	3.33E-05	24	EF	Marginal	100%
							Cobalt	7440-48-4	6.63E-05	24	EF	Marginal	100%
							Nickel	7440-02-0	1.00E-03	24	EF	Average	100%
							Phosphorus	7723-14-0	5.23E-04	24	EF	Average	100%
							Silver	7440-22-4	3.81E-05	24	EF	Average	100%
							Selenium	7782-49-2	5.58E-06	24	EF	Marginal	100%
							Thallium	7440-28-0	4.43E-04	24	EF	Average	100%
							Tin	7440-31-5	2.00E-04	24	EF	Average	100%
							Vanadium	7440-62-2	2.59E-05	24	EF	Marginal	100%
							Zinc	7440-66-6	2.43E-03	24	EF	Marginal	100%
							1,2-Dichlorobenzene	95-50-1	2.32E-05	1	EF	Average	100%
							1,2,4,5-Tetrachlorobenzene	95-94-3	5.85E-07	24	EF	Average	100%
							1,2,4 – Trichlorobenzene	120-82-1	5.85E-07	24	EF	Average	100%
							2,3,4,6-Tetrachlorophenol	58-90-2	1.97E-06	24	EF	Average	100%
							2,4,6-Trichlorophenol	88-06-2	5.94E-07	24	EF	Average	100%
							2,4-Dichlorophenol	120-83-2	1.17E-06	24	EF	Average	100%
							Pentachlorophenol	87-86-5	2.34E-06	24	EF	Average	100%
							Hexachlorobenzene	118-74-1	5.85E-07	24	EF	Average	100%
							Pentachlorobenzene	608-93-5	1.54E-06	24	EF	Average	100%
							Acenaphthylene	208-96-8	1.75E-07	24	EF	Marginal	100%
							Acenaphthene	83-32-9	2.21E-07	24	EF	Marginal	100%
							Anthracene	120-12-7	5.95E-08	24	EF	Marginal	100%
							Benzo(a)anthracene	56-55-3	2.70E-08	24	EF	Marginal	100%
							Benzo(b)fluoranthene	205-99-2	5.35E-08	24	EF	Marginal	100%
							Benzo(k)fluoranthene	207-08-9	2.14E-08	24	EF	Marginal	100%
							Benzo(a)fluorene	238-84-6	3.14E-07	24	EF	Average	100%
							Benzo(b)fluorene	243-17-4	2.15E-07	24	EF	Average	100%
							Benzo(ghi)perylene	191-24-2	4.76E-07	24	EF	Marginal	100%
							Benzo(a)pyrene	50-32-8	4.57E-08	24	EF	Marginal	100%
							Benzo(e)pyrene	192-97-2	9.89E-08	24	EF	Average	100%
							Biphenyl	92-51-3	3.39E-05	1	EF	Average	100%
							Chrysene	218-01-9	5.28E-08	24	EF	Marginal	100%
							Dibenzo(a,c)anthracene	215-58-7	3.04E-07	24	EF	Average	100%
							Dibenzo(a,h)anthracene	53-70-3	2.04E-08	24	EF	Marginal	100%
							Fluoranthene	206-44-0	4.89E-07	24	EF	Marginal	100%
							Fluorine	86-73-7	3.56E-07	24	EF	Marginal	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	9.56E-08	24	EF	Marginal	100%
							1 – Methylnaphthalene	90-12-0	1.12E-06	24	EF	Average	100%
							2 – Methylnaphthalene	91-57-6	6.31E-06	24	EF	Marginal	100%
							Naphthalene	91-20-3	8.18E-06	24, 10 min	EF	Marginal	100%
							Perylene	198-55-0	1.72E-08	24	EF	Average	100%
							Phenanthrene	85-01-8	1.17E-06	24	EF	Marginal	100%
							Pyrene	129-00-0	5.98E-07	24	EF	Marginal	100%
							Tetralin	119-64-2	5.66E-06	24	EF	Average	100%
							O-terphenyl	84-15-1	9.29E-07	24	EF	Average	100%
							Acetaldehyde	75-07-0	7.17E-09	½, 24	EF	Average	100%
							Benzene	71-43-2	3.64E-04	24	EF	Average	100%
							Bromodichloromethane	75-27-4	2.50E-03	24	EF	Average	100%
							Bromoform	75-25-2	6.84E-04	24	EF	Average	100%
							Bromomethane	74-83-9	4.09E-04	24	EF	Average	100%
							Carbon tetrachloride	56-23-5	4.26E-06	24	EF	Average	100%

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Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Chloroform	67-66-3	5.79E-06	24	EF	Average	100%
							Dichlorodifluoromethane	75-71-8	9.89E-04	24	EF	Average	100%
							Dichloroethene, 1,1 -	75-34-3	6.42E-06	24	EF	Average	100%
							Dichloromethane	75-09-2	2.00E-03	24	EF	Average	100%
							Ethylbenzene	100-41-4	1.18E-05	24	EF	Average	100%
							Ethylene Dibromide	106-93-4	4.01E-06	24	EF	Average	100%
							Formaldehyde	50-00-0	9.54E-04	24	EF	Average	100%
							Tetrachloroethene	127-18-4	6.44E-05	24	EF	Average	100%
							Toluene	108-88-3	5.90E-04	24	EF	Average	100%
							Trichloroethane, 1,1,1 -	71-55-6	1.62E-05	24	EF	Average	100%
							Trichloroethene	86-42-0	5.58E-06	24	EF	Average	100%
							Trichloroethylene, 1,1,2 -	79-01-6	5.58E-06	24	EF	Average	100%
							Trichlorofluoromethane	75-69-4	1.96E-03	24	EF	Average	100%
							Vinyl chloride	75-01-4	4.95E-04	24	EF	Average	100%
							Xylenes, m-, p- and o-	1330-20-7	6.86E-03	24, 10 min	EF	Average	100%
							Nitrous Oxides	10024-97-2	4.43E-03	24	EF	Marginal	100%
							3-Methylchloranthene	56-49-5	9.96E-09	24	EF	Marginal	100%
							7,12-Dimethylbenz(a)anthracene	57-97-6	8.85E-08	24	EF	Marginal	100%
							Butane	106-97-8	1.16E-02	24	EF	Marginal	100%
							Dichlorobenzene	25321-22-6	6.64E-06	24	EF	Marginal	100%
							Ethane	74-84-0	1.72E-02	24	EF	Marginal	100%
							Fluorene	86-73-7	1.55E-08	24	EF	Marginal	100%
							Hexane	110-54-3	9.96E-03	24	EF	Marginal	100%
							Pentane	109-66-0	1.44E-02	24	EF	Marginal	100%
							Propane	74-98-6	8.85E-03	24	EF	Marginal	100%
							Copper	7440-50-8	4.70E-06	24	EF	Marginal	100%
							Manganese	7439-96-5	2.10E-06	24	EF	Marginal	100%
							Molybdenum	7439-98-7	6.09E-06	24	EF	Marginal	100%
1E	Main Stack - Start Up - Phase 1 - Two Trains	14.05	132	1.7	87.6	(680538, 4860346)	Carbon Monoxide	630-08-0	1.16E+00	1	EF	Above-Average	100%
							Nitrogen Oxides	10102-44-0	5.26E-01	½	EF	Above-Average	100%
							Sulphur Dioxide	7446-09-5	1.03E-01	1, 24	EF	Above-Average	100%
							Total Particulate Matter	N/A	1.05E-01	1, 24	EF	Marginal	100%
							Filterable TSP	N/A	2.63E-02	24	EF	Above-Average	100%
							PM10	N/A	1.05E-01	24	EF	Marginal	100%
							PM2.5	N/A	1.05E-01	24	EF	Marginal	100%
							Lead	7439-92-1	6.92E-06	1, 24	EF	Marginal	100%
							Cadmium	7440-43-9	1.52E-05	24	EF	Marginal	100%
							Mercury	7439-97-6	3.60E-06	24	EF	Marginal	100%
							Nitrous Oxides	10024-97-2	8.85E-03	24	EF	Marginal	100%
							2 – Methylnaphthalene	91-57-6	3.32E-07	½, 24	EF	Marginal	100%
							3-Methylchloranthene	56-49-5	2.49E-08	24	EF	Marginal	100%
							7,12-Dimethylbenz(a)anthracene	57-97-6	2.21E-07	24	EF	Marginal	100%
							Acenaphthene	83-32-9	2.49E-08	24	EF	Marginal	100%
							Acenaphthylene	208-96-8	2.49E-08	24	EF	Marginal	100%
							Anthracene	120-12-7	3.32E-08	24	EF	Marginal	100%
							Benzo(a)anthracene	56-55-3	2.49E-08	24	EF	Marginal	100%
							Benzene	71-43-2	2.91E-05	24	EF	Above-Average	100%
							Benzo(a)pyrene	50-32-8	1.66E-08	½, 24	EF	Marginal	100%
							Benzo(b)fluoranthene	205-99-2	2.49E-08	½, 24	EF	Marginal	100%

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Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Benzo(ghi)perylene	191-24-2	1.66E-08	24	EF	Marginal	100%
							Benzo(k)fluoranthene	205-82-3	2.49E-08	24	EF	Marginal	100%
							Butane	106-97-8	2.91E-02	24	EF	Marginal	100%
							Chrysene	218-01-9	2.49E-08	24	EF	Marginal	100%
							Dibenzo(a,h)anthracene	53-70-3	1.66E-08	24	EF	Marginal	100%
							Dichlorobenzene	25321-22-6	1.66E-05	24	EF	Marginal	100%
							Ethane	74-84-0	4.29E-02	24	EF	Marginal	100%
							Fluoranthene	206-44-0	4.15E-08	24	EF	Marginal	100%
							Fluorene	86-73-7	3.87E-08	24	EF	Marginal	100%
							Formaldehyde	50-00-0	1.04E-03	24	EF	Above-Average	100%
							Hexane	110-54-3	2.49E-02	24	EF	Marginal	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	2.49E-08	24	EF	Marginal	100%
							Naphthalene	91-20-3	8.44E-06	24	EF	Marginal	100%
							Pentane	109-66-0	3.60E-02	24	EF	Marginal	100%
							Phenanthrene	85-01-8	2.35E-07	24	EF	Marginal	100%
							Propane	74-98-6	2.21E-02	24	EF	Marginal	100%
							Pyrene	129-00-0	6.92E-08	24	EF	Marginal	100%
							Toluene	108-88-3	4.70E-05	24	EF	Average	100%
							Arsenic	7440-38-2	2.77E-06	24	EF	Marginal	100%
							Barium	7440-39-3	6.09E-05	24	EF	Marginal	100%
							Beryllium	7440-41-7	1.66E-07	24	EF	Marginal	100%
							Chromium (hexavalent)	7440-47-3	1.94E-05	24	EF	Marginal	100%
							Total Chromium (and compounds)	7440-47-3	1.94E-05	24	EF	Marginal	100%
							Cobalt	7440-48-4	1.16E-06	24	EF	Marginal	100%
							Copper	7440-50-8	1.18E-05	24	EF	Marginal	100%
							Manganese	7439-96-5	5.26E-06	24	EF	Marginal	100%
							Molybdenum	7439-98-7	1.52E-05	24	EF	Marginal	100%
							Nickel	7440-02-0	2.91E-05	24	EF	Marginal	100%
							Selenium	7782-49-2	3.32E-07	24	EF	Marginal	100%
							Vanadium	7440-62-2	3.18E-05	24	EF	Marginal	100%
							Zinc	7440-66-6	4.01E-04	24	EF	Marginal	100%
1F	Main Stack - Start Up - Phase 1 - One Train Only	7.02	132	1.7	87.6	(680538, 4860346)	Carbon Monoxide	630-08-0	5.81E-01	1	EF	Above-Average	100%
							Nitrogen Oxides	10102-44-0	2.63E-01	½	EF	Above-Average	100%
							Sulphur Dioxide	7446-09-5	5.14E-02	1, 24	EF	Above-Average	100%
							Total Particulate Matter	N/A	5.26E-02	24	EF	Marginal	100%
							Filterable TSP	N/A	1.31E-02	24	EF	Above-Average	100%
							PM10	N/A	5.26E-02	24	EF	Marginal	100%
							PM2.5	N/A	5.26E-02	24	EF	Marginal	100%
							Lead	7439-92-1	3.46E-06	1, 24	EF	Marginal	100%
							Cadmium	7440-43-9	7.61E-06	24	EF	Marginal	100%
							Mercury	7439-97-6	1.80E-06	24	EF	Marginal	100%
							Nitrous Oxides	10024-97-2	4.43E-03	24	EF	Marginal	100%
							2 – Methylnaphthalene	91-57-6	1.66E-07	½, 24	EF	Marginal	100%
							3-Methylchloranthene	56-49-5	1.25E-08	24	EF	Marginal	100%
							7,12-Dimethylbenz(a)anthracene	57-97-6	1.11E-07	24	EF	Marginal	100%
							Acenaphthene	83-32-9	1.25E-08	24	EF	Marginal	100%
							Acenaphthylene	208-96-8	1.25E-08	24	EF	Marginal	100%
							Anthracene	120-12-7	1.66E-08	24	EF	Marginal	100%
							Benzo(a)anthracene	56-55-3	1.25E-08	24	EF	Marginal	100%

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Benzene	71-43-2	1.45E-05	24	EF	Above-Average	100%
							Benzo(a)pyrene	50-32-8	8.30E-09	½, 24	EF	Marginal	100%
							Benzo(b)fluoranthene	205-99-2	1.25E-08	½, 24	EF	Marginal	100%
							Benzo(ghi)perylene	191-24-2	8.30E-09	24	EF	Marginal	100%
							Benzo(k)fluoranthene	205-82-3	1.25E-08	24	EF	Marginal	100%
							Butane	106-97-8	1.45E-02	24	EF	Marginal	100%
							Chrysene	218-01-9	1.25E-08	24	EF	Marginal	100%
							Dibenzo(a,h)anthracene	53-70-3	8.30E-09	24	EF	Marginal	100%
							Dichlorobenzene	25321-22-6	8.30E-06	24	EF	Marginal	100%
							Ethane	74-84-0	2.14E-02	24	EF	Marginal	100%
							Fluoranthene	206-44-0	2.08E-08	24	EF	Marginal	100%
							Fluorene	86-73-7	1.94E-08	24	EF	Marginal	100%
							Formaldehyde	50-00-0	5.19E-04	24	EF	Above-Average	100%
							Hexane	110-54-3	1.25E-02	24	EF	Marginal	100%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.25E-08	24	EF	Marginal	100%
							Naphthalene	91-20-3	4.22E-06	24	EF	Marginal	100%
							Pentane	109-66-0	1.80E-02	24	EF	Marginal	100%
							Phenanthrene	85-01-8	1.18E-07	24	EF	Marginal	100%
							Propane	74-98-6	1.11E-02	24	EF	Marginal	100%
							Pyrene	129-00-0	3.46E-08	24	EF	Marginal	100%
							Toluene	108-88-3	2.35E-05	24	EF	Average	100%
							Arsenic	7440-38-2	1.38E-06	24	EF	Marginal	100%
							Barium	7440-39-3	3.04E-05	24	EF	Marginal	100%
							Beryllium	7440-41-7	8.30E-08	24	EF	Marginal	100%
							Chromium (hexavalent)	7440-47-3	9.68E-06	24	EF	Marginal	100%
							Total Chromium (and compounds)	7440-47-3	9.68E-06	24	EF	Marginal	100%
							Cobalt	7440-48-4	5.81E-07	24	EF	Marginal	100%
							Copper	7440-50-8	5.88E-06	24	EF	Marginal	100%
							Manganese	7439-96-5	2.63E-06	24	EF	Marginal	100%
							Molybdenum	7439-98-7	7.61E-06	24	EF	Marginal	100%
							Nickel	7440-02-0	1.45E-05	24	EF	Marginal	100%
							Selenium	7782-49-2	1.66E-07	24	EF	Marginal	100%
							Vanadium	7440-62-2	1.59E-05	24	EF	Marginal	100%
							Zinc	7440-66-6	2.01E-04	24	EF	Marginal	100%
1G	Main Stack - fans only	23.61	20	1.7	87.6	(680538, 4860346)	Odour	N/A	1.83E+03	10-min	ST	Above-Average	100%
2	Silo Filling	0.31	Ambient	0.10	5.4864	(680551,4860359)	Total Particulate Matter	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM10	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM2.5	N/A	1.07E-02	24	EC	Above-Average	<1%
		0.31	Ambient	0.10	4.8768	(680513,4860332)	Total Particulate Matter	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM10	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM2.5	N/A	1.07E-02	24	EC	Above-Average	<1%
		0.31	Ambient	0.10	3.9624	(680517,4860333)	Total Particulate Matter	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM10	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM2.5	N/A	1.07E-02	24	EC	Above-Average	<1%
		0.31	Ambient	0.10	12.4	(680537,4860391)	Total Particulate Matter	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM10	N/A	1.07E-02	24	EC	Above-Average	<1%
							PM2.5	N/A	1.07E-02	24	EC	Above-Average	<1%
3	Stand-by generator	1.16	265.85	0.2	3	(680475,4860419)	Carbon Monoxide	630-08-0	2.56E-01	½	EF	Marginal	12%
							Nitrogen Oxides	10102-44-0	1.12E+00	1, 24	EF	Marginal	18%
							Sulphur Dioxide	7446-09-5	1.88E-02	1, 24	EF	Above-Average	1%

Table 2
Source Summary Table

Source Identifier	Source Description	Source Parameters					Emission Data						
		Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [x, y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
							Total Particulate Matter	N/A	3.25E-02	24	EF	Above-Average	3%
							Filterable TSP	N/A	2.03E-02	24	EF	Above-Average	5%
							PM10	N/A	1.88E-02	24	EF	Above-Average	2%
							PM2.5	N/A	1.88E-02	24	EF	Above-Average	2%
							Benzene	71-43-2	2.54E-04	½, 24	EF	Marginal	16%
							Toluene	108-88-3	9.21E-05	24	EF	Marginal	4%
							Xylenes, m-, p- and o-	1330-20-7	6.32E-05	10-min, 24	EF	Marginal	<1%
							Formaldehyde	50-00-0	2.58E-05	24	EF	Marginal	1%
							Acetaldehyde	75-07-0	8.26E-06	½, 24	EF	Marginal	100%
							Naphthalene	91-20-3	4.26E-05	24	EF	Marginal	70%
							Acenaphthylene	208-96-8	3.02E-06	24	EF	Marginal	83%
							Acenaphthene	83-32-9	1.53E-06	24	EF	Marginal	66%
							Fluorene	86-73-7	4.19E-06	24	EF	Marginal	76%
							Phenanthrene	85-01-8	1.34E-05	24	EF	Marginal	77%
							Anthracene	120-12-7	4.03E-07	24	EF	Marginal	70%
							Fluoranthene	206-44-0	1.32E-06	24	EF	Marginal	43%
							Pyrene	129-00-0	1.22E-06	24	EF	Marginal	36%
							Benzo(a)anthracene	56-55-3	2.04E-07	24	EF	Marginal	76%
							Chrysene	218-01-9	5.01E-07	24	EF	Marginal	76%
							Benzo(b)fluoranthene	205-99-2	3.64E-07	24	EF	Marginal	69%
							Benzo(k)fluoranthene	207-08-9	7.14E-08	24	EF	Marginal	62%
							Benzo(a)pyrene	50-32-8	8.42E-08	½, 24	EF	Marginal	36%
							Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	24	EF	Marginal	30%
							Dibenzo(a,h)anthracene	53-70-3	1.13E-07	24	EF	Marginal	69%
							Benzo(ghi)perylene	191-24-2	1.82E-07	24	EF	Marginal	9%

Notes:

"V-ST" - Validated Source Test, "ST" - Source Test, "EF" - Emission Factor, "MB" Mass Balance, "EC" - Engineering Calculation
Data Quality Categories: "Highest"; "Above-Average"; "Average"; and "Marginal"

Table 3
Dispersion Modelling Input Summary Table

Relevant Section of the Regulation	Section Title	Summary of How the Approved Dispersion Model Was Used	Location of Supporting Documentation in ESDM Report
Section 8	Negligible Sources of Contaminants	Sources and contaminants that were considered negligible were explicitly identified, and therefore were not modelled in accordance with s.8 of O.Reg.419/05.	Section 3.0, Table 1
Section 9	Same Structure Contamination	Not applicable as the Facility is the only tenant occupying the building, and does not have a child care facility, health care facility, senior's residence, long-term care facility or an education facility located on-site.	N/A
Section 10	Operating Conditions	All equipment was assumed to be operating at the maximum production rates, simultaneously.	Section 4.0, Table 4
Section 11	Source of Contaminant Emission Rates	The emission rate for each significant contaminant emitted from a significant source was estimated, the methodology for the calculation is documented in Table 2 - Source Summary Table.	Section 4.0, Table 2
Section 12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	The operating conditions were estimated in accordance with s.10(1) 1 and s.11(1) 1 of O.Reg.419/05 and are therefore considered to result in the highest POI concentration that the Facility is capable of for each contaminant emitted.	Section 4.0
Section 13	Meteorological Conditions	Meteorological data used in this assessment was taken from the EA.	Section 6.0
Section 14	Area of Modelling Coverage (receptor locations)	The area of modelling coverage was selected to match the EA.	Section 6.0, Figure 7
Section 15	Stack Height for Certain New Sources of Contaminant	The stack height meets the GEP stack height.	N/A
Section 16	Terrain Data	Terrain data was taken from the EA.	Section 6.0, Figure 6
Section 17	Averaging Periods	1 hour, 24 hour and 30 day averaging periods were modelled. 10-minute and 1/2 hour averaging periods were calculated using table 4-1 of the ADMGO document.	Table 5

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
Stack 1 (Scenario A and H)	Main Stack - Normal Operation - Two Trains	Point	87.6	23.02	132.2	1.7	(680538, 4860346)	Carbon Monoxide	630-08-0	1.92E+00	1
								Sulphur Dioxide	7446-09-5	1.49E+00	1, 24
								Total Particulate Matter	N/A	9.55E-01	24
								Filterable TSP	N/A	3.84E-01	24
								PM10	N/A	9.55E-01	24
								PM2.5	N/A	8.95E-01	24
								VOCs as CH4	N/A	2.09E+00	24
								Lead	7439-92-1	2.13E-03	24, 30 days
								Cadmium	7440-43-9	2.98E-04	24
								Mercury	7439-97-6	6.39E-04	24
								Hydrogen Fluoride	7664-39-3	3.84E-02	24, 30 days
								PCDD (I-TEQ)	N/A	2.56E-09	1, 24
								Hydrogen Chloride	7647-01-0	3.84E-01	24
								Ammonia	7664-41-7	4.22E-01	24
								Nitrogen Oxides	10102-44-0	5.14E+00	1, 24
								Polychlorinated Biphenyls (PCB)	N/A	3.08E-06	1, 24
								Aluminum	7429-90-5	1.69E-03	24
								Antimony	7440-36-0	1.17E-04	24
								Arsenic	7440-38-2	1.79E-05	24
								Barium	7440-39-3	9.01E-05	24
								Beryllium	7440-41-7	1.42E-05	24
								Boron	7440-42-8	6.52E-03	24
								Chromium (hexavalent)	18540-29-9	1.36E-05	24
								Total Chromium (and compounds)	7440-47-3	9.59E-05	24
								Cobalt	7440-48-4	2.47E-04	24
								Nickel	7440-02-0	3.71E-03	24
								Phosphorus	7723-14-0	1.96E-03	24
								Silver	7440-22-4	1.43E-04	24
								Selenium	7782-49-2	2.05E-05	24
								Thallium	7440-28-0	1.66E-03	24
								Tin	7440-31-5	7.50E-04	24
								Vanadium	7440-62-2	4.96E-05	24
								Zinc	7440-66-6	8.50E-03	24
								1,2-Dichlorobenzene	95-50-1	8.72E-05	1
								1,2,4,5-Tetrachlorobenzene	95-94-3	2.19E-06	24
								1,2,4 – Trichlorobenzene	120-82-1	2.19E-06	24
								2,3,4,6-Tetrachlorophenol	58-90-2	7.41E-06	24
								2,4,6-Trichlorophenol	88-06-2	2.23E-06	24
								2,4-Dichlorophenol	120-83-2	4.39E-06	24
								Pentachlorophenol	87-86-5	8.79E-06	24
								Hexachlorobenzene	118-74-1	2.19E-06	24
								Pentachlorobenzene	608-93-5	5.77E-06	24
								Acenaphthylene	208-96-8	6.18E-07	24
								Acenaphthene	83-32-9	7.93E-07	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Anthracene	120-12-7	1.73E-07	24
								Benzo(a)anthracene	56-55-3	6.39E-08	24
								Benzo(b)fluoranthene	205-99-2	1.63E-07	24
								Benzo(k)fluoranthene	207-08-9	4.30E-08	24
								Benzo(a)fluorene	238-84-6	1.18E-06	24
								Benzo(b)fluorene	243-17-4	8.06E-07	24
								Benzo(ghi)perylene	191-24-2	1.76E-06	24
								Benzo(a)pyrene	50-32-8	1.47E-07	24
								Benzo(e)pyrene	192-97-2	3.71E-07	24
								Biphenyl	92-51-3	1.27E-04	1
								Chrysene	218-01-9	1.61E-07	24
								Dibenzo(a,c)anthracene	215-58-7	1.14E-06	24
								Dibenzo(a,h)anthracene	53-70-3	5.16E-08	24
								Fluoranthene	206-44-0	1.77E-06	24
								Fluorine	86-73-7	1.33E-06	24
								Indeno(1,2,3 – cd)pyrene	193-39-5	3.21E-07	24
								1 – methylnaphthalene	90-12-0	4.18E-06	24
								2 – methylnaphthalene	91-57-6	2.32E-05	24
								Naphthalene	91-20-3	1.80E-05	24, 10 min
								Perylene	198-55-0	6.44E-08	24
								Phenanthrene	85-01-8	4.03E-06	24
								Pyrene	129-00-0	2.14E-06	24
								Tetralin	119-64-2	2.12E-05	24
								O-terphenyl	84-15-1	3.49E-06	24
								Acetaldehyde	75-07-0	2.15E-08	½, 24
								Benzene	71-43-2	1.32E-03	24
								Bromodichloromethane	75-27-4	7.50E-03	24
								Bromoform	75-25-2	2.05E-03	24
								Bromomethane	74-83-9	1.53E-03	24
								Carbon tetrachloride	56-23-5	1.28E-05	24
								Chloroform	67-66-3	2.17E-05	24
								Dichlorodifluoromethane	75-71-8	3.71E-03	24
								Dichloroethene, 1,1 -	75-34-3	2.41E-05	24
								Dichloromethane	75-09-2	7.50E-03	24
								Ethylbenzene	100-41-4	4.42E-05	24
								Ethylene Dibromide	106-93-4	1.20E-05	24
								Formaldehyde	50-00-0	2.02E-03	24
								Tetrachloroethene	127-18-4	2.42E-04	24
								Toluene	108-88-3	2.14E-03	24
								Trichloroethane, 1,1,1 -	71-55-6	6.08E-05	24
								Trichloroethene	86-42-0	2.10E-05	24
								Trichloroethylene, 1,1,2 -	79-01-6	2.10E-05	24
								Trichlorofluoromethane	75-69-4	7.34E-03	24
								Vinyl chloride	75-01-4	1.86E-03	24
								Xylenes, m-, p- and o-	1330-20-7	2.57E-02	24, 10 min

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
Stack 1 (Scenario B)	Main Stack - Normal Operation - One Train Only	Point	87.6	11.51	132.22	1.7	(680538, 4860346)	Carbon Monoxide	630-08-0	9.59E-01	1
								Sulphur Dioxide	7446-09-5	7.47E-01	1, 24
								Total Particulate Matter	N/A	4.78E-01	24
								Filterable TSP	N/A	1.92E-01	24
								PM10	N/A	4.78E-01	24
								PM2.5	N/A	4.48E-01	24
								VOCs as CH4	N/A	1.04E+00	24
								Lead	7439-92-1	1.07E-03	24, 30 days
								Cadmium	7440-43-9	1.49E-04	24
								Mercury	7439-97-6	3.20E-04	24
								Hydrogen Fluoride	7664-39-3	1.92E-02	24, 30 days
								PCDD (I-TEQ)	N/A	1.28E-09	1, 24
								Hydrogen Chloride	7647-01-0	1.92E-01	24
								Ammonia	7664-41-7	2.11E-01	24
								Nitrogen Oxides	10102-44-0	2.57E+00	1, 24
								Polychlorinated Biphenyls (PCB)	N/A	1.54E-06	1, 24
								Aluminum	7429-90-5	8.47E-04	24
								Antimony	7440-36-0	5.84E-05	24
								Arsenic	7440-38-2	8.95E-06	24
								Barium	7440-39-3	4.51E-05	24
								Beryllium	7440-41-7	7.10E-06	24
								Boron	7440-42-8	3.26E-03	24
								Chromium (hexavalent)	18540-29-9	6.82E-06	24
								Total Chromium (and compounds)	7440-47-3	4.79E-05	24
								Cobalt	7440-48-4	1.23E-04	24
								Nickel	7440-02-0	1.86E-03	24
								Phosphorus	7723-14-0	9.81E-04	24
								Silver	7440-22-4	7.14E-05	24
								Selenium	7782-49-2	1.02E-05	24
								Thallium	7440-28-0	8.31E-04	24
								Tin	7440-31-5	3.75E-04	24
								Vanadium	7440-62-2	2.48E-05	24
								Zinc	7440-66-6	4.25E-03	24
								1,2-Dichlorobenzene	95-50-1	4.36E-05	1
								1,2,4,5-Tetrachlorobenzene	95-94-3	1.10E-06	24
								1,2,4 – Trichlorobenzene	120-82-1	1.10E-06	24
								2,3,4,6-Tetrachlorophenol	58-90-2	3.70E-06	24
								2,4,6-Trichlorophenol	88-06-2	1.12E-06	24
								2,4-Dichlorophenol	120-83-2	2.19E-06	24
								Pentachlorophenol	87-86-5	4.39E-06	24
								Hexachlorobenzene	118-74-1	1.10E-06	24
								Pentachlorobenzene	608-93-5	2.88E-06	24
								Acenaphthylene	208-96-8	3.09E-07	24
								Acenaphthene	83-32-9	3.96E-07	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Anthracene	120-12-7	8.67E-08	24
								Benzo(a)anthracene	56-55-3	3.20E-08	24
								Benzo(b)fluoranthene	205-99-2	8.16E-08	24
								Benzo(k)fluoranthene	207-08-9	2.15E-08	24
								Benzo(a)fluorene	238-84-6	5.89E-07	24
								Benzo(b)fluorene	243-17-4	4.03E-07	24
								Benzo(ghi)perylene	191-24-2	8.80E-07	24
								Benzo(a)pyrene	50-32-8	7.33E-08	24
								Benzo(e)pyrene	192-97-2	1.86E-07	24
								Biphenyl	92-51-3	6.36E-05	1
								Chrysene	218-01-9	8.03E-08	24
								Dibenzo(a,c)anthracene	215-58-7	5.71E-07	24
								Dibenzo(a,h)anthracene	53-70-3	2.58E-08	24
								Fluoranthene	206-44-0	8.86E-07	24
								Fluorine	86-73-7	6.67E-07	24
								Indeno(1,2,3 – cd)pyrene	193-39-5	1.61E-07	24
								1 – methylnaphthalene	90-12-0	2.09E-06	24
								2 – methylnaphthalene	91-57-6	1.16E-05	24
								Naphthalene	91-20-3	9.01E-06	24, 10 min
								Perylene	198-55-0	3.22E-08	24
								Phenanthrene	85-01-8	2.02E-06	24
								Pyrene	129-00-0	1.07E-06	24
								Tetralin	119-64-2	1.06E-05	24
								O-terphenyl	84-15-1	1.74E-06	24
								Acetaldehyde	75-07-0	1.07E-08	½, 24
								Benzene	71-43-2	6.61E-04	24
								Bromodichloromethane	75-27-4	3.75E-03	24
								Bromoform	75-25-2	1.03E-03	24
								Bromomethane	74-83-9	7.67E-04	24
								Carbon tetrachloride	56-23-5	6.39E-06	24
								Chloroform	67-66-3	1.09E-05	24
								Dichlorodifluoromethane	75-71-8	1.86E-03	24
								Dichloroethene, 1,1 -	75-34-3	1.20E-05	24
								Dichloromethane	75-09-2	3.75E-03	24
								Ethylbenzene	100-41-4	2.21E-05	24
								Ethylene Dibromide	106-93-4	6.02E-06	24
								Formaldehyde	50-00-0	1.01E-03	24
								Tetrachloroethene	127-18-4	1.21E-04	24
								Toluene	108-88-3	1.07E-03	24
								Trichloroethane, 1,1,1 -	71-55-6	3.04E-05	24
								Trichloroethene	86-42-0	1.05E-05	24
								Trichloroethylene, 1,1,2 -	79-01-6	1.05E-05	24
								Trichlorofluoromethane	75-69-4	3.67E-03	24
								Vinyl chloride	75-01-4	9.29E-04	24
								Xylenes, m-, p- and o-	1330-20-7	1.29E-02	24, 10 min

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
Stack 1 (Scenario C)	Main Stack - Start Up - Phase 2 - Two Trains	Point	87.6	17.22	132	1.7	(680538, 4860346)	Carbon Monoxide	630-08-0	1.95E+00	½
								Sulphur Dioxide	7446-09-5	8.99E-01	1, 24
								Total Particulate Matter	N/A	5.93E-01	24
								Filterable TSP	N/A	2.25E-01	24
								PM10	N/A	5.93E-01	24
								PM2.5	N/A	5.61E-01	24
								VOCs as CH4	N/A	1.17E+00	24
								Lead	7439-92-1	1.14E-03	24, 30 days
								Cadmium	7440-43-9	1.71E-04	24
								Mercury	7439-97-6	3.44E-04	24
								Hydrogen Fluoride	7664-39-3	2.04E-02	24, 30 days
								PCDD	N/A	1.36E-09	1, 24
								Hydrogen Chloride	7647-01-0	2.04E-01	24
								Ammonia	7664-41-7	2.25E-01	24
								Nitrogen Oxides	10102-44-0	3.16E+00	1, 24
								Polychlorinated Biphenyls (PCB)	N/A	1.64E-06	1, 24
								Aluminum	7429-90-5	9.03E-04	24
								Arsenic	7440-36-0	6.45E-05	24
								Antimony	7440-38-2	9.54E-06	24
								Barium	7440-39-3	9.67E-05	24
								Beryllium	7440-41-7	7.70E-06	24
								Boron	7440-42-8	3.48E-03	24
								Chromium (hexavalent)	18540-29-9	2.28E-05	24
								Total Chromium (and compounds)	7440-47-3	6.66E-05	24
								Cobalt	7440-48-4	1.33E-04	24
								Nickel	7440-02-0	2.00E-03	24
								Phosphorus	7723-14-0	1.05E-03	24
								Silver	7440-22-4	7.61E-05	24
								Selenium	7782-49-2	1.12E-05	24
								Thallium	7440-28-0	8.86E-04	24
								Tin	7440-31-5	4.00E-04	24
								Vanadium	7440-62-2	5.19E-05	24
								Zinc	7440-66-6	4.85E-03	24
								1,2-Dichlorobenzene	95-50-1	4.65E-05	1
								1,2,4,5-Tetrachlorobenzene	95-94-3	1.17E-06	24
								1,2,4 – Trichlorobenzene	120-82-1	1.17E-06	24
								2,3,4,6-Tetrachlorophenol	58-90-2	3.95E-06	24
								2,4,6-Trichlorophenol	88-06-2	1.19E-06	24
								2,4-Dichlorophenol	120-83-2	2.34E-06	24
								Pentachlorophenol	87-86-5	4.68E-06	24
								Hexachlorobenzene	118-74-1	1.17E-06	24
								Pentachlorobenzene	608-93-5	3.07E-06	24
								Acenaphthylene	208-96-8	3.49E-07	24
								Acenaphthene	83-32-9	4.42E-07	24
								Anthracene	120-12-7	1.19E-07	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Benzo(a)anthracene	56-55-3	5.40E-08	24
								Benzo(b)fluoranthene	205-99-2	1.07E-07	24
								Benzo(k)fluoranthene	207-08-9	4.29E-08	24
								Benzo(a)fluorene	238-84-6	6.28E-07	24
								Benzo(b)fluorene	243-17-4	4.30E-07	24
								Benzo(ghi)perylene	191-24-2	9.51E-07	24
								Benzo(a)pyrene	50-32-8	9.14E-08	24
								Benzo(e)pyrene	192-97-2	1.98E-07	24
								Biphenyl	92-51-3	6.78E-05	1
								Chrysene	218-01-9	1.06E-07	24
								Dibenzo(a,c)anthracene	215-58-7	6.09E-07	24
								Dibenzo(a,h)anthracene	53-70-3	4.08E-08	24
								Fluoranthene	206-44-0	9.78E-07	24
								Fluorine	86-73-7	7.11E-07	24
								Indeno(1,2,3 – cd)pyrene	193-39-5	1.91E-07	24
								1 – Methylnaphthalene	90-12-0	2.23E-06	24
								2 – Methylnaphthalene	91-57-6	1.26E-05	24
								Naphthalene	91-20-3	1.64E-05	24, 10 min
								Perylene	198-55-0	3.43E-08	24
								Phenanthrene	85-01-8	2.34E-06	24
								Pyrene	129-00-0	1.20E-06	24
								Tetralin	119-64-2	1.13E-05	24
								O-terphenyl	84-15-1	1.86E-06	24
								Acetaldehyde	75-07-0	1.43E-08	½, 24
								Benzene	71-43-2	7.27E-04	24
								Bromodichloromethane	75-27-4	5.00E-03	24
								Bromoform	75-25-2	1.37E-03	24
								Bromomethane	74-83-9	8.18E-04	24
								Carbon tetrachloride	56-23-5	8.52E-06	24
								Chloroform	67-66-3	1.16E-05	24
								Dichlorodifluoromethane	75-71-8	1.98E-03	24
								Dichloroethene, 1,1 -	75-34-3	1.28E-05	24
								Dichloromethane	75-09-2	4.00E-03	24
								Ethylbenzene	100-41-4	2.35E-05	24
								Ethylene Dibromide	106-93-4	8.02E-06	24
								Formaldehyde	50-00-0	1.91E-03	24
								Tetrachloroethene	127-18-4	1.29E-04	24
								Toluene	108-88-3	1.18E-03	24
								Trichloroethane, 1,1,1 -	71-55-6	3.24E-05	24
								Trichloroethene	86-42-0	1.12E-05	24
								Trichloroethylene, 1,1,2 -	79-01-6	1.12E-05	24
								Trichlorofluoromethane	75-69-4	3.91E-03	24
								Vinyl chloride	75-01-4	9.91E-04	24
								Xylenes, m-, p- and o-	1330-20-7	1.37E-02	24, 10 min
								Nitrous Oxides	10024-97-2	8.85E-03	24
								3-Methylchloranthene	56-49-5	1.99E-08	24
								7,12-Dimethylbenz(a)anthracene	57-97-6	1.77E-07	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Butane	106-97-8	2.32E-02	24
								Dichlorobenzene	25321-22-6	1.33E-05	24
								Ethane	74-84-0	3.43E-02	24
								Fluorene	86-73-7	3.10E-08	24
								Hexane	110-54-3	1.99E-02	24
								Pentane	109-66-0	2.88E-02	24
								Propane	74-98-6	1.77E-02	24
								Copper	7440-50-8	9.41E-06	24
								Manganese	7439-96-5	4.21E-06	24
								Molybdenum	7439-98-7	1.22E-05	24
Stack 1 (Scenario D)	Main Stack - Start Up - Phase 2 - One Train Only	Point	87.6	8.61	132	1.7	(680538, 4860346)	Carbon Monoxide	630-08-0	9.76E-01	½
								Sulphur Dioxide	7446-09-5	4.49E-01	1, 24
								Total Particulate Matter	N/A	2.97E-01	24
								Filterable TSP	N/A	1.13E-01	24
								PM10	N/A	2.97E-01	24
								PM2.5	N/A	2.81E-01	24
								VOCs as CH4	N/A	5.87E-01	24
								Lead	7439-92-1	5.71E-04	24, 30 days
								Cadmium	7440-43-9	8.56E-05	24
								Mercury	7439-97-6	1.72E-04	24
								Hydrogen Fluoride	7664-39-3	1.02E-02	24, 30 days
								PCDD	N/A	6.81E-10	1, 24
								Hydrogen Chloride	7647-01-0	1.02E-01	24
								Ammonia	7664-41-7	1.12E-01	24
								Nitrogen Oxides	10102-44-0	1.58E+00	1, 24
								Polychlorinated Biphenyls (PCB)	N/A	8.20E-07	1, 24
								Aluminum	7429-90-5	4.51E-04	24
								Arsenic	7440-36-0	3.22E-05	24
								Antimony	7440-38-2	4.77E-06	24
								Barium	7440-39-3	4.84E-05	24
								Beryllium	7440-41-7	3.85E-06	24
								Boron	7440-42-8	1.74E-03	24
								Chromium (hexavalent)	18540-29-9	1.14E-05	24
								Total Chromium (and compounds)	7440-47-3	3.33E-05	24
								Cobalt	7440-48-4	6.63E-05	24
								Nickel	7440-02-0	1.00E-03	24
								Phosphorus	7723-14-0	5.23E-04	24
								Silver	7440-22-4	3.81E-05	24
								Selenium	7782-49-2	5.58E-06	24
								Thallium	7440-28-0	4.43E-04	24
								Tin	7440-31-5	2.00E-04	24
								Vanadium	7440-62-2	2.59E-05	24
								Zinc	7440-66-6	2.43E-03	24
								1,2-Dichlorobenzene	95-50-1	2.32E-05	1

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Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								1,2,4,5-Tetrachlorobenzene	95-94-3	5.85E-07	24
								1,2,4 – Trichlorobenzene	120-82-1	5.85E-07	24
								2,3,4,6-Tetrachlorophenol	58-90-2	1.97E-06	24
								2,4,6-Trichlorophenol	88-06-2	5.94E-07	24
								2,4-Dichlorophenol	120-83-2	1.17E-06	24
								Pentachlorophenol	87-86-5	2.34E-06	24
								Hexachlorobenzene	118-74-1	5.85E-07	24
								Pentachlorobenzene	608-93-5	1.54E-06	24
								Acenaphthylene	208-96-8	1.75E-07	24
								Acenaphthene	83-32-9	2.21E-07	24
								Anthracene	120-12-7	5.95E-08	24
								Benzo(a)anthracene	56-55-3	2.70E-08	24
								Benzo(b)fluoranthene	205-99-2	5.35E-08	24
								Benzo(k)fluoranthene	207-08-9	2.14E-08	24
								Benzo(a)fluorene	238-84-6	3.14E-07	24
								Benzo(b)fluorene	243-17-4	2.15E-07	24
								Benzo(ghi)perylene	191-24-2	4.76E-07	24
								Benzo(a)pyrene	50-32-8	4.57E-08	24
								Benzo(e)pyrene	192-97-2	9.89E-08	24
								Biphenyl	92-51-3	3.39E-05	1
								Chrysene	218-01-9	5.28E-08	24
								Dibenzo(a,c)anthracene	215-58-7	3.04E-07	24
								Dibenzo(a,h)anthracene	53-70-3	2.04E-08	24
								Fluoranthene	206-44-0	4.89E-07	24
								Fluorine	86-73-7	3.56E-07	24
								Indeno(1,2,3 – cd)pyrene	193-39-5	9.56E-08	24
								1 – Methylnaphthalene	90-12-0	1.12E-06	24
								2 – Methylnaphthalene	91-57-6	6.31E-06	24
								Naphthalene	91-20-3	8.18E-06	24, 10 min
								Perylene	198-55-0	1.72E-08	24
								Phenanthrene	85-01-8	1.17E-06	24
								Pyrene	129-00-0	5.98E-07	24
								Tetralin	119-64-2	5.66E-06	24
								O-terphenyl	84-15-1	9.29E-07	24
								Acetaldehyde	75-07-0	7.17E-09	½, 24
								Benzene	71-43-2	3.64E-04	24
								Bromodichloromethane	75-27-4	2.50E-03	24
								Bromoform	75-25-2	6.84E-04	24
								Bromomethane	74-83-9	4.09E-04	24
								Carbon tetrachloride	56-23-5	4.26E-06	24
								Chloroform	67-66-3	5.79E-06	24
								Dichlorodifluoromethane	75-71-8	9.89E-04	24
								Dichloroethene, 1,1 -	75-34-3	6.42E-06	24
								Dichloromethane	75-09-2	2.00E-03	24
								Ethylbenzene	100-41-4	1.18E-05	24
								Ethylene Dibromide	106-93-4	4.01E-06	24
								Formaldehyde	50-00-0	9.54E-04	24

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Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Tetrachloroethene	127-18-4	6.44E-05	24
								Toluene	108-88-3	5.90E-04	24
								Trichloroethane, 1,1,1 -	71-55-6	1.62E-05	24
								Trichloroethene	86-42-0	5.58E-06	24
								Trichloroethylene, 1,1,2 -	79-01-6	5.58E-06	24
								Trichlorofluoromethane	75-69-4	1.96E-03	24
								Vinyl chloride	75-01-4	4.95E-04	24
								Xylenes, m-, p- and o-	1330-20-7	6.86E-03	24, 10 min
								Nitrous Oxides	10024-97-2	4.43E-03	24
								3-Methylchloranthene	56-49-5	9.96E-09	24
								7,12-Dimethylbenz(a)anthracene	57-97-6	8.85E-08	24
								Butane	106-97-8	1.16E-02	24
								Dichlorobenzene	25321-22-6	6.64E-06	24
								Ethane	74-84-0	1.72E-02	24
								Fluorene	86-73-7	1.55E-08	24
								Hexane	110-54-3	9.96E-03	24
								Pentane	109-66-0	1.44E-02	24
								Propane	74-98-6	8.85E-03	24
								Copper	7440-50-8	4.70E-06	24
								Manganese	7439-96-5	2.10E-06	24
								Molybdenum	7439-98-7	6.09E-06	24
Stack 1 (Scenario E)	Main Stack - Start Up - Phase 1 - Two Trains	Point	87.6	6.19	132	1.7	(680538, 4860346)	Carbon Monoxide	630-08-0	1.16E+00	1
								Nitrogen Oxides	10102-44-0	5.26E-01	½
								Sulphur Dioxide	7446-09-5	1.03E-01	1, 24
								Total Particulate Matter	N/A	1.05E-01	1, 24
								Filterable TSP	N/A	2.63E-02	24
								PM10	N/A	1.05E-01	24
								PM2.5	N/A	1.05E-01	24
								Lead	7439-92-1	6.92E-06	1, 24
								Cadmium	7440-43-9	1.52E-05	24
								Mercury	7439-97-6	3.60E-06	24
								Nitrous Oxides	10024-97-2	8.85E-03	24
								2 – Methylnaphthalene	91-57-6	3.32E-07	½, 24
								3-Methylchloranthene	56-49-5	2.49E-08	24
								7,12-Dimethylbenz(a)anthracene	57-97-6	2.21E-07	24
								Acenaphthene	83-32-9	2.49E-08	24
								Acenaphthylene	208-96-8	2.49E-08	24
								Anthracene	120-12-7	3.32E-08	24
								Benzo(a)anthracene	56-55-3	2.49E-08	24
								Benzene	71-43-2	2.91E-05	24
								Benzo(a)pyrene	50-32-8	1.66E-08	½, 24
								Benzo(b)fluoranthene	205-99-2	2.49E-08	½, 24
								Benzo(ghi)perylene	191-24-2	1.66E-08	24
								Benzo(k)fluoranthene	205-82-3	2.49E-08	24
								Butane	106-97-8	2.91E-02	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Chrysene	218-01-9	2.49E-08	24
								Dibenzo(a,h)anthracene	53-70-3	1.66E-08	24
								Dichlorobenzene	25321-22-6	1.66E-05	24
								Ethane	74-84-0	4.29E-02	24
								Fluoranthene	206-44-0	4.15E-08	24
								Fluorene	86-73-7	3.87E-08	24
								Formaldehyde	50-00-0	1.04E-03	24
								Hexane	110-54-3	2.49E-02	24
								Indeno(1,2,3 – cd)pyrene	193-39-5	2.49E-08	24
								Naphthalene	91-20-3	8.44E-06	24
								Pentane	109-66-0	3.60E-02	24
								Phenanthrene	85-01-8	2.35E-07	24
								Propane	74-98-6	2.21E-02	24
								Pyrene	129-00-0	6.92E-08	24
								Toluene	108-88-3	4.70E-05	24
								Arsenic	7440-38-2	2.77E-06	24
								Barium	7440-39-3	6.09E-05	24
								Beryllium	7440-41-7	1.66E-07	24
								Chromium (hexavalent)	7440-47-3	1.94E-05	24
								Total Chromium (and compounds)	7440-47-3	1.94E-05	24
								Cobalt	7440-48-4	1.16E-06	24
								Copper	7440-50-8	1.18E-05	24
								Manganese	7439-96-5	5.26E-06	24
								Molybdenum	7439-98-7	1.52E-05	24
								Nickel	7440-02-0	2.91E-05	24
								Selenium	7782-49-2	3.32E-07	24
								Vanadium	7440-62-2	3.18E-05	24
								Zinc	7440-66-6	4.01E-04	24
Stack 1 (Scenario F)	Main Stack - Start Up - Phase 1 - One Train Only	Point	87.6	3.09	132	1.7	(680538, 4860346)	Carbon Monoxide	630-08-0	5.81E-01	1
								Nitrogen Oxides	10102-44-0	2.63E-01	½
								Sulphur Dioxide	7446-09-5	5.14E-02	1, 24
								Total Particulate Matter	N/A	5.26E-02	24
								Filterable TSP	N/A	1.31E-02	24
								PM10	N/A	5.26E-02	24
								PM2.5	N/A	5.26E-02	24
								Lead	7439-92-1	3.46E-06	1, 24
								Cadmium	7440-43-9	7.61E-06	24
								Mercury	7439-97-6	1.80E-06	24
								Nitrous Oxides	10024-97-2	4.43E-03	24
								2 – Methylnaphthalene	91-57-6	1.66E-07	½, 24
								3-Methylchloranthene	56-49-5	1.25E-08	24
								7,12-Dimethylbenz(a)anthracene	57-97-6	1.11E-07	24
								Acenaphthene	83-32-9	1.25E-08	24
								Acenaphthylene	208-96-8	1.25E-08	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
								Anthracene	120-12-7	1.66E-08	24
								Benzo(a)anthracene	56-55-3	1.25E-08	24
								Benzene	71-43-2	1.45E-05	24
								Benzo(a)pyrene	50-32-8	8.30E-09	½, 24
								Benzo(b)fluoranthene	205-99-2	1.25E-08	½, 24
								Benzo(ghi)perylene	191-24-2	8.30E-09	24
								Benzo(k)fluoranthene	205-82-3	1.25E-08	24
								Butane	106-97-8	1.45E-02	24
								Chrysene	218-01-9	1.25E-08	24
								Dibenzo(a,h)anthracene	53-70-3	8.30E-09	24
								Dichlorobenzene	25321-22-6	8.30E-06	24
								Ethane	74-84-0	2.14E-02	24
								Fluoranthene	206-44-0	2.08E-08	24
								Fluorene	86-73-7	1.94E-08	24
								Formaldehyde	50-00-0	5.19E-04	24
								Hexane	110-54-3	1.25E-02	24
								Indeno(1,2,3 – cd)pyrene	193-39-5	1.25E-08	24
								Naphthalene	91-20-3	4.22E-06	24
								Pentane	109-66-0	1.80E-02	24
								Phenanthrene	85-01-8	1.18E-07	24
								Propane	74-98-6	1.11E-02	24
								Pyrene	129-00-0	3.46E-08	24
								Toluene	108-88-3	2.35E-05	24
								Arsenic	7440-38-2	1.38E-06	24
								Barium	7440-39-3	3.04E-05	24
								Beryllium	7440-41-7	8.30E-08	24
								Chromium (hexavalent)	7440-47-3	9.68E-06	24
								Total Chromium (and compounds)	7440-47-3	9.68E-06	24
								Cobalt	7440-48-4	5.81E-07	24
								Copper	7440-50-8	5.88E-06	24
								Manganese	7439-96-5	2.63E-06	24
								Molybdenum	7439-98-7	7.61E-06	24
								Nickel	7440-02-0	1.45E-05	24
								Selenium	7782-49-2	1.66E-07	24
								Vanadium	7440-62-2	1.59E-05	24
								Zinc	7440-66-6	2.01E-04	24
Stack 1 (Scenario G)	Main Stack - fans only	Point	87.6	10.40	20	1.7	(680538, 4860346)	Odour	N/A	1.83E+03	10-min
Stack 2A	Carbon silo filling	Point	5.4864	38.42	Ambient	0.10	(680551,4860359)	Total Particulate Matter	N/A	1.07E-02	24
								PM10	N/A	1.07E-02	24
								PM2.5	N/A	1.07E-02	24
Stack 2B	Pozzolan silo filling	Point	4.8768	38.42	Ambient	0.10	(680513,4860332)	Total Particulate Matter	N/A	1.07E-02	24
								PM10	N/A	1.07E-02	24
								PM2.5	N/A	1.07E-02	24

Table 4
Dispersion Modelling Source Summary Table

Modelling ID	Source ID(s)	Source Type	Stack Height Above Grade [m]	Stack Gas Exit Velocity [m/s]	Stack Gas Exit Temperature [°C]	Stack Inner Diameter	Source Coordinates (x,y) [m]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]
Stack 2C	Portland Cement silo filling	Point	3.9624	38.42	Ambient	0.10	(680517,4860333)	Total Particulate Matter	N/A	1.07E-02	24
								PM10	N/A	1.07E-02	24
								PM2.5	N/A	1.07E-02	24
Stack 2D	Pebble Lime silo filling	Point	12.4	38.42	Ambient	0.10	(680537,4860391)	Total Particulate Matter	N/A	1.07E-02	24
								PM10	N/A	1.07E-02	24
								PM2.5	N/A	1.07E-02	24
Stack 3	Stand-by generator	Point	3	36.92	265.85	0.2	(680475,4860419)	Carbon Monoxide	630-08-0	2.56E-01	½
								Nitrogen Oxides	10102-44-0	1.12E+00	1, 24
								Sulphur Dioxide	7446-09-5	1.88E-02	1, 24
								Total Particulate Matter	N/A	3.25E-02	24
								Filterable TSP	N/A	2.03E-02	24
								PM10	N/A	1.88E-02	24
								PM2.5	N/A	1.88E-02	24
								Benzene	71-43-2	2.54E-04	½, 24
								Toluene	108-88-3	9.21E-05	24
								Xylenes, m-, p- and o-	1330-20-7	6.32E-05	10-min, 24
								Formaldehyde	50-00-0	2.58E-05	24
								Acetaldehyde	75-07-0	8.26E-06	½, 24
								Naphthalene	91-20-3	4.26E-05	24
								Acenaphthylene	208-96-8	3.02E-06	24
								Acenaphthene	83-32-9	1.53E-06	24
								Fluorene	86-73-7	4.19E-06	24
								Phenanthrene	85-01-8	1.34E-05	24
								Anthracene	120-12-7	4.03E-07	24
								Fluoranthene	206-44-0	1.32E-06	24
								Pyrene	129-00-0	1.22E-06	24
								Benzo(a)anthracene	56-55-3	2.04E-07	24
								Chrysene	218-01-9	5.01E-07	24
								Benzo(b)fluoranthene	205-99-2	3.64E-07	24
								Benzo(k)fluoranthene	207-08-9	7.14E-08	24
								Benzo(a)pyrene	50-32-8	8.42E-08	½, 24
								Indeno(1,2,3 – cd)pyrene	193-39-5	1.36E-07	24
								Dibenzo(a,h)anthracene	53-70-3	1.13E-07	24
								Benzo(ghi)perylene	191-24-2	1.82E-07	24

Table 5 - Scenario A
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	1.92E+00	1.26E+03	1.33E+01	POI 1 - (680.374, 4860.676)	½	6000	Health	Schedule 3	<1%	1.27E+03	21.17%
Sulphur Dioxide	7446-09-5	Calpuff	1.49E+00	1.93E+01	1.46E+00	POI 9 - (680.554, 4858.156)	24	275	Health & Vegetation	Schedule 3	<1%	2.08E+01	7.55%
Sulphur Dioxide	7446-09-5	Calpuff	1.49E+00	1.95E+01	8.62E+00	POI 1	1	690	Health & Vegetation	Schedule 3	1.25%	2.81E+01	4.08%
Total Particulate Matter	N/A	Calpuff	9.55E-01	3.54E+01	1.05E+00	POI 9	24	120	Visibility	Schedule 3	<1%	3.64E+01	30.37%
PM10	N/A	Calpuff	9.55E-01	—	1.05E+00	POI 9	24	50	—	Ontario AAQC	2.09%	1.05E+00	2.09%
PM2.5	N/A	Calpuff	8.95E-01	2.04E+01	9.87E-01	POI 9	24	30	—	Ontario AAQC	3.29%	2.14E+01	71.29%
Lead	7439-92-1	Calpuff	2.13E-03	4.98E-03	2.09E-03	POI 9	24	0.5	Health	Schedule 3	<1%	7.07E-03	1.41%
Lead	7439-92-1	Calpuff	2.13E-03	1.92E-03	2.52E-04	POI 17 - (681.154, 4861.556)	30-day	0.2	Health	Schedule 3	<1%	2.17E-03	1.09%
Cadmium	7440-43-9	Calpuff	2.98E-04	6.04E-04	2.92E-04	POI 9	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	8.96E-04	Below URT
Cadmium	7440-43-9	Calpuff	2.98E-04	1.76E-03	2.07E-03	POI 1	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	3.83E-03	Below URT
Mercury	7439-97-6	Calpuff	6.39E-04	—	6.26E-04	POI 9	24	2	Health	Schedule 3	<1%	6.26E-04	<1%
Fluorides	7664-39-3	Calpuff	3.84E-02	—	3.76E-02	POI 9	24	0.86	Vegetation	Schedule 3	4.37%	3.76E-02	4.37%
Fluorides	7664-39-3	Calpuff	3.84E-02	—	4.53E-03	POI 17	30-day	0.34	Vegetation	Schedule 3	1.33%	4.53E-03	1.33%
PCDD	N/A	Calpuff	2.56E-09	2.37E-08	2.51E-09	POI 9	24	5.00E-06	—	Guideline	<1%	2.62E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	3.84E-01	—	3.76E-01	POI 9	24	20	Health	Schedule 3	1.88%	3.76E-01	1.88%
Ammonia	7664-41-7	Calpuff	4.22E-01	—	4.13E-01	POI 9	24	100	Health	Schedule 3	<1%	4.13E-01	<1%
Nitrogen Oxides	10102-44-0	Calpuff	5.14E+00	5.82E+01	5.04E+00	POI 9	24	200	Health	Schedule 3	2.52%	6.32E+01	31.62%
Nitrogen Oxides	10102-44-0	Calpuff	5.14E+00	6.46E+01	2.97E+01	POI 1	1	400	Health	Schedule 3	7.42%	9.43E+01	23.57%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	3.08E-06	4.20E-05	3.02E-06	POI 9	24	0.15	Health	Point-of-Impingement	<1%	4.50E-05	<1%
Aluminum	7429-90-5	Calpuff	1.69E-03	2.10E-01	1.66E-03	POI 9	24	4.8	—	JSL	Below JSL	2.12E-01	Below JSL
Antimony	7440-36-0	Calpuff	1.17E-04	3.02E-03	1.14E-04	POI 9	24	25	Health	Schedule 3	<1%	3.13E-03	<1%
Arsenic	7440-38-2	Calpuff	1.79E-05	1.81E-03	1.75E-05	POI 9	24	0.3	Health	Guideline	<1%	1.83E-03	<1%
Arsenic	7440-38-2	Calpuff	1.79E-05	5.29E-03	1.24E-04	POI 1	½	1	Health	Guideline	<1%	5.42E-03	<1%
Barium	7440-39-3	Calpuff	9.01E-05	8.18E-03	8.83E-05	POI 9	24	10	Health	Guideline	<1%	8.27E-03	<1%
Barium	7440-39-3	Calpuff	9.01E-05	2.40E-02	6.24E-04	POI 1	½	30	Health	Guideline	<1%	2.46E-02	<1%
Beryllium	7440-41-7	Calpuff	1.42E-05	3.02E-04	1.39E-05	POI 9	24	0.01	Health	Schedule 3	<1%	3.16E-04	3.16%
Boron	7440-42-8	Calpuff	6.52E-03	8.00E-02	6.39E-03	POI 9	24	120	Particulate	Schedule 3	<1%	8.64E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	1.36E-05	—	1.34E-05	POI 9	24	0.1	—	Guideline	<1%	1.34E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	9.59E-05	2.76E-03	9.40E-05	POI 9	24	0.5	Health	Guideline	<1%	2.85E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	9.59E-05	8.06E-03	6.64E-04	POI 1	½	5	Health	Guideline	<1%	8.73E-03	<1%
Cobalt	7440-48-4	Calpuff	2.47E-04	6.04E-04	2.42E-04	POI 9	24	0.1	Health	Guideline	<1%	8.46E-04	<1%
Cobalt	7440-48-4	Calpuff	2.47E-04	1.76E-03	1.71E-03	POI 1	½	0.3	Health	Guideline	<1%	3.47E-03	1.16%
Nickel	7440-02-0	Calpuff	3.71E-03	4.49E-03	3.64E-03	POI 9	24	0.1	Vegetation	Schedule 3	3.64%	8.13E-03	8.13%
Phosphorus	7723-14-0	Calpuff	1.96E-03	7.00E-02	1.92E-03	POI 9	24	0.35	—	JSL	Below JSL	7.19E-02	Below JSL
Silver	7440-22-4	Calpuff	1.43E-04	3.42E-04	1.40E-04	POI 9	24	1	Health	Schedule 3	<1%	4.82E-04	<1%
Selenium	7782-49-2	Calpuff	2.05E-05	3.02E-03	2.00E-05	POI 9	24	10	Health	Guideline	<1%	3.04E-03	<1%
Selenium	7782-49-2	Calpuff	2.05E-05	8.82E-03	1.42E-04	POI 1	½	20	Health	Guideline	<1%	8.96E-03	<1%
Thallium	7440-28-0	Calpuff	1.66E-03	—	1.63E-03	POI 9	24	0.24	—	JSL	Below JSL	1.63E-03	Below JSL
Tin	7440-31-5	Calpuff	7.50E-04	3.02E-03	7.35E-04	POI 9	24	10	Health	Schedule 3	<1%	3.75E-03	<1%
Vanadium	7440-62-2	Calpuff	4.96E-05	1.55E-03	4.86E-05	POI 9	24	2	Health	Schedule 3	<1%	1.60E-03	<1%
Zinc	7440-66-6	Calpuff	8.50E-03	4.00E-02	8.33E-03	POI 9	24	120	Particulate	Schedule 3	<1%	4.83E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	8.72E-05	3.60E-02	6.04E-04	POI 1	½	37000	Health	Guideline	<1%	3.66E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	8.72E-05	3.00E-02	5.03E-04	POI 1	1	30500	Health	Point-of-Impingement	<1%	3.05E-02	<1%

Table 5 - Scenario A
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	2.19E-06	—	2.15E-06	POI 9	24	1	—	JSL	Below JSL	2.15E-06	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	2.19E-06	5.00E-02	2.15E-06	POI 9	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	2.19E-06	1.32E-01	1.52E-05	POI 1	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	7.41E-06	—	7.26E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	7.26E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	2.23E-06	—	2.19E-06	POI 9	24	1.5	—	JSL	Below JSL	2.19E-06	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	4.39E-06	—	4.30E-06	POI 9	24	77	—	JSL	Below JSL	4.30E-06	Below JSL
Pentachlorophenol	87-86-5	Calpuff	8.79E-06	8.76E-04	8.61E-06	POI 9	24	20	Health	Guideline	<1%	8.85E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	8.79E-06	2.56E-03	6.09E-05	POI 1	½	60	Health	Guideline	<1%	2.62E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	2.19E-06	6.25E-05	2.15E-06	POI 9	24	0.011	—	JSL	Below JSL	6.47E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	5.77E-06	—	5.65E-06	POI 9	24	3	—	JSL	Below JSL	5.65E-06	Below JSL
Acenaphthylene	208-96-8	Calpuff	6.18E-07	3.09E-04	6.06E-07	POI 9	24	3.5	—	JSL	Below JSL	3.10E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	7.93E-07	1.25E-03	7.77E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	1.73E-07	1.63E-04	1.70E-07	POI 9	24	0.2	—	JSL	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	6.39E-08	6.77E-05	6.26E-08	POI 9	24	0.1	—	De Minimus	Below De Minimus	6.78E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	1.63E-07	1.42E-04	1.60E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	4.30E-08	6.77E-05	4.22E-08	POI 9	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	1.18E-06	1.35E-04	1.15E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	8.06E-07	1.35E-04	7.90E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	1.76E-06	7.07E-05	1.72E-06	POI 9	24	1.2	—	JSL	Below JSL	7.24E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	1.47E-07	6.77E-05	1.44E-07	POI 9	24	0.0011	Health	Guideline	<1%	6.78E-05	6.17%
Benzo(a)pyrene	50-32-8	Calpuff	1.47E-07	1.98E-04	1.02E-06	POI 1	½	0.0033	Health	Guideline	<1%	1.99E-04	6.03%
Benzo(e)pyrene	192-97-2	Calpuff	3.71E-07	1.35E-04	3.64E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	1.27E-04	1.36E-03	1.25E-04	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.48E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	1.61E-07	9.64E-05	1.57E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	9.66E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	1.14E-06	—	1.12E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.12E-06	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	5.16E-08	6.77E-05	5.05E-08	POI 9	24	0.1	—	De Minimus	Below De Minimus	6.78E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	1.77E-06	6.01E-04	1.74E-06	POI 9	24	140	—	JSL	Below JSL	6.03E-04	Below JSL
Fluorine	86-73-7	Calpuff	1.33E-06	—	1.31E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.31E-06	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	3.21E-07	6.77E-05	3.15E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	6.80E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	4.18E-06	1.30E-03	4.10E-06	POI 9	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	2.32E-05	2.19E-03	2.27E-05	POI 9	24	10	—	JSL	Below JSL	2.21E-03	Below JSL
Naphthalene	91-20-3	Calpuff	1.80E-05	2.43E-03	1.77E-05	POI 9	24	22.5	Health	Guideline	<1%	2.45E-03	<1%
Naphthalene	91-20-3	Calpuff	1.80E-05	7.09E-03	1.25E-04	POI 1	½	36	Odour	Guideline	<1%	7.22E-03	<1%
Naphthalene	91-20-3	Calpuff	1.80E-05	9.77E-03	1.72E-04	POI 1	10-min	50	Odour	Guideline	<1%	9.94E-03	<1%
Perylene	198-55-0	Calpuff	6.44E-08	1.35E-04	6.31E-08	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	4.03E-06	2.57E-03	3.95E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	2.14E-06	2.83E-04	2.10E-06	POI 9	24	0.2	—	JSL	Below JSL	2.85E-04	Below JSL
Tetralin	119-64-2	Calpuff	2.12E-05	1.35E-04	2.08E-05	POI 9	24	1200	—	JSL	Below JSL	1.56E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	3.49E-06	1.35E-04	3.42E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.38E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	2.15E-08	1.76E+00	2.11E-08	POI 9	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	2.15E-08	5.21E+00	1.49E-07	POI 1	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	1.32E-03	1.18E+01	1.29E-03	POI 9	24	N/A	N/A	N/A	N/A	1.18E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	7.50E-03	2.00E-02	7.35E-03	POI 9	24	0.1	—	De Minimus	Below De Minimus	2.73E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	2.05E-03	3.00E-02	2.01E-03	POI 9	24	55	Health	Guideline	<1%	3.20E-02	<1%
Bromoform	75-25-2	Calpuff	2.05E-03	8.40E-02	1.42E-02	POI 1	½	165	Health	Guideline	<1%	9.82E-02	<1%
Bromomethane	74-83-9	Calpuff	1.53E-03	9.00E-02	1.50E-03	POI 9	24	1350	Health	Guideline	<1%	9.15E-02	<1%
Bromomethane	74-83-9	Calpuff	1.53E-03	2.64E-01	1.06E-02	POI 1	½	4000	Health	Guideline	<1%	2.75E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	1.28E-05	7.40E-01	1.25E-05	POI 9	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	2.17E-05	2.30E-01	2.13E-05	POI 9	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	3.71E-03	3.23E+00	3.64E-03	POI 9	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	3.71E-03	9.44E+00	2.57E-02	POI 1	½	1500000	Health	Guideline	<1%	9.47E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	2.41E-05	7.31E-03	1.67E-04	POI 1	½	600	Health	Guideline	<1%	7.47E-03	<1%
Dichloromethane	75-09-2	Calpuff	7.50E-03	1.27E+00	7.35E-03	POI 9	24	220	Health	Schedule 3	<1%	1.28E+00	<1%
Ethylbenzene	100-41-4	Calpuff	4.42E-05	1.24E+00	4.33E-05	POI 9	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	4.42E-05	5.00E+00	4.21E-04	POI 1	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%
Ethylene Dibromide	106-93-4	Calpuff	1.20E-05	5.20E-03	1.18E-05	POI 9	24	3	Health	Guideline	<1%	5.21E-03	<1%

Table 5 - Scenario A
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Ethylene Dibromide	106-93-4	Calpuff	1.20E-05	1.20E-02	8.34E-05	POI 1	½	9	Health	Guideline	<1%	1.21E-02	<1%
Formaldehyde	50-00-0	Calpuff	2.02E-03	3.38E+00	1.98E-03	POI 9	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	2.42E-04	4.90E-01	2.37E-04	POI 9	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	2.14E-03	9.47E+00	2.10E-03	POI 9	24	2000	Odour	Guideline	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	6.08E-05	1.10E-01	5.96E-05	POI 9	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	Calpuff	2.10E-05	5.40E-01	2.05E-05	POI 9	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	2.10E-05	—	2.05E-05	POI 9	24	12	Health	Schedule 3	<1%	2.05E-05	<1%
Trichlorofluoromethane	75-69-4	Calpuff	7.34E-03	2.15E+00	7.19E-03	POI 9	24	6000	Health	Guideline	<1%	2.16E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	7.34E-03	6.28E+00	5.08E-02	POI 1	½	18000	Health	Guideline	<1%	6.33E+00	<1%
Vinyl chloride	75-01-4	Calpuff	1.86E-03	5.88E-03	1.82E-03	POI 9	24	1	Health	Schedule 3	<1%	7.70E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	2.57E-02	4.83E+00	2.52E-02	POI 9	24	730	Health	Schedule 3	<1%	4.86E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	2.57E-02	1.94E+01	2.45E-01	POI 1	10-min	3000	Odour	Guideline	<1%	1.96E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	9000	Health	Guideline	<1%	0.00E+00	<1%
Nitrous Oxides	10024-97-2	Calpuff	0.00E+00	—	0.00E+00	N/A	½	27000	Health	Guideline	<1%	0.00E+00	<1%
3-Methylchloranthene	56-49-5	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Butane	106-97-8	Calpuff	0.00E+00	—	0.00E+00	N/A	24	7600	—	JSL	Below JSL	0.00E+00	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Ethane	74-84-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	4800	—	JSL	Below JSL	0.00E+00	Below JSL
Fluorene	86-73-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Hexane	110-54-3	Calpuff	0.00E+00	—	0.00E+00	N/A	24	7500	Health	Schedule 3	<1%	0.00E+00	<1%
Pentane	109-66-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	4200	—	JSL	Below JSL	0.00E+00	Below JSL
Propane	74-98-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	7200	—	JSL	Below JSL	0.00E+00	Below JSL
Copper	7440-50-8	Calpuff	0.00E+00	—	0.00E+00	N/A	24	50	Health	Schedule 3	<1%	0.00E+00	<1%
Manganese	7439-96-5	Calpuff	0.00E+00	—	0.00E+00	N/A	24	1	Health	Guideline	<1%	0.00E+00	<1%
Manganese	7439-96-5	Calpuff	0.00E+00	—	0.00E+00	N/A	½	3	Health	Guideline	<1%	0.00E+00	<1%
Molybdenum	7439-98-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	120	Particulate	Guideline	<1%	0.00E+00	<1%
Molybdenum	7439-98-7	Calpuff	0.00E+00	—	0.00E+00	N/A	½	100	Particulate	Guideline	<1%	0.00E+00	<1%

Table 5 - Scenario B
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	9.59E-01	1.26E+03	9.92E+00	POI 2 - (680.414, 4860.636)	½	6000	Health	Schedule 3	<1%	1.27E+03	21.12%
Sulphur Dioxide	7446-09-5	Calpuff	7.47E-01	1.93E+01	1.13E+00	POI 10 - (680.604, 4860.856)	24	275	Health & Vegetation	Schedule 3	<1%	2.04E+01	7.43%
Sulphur Dioxide	7446-09-5	Calpuff	7.47E-01	1.95E+01	6.44E+00	POI 2	1	690	Health & Vegetation	Schedule 3	<1%	2.59E+01	3.76%
Total Particulate Matter	N/A	Calpuff	4.78E-01	3.54E+01	5.68E-01	POI 10	24	120	Visibility	Schedule 3	<1%	3.60E+01	29.97%
PM10	N/A	Calpuff	4.78E-01	—	5.68E-01	POI 10	24	50	—	Ontario AAQC	1.14%	5.68E-01	1.14%
PM2.5	N/A	Calpuff	4.48E-01	2.04E+01	5.39E-01	POI 10	24	30	—	Ontario AAQC	1.80%	2.09E+01	69.80%
Lead	7439-92-1	Calpuff	1.07E-03	4.98E-03	1.61E-03	POI 10	24	0.5	Health	Schedule 3	<1%	6.59E-03	1.32%
Lead	7439-92-1	Calpuff	1.07E-03	1.92E-03	2.03E-04	POI 18 - (681.004, 4859.856)	30-day	0.2	Health	Schedule 3	<1%	2.12E-03	1.06%
Cadmium	7440-43-9	Calpuff	1.49E-04	6.04E-04	2.25E-04	POI 10	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	8.29E-04	Below URT
Cadmium	7440-43-9	Calpuff	1.49E-04	1.76E-03	1.54E-03	POI 2	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	3.31E-03	Below URT
Mercury	7439-97-6	Calpuff	3.20E-04	—	4.82E-04	POI 10	24	2	Health	Schedule 3	<1%	4.82E-04	<1%
Fluorides	7664-39-3	Calpuff	1.92E-02	—	2.89E-02	POI 10	24	0.86	Vegetation	Schedule 3	3.37%	2.89E-02	3.37%
Fluorides	7664-39-3	Calpuff	1.92E-02	—	3.65E-03	POI 18	30-day	0.34	Vegetation	Schedule 3	1.07%	3.65E-03	1.07%
PCDD	N/A	Calpuff	1.28E-09	2.37E-08	1.93E-09	POI 10	24	5.00E-06	—	Guideline	<1%	2.56E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	1.92E-01	—	2.89E-01	POI 10	24	20	Health	Schedule 3	1.45%	2.89E-01	1.45%
Ammonia	7664-41-7	Calpuff	2.11E-01	—	3.18E-01	POI 10	24	100	Health	Schedule 3	<1%	3.18E-01	<1%
Nitrogen Oxides	10102-44-0	Calpuff	2.57E+00	5.82E+01	3.88E+00	POI 10	24	200	Health	Schedule 3	1.94%	6.21E+01	31.04%
Nitrogen Oxides	10102-44-0	Calpuff	2.57E+00	6.46E+01	2.22E+01	POI 2	1	400	Health	Schedule 3	5.54%	8.68E+01	21.69%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	1.54E-06	4.20E-05	2.32E-06	POI 10	24	0.15	Health	Point-of-Impingement	<1%	4.43E-05	<1%
Aluminum	7429-90-5	Calpuff	8.47E-04	2.10E-01	1.28E-03	POI 10	24	4.8	—	JSL	Below JSL	2.11E-01	Below JSL
Antimony	7440-36-0	Calpuff	5.84E-05	3.02E-03	8.81E-05	POI 10	24	25	Health	Schedule 3	<1%	3.11E-03	<1%
Arsenic	7440-38-2	Calpuff	8.95E-06	1.81E-03	1.35E-05	POI 10	24	0.3	Health	Guideline	<1%	1.82E-03	<1%
Arsenic	7440-38-2	Calpuff	8.95E-06	5.29E-03	9.26E-05	POI 2	½	1	Health	Guideline	<1%	5.38E-03	<1%
Barium	7440-39-3	Calpuff	4.51E-05	8.18E-03	6.80E-05	POI 10	24	10	Health	Guideline	<1%	8.25E-03	<1%
Barium	7440-39-3	Calpuff	4.51E-05	2.40E-02	4.66E-04	POI 2	½	30	Health	Guideline	<1%	2.45E-02	<1%
Beryllium	7440-41-7	Calpuff	7.10E-06	3.02E-04	1.07E-05	POI 10	24	0.01	Health	Schedule 3	<1%	3.13E-04	3.13%
Boron	7440-42-8	Calpuff	3.26E-03	8.00E-02	4.92E-03	POI 10	24	120	Particulate	Schedule 3	<1%	8.49E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	6.82E-06	—	1.03E-05	POI 10	24	0.1	—	Guideline	<1%	1.03E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	4.79E-05	2.76E-03	7.24E-05	POI 10	24	0.5	Health	Guideline	<1%	2.83E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	4.79E-05	8.06E-03	4.96E-04	POI 2	½	5	Health	Guideline	<1%	8.56E-03	<1%
Cobalt	7440-48-4	Calpuff	1.23E-04	6.04E-04	1.86E-04	POI 10	24	0.1	Health	Guideline	<1%	7.90E-04	<1%
Cobalt	7440-48-4	Calpuff	1.23E-04	1.76E-03	1.28E-03	POI 2	½	0.3	Health	Guideline	<1%	3.04E-03	1.01%
Nickel	7440-02-0	Calpuff	1.86E-03	4.49E-03	2.80E-03	POI 10	24	0.1	Vegetation	Schedule 3	2.80%	7.29E-03	7.29%
Phosphorus	7723-14-0	Calpuff	9.81E-04	7.00E-02	1.48E-03	POI 10	24	0.35	—	JSL	Below JSL	7.15E-02	Below JSL
Silver	7440-22-4	Calpuff	7.14E-05	3.42E-04	1.08E-04	POI 10	24	1	Health	Schedule 3	<1%	4.50E-04	<1%
Selenium	7782-49-2	Calpuff	1.02E-05	3.02E-03	1.54E-05	POI 10	24	10	Health	Guideline	<1%	3.04E-03	<1%
Selenium	7782-49-2	Calpuff	1.02E-05	8.82E-03	1.06E-04	POI 2	½	20	Health	Guideline	<1%	8.93E-03	<1%
Thallium	7440-28-0	Calpuff	8.31E-04	—	1.25E-03	POI 10	24	0.24	—	JSL	Below JSL	1.25E-03	Below JSL
Tin	7440-31-5	Calpuff	3.75E-04	3.02E-03	5.66E-04	POI 10	24	10	Health	Schedule 3	<1%	3.59E-03	<1%
Vanadium	7440-62-2	Calpuff	2.48E-05	1.55E-03	3.74E-05	POI 10	24	2	Health	Schedule 3	<1%	1.59E-03	<1%
Zinc	7440-66-6	Calpuff	4.25E-03	4.00E-02	6.42E-03	POI 10	24	120	Particulate	Schedule 3	<1%	4.64E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	4.36E-05	3.60E-02	4.51E-04	POI 2	½	37000	Health	Guideline	<1%	3.65E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	4.36E-05	3.00E-02	3.76E-04	POI 2	1	30500	Health	Point-of-Impingement	<1%	3.04E-02	<1%

Table 5 - Scenario B
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	1.10E-06	—	1.66E-06	POI 10	24	1	—	JSL	Below JSL	1.66E-06	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	1.10E-06	5.00E-02	1.66E-06	POI 10	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	1.10E-06	1.32E-01	1.14E-05	POI 2	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	3.70E-06	—	5.59E-06	POI 10	24	0.1	—	De Minimus	Below De Minimus	5.59E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	1.12E-06	—	1.68E-06	POI 10	24	1.5	—	JSL	Below JSL	1.68E-06	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	2.19E-06	—	3.31E-06	POI 10	24	77	—	JSL	Below JSL	3.31E-06	Below JSL
Pentachlorophenol	87-86-5	Calpuff	4.39E-06	8.76E-04	6.63E-06	POI 10	24	20	Health	Guideline	<1%	8.83E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	4.39E-06	2.56E-03	4.54E-05	POI 2	½	60	Health	Guideline	<1%	2.60E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	1.10E-06	6.25E-05	1.66E-06	POI 10	24	0.011	—	JSL	Below JSL	6.42E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	2.88E-06	—	4.35E-06	POI 10	24	3	—	JSL	Below JSL	4.35E-06	Below JSL
Acenaphthylene	208-96-8	Calpuff	3.09E-07	3.09E-04	4.66E-07	POI 10	24	3.5	—	JSL	Below JSL	3.09E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	3.96E-07	1.25E-03	5.98E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	8.67E-08	1.63E-04	1.31E-07	POI 10	24	0.2	—	JSL	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	3.20E-08	6.77E-05	4.82E-08	POI 10	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	8.16E-08	1.42E-04	1.23E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	2.15E-08	6.77E-05	3.25E-08	POI 10	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	5.89E-07	1.35E-04	8.89E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	4.03E-07	1.35E-04	6.08E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	8.80E-07	7.07E-05	1.33E-06	POI 10	24	1.2	—	JSL	Below JSL	7.20E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	7.33E-08	6.77E-05	1.11E-07	POI 10	24	0.0011	Health	Guideline	<1%	6.78E-05	6.16%
Benzo(a)pyrene	50-32-8	Calpuff	7.33E-08	1.98E-04	7.58E-07	POI 2	½	0.0033	Health	Guideline	<1%	1.99E-04	6.02%
Benzo(e)pyrene	192-97-2	Calpuff	1.86E-07	1.35E-04	2.80E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	6.36E-05	1.36E-03	9.59E-05	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.46E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	8.03E-08	9.64E-05	1.21E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	9.65E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	5.71E-07	—	8.62E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	8.62E-07	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	2.58E-08	6.77E-05	3.89E-08	POI 10	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	8.86E-07	6.01E-04	1.34E-06	POI 10	24	140	—	JSL	Below JSL	6.02E-04	Below JSL
Fluorine	86-73-7	Calpuff	6.67E-07	—	1.01E-06	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.01E-06	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	1.61E-07	6.77E-05	2.42E-07	POI 10	24	0.1	—	De Minimus	Below De Minimus	6.79E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	2.09E-06	1.30E-03	3.16E-06	POI 10	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	1.16E-05	2.19E-03	1.75E-05	POI 10	24	10	—	JSL	Below JSL	2.21E-03	Below JSL
Naphthalene	91-20-3	Calpuff	9.01E-06	2.43E-03	1.36E-05	POI 10	24	22.5	Health	Guideline	<1%	2.44E-03	<1%
Naphthalene	91-20-3	Calpuff	9.01E-06	7.09E-03	9.32E-05	POI 2	½	36	Odour	Guideline	<1%	7.19E-03	<1%
Naphthalene	91-20-3	Calpuff	9.01E-06	9.77E-03	1.28E-04	POI 2	10-min	50	Odour	Guideline	<1%	9.90E-03	<1%
Perylene	198-55-0	Calpuff	3.22E-08	1.35E-04	4.86E-08	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	2.02E-06	2.57E-03	3.04E-06	POI 10	24	0.1	—	De Minimus	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	1.07E-06	2.83E-04	1.61E-06	POI 10	24	0.2	—	JSL	Below JSL	2.85E-04	Below JSL
Tetralin	119-64-2	Calpuff	1.06E-05	1.35E-04	1.60E-05	POI 10	24	1200	—	JSL	Below JSL	1.51E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	1.74E-06	1.35E-04	2.63E-06	POI 10	24	0.1	—	De Minimus	Below De Minimus	1.38E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	1.07E-08	1.76E+00	1.62E-08	POI 10	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	1.07E-08	5.21E+00	1.11E-07	POI 2	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	6.61E-04	1.18E+01	9.97E-04	POI 10	24	N/A	N/A	N/A	N/A	1.18E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	3.75E-03	2.00E-02	5.66E-03	POI 10	24	0.1	—	De Minimus	Below De Minimus	2.57E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	1.03E-03	3.00E-02	1.55E-03	POI 10	24	55	Health	Guideline	<1%	3.15E-02	<1%
Bromoform	75-25-2	Calpuff	1.03E-03	8.40E-02	1.06E-02	POI 2	½	165	Health	Guideline	<1%	9.46E-02	<1%
Bromomethane	74-83-9	Calpuff	7.67E-04	9.00E-02	1.16E-03	POI 10	24	1350	Health	Guideline	<1%	9.12E-02	<1%
Bromomethane	74-83-9	Calpuff	7.67E-04	2.64E-01	7.93E-03	POI 2	½	4000	Health	Guideline	<1%	2.72E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	6.39E-06	7.40E-01	9.65E-06	POI 10	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	1.09E-05	2.30E-01	1.64E-05	POI 10	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	1.86E-03	3.23E+00	2.80E-03	POI 10	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	1.86E-03	9.44E+00	1.92E-02	POI 2	½	1500000	Health	Guideline	<1%	9.46E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	1.20E-05	7.31E-03	1.25E-04	POI 2	½	600	Health	Guideline	<1%	7.43E-03	<1%
Dichloromethane	75-09-2	Calpuff	3.75E-03	1.27E+00	5.66E-03	POI 10	24	220	Health	Schedule 3	<1%	1.28E+00	<1%
Ethylbenzene	100-41-4	Calpuff	2.21E-05	1.24E+00	3.33E-05	POI 10	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	2.21E-05	5.00E+00	3.14E-04	POI 2	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%

Table 5 - Scenario B
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Ethylene Dibromide	106-93-4	Calpuff	6.02E-06	5.20E-03	9.08E-06	POI 10	24	3	Health	Guideline	<1%	5.21E-03	<1%
Ethylene Dibromide	106-93-4	Calpuff	6.02E-06	1.20E-02	6.23E-05	POI 2	½	9	Health	Guideline	<1%	1.21E-02	<1%
Formaldehyde	50-00-0	Calpuff	1.01E-03	3.38E+00	1.53E-03	POI 10	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	1.21E-04	4.90E-01	1.82E-04	POI 10	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	1.07E-03	9.47E+00	1.62E-03	POI 10	24	2000	Odour	Guideline	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	3.04E-05	1.10E-01	4.59E-05	POI 10	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	Calpuff	1.05E-05	5.40E-01	1.58E-05	POI 10	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	1.05E-05	—	1.58E-05	POI 10	24	12	Health	Schedule 3	<1%	1.58E-05	<1%
Trichlorofluoromethane	75-69-4	Calpuff	3.67E-03	2.15E+00	5.54E-03	POI 10	24	6000	Health	Guideline	<1%	2.16E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	3.67E-03	6.28E+00	3.80E-02	POI 2	½	18000	Health	Guideline	<1%	6.31E+00	<1%
Vinyl chloride	75-01-4	Calpuff	9.29E-04	5.88E-03	1.40E-03	POI 10	24	1	Health	Schedule 3	<1%	7.28E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	1.29E-02	4.83E+00	1.94E-02	POI 10	24	730	Health	Schedule 3	<1%	4.85E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	1.29E-02	1.94E+01	1.83E-01	POI 2	10-min	3000	Odour	Guideline	<1%	1.96E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	9000	Health	Guideline	<1%	0.00E+00	<1%
Nitrous Oxides	10024-97-2	Calpuff	0.00E+00	—	0.00E+00	POI 2	½	27000	Health	Guideline	<1%	0.00E+00	<1%
3-Methylchloranthene	56-49-5	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Butane	106-97-8	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	7600	—	JSL	Below JSL	0.00E+00	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Ethane	74-84-0	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	4800	—	JSL	Below JSL	0.00E+00	Below JSL
Fluorene	86-73-7	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Hexane	110-54-3	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	7500	Health	Schedule 3	<1%	0.00E+00	<1%
Pentane	109-66-0	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	4200	—	JSL	Below JSL	0.00E+00	Below JSL
Propane	74-98-6	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	7200	—	JSL	Below JSL	0.00E+00	Below JSL
Copper	7440-50-8	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	50	Health	Schedule 3	<1%	0.00E+00	<1%
Manganese	7439-96-5	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	1	Health	Guideline	<1%	0.00E+00	<1%
Manganese	7439-96-5	Calpuff	0.00E+00	—	0.00E+00	POI 2	½	3	Health	Guideline	<1%	0.00E+00	<1%
Molybdenum	7439-98-7	Calpuff	0.00E+00	—	0.00E+00	POI 10	24	120	Particulate	Guideline	<1%	0.00E+00	<1%
Molybdenum	7439-98-7	Calpuff	0.00E+00	—	0.00E+00	POI 2	½	100	Particulate	Guideline	<1%	0.00E+00	<1%

Table 5 - Scenario C
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	1.95E+00	1.26E+03	2.09E+01	POI 3 - (680.054, 4860.356)	½	6000	Health	Schedule 3	<1%	1.28E+03	21.30%
Sulphur Dioxide	7446-09-5	Calpuff	8.99E-01	1.93E+01	1.06E+00	POI 11 - (680.254, 4861.356)	24	275	Health & Vegetation	Schedule 3	<1%	2.04E+01	7.40%
Sulphur Dioxide	7446-09-5	Calpuff	8.99E-01	1.95E+01	8.04E+00	POI 3	1	690	Health & Vegetation	Schedule 3	1.16%	2.75E+01	3.99%
Total Particulate Matter	N/A	Calpuff	5.93E-01	3.54E+01	6.66E-01	POI 11	24	120	Visibility	Schedule 3	<1%	3.61E+01	30.06%
PM10	N/A	Calpuff	5.93E-01	—	6.66E-01	POI 11	24	50	—	Ontario AAQC	1.33%	6.66E-01	1.33%
PM2.5	N/A	Calpuff	5.61E-01	2.04E+01	6.35E-01	POI 11	24	30	—	Ontario AAQC	2.12%	2.10E+01	70.12%
Lead	7439-92-1	Calpuff	1.14E-03	4.98E-03	1.35E-03	POI 11	24	0.5	Health	Schedule 3	<1%	6.33E-03	1.27%
Lead	7439-92-1	Calpuff	1.14E-03	1.92E-03	1.58E-04	POI 19 - (681.004, 4859.856)	30-day	0.2	Health	Schedule 3	<1%	2.08E-03	1.04%
Cadmium	7440-43-9	Calpuff	1.71E-04	6.04E-04	2.03E-04	POI 11	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	8.07E-04	Below URT
Cadmium	7440-43-9	Calpuff	1.71E-04	1.76E-03	1.84E-03	POI 3	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	3.60E-03	Below URT
Mercury	7439-97-6	Calpuff	3.44E-04	—	4.07E-04	POI 11	24	2	Health	Schedule 3	<1%	4.07E-04	<1%
Fluorides	7664-39-3	Calpuff	2.04E-02	—	2.42E-02	POI 11	24	0.86	Vegetation	Schedule 3	2.81%	2.42E-02	2.81%
Fluorides	7664-39-3	Calpuff	2.04E-02	—	2.82E-03	POI 19	30-day	0.34	Vegetation	Schedule 3	<1%	2.82E-03	<1%
PCDD	N/A	Calpuff	1.36E-09	2.37E-08	1.61E-09	POI 11	24	5.00E-06	—	Guideline	<1%	2.53E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	2.04E-01	—	2.42E-01	POI 11	24	20	Health	Schedule 3	1.21%	2.42E-01	1.21%
Ammonia	7664-41-7	Calpuff	2.25E-01	—	2.66E-01	POI 11	24	100	Health	Schedule 3	<1%	2.66E-01	<1%
Nitrogen Oxides	10102-44-0	Calpuff	3.16E+00	5.82E+01	3.74E+00	POI 11	24	200	Health	Schedule 3	1.87%	6.19E+01	30.97%
Nitrogen Oxides	10102-44-0	Calpuff	3.16E+00	6.46E+01	2.83E+01	POI 3	1	400	Health	Schedule 3	7.07%	9.29E+01	23.22%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	1.64E-06	4.20E-05	1.94E-06	POI 11	24	0.15	Health	Point-of-Impingement	<1%	4.39E-05	<1%
Aluminum	7429-90-5	Calpuff	9.03E-04	2.10E-01	1.07E-03	POI 11	24	4.8	—	JSL	Below JSL	2.11E-01	Below JSL
Antimony	7440-36-0	Calpuff	6.45E-05	3.02E-03	7.63E-05	POI 11	24	25	Health	Schedule 3	<1%	3.10E-03	<1%
Arsenic	7440-38-2	Calpuff	9.54E-06	1.81E-03	1.13E-05	POI 11	24	0.3	Health	Guideline	<1%	1.82E-03	<1%
Arsenic	7440-38-2	Calpuff	9.54E-06	5.29E-03	1.02E-04	POI 3	½	1	Health	Guideline	<1%	5.39E-03	<1%
Barium	7440-39-3	Calpuff	9.67E-05	8.18E-03	1.14E-04	POI 11	24	10	Health	Guideline	<1%	8.29E-03	<1%
Barium	7440-39-3	Calpuff	9.67E-05	2.40E-02	1.04E-03	POI 3	½	30	Health	Guideline	<1%	2.50E-02	<1%
Beryllium	7440-41-7	Calpuff	7.70E-06	3.02E-04	9.11E-06	POI 11	24	0.01	Health	Schedule 3	<1%	3.11E-04	3.11%
Boron	7440-42-8	Calpuff	3.48E-03	8.00E-02	4.11E-03	POI 11	24	120	Particulate	Schedule 3	<1%	8.41E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	2.28E-05	—	2.69E-05	POI 11	24	0.1	—	Guideline	<1%	2.69E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	6.66E-05	2.76E-03	7.88E-05	POI 11	24	0.5	Health	Guideline	<1%	2.84E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	6.66E-05	8.06E-03	7.15E-04	POI 3	½	5	Health	Guideline	<1%	8.78E-03	<1%
Cobalt	7440-48-4	Calpuff	1.33E-04	6.04E-04	1.57E-04	POI 11	24	0.1	Health	Guideline	<1%	7.61E-04	<1%
Cobalt	7440-48-4	Calpuff	1.33E-04	1.76E-03	1.42E-03	POI 3	½	0.3	Health	Guideline	<1%	3.19E-03	1.06%
Nickel	7440-02-0	Calpuff	2.00E-03	4.49E-03	2.37E-03	POI 11	24	0.1	Vegetation	Schedule 3	2.37%	6.86E-03	6.86%
Phosphorus	7723-14-0	Calpuff	1.05E-03	7.00E-02	1.24E-03	POI 11	24	0.35	—	JSL	Below JSL	7.12E-02	Below JSL
Silver	7440-22-4	Calpuff	7.61E-05	3.42E-04	9.01E-05	POI 11	24	1	Health	Schedule 3	<1%	4.32E-04	<1%
Selenium	7782-49-2	Calpuff	1.12E-05	3.02E-03	1.32E-05	POI 11	24	10	Health	Guideline	<1%	3.03E-03	<1%
Selenium	7782-49-2	Calpuff	1.12E-05	8.82E-03	1.20E-04	POI 3	½	20	Health	Guideline	<1%	8.94E-03	<1%
Thallium	7440-28-0	Calpuff	8.86E-04	—	1.05E-03	POI 11	24	0.24	—	JSL	Below JSL	1.05E-03	Below JSL
Tin	7440-31-5	Calpuff	4.00E-04	3.02E-03	4.73E-04	POI 11	24	10	Health	Schedule 3	<1%	3.49E-03	<1%
Vanadium	7440-62-2	Calpuff	5.19E-05	1.55E-03	6.14E-05	POI 11	24	2	Health	Schedule 3	<1%	1.61E-03	<1%
Zinc	7440-66-6	Calpuff	4.85E-03	4.00E-02	5.75E-03	POI 11	24	120	Particulate	Schedule 3	<1%	4.57E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	4.65E-05	3.60E-02	4.99E-04	POI 3	½	37000	Health	Guideline	<1%	3.65E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	4.65E-05	3.00E-02	4.16E-04	POI 3	1	30500	Health	Point-of-Impingement	<1%	3.04E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	1.17E-06	—	1.38E-06	POI 11	24	1	—	JSL	Below JSL	1.38E-06	Below JSL

Table 5 - Scenario C
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	1.17E-06	5.00E-02	1.38E-06	POI 11	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	1.17E-06	1.32E-01	1.26E-05	POI 3	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	3.95E-06	—	4.67E-06	POI 11	24	0.1	—	De Minimus	Below De Minimus	4.67E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	1.19E-06	—	1.41E-06	POI 11	24	1.5	—	JSL	Below JSL	1.41E-06	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	2.34E-06	—	2.77E-06	POI 11	24	77	—	JSL	Below JSL	2.77E-06	Below JSL
Pentachlorophenol	87-86-5	Calpuff	4.68E-06	8.76E-04	5.54E-06	POI 11	24	20	Health	Guideline	<1%	8.82E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	4.68E-06	2.56E-03	5.03E-05	POI 3	½	60	Health	Guideline	<1%	2.61E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	1.17E-06	6.25E-05	1.38E-06	POI 11	24	0.011	—	JSL	Below JSL	6.39E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	3.07E-06	—	3.64E-06	POI 11	24	3	—	JSL	Below JSL	3.64E-06	Below JSL
Acenaphthylene	208-96-8	Calpuff	3.49E-07	3.09E-04	4.13E-07	POI 11	24	3.5	—	JSL	Below JSL	3.09E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	4.42E-07	1.25E-03	5.24E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	1.19E-07	1.63E-04	1.41E-07	POI 11	24	0.2	—	JSL	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	5.40E-08	6.77E-05	6.39E-08	POI 11	24	0.1	—	De Minimus	Below De Minimus	6.78E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	1.07E-07	1.42E-04	1.27E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	4.29E-08	6.77E-05	5.07E-08	POI 11	24	0.1	—	De Minimus	Below De Minimus	6.78E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	6.28E-07	1.35E-04	7.43E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	4.30E-07	1.35E-04	5.08E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	9.51E-07	7.07E-05	1.13E-06	POI 11	24	1.2	—	JSL	Below JSL	7.18E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	9.14E-08	6.77E-05	1.08E-07	POI 11	24	0.0011	Health	Guideline	<1%	6.78E-05	6.16%
Benzo(a)pyrene	50-32-8	Calpuff	9.14E-08	1.98E-04	9.81E-07	POI 3	½	0.0033	Health	Guideline	<1%	1.99E-04	6.03%
Benzo(e)pyrene	192-97-2	Calpuff	1.98E-07	1.35E-04	2.34E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	6.78E-05	1.36E-03	8.02E-05	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.44E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	1.06E-07	9.64E-05	1.25E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	9.65E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	6.09E-07	—	7.21E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	7.21E-07	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	4.08E-08	6.77E-05	4.83E-08	POI 11	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	9.78E-07	6.01E-04	1.16E-06	POI 11	24	140	—	JSL	Below JSL	6.02E-04	Below JSL
Fluorine	86-73-7	Calpuff	7.11E-07	—	8.42E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	8.42E-07	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	1.91E-07	6.77E-05	2.26E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	6.79E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	2.23E-06	1.30E-03	2.64E-06	POI 11	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	1.26E-05	2.19E-03	1.49E-05	POI 11	24	10	—	JSL	Below JSL	2.20E-03	Below JSL
Naphthalene	91-20-3	Calpuff	1.64E-05	2.43E-03	1.94E-05	POI 11	24	22.5	Health	Guideline	<1%	2.45E-03	<1%
Naphthalene	91-20-3	Calpuff	1.64E-05	7.09E-03	1.76E-04	POI 3	½	36	Odour	Guideline	<1%	7.27E-03	<1%
Naphthalene	91-20-3	Calpuff	1.64E-05	9.77E-03	2.41E-04	POI 3	10-min	50	Odour	Guideline	<1%	1.00E-02	<1%
Perylene	198-55-0	Calpuff	3.43E-08	1.35E-04	4.06E-08	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	2.34E-06	2.57E-03	2.77E-06	POI 11	24	0.1	—	De Minimus	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	1.20E-06	2.83E-04	1.42E-06	POI 11	24	0.2	—	JSL	Below JSL	2.84E-04	Below JSL
Tetralin	119-64-2	Calpuff	1.13E-05	1.35E-04	1.34E-05	POI 11	24	1200	—	JSL	Below JSL	1.48E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	1.86E-06	1.35E-04	2.20E-06	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.37E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	1.43E-08	1.76E+00	1.70E-08	POI 11	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	1.43E-08	5.21E+00	1.54E-07	POI 3	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	7.27E-04	1.18E+01	8.61E-04	POI 11	24	N/A	N/A	N/A	N/A	1.18E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	5.00E-03	2.00E-02	5.92E-03	POI 11	24	0.1	—	De Minimus	Below De Minimus	2.59E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	1.37E-03	3.00E-02	1.62E-03	POI 11	24	55	Health	Guideline	<1%	3.16E-02	<1%
Bromoform	75-25-2	Calpuff	1.37E-03	8.40E-02	1.47E-02	POI 3	½	165	Health	Guideline	<1%	9.87E-02	<1%
Bromomethane	74-83-9	Calpuff	8.18E-04	9.00E-02	9.68E-04	POI 11	24	1350	Health	Guideline	<1%	9.10E-02	<1%
Bromomethane	74-83-9	Calpuff	8.18E-04	2.64E-01	8.78E-03	POI 3	½	4000	Health	Guideline	<1%	2.73E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	8.52E-06	7.40E-01	1.01E-05	POI 11	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	1.16E-05	2.30E-01	1.37E-05	POI 11	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	1.98E-03	3.23E+00	2.34E-03	POI 11	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	1.98E-03	9.44E+00	2.12E-02	POI 3	½	1500000	Health	Guideline	<1%	9.47E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	1.28E-05	7.31E-03	1.38E-04	POI 3	½	600	Health	Guideline	<1%	7.45E-03	<1%
Dichloromethane	75-09-2	Calpuff	4.00E-03	1.27E+00	4.73E-03	POI 11	24	220	Health	Schedule 3	<1%	1.27E+00	<1%
Ethylbenzene	100-41-4	Calpuff	2.35E-05	1.24E+00	2.79E-05	POI 11	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	2.35E-05	5.00E+00	3.47E-04	POI 3	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%
Ethylene Dibromide	106-93-4	Calpuff	8.02E-06	5.20E-03	9.50E-06	POI 11	24	3	Health	Guideline	<1%	5.21E-03	<1%

Table 5 - Scenario C
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Ethylene Dibromide	106-93-4	Calpuff	8.02E-06	1.20E-02	8.61E-05	POI 3	½	9	Health	Guideline	<1%	1.21E-02	<1%
Formaldehyde	50-00-0	Calpuff	1.91E-03	3.38E+00	2.26E-03	POI 11	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	1.29E-04	4.90E-01	1.52E-04	POI 11	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	1.18E-03	9.47E+00	1.40E-03	POI 11	24	2000	Odour	Guideline	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	3.24E-05	1.10E-01	3.84E-05	POI 11	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	Calpuff	1.12E-05	5.40E-01	1.32E-05	POI 11	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	1.12E-05	—	1.32E-05	POI 11	24	12	Health	Schedule 3	<1%	1.32E-05	<1%
Trichlorofluoromethane	75-69-4	Calpuff	3.91E-03	2.15E+00	4.63E-03	POI 11	24	6000	Health	Guideline	<1%	2.15E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	3.91E-03	6.28E+00	4.20E-02	POI 3	½	18000	Health	Guideline	<1%	6.32E+00	<1%
Vinyl chloride	75-01-4	Calpuff	9.91E-04	5.88E-03	1.17E-03	POI 11	24	1	Health	Schedule 3	<1%	7.05E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	1.37E-02	4.83E+00	1.62E-02	POI 11	24	730	Health	Schedule 3	<1%	4.85E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	1.37E-02	1.94E+01	2.02E-01	POI 3	10-min	3000	Odour	Guideline	<1%	1.96E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	8.85E-03	—	1.05E-02	POI 11	24	9000	Health	Guideline	<1%	1.05E-02	<1%
Nitrous Oxides	10024-97-2	Calpuff	8.85E-03	—	9.50E-02	POI 3	½	27000	Health	Guideline	<1%	9.50E-02	<1%
3-Methylchloranthene	56-49-5	Calpuff	1.99E-08	—	2.36E-08	POI 11	24	0.1	—	De Minimus	Below De Minimus	2.36E-08	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	1.77E-07	—	2.10E-07	POI 11	24	0.1	—	De Minimus	Below De Minimus	2.10E-07	Below De Minimus
Butane	106-97-8	Calpuff	2.32E-02	—	2.75E-02	POI 11	24	7600	—	JSL	Below JSL	2.75E-02	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	1.33E-05	—	1.57E-05	POI 11	24	0.1	—	De Minimus	Below De Minimus	1.57E-05	Below De Minimus
Ethane	74-84-0	Calpuff	3.43E-02	—	4.06E-02	POI 11	24	4800	—	JSL	Below JSL	4.06E-02	Below JSL
Fluorene	86-73-7	Calpuff	3.10E-08	—	3.67E-08	POI 11	24	0.1	—	De Minimus	Below De Minimus	3.67E-08	Below De Minimus
Hexane	110-54-3	Calpuff	1.99E-02	—	2.36E-02	POI 11	24	7500	Health	Schedule 3	<1%	2.36E-02	<1%
Pentane	109-66-0	Calpuff	2.88E-02	—	3.41E-02	POI 11	24	4200	—	JSL	Below JSL	3.41E-02	Below JSL
Propane	74-98-6	Calpuff	1.77E-02	—	2.10E-02	POI 11	24	7200	—	JSL	Below JSL	2.10E-02	Below JSL
Copper	7440-50-8	Calpuff	9.41E-06	—	1.11E-05	POI 11	24	50	Health	Schedule 3	<1%	1.11E-05	<1%
Manganese	7439-96-5	Calpuff	4.21E-06	—	4.98E-06	POI 11	24	1	Health	Guideline	<1%	4.98E-06	<1%
Manganese	7439-96-5	Calpuff	4.21E-06	—	4.51E-05	POI 3	½	3	Health	Guideline	<1%	4.51E-05	<1%
Molybdenum	7439-98-7	Calpuff	1.22E-05	—	1.44E-05	POI 11	24	120	Particulate	Guideline	<1%	1.44E-05	<1%
Molybdenum	7439-98-7	Calpuff	1.22E-05	—	1.31E-04	POI 3	½	100	Particulate	Guideline	<1%	1.31E-04	<1%

Table 5 - Scenario D
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	9.76E-01	1.26E+03	1.08E+01	POI 4 - (679.854, 4860.756)	½	6000	Health	Schedule 3	<1%	1.27E+03	21.13%
Sulphur Dioxide	7446-09-5	Calpuff	4.49E-01	1.93E+01	7.48E-01	POI 12 - (680.954, 4858.756)	24	275	Health & Vegetation	Schedule 3	<1%	2.00E+01	7.29%
Sulphur Dioxide	7446-09-5	Calpuff	4.49E-01	1.95E+01	4.14E+00	POI 4	1	690	Health & Vegetation	Schedule 3	<1%	2.36E+01	3.43%
Total Particulate Matter	N/A	Calpuff	2.97E-01	3.54E+01	3.76E-01	POI 12	24	120	Visibility	Schedule 3	<1%	3.58E+01	29.81%
PM10	N/A	Calpuff	2.97E-01	—	3.76E-01	POI 12	24	50	—	Ontario AAQC	<1%	3.76E-01	<1%
PM2.5	N/A	Calpuff	2.81E-01	2.04E+01	3.60E-01	POI 12	24	30	—	Ontario AAQC	1.20%	2.08E+01	69.20%
Lead	7439-92-1	Calpuff	5.71E-04	4.98E-03	9.50E-04	POI 12	24	0.5	Health	Schedule 3	<1%	5.93E-03	1.19%
Lead	7439-92-1	Calpuff	5.71E-04	1.92E-03	1.31E-04	POI 20 - (680.954, 4859.906)	30-day	0.2	Health	Schedule 3	<1%	2.05E-03	1.03%
Cadmium	7440-43-9	Calpuff	8.56E-05	6.04E-04	1.42E-04	POI 12	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	7.46E-04	Below URT
Cadmium	7440-43-9	Calpuff	8.56E-05	1.76E-03	9.46E-04	POI 4	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	2.71E-03	Below URT
Mercury	7439-97-6	Calpuff	1.72E-04	—	2.86E-04	POI 12	24	2	Health	Schedule 3	<1%	2.86E-04	<1%
Fluorides	7664-39-3	Calpuff	1.02E-02	—	1.70E-02	POI 12	24	0.86	Vegetation	Schedule 3	1.98%	1.70E-02	1.98%
Fluorides	7664-39-3	Calpuff	1.02E-02	—	2.35E-03	POI 20	30-day	0.34	Vegetation	Schedule 3	<1%	2.35E-03	<1%
PCDD	N/A	Calpuff	6.81E-10	2.37E-08	1.13E-09	POI 12	24	5.00E-06	—	Guideline	<1%	2.48E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	1.02E-01	—	1.70E-01	POI 12	24	20	Health	Schedule 3	<1%	1.70E-01	<1%
Ammonia	7664-41-7	Calpuff	1.12E-01	—	1.87E-01	POI 12	24	100	Health	Schedule 3	<1%	1.87E-01	<1%
Nitrogen Oxides	10102-44-0	Calpuff	1.58E+00	5.82E+01	2.63E+00	POI 12	24	200	Health	Schedule 3	1.32%	6.08E+01	30.42%
Nitrogen Oxides	10102-44-0	Calpuff	1.58E+00	6.46E+01	1.46E+01	POI 4	1	400	Health	Schedule 3	3.64%	7.92E+01	19.79%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	8.20E-07	4.20E-05	1.36E-06	POI 12	24	0.15	Health	Point-of-Impingement	<1%	4.34E-05	<1%
Aluminum	7429-90-5	Calpuff	4.51E-04	2.10E-01	7.51E-04	POI 12	24	4.8	—	JSL	Below JSL	2.11E-01	Below JSL
Antimony	7440-36-0	Calpuff	3.22E-05	3.02E-03	5.36E-05	POI 12	24	25	Health	Schedule 3	<1%	3.07E-03	<1%
Arsenic	7440-38-2	Calpuff	4.77E-06	1.81E-03	7.94E-06	POI 12	24	0.3	Health	Guideline	<1%	1.82E-03	<1%
Arsenic	7440-38-2	Calpuff	4.77E-06	5.29E-03	5.27E-05	POI 4	½	1	Health	Guideline	<1%	5.34E-03	<1%
Barium	7440-39-3	Calpuff	4.84E-05	8.18E-03	8.05E-05	POI 12	24	10	Health	Guideline	<1%	8.26E-03	<1%
Barium	7440-39-3	Calpuff	4.84E-05	2.40E-02	5.34E-04	POI 4	½	30	Health	Guideline	<1%	2.45E-02	<1%
Beryllium	7440-41-7	Calpuff	3.85E-06	3.02E-04	6.41E-06	POI 12	24	0.01	Health	Schedule 3	<1%	3.08E-04	3.08%
Boron	7440-42-8	Calpuff	1.74E-03	8.00E-02	2.89E-03	POI 12	24	120	Particulate	Schedule 3	<1%	8.29E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	1.14E-05	—	1.89E-05	POI 12	24	0.1	—	Guideline	<1%	1.89E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	3.33E-05	2.76E-03	5.54E-05	POI 12	24	0.5	Health	Guideline	<1%	2.82E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	3.33E-05	8.06E-03	3.68E-04	POI 4	½	5	Health	Guideline	<1%	8.43E-03	<1%
Cobalt	7440-48-4	Calpuff	6.63E-05	6.04E-04	1.10E-04	POI 12	24	0.1	Health	Guideline	<1%	7.14E-04	<1%
Cobalt	7440-48-4	Calpuff	6.63E-05	1.76E-03	7.32E-04	POI 4	½	0.3	Health	Guideline	<1%	2.50E-03	<1%
Nickel	7440-02-0	Calpuff	1.00E-03	4.49E-03	1.67E-03	POI 12	24	0.1	Vegetation	Schedule 3	1.67%	6.16E-03	6.16%
Phosphorus	7723-14-0	Calpuff	5.23E-04	7.00E-02	8.70E-04	POI 12	24	0.35	—	JSL	Below JSL	7.09E-02	Below JSL
Silver	7440-22-4	Calpuff	3.81E-05	3.42E-04	6.33E-05	POI 12	24	1	Health	Schedule 3	<1%	4.05E-04	<1%
Selenium	7782-49-2	Calpuff	5.58E-06	3.02E-03	9.29E-06	POI 12	24	10	Health	Guideline	<1%	3.03E-03	<1%
Selenium	7782-49-2	Calpuff	5.58E-06	8.82E-03	6.17E-05	POI 4	½	20	Health	Guideline	<1%	8.88E-03	<1%
Thallium	7440-28-0	Calpuff	4.43E-04	—	7.37E-04	POI 12	24	0.24	—	JSL	Below JSL	7.37E-04	Below JSL
Tin	7440-31-5	Calpuff	2.00E-04	3.02E-03	3.33E-04	POI 12	24	10	Health	Schedule 3	<1%	3.35E-03	<1%
Vanadium	7440-62-2	Calpuff	2.59E-05	1.55E-03	4.32E-05	POI 12	24	2	Health	Schedule 3	<1%	1.59E-03	<1%
Zinc	7440-66-6	Calpuff	2.43E-03	4.00E-02	4.04E-03	POI 12	24	120	Particulate	Schedule 3	<1%	4.40E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	2.32E-05	3.60E-02	2.57E-04	POI 4	½	37000	Health	Guideline	<1%	3.63E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	2.32E-05	3.00E-02	2.14E-04	POI 4	1	30500	Health	Point-of-Impingement	<1%	3.02E-02	<1%

Table 5 - Scenario D
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	5.85E-07	—	9.73E-07	POI 12	24	1	—	JSL	Below JSL	9.73E-07	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	5.85E-07	5.00E-02	9.73E-07	POI 12	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	5.85E-07	1.32E-01	6.46E-06	POI 4	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	1.97E-06	—	3.29E-06	POI 12	24	0.1	—	De Minimus	Below De Minimus	3.29E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	5.94E-07	—	9.89E-07	POI 12	24	1.5	—	JSL	Below JSL	9.89E-07	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	1.17E-06	—	1.95E-06	POI 12	24	77	—	JSL	Below JSL	1.95E-06	Below JSL
Pentachlorophenol	87-86-5	Calpuff	2.34E-06	8.76E-04	3.90E-06	POI 12	24	20	Health	Guideline	<1%	8.80E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	2.34E-06	2.56E-03	2.59E-05	POI 4	½	60	Health	Guideline	<1%	2.58E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	5.85E-07	6.25E-05	9.73E-07	POI 12	24	0.011	—	JSL	Below JSL	6.35E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	1.54E-06	—	2.56E-06	POI 12	24	3	—	JSL	Below JSL	2.56E-06	Below JSL
Acenaphthylene	208-96-8	Calpuff	1.75E-07	3.09E-04	2.91E-07	POI 12	24	3.5	—	JSL	Below JSL	3.09E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	2.21E-07	1.25E-03	3.68E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	5.95E-08	1.63E-04	9.90E-08	POI 12	24	0.2	—	JSL	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	2.70E-08	6.77E-05	4.49E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	5.35E-08	1.42E-04	8.90E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	2.14E-08	6.77E-05	3.57E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	3.14E-07	1.35E-04	5.22E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	2.15E-07	1.35E-04	3.57E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	4.76E-07	7.07E-05	7.92E-07	POI 12	24	1.2	—	JSL	Below JSL	7.15E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	4.57E-08	6.77E-05	7.61E-08	POI 12	24	0.0011	Health	Guideline	<1%	6.78E-05	6.16%
Benzo(a)pyrene	50-32-8	Calpuff	4.57E-08	1.98E-04	5.05E-07	POI 4	½	0.0033	Health	Guideline	<1%	1.99E-04	6.02%
Benzo(e)pyrene	192-97-2	Calpuff	9.89E-08	1.35E-04	1.65E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	3.39E-05	1.36E-03	5.64E-05	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.42E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	5.28E-08	9.64E-05	8.78E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	9.65E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	3.04E-07	—	5.07E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	5.07E-07	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	2.04E-08	6.77E-05	3.39E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	4.89E-07	6.01E-04	8.14E-07	POI 12	24	140	—	JSL	Below JSL	6.02E-04	Below JSL
Fluorine	86-73-7	Calpuff	3.56E-07	—	5.92E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	5.92E-07	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	9.56E-08	6.77E-05	1.59E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	6.79E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	1.12E-06	1.30E-03	1.86E-06	POI 12	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	6.31E-06	2.19E-03	1.05E-05	POI 12	24	10	—	JSL	Below JSL	2.20E-03	Below JSL
Naphthalene	91-20-3	Calpuff	8.18E-06	2.43E-03	1.36E-05	POI 12	24	22.5	Health	Guideline	<1%	2.44E-03	<1%
Naphthalene	91-20-3	Calpuff	8.18E-06	7.09E-03	9.04E-05	POI 4	½	36	Odour	Guideline	<1%	7.18E-03	<1%
Naphthalene	91-20-3	Calpuff	8.18E-06	9.77E-03	1.24E-04	POI 4	10-min	50	Odour	Guideline	<1%	9.89E-03	<1%
Perylene	198-55-0	Calpuff	1.72E-08	1.35E-04	2.85E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	1.17E-06	2.57E-03	1.94E-06	POI 12	24	0.1	—	De Minimus	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	5.98E-07	2.83E-04	9.95E-07	POI 12	24	0.2	—	JSL	Below JSL	2.84E-04	Below JSL
Tetralin	119-64-2	Calpuff	5.66E-06	1.35E-04	9.42E-06	POI 12	24	1200	—	JSL	Below JSL	1.44E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	9.29E-07	1.35E-04	1.55E-06	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.37E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	7.17E-09	1.76E+00	1.19E-08	POI 12	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	7.17E-09	5.21E+00	7.92E-08	POI 4	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	3.64E-04	1.18E+01	6.05E-04	POI 12	24	N/A	N/A	N/A	N/A	1.18E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	2.50E-03	2.00E-02	4.16E-03	POI 12	24	0.1	—	De Minimus	Below De Minimus	2.42E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	6.84E-04	3.00E-02	1.14E-03	POI 12	24	55	Health	Guideline	<1%	3.11E-02	<1%
Bromoform	75-25-2	Calpuff	6.84E-04	8.40E-02	7.55E-03	POI 4	½	165	Health	Guideline	<1%	9.16E-02	<1%
Bromomethane	74-83-9	Calpuff	4.09E-04	9.00E-02	6.80E-04	POI 12	24	1350	Health	Guideline	<1%	9.07E-02	<1%
Bromomethane	74-83-9	Calpuff	4.09E-04	2.64E-01	4.52E-03	POI 4	½	4000	Health	Guideline	<1%	2.69E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	4.26E-06	7.40E-01	7.09E-06	POI 12	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	5.79E-06	2.30E-01	9.64E-06	POI 12	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	9.89E-04	3.23E+00	1.65E-03	POI 12	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	9.89E-04	9.44E+00	1.09E-02	POI 4	½	1500000	Health	Guideline	<1%	9.45E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	6.42E-06	7.31E-03	7.10E-05	POI 4	½	600	Health	Guideline	<1%	7.38E-03	<1%
Dichloromethane	75-09-2	Calpuff	2.00E-03	1.27E+00	3.33E-03	POI 12	24	220	Health	Schedule 3	<1%	1.27E+00	<1%
Ethylbenzene	100-41-4	Calpuff	1.18E-05	1.24E+00	1.96E-05	POI 12	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	1.18E-05	5.00E+00	1.79E-04	POI 4	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%

Table 5 - Scenario D
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Ethylene Dibromide	106-93-4	Calpuff	4.01E-06	5.20E-03	6.68E-06	POI 12	24	3	Health	Guideline	<1%	5.21E-03	<1%
Ethylene Dibromide	106-93-4	Calpuff	4.01E-06	1.20E-02	4.43E-05	POI 4	½	9	Health	Guideline	<1%	1.20E-02	<1%
Formaldehyde	50-00-0	Calpuff	9.54E-04	3.38E+00	1.59E-03	POI 12	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	6.44E-05	4.90E-01	1.07E-04	POI 12	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	5.90E-04	9.47E+00	9.81E-04	POI 12	24	2000	Odour	Guideline	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	1.62E-05	1.10E-01	2.70E-05	POI 12	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	Calpuff	5.58E-06	5.40E-01	9.29E-06	POI 12	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	5.58E-06	—	9.29E-06	POI 12	24	12	Health	Schedule 3	<1%	9.29E-06	<1%
Trichlorofluoromethane	75-69-4	Calpuff	1.96E-03	2.15E+00	3.25E-03	POI 12	24	6000	Health	Guideline	<1%	2.15E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	1.96E-03	6.28E+00	2.16E-02	POI 4	½	18000	Health	Guideline	<1%	6.30E+00	<1%
Vinyl chloride	75-01-4	Calpuff	4.95E-04	5.88E-03	8.24E-04	POI 12	24	1	Health	Schedule 3	<1%	6.70E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	6.86E-03	4.83E+00	1.14E-02	POI 12	24	730	Health	Schedule 3	<1%	4.84E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	6.86E-03	1.94E+01	1.04E-01	POI 4	10-min	3000	Odour	Guideline	<1%	1.95E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	4.43E-03	—	7.37E-03	POI 12	24	9000	Health	Guideline	<1%	7.37E-03	<1%
Nitrous Oxides	10024-97-2	Calpuff	4.43E-03	—	4.89E-02	POI 4	½	27000	Health	Guideline	<1%	4.89E-02	<1%
3-Methylchloranthene	56-49-5	Calpuff	9.96E-09	—	1.66E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.66E-08	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	8.85E-08	—	1.47E-07	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.47E-07	Below De Minimus
Butane	106-97-8	Calpuff	1.16E-02	—	1.93E-02	POI 12	24	7600	—	JSL	Below JSL	1.93E-02	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	6.64E-06	—	1.11E-05	POI 12	24	0.1	—	De Minimus	Below De Minimus	1.11E-05	Below De Minimus
Ethane	74-84-0	Calpuff	1.72E-02	—	2.85E-02	POI 12	24	4800	—	JSL	Below JSL	2.85E-02	Below JSL
Fluorene	86-73-7	Calpuff	1.55E-08	—	2.58E-08	POI 12	24	0.1	—	De Minimus	Below De Minimus	2.58E-08	Below De Minimus
Hexane	110-54-3	Calpuff	9.96E-03	—	1.66E-02	POI 12	24	7500	Health	Schedule 3	<1%	1.66E-02	<1%
Pentane	109-66-0	Calpuff	1.44E-02	—	2.39E-02	POI 12	24	4200	—	JSL	Below JSL	2.39E-02	Below JSL
Propane	74-98-6	Calpuff	8.85E-03	—	1.47E-02	POI 12	24	7200	—	JSL	Below JSL	1.47E-02	Below JSL
Copper	7440-50-8	Calpuff	4.70E-06	—	7.83E-06	POI 12	24	50	Health	Schedule 3	<1%	7.83E-06	<1%
Manganese	7439-96-5	Calpuff	2.10E-06	—	3.50E-06	POI 12	24	1	Health	Guideline	<1%	3.50E-06	<1%
Manganese	7439-96-5	Calpuff	2.10E-06	—	2.32E-05	POI 4	½	3	Health	Guideline	<1%	2.32E-05	<1%
Molybdenum	7439-98-7	Calpuff	6.09E-06	—	1.01E-05	POI 12	24	120	Particulate	Guideline	<1%	1.01E-05	<1%
Molybdenum	7439-98-7	Calpuff	6.09E-06	—	6.73E-05	POI 4	½	100	Particulate	Guideline	<1%	6.73E-05	<1%

Table 5 - Scenario E
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	1.16E+00	1.26E+03	1.71E+01	POI 5 - (680.654, 4860.596)	½	6000	Health	Schedule 3	<1%	1.27E+03	21.24%
Sulphur Dioxide	7446-09-5	Calpuff	1.03E-01	1.93E+01	1.91E-01	POI 13 - (680.654, 4861.256)	24	275	Health & Vegetation	Schedule 3	<1%	1.95E+01	7.09%
Sulphur Dioxide	7446-09-5	Calpuff	1.03E-01	1.95E+01	1.26E+00	POI 5	1	690	Health & Vegetation	Schedule 3	<1%	2.08E+01	3.01%
Total Particulate Matter	N/A	Calpuff	1.05E-01	3.54E+01	1.19E-01	POI 13	24	120	Visibility	Schedule 3	<1%	3.55E+01	29.60%
PM10	N/A	Calpuff	1.05E-01	—	1.19E-01	POI 13	24	50	—	Ontario AAQC	<1%	1.19E-01	<1%
PM2.5	N/A	Calpuff	1.05E-01	2.04E+01	1.19E-01	POI 13	24	30	—	Ontario AAQC	<1%	2.05E+01	68.40%
Lead	7439-92-1	Calpuff	6.92E-06	4.98E-03	1.29E-05	POI 13	24	0.5	Health	Schedule 3	<1%	4.99E-03	<1%
Lead	7439-92-1	Calpuff	6.92E-06	1.92E-03	1.93E-06	POI 21 - (680.654, 4860.906)	30-day	0.2	Health	Schedule 3	<1%	1.92E-03	<1%
Cadmium	7440-43-9	Calpuff	1.52E-05	6.04E-04	2.83E-05	POI 13	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	6.32E-04	Below URT
Cadmium	7440-43-9	Calpuff	1.52E-05	1.76E-03	2.24E-04	POI 5	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	1.99E-03	Below URT
Mercury	7439-97-6	Calpuff	3.60E-06	—	6.70E-06	POI 13	24	2	Health	Schedule 3	<1%	6.70E-06	<1%
Fluorides	7664-39-3	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.86	Vegetation	Schedule 3	<1%	0.00E+00	<1%
Fluorides	7664-39-3	Calpuff	0.00E+00	—	0.00E+00	N/A	30-day	0.34	Vegetation	Schedule 3	<1%	0.00E+00	<1%
PCDD	N/A	Calpuff	0.00E+00	2.37E-08	0.00E+00	N/A	24	5.00E-06	—	Guideline	<1%	2.37E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	20	Health	Schedule 3	<1%	0.00E+00	<1%
Ammonia	7664-41-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	100	Health	Schedule 3	<1%	0.00E+00	<1%
Nitrogen Oxides	10102-44-0	Calpuff	5.26E-01	5.82E+01	9.79E-01	POI 13	24	200	Health	Schedule 3	<1%	5.92E+01	29.59%
Nitrogen Oxides	10102-44-0	Calpuff	5.26E-01	6.46E+01	6.45E+00	POI 5	1	400	Health	Schedule 3	1.61%	7.10E+01	17.76%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	0.00E+00	4.20E-05	0.00E+00	N/A	24	0.15	Health	Point-of-Impingement	<1%	4.20E-05	<1%
Aluminum	7429-90-5	Calpuff	0.00E+00	2.10E-01	0.00E+00	N/A	24	4.8	—	JSL	Below JSL	2.10E-01	Below JSL
Antimony	7440-36-0	Calpuff	0.00E+00	3.02E-03	0.00E+00	N/A	24	25	Health	Schedule 3	<1%	3.02E-03	<1%
Arsenic	7440-38-2	Calpuff	2.77E-06	1.81E-03	5.15E-06	POI 13	24	0.3	Health	Guideline	<1%	1.82E-03	<1%
Arsenic	7440-38-2	Calpuff	2.77E-06	5.29E-03	4.07E-05	POI 5	½	1	Health	Guideline	<1%	5.33E-03	<1%
Barium	7440-39-3	Calpuff	6.09E-05	8.18E-03	1.13E-04	POI 13	24	10	Health	Guideline	<1%	8.29E-03	<1%
Barium	7440-39-3	Calpuff	6.09E-05	2.40E-02	8.96E-04	POI 5	½	30	Health	Guideline	<1%	2.49E-02	<1%
Beryllium	7440-41-7	Calpuff	1.66E-07	3.02E-04	3.09E-07	POI 13	24	0.01	Health	Schedule 3	<1%	3.02E-04	3.02%
Boron	7440-42-8	Calpuff	0.00E+00	8.00E-02	0.00E+00	N/A	24	120	Particulate	Schedule 3	<1%	8.00E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	1.94E-05	—	3.61E-05	POI 13	24	0.1	—	Guideline	<1%	3.61E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	1.94E-05	2.76E-03	3.61E-05	POI 13	24	0.5	Health	Guideline	<1%	2.80E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	1.94E-05	8.06E-03	2.85E-04	POI 5	½	5	Health	Guideline	<1%	8.35E-03	<1%
Cobalt	7440-48-4	Calpuff	1.16E-06	6.04E-04	2.16E-06	POI 13	24	0.1	Health	Guideline	<1%	6.06E-04	<1%
Cobalt	7440-48-4	Calpuff	1.16E-06	1.76E-03	1.71E-05	POI 5	½	0.3	Health	Guideline	<1%	1.78E-03	<1%
Nickel	7440-02-0	Calpuff	2.91E-05	4.49E-03	5.41E-05	POI 13	24	0.1	Vegetation	Schedule 3	<1%	4.54E-03	4.54%
Phosphorus	7723-14-0	Calpuff	0.00E+00	7.00E-02	0.00E+00	N/A	24	0.35	—	JSL	Below JSL	7.00E-02	Below JSL
Silver	7440-22-4	Calpuff	0.00E+00	3.42E-04	0.00E+00	N/A	24	1	Health	Schedule 3	<1%	3.42E-04	<1%
Selenium	7782-49-2	Calpuff	3.32E-07	3.02E-03	6.18E-07	POI 13	24	10	Health	Guideline	<1%	3.02E-03	<1%
Selenium	7782-49-2	Calpuff	3.32E-07	8.82E-03	4.89E-06	POI 5	½	20	Health	Guideline	<1%	8.82E-03	<1%
Thallium	7440-28-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.24	—	JSL	Below JSL	0.00E+00	Below JSL
Tin	7440-31-5	Calpuff	0.00E+00	3.02E-03	0.00E+00	N/A	24	10	Health	Schedule 3	<1%	3.02E-03	<1%
Vanadium	7440-62-2	Calpuff	3.18E-05	1.55E-03	5.92E-05	POI 13	24	2	Health	Schedule 3	<1%	1.61E-03	<1%
Zinc	7440-66-6	Calpuff	4.01E-04	4.00E-02	7.47E-04	POI 13	24	120	Particulate	Schedule 3	<1%	4.07E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	0.00E+00	3.60E-02	0.00E+00	N/A	½	37000	Health	Guideline	<1%	3.60E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	0.00E+00	3.00E-02	0.00E+00	N/A	1	30500	Health	Point-of-Impingement	<1%	3.00E-02	<1%

Table 5 - Scenario E
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	0.00E+00	—	0.00E+00	N/A	24	1	—	JSL	Below JSL	0.00E+00	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	0.00E+00	5.00E-02	0.00E+00	N/A	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	0.00E+00	1.32E-01	0.00E+00	N/A	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	1.5	—	JSL	Below JSL	0.00E+00	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	77	—	JSL	Below JSL	0.00E+00	Below JSL
Pentachlorophenol	87-86-5	Calpuff	0.00E+00	8.76E-04	0.00E+00	N/A	24	20	Health	Guideline	<1%	8.76E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	0.00E+00	2.56E-03	0.00E+00	N/A	½	60	Health	Guideline	<1%	2.56E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	0.00E+00	6.25E-05	0.00E+00	N/A	24	0.011	—	JSL	Below JSL	6.25E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	0.00E+00	—	0.00E+00	N/A	24	3	—	JSL	Below JSL	0.00E+00	Below JSL
Acenaphthylene	208-96-8	Calpuff	2.49E-08	3.09E-04	4.64E-08	POI 13	24	3.5	—	JSL	Below JSL	3.09E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	2.49E-08	1.25E-03	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	3.32E-08	1.63E-04	6.18E-08	POI 13	24	0.2	—	JSL	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	2.49E-08	6.77E-05	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	2.49E-08	1.42E-04	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	2.49E-08	6.77E-05	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	1.66E-08	7.07E-05	3.09E-08	POI 13	24	1.2	—	JSL	Below JSL	7.07E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	1.66E-08	6.77E-05	3.09E-08	POI 13	24	0.0011	Health	Guideline	<1%	6.77E-05	6.16%
Benzo(a)pyrene	50-32-8	Calpuff	1.66E-08	1.98E-04	2.44E-07	POI 5	½	0.0033	Health	Guideline	<1%	1.98E-04	6.01%
Benzo(e)pyrene	192-97-2	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	0.00E+00	1.36E-03	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.36E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	2.49E-08	9.64E-05	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	9.64E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	1.66E-08	6.77E-05	3.09E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	4.15E-08	6.01E-04	7.73E-08	POI 13	24	140	—	JSL	Below JSL	6.01E-04	Below JSL
Fluorine	86-73-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	2.49E-08	6.77E-05	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	0.00E+00	1.30E-03	0.00E+00	N/A	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	3.32E-07	2.19E-03	6.18E-07	POI 13	24	10	—	JSL	Below JSL	2.19E-03	Below JSL
Naphthalene	91-20-3	Calpuff	8.44E-06	2.43E-03	1.57E-05	POI 13	24	22.5	Health	Guideline	<1%	2.45E-03	<1%
Naphthalene	91-20-3	Calpuff	8.44E-06	7.09E-03	1.24E-04	POI 5	½	36	Odour	Guideline	<1%	7.22E-03	<1%
Naphthalene	91-20-3	Calpuff	8.44E-06	9.77E-03	1.71E-04	POI 5	10-min	50	Odour	Guideline	<1%	9.94E-03	<1%
Perylene	198-55-0	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	2.35E-07	2.57E-03	4.38E-07	POI 13	24	0.1	—	De Minimus	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	6.92E-08	2.83E-04	1.29E-07	POI 13	24	0.2	—	JSL	Below JSL	2.83E-04	Below JSL
Tetralin	119-64-2	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	1200	—	JSL	Below JSL	1.35E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	0.00E+00	1.76E+00	0.00E+00	N/A	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	0.00E+00	5.21E+00	0.00E+00	N/A	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	2.91E-05	1.18E+01	5.41E-05	POI 13	24	N/A	N/A	N/A	N/A	1.18E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	0.00E+00	2.00E-02	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	2.00E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	0.00E+00	3.00E-02	0.00E+00	N/A	24	55	Health	Guideline	<1%	3.00E-02	<1%
Bromoform	75-25-2	Calpuff	0.00E+00	8.40E-02	0.00E+00	N/A	½	165	Health	Guideline	<1%	8.40E-02	<1%
Bromomethane	74-83-9	Calpuff	0.00E+00	9.00E-02	0.00E+00	N/A	24	1350	Health	Guideline	<1%	9.00E-02	<1%
Bromomethane	74-83-9	Calpuff	0.00E+00	2.64E-01	0.00E+00	N/A	½	4000	Health	Guideline	<1%	2.64E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	0.00E+00	7.40E-01	0.00E+00	N/A	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	0.00E+00	2.30E-01	0.00E+00	N/A	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	0.00E+00	3.23E+00	0.00E+00	N/A	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	0.00E+00	9.44E+00	0.00E+00	N/A	½	1500000	Health	Guideline	<1%	9.44E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	0.00E+00	7.31E-03	0.00E+00	N/A	½	600	Health	Guideline	<1%	7.31E-03	<1%
Dichloromethane	75-09-2	Calpuff	0.00E+00	1.27E+00	0.00E+00	N/A	24	220	Health	Schedule 3	<1%	1.27E+00	<1%
Ethylbenzene	100-41-4	Calpuff	0.00E+00	1.24E+00	0.00E+00	N/A	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	0.00E+00	5.00E+00	0.00E+00	N/A	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%

Table 5 - Scenario E
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Ethylene Dibromide	106-93-4	Calpuff	0.00E+00	5.20E-03	0.00E+00	N/A	24	3	Health	Guideline	<1%	5.20E-03	<1%
Ethylene Dibromide	106-93-4	Calpuff	0.00E+00	1.20E-02	0.00E+00	N/A	½	9	Health	Guideline	<1%	1.20E-02	<1%
Formaldehyde	50-00-0	Calpuff	1.04E-03	3.38E+00	1.93E-03	POI 13	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	0.00E+00	4.90E-01	0.00E+00	N/A	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	4.70E-05	9.47E+00	8.76E-05	POI 13	24	2000	Odour	Guideline	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	0.00E+00	1.10E-01	0.00E+00	N/A	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	Calpuff	0.00E+00	5.40E-01	0.00E+00	N/A	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	12	Health	Schedule 3	<1%	0.00E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	0.00E+00	2.15E+00	0.00E+00	N/A	24	6000	Health	Guideline	<1%	2.15E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	0.00E+00	6.28E+00	0.00E+00	N/A	½	18000	Health	Guideline	<1%	6.28E+00	<1%
Vinyl chloride	75-01-4	Calpuff	0.00E+00	5.88E-03	0.00E+00	N/A	24	1	Health	Schedule 3	<1%	5.88E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	0.00E+00	4.83E+00	0.00E+00	N/A	24	730	Health	Schedule 3	<1%	4.83E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	0.00E+00	1.94E+01	0.00E+00	N/A	10-min	3000	Odour	Guideline	<1%	1.94E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	8.85E-03	—	1.65E-02	POI 13	24	9000	Health	Guideline	<1%	1.65E-02	<1%
Nitrous Oxides	10024-97-2	Calpuff	8.85E-03	—	1.30E-01	POI 5	½	27000	Health	Guideline	<1%	1.30E-01	<1%
3-Methylchloranthene	56-49-5	Calpuff	2.49E-08	—	4.64E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	4.64E-08	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	2.21E-07	—	4.12E-07	POI 13	24	0.1	—	De Minimus	Below De Minimus	4.12E-07	Below De Minimus
Butane	106-97-8	Calpuff	2.91E-02	—	5.41E-02	POI 13	24	7600	—	JSL	Below JSL	5.41E-02	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	1.66E-05	—	3.09E-05	POI 13	24	0.1	—	De Minimus	Below De Minimus	3.09E-05	Below De Minimus
Ethane	74-84-0	Calpuff	4.29E-02	—	7.99E-02	POI 13	24	4800	—	JSL	Below JSL	7.99E-02	Below JSL
Fluorene	86-73-7	Calpuff	3.87E-08	—	7.21E-08	POI 13	24	0.1	—	De Minimus	Below De Minimus	7.21E-08	Below De Minimus
Hexane	110-54-3	Calpuff	2.49E-02	—	4.64E-02	POI 13	24	7500	Health	Schedule 3	<1%	4.64E-02	<1%
Pentane	109-66-0	Calpuff	3.60E-02	—	6.70E-02	POI 13	24	4200	—	JSL	Below JSL	6.70E-02	Below JSL
Propane	74-98-6	Calpuff	2.21E-02	—	4.12E-02	POI 13	24	7200	—	JSL	Below JSL	4.12E-02	Below JSL
Copper	7440-50-8	Calpuff	1.18E-05	—	2.19E-05	POI 13	24	50	Health	Schedule 3	<1%	2.19E-05	<1%
Manganese	7439-96-5	Calpuff	5.26E-06	—	9.79E-06	POI 13	24	1	Health	Guideline	<1%	9.79E-06	<1%
Manganese	7439-96-5	Calpuff	5.26E-06	—	7.74E-05	POI 5	½	3	Health	Guideline	<1%	7.74E-05	<1%
Molybdenum	7439-98-7	Calpuff	1.52E-05	—	2.83E-05	POI 13	24	120	Particulate	Guideline	<1%	2.83E-05	<1%
Molybdenum	7439-98-7	Calpuff	1.52E-05	—	2.24E-04	POI 5	½	100	Particulate	Guideline	<1%	2.24E-04	<1%

Table 5 - Scenario F
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	5.81E-01	1.26E+03	1.30E+01	POI 6 - (680.574, 4860.096)	½	6000	Health	Schedule 3	<1%	1.27E+03	21.17%
Sulphur Dioxide	7446-09-5	Calpuff	5.14E-02	1.93E+01	1.54E-01	POI 14 - (680.774, 4860.256)	24	275	Health & Vegetation	Schedule 3	<1%	1.95E+01	7.07%
Sulphur Dioxide	7446-09-5	Calpuff	5.14E-02	1.95E+01	9.60E-01	POI 6	1	690	Health & Vegetation	Schedule 3	<1%	2.05E+01	2.97%
Total Particulate Matter	N/A	Calpuff	5.26E-02	3.54E+01	6.70E-02	POI 14	24	120	Visibility	Schedule 3	<1%	3.55E+01	29.56%
PM10	N/A	Calpuff	5.26E-02	—	6.70E-02	POI 14	24	50	—	Ontario AAQC	<1%	6.70E-02	<1%
PM2.5	N/A	Calpuff	5.26E-02	2.04E+01	6.70E-02	POI 14	24	30	—	Ontario AAQC	<1%	2.05E+01	68.22%
Lead	7439-92-1	Calpuff	3.46E-06	4.98E-03	1.03E-05	POI 14	24	0.5	Health	Schedule 3	<1%	4.99E-03	<1%
Lead	7439-92-1	Calpuff	3.46E-06	1.92E-03	1.12E-06	POI 22 - (680.894, 4859.956)	30-day	0.2	Health	Schedule 3	<1%	1.92E-03	<1%
Cadmium	7440-43-9	Calpuff	7.61E-06	6.04E-04	2.28E-05	POI 14	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	6.27E-04	Below URT
Cadmium	7440-43-9	Calpuff	7.61E-06	1.76E-03	1.71E-04	POI 6	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	1.93E-03	Below URT
Mercury	7439-97-6	Calpuff	1.80E-06	—	5.38E-06	POI 14	24	2	Health	Schedule 3	<1%	5.38E-06	<1%
Fluorides	7664-39-3	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.86	Vegetation	Schedule 3	<1%	0.00E+00	<1%
Fluorides	7664-39-3	Calpuff	0.00E+00	—	0.00E+00	N/A	30-day	0.34	Vegetation	Schedule 3	<1%	0.00E+00	<1%
PCDD	N/A	Calpuff	0.00E+00	2.37E-08	0.00E+00	N/A	24	5.00E-06	—	Guideline	<1%	2.37E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	20	Health	Schedule 3	<1%	0.00E+00	<1%
Ammonia	7664-41-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	100	Health	Schedule 3	<1%	0.00E+00	<1%
Nitrogen Oxides	10102-44-0	Calpuff	2.63E-01	5.82E+01	7.86E-01	POI 14	24	200	Health	Schedule 3	<1%	5.90E+01	29.49%
Nitrogen Oxides	10102-44-0	Calpuff	2.63E-01	6.46E+01	4.91E+00	POI 6	1	400	Health	Schedule 3	1.23%	6.95E+01	17.38%
Nitrogen Oxides	10102-44-1	Calpuff	0.00E+00	6.98E+01	0.00E+00	N/A	½	1880	—	Generator Testing	<1%	6.98E+01	3.71%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	0.00E+00	4.20E-05	0.00E+00	N/A	24	0.15	Health	Point-of-Impingement	<1%	4.20E-05	<1%
Aluminum	7429-90-5	Calpuff	0.00E+00	2.10E-01	0.00E+00	N/A	24	4.8	—	JSL	Below JSL	2.10E-01	Below JSL
Antimony	7440-36-0	Calpuff	0.00E+00	3.02E-03	0.00E+00	N/A	24	25	Health	Schedule 3	<1%	3.02E-03	<1%
Arsenic	7440-38-2	Calpuff	1.38E-06	1.81E-03	4.14E-06	POI 14	24	0.3	Health	Guideline	<1%	1.81E-03	<1%
Arsenic	7440-38-2	Calpuff	1.38E-06	5.29E-03	3.10E-05	POI 6	½	1	Health	Guideline	<1%	5.32E-03	<1%
Barium	7440-39-3	Calpuff	3.04E-05	8.18E-03	9.10E-05	POI 14	24	10	Health	Guideline	<1%	8.27E-03	<1%
Barium	7440-39-3	Calpuff	3.04E-05	2.40E-02	6.83E-04	POI 6	½	30	Health	Guideline	<1%	2.47E-02	<1%
Beryllium	7440-41-7	Calpuff	8.30E-08	3.02E-04	2.48E-07	POI 14	24	0.01	Health	Schedule 3	<1%	3.02E-04	3.02%
Boron	7440-42-8	Calpuff	0.00E+00	8.00E-02	0.00E+00	N/A	24	120	Particulate	Schedule 3	<1%	8.00E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	9.68E-06	—	2.90E-05	POI 14	24	0.1	—	Guideline	<1%	2.90E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	9.68E-06	2.76E-03	2.90E-05	POI 14	24	0.5	Health	Guideline	<1%	2.79E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	9.68E-06	8.06E-03	2.17E-04	POI 6	½	5	Health	Guideline	<1%	8.28E-03	<1%
Cobalt	7440-48-4	Calpuff	5.81E-07	6.04E-04	1.74E-06	POI 14	24	0.1	Health	Guideline	<1%	6.06E-04	<1%
Cobalt	7440-48-4	Calpuff	5.81E-07	1.76E-03	1.30E-05	POI 6	½	0.3	Health	Guideline	<1%	1.78E-03	<1%
Nickel	7440-02-0	Calpuff	1.45E-05	4.49E-03	4.34E-05	POI 14	24	0.1	Vegetation	Schedule 3	<1%	4.53E-03	4.53%
Phosphorus	7723-14-0	Calpuff	0.00E+00	7.00E-02	0.00E+00	N/A	24	0.35	—	JSL	Below JSL	7.00E-02	Below JSL
Silver	7440-22-4	Calpuff	0.00E+00	3.42E-04	0.00E+00	N/A	24	1	Health	Schedule 3	<1%	3.42E-04	<1%
Selenium	7782-49-2	Calpuff	1.66E-07	3.02E-03	4.96E-07	POI 14	24	10	Health	Guideline	<1%	3.02E-03	<1%
Selenium	7782-49-2	Calpuff	1.66E-07	8.82E-03	3.72E-06	POI 6	½	20	Health	Guideline	<1%	8.82E-03	<1%
Thallium	7440-28-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.24	—	JSL	Below JSL	0.00E+00	Below JSL
Tin	7440-31-5	Calpuff	0.00E+00	3.02E-03	0.00E+00	N/A	24	10	Health	Schedule 3	<1%	3.02E-03	<1%
Vanadium	7440-62-2	Calpuff	1.59E-05	1.55E-03	4.76E-05	POI 14	24	2	Health	Schedule 3	<1%	1.60E-03	<1%
Zinc	7440-66-6	Calpuff	2.01E-04	4.00E-02	6.00E-04	POI 14	24	120	Particulate	Schedule 3	<1%	4.06E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	0.00E+00	3.60E-02	0.00E+00	N/A	½	37000	Health	Guideline	<1%	3.60E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	0.00E+00	3.00E-02	0.00E+00	N/A	1	30500	Health	Point-of-Impingement	<1%	3.00E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	0.00E+00	—	0.00E+00	N/A	24	1	—	JSL	Below JSL	0.00E+00	Below JSL
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	0.00E+00	5.00E-02	0.00E+00	N/A	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	0.00E+00	1.32E-01	0.00E+00	N/A	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	1.5	—	JSL	Below JSL	0.00E+00	Below JSL

Table 5 - Scenario F
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
2,4-Dichlorophenol	120-83-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	77	—	JSL	Below JSL	0.00E+00	Below JSL
Pentachlorophenol	87-86-5	Calpuff	0.00E+00	8.76E-04	0.00E+00	N/A	24	20	Health	Guideline	<1%	8.76E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	0.00E+00	2.56E-03	0.00E+00	N/A	½	60	Health	Guideline	<1%	2.56E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	0.00E+00	6.25E-05	0.00E+00	POI 14	24	0.011	—	JSL	Below JSL	6.25E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	0.00E+00	—	0.00E+00	POI 14	24	3	—	JSL	Below JSL	0.00E+00	Below JSL
Acenaphthylene	208-96-8	Calpuff	1.25E-08	3.09E-04	3.72E-08	POI 14	24	3.5	—	JSL	Below JSL	3.09E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	1.25E-08	1.25E-03	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	1.25E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	1.66E-08	1.63E-04	4.96E-08	POI 14	24	0.2	—	JSL	Below JSL	1.63E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	1.25E-08	6.77E-05	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	1.25E-08	1.42E-04	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	1.25E-08	6.77E-05	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	0.00E+00	1.35E-04	0.00E+00	POI 14	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	0.00E+00	1.35E-04	0.00E+00	POI 14	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	8.30E-09	7.07E-05	2.48E-08	POI 14	24	1.2	—	JSL	Below JSL	7.07E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	8.30E-09	6.77E-05	2.48E-08	POI 14	24	0.0011	Health	Guideline	<1%	6.77E-05	6.16%
Benzo(a)pyrene	50-32-8	Calpuff	8.30E-09	1.98E-04	1.86E-07	POI 6	½	0.0033	Health	Guideline	<1%	1.98E-04	6.01%
Benzo(e)pyrene	192-97-2	Calpuff	0.00E+00	1.35E-04	0.00E+00	POI 14	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	0.00E+00	1.36E-03	0.00E+00	POI 14	24	0.1	—	De Minimus	Below De Minimus	1.36E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	1.25E-08	9.64E-05	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	9.64E-05	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	8.30E-09	6.77E-05	2.48E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	2.08E-08	6.01E-04	6.21E-08	POI 14	24	140	—	JSL	Below JSL	6.01E-04	Below JSL
Fluorine	86-73-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	1.25E-08	6.77E-05	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	6.77E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	0.00E+00	1.30E-03	0.00E+00	N/A	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	1.66E-07	2.19E-03	4.96E-07	POI 14	24	10	—	JSL	Below JSL	2.19E-03	Below JSL
Naphthalene	91-20-3	Calpuff	4.22E-06	2.43E-03	1.26E-05	POI 14	24	22.5	Health	Guideline	<1%	2.44E-03	<1%
Naphthalene	91-20-3	Calpuff	4.22E-06	7.09E-03	9.46E-05	POI 6	½	36	Odour	Guideline	<1%	7.19E-03	<1%
Naphthalene	91-20-3	Calpuff	4.22E-06	9.77E-03	1.30E-04	POI 6	10-min	50	Odour	Guideline	<1%	9.90E-03	<1%
Perylene	198-55-0	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	1.18E-07	2.57E-03	3.52E-07	POI 14	24	0.1	—	De Minimus	Below De Minimus	2.57E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	3.46E-08	2.83E-04	1.03E-07	POI 14	24	0.2	—	JSL	Below JSL	2.83E-04	Below JSL
Tetralin	119-64-2	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	1200	—	JSL	Below JSL	1.35E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	0.00E+00	1.35E-04	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	0.00E+00	1.76E+00	0.00E+00	N/A	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	0.00E+00	5.21E+00	0.00E+00	N/A	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	1.45E-05	1.18E+01	4.34E-05	POI 14	24	N/A	N/A	N/A	N/A	1.18E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	0.00E+00	2.00E-02	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	2.00E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	0.00E+00	3.00E-02	0.00E+00	N/A	24	55	Health	Guideline	<1%	3.00E-02	<1%
Bromoform	75-25-2	Calpuff	0.00E+00	8.40E-02	0.00E+00	N/A	½	165	Health	Guideline	<1%	8.40E-02	<1%
Bromomethane	74-83-9	Calpuff	0.00E+00	9.00E-02	0.00E+00	N/A	24	1350	Health	Guideline	<1%	9.00E-02	<1%
Bromomethane	74-83-9	Calpuff	0.00E+00	2.64E-01	0.00E+00	N/A	½	4000	Health	Guideline	<1%	2.64E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	0.00E+00	7.40E-01	0.00E+00	N/A	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	0.00E+00	2.30E-01	0.00E+00	N/A	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	0.00E+00	3.23E+00	0.00E+00	N/A	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	0.00E+00	9.44E+00	0.00E+00	N/A	½	1500000	Health	Guideline	<1%	9.44E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	0.00E+00	7.31E-03	0.00E+00	N/A	½	600	Health	Guideline	<1%	7.31E-03	<1%
Dichloromethane	75-09-2	Calpuff	0.00E+00	1.27E+00	0.00E+00	N/A	24	220	Health	Schedule 3	<1%	1.27E+00	<1%
Ethylbenzene	100-41-4	Calpuff	0.00E+00	1.24E+00	0.00E+00	N/A	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	0.00E+00	5.00E+00	0.00E+00	N/A	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%
Ethylene Dibromide	106-93-4	Calpuff	0.00E+00	5.20E-03	0.00E+00	N/A	24	3	Health	Guideline	<1%	5.20E-03	<1%
Ethylene Dibromide	106-93-4	Calpuff	0.00E+00	1.20E-02	0.00E+00	N/A	½	9	Health	Guideline	<1%	1.20E-02	<1%
Formaldehyde	50-00-0	Calpuff	5.19E-04	3.38E+00	1.55E-03	POI 14	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	0.00E+00	4.90E-01	0.00E+00	N/A	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	2.35E-05	9.47E+00	7.03E-05	POI 14	24	2000	Odour	Guideline	<1%	9.47E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	0.00E+00	1.10E-01	0.00E+00	N/A	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%

Table 5 - Scenario F
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Trichloroethene	86-42-0	Calpuff	0.00E+00	5.40E-01	0.00E+00	N/A	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	12	Health	Schedule 3	<1%	0.00E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	0.00E+00	2.15E+00	0.00E+00	N/A	24	6000	Health	Guideline	<1%	2.15E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	0.00E+00	6.28E+00	0.00E+00	N/A	½	18000	Health	Guideline	<1%	6.28E+00	<1%
Vinyl chloride	75-01-4	Calpuff	0.00E+00	5.88E-03	0.00E+00	N/A	24	1	Health	Schedule 3	<1%	5.88E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	0.00E+00	4.83E+00	0.00E+00	N/A	24	730	Health	Schedule 3	<1%	4.83E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	0.00E+00	1.94E+01	0.00E+00	N/A	10-min	3000	Odour	Guideline	<1%	1.94E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	4.43E-03	—	1.32E-02	POI 14	24	9000	Health	Guideline	<1%	1.32E-02	<1%
Nitrous Oxides	10024-97-2	Calpuff	4.43E-03	—	9.93E-02	POI 6	½	27000	Health	Guideline	<1%	9.93E-02	<1%
3-Methylchloranthene	56-49-5	Calpuff	1.25E-08	—	3.72E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	3.72E-08	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	1.11E-07	—	3.31E-07	POI 14	24	0.1	—	De Minimus	Below De Minimus	3.31E-07	Below De Minimus
Butane	106-97-8	Calpuff	1.45E-02	—	4.34E-02	POI 14	24	7600	—	JSL	Below JSL	4.34E-02	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	8.30E-06	—	2.48E-05	POI 14	24	0.1	—	De Minimus	Below De Minimus	2.48E-05	Below De Minimus
Ethane	74-84-0	Calpuff	2.14E-02	—	6.41E-02	POI 14	24	4800	—	JSL	Below JSL	6.41E-02	Below JSL
Fluorene	86-73-7	Calpuff	1.94E-08	—	5.79E-08	POI 14	24	0.1	—	De Minimus	Below De Minimus	5.79E-08	Below De Minimus
Hexane	110-54-3	Calpuff	1.25E-02	—	3.72E-02	POI 14	24	7500	Health	Schedule 3	<1%	3.72E-02	<1%
Pentane	109-66-0	Calpuff	1.80E-02	—	5.38E-02	POI 14	24	4200	—	JSL	Below JSL	5.38E-02	Below JSL
Propane	74-98-6	Calpuff	1.11E-02	—	3.31E-02	POI 14	24	7200	—	JSL	Below JSL	3.31E-02	Below JSL
Copper	7440-50-8	Calpuff	5.88E-06	—	1.76E-05	POI 14	24	50	Health	Schedule 3	<1%	1.76E-05	<1%
Manganese	7439-96-5	Calpuff	2.63E-06	—	7.86E-06	POI 14	24	1	Health	Guideline	<1%	7.86E-06	<1%
Manganese	7439-96-5	Calpuff	2.63E-06	—	5.90E-05	POI 6	½	3	Health	Guideline	<1%	5.90E-05	<1%
Molybdenum	7439-98-7	Calpuff	7.61E-06	—	2.28E-05	POI 14	24	120	Particulate	Guideline	<1%	2.28E-05	<1%
Molybdenum	7439-98-7	Calpuff	7.61E-06	—	1.71E-04	POI 6	½	100	Particulate	Guideline	<1%	1.71E-04	<1%

Table 5 - Scenario G
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [OU/s]	Background Concentration [OU/m³]	Maximum POI Concentration [OU/m³]	Averaging Period [hours]	MOE POI Limit [OU/m³]	Maximum POI Location	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [OU/m³]	Percentage of MOE Limit [%]
Odour	N/A	Calpuff	1.83E+03	—	1.13E-01	10-min	1	POI 7 - (680.735, 4860.25)	—	Schedule 3	11.27%	1.13E-01	11.27%

Table 5 - Scenario H
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Carbon Monoxide	630-08-0	Calpuff	2.17E+00	1.26E+03	6.97E+01	POI 8 - (680.463, 4860.527)	½	6000	Health	Schedule 3	1.16%	1.33E+03	22.11%
Sulphur Dioxide	7446-09-5	Calpuff	1.51E+00	1.93E+01	1.79E+00	POI 15 - (680.416, 4860.511)	24	275	Health & Vegetation	Schedule 3	<1%	2.11E+01	7.67%
Sulphur Dioxide	7446-09-5	Calpuff	1.51E+00	1.95E+01	9.33E+00	POI 8	1	690	Health & Vegetation	Schedule 3	1.35%	2.88E+01	4.18%
Total Particulate Matter	N/A	Calpuff	1.03E+00	3.54E+01	6.39E+00	POI 16 - (680.510, 4860.543)	24	120	Visibility	Schedule 3	5.32%	4.18E+01	34.82%
PM10	N/A	Calpuff	1.02E+00	—	5.45E+00	POI 16	24	50	—	Ontario AAQC	10.90%	5.45E+00	10.90%
PM2.5	N/A	Calpuff	9.57E-01	2.04E+01	5.45E+00	POI 16	24	30	—	Ontario AAQC	18.17%	2.59E+01	86.17%
Lead	7439-92-1	Calpuff	2.13E-03	4.98E-03	2.09E-03	POI 16	24	0.5	Health	Schedule 3	<1%	7.07E-03	1.41%
Lead	7439-92-1	Calpuff	2.13E-03	1.92E-03	2.52E-04	POI 17	30-day	0.2	Health	Schedule 3	<1%	2.17E-03	1.09%
Cadmium	7440-43-9	Calpuff	2.98E-04	6.04E-04	2.92E-04	POI 9	24	0.25	Upper Risk Threshold	Schedule 6	Below URT	8.96E-04	Below URT
Cadmium	7440-43-9	Calpuff	2.98E-04	1.76E-03	2.07E-03	POI 1	½	0.75	Upper Risk Threshold	Schedule 6	Below URT	3.83E-03	Below URT
Mercury	7439-97-6	Calpuff	6.39E-04	—	6.26E-04	POI 9	24	2	Health	Schedule 3	<1%	6.26E-04	<1%
Fluorides	7664-39-3	Calpuff	3.84E-02	—	3.76E-02	POI 9	24	0.86	Vegetation	Schedule 3	4.37%	3.76E-02	4.37%
Fluorides	7664-39-3	Calpuff	3.84E-02	—	4.53E-03	POI 17	30-day	0.34	Vegetation	Schedule 3	1.33%	4.53E-03	1.33%
PCDD	N/A	Calpuff	2.56E-09	2.37E-08	2.51E-09	POI 9	24	5.00E-06	—	Guideline	<1%	2.62E-08	<1%
Hydrogen Chloride	7647-01-0	Calpuff	3.84E-01	—	3.76E-01	POI 9	24	20	Health	Schedule 3	1.88%	3.76E-01	1.88%
Ammonia	7664-41-7	Calpuff	4.22E-01	—	4.13E-01	POI 9	24	100	Health	Schedule 3	<1%	4.13E-01	<1%
Nitrogen Oxides	10102-44-1	Calpuff	6.26E+00	6.98E+01	3.24E+02	POI 8	½	1880	—	Generator Testing	17.25%	3.94E+02	20.96%
Polychlorinated Biphenyls (PCB)	N/A	Calpuff	3.08E-06	4.20E-05	3.02E-06	POI 9	24	0.15	Health	Point-of-Impingement	<1%	4.50E-05	<1%
Aluminum	7429-90-5	Calpuff	1.69E-03	2.10E-01	1.66E-03	POI 9	24	4.8	—	JSL	Below JSL	2.12E-01	Below JSL
Antimony	7440-36-0	Calpuff	1.17E-04	3.02E-03	1.14E-04	POI 9	24	25	Health	Schedule 3	<1%	3.13E-03	<1%
Arsenic	7440-38-2	Calpuff	1.79E-05	1.81E-03	1.75E-05	POI 9	24	0.3	Health	Guideline	<1%	1.83E-03	<1%
Arsenic	7440-38-2	Calpuff	1.79E-05	5.29E-03	1.24E-04	POI 1	½	1	Health	Guideline	<1%	5.42E-03	<1%
Barium	7440-39-3	Calpuff	9.01E-05	8.18E-03	8.83E-05	POI 9	24	10	Health	Guideline	<1%	8.27E-03	<1%
Barium	7440-39-3	Calpuff	9.01E-05	2.40E-02	6.24E-04	POI 1	½	30	Health	Guideline	<1%	2.46E-02	<1%
Beryllium	7440-41-7	Calpuff	1.42E-05	3.02E-04	1.39E-05	POI 9	24	0.01	Health	Schedule 3	<1%	3.16E-04	3.16%
Boron	7440-42-8	Calpuff	6.52E-03	8.00E-02	6.39E-03	POI 9	24	120	Particulate	Schedule 3	<1%	8.64E-02	<1%
Chromium (hexavalent)	18540-29-9	Calpuff	1.36E-05	—	1.34E-05	POI 9	24	0.1	—	Guideline	<1%	1.34E-05	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	9.59E-05	2.76E-03	9.40E-05	POI 9	24	0.5	Health	Guideline	<1%	2.85E-03	<1%
Total Chromium (and compounds)	7440-47-3	Calpuff	9.59E-05	8.06E-03	6.64E-04	POI 1	½	5	Health	Guideline	<1%	8.73E-03	<1%
Cobalt	7440-48-4	Calpuff	2.47E-04	6.04E-04	2.42E-04	POI 9	24	0.1	Health	Guideline	<1%	8.46E-04	<1%
Cobalt	7440-48-4	Calpuff	2.47E-04	1.76E-03	1.71E-03	POI 1	½	0.3	Health	Guideline	<1%	3.47E-03	1.16%
Nickel	7440-02-0	Calpuff	3.71E-03	4.49E-03	3.64E-03	POI 9	24	0.1	Vegetation	Schedule 3	3.64%	8.13E-03	8.13%
Phosphorus	7723-14-0	Calpuff	1.96E-03	7.00E-02	1.92E-03	POI 9	24	0.35	—	JSL	Below JSL	7.19E-02	Below JSL
Silver	7440-22-4	Calpuff	1.43E-04	3.42E-04	1.40E-04	POI 9	24	1	Health	Schedule 3	<1%	4.82E-04	<1%
Selenium	7782-49-2	Calpuff	2.05E-05	3.02E-03	2.00E-05	POI 9	24	10	Health	Guideline	<1%	3.04E-03	<1%
Selenium	7782-49-2	Calpuff	2.05E-05	8.82E-03	1.42E-04	POI 1	½	20	Health	Guideline	<1%	8.96E-03	<1%
Thallium	7440-28-0	Calpuff	1.66E-03	—	1.63E-03	POI 9	24	0.24	—	JSL	Below JSL	1.63E-03	Below JSL
Tin	7440-31-5	Calpuff	7.50E-04	3.02E-03	7.35E-04	POI 9	24	10	Health	Schedule 3	<1%	3.75E-03	<1%
Vanadium	7440-62-2	Calpuff	4.96E-05	1.55E-03	4.86E-05	POI 9	24	2	Health	Schedule 3	<1%	1.60E-03	<1%
Zinc	7440-66-6	Calpuff	8.50E-03	4.00E-02	8.33E-03	POI 9	24	120	Particulate	Schedule 3	<1%	4.83E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	8.72E-05	3.60E-02	6.04E-04	POI 1	½	37000	Health	Guideline	<1%	3.66E-02	<1%
1,2-Dichlorobenzene	95-50-1	Calpuff	8.72E-05	3.00E-02	5.03E-04	POI 1	1	30500	Health	Point-of-Impingement	<1%	3.05E-02	<1%
1,2,4,5-Tetrachlorobenzene	95-94-3	Calpuff	2.19E-06	—	2.15E-06	POI 9	24	1	—	JSL	Below JSL	2.15E-06	Below JSL

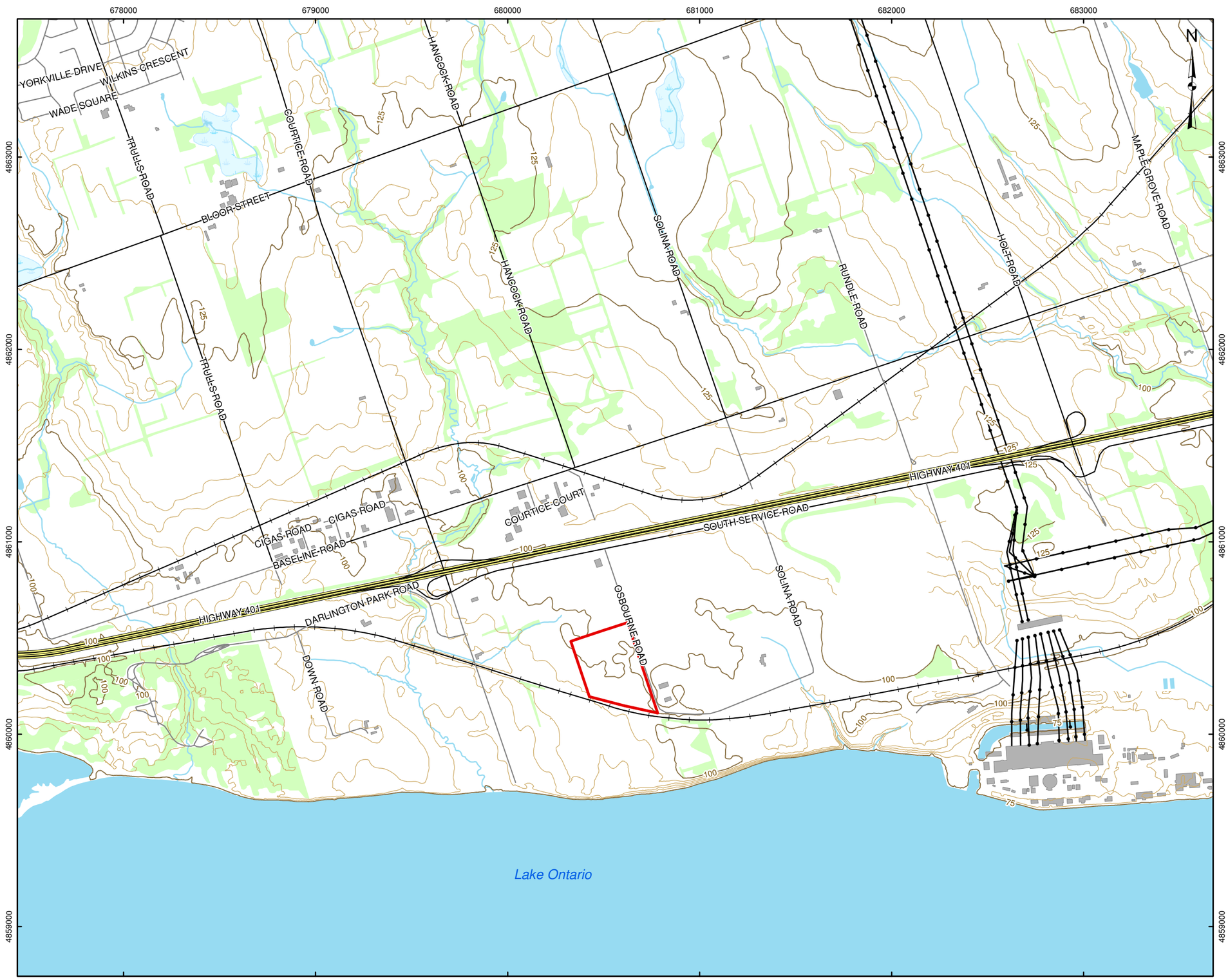
Table 5 - Scenario H
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	2.19E-06	5.00E-02	2.15E-06	POI 9	24	400	Health	Guideline	<1%	5.00E-02	<1%
1,2,4 – Trichlorobenzene	120-82-1	Calpuff	2.19E-06	1.32E-01	1.52E-05	POI 1	½	100	Particulate	Guideline	<1%	1.32E-01	<1%
2,3,4,6-Tetrachlorophenol	58-90-2	Calpuff	7.41E-06	—	7.26E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	7.26E-06	Below De Minimus
2,4,6-Trichlorophenol	88-06-2	Calpuff	2.23E-06	—	2.19E-06	POI 9	24	1.5	—	JSL	Below JSL	2.19E-06	Below JSL
2,4-Dichlorophenol	120-83-2	Calpuff	4.39E-06	—	4.30E-06	POI 9	24	77	—	JSL	Below JSL	4.30E-06	Below JSL
Pentachlorophenol	87-86-5	Calpuff	8.79E-06	8.76E-04	8.61E-06	POI 9	24	20	Health	Guideline	<1%	8.85E-04	<1%
Pentachlorophenol	87-86-5	Calpuff	8.79E-06	2.56E-03	6.09E-05	POI 1	½	60	Health	Guideline	<1%	2.62E-03	<1%
Hexachlorobenzene	118-74-1	Calpuff	2.19E-06	6.25E-05	2.15E-06	POI 9	24	0.011	—	JSL	Below JSL	6.47E-05	Below JSL
Pentachlorobenzene	608-93-5	Calpuff	5.77E-06	—	5.65E-06	POI 9	24	3	—	JSL	Below JSL	5.65E-06	Below JSL
Acenaphthylene	208-96-8	Calpuff	3.64E-06	3.09E-04	2.77E-04	POI 9	24	3.5	—	JSL	Below JSL	5.86E-04	Below JSL
Acenaphthene	83-32-9	Calpuff	2.33E-06	1.25E-03	1.40E-04	POI 15	24	0.1	—	De Minimus	Below De Minimus	1.39E-03	Below De Minimus
Anthracene	120-12-7	Calpuff	5.76E-07	1.63E-04	3.69E-05	POI 15	24	0.2	—	JSL	Below JSL	2.00E-04	Below JSL
Benzo(a)anthracene	56-55-3	Calpuff	2.68E-07	6.77E-05	1.87E-05	POI 15	24	0.1	—	De Minimus	Below De Minimus	8.64E-05	Below De Minimus
Benzo(b)fluoranthene	205-99-2	Calpuff	5.27E-07	1.42E-04	3.33E-05	POI 15	24	0.1	—	De Minimus	Below De Minimus	1.75E-04	Below De Minimus
Benzo(k)fluoranthene	207-08-9	Calpuff	1.14E-07	6.77E-05	6.54E-06	POI 15	24	0.1	—	De Minimus	Below De Minimus	7.42E-05	Below De Minimus
Benzo(a)fluorene	238-84-6	Calpuff	1.18E-06	1.35E-04	1.15E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(b)fluorene	243-17-4	Calpuff	8.06E-07	1.35E-04	7.90E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.36E-04	Below De Minimus
Benzo(ghi)perylene	191-24-2	Calpuff	1.94E-06	7.07E-05	1.67E-05	POI 15	24	1.2	—	JSL	Below JSL	8.74E-05	Below JSL
Benzo(a)pyrene	50-32-8	Calpuff	2.31E-07	6.77E-05	7.71E-06	POI 15	24	0.0011	Health	Guideline	<1%	7.54E-05	6.86%
Benzo(a)pyrene	50-32-8	Calpuff	2.31E-07	1.98E-04	2.44E-05	POI 8	½	0.0033	Health	Guideline	<1%	2.22E-04	6.74%
Benzo(e)pyrene	192-97-2	Calpuff	3.71E-07	1.35E-04	3.64E-07	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Biphenyl	92-51-3	Calpuff	1.27E-04	1.36E-03	1.25E-04	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.48E-03	Below De Minimus
Chrysene	218-01-9	Calpuff	6.62E-07	9.64E-05	4.59E-05	POI 15	24	0.1	—	De Minimus	Below De Minimus	1.42E-04	Below De Minimus
Dibenzo(a,c)anthracene	215-58-7	Calpuff	1.14E-06	—	1.12E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.12E-06	Below De Minimus
Dibenzo(a,h)anthracene	53-70-3	Calpuff	1.65E-07	6.77E-05	1.03E-05	POI 15	24	0.1	—	De Minimus	Below De Minimus	7.80E-05	Below De Minimus
Fluoranthene	206-44-0	Calpuff	3.09E-06	6.01E-04	1.21E-04	POI 15	24	140	—	JSL	Below JSL	7.22E-04	Below JSL
Fluorine	86-73-7	Calpuff	1.33E-06	—	1.31E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.31E-06	Below De Minimus
Indeno(1,2,3 – cd)pyrene	193-39-5	Calpuff	4.57E-07	6.77E-05	1.25E-05	POI 15	24	0.1	—	De Minimus	Below De Minimus	8.02E-05	Below De Minimus
1 – methylnaphthalene	90-12-0	Calpuff	4.18E-06	1.30E-03	4.10E-06	POI 9	24	12	—	JSL	Below JSL	1.30E-03	Below JSL
2 – methylnaphthalene	91-57-6	Calpuff	2.32E-05	2.19E-03	2.27E-05	POI 9	24	10	—	JSL	Below JSL	2.21E-03	Below JSL
Naphthalene	91-20-3	Calpuff	6.06E-05	2.43E-03	3.90E-03	POI 15	24	22.5	Health	Guideline	<1%	6.33E-03	<1%
Naphthalene	91-20-3	Calpuff	6.06E-05	7.09E-03	1.23E-02	POI 8	½	36	Odour	Guideline	<1%	1.94E-02	<1%
Naphthalene	91-20-3	Calpuff	6.06E-05	9.77E-03	1.70E-02	POI 8	10-min	50	Odour	Guideline	<1%	2.67E-02	<1%
Perylene	198-55-0	Calpuff	6.44E-08	1.35E-04	6.31E-08	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.35E-04	Below De Minimus
Phenanthrene	85-01-8	Calpuff	1.74E-05	2.57E-03	1.23E-03	POI 15	24	0.1	—	De Minimus	Below De Minimus	3.80E-03	Below De Minimus
Pyrene	129-00-0	Calpuff	3.35E-06	2.83E-04	1.12E-04	POI 15	24	0.2	—	JSL	Below JSL	3.95E-04	Below JSL
Tetralin	119-64-2	Calpuff	2.12E-05	1.35E-04	2.08E-05	POI 9	24	1200	—	JSL	Below JSL	1.56E-04	Below JSL
O-terphenyl	84-15-1	Calpuff	3.49E-06	1.35E-04	3.42E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	1.38E-04	Below De Minimus
Acetaldehyde	75-07-0	Calpuff	8.28E-06	1.76E+00	7.57E-04	POI 15	24	500	Health	Schedule 3	<1%	1.76E+00	<1%
Acetaldehyde	75-07-0	Calpuff	8.28E-06	5.21E+00	2.39E-03	POI 8	½	500	Health	Schedule 3	<1%	5.21E+00	1.04%
Benzene	71-43-2	Calpuff	1.58E-03	1.18E+01	2.33E-02	POI 15	24	N/A	N/A	N/A	N/A	1.19E+01	N/A
Bromodichloromethane	75-27-4	Calpuff	7.50E-03	2.00E-02	7.35E-03	POI 9	24	0.1	—	De Minimus	Below De Minimus	2.73E-02	Below De Minimus
Bromoform	75-25-2	Calpuff	2.05E-03	3.00E-02	2.01E-03	POI 9	24	55	Health	Guideline	<1%	3.20E-02	<1%
Bromoform	75-25-2	Calpuff	2.05E-03	8.40E-02	1.42E-02	POI 1	½	165	Health	Guideline	<1%	9.82E-02	<1%
Bromomethane	74-83-9	Calpuff	1.53E-03	9.00E-02	1.50E-03	POI 9	24	1350	Health	Guideline	<1%	9.15E-02	<1%
Bromomethane	74-83-9	Calpuff	1.53E-03	2.64E-01	1.06E-02	POI 1	½	4000	Health	Guideline	<1%	2.75E-01	<1%
Carbon tetrachloride	56-23-5	Calpuff	1.28E-05	7.40E-01	1.25E-05	POI 9	24	2.4	Health	Schedule 3	<1%	7.40E-01	30.83%
Chloroform	67-66-3	Calpuff	2.17E-05	2.30E-01	2.13E-05	POI 9	24	1	Health	Schedule 3	<1%	2.30E-01	23.00%
Dichlorodifluoromethane	75-71-8	Calpuff	3.71E-03	3.23E+00	3.64E-03	POI 9	24	500000	Health	Guideline	<1%	3.23E+00	<1%
Dichlorodifluoromethane	75-71-8	Calpuff	3.71E-03	9.44E+00	2.57E-02	POI 1	½	1500000	Health	Guideline	<1%	9.47E+00	<1%
Dichloroethene, 1,1 -	75-34-3	Calpuff	2.41E-05	7.31E-03	1.67E-04	POI 1	½	600	Health	Guideline	<1%	7.47E-03	<1%
Dichloromethane	75-09-2	Calpuff	7.50E-03	1.27E+00	7.35E-03	POI 9	24	220	Health	Schedule 3	<1%	1.28E+00	<1%
Ethylbenzene	100-41-4	Calpuff	4.42E-05	1.24E+00	4.33E-05	POI 9	24	1000	Health	Schedule 3	<1%	1.24E+00	<1%
Ethylbenzene	100-41-4	Calpuff	4.42E-05	5.00E+00	4.21E-04	POI 1	10-min	1900	Odour	Guideline	<1%	5.00E+00	<1%

Table 5 - Scenario H
Emission Summary Table

Contaminant	CAS No.	Air Dispersion Model Used	Total Emission Rate [g/s]	Background Concentration [µg/m³]	Maximum POI Concentration [µg/m³]	Maximum POI Location	Averaging Period [hours]	MOE POI Limit [µg/m³]	Limiting Effect	Regulation Schedule No.	Percentage of MOE Limit [%]	Maximum POI Concentration (Including Background) [µg/m³]	Percentage of MOE Limit [%]
Ethylene Dibromide	106-93-4	Calpuff	1.20E-05	5.20E-03	1.18E-05	POI 9	24	3	Health	Guideline	<1%	5.21E-03	<1%
Ethylene Dibromide	106-93-4	Calpuff	1.20E-05	1.20E-02	8.34E-05	POI 1	½	9	Health	Guideline	<1%	1.21E-02	<1%
Formaldehyde	50-00-0	Calpuff	2.05E-03	3.38E+00	2.45E-03	POI 15	24	65	Health	Schedule 3	<1%	3.38E+00	5.20%
Tetrachloroethene	127-18-4	Calpuff	2.42E-04	4.90E-01	2.37E-04	POI 9	24	360	Health	Schedule 3	<1%	4.90E-01	<1%
Toluene	108-88-3	Calpuff	2.23E-03	9.47E+00	8.44E-03	POI 15	24	2000	Odour	Guideline	<1%	9.48E+00	<1%
Trichloroethane, 1,1,1 -	71-55-6	Calpuff	6.08E-05	1.10E-01	5.96E-05	POI 9	24	115000	Health	Schedule 3	<1%	1.10E-01	<1%
Trichloroethene	86-42-0	Calpuff	2.10E-05	5.40E-01	2.05E-05	POI 9	24	12	—	Guideline	<1%	5.40E-01	4.50%
Trichloroethylene, 1,1,2 -	79-01-6	Calpuff	2.10E-05	—	2.05E-05	POI 9	24	12	Health	Schedule 3	<1%	2.05E-05	<1%
Trichlorofluoromethane	75-69-4	Calpuff	7.34E-03	2.15E+00	7.19E-03	POI 9	24	6000	Health	Guideline	<1%	2.16E+00	<1%
Trichlorofluoromethane	75-69-4	Calpuff	7.34E-03	6.28E+00	5.08E-02	POI 1	½	18000	Health	Guideline	<1%	6.33E+00	<1%
Vinyl chloride	75-01-4	Calpuff	1.86E-03	5.88E-03	1.82E-03	POI 9	24	1	Health	Schedule 3	<1%	7.70E-03	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	2.58E-02	4.83E+00	2.44E-02	POI 15	24	730	Health	Schedule 3	<1%	4.85E+00	<1%
Xylenes, m-, p- and o-	1330-20-7	Calpuff	2.58E-02	1.94E+01	2.46E-01	POI 8	10-min	3000	Odour	Guideline	<1%	1.96E+01	<1%
Nitrous Oxides	10024-97-2	Calpuff	0.00E+00	—	0.00E+00	N/A	24	9000	Health	Guideline	<1%	0.00E+00	<1%
Nitrous Oxides	10024-97-2	Calpuff	0.00E+00	—	0.00E+00	N/A	½	27000	Health	Guideline	<1%	0.00E+00	<1%
3-Methylchloranthene	56-49-5	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
7,12-Dimethylbenz(a)anthracene	57-97-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Butane	106-97-8	Calpuff	0.00E+00	—	0.00E+00	N/A	24	7600	—	JSL	Below JSL	0.00E+00	Below JSL
Dichlorobenzene	25321-22-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	0.1	—	De Minimus	Below De Minimus	0.00E+00	Below De Minimus
Ethane	74-84-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	4800	—	JSL	Below JSL	0.00E+00	Below JSL
Fluorene	86-73-7	Calpuff	4.19E-06	—	4.11E-06	POI 9	24	0.1	—	De Minimus	Below De Minimus	4.11E-06	Below De Minimus
Hexane	110-54-3	Calpuff	0.00E+00	—	0.00E+00	N/A	24	7500	Health	Schedule 3	<1%	0.00E+00	<1%
Pentane	109-66-0	Calpuff	0.00E+00	—	0.00E+00	N/A	24	4200	—	JSL	Below JSL	0.00E+00	Below JSL
Propane	74-98-6	Calpuff	0.00E+00	—	0.00E+00	N/A	24	7200	—	JSL	Below JSL	0.00E+00	Below JSL
Copper	7440-50-8	Calpuff	0.00E+00	—	0.00E+00	N/A	24	50	Health	Schedule 3	<1%	0.00E+00	<1%
Manganese	7439-96-5	Calpuff	0.00E+00	—	0.00E+00	N/A	24	1	Health	Guideline	<1%	0.00E+00	<1%
Manganese	7439-96-5	Calpuff	0.00E+00	—	0.00E+00	N/A	½	3	Health	Guideline	<1%	0.00E+00	<1%
Molybdenum	7439-98-7	Calpuff	0.00E+00	—	0.00E+00	N/A	24	120	Particulate	Guideline	<1%	0.00E+00	<1%
Molybdenum	7439-98-7	Calpuff	0.00E+00	—	0.00E+00	N/A	½	100	Particulate	Guideline	<1%	0.00E+00	<1%

FIGURES



LEGEND

- Major Contour (25 m)
- Minor Contour (5 m)
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Utility Line
- Watercourse
- Waterbody
- Wetland
- Woodlot
- Building Footprint
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.5 0.25 0 0.5 1
SCALE 1:20,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
SITE LOCATION PLAN

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	**FIGURE: 1**	
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

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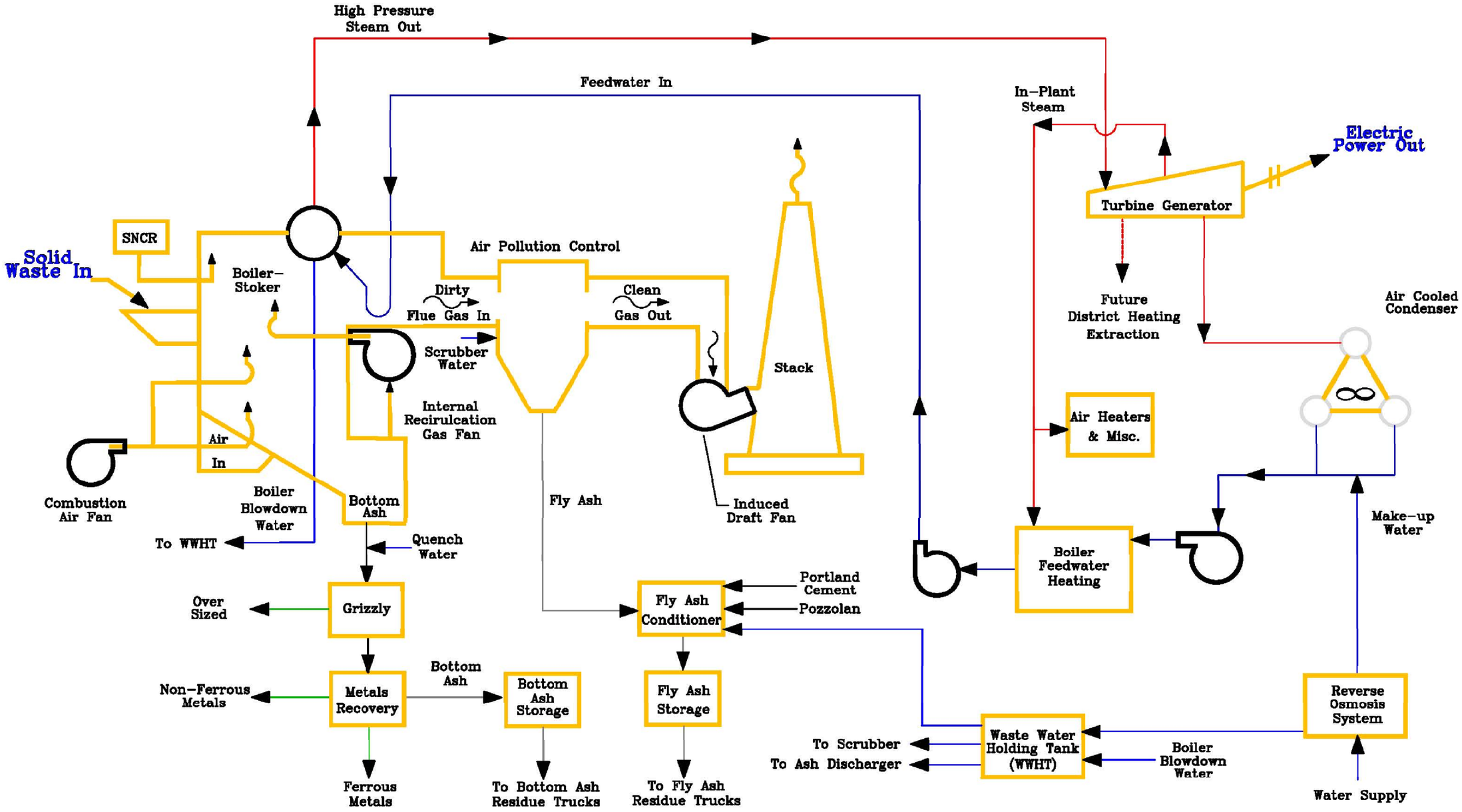


PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

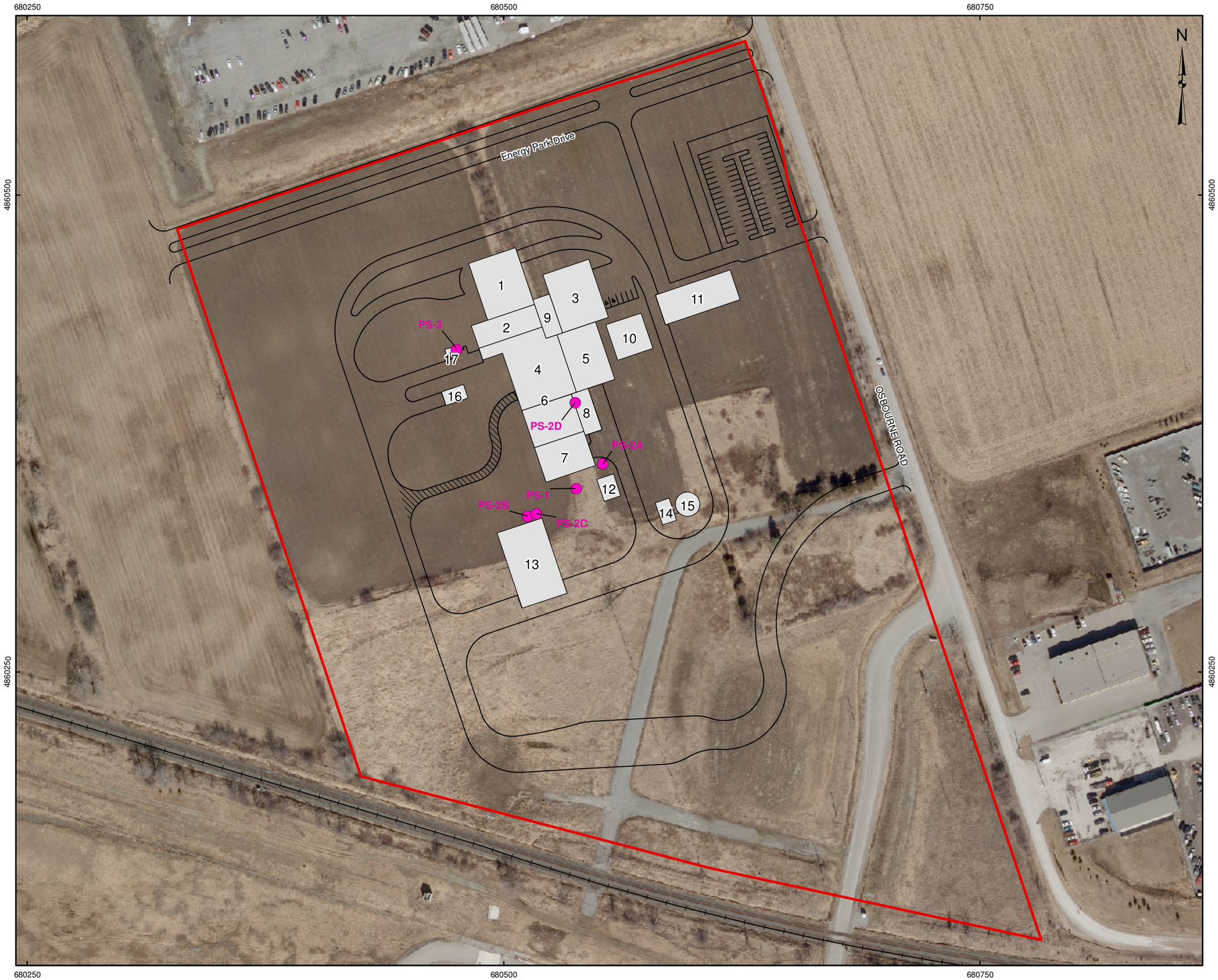
SIMPLIFIED PROCESS FLOW DIAGRAM

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	13 Jan. 2011		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 2

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CofA\Air\Simplified_Process_Flow_Diagram.mxd



LEGEND

- Point Source
- Site Road (Paved)
- Site Road (Gravel)
- Railway
- Roof Plan
- Approximate Site Boundary

Point Source	Description
PS-1	Main Stack
PS-2A	Carbon Silo Baghouse Exhaust
PS-2B	Pozzolan Silo Baghouse Exhaust
PS-2C	Portland Cement Silo Baghouse Exhaust
PS-2D	Lime Silo Baghouse Exhaust
PS-3	Diesel Generator

ID	Building	Height (m)
1	Tipping Building	15.0
2	Refuse Building	35.1
3	Admin Building	5.3
4	Boiler Building	35.1
5	Turbine Building	19.0
6	Scrubber Building	35.1
7	Baghouse Building	25.0
8	Maintenance and Storage Building	12.1
9	Control Room	24.2
10	Air Cooled Condensers	24.7
11	Visitor Centre	11.3
12	Electrical Building	5.0
13	Residue Storage Building	17.2
14	Fire Water Pump House	10.0
15	Fire Water Tank	8.0
16	Grizzly Building	6.0
17	Diesel Genset	2.5

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions, obtained on December 16, 2010, 20 cm resolution.
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

50 25 0 50 100
SCALE 1:2,000 METERS

PROJECT
DURHAM YORK ENERGY CENTRE

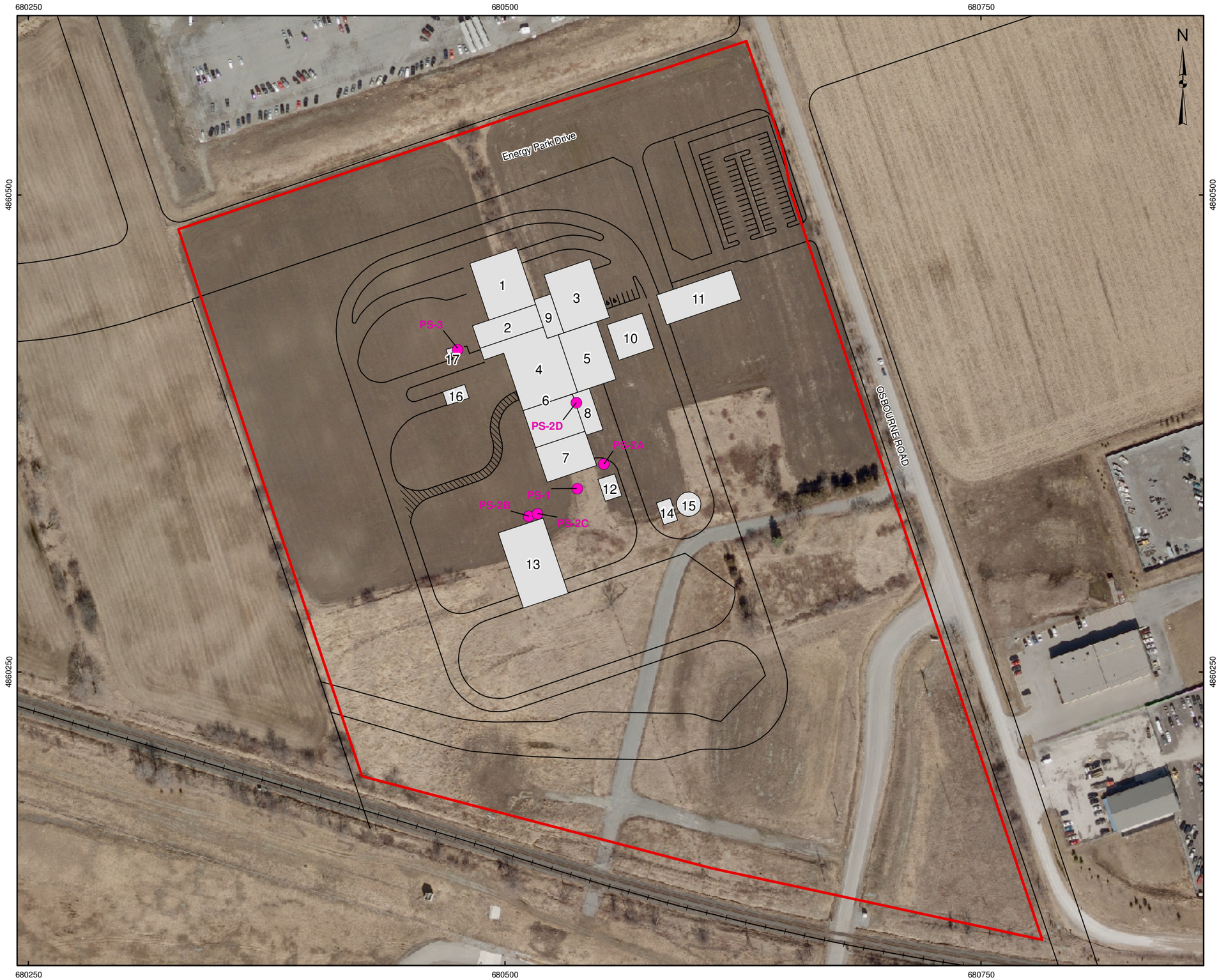
TITLE
DISPERSION MODELLING PLAN – OSBOURNE ROAD ENTRANCE

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	10 Jan. 2011		
CHECK	KA	10 Jan. 2011		
REVIEW	PN	10 Jan. 2011		

FIGURE: 3A

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CofA\AirDispersion_Modelling_Plan_LayoutB.mxd



LEGEND

- Point Source
- Site Road (Paved)
- Site Road (Gravel)
- Railway
- Roof Plan
- Approximate Site Boundary

Point Source	Description
PS-1	Main Stack
PS-2A	Carbon Silo Baghouse Exhaust
PS-2B	Pozzolan Silo Baghouse Exhaust
PS-2C	Portland Cement Silo Baghouse Exhaust
PS-2D	Lime Silo Baghouse Exhaust
PS-3	Diesel Generator

ID	Building	Height (m)
1	Tipping Building	15.0
2	Refuse Building	35.1
3	Admin Building	5.3
4	Boiler Building	35.1
5	Turbine Building	19.0
6	Scrubber Building	35.1
7	Baghouse Building	25.0
8	Maintenance and Storage Building	12.1
9	Control Room	24.2
10	Air Cooled Condensers	24.7
11	Visitor Centre	11.3
12	Electrical Building	5.0
13	Residue Storage Building	17.2
14	Fire Water Pump House	10.0
15	Fire Water Tank	8.0
16	Grizzly Building	6.0
17	Diesel Genset	2.5

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions, obtained on December 16, 2010, 20 cm resolution.
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

50 25 0 50 100
SCALE 1:2,000 METERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
DISPERSION MODELLING PLAN – COURTICE ROAD ENTRANCE

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 3B

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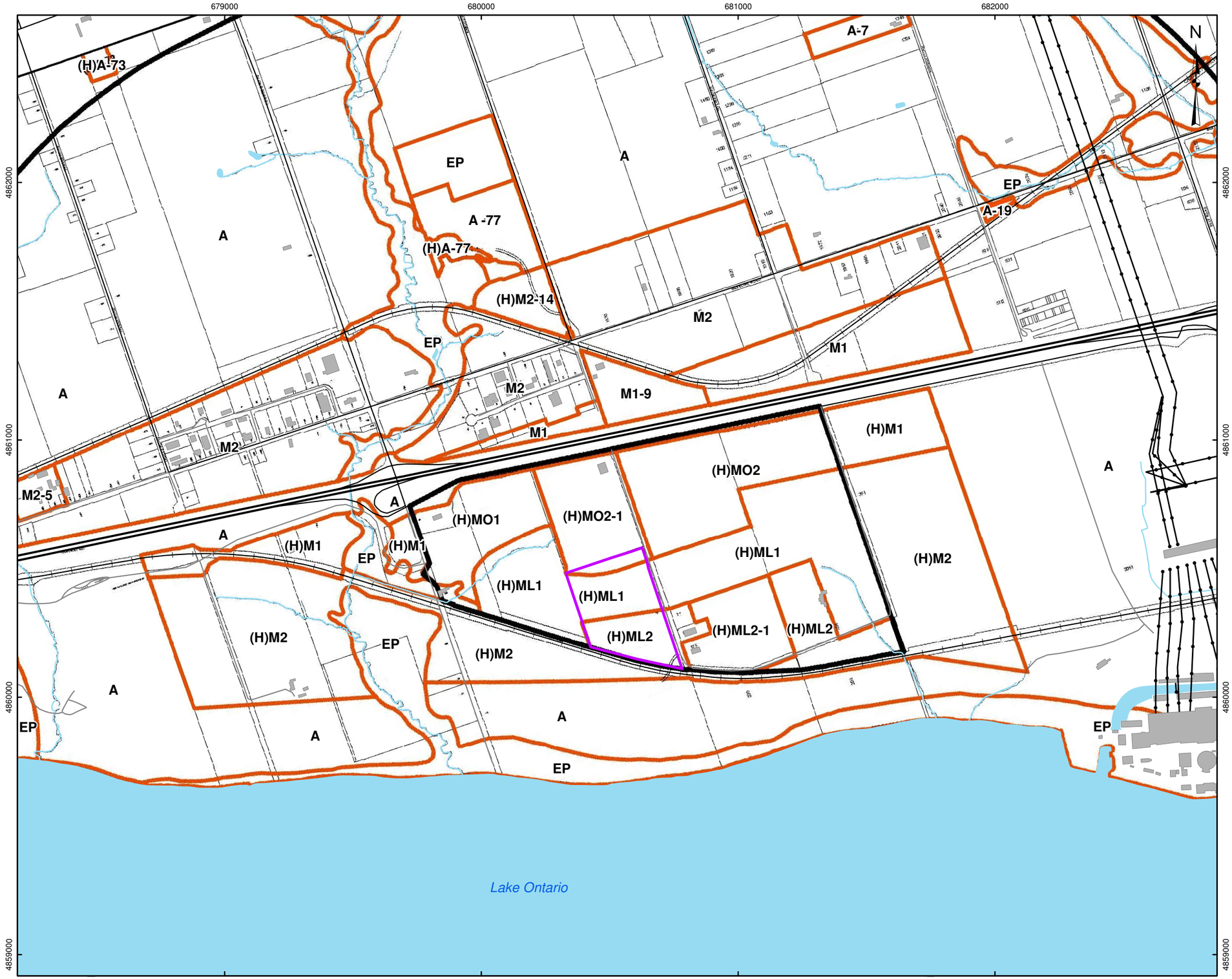


LEGEND

- Highway
- Major Road
- Local Road
- Railway
- Utility Line
- Watercourse
- Waterbody
- Building Footprint
- Approximate Site Boundary
- Zoning

A - Agricultural
M1 - Light Industrial
M2 - Eeneral Industrial
MO1 - Energy Park Office
MO2 - Energy Park Prestige
ML1 - Energy Park Light Industrial
ML2 - Energy Park General Industrial
EP - Environmental Protection

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Zoning - The Town of Newcastle Zoning By-Law 84-63
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.25 0 0.25 0.5 0.75
SCALE 1:15,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

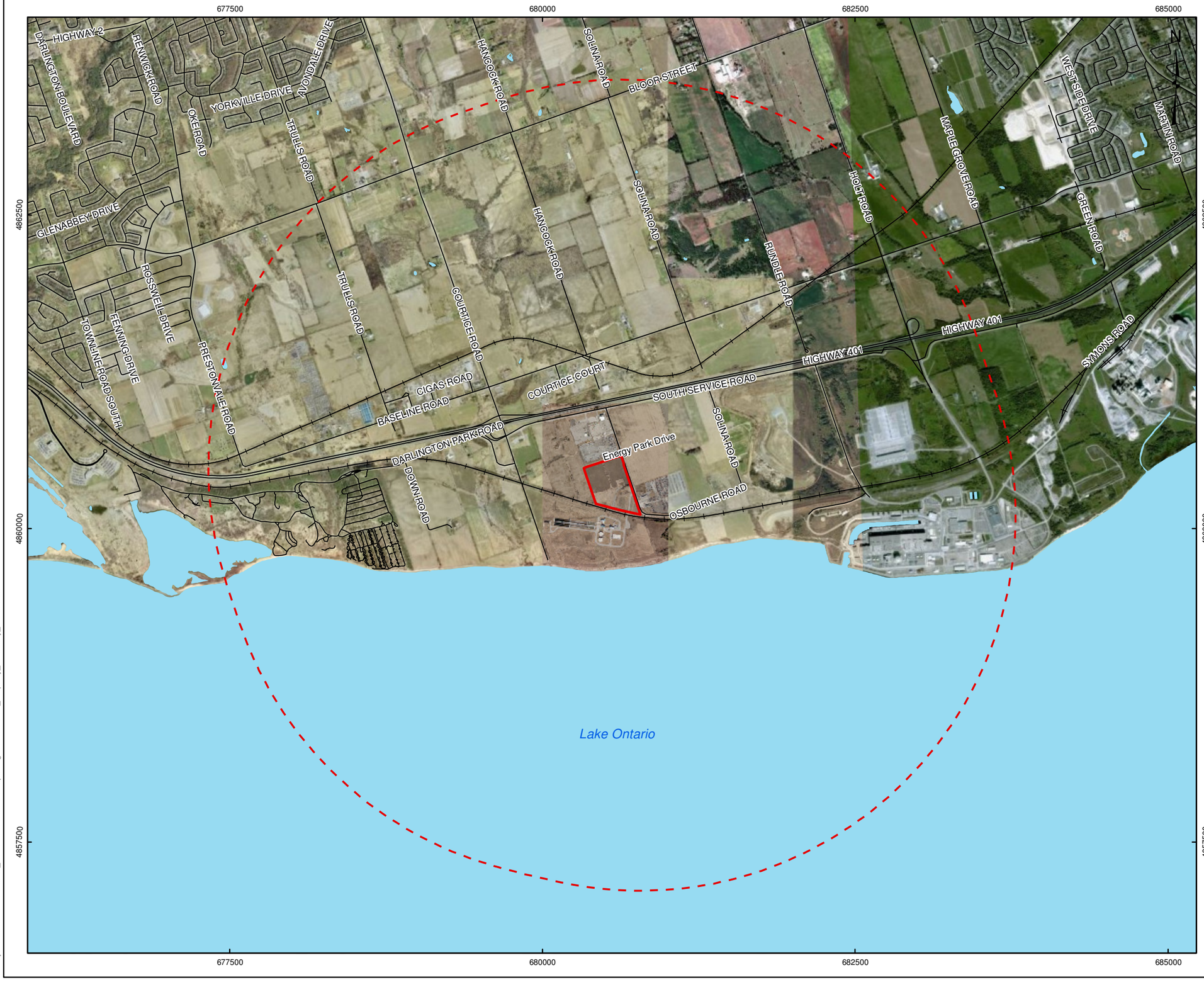
TITLE
SCALED AREA LOCATION PLAN

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 4

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\Cof\A\AirScaled_Area_Location_Plan.mxd



LEGEND

- Road
- Railway
- Waterbody
- 3 km Site Boundary Buffer
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions, obtained on December 16, 2010, 20 cm resolution;
Bing Maps © 2009 Microsoft Corporation and its data suppliers
Produced by Golder Associates Ltd under licence from
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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.5 0.25 0 0.5 1 1.5
SCALE 1:30,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

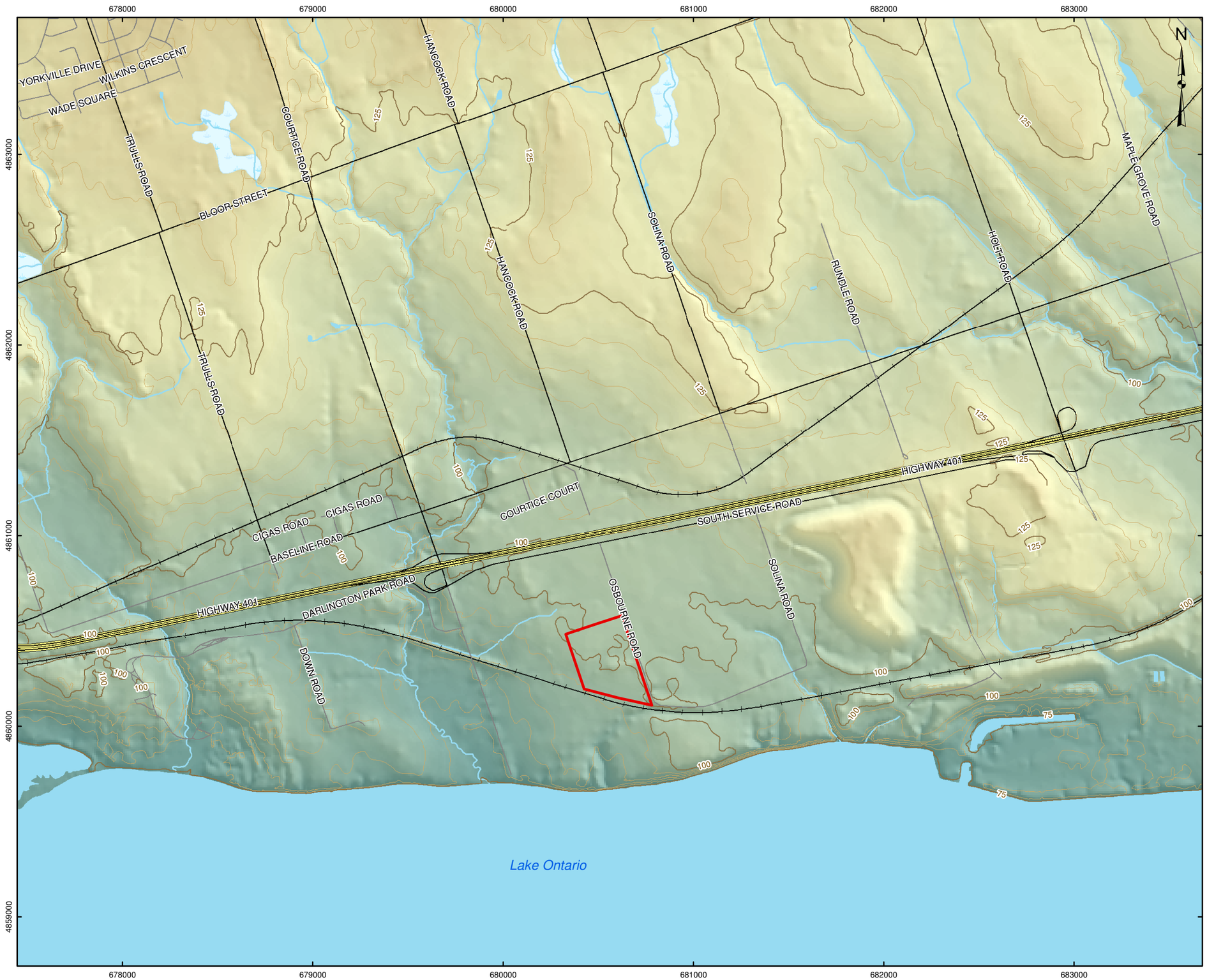
TITLE
3 km PROPERTY BOUNDARY BUFFER

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 5

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CoA\Air\3km_Property_Boundary_Buffer.mxd



LEGEND

- Major Contour (25 m)
- Minor Contour (5 m)
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Watercourse
- Waterbody
- Wetland
- Approximate Site Boundary

Elevation (masl)

High : 200

Low : 50

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Produced by Golder Associates Ltd under licence from
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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.5 0.25 0 0.5 1

SCALE 1:20,000 KILOMETERS

PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

TERRAIN ELEVATION

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 6

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CofA\Air\Terrain_Elevation.mxd

660000 670000 680000 690000 700000

4880000 4870000 4860000 4850000

N

Lake Ontario

LEGEND

- 10 m Property Boundary Receptor
- Gridded Receptor
- Road
- Railway
- Waterbody
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

2.5 0 2.5 5 7.5

SCALE 1:150,000 KILOMETERS

PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

DISPERSION MODELLING GRIDDED RECEPTORS

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 7

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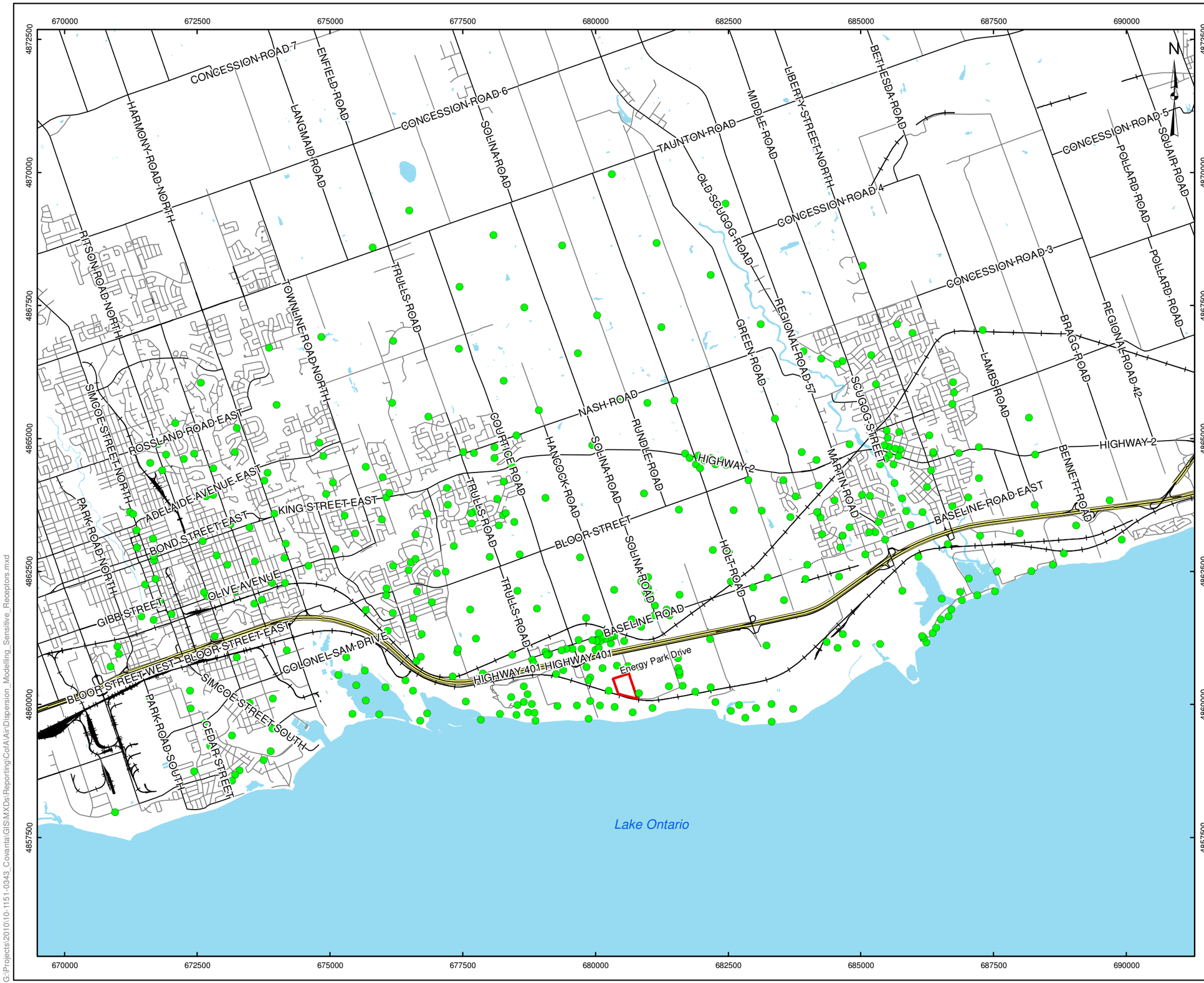

LEGEND

- Sensitive Receptor
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Waterbody
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Produced by Golder Associates Ltd under licence from
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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

1 0.5 0 1 2 3 4
SCALE 1:70,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
DISPERSION MODELLING SENSITIVE RECEPTORS

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 8

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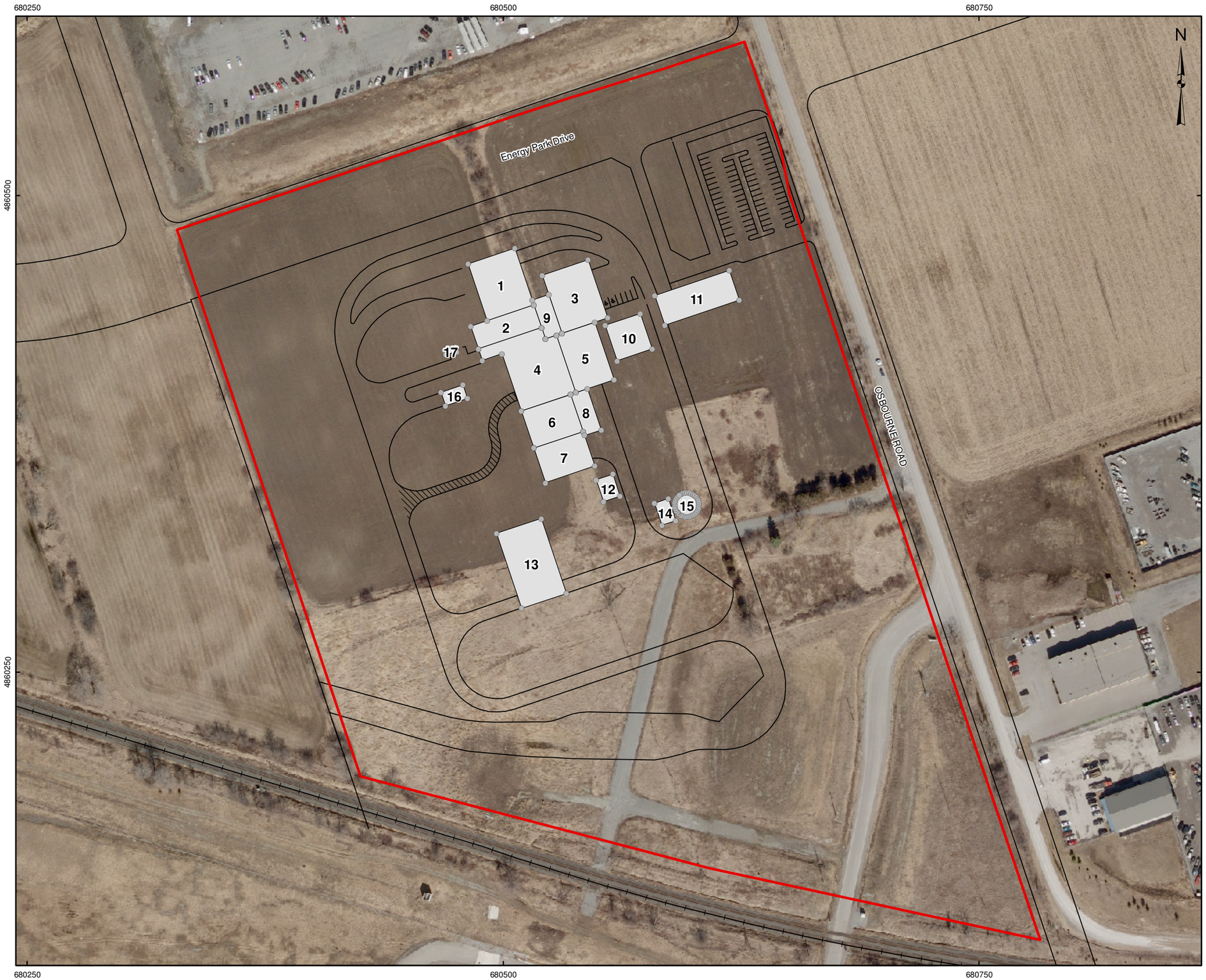

LEGEND

- Site Road (Paved)
- Site Road (Gravel)
- Railway
- Roof Plan
- Approximate Site Boundary

ID	Building	Height (m)
1	Tipping Building	15.0
2	Refuse Building	35.1
3	Admin Building	5.3
4	Boiler Building	35.1
5	Turbine Building	19.0
6	Scrubber Building	35.1
7	Baghouse Building	25.0
8	Maintenance and Storage Building	12.1
9	Control Room	24.2
10	Air Cooled Condensers	24.7
11	Visitor Centre	11.3
12	Electrical Building	5.0
13	Residue Storage Building	17.2
14	Fire Water Pump House	10.0
15	Fire Water Tank	8.0
16	Grizzly Building	6.0
17	Diesel Genset	2.5

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions, obtained on December 16, 2010, 20 cm resolution.
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Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

50 25 0 50 100
SCALE 1:2,000 METERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
BUILDING LOCATION PLAN – COURTICE ROAD ENTRANCE

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343		SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	**FIGURE: 9**
GIS	PRM	1 Feb. 2011	
CHECK	KA	1 Feb. 2011	
REVIEW	PN	1 Feb. 2011	

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679000
680000
681000
682000
4861000
4860000
4859000
4858000

TRULLS ROAD
CIGAS ROAD
CIGAS ROAD
BASELINE ROAD
HANGOGK ROAD
MCKNIGHT ROAD
PROGRESS DRIVE
RUNDLE ROAD
HIGHWAY 401
HIGHWAY 401
SOUTH SERVICE ROAD
SOLINA ROAD
DARLINGTON PARK ROAD
DOWN ROAD
COURTICE ROAD
OSBOURNE ROAD

POI 1
POI 2
POI 3
POI 4
POI 5
POI 6
POI 7
POI 8
POI 9
POI 10
POI 11
POI 12
POI 13
POI 14
POI 15
POI 16
POI 17
POI 18
POI 19
POI 20
POI 21
POI 22
POI 23

Lake Ontario

N

LEGEND

- Maximum POI Loaction
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Watercourse
- Waterbody
- Wetland
- Roof Plan
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.25 0.125 0 0.25 0.5 0.75
SCALE 1:15,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
POI LOCATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	**FIGURE: 10**	
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CofA\Air\POI_Locations.mxd

APPENDIX A

Copies of the Modification Log

APPENDIX A
Copies of the Modification Log

Example Comprehensive CofA Modification Log

Log #	Date	Description of Modification	Substance	Exisiting ER (g/s)	Modified ER (g/s)	Existing POI (mg/m^3)	New POI (mg/m^3)	POI Limit (mg/m^3)	Comments	Completed By

APPENDIX B

Project Description

APPENDIX B
Project Description

Detailed project description can be found in *Design and Operations Report in Support of Environmental Protection Act Section 27 Certificate of Approval (Waste) Application, February 2011* .

APPENDIX C

Emission Rate Calculations

Operating Point	TPD	HHV	mmbtu/hr	100% Availability TPY	95% Availablility TPY	% MCR
2'-110%MCR	238	6449	127.8	86,833	82,491	110%

Condition	Output dscfm at 7	Calculated Flue Gas 10%	15%	F-factor Flue Gas EPA	5%
2'-110%MCR	28749	31624	33061	30660	32193

Condition: 2'-110%MCR **Flow Rate Calculations For Scenarios A and B** **Page 1 of 2**

1 **MSW/MWC Conditions**

TPD	237.8984
HHV	6448.789
mmbtu/hr	127.8
Thermal Input	110%
excess air	54
Econ Outlet Temp F	330.1
Scrubber out Temp F	285.8
steam rate (calc'd) lbs/hr	88751

2 **Economizer Flue Gas**

	Volume % Wet	Volume % Dry	Weight % Wet	Weight % Dry	Molecular Weight Wet	Molecular Weight Dry
CO2	10.92	12.91	0.169	0.187	4.805	5.682
O2	6.19	7.32	0.070	0.077	1.981	2.342
N2	67.40	79.71	0.663	0.735	18.872	22.318
H2O	15.44	0.00	0.098	0.000	2.779	0.000
SO2	0.0052	0.0061	0.000	0.000	0.003	0.004
HCl	0.0367	0.0434	0.000	0.001	0.013	0.016
Total	99.99	99.99	1.000	1.000	28.454	30.362
MW	28.45	30.36				
lb/hr	155656	481227				
scfm	34805	29431				

3 **H20 and In-Leakage**

H20	pph	1578	
In-Leakage	pph	4669	3 % of wet gas rate at economizer 0.97%

4 **Stack Volumetric Rate (scfm)**

	Econ	In-Leakage	H2O	Total	Design +10 %	Design +15 %
CO2	3801	0	0	3801	4181	4371
O2	2154	217	0	2371	2608	2727
N2	23459	821	0	24280	26707	27921
H2O	5374	0	563	5937	6531	6828
SO2	2	0	0	2	2	2
HCl	13	0	0	13	14	15
Total - Wet	34802	1038	563	36403	40044	41864
Total - Dry	29429	1038	0	30466	33513	35036

5 **Flue Gas Analysis**

	Economizer Wet %	Economizer Dry %	Stack Wet %	Stack Dry %
CO2	10.92	12.91	10.44	12.48
O2	6.19	7.32	6.51	7.78
N2	67.40	79.71	66.70	79.69
H2O	15.44	0.00	16.31	0.00
SO2	0.01	0.01	0.00	0.01
HCl	0.04	0.04	0.04	0.04
Total	99.99	99.99	100.00	100.00

6 **Mass Flow Rates**

	Econ	In-Leakage	H2O	Total	Design +10 %	Design +15 %
CO2	26082	0	0	26082	28690	29994
O2	10746	1082	0	11828	13011	13602
N2	102970	3603	0	106573	117230	122559
H2O	15097	0	1583	16680	18348	19182
SO2	18	0	0	18	20	21
HCl	73	0	0	73	80	84
Total - Wet	154987	4684	1583	161254	177379	185442
Total - Dry	139889	4684	0	144574	159031	166260

7 **Flue Gas Temperatures**

	F	C
Economizer	330.1	165.6
SDA Outlet	285.8	141.0
Stack	270.0	132.2

Total Adjustment

8 **Stack Volumetric flue rates**

	Calc'd	+10 %	+15 %
dscfm at 68 F	30466	33513	35036
wscfm at 68 F	36403	40044	41864
acfm at 270 F	50331	55364	57880

Operating Point	TPD	HHV	mmbtu/hr	100% Availability TPY	95% Availablility TPY	% MCR
2'-110%MCR	238	6449	127.8	86,833	82,491	110%

Condition	Output dscfm at 7	Calculated Flue Gas 10%	15%	F-factor Flue Gas EPA	5%
2'-110%MCR	28749	31624	33061	30660	32193

Condition: 2'-110%MCR Flow Rate Calculations For Scenarios A and B

Summary Report - imperial	
MWC Operating Condition	
TPD	237.8984
HHV	6448.789
mmbtu/hr	127.8
MCR	110%
steam rate (calc'd)	88750.58

Stack Gas Analysis (vol %)	Wet	Dry
CO2	10.44	12.48
O2	6.51	7.78
N2	66.70	79.69
H2O	16.31	0.00
SO2	0.00	0.01
HCl	0.04	0.04
Total	100.00	100.00

Stack Flue Gas Rate	Calc'd	+10 %	+15 %
dscfm at 68 F	30466	33513	35036
dscfm at 7 % O2	28749	31624	33061
dscfm at 11 % O2, 298.15	41053	45159	47211
wscfm at 68 F	36403	40044	41864
acfm at 270 F	50331	55364	57880
dscm/min at 7 % O2	815	896	937
dscm/min at 11 % O2, 29	1163	1280	1338

Summary Report - metric	
MWC Operating Condition	
TPD	237.8984
HHV	6448.789
mmbtu/hr	127.8
MCR	110%
steam rate (calc'd)	88750.58

Stack Gas Analysis (vol %)	Wet	Dry
CO2	10.44	12.48
O2	6.51	7.78
N2	66.70	79.69
H2O	16.31	0.00
SO2	0.00	0.01
HCl	0.04	0.04
Total	100.00	100.00

Stack Flue Gas Rate	Calc'd	+10 %	+15 %
dm^3/s at 68 F	14.38	15.82	16.54
dm^3/s at 7 % O2	13.57	14.92	15.60
dm^3/s at 11 % O2, 298.15	19.37	21.31	22.28
wm^3/s at 68 F	17.18	18.90	19.76
am^3/s at 270 F	23.75	26.13	27.32

Source 1 (Scenario A)

Main Stack - Normal Operation - Two Trains

Source Description: Emissions from the main stack under Normal operation with both boilers operational.

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

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 2')	21.31	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
	26.13	m^3/s at operational conditions
Total Volumetric flow rate	52.26	m^3/s at operational conditions
Waste Processing Rate	215.77	Mg/day

Sample Calculation 1: Particulate matter emission per train

Emission Rate [g/s] = Concentration[mg/dscm] x volumetric flow rate [dm^3/s] x 1/1000 [mg/g]

$$= \frac{22.41\ \frac{ug}{m^3} \times 21\ \frac{m^3}{s} \times 1\ mol}{1{,}000\ m^3} = 4.78E\text{-}01\ \frac{g}{s}$$

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]

$$= \frac{1.50E\text{-}03\ \frac{kg}{Mg} \times 216\ \frac{Mg}{day} \times 1000\ \frac{Kg}{1\ g} \times 1\ day}{86400\ s} = 3.75E\text{-}03\ \frac{g}{s}$$

Source Emissions:

Contaminant	CAS Number	Concentration per train	Units[1]	Concentration Reference[2,3,4]	Emission Rate per Train [g/s]	Total Emission Rate [g/s]
Carbon Monoxide	630-08-0	4.50E+01	mg/Rm3	Provided by Covanta	9.59E-01	1.92E+00
Sulphur Dioxide	7446-09-5	3.50E+01	mg/Rm3	Provided by Covanta	7.47E-01	1.49E+00
Total Particulate Matter	N/A	2.24E+01	mg/Rm3	Provided by Covanta	4.78E-01	9.55E-01
Filterable TSP	N/A	9.00E+00	mg/Rm3	Provided by Covanta	1.92E-01	3.84E-01
PM10	N/A	2.24E+01	mg/Rm3	Provided by Covanta	4.78E-01	9.55E-01
PM2.5	N/A	2.10E+01	mg/Rm3	Provided by Covanta	4.48E-01	8.95E-01
VOCs as CH4	N/A	4.90E+01	mg/Rm3	Provided by Covanta	1.04E+00	2.09E+00
Lead	7439-92-1	5.00E-02	mg/Rm3	Provided by Covanta	1.07E-03	2.13E-03
Cadmium	7440-43-9	7.00E-03	mg/Rm3	Provided by Covanta	1.49E-04	2.98E-04
Mercury	7439-97-6	1.50E-02	mg/Rm3	Provided by Covanta	3.20E-04	6.39E-04
Hydrogen Fluoride	7664-39-3	9.00E-01	mg/Rm3	Provided by Covanta	1.92E-02	3.84E-02
PCDD (I-TEQ)	N/A	6.00E-08	mg/Rm3	Provided by Covanta	1.28E-09	2.56E-09
Hydrogen Chloride	7647-01-0	9.00E+00	mg/Rm3	Provided by Covanta	1.92E-01	3.84E-01
Ammonia	7664-41-7	9.90E+00	mg/Rm3	Provided by Covanta	2.11E-01	4.22E-01
Nitrogen Oxides	10102-44-0	1.21E+02	mg/Rm3	Provided by Covanta	2.57E+00	5.14E+00
Polychlorinated Biphenyls (PCB)	N/A	7.22E-05	mg/Rm3	YD Generic Risk Assessment	1.54E-06	3.08E-06
Aluminum	7429-90-5	3.98E-02	mg/Rm3	MOE Peel HHRA	8.47E-04	1.69E-03
Antimony	7440-36-0	2.74E-03	mg/Rm3	YD Generic Risk Assessment	5.84E-05	1.17E-04
Arsenic	7440-38-2	4.20E-04	mg/Rm3	Manufacturer Specification	8.95E-06	1.79E-05
Barium	7440-39-3	2.11E-03	mg/Rm3	MOE Peel HHRA	4.51E-05	9.01E-05
Beryllium	7440-41-7	3.33E-04	mg/Rm3	MOE Peel HHRA	7.10E-06	1.42E-05
Boron	7440-42-8	1.53E-01	mg/Rm3	YD Generic Risk Assessment	3.26E-03	6.52E-03
Chromium (hexavalent)	18540-29-9	3.20E-04	mg/Rm3	Manufacturer Specification	6.82E-06	1.36E-05
Total Chromium (and compounds)	7440-47-3	2.25E-03	mg/Rm3	Manufacturer Specification	4.79E-05	9.59E-05
Cobalt	7440-48-4	5.79E-03	mg/Rm3	MOE Peel HHRA	1.23E-04	2.47E-04
Nickel	7440-02-0	8.71E-02	mg/Rm3	MOE Peel HHRA	1.86E-03	3.71E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm3	MOE Peel HHRA	9.81E-04	1.96E-03
Silver	7440-22-4	3.35E-03	mg/Rm3	MOE Peel HHRA	7.14E-05	1.43E-04
Selenium	7782-49-2	4.80E-04	mg/Rm3	Manufacturer Specification	1.02E-05	2.05E-05
Thallium	7440-28-0	3.90E-02	mg/Rm3	Manufacturer Specification	8.31E-04	1.66E-03
Tin	7440-31-5	1.76E-02	mg/Rm3	MOE Peel HHRA	3.75E-04	7.50E-04
Vanadium	7440-62-2	1.16E-03	mg/Rm3	MOE Peel HHRA	2.48E-05	4.96E-05
Zinc	7440-66-6	2.00E-01	mg/Rm3	MOE Peel HHRA	4.25E-03	8.50E-03
1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm3	MOE Peel HHRA	4.36E-05	8.72E-05
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm3	YD Generic Risk Assessment	1.10E-06	2.19E-06
1,2,4 – Trichlorobenzene	120-82-1	5.15E-05	mg/Rm3	YD Generic Risk Assessment	1.10E-06	2.19E-06
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm3	MOE Peel HHRA	3.70E-06	7.41E-06
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm3	MOE Hartford HHRA	1.12E-06	2.23E-06
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm3	YD Generic Risk Assessment	2.19E-06	4.39E-06
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm3	MOE Peel HHRA	4.39E-06	8.79E-06
Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm3	YD Generic Risk Assessment	1.10E-06	2.19E-06
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm3	MOE Peel HHRA	2.88E-06	5.77E-06
Acenaphthylene	208-96-8	1.45E-05	mg/Rm3	Manufacturer Specification	3.09E-07	6.18E-07
Acenaphthene	83-32-9	1.86E-05	mg/Rm3	Manufacturer Specification	3.96E-07	7.93E-07
Anthracene	120-12-7	4.07E-06	mg/Rm3	Manufacturer Specification	8.67E-08	1.73E-07

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

1. Concentrations are at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
2. Manufacturer Specifications are taken from the Environemental Assessment (See Appendedix D of ESDM)
3. YD Generic Risk Assessment refers to Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005 and is taken from the Environmental Assessment.
4. MOE Peel HHRA refers to MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999) and is taken from the Environmental Assessment

Source 1 (Scenario B)

Main Stack - Normal Operation - One Train Only

Source Description: Emissions from the main stack under Normal operation with only one boiler operational.

Operating Rate: One boiler is operating at 110% MCR at operating point 2`. The second boiler is not operational.

Methodology: Emission Factor
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 2')	21.31	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
	26.13	m^3/s at operational conditions
Waste Processing Rate	215.77	Mg/day

Sample Calculation 1: Particulate matter emission per train

Emission Rate [g/s] = Concentration[mg/dscm] x volumetric flow rate [dm^3/s] x 1/1000 [mg/g]

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

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

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]

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

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

Source Emissions:

Contaminant	CAS Number	Concentration per train	Units	Concentration Reference[1,2,3]	Emission Rate per Train [g/s]	Total Emission Rate [g/s]
Carbon Monoxide	630-08-0	4.50E+01	mg/Rm3	Provided by Covanta	9.59E-01	9.59E-01
Sulphur Dioxide	7446-09-5	3.50E+01	mg/Rm3	Provided by Covanta	7.47E-01	7.47E-01
Total Particulate Matter	N/A	2.24E+01	mg/Rm3	Provided by Covanta	4.78E-01	4.78E-01
Filterable TSP	N/A	9.00E+00	mg/Rm3	Provided by Covanta	1.92E-01	1.92E-01
PM10	N/A	2.24E+01	mg/Rm3	Provided by Covanta	4.78E-01	4.78E-01
PM2.5	N/A	2.10E+01	mg/Rm3	Provided by Covanta	4.48E-01	4.48E-01
VOCs as CH4	N/A	4.90E+01	mg/Rm3	Provided by Covanta	1.04E+00	1.04E+00
Lead	7439-92-1	5.00E-02	mg/Rm3	Provided by Covanta	1.07E-03	1.07E-03
Cadmium	7440-43-9	7.00E-03	mg/Rm3	Provided by Covanta	1.49E-04	1.49E-04
Mercury	7439-97-6	1.50E-02	mg/Rm3	Provided by Covanta	3.20E-04	3.20E-04
Hydrogen Fluoride	7664-39-3	9.00E-01	mg/Rm3	Provided by Covanta	1.92E-02	1.92E-02
PCDD (I-TEQ)	N/A	6.00E-08	mg/Rm3	Provided by Covanta	1.28E-09	1.28E-09
Hydrogen Chloride	7647-01-0	9.00E+00	mg/Rm3	Provided by Covanta	1.92E-01	1.92E-01
Ammonia	7664-41-7	9.90E+00	mg/Rm3	Provided by Covanta	2.11E-01	2.11E-01
Nitrogen Oxides	10102-44-0	1.21E+02	mg/Rm3	Provided by Covanta	2.57E+00	2.57E+00
Polychlorinated Biphenyls (PCB)	N/A	7.22E-05	mg/Rm3	YD Generic Risk Assessment	1.54E-06	1.54E-06
Aluminum	7429-90-5	3.98E-02	mg/Rm3	MOE Peel HHRA	8.47E-04	8.47E-04
Antimony	7440-36-0	2.74E-03	mg/Rm3	YD Generic Risk Assessment	5.84E-05	5.84E-05
Arsenic	7440-38-2	4.20E-04	mg/Rm3	Manufacturer Specification	8.95E-06	8.95E-06
Barium	7440-39-3	2.11E-03	mg/Rm3	MOE Peel HHRA	4.51E-05	4.51E-05
Beryllium	7440-41-7	3.33E-04	mg/Rm3	MOE Peel HHRA	7.10E-06	7.10E-06
Boron	7440-42-8	1.53E-01	mg/Rm3	YD Generic Risk Assessment	3.26E-03	3.26E-03
Chromium (hexavalent)	18540-29-9	3.20E-04	mg/Rm3	Manufacturer Specification	6.82E-06	6.82E-06
Total Chromium (and compounds)	7440-47-3	2.25E-03	mg/Rm3	Manufacturer Specification	4.79E-05	4.79E-05
Cobalt	7440-48-4	5.79E-03	mg/Rm3	MOE Peel HHRA	1.23E-04	1.23E-04
Nickel	7440-02-0	8.71E-02	mg/Rm3	MOE Peel HHRA	1.86E-03	1.86E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm3	MOE Peel HHRA	9.81E-04	9.81E-04
Silver	7440-22-4	3.35E-03	mg/Rm3	MOE Peel HHRA	7.14E-05	7.14E-05
Selenium	7782-49-2	4.80E-04	mg/Rm3	Manufacturer Specification	1.02E-05	1.02E-05
Thallium	7440-28-0	3.90E-02	mg/Rm3	Manufacturer Specification	8.31E-04	8.31E-04
Tin	7440-31-5	1.76E-02	mg/Rm3	MOE Peel HHRA	3.75E-04	3.75E-04
Vanadium	7440-62-2	1.16E-03	mg/Rm3	MOE Peel HHRA	2.48E-05	2.48E-05
Zinc	7440-66-6	2.00E-01	mg/Rm3	MOE Peel HHRA	4.25E-03	4.25E-03
1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm3	MOE Peel HHRA	4.36E-05	4.36E-05
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm3	YD Generic Risk Assessment	1.10E-06	1.10E-06
1,2,4 – Trichlorobenzene	120-82-1	5.15E-05	mg/Rm3	YD Generic Risk Assessment	1.10E-06	1.10E-06
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm3	MOE Peel HHRA	3.70E-06	3.70E-06
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm3	MOE Hartford HHRA	1.12E-06	1.12E-06
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm3	YD Generic Risk Assessment	2.19E-06	2.19E-06
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm3	MOE Peel HHRA	4.39E-06	4.39E-06

Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm3	YD Generic Risk Assessment	1.10E-06	1.10E-06
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm3	MOE Peel HHRA	2.88E-06	2.88E-06
Acenaphthylene	208-96-8	1.45E-05	mg/Rm3	Manufacturer Specification	3.09E-07	3.09E-07
Acenaphthene	83-32-9	1.86E-05	mg/Rm3	Manufacturer Specification	3.96E-07	3.96E-07
Anthracene	120-12-7	4.07E-06	mg/Rm3	Manufacturer Specification	8.67E-08	8.67E-08
Benzo(a)anthracene	56-55-3	1.50E-06	mg/Rm3	Manufacturer Specification	3.20E-08	3.20E-08
Benzo(b)fluoranthene	205-99-2	3.83E-06	mg/Rm3	Manufacturer Specification	8.16E-08	8.16E-08
Benzo(k)fluoranthene	207-08-9	1.01E-06	mg/Rm3	Manufacturer Specification	2.15E-08	2.15E-08
Benzo(a)fluorene	238-84-6	2.76E-05	mg/Rm3	MOE Peel HHRA	5.89E-07	5.89E-07
Benzo(b)fluorene	243-17-4	1.89E-05	mg/Rm3	MOE Peel HHRA	4.03E-07	4.03E-07
Benzo(ghi)perylene	191-24-2	4.13E-05	mg/Rm3	Manufacturer Specification	8.80E-07	8.80E-07
Benzo(a)pyrene	50-32-8	3.44E-06	mg/Rm3	Manufacturer Specification	7.33E-08	7.33E-08
Benzo(e)pyrene	192-97-2	8.71E-06	mg/Rm3	Manufacturer Specification	1.86E-07	1.86E-07
Biphenyl	92-51-3	2.98E-03	mg/Rm3	MOE Peel HHRA	6.36E-05	6.36E-05
Chrysene	218-01-9	3.77E-06	mg/Rm3	Manufacturer Specification	8.03E-08	8.03E-08
Dibenzo(a,c)anthracene	215-58-7	2.68E-05	mg/Rm3	YD Generic Risk Assessment	5.71E-07	5.71E-07
Dibenzo(a,h)anthracene	53-70-3	1.21E-06	mg/Rm3	Manufacturer Specification	2.58E-08	2.58E-08
Fluoranthene	206-44-0	4.16E-05	mg/Rm3	Manufacturer Specification	8.86E-07	8.86E-07
Fluorine	86-73-7	3.13E-05	mg/Rm3	Manufacturer Specification	6.67E-07	6.67E-07
Indeno(1,2,3 – cd)pyrene	193-39-5	7.54E-06	mg/Rm3	Manufacturer Specification	1.61E-07	1.61E-07
1 – methylnaphthalene	90-12-0	9.82E-05	mg/Rm3	MOE Peel HHRA	2.09E-06	2.09E-06
2 – methylnaphthalene	91-57-6	5.44E-04	mg/Rm3	Manufacturer Specification	1.16E-05	1.16E-05
Naphthalene	91-20-3	4.23E-04	mg/Rm3	Manufacturer Specification	9.01E-06	9.01E-06
Perylene	198-55-0	1.51E-06	mg/Rm3	Manufacturer Specification	3.22E-08	3.22E-08
Phenanthrene	85-01-8	9.46E-05	mg/Rm3	Manufacturer Specification	2.02E-06	2.02E-06
Pyrene	129-00-0	5.02E-05	mg/Rm3	Manufacturer Specification	1.07E-06	1.07E-06
Tetralin	119-64-2	4.99E-04	mg/Rm3	MOE Peel HHRA	1.06E-05	1.06E-05
O-terphenyl	84-15-1	8.18E-05	mg/Rm3	MOE Peel HHRA	1.74E-06	1.74E-06
Acetaldehyde	75-07-0	4.30E-09	kg/Mg	US EPA Fire Database	1.07E-08	1.07E-08
Benzene	71-43-2	3.10E-02	mg/Rm3	Manufacturer Specification	6.61E-04	6.61E-04
Bromodichloromethane	75-27-4	1.50E-03	kg/Mg	US EPA Fire Database	3.75E-03	3.75E-03
Bromoform	75-25-2	4.11E-04	kg/Mg	US EPA Fire Database	1.03E-03	1.03E-03
Bromomethane	74-83-9	3.60E-02	mg/Rm3	MOE Peel HHRA	7.67E-04	7.67E-04
Carbon tetrachloride	56-23-5	2.56E-06	kg/Mg	US EPA Fire Database	6.39E-06	6.39E-06
Chloroform	67-66-3	5.10E-04	mg/Rm3	YD Generic Risk Assessment	1.09E-05	1.09E-05
Dichlorodifluoromethane	75-71-8	8.71E-02	mg/Rm3	MOE Peel HHRA	1.86E-03	1.86E-03
Dichloroethene, 1,1 -	75-34-3	5.65E-04	mg/Rm3	MOE Peel HHRA	1.20E-05	1.20E-05
Dichloromethane	75-09-2	1.76E-01	mg/Rm3	YD Generic Risk Assessment	3.75E-03	3.75E-03
Ethylbenzene	100-41-4	1.04E-03	mg/Rm3	MOE Peel HHRA	2.21E-05	2.21E-05
Ethylene Dibromide	106-93-4	2.41E-06	kg/Mg	US EPA Fire Database	6.02E-06	6.02E-06
Formaldehyde	50-00-0	4.75E-02	mg/Rm3	YD Generic Risk Assessment	1.01E-03	1.01E-03
Tetrachloroethene	127-18-4	5.67E-03	mg/Rm3	YD Generic Risk Assessment	1.21E-04	1.21E-04
Toluene	108-88-3	5.03E-02	mg/Rm3	MOE Peel HHRA	1.07E-03	1.07E-03
Trichloroethane, 1,1,1 -	71-55-6	1.43E-03	mg/Rm3	MOE Peel HHRA	3.04E-05	3.04E-05
Trichloroethene	86-42-0	4.92E-04	mg/Rm3	MOE Peel HHRA	1.05E-05	1.05E-05
Trichloroethylene, 1,1,2 -	79-01-6	4.92E-04	mg/Rm3	MOE Peel HHRA	1.05E-05	1.05E-05
Trichlorofluoromethane	75-69-4	1.72E-01	mg/Rm3	MOE Peel HHRA	3.67E-03	3.67E-03
Vinyl chloride	75-01-4	4.36E-02	mg/Rm3	MOE Peel HHRA	9.29E-04	9.29E-04
Xylenes, m-, p- and o-	1330-20-7	6.04E-01	mg/Rm3	MOE Peel HHRA	1.29E-02	1.29E-02

1. Concentrations are at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
2. Manufacturer Specifications are taken from the Environemental Assessment (See Appendedix D of ESDM)
3. YD Generic Risk Assessment refers to Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005 and is taken from the Environmental Assessment.
4. MOE Peel HHRA refers to MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999) and is taken from the Environmental Assessment

Operating Point	TPD	HHV	mmbtu/hr	100% Availability TPY	95% Availablility TPY	% MCR
4-60%MCR	159	5078	67.1	57,889	54,994	60%

Condition	Output dscfm at 7	Calculated Flue Gas 10%	Calculated Flue Gas 15%	F-factor Flue Gas EPA	F-factor Flue Gas 5%
4-60%MCR	15324	16856	17622	16095	16900

Condition: 4-60%MCR **Flow Rate Calculations For Scenarios C and D**

1 **MSW/MWC Conditions**

TPD	158.5989
HHV	5077.948
mmbtu/hr	67.1
Thermal Input	60%
excess air	54
Econ Outlet Temp F	330.1
Scrubber out Temp F	285.8
steam rate (calc'd) lbs/hr	43096

2 **Economizer Flue Gas**

	Volume % Wet	Volume % Dry	Weight % Wet	Weight % Dry	Molecular Weight Wet	Molecular Weight Dry
CO2	10.92	12.91	0.169	0.187	4.805	5.682
O2	6.19	7.32	0.070	0.077	1.981	2.342
N2	67.40	79.71	0.663	0.735	18.872	22.318
H2O	15.44	0.00	0.098	0.000	2.779	0.000
SO2	0.0052	0.0061	0.000	0.000	0.003	0.004
HCl	0.0367	0.0434	0.000	0.001	0.013	0.016
Total	99.99	99.99	1.000	1.000	28.454	30.362
MW	28.45	30.36				
lb/hr	81680	481227				
scfm	18552	15687				

3 **H20 and In-Leakage**

H20	pph	847		
In-Leakage	pph	2449	3 % of wet gas rate at economizer	0.51%

4 **Stack Volumetric Rate (scfm)**

	Econ	In-Leakage	H2O	Total	Design +10 %	Design +15 %
CO2	2026	0	0	2026	2228	2330
O2	1148	114	0	1262	1388	1451
N2	12504	431	0	12934	14228	14874
H2O	2864	0	302	3166	3483	3641
SO2	1	0	0	1	1	1
HCl	7	0	0	7	7	8
Total - Wet	18550	544	302	19396	21336	22306
Total - Dry	15686	544	0	16230	17853	18664

5 **Flue Gas Analysis**

	Economizer Wet %	Economizer Dry %	Stack Wet %	Stack Dry %
CO2	10.92	12.91	10.44	12.48
O2	6.19	7.32	6.51	7.78
N2	67.40	79.71	66.68	79.69
H2O	15.44	0.00	16.33	0.00
SO2	0.01	0.01	0.00	0.01
HCl	0.04	0.04	0.04	0.04
Total	99.99	99.99	100.00	100.00

6 **Mass Flow Rates**

	Econ	In-Leakage	H2O	Total	Design +10 %	Design +15 %
CO2	13902	0	0	13902	15292	15987
O2	5728	567	0	6295	6925	7240
N2	54884	1890	0	56774	62451	65290
H2O	8047	0	849	8896	9785	10230
SO2	10	0	0	10	11	11
HCl	39	0	0	39	43	45
Total - Wet	82609	2457	849	85915	94507	98803
Total - Dry	74562	2457	0	77020	84722	88572

7 **Flue Gas Temperatures**

	F	C
Economizer	330.1	165.6
SDA Outlet	285.8	141.0
Stack	270	132.2

8 **Stack Volumetric flue rates**

	Calc'd	Total Adjustment +10 %	Total Adjustment +15 %
dscfm at 68 F	16230	17853	18664
wscfm at 68 F	19396	21336	22306
acfm at 270 F	26817	29499	30840

Operating Point	TPD	HHV	mmbtu/hr	100% Availability TPY	95% Availablility TPY	% MCR
4-60%MCR	159	5078	67.1	57,889	54,994	60%

Condition	Output dscfm at 7	Calculated Flue Gas 10%	15%	F-factor Flue Gas EPA	5%
4-60%MCR	15324	16856	17622	16095	16900

Condition: 4-60%MCR **Flow Rate Calculations For Scenarios C and D**

9

Summary Report	
MWC Operating Condition	
TPD	158.5989
HHV	5077.948
mmbtu/hr	67.1
MCR	60%
steam rate (calc'd)	43095.52

Stack Gas Analysis (vol %)	Wet	Dry
CO2	10.44	12.48
O2	6.51	7.78
N2	66.68	79.69
H2O	16.33	0.00
SO2	0.00	0.01
HCl	0.04	0.04
Total	100.00	100.00

Stack Flue Gas Rate	Calc'd	+10 %	+15 %
dscfm at 68 F	16230	17853	18664
dscfm at 7 % O2	15324	16856	17622
dscfm at 11 % O2, 298.15 K	21882	24070	25164
wscfm at 68 F	19396	21336	22306
acfm at 270 F	26817	29499	30840
dscm/min at 7 % O2	434	478	499
dscm/min at 11 % O2, 298.5 K	620	682	713

Summary Report - metric	
MWC Operating Condition	
TPD	158.5989
HHV	5077.948
mmbtu/hr	67.1
MCR	60%
steam rate (calc'd)	43095.52

Stack Gas Analysis (vol %)	Wet	Dry
CO2	10.44	12.48
O2	6.51	7.78
N2	66.68	79.69
H2O	16.33	0.00
SO2	0.00	0.01
HCl	0.04	0.04
Total	100.00	100.00

Stack Flue Gas Rate	Calc'd	+10 %	+15 %
dm^3/s at 68 F	7.66	8.43	8.81
dm^3/s at 7 % O2	7.23	7.96	8.32
dm^3/s at 11 % O2, 298.15 K	10.33	11.36	11.88
wm^3/s at 68 F	9.15	10.07	10.53
am^3/s at 270 F	12.66	13.92	14.55

Phase 2 Start-up **Flow Rate Calculation for Scenarios C and D**

Phase 2 - Natural gas and MSW firing; assume 40% of Operating Ref. Pt. 1 (firing diagram) heat input from natural gas; 60% from MSW

Calculation for Auxilliary Burner Flow Rate

wscfm = H (MMBtu/hr) x [Fd (dscf/MMBtu) x (20.9/(20.9-O_{2d}) + (Fw - Fd)] x (1 hr / 60 min)
dscfm = H (MMBtu/hr) x [Fd (dscf/MMBtu) x (20.9/(20.9-O2d)] x (1 hr / 60 min)
dscfm @ 7% O_{2d} = dscfm @ O_2 x (20.9 - actual O_{2d}) / (20.9 - 7)
wscfm = H (MMBtu/hr) x [Fd (dscf/MMBtu) x (20.9/(20.9-O2d) + (Fw - Fd)] x [Ts + 460) / 528] x (1 hr / 60 min)

Fd	8,710	dscf/MMBtu
Fw	10,610	wscf/MMBtu
O_{2d}	2	

Auxiliary Burner Heat Input	44.8	MMBtu/hr		
Auxiliary Burner Flue Gas Flow Rate (at 293.15 K, 2% oxygen)	8,610	wscfm	4.06	wm3/s
Auxiliary Burner Flue Gas Flow Rate (at 293.15 K, 2% oxygen)	7,192	dscfm	3.39	dm3/s
Auxiliary Burner Flue Gas Flow Rate (at 298.15 K, 11% oxygen)	13,499	dscfm	6.37	dm3/s
	11,904	acfm	5.62	am3/s

Calculation for MSW Combustion Flue Gas Flow Rate

MSW Combustion Heat Input @ 60% of Heat Input Rate at Operating Point 1 (Equal to Operating Point 4)	67.1	MMBtu/hr		
Flue Gas Flow Rate (at 298.15 K, 11% oxygen)	24,070	dscfm	11.36	dm3/s
Flue Gas Flow Rate	29,499	acfm	13.92	am3/s
Total Flue Gas Flow Rate	41,403	acfm	19.54	am3/s

Source 1 (Scenario C)

Main Stack - Start Up - Phase 2 - Two Trains

Source Description: Emissions from the main stack under start-up (Phase 2) with both boilers operational. Under phase 2, the boilers are operational at operating point 4. Additional heat is provided by natural gas fired auxilliary boilers. This phase lasts approximately 1 hour.

Operating Rate: Under this scenario, both boilers are under Phase 2 of the start up. It has been assumed that 40% of heat input (at operation point 1) is from natural gas and 60% from MSW.

Methodology: Emission Factor
Source: The Source of each MSW firing emission concentration is documented in the Source Description sheet for Source 1A.
Natural gas firing emission factors are taken from US EPA AP42 chapter 1.4

Train Parameters:	Volumetric flow rate - per train (MSW Firing, Operating Point 4)	11.36	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
		13.92	m^3/s at operational conditions
	Volumetric flow rate - per train (Natural Gas Firing)	6.37	Rm^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
		5.62	m^3/s at operational conditions
	Total volumetric flow rate per train	17.73	Rm^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature
		19.54	m^3/s at operational conditions
	Total volumetric flow rate	39.08	m^3/s at operational conditions
	Maximum Heat Input (Auxiliary Boiler - Natural Gas Firing)	44.8	MMBtu/hr

Sample Calculation 2: Particulate matter emission per train

MSW Firing

Emission Rate [g/s] = Concentration[mg/Rm3] x volumetric flow rate [Rm³/s] x 1/1000 [mg/g]

$$= \frac{22.41\ \frac{ug}{m^3} \times 11\ \frac{m^3}{s} \times 1\ \frac{mol}{1{,}000\ m^3}}{}$$

$$= \frac{2.55E\text{-}01\ g}{s}$$

Natural Gas Firing

Emission Rate [g/s] = Emission Factor [lb/10^6 scf] x Maximum Heat Input [Btu/hr] / 1020 [BTU/Scf] x 454[g/lb] / 3600 [hr/s]

$$\frac{7.60\ lb}{1{,}000{,}000\ scf} \times \frac{44{,}800{,}000\ BTU}{hr} \times \frac{1\ scf}{1{,}020\ BTU} \times \frac{454\ g}{1\ lb} \times \frac{1\ hr}{3600\ s}$$

$$\frac{4.21E\text{-}02\ g}{s}$$

Source Emissions :

Contaminant	CAS Number	MSW Firing Boiler			Natural Gas Firing Auxiliary Boiler		Total Emission Rate [g/s]
		Concentration per train	Units	Emission Rate per Train [g/s]	US EPA EF [lb/10^6 scf]	Emission Rate per Train [g/s]	
Carbon Monoxide	630-08-0	4.50E+01	mg/Rm3	5.11E-01	8.40E+01	4.65E-01	1.95E+00
Sulphur Dioxide	7446-09-5	3.50E+01	mg/Rm3	3.98E-01	6.00E-01	5.14E-02	8.99E-01
Total Particulate Matter	N/A	2.24E+01	mg/Rm3	2.55E-01	7.60E+00	4.21E-02	5.93E-01
Filterable TSP	N/A	9.00E+00	mg/Rm3	1.02E-01	1.90E+00	1.05E-02	2.25E-01
PM10	N/A	2.24E+01	mg/Rm3	2.55E-01	7.60E+00	4.21E-02	5.93E-01
PM2.5	N/A	2.10E+01	mg/Rm3	2.39E-01	7.60E+00	4.21E-02	5.61E-01
VOCs as CH4	N/A	4.90E+01	mg/Rm3	5.57E-01	5.50E+00	3.04E-02	1.17E+00
Lead	7439-92-1	5.00E-02	mg/Rm3	5.68E-04	5.00E-04	2.77E-06	1.14E-03
Cadmium	7440-43-9	7.00E-03	mg/Rm3	7.95E-05	1.10E-03	6.09E-06	1.71E-04
Mercury	7439-97-6	1.50E-02	mg/Rm3	1.70E-04	2.60E-04	1.44E-06	3.44E-04
Hydrogen Fluoride	7664-39-3	9.00E-01	mg/Rm3	1.02E-02	N/A	N/A	2.04E-02
PCDD	N/A	6.00E-08	mg/Rm3	6.81E-10	N/A	N/A	1.36E-09
Hydrogen Chloride	7647-01-0	9.00E+00	mg/Rm3	1.02E-01	N/A	N/A	2.04E-01
Ammonia	7664-41-7	9.90E+00	mg/Rm3	1.12E-01	N/A	N/A	2.25E-01
Nitrogen Oxides	10102-44-0	1.21E+02	mg/Rm3	1.37E+00	3.80E+01	2.10E-01	3.16E+00
Polychlorinated Biphenyls (PCB)	N/A	7.22E-05	mg/Rm3	8.20E-07	N/A	N/A	1.64E-06
Aluminum	7429-90-5	3.98E-02	mg/Rm3	4.51E-04	N/A	N/A	9.03E-04
Arsenic	7440-36-0	2.74E-03	mg/Rm3	3.11E-05	2.00E-04	1.11E-06	6.45E-05
Antimony	7440-38-2	4.20E-04	mg/Rm3	4.77E-06	N/A	N/A	9.54E-06
Barium	7440-39-3	2.11E-03	mg/Rm3	2.40E-05	4.40E-03	2.43E-05	9.67E-05
Beryllium	7440-41-7	3.33E-04	mg/Rm3	3.78E-06	1.20E-05	6.64E-08	7.70E-06
Boron	7440-42-8	1.53E-01	mg/Rm3	1.74E-03	N/A	N/A	3.48E-03
Chromium (hexavalent)	18540-29-9	3.20E-04	mg/Rm3	3.63E-06	1.40E-03	7.75E-06	2.28E-05
Total Chromium (and compounds)	7440-47-3	2.25E-03	mg/Rm3	2.56E-05	1.40E-03	7.75E-06	6.66E-05
Cobalt	7440-48-4	5.79E-03	mg/Rm3	6.58E-05	8.40E-05	4.65E-07	1.33E-04
Nickel	7440-02-0	8.71E-02	mg/Rm3	9.89E-04	2.10E-03	1.16E-05	2.00E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm3	5.23E-04	N/A	N/A	1.05E-03
Silver	7440-22-4	3.35E-03	mg/Rm3	3.81E-05	N/A	N/A	7.61E-05
Selenium	7782-49-2	4.80E-04	mg/Rm3	5.45E-06	2.40E-05	1.33E-07	1.12E-05
Thallium	7440-28-0	3.90E-02	mg/Rm3	4.43E-04	N/A	N/A	8.86E-04
Tin	7440-31-5	1.76E-02	mg/Rm3	2.00E-04	N/A	N/A	4.00E-04
Vanadium	7440-62-2	1.16E-03	mg/Rm3	1.32E-05	2.30E-03	1.27E-05	5.19E-05
Zinc	7440-66-6	2.00E-01	mg/Rm3	2.27E-03	2.90E-02	1.60E-04	4.85E-03

1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm3	2.32E-05	N/A	N/A	4.65E-05
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm3	5.85E-07	N/A	N/A	1.17E-06
1,2,4 – Trichlorobenzene	120-82-1	5.15E-05	mg/Rm3	5.85E-07	N/A	N/A	1.17E-06
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm3	1.97E-06	N/A	N/A	3.95E-06
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm3	5.94E-07	N/A	N/A	1.19E-06
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm3	1.17E-06	N/A	N/A	2.34E-06
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm3	2.34E-06	N/A	N/A	4.68E-06
Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm3	5.85E-07	N/A	N/A	1.17E-06
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm3	1.54E-06	N/A	N/A	3.07E-06
Acenaphthylene	208-96-8	1.45E-05	mg/Rm3	1.65E-07	1.80E-06	9.96E-09	3.49E-07
Acenaphthene	83-32-9	1.86E-05	mg/Rm3	2.11E-07	1.80E-06	9.96E-09	4.42E-07
Anthracene	120-12-7	4.07E-06	mg/Rm3	4.62E-08	2.40E-06	1.33E-08	1.19E-07
Benzo(a)anthracene	56-55-3	1.50E-06	mg/Rm3	1.70E-08	1.80E-06	9.96E-09	5.40E-08
Benzo(b)fluoranthene	205-99-2	3.83E-06	mg/Rm3	4.35E-08	1.80E-06	9.96E-09	1.07E-07
Benzo(k)fluoranthene	207-08-9	1.01E-06	mg/Rm3	1.15E-08	1.80E-06	9.96E-09	4.29E-08
Benzo(a)fluorene	238-84-6	2.76E-05	mg/Rm3	3.14E-07	N/A	N/A	6.28E-07
Benzo(b)fluorene	243-17-4	1.89E-05	mg/Rm3	2.15E-07	N/A	N/A	4.30E-07
Benzo(ghi)perylene	191-24-2	4.13E-05	mg/Rm3	4.69E-07	1.20E-06	6.64E-09	9.51E-07
Benzo(a)pyrene	50-32-8	3.44E-06	mg/Rm3	3.91E-08	1.20E-06	6.64E-09	9.14E-08
Benzo(e)pyrene	192-97-2	8.71E-06	mg/Rm3	9.89E-08	N/A	N/A	1.98E-07
Biphenyl	92-51-3	2.98E-03	mg/Rm3	3.39E-05	N/A	N/A	6.78E-05
Chrysene	218-01-9	3.77E-06	mg/Rm3	4.28E-08	1.80E-06	9.96E-09	1.06E-07
Dibenzo(a,c)anthracene	215-58-7	2.68E-05	mg/Rm3	3.04E-07	N/A	N/A	6.09E-07
Dibenzo(a,h)anthracene	53-70-3	1.21E-06	mg/Rm3	1.37E-08	1.20E-06	6.64E-09	4.08E-08
Fluoranthene	206-44-0	4.16E-05	mg/Rm3	4.72E-07	3.00E-06	1.66E-08	9.78E-07
Fluorine	86-73-7	3.13E-05	mg/Rm3	3.56E-07	N/A	N/A	7.11E-07
Indeno(1,2,3 – cd)pyrene	193-39-5	7.54E-06	mg/Rm3	8.56E-08	1.80E-06	9.96E-09	1.91E-07
1 – Methylnaphthalene	90-12-0	9.82E-05	mg/Rm3	1.12E-06	N/A	N/A	2.23E-06
2 – Methylnaphthalene	91-57-6	5.44E-04	mg/Rm3	6.18E-06	2.40E-05	1.33E-07	1.26E-05
Naphthalene	91-20-3	4.23E-04	mg/Rm3	4.80E-06	6.10E-04	3.38E-06	1.64E-05
Perylene	198-55-0	1.51E-06	mg/Rm3	1.72E-08	N/A	N/A	3.43E-08
Phenanthrene	85-01-8	9.46E-05	mg/Rm3	1.07E-06	1.70E-05	9.41E-08	2.34E-06
Pyrene	129-00-0	5.02E-05	mg/Rm3	5.70E-07	5.00E-06	2.77E-08	1.20E-06
Tetralin	119-64-2	4.99E-04	mg/Rm3	5.66E-06	N/A	N/A	1.13E-05
O-terphenyl	84-15-1	8.18E-05	mg/Rm3	9.29E-07	N/A	N/A	1.86E-06
Acetaldehyde	75-07-0	4.30E-09	kg/Mg	7.17E-09	N/A	N/A	1.43E-08
Benzene	71-43-2	3.10E-02	mg/Rm3	3.52E-04	2.10E-03	1.16E-05	7.27E-04
Bromodichloromethane	75-27-4	1.50E-03	kg/Mg	2.50E-03	N/A	N/A	5.00E-03
Bromoform	75-25-2	4.11E-04	kg/Mg	6.84E-04	N/A	N/A	1.37E-03
Bromomethane	74-83-9	3.60E-02	mg/Rm3	4.09E-04	N/A	N/A	8.18E-04
Carbon tetrachloride	56-23-5	2.56E-06	kg/Mg	4.26E-06	N/A	N/A	8.52E-06
Chloroform	67-66-3	5.10E-04	mg/Rm3	5.79E-06	N/A	N/A	1.16E-05
Dichlorodifluoromethane	75-71-8	8.71E-02	mg/Rm3	9.89E-04	N/A	N/A	1.98E-03
Dichloroethene, 1,1 -	75-34-3	5.65E-04	mg/Rm3	6.42E-06	N/A	N/A	1.28E-05
Dichloromethane	75-09-2	1.76E-01	mg/Rm3	2.00E-03	N/A	N/A	4.00E-03
Ethylbenzene	100-41-4	1.04E-03	mg/Rm3	1.18E-05	N/A	N/A	2.35E-05
Ethylene Dibromide	106-93-4	2.41E-06	kg/Mg	4.01E-06	N/A	N/A	8.02E-06
Formaldehyde	50-00-0	4.75E-02	mg/Rm3	5.39E-04	7.50E-02	4.15E-04	1.91E-03
Tetrachloroethene	127-18-4	5.67E-03	mg/Rm3	6.44E-05	N/A	N/A	1.29E-04
Toluene	108-88-3	5.03E-02	mg/Rm3	5.71E-04	3.40E-03	1.88E-05	1.18E-03
Trichloroethane, 1,1,1 -	71-55-6	1.43E-03	mg/Rm3	1.62E-05	N/A	N/A	3.24E-05
Trichloroethene	86-42-0	4.92E-04	mg/Rm3	5.58E-06	N/A	N/A	1.12E-05
Trichloroethylene, 1,1,2 -	79-01-6	4.92E-04	mg/Rm3	5.58E-06	N/A	N/A	1.12E-05
Trichlorofluoromethane	75-69-4	1.72E-01	mg/Rm3	1.96E-03	N/A	N/A	3.91E-03
Vinyl chloride	75-01-4	4.36E-02	mg/Rm3	4.95E-04	N/A	N/A	9.91E-04
Xylenes, m-, p- and o-	1330-20-7	6.04E-01	mg/Rm3	6.86E-03	N/A	N/A	1.37E-02
Nitrous Oxides	10024-97-2	N/A	N/A	N/A	6.40E-01	4.43E-03	8.85E-03

3-Methylchloranthene	56-49-5	N/A	N/A	N/A	1.80E-06	9.96E-09	1.99E-08
7,12-Dimethylbenz(a)anthracene	57-97-6	N/A	N/A	N/A	1.60E-05	8.85E-08	1.77E-07
Butane	106-97-8	N/A	N/A	N/A	2.10E+00	1.16E-02	2.32E-02
Dichlorobenzene	25321-22-6	N/A	N/A	N/A	1.20E-03	6.64E-06	1.33E-05
Ethane	74-84-0	N/A	N/A	N/A	3.10E+00	1.72E-02	3.43E-02
Fluorene	86-73-7	N/A	N/A	N/A	2.80E-06	1.55E-08	3.10E-08
Hexane	110-54-3	N/A	N/A	N/A	1.80E+00	9.96E-03	1.99E-02
Pentane	109-66-0	N/A	N/A	N/A	2.60E+00	1.44E-02	2.88E-02
Propane	74-98-6	N/A	N/A	N/A	1.60E+00	8.85E-03	1.77E-02
Copper	7440-50-8	N/A	N/A	N/A	8.50E-04	4.70E-06	9.41E-06
Manganese	7439-96-5	N/A	N/A	N/A	3.80E-04	2.10E-06	4.21E-06
Molybdenum	7439-98-7	N/A	N/A	N/A	1.10E-03	6.09E-06	1.22E-05

Source 1 (Scenario D)

Main Stack - Start Up - Phase 2 - One Train Only

Source Description: Emissions from the main stack under start-up (Phase 2) with only one boiler operational. Under phase 2, the boiler is operational at operating point 4. Additional heat is provided by a natural gas fired auxilliary boiler. This phase lasts approximately 1 hour.

Operating Rate: Under this scenario, one train is operational under Phase 2 of the start up. It has been assumed that 40% of heat input (at operation point 1) is from natural gas and 60% from MSW. The second train is not operational.

Methodology: Emission Factor
Source: The Source of each MSW firing emission concentration is documented in the Source Description sheet for Source 1A.
Natural gas firing emission factors are taken from US EPA AP42 chapter 1.4

Train Parameters:

Volumetric flow rate (MSW Firing)	11.36 13.92	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature m^3/s at operational conditions
Volumetric flow rate (Natural Gas Firing)	6.37 5.62	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature m^3/s at operational conditions
Total volumetric flow rate	17.73 19.54	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature m^3/s at operational conditions
Maximum Heat Input (Auxiliary Boiler - Natural Gas Firing)	44.8	MMBtu/hr

Sample Calculation: Particulate matter emission per train

MSW Firing

Emission Rate [g/s] = Concentration[mg/dscm] x volumetric flow rate [dm^3/s] x 1/1000 [mg/g]

$$= \frac{22.41 \text{ ug}}{\text{m}^3} \left| \frac{11 \text{ m}^3}{\text{s}} \right| \frac{1 \text{ mol}}{1{,}000 \text{ m}^3}$$

$$= \frac{2.55\text{E-}01 \text{ g}}{\text{s}}$$

Natural Gas Firing

Emission Rate [g/s] = Emission Factor [$lb/10^6$ scf] x Maximum Heat Input [Btu/hr] / 1020 [BTU/Scf] x 454[g/lb] / 3600 [hr/s]

$$\frac{7.60 \text{ lb}}{1{,}000{,}000 \text{ scf}} \left| \frac{44{,}800{,}000 \text{ BTU}}{\text{hr}} \right| \frac{1 \text{ scf}}{1{,}020 \text{ BTU}} \left| \frac{454 \text{ g}}{1 \text{ lb}} \right| \frac{1 \text{ hr}}{3600 \text{ s}}$$

$$\frac{4.21\text{E-}02 \text{ g}}{\text{s}}$$

Source Emissions :

Contaminant	CAS Number	MSW Firing Boiler			Natural Gas Firing Auxiliary Boiler		Total Emission Rate [g/s]
		Concentration per train	Units	Emission Rate per Train [g/s]	US EPA EF [lb/10^6 scf]	Emission Rate per Train [g/s]	
Carbon Monoxide	630-08-0	4.50E+01	mg/Rm3	5.11E-01	8.40E+01	4.65E-01	9.76E-01
Sulphur Dioxide	7446-09-5	3.50E+01	mg/Rm3	3.98E-01	6.00E-01	5.14E-02	4.49E-01
Total Particulate Matter	N/A	2.24E+01	mg/Rm3	2.55E-01	7.60E+00	4.21E-02	2.97E-01
Filterable TSP	N/A	9.00E+00	mg/Rm3	1.02E-01	1.90E+00	1.05E-02	1.13E-01
PM10	N/A	2.24E+01	mg/Rm3	2.55E-01	7.60E+00	4.21E-02	2.97E-01
PM2.5	N/A	2.10E+01	mg/Rm3	2.39E-01	7.60E+00	4.21E-02	2.81E-01
VOCs as CH4	N/A	4.90E+01	mg/Rm3	5.57E-01	5.50E+00	3.04E-02	5.87E-01
Lead	7439-92-1	5.00E-02	mg/Rm3	5.68E-04	5.00E-04	2.77E-06	5.71E-04
Cadmium	7440-43-9	7.00E-03	mg/Rm3	7.95E-05	1.10E-03	6.09E-06	8.56E-05
Mercury	7439-97-6	1.50E-02	mg/Rm3	1.70E-04	2.60E-04	1.44E-06	1.72E-04
Hydrogen Fluoride	7664-39-3	9.00E-01	mg/Rm3	1.02E-02	N/A	N/A	1.02E-02
PCDD	N/A	6.00E-08	mg/Rm3	6.81E-10	N/A	N/A	6.81E-10
Hydrogen Chloride	7647-01-0	9.00E+00	mg/Rm3	1.02E-01	N/A	N/A	1.02E-01
Ammonia	7664-41-7	9.90E+00	mg/Rm3	1.12E-01	N/A	N/A	1.12E-01
Nitrogen Oxides	10102-44-0	1.21E+02	mg/Rm3	1.37E+00	3.80E+01	2.10E-01	1.58E+00
Polychlorinated Biphenyls (PCB)	N/A	7.22E-05	mg/Rm3	8.20E-07	N/A	N/A	8.20E-07
Aluminum	7429-90-5	3.98E-02	mg/Rm3	4.51E-04	N/A	N/A	4.51E-04
Arsenic	7440-36-0	2.74E-03	mg/Rm3	3.11E-05	2.00E-04	1.11E-06	3.22E-05
Antimony	7440-38-2	4.20E-04	mg/Rm3	4.77E-06	N/A	N/A	4.77E-06
Barium	7440-39-3	2.11E-03	mg/Rm3	2.40E-05	4.40E-03	2.43E-05	4.84E-05
Beryllium	7440-41-7	3.33E-04	mg/Rm3	3.78E-06	1.20E-05	6.64E-08	3.85E-06
Boron	7440-42-8	1.53E-01	mg/Rm3	1.74E-03	N/A	N/A	1.74E-03
Chromium (hexavalent)	18540-29-9	3.20E-04	mg/Rm3	3.63E-06	1.40E-03	7.75E-06	1.14E-05
Total Chromium (and compounds)	7440-47-3	2.25E-03	mg/Rm3	2.56E-05	1.40E-03	7.75E-06	3.33E-05
Cobalt	7440-48-4	5.79E-03	mg/Rm3	6.58E-05	8.40E-05	4.65E-07	6.63E-05
Nickel	7440-02-0	8.71E-02	mg/Rm3	9.89E-04	2.10E-03	1.16E-05	1.00E-03
Phosphorus	7723-14-0	4.60E-02	mg/Rm3	5.23E-04	N/A	N/A	5.23E-04
Silver	7440-22-4	3.35E-03	mg/Rm3	3.81E-05	N/A	N/A	3.81E-05
Selenium	7782-49-2	4.80E-04	mg/Rm3	5.45E-06	2.40E-05	1.33E-07	5.58E-06
Thallium	7440-28-0	3.90E-02	mg/Rm3	4.43E-04	N/A	N/A	4.43E-04
Tin	7440-31-5	1.76E-02	mg/Rm3	2.00E-04	N/A	N/A	2.00E-04
Vanadium	7440-62-2	1.16E-03	mg/Rm3	1.32E-05	2.30E-03	1.27E-05	2.59E-05
Zinc	7440-66-6	2.00E-01	mg/Rm3	2.27E-03	2.90E-02	1.60E-04	2.43E-03
1,2-Dichlorobenzene	95-50-1	2.05E-03	mg/Rm3	2.32E-05	N/A	N/A	2.32E-05
1,2,4,5-Tetrachlorobenzene	95-94-3	5.15E-05	mg/Rm3	5.85E-07	N/A	N/A	5.85E-07
1,2,4 – Trichlorobenzene	120-82-1	5.15E-05	mg/Rm3	5.85E-07	N/A	N/A	5.85E-07
2,3,4,6-Tetrachlorophenol	58-90-2	1.74E-04	mg/Rm3	1.97E-06	N/A	N/A	1.97E-06
2,4,6-Trichlorophenol	88-06-2	5.23E-05	mg/Rm3	5.94E-07	N/A	N/A	5.94E-07
2,4-Dichlorophenol	120-83-2	1.03E-04	mg/Rm3	1.17E-06	N/A	N/A	1.17E-06
Pentachlorophenol	87-86-5	2.06E-04	mg/Rm3	2.34E-06	N/A	N/A	2.34E-06
Hexachlorobenzene	118-74-1	5.15E-05	mg/Rm3	5.85E-07	N/A	N/A	5.85E-07
Pentachlorobenzene	608-93-5	1.35E-04	mg/Rm3	1.54E-06	N/A	N/A	1.54E-06
Acenaphthylene	208-96-8	1.45E-05	mg/Rm3	1.65E-07	1.80E-06	9.96E-09	1.75E-07
Acenaphthene	83-32-9	1.86E-05	mg/Rm3	2.11E-07	1.80E-06	9.96E-09	2.21E-07
Anthracene	120-12-7	4.07E-06	mg/Rm3	4.62E-08	2.40E-06	1.33E-08	5.95E-08
Benzo(a)anthracene	56-55-3	1.50E-06	mg/Rm3	1.70E-08	1.80E-06	9.96E-09	2.70E-08
Benzo(b)fluoranthene	205-99-2	3.83E-06	mg/Rm3	4.35E-08	1.80E-06	9.96E-09	5.35E-08
Benzo(k)fluoranthene	207-08-9	1.01E-06	mg/Rm3	1.15E-08	1.80E-06	9.96E-09	2.14E-08
Benzo(a)fluorene	238-84-6	2.76E-05	mg/Rm3	3.14E-07	N/A	N/A	3.14E-07
Benzo(b)fluorene	243-17-4	1.89E-05	mg/Rm3	2.15E-07	N/A	N/A	2.15E-07
Benzo(ghi)perylene	191-24-2	4.13E-05	mg/Rm3	4.69E-07	1.20E-06	6.64E-09	4.76E-07
Benzo(a)pyrene	50-32-8	3.44E-06	mg/Rm3	3.91E-08	1.20E-06	6.64E-09	4.57E-08
Benzo(e)pyrene	192-97-2	8.71E-06	mg/Rm3	9.89E-08	N/A	N/A	9.89E-08
Biphenyl	92-51-3	2.98E-03	mg/Rm3	3.39E-05	N/A	N/A	3.39E-05
Chrysene	218-01-9	3.77E-06	mg/Rm3	4.28E-08	1.80E-06	9.96E-09	5.28E-08
Dibenzo(a,c)anthracene	215-58-7	2.68E-05	mg/Rm3	3.04E-07	N/A	N/A	3.04E-07
Dibenzo(a,h)anthracene	53-70-3	1.21E-06	mg/Rm3	1.37E-08	1.20E-06	6.64E-09	2.04E-08
Fluoranthene	206-44-0	4.16E-05	mg/Rm3	4.72E-07	3.00E-06	1.66E-08	4.89E-07
Fluorine	86-73-7	3.13E-05	mg/Rm3	3.56E-07	N/A	N/A	3.56E-07
Indeno(1,2,3 – cd)pyrene	193-39-5	7.54E-06	mg/Rm3	8.56E-08	1.80E-06	9.96E-09	9.56E-08
1 – Methylnaphthalene	90-12-0	9.82E-05	mg/Rm3	1.12E-06	N/A	N/A	1.12E-06
2 – Methylnaphthalene	91-57-6	5.44E-04	mg/Rm3	6.18E-06	2.40E-05	1.33E-07	6.31E-06
Naphthalene	91-20-3	4.23E-04	mg/Rm3	4.80E-06	6.10E-04	3.38E-06	8.18E-06
Perylene	198-55-0	1.51E-06	mg/Rm3	1.72E-08	N/A	N/A	1.72E-08
Phenanthrene	85-01-8	9.46E-05	mg/Rm3	1.07E-06	1.70E-05	9.41E-08	1.17E-06
Pyrene	129-00-0	5.02E-05	mg/Rm3	5.70E-07	5.00E-06	2.77E-08	5.98E-07

Tetralin	119-64-2	4.99E-04	mg/Rm3	5.66E-06	N/A	N/A	5.66E-06
O-terphenyl	84-15-1	8.18E-05	mg/Rm3	9.29E-07	N/A	N/A	9.29E-07
Acetaldehyde	75-07-0	4.30E-09	kg/Mg	7.17E-09	N/A	N/A	7.17E-09
Benzene	71-43-2	3.10E-02	mg/Rm3	3.52E-04	2.10E-03	1.16E-05	3.64E-04
Bromodichloromethane	75-27-4	1.50E-03	kg/Mg	2.50E-03	N/A	N/A	2.50E-03
Bromoform	75-25-2	4.11E-04	kg/Mg	6.84E-04	N/A	N/A	6.84E-04
Bromomethane	74-83-9	3.60E-02	mg/Rm3	4.09E-04	N/A	N/A	4.09E-04
Carbon tetrachloride	56-23-5	2.56E-06	kg/Mg	4.26E-06	N/A	N/A	4.26E-06
Chloroform	67-66-3	5.10E-04	mg/Rm3	5.79E-06	N/A	N/A	5.79E-06
Dichlorodifluoromethane	75-71-8	8.71E-02	mg/Rm3	9.89E-04	N/A	N/A	9.89E-04
Dichloroethene, 1,1 -	75-34-3	5.65E-04	mg/Rm3	6.42E-06	N/A	N/A	6.42E-06
Dichloromethane	75-09-2	1.76E-01	mg/Rm3	2.00E-03	N/A	N/A	2.00E-03
Ethylbenzene	100-41-4	1.04E-03	mg/Rm3	1.18E-05	N/A	N/A	1.18E-05
Ethylene Dibromide	106-93-4	2.41E-06	kg/Mg	4.01E-06	N/A	N/A	4.01E-06
Formaldehyde	50-00-0	4.75E-02	mg/Rm3	5.39E-04	7.50E-02	4.15E-04	9.54E-04
Tetrachloroethene	127-18-4	5.67E-03	mg/Rm3	6.44E-05	N/A	N/A	6.44E-05
Toluene	108-88-3	5.03E-02	mg/Rm3	5.71E-04	3.40E-03	1.88E-05	5.90E-04
Trichloroethane, 1,1,1 -	71-55-6	1.43E-03	mg/Rm3	1.62E-05	N/A	N/A	1.62E-05
Trichloroethene	86-42-0	4.92E-04	mg/Rm3	5.58E-06	N/A	N/A	5.58E-06
Trichloroethylene, 1,1,2 -	79-01-6	4.92E-04	mg/Rm3	5.58E-06	N/A	N/A	5.58E-06
Trichlorofluoromethane	75-69-4	1.72E-01	mg/Rm3	1.96E-03	N/A	N/A	1.96E-03
Vinyl chloride	75-01-4	4.36E-02	mg/Rm3	4.95E-04	N/A	N/A	4.95E-04
Xylenes, m-, p- and o-	1330-20-7	6.04E-01	mg/Rm3	6.86E-03	N/A	N/A	6.86E-03
Nitrous Oxides	10024-97-2	N/A	N/A	N/A	6.40E-01	4.43E-03	4.43E-03
3-Methylchloranthene	56-49-5	N/A	N/A	N/A	1.80E-06	9.96E-09	9.96E-09
7,12-Dimethylbenz(a)anthracene	57-97-6	N/A	N/A	N/A	1.60E-05	8.85E-08	8.85E-08
Butane	106-97-8	N/A	N/A	N/A	2.10E+00	1.16E-02	1.16E-02
Dichlorobenzene	25321-22-6	N/A	N/A	N/A	1.20E-03	6.64E-06	6.64E-06
Ethane	74-84-0	N/A	N/A	N/A	3.10E+00	1.72E-02	1.72E-02
Fluorene	86-73-7	N/A	N/A	N/A	2.80E-06	1.55E-08	1.55E-08
Hexane	110-54-3	N/A	N/A	N/A	1.80E+00	9.96E-03	9.96E-03
Pentane	109-66-0	N/A	N/A	N/A	2.60E+00	1.44E-02	1.44E-02
Propane	74-98-6	N/A	N/A	N/A	1.60E+00	8.85E-03	8.85E-03
Copper	7440-50-8	N/A	N/A	N/A	8.50E-04	4.70E-06	4.70E-06
Manganese	7439-96-5	N/A	N/A	N/A	3.80E-04	2.10E-06	2.10E-06
Molybdenum	7439-98-7	N/A	N/A	N/A	1.10E-03	6.09E-06	6.09E-06

Start-up conditions (per Boiler Unit)

Basis:
Phase 1 - Natural gas firing only; assume maximum heat input from auxiliary burners - **six hours duration**

Description	Value	Units
Maximum heat input for auxiliary buner	56	MMBtu/hr
Number of auxiliary burners	1	
Total maximum heat input for auxiliary burners	56	MMBtu/hr
Assumed flue gas temperature for auxiliary burners	270	deg. F
Assumed excess air for auxiliary burners	10%	
Fuel for auxiliary burners		Natural Gas
Assumed oil heating value	1,020	mmBtu/10^6 scf

Phase 1 **Flow Rate Calculation for Scenarios E and F**

Calculate acfm for auxiliary burners at full load

wscfm = H (MMBtu/hr) x [Fd (dscf/MMBtu) x (20.9/(20.9-O_{2d}) + (Fw - Fd)] x (1 hr / 60 min)
dscfm = H (MMBtu/hr) x [Fd (dscf/MMBtu) x (20.9/(20.9-O2d)] x (1 hr / 60 min)
dscfm @ 7% O_{2d} = dscfm @ O_2 x (20.9 - actual O_{2d}) / (20.9 - 7)
wscfm = H (MMBtu/hr) x [Fd (dscf/MMBtu) x (20.9/(20.9-O2d) + (Fw - Fd)] x [Ts + 460) / 528] x (1 hr / 60 min)

Fd	8,710	dscf/MMBtu
Fw	10,610	wscf/MMBtu
O_{2d}	2	

Flue gas flow rate (at 293.15 K, 2% oxygen)	10,763	wscfm		
Flue gas flow rate (at 293.15 K, 2% oxygen)	8,990	dscfm		
Flue gas flow rate (at 293.15 K, 7% oxygen)	12,223	dscfm	5.77	dm³/s
Flue gas flow rate (at 298.15 K, 11% oxygen)	16,874	dscfm	7.96	dm³/s
Flue Gas Flow Rate	14,881	acfm	7.02	am³/s

Source 1 (Scenario E)

Main Stack - Start Up - Phase 1 - Two Trains

Source Description: Emissions from the main stack under start-up (Phase 1) with both trains operational. Under phase 1, heat is provided by natural gas fired auxilliary boilers. This phase lasts approximately 6 hours.

Operating Rate: Under this scenario, both trains are operational under Phase 1 of the start up. All heat is provided by natural gas combustion from auxilliary boilers.

Methodology: Emission Factor
Source: Natural gas firing emission factors are taken from US EPA AP42 chapter 1.4

Train Parameters:	Volumetric flow rate per train (Natural Gas Firing)	7.96 7.02	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature m^3/s at operational conditions
	Total volumetric flow rate	14.05	m^3/s at operational conditions
	Maximum Heat Input (Auxiliary Boiler - Natural Gas Firing)	56	MMBtu/hr

Sample Calculation 1: Carbon monoxide emission per train

Emission Rate [g/s] = Emission Factor [$lb/10^6$ scf] x Maximum Heat Input [Btu/hr] / 1020 [BTU/Scf] x 454[g/lb] / 3600 [hr/s]

84.00	lb	56,000,000	BTU	1	scf	454	g	1	hr
1,000,000	scf		hr	1,020	BTU	1	lb	3600	s

5.82E-01	g
	s

Source Emissions :

Contaminant	CAS Number	US EPA EF [lb/10^6 scf]	Emission Rate per Train [g/s]	Total Emission Rate [g/s]
Carbon Monoxide	630-08-0	8.40E+01	5.81E-01	1.16E+00
Nitrogen Oxides	10102-44-0	3.80E+01	2.63E-01	5.26E-01
Sulphur Dioxide	7446-09-5	N/A	5.14E-02	1.03E-01
Total Particulate Matter	N/A	1.90E+00	5.26E-02	1.05E-01
Filterable TSP	N/A	6.40E-01	1.31E-02	2.63E-02
PM_{10}	N/A	1.90E+00	5.26E-02	1.05E-01
$PM_{2.5}$	N/A	1.90E+00	5.26E-02	1.05E-01
Lead	7439-92-1	5.00E-04	3.46E-06	6.92E-06
Cadmium	7440-43-9	1.10E-03	7.61E-06	1.52E-05
Mercury	7439-97-6	2.60E-04	1.80E-06	3.60E-06
Nitrous Oxides	10024-97-2	6.40E-01	4.43E-03	8.85E-03
2 – Methylnaphthalene	91-57-6	2.40E-05	1.66E-07	3.32E-07
3-Methylchloranthene	56-49-5	1.80E-06	1.25E-08	2.49E-08
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.11E-07	2.21E-07
Acenaphthene	83-32-9	1.80E-06	1.25E-08	2.49E-08
Acenaphthylene	208-96-8	1.80E-06	1.25E-08	2.49E-08
Anthracene	120-12-7	2.40E-06	1.66E-08	3.32E-08
Benzo(a)anthracene	56-55-3	1.80E-06	1.25E-08	2.49E-08
Benzene	71-43-2	2.10E-03	1.45E-05	2.91E-05
Benzo(a)pyrene	50-32-8	1.20E-06	8.30E-09	1.66E-08
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.25E-08	2.49E-08
Benzo(ghi)perylene	191-24-2	1.20E-06	8.30E-09	1.66E-08
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.25E-08	2.49E-08
Butane	106-97-8	2.10E+00	1.45E-02	2.91E-02
Chrysene	218-01-9	1.80E-06	1.25E-08	2.49E-08
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.30E-09	1.66E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.30E-06	1.66E-05
Ethane	74-84-0	3.10E+00	2.14E-02	4.29E-02
Fluoranthene	206-44-0	3.00E-06	2.08E-08	4.15E-08
Fluorene	86-73-7	2.80E-06	1.94E-08	3.87E-08
Formaldehyde	50-00-0	7.50E-02	5.19E-04	1.04E-03
Hexane	110-54-3	1.80E+00	1.25E-02	2.49E-02
Indeno(1,2,3 – cd)pyrene	193-39-5	1.80E-06	1.25E-08	2.49E-08
Naphthalene	91-20-3	6.10E-04	4.22E-06	8.44E-06
Pentane	109-66-0	2.60E+00	1.80E-02	3.60E-02
Phenanthrene	85-01-8	1.70E-05	1.18E-07	2.35E-07
Propane	74-98-6	1.60E+00	1.11E-02	2.21E-02
Pyrene	129-00-0	5.00E-06	3.46E-08	6.92E-08
Toluene	108-88-3	3.40E-03	2.35E-05	4.70E-05
Arsenic	7440-38-2	2.00E-04	1.38E-06	2.77E-06
Barium	7440-39-3	4.40E-03	3.04E-05	6.09E-05
Beryllium	7440-41-7	1.20E-05	8.30E-08	1.66E-07
Chromium (hexavalent)	7440-47-3	1.40E-03	9.68E-06	1.94E-05
Total Chromium (and compounds)	7440-47-3	1.40E-03	9.68E-06	1.94E-05
Cobalt	7440-48-4	8.40E-05	5.81E-07	1.16E-06
Copper	7440-50-8	8.50E-04	5.88E-06	1.18E-05
Manganese	7439-96-5	3.80E-04	2.63E-06	5.26E-06
Molybdenum	7439-98-7	1.10E-03	7.61E-06	1.52E-05
Nickel	7440-02-0	2.10E-03	1.45E-05	2.91E-05
Selenium	7782-49-2	2.40E-05	1.66E-07	3.32E-07
Vanadium	7440-62-2	2.30E-03	1.59E-05	3.18E-05
Zinc	7440-66-6	2.90E-02	2.01E-04	4.01E-04

Source 1 (Scenario F)

Main Stack - Start Up - Phase 1 - One Train Only

Source Description: Emissions from the main stack under start-up (Phase 1) with one train operational. Under phase 1, heat is provided by a natural gas fired auxilliary boiler. This phase lasts approximately 6 hours.

Operating Rate: Under this scenario, one train is operational under Phase 1 of the start up. All heat is provided by natural gas combustion from auxilliary boilers. The second train is not operational.

Methodology: Emission Factor
Source: Natural gas firing emission factors are taken from US EPA AP42 chapter 1.4

Train Parameters:	Volumetric flow rate (Natural Gas Firing)	7.96 7.02	m^3/s at reference conditions of 0% Moisture, 11% Oxygen and 298.15K temperature m^3/s at operational conditions
	Maximum Heat Input (Auxiliary Boiler - Natural Gas Firing)	56	MMBtu/hr

Sample Calculation 1: Carbon monoxide emission per train

Emission Rate [g/s] = Emission Factor [lb/10^6 scf] x Maximum Heat Input [Btu/hr] / 1020 [BTU/Scf] x 454[g/lb] / 3600 [hr/s]

$$\frac{84.00\ \text{lb}}{1{,}000{,}000\ \text{scf}} \times \frac{56{,}000{,}000\ \text{BTU}}{\text{hr}} \times \frac{1\ \text{scf}}{1{,}020\ \text{BTU}} \times \frac{454\ \text{g}}{1\ \text{lb}} \times \frac{1\ \text{hr}}{3600\ \text{s}}$$

$$= 5.82\text{E-}01\ \frac{\text{g}}{\text{s}}$$

Source Emissions :

Contaminant	CAS Number	US EPA EF [lb/10^6 scf]	Emission Rate [g/s]
Carbon Monoxide	630-08-0	8.40E+01	5.81E-01
Nitrogen Oxides	10102-44-0	3.80E+01	2.63E-01
Sulphur Dioxide	7446-09-5	N/A	5.14E-02
Total Particulate Matter	N/A	1.90E+00	5.26E-02
Filterable TSP	N/A	6.40E-01	1.31E-02
PM_{10}	N/A	1.90E+00	5.26E-02
$PM_{2.5}$	N/A	1.90E+00	5.26E-02
Lead	7439-92-1	5.00E-04	3.46E-06
Cadmium	7440-43-9	1.10E-03	7.61E-06
Mercury	7439-97-6	2.60E-04	1.80E-06
Nitrous Oxides	10024-97-2	6.40E-01	4.43E-03
2 – Methylnaphthalene	91-57-6	2.40E-05	1.66E-07
3-Methylchloranthene	56-49-5	1.80E-06	1.25E-08
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.11E-07
Acenaphthene	83-32-9	1.80E-06	1.25E-08
Acenaphthylene	208-96-8	1.80E-06	1.25E-08
Anthracene	120-12-7	2.40E-06	1.66E-08
Benzo(a)anthracene	56-55-3	1.80E-06	1.25E-08
Benzene	71-43-2	2.10E-03	1.45E-05
Benzo(a)pyrene	50-32-8	1.20E-06	8.30E-09
Benzo(b)fluoranthene	205-99-2	1.80E-06	1.25E-08
Benzo(ghi)perylene	191-24-2	1.20E-06	8.30E-09
Benzo(k)fluoranthene	205-82-3	1.80E-06	1.25E-08
Butane	106-97-8	2.10E+00	1.45E-02
Chrysene	218-01-9	1.80E-06	1.25E-08
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.30E-09
Dichlorobenzene	25321-22-6	1.20E-03	8.30E-06
Ethane	74-84-0	3.10E+00	2.14E-02
Fluoranthene	206-44-0	3.00E-06	2.08E-08
Fluorene	86-73-7	2.80E-06	1.94E-08
Formaldehyde	50-00-0	7.50E-02	5.19E-04
Hexane	110-54-3	1.80E+00	1.25E-02
Indeno(1,2,3 – cd)pyrene	193-39-5	1.80E-06	1.25E-08
Naphthalene	91-20-3	6.10E-04	4.22E-06
Pentane	109-66-0	2.60E+00	1.80E-02
Phenanthrene	85-01-8	1.70E-05	1.18E-07
Propane	74-98-6	1.60E+00	1.11E-02
Pyrene	129-00-0	5.00E-06	3.46E-08
Toluene	108-88-3	3.40E-03	2.35E-05
Arsenic	7440-38-2	2.00E-04	1.38E-06
Barium	7440-39-3	4.40E-03	3.04E-05
Beryllium	7440-41-7	1.20E-05	8.30E-08
Chromium (hexavalent)	7440-47-3	1.40E-03	9.68E-06
Total Chromium (and compounds)	7440-47-3	1.40E-03	9.68E-06
Cobalt	7440-48-4	8.40E-05	5.81E-07
Copper	7440-50-8	8.50E-04	5.88E-06
Manganese	7439-96-5	3.80E-04	2.63E-06
Molybdenum	7439-98-7	1.10E-03	7.61E-06
Nickel	7440-02-0	2.10E-03	1.45E-05
Selenium	7782-49-2	2.40E-05	1.66E-07
Vanadium	7440-62-2	2.30E-03	1.59E-05
Zinc	7440-66-6	2.90E-02	2.01E-04

Source 2

Silo Filling

Source Description: There are four (4) silos at the facility. Emissions occur during silo filling and are controlled via a baghouse. Properties of each silo are given in the following table:

Parameter	Pebble Lime	Carbon	Pozzolan	Portland Cement
Usage rate (lb/hr)	401	60	207	227
Delivery Payload (tons)	20	20	25	20
Fill Frequency (days)	4.2	27.8	10.1	7.3
Deliveries per year	88.8	14.1	37.3	50.7

Operating Rate: Maximum emissions occur during silo filling which takes approximately 4 hours per silo.

Methodology: Emission Factor
Source: Provided by Covanta

Train Parameters:

Baghouse Filter Efficiency	0.0344	g/m3
Filter Flow Rate	0.31	m3/s

Sample Calculation: Particulate Matter from Pebble Lime Silo

Emission Rate [g/s] = Flow Rate [m3/s] x Filter Efficiency [g/m3]

$$= \frac{0.03 \ \frac{g}{m^3} \mid 0.31 \ \frac{m^3}{s}}{}$$

$$= \frac{1.07E\text{-}02 \ \frac{g}{s}}{}$$

Source Emissions:

Silo	Contaminant	CAS Number	Emission Rate [g/s]
Pebble Lime	Total Particulate Matter	N/A	1.07E-02
	PM_{10}	N/A	1.07E-02
	$PM_{2.5}$	N/A	1.07E-02
Carbon	Total Particulate Matter	N/A	1.07E-02
	PM_{10}	N/A	1.07E-02
	PM2.5	N/A	1.07E-02
Pozzolan	Total Particulate Matter	N/A	1.07E-02
	PM_{10}	N/A	1.07E-02
	$PM_{2.5}$	N/A	1.07E-02
Portland Cement	Total Particulate Matter	N/A	1.07E-02
	PM_{10}	N/A	1.07E-02
	$PM_{2.5}$	N/A	1.07E-02

Source 3

Stand-by Generator

Source Description: The Facility has one stand-by generator with a 250 kw power rating

Operating Rate: Maximum emissions occur when the diesel generator is operating at 100% capacity.

Methodology: Emission Factor
Source: Diesel firing emission factors are taken from US EPA AP42 chapter 3.4

Equipment Parameters: Maximum Power Rating 250 kW
369 HP, estimated from KW with 10% added to account for operational variability.
2.6 MMBtu/hr, based on 7000 BTU/hp-hr, AP-42 Table 3.4-1.

Sample Calculation : Carbon monoxide

Emission Rate [g/s] = Emission Factor [lb/hp-hr] x Maximum Heat Input [hp/hr] x 454[g/lb] / 3600 [hr/s]

$$= \frac{0.01\ \text{lb}}{\text{hp-hr}} \times \frac{369\ \text{HP}}{\text{hr}} \times \frac{454\ \text{g}}{1\ \text{lb}} \times \frac{1\ \text{hr}}{3600\ \text{s}}$$

$$= 2.56\text{E-}01\ \frac{\text{g}}{\text{s}}$$

Sample Calculation 1: Bemzene

Emission Rate [g/s] = Emission Factor [lb/10^6 scf] x Maximum Heat Input [Btu/hr] / 1020 [BTU/Scf] x 454[g/lb] / 3600 [hr/s]

$$\frac{0.00\ \text{lb}}{\text{MMBtu}} \times \frac{3\ \text{MMBTU}}{\text{hr}} \times \frac{454\ \text{g}}{1\ \text{lb}} \times \frac{1\ \text{hr}}{3600\ \text{s}}$$

$$2.54\text{E-}04\ \frac{\text{g}}{\text{s}}$$

Source Emissions:

Contaminant	CAS Number	US EPA EF [lb/hp-hr]	Units	Emission Rate [g/s]
Carbon Monoxide	630-08-0	5.50E-03	lb/hp-hr	2.56E-01
Nitrogen Oxides	10102-44-0	2.40E-02	lb/hp-hr	1.12E+00
Sulphur Dioxide	7446-09-5	4.05E-04	lb/hp-hr	1.88E-02
Total Particulate Matter	N/A	7.00E-04	lb/hp-hr	3.25E-02
Filterable TSP	N/A	2.03E-02	lb/hp-hr	2.03E-02
PM_{10}	N/A	1.88E-02	lb/hp-hr	1.88E-02
$PM_{2.5}$	N/A	1.88E-02	lb/hp-hr	1.88E-02
Benzene	71-43-2	7.76E-04	lb/mmbtu	2.54E-04
Toluene	108-88-3	2.81E-04	lb/mmbtu	9.21E-05
Xylenes, m-, p- and o-	1330-20-7	1.93E-04	lb/mmbtu	6.32E-05
Formaldehyde	50-00-0	7.89E-05	lb/mmbtu	2.58E-05
Acetaldehyde	75-07-0	2.52E-05	lb/mmbtu	8.26E-06
Naphthalene	91-20-3	1.30E-04	lb/mmbtu	4.26E-05
Acenaphthylene	208-96-8	9.23E-06	lb/mmbtu	3.02E-06
Acenaphthene	83-32-9	4.68E-06	lb/mmbtu	1.53E-06
Fluorene	86-73-7	1.28E-05	lb/mmbtu	4.19E-06
Phenanthrene	85-01-8	4.08E-05	lb/mmbtu	1.34E-05
Anthracene	120-12-7	1.23E-06	lb/mmbtu	4.03E-07
Fluoranthene	206-44-0	4.03E-06	lb/mmbtu	1.32E-06
Pyrene	129-00-0	3.71E-06	lb/mmbtu	1.22E-06
Benzo(a)anthracene	56-55-3	6.22E-07	lb/mmbtu	2.04E-07
Chrysene	218-01-9	1.53E-06	lb/mmbtu	5.01E-07
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/mmbtu	3.64E-07
Benzo(k)fluoranthene	207-08-9	2.18E-07	lb/mmbtu	7.14E-08
Benzo(a)pyrene	50-32-8	2.57E-07	lb/mmbtu	8.42E-08
Indeno(1,2,3 – cd)pyrene	193-39-5	4.14E-07	lb/mmbtu	1.36E-07
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/mmbtu	1.13E-07
Benzo(ghi)perylene	191-24-2	5.56E-07	lb/mmbtu	1.821E-07

Source 4

Residual Ash Building Exhaust Fans

Source Description: The residual ash building is used for storage of residual bottom ash. This material is typically cooled and moist with a nominal 20 to 25% moisture content. The residual ash building has two fans each with a flow rate of 20,000 cfm. Each fan is fitted with a filter to control particulate emissions.

Operating Rate: Maximum emissions occur when both fans are in operation

Methodology: Engineering Calculation
Source: Provided by Covanta

Train Parameters:

Filter Efficiency	0.00022	grains/ft^3
	0.0005	g/m^3
Total Flow Rate	40000	ft^3/min
	18.87	m^3/s

Sample Calculation: Particulate Matter from Exhaust Fan Flow Rate

Emission Rate [g/s] = Flow Rate [m^3/s] x Filter Efficiency [g/m^3]

$$= \frac{0.0005\ \text{g}/\text{m}^3 \times 18.87\ \text{m}^3/\text{s}}{}$$

$$= 9.50\text{E-}03\ \text{g/s}$$

Source	Contaminant	CAS Number	Emission Rate [g/s]
Residual Ash Building Exhaust Fans	Total Particulate Matter	N/A	9.50E-03
	PM_{10}	N/A	9.50E-03
	$PM_{2.5}$	N/A	9.50E-03

APPENDIX D

Summary of Emission Factors Taken from Environmental Assessment

York Durham Emissions

Contaminant	Emission Factor	EF Units	Rating	Reference	Notes	MCR Emission Rate (g/s)	MCTD Emission Rate (g/s)
Combustion Gases							
Sulfur Dioxide (SO2)	35	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	1.45E+00	1.16E+00
Hydrogen Chloride (HCl)	9	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	3.72E-01	2.97E-01
Hydrogen Fluoride (HF)	0.9	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	3.72E-02	2.97E-02
Oxides of Nitrogen (NOx)	121	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	5.00E+00	4.00E+00
Carbon Monoxide (CO)	45	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	1.86E+00	1.49E+00
Particulate Matter PM10	9	mg/Rm3		Assumed TPM=PM10=PM2.5	Conservative Assumption that all PM is in the PM2.5 size range	3.72E-01	2.97E-01
Particulate Matter PM2.5	9	mg/Rm3		Assumed TPM=PM10=PM2.5	Conservative Assumption that all PM is in the PM2.5 size range	3.72E-01	2.97E-01
Total Particulate Matter	9	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	3.72E-01	2.97E-01
Ammonia (Slip at stack)	5400	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	2.23E-01	1.78E-01
Organic Matter (as CH4)	49	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	2.02E+00	1.62E+00
Chlorinated Polycuclic Aromatics							
Dioxins (as TEQ Toxic Equivalents)	6.00E-08	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	2.48E-09	1.98E-09
Polychlorinated Biphenyls (PCB)	7.22E-05	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	2.98E-06	2.39E-06
Metals							
Aluminum	3.98E-02	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.64E-03	1.31E-03
Antimony	2.74E-03	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	1.13E-04	9.05E-05
Arsenic	4.20E-01	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.73E-05	1.39E-05
Barium	2.11E-03	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	8.73E-05	6.99E-05
Beryllium	3.33E-04	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.38E-05	1.10E-05
Boron	1.53E-01	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	6.32E-03	5.06E-03
Cadmium (Cd)	7.00E-03	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	2.89E-04	2.31E-04
Cadmium and Thallium (Cd + Th)	4.60E-02	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	1.90E-03	1.52E-03
Chromium (hexavalent)	3.20E-01	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.32E-05	1.06E-05
Total Chromium (and compounds)	2.25E+00	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	9.29E-05	7.43E-05
Cobalt	5.79E-03	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.39E-04	1.91E-04
Lead (Pb)	5.00E-02	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	2.06E-03	1.65E-03
Mercury (Hg) - Vapour/Particulate phase	1.50E-02	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	6.19E-04	4.96E-04
Nickel	8.71E-02	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	3.60E-03	2.88E-03
Phosphorus	4.60E-02	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.90E-03	1.52E-03
Silver	3.35E-03	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.38E-04	1.11E-04
Selenium	4.80E-01	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.98E-05	1.59E-05
Thallium	3.90E-02	mg/Rm3		Eng. Calculation	Difference between manufacturer guarantees for cadmium alone and Cd+Th	1.61E-03	1.29E-03
Tin	1.76E-02	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	7.27E-04	5.81E-04
Vanadium	1.16E-03	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	4.80E-05	3.84E-05
Zinc	2.00E-01	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	8.24E-03	6.59E-03
Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	4.60E-01	mg/Rm3		Manufacturer Specification	Guaranteed Maximum Emission Limit (Form 4 - Section 8)	1.90E-02	1.52E-02
Chlorinated Monocyclic Aromatics							
1,2-Dichlorobenzene	2.05E-03	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	8.45E-05	6.76E-05
1,2,4,5-Tetrachlorobenzene	5.15E-05	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	2.13E-06	1.70E-06
1,2,4 – Trichlorobenzene	5.15E-05	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	2.13E-06	1.70E-06
2,3,4,6-Tetrachlorophenol	1.74E-04	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	7.18E-06	5.74E-06
2,4,6-Trichlorophenol	5.23E-05	mg/Rm3		MOE Hartford HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.16E-06	1.73E-06
2,4-Dichlorophenol	1.03E-04	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	4.25E-06	3.40E-06
Pentachlorophenol	2.06E-04	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	8.51E-06	6.81E-06
Hexachlorobenzene	5.15E-05	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	2.13E-06	1.70E-06
Pentachlorobenzene	1.35E-04	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	5.59E-06	4.47E-06
Polycyclic Organic Matter							
Acenaphthylene	1.45E-02	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	5.99E-07	4.79E-07
Acenaphthene	1.86E-02	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	7.68E-07	6.15E-07
Anthracene	4.07E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.68E-07	1.34E-07
Benzo(a)anthracene	1.50E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	6.19E-08	4.96E-08
Benzo(b)fluoranthene	3.83E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.58E-07	1.27E-07
Benzo(k)fluoranthene	1.01E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	4.17E-08	3.34E-08
Benzo(a)fluorene	2.76E-05	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.14E-06	9.13E-07
Benzo(b)fluorene	1.89E-05	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	7.81E-07	6.25E-07
Benzo(ghi)perylene	4.13E-02	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.71E-06	1.36E-06
Benzo(a)pyrene	3.44E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.42E-07	1.14E-07
Benzo(e)pyrene	8.71E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	3.60E-07	2.88E-07
Biphenyl	2.98E-03	mg/Rm3		MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.23E-04	9.86E-05
2-chloronaphthalene	NA					NA	NA
Chrysene	3.77E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.56E-07	1.25E-07
Coronene	NA					NA	NA
Dibenzo(a,c)anthracene	2.68E-05	mg/Rm3		YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	1.11E-06	8.85E-07
Dibenzo(a,h)anthracene	1.21E-03	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	5.00E-08	4.00E-08
Dibenzo(a,e)pyrene	NA					NA	NA
9,10 – dimethylanthracene	NA					NA	NA
7,12 – dimethylbenzo(a)anthracene	NA					NA	NA
Fluoranthene	4.16E-02	µg/dscm		Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.72E-06	1.37E-06

Fluorine	3.13E-02	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.29E-06	1.03E-06
Indeno(1,2,3 – cd)pyrene	7.54E-03	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	3.11E-07	2.49E-07
2 – methylanthracene	NA				NA	NA
3 – methylcholanthrene	NA				NA	NA
1 – methylnaphthalene	9.82E-05	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	4.05E-06	3.24E-06
2 – methylnaphthalene	5.44E-01	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	2.25E-05	1.80E-05
1 – methylphenanthrene	NA				NA	NA
9 – methylphenanthrene	NA				NA	NA
Naphthalene	4.23E-01	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.75E-05	1.40E-05
Perylene	1.51E-03	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	6.23E-08	4.99E-08
Phenanthrene	9.46E-02	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	3.91E-06	3.13E-06
Picene	NA				NA	NA
Pyrene	5.02E-02	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	2.07E-06	1.66E-06
Quinoline	NA				NA	NA
Tetralin	4.99E-04	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.06E-05	1.65E-05
Triphenylene	NA				NA	NA
O-terphenyl	8.18E-05	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	3.38E-06	2.70E-06
M-terphenyl	NA				NA	NA
P-terphenyl	NA				NA	NA
Volatile Organic Chemicals (VOC)						
Acetaldehyde	4.30E-09	kg/Mg	US EPA	FIRE database	2.18E-08	1.75E-08
Acetone	NA				NA	NA
Acrolein	NA				NA	NA
Benzene	3.10E+01	µg/dscm	Manufacturer Specification	Emission Limit based on reference facilities - in clarification email dated March 3, 2009	1.28E-03	1.02E-03
Bromodichloromethane	1.50E-03	kg/Mg	US EPA	FIRE database	7.59E-03	6.09E-03
Bromoform	4.11E-04	kg/Mg	US EPA	FIRE database	2.08E-03	1.67E-03
Bromomethane	3.60E-02	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.49E-03	1.19E-03
Butadiene, 1,3 -	NA				NA	NA
Butanone, 2 -	NA				NA	NA
Carbon tetrachloride	2.56E-06	kg/Mg	US EPA	FIRE database	1.29E-05	1.04E-05
Chloroform	5.10E-04	mg/Rm3	YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	2.11E-05	1.69E-05
Cumene	NA				NA	NA
Dibromochloromethane	NA				NA	NA
Dichlorodifluoromethane	8.71E-02	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	3.59E-03	2.88E-03
Dichloroethane, 1,2 -	NA				NA	NA
Dichloroethane, trans – 1,2 -	NA				NA	NA
Dichloroethene, 1,1 -	5.65E-04	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.33E-05	1.87E-05
Dichloromethane	1.76E-01	mg/Rm3	YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	7.27E-03	5.82E-03
Dichloropropane, 1,2 -	NA				NA	NA
Ethylbenzene	1.04E-03	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	4.28E-05	3.42E-05
Ethylene Dibromide	2.41E-06	kg/Mg	US EPA	FIRE database	1.22E-05	9.77E-06
Formaldehyde	4.75E-02	mg/Rm3	YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	1.96E-03	1.57E-03
Mesitylene	NA				NA	NA
Styrene	NA				NA	NA
Tetrachloroethene	5.67E-03	mg/Rm3	YD Generic Risk Assessment	Algonquin Power EFW plant in Ontario stack testing between 2003 and 2005	2.34E-04	1.87E-04
Toluene	5.03E-02	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.08E-03	1.66E-03
Trichloroethane, 1,1,1 -	1.43E-03	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	5.89E-05	4.72E-05
Trichloroethene	4.92E-04	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.03E-05	1.62E-05
Trichloroethylene, 1,1,2 -	4.92E-04	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.03E-05	1.62E-05
Trichlorofluoromethane	1.72E-01	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	7.11E-03	5.69E-03
Trichlorotrifluoroethane	NA					
Vinyl chloride	4.36E-02	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	1.80E-03	1.44E-03
Xylenes, m-, p- and o-	6.04E-01	mg/Rm3	MOE Peel HHRA	From MOE document "Environmental Risks of Municipal Non-Hazardous Waste Landfilling and Incineration (1999)	2.49E-02	2.00E-02
Phthalates						
DEHP	NA				NA	NA
Other						
Phosphorus Pentachloride	NA				NA	NA

Notes:

4 C difference in temp between dscm and Rm3 conditions conservatively ignored in emission calcs

APPENDIX E

Technical Memorandum Regarding Odour and Draft Odour Management Plan

MEMORANDUM

TO Sam Joshi - Covanta

DATE 17 December 2010

FROM Anthony Ciccone

PROJECT No. 10-1151-0343

ODOUR SAMPLING AT COVANTA FACILITY

1.0 INTRODUCTION

The following is the suggested methodology for obtaining representative odour samples from the Tipping Floor at the Covanta Onondaga facility. The odour samples measured in odour units (OU) will be used to model the potential odour impact from the Durham/York EfW under upset conditions. Upset conditions have been defined, for maximum odour impact, when the combustion system is down and odourous air from the Tipping Floor (used as combustion air for the EfW) is vented directly from the stack with no treatment. Under these conditions, the fans continue to operate, keeping the EfW building under negative pressure.

Odour was not assessed as part of the D/Y Environmental Assessment but is a requirement from the MOE. The EfW will be required to demonstrate compliance with 1 OU (10 min avg) beyond the property line.

This method is intended to determine the odour threshold values (ED_{50}) of undefined mixtures of gaseous odourants when the samples are collected by dynamic dilution and evaluated using dynamic olfactometry with a panel of human assessors (odour panel evaluation technique).

2.0 DEFINITIONS

Odour Unit (O.U. dimensionless)	Number of unit volumes of odourless gas required to dilute one unit volume of odourous gas to reach the odour threshold.
ED50 - Odour Threshold Values	Odour unit value at which 50 per cent of the population detects an odour
Odour Monitoring Location	Specific location which is accessible for purposes of obtaining an odour sample

3.0 SCOPE

This odour sampling protocol presents the basic methods for quantifying odour concentrations and recording the data at the Covanta Onondaga EfW. Odour concentrations are determined using an instrument called an "olfactometer." The standard followed for olfactometry is ASTM Standard of Practice E679-91, "Determination of Odor and Taste Threshold by a Forced-Choice Ascending Concentration Series Method of Limits."

4.0 MATERIAL REQUIRED

The following materials will be supplied by St. Croix Sensory, Inc.

- Vac/Scent Air Sampling Chamber
- 10-Litre, 2 mil Tedlar® Air Sampling Bags

5.0 REFERENCES

Operating manual for the Vac/Scent Air Sampling Chamber provided by St. Croix Sensory, Inc.

6.0 PROCEDURE

1. Observe and record the Facility operating conditions. Record indoor temperature, pressure, wet bulb and dry bulb temperature.
2. Assign a sample number to the Tedlar bag.
3. Collect Tedlar bag samples following the attached VAC'SCENT® Air Sampling Vacuum Chamber
4. The Tedlar bag samples are to be shipped to the St. Crois Sensory olfactometry laboratory for independent analysis.
5. Record length of time to take Tedlar bag sample.
6. Check the bag for leaks via observations.
7. Store bags in a shipping box for UPS pickup at 4:00 PM.
8. Update the chain of custody sheet each time a bag sample is collected.
9. Use chain of custody seals and tape to secure the samples against tampering.

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AC'SCENT® Vacuum Chamber

- Sensible design and easy to use
- Portable and convenient
- 23.25 x 20.75 x 7.75”
- 5.5 x 9” window in lid for viewing
- Heavy duty, vacuum tight case
- Accommodates up to 20 liter size bags
  -larger 40 liter size case available
- Integral pump powered by 4 D-size batteries
  - no additional sample pump is needed
- Direct filling of sample bag using negative pressure
  - no pump contamination
- 2 L/min vacuum filling of sample bag
- Includes: step-by-step instructions
  tubing connectors
  4 D-size batteries
- Designed to be used with 1/4”OD, 3/16”ID Teflon tubing and 1/4”OD, 1/8”ID Silicone tubing.

Ideal for collecting air samples

US$1,275

For more information on the
***VAC'SCENT*® Air Sampling Vacuum Chamber**
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or visit
www.fivesenses.com

St. Croix Sensory, Inc. 3549 Lake Elmo Ave. N., P.O. Box 313 Lake Elmo, MN 55042
1-800-879-9231 Fax 651-439-1065 stcroix@fivesenses.com

Set-up

1. With the vacuum chamber open, place the Tedlar sample bag into chamber.
2. Connect the bag to the inside of the Sample Valve **(D)** with the tubing.
3. Open sample bag valve.
4. Insert 4 D-size batteries.
5. Turn on Pump.
6. Close vacuum chamber - close all four latches.
7. Insert the provided Hose Barb Connector with 1" silicone tubing into the outside of the Sample Valve **(D)**, then connect a sufficient amount of a PTFE (Teflon) Tubing to the 1" silicone tubing (the silicone will act as a coupling between the PTFE Tubing and the hose barb connector).
   This becomes the Sample Line.

Fill the Bag for Conditioning

8. Connect the Pump Inlet Valve **(B)** to the Chamber In/Out Valve **(C)** with the Silicone Tubing Connector Line. This will begin the filling of the bag.
9. The sample will begin collecting through the Sample Line.
10. Fill the bag 1/4 to 1/2 full.

Empty the Bag

11. Disconnect the Silicone Tubing Connector Line from the Pump Inlet Valve **(B)** and attach it to the Pump Outlet Valve **(A)**. This will pressurize the chamber and deflate the bag through the Sample Line **(D)**,
    -the tubing connector must be in **(D)** to open the valve and deflate the bag.
12. Empty the bag completely.

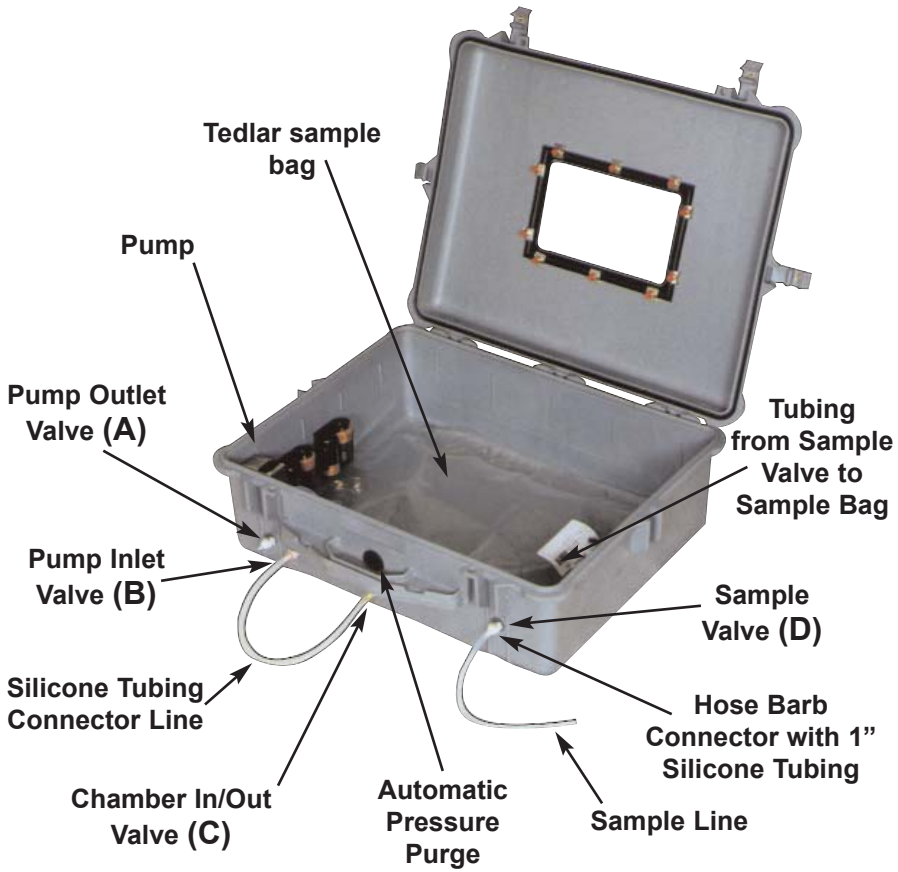
Prime the Sample Line

13. Disconnect the Silicone Tubing Connector Line from the Pump Outlet Valve **(A)**.
14. Disconnect the tubing connector with the Sample Line from the Sample Valve **(D)** and attach it to the Pump Inlet Valve **(B)**.
15. Wait for a sufficient amount of time (15-30 sec.) for the Sample Line to fill with odor from the sample location
    [thus, removing non-sample air from the Sample Line].
16. Disconnect the tubing connector with the Sample Line from the Pump Inlet Valve **(B)** and reattach to the Sample Valve **(D)**.

Collecting a Sample

17. Attach the Silicone Tubing Connector Line to the Pump Inlet Valve **(B)**
    -the other end should still be attached to the Chamber In/Out Valve **(C)**.
18. Fill the bag 3/4 full.
19. When the bag is 3/4 full, disconnect the tubing connector with the Sample Line from Sample Valve **(D)**.
20. Due to the negative pressure in side the chamber, it will be difficult to open. To de-pressurize the chamber, disconnect the Silicone Tubing Connector Line from the Pump Inlet Valve **(B)** and connect to Pump Outlet Valve **(A).**
    * **Be sure that the Sample Line from Sample Valve (D) has been disconnected or you will begin to empty the bag.**
21. Within a few seconds, you will be able to open the chamber.
22. Close the bag valve.
23. Turn the Pump off.
24. Remove the bag from the vacuum chamber.
25. *Depending on the quality of the air being sampled, replacement of PTFE and Silicone tubing on the Sample Valve **(D)** may be necessary between samples.*

VAC'SCENT Operating Instructions



If you have any questions, Call: 1-800-879-9231

St. Croix Sensory, Inc.

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e-mail: stcroix@fivesenses.com

St. Croix Sensory, Inc.

Golder Associates

Covanta Onondaga

Odor Evaluation Report

Report No. 1100701
01/07/11

Data Release Authorization:

Natasha Satre
Laboratory Associate

Reviewed and Approved:

Charles McGinley, P.E.
Technical Director

St. Croix Sensory is a laboratory dedicated to practicing state-of-the-art sensory evaluation and to advancing the science of sensory perception.

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Email: stcroix@fivesenses.com

St. Croix Sensory, Inc.

Odor Evaluation Report

Client: Golder Associates

Project: Covanta Onondaga

Report No.: **1100701**

Evaluation Date: 01/07/11

			ASTM E679 & EN13725		ASTM E544	PERSISTENCY	CHARACTERIZATION		
#	Field No.	Sample Description	Detection Threshold	Recognition Threshold	Intensity	Dose-Response Slope	Hedonic Tone	Principal Odor Descriptors	**Comments**
1	ONO 1	Ambient Tipping Floor - Bay 1	670	110					
2	ONO 2	Ambient Tipping Floor - Bay 1-2	140	90					
3	ONO 3	Ambient Tipping Floor - Bay 3	120	80					
4	ONO 4	Ambient Tipping Floor - Bay 2-3	45	25					
5	ONO 5	Ambient Tipping Floor - Bay 1-2	140	100					
6	ONO 6	Ambient Tipping Floor - Bay 1	100	60					
7									
8									
9									
10									

P.O. Box 313, 3549 Lake Elmo Ave. N., Lake Elmo, MN 55042 U.S.A. Tel:800-879-9231 Fax:651-439-1065 E-mail:stcroix@fivesenses.com Web:www.fivesenses.com

St. Croix Sensory, Inc.

CHAIN OF CUSTODY RECORD FOR ODOR SAMPLES

Page 1 of 1

Client: GOLDER ASSOCIATES

Sampled By: PAUL ABT

Project Name: COVANTA ONONDAGA

Sampling Date: 1/5/2011

Odor Evaluations Requested: (X)

For Laboratory use Only

Odor Evaluation Report No.

Comments:

	1200 hr	1530 hr
WET BULB	39.2	35.7
DRY BULB	~~35.7~~ 41.0	37.0

Line No.	Field No.	Sample Description	LOCATION	Sample Time	Field H_2S (ppm)	Odor Concentration* (Detection & Recognition Threshold)	Odor Intensity* (PPM 1-Butanol)	Odor Characterization (Hedonic Tone & Descriptors)	Odor Persistency ("Dose-Response")	Laboratory Sample No. LN	Laboratory Sample No. FN
1	ONO 1	AMBIENT TIPPING FLOOR	BAY 1	1156-59	0	X					
2	ONO 2	↓	BAY 1-2	1240-43	0	X					
3	ONO 3	↓	BAY 3	1321-23	0	X					
4	ONO 4	↓	BAY 2-3	1408-10	0	X					
5	ONO 5	↓	BAY 1-2	1449-52	0	X					
6	ONO 6	↓	BAY 1	1546-49	0	X					
7											
8											
9											
10											
11											
12											

Transmittal

Number of Shipping Boxes 2

1-LAB 1-EQUIP

Relinquished By	Date	Time	Accepted By	Date	Time	Comments & Exceptions Noted
Paul S. Abt (signature)	1/6/11					
Received at St. Croix Sensory Laboratory			(signature)	1/7/11	10:30	

*Odor Concentration: ASTM E679-04 and EN13725:2003 and Odor Intensity: ASTM E544-99(2004)

Source 1 (Scenario G)

Main Stack (Off-Line Operation)

Source Description: Emissions from the main stack under the potential scenario where both trains are off-line for an extended period of time and the pit has MSW. Under this scenario, the fans would still be operating, drawing air through the combustion system, releasing uncombusted odourous air into the atmosphere.

Operating Rate: Under this scenario, maximum emissions occur when both combustion air fans are operational but both trains are off-line.

Methodology: Source Testing
Source: Emission measurements from the Covanta Onadoga Waste-to Energy facility, near Syracuse New York (See Appendix D). The Results are summarised below.

Sample Description	Detection Threshold (OU/m^3)	Recognition Threshold (OU/m^3)
Ambient Tipping Floor - Bay 1	670	110
Ambient Tipping Floor - Bay 1-2	140	90
Ambient Tipping Floor - Bay 3	120	80
Ambient Tipping Floor - Bay 2-3	45	25
Ambient Tipping Floor - Bay 1-2	140	100
Ambient Tipping Floor - Bay 1	100	60
Average	**202.5**	**77.5**

Fan Parameters: Flow Rate (per fan) 42500 m^3/hr at ambient conditions
11.81 m^3/s

Total Flow Rate 23.61 m^3/s

Source Emissions:
Sample Calculation: Odour Emissions

Emission Rate [g/s] = Average Recognition Threshold [OU/m^3] x Total Fan Flow Rate [m^3/s]

$$= \frac{77.50 \ \frac{OU}{m^3} \mid 23.61 \ \frac{m^3}{s}}{}$$

$$= \frac{1.83E+03 \ OU}{s}$$

March 2011

DURHAM-YORK ENERGY CENTRE

Preliminary Best Management Practices Plan for the Odour Emissions

Submitted to:
Ontario Ministry of the Environment
Director Section 9
Environmental Assessment and Approvals Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

REPORT

Report Number: 10-1151-0343 (3000)

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Golder Associates

Table of Contents

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

Under the Environmental Assessment Act – Notice to Proceed with Undertaking EA File No. 04-EA-02-08 (Section 18), an Odour Management and Mitigation Plan (OMMP) is required six (6) months prior to construction of the Durham York Energy Centre (DYEC). The OMMP includes the following

1) Standard operating and shut down procedures;

2) Maintenance schedules;

3) Ongoing monitoring for and reporting of odour;

4) Corrective action measures and other best management practices for ongoing odour control and for potential operational malfunctions;

5) A schedule for odour testing at sensitive receptors; and,

6) A section that specifically addresses odour control measures should operation of the undertaking be disrupted or cease.

The purpose of this document is to establish the Best Management Practices (BMPs) for the control of odour emissions from the Durham-York Energy Centre (Facility) located at 72 Osbourne Road, Clarrington, Ontario, L1E 2R2. The BMP is a "Live" document that will be periodically updated based on new information and practices at the Facility. The BMP requires the following:

- identify the sources of odour emissions associated with the Facility;
- identify key personnel responsible for implementing the plan;
- provide a process description and method of operations (normal & shut down);
- provide a process to handle odours during plant disruptions;
- outline methods of mitigation and operating procedures;
- monitoring, including complaint response;
- describe how the Plan will be implemented, including the training of personnel;
- provide a maintenance schedule;
- describe inspection and maintenance procedures; and
- describe methods of monitoring and record-keeping to verify and document ongoing compliance with the Plan.

This Plan follows the following structure:

- Section 2 provides a brief description of the Facility.
- Section 3 identifies the responsibilities held by each of the employment levels at the Facility as they pertain to this BMP Plan.
- Section 4 documents the BMPs that will be in place at the Facility and the decision making process used to develop these BMPs. This section follows the Plan Do Check and Act (PDCA) cycle according to ISO guidelines. The “Plan” section includes identification and characterization of the emission sources and existing BMPs at the Facility. The “Do” section includes a schedule for implementation of the proposed tasks. The “Check” section includes a description of monitoring procedures and a recordkeeping system. The “Act” section includes guidelines for periodic review of the BMPs to promote its continuous improvement.

2.0 FACILITY DESCRIPTION

The Regional Municipalities of Durham and York ("Durham-York") propose to develop an EfW located on the west side of Osborne Road, south of Highway 401 and north of a CN Rail Corridor in the Municipality of Clarington. The EfW facility is a Thermal Treatment Facility, capable of recovering materials and energy from post-diversion residual waste with energy being exported to the marketplace.

The EfW Facility will accept Municipal Solid Waste (MSW) from the Regions of Durham and York. The sources of waste are post-diversion residual waste collected at curbside as well as any residual waste materials collected at public drop-off centers and transfers stations. The only institutional, commercial, and industrial **(**IC&I) waste to be managed at the Facility will be residual waste where the Regions' bear the responsibility for management. The facility is designed to 140,000 tpy of waste, with MSW delivered to the facility six (6) days per week.

The EfW Facility consists of two (2) identical combustion trains, each designed to handle 70,000 tonnes/year of MSW. Each train has identical boilers/furnaces and air pollution control equipment such as carbon injection, dry scrubbers and fabric filters. The treated exhaust gases are vented to a common 87.6 m stack and released into the atmosphere.

Waste will only be accepted from approved haulers that have a valid waste licences except for municipal or exempt vehicles as per Section 16(2) (a) of Regulation 347 *General – Waste Management*, made under the *Environmental Protection Act*, R.S.O. 1990. All incoming waste vehicles must proceed to a weight scale to allow the vehicle weight, waste type and source to be recorded by the scale operator. The refuse (storage) pit will be sized to allow continued firing of the system. Seven (7) days of storage will be provided and distributed above and below the tipping floor level.

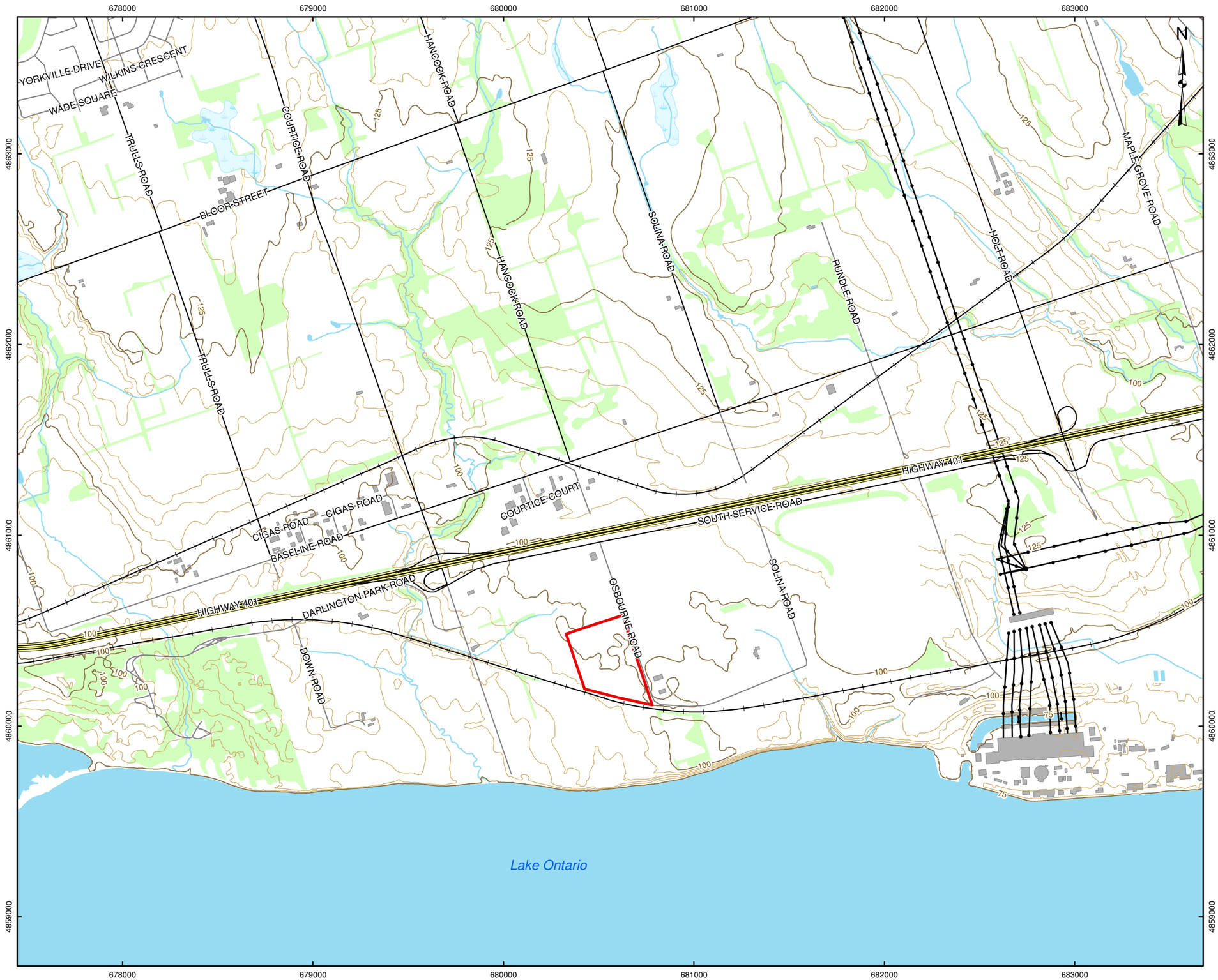
The facility will be designed to draw combustion air from above the storage pit. This will maintain a negative pressure in the tipping building and help prevent the escape of dust and odour from the Facility. When the entrance/exit doors are closed during non-delivery hours, combustion air will be admitted to the tipping area from outside the building through manually operable louvers in the tipping building walls.

Table 1 presents general information about the Facility relevant to this Plan.

Table 1: Facility Description

Facility:	**Durham-York Energy Centre**
Location:	72 Osbourne Road, Courtice, Ontario, L1E 2R2 Clarington Energy Business Park, Clarington, Ontario
Main activities / equipment used:	Thermal Treatment of Solid Waste
Production:	140,000 tonnes/a MCR 218 tonne/day @ 13 MJ/kg.
Predominant wind direction:	Northwest

The location of the facility is presented Figure 1.



LEGEND

- Major Contour (25 m)
- Minor Contour (5 m)
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Utility Line
- Watercourse
- Waterbody
- Wetland
- Woodlot
- Building Footprint
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.5 0.25 0 0.5 1
SCALE 1:20,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
SITE LOCATION PLAN

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	FIGURE: 1	
GIS	PRM	1 Feb. 2011		
CHECK	KA	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\Cof\AirSite_Location_Plan.mxd

3.0 RESPONSIBILITIES

The following identifies the responsibilities held by each of the employment levels at the Facility as they pertain to this Plan.

3.1 Facility Manager or designated official:

The Senior Management Representative, or designate, is responsible for:

- reviewing the effectiveness of the current odour control measures at the Facility; and
- ensuring the required resources is in place to execute the plan.

3.2 Facility Environmental Engineer or designated official:

The Accountable Site Representative, or designate, is responsible for:

- reviewing the effectiveness of the current odour control measures at the Facility;
- maintaining documentation of schedules and logs;
- ensuring the training of site personnel and contractors on the plan and best management practices to be implemented; and
- completing odour logs.

3.3 Shift Supervisor or designated official:

The Unit Operations Supervisor is responsible for:

- reviewing the effectiveness of the current odour control measures at the Facility;
- implementing odour control measures; and
- scheduling and coordinating the implementation of odour control measures.

3.4 Site Personnel and Contractors

All Site Personnel and Contractors are responsible for:

- reviewing the effectiveness of the current odour control measures at the Facility; and
- following the odour control procedures that are currently in place.

4.0 ODOUR EMISSIONS BEST MANAGEMENT PRACTICES PLAN

This section describes the odour control measures that are implemented at the Facility and the decision making process that has been used in the BMP development for the Facility. This section follows the Plan-Do-Check and Act (PDCA) cycle:

- Section 4.1 Identifies and characterizes the emission sources and BMPs at the Facility.
- Section 4.2 Documents the schedule for implementation of the proposed improvements.
- Section 4.3 Describes the monitoring procedures and a recordkeeping system.
- Section 4.4 Describes the BMP review and update procedures to promote its continuous improvement.

4.1 Identification and Classification of Odour Emission Sources

The following sections expand on the PDCA procedure to mitigate odour at the Facility. Once the odorous compound is emitted, its travelling distance from the source is affected by various parameters (e.g., wind speed and direction, building wake impacts).

4.1.1 Identification of the Sources of Odour Emissions

The MSW to be processed may include odorous substances. Potential odour emissions sources include:

- truck transportation of waste onto the site;
- handling and storage of waste onsite; and,
- thermal treatment of waste on-site.

A primary potential source of odour at the Facility is the waste delivery trucks entering or queuing to enter the plant, as well as empty trucks leaving the Facility.

The Regions have advance waste management programs for source separation and diversion of waste from landfills. Specifically, the diversion of household organic waste will reduce the amount of potential odour generating waste from reaching the Facility.

4.1.1.1 Normal Operations

MSW will be delivered to the Facility in standard packer vehicles or fully enclosed transfer trailers with capacities up to 92 m^3 from Regional Transfer stations. Upon entering the Facility, trucks would be directed to an automated truck scale to maintain an accurate accounting of all refuse delivered to the Facility. Waste delivery vehicles would be present on-site (queuing) for a short duration. An objective of the Facility will be to minimize queuing time to as short as possible.

Any waste that potentially falls off the trucks will be picked up and moved to the tipping haul for disposal as soon as possible. The facility sweeper truck will be sent around to clean up any residual material.

As all trucks would be enclosed until they enter the tipping building, reducing the potential for the release of odour emissions. The tipping floor shall be totally enclosed with an overhead entrance door and sliding exit door. The entrance door will be approximately 4.9m wide x 5.5 m high. The tipping area general arrangement shall be designed to allow for the trucks to back-in toward the pit. The exit door shall be on the opposite side of the tipping floor from the entrance. The exit door (11m wide x 5.5m high) is designed to open widely to allow trucks to back into the far tipping bays safely.

Four tipping bays will allow simultaneous discharge of refuse from multiple vehicles into the refuse pit. Trucks entering the tipping enclosure are directed to a specific tipping bay by a tipping floor operator and discharge their waste onto the floor for inspection by the tipping floor operators. Any unacceptable waste is removed and placed in a dedicated pile or area within the tipping building for subsequent disposal.

Under normal operating conditions one or both combustion trains will be on line. Combustion air will be drawn from the tipping hall by inlet ducts above the storage pit. This will keep tipping hall and refuse storage pit under negative pressure and help prevent the escape of dust and odour from the Facility. Potential malodorous air will be drawn into the furnace and destroyed. The primary air will be introduced into the furnaces thereby subjecting these pollutants to direct flame, high temperature oxidation. In addition, the louvers on outside wall are also in closed position during truck deliveries.

When the entrance/exit doors are closed during non-delivery hours, combustion air will be admitted to the tipping area from outside the building through manually operable louvers in the tipping building walls.

Table 2 presents a summary of the main sources of odour emissions existing at the Facility, as well as the potential causes for emissions resulting from these sources.

Table 2: Facility Odour Sources

Process / Activity	Causes
Truck transportation of waste onto the site	➢ Long queuing time ➢ Uncovered trucks
MSW handling and storage on site	➢ Open doors and louvers ➢ Long storage times
MSW combustion.	➢ Combustion equipment off-line

4.1.1.2 Shut-Down or Disruption of Operations

As identified, a potential source of odours is the delivery of waste trucks to the Facility. During periods of disruptions or near a shut-down periods, waste trucks will be diverted from the Facility to other sites based on a Standard Operating Process (SOP) developed between the Facility and the transfer stations which are operated by the Regions.

Storage and handling of waste can also lead to potential odour emissions during shut down or disruptions. During periods when both combustion units are offline due to unscheduled reasons, procedures will ensure that any odour from the waste collected in the pit will be contained and/or mitigated. This will include, minimizing or

preventing further accumulation of waste in the pit, maintaining negative pressure ventilation in the building using boiler fans, ensuring all doors remain closed, and all other means as required. During these periods, odour monitoring efforts will be increased. In the unusual case where both units are offline with no reasonable expectation to be returned to service in the near future, and odours generated from the waste are unable to be contained, the facility will transfer the waste to an alternate disposal site.

4.1.2 Preventative and Control Measures at the Facility

Preventative and control measures can influence one or more factors affecting the generation and/or transport of odour emissions and subsequently minimize their potential impacts.

For purpose of this BMP Plan, the following definitions apply:

- Preventative Measures - include types of measures that provide control with preventative actions such as operational practices
- Reactive (Control) Measures - include types of measures needed to accommodate immediate circumstances, unanticipated or expected.

Table 3 presents description of preventative and control measures for odour emissions at the Facility. All odour management initiatives will be recorded in an Odour Mitigation Log. A sample log is provided in Appendix C.

4.2 Implementation Schedule for the BMP Plan

All of the BMPs listed in Table 3 will be implemented at the Facility prior to commercial operations.

4.2.1 Training

As part of maintaining BMP for controlling and preventing odour emissions, Facility staff will be trained to identify odour concerns.

The training will cover:

- the control techniques in place for managing odour and how to maintain them; how to conduct a odour observation check and fill out the associated paperwork;
- what to do in the case of an unexpected odour release; and
- who to notify of any concerns or problems pertaining to odour.

Refresher training will be provided as necessary, based on changes to the odour emission control techniques.

DYEC will identify site personnel and contractors that are to receive training on the requirements of this Plan. Training will be provided by the Environmental Department.

Table 3: Description of Odour Preventative Control Measures Durham-York Energy Centre

Emission Source	Description	Control Measures / Preventative Procedure
Trucks	➢ Minimize the queue time of trucks onsite ➢ Uncovered trucks ➢ Waste falling off trucks	➢ Communication with Transfer Stations to divert trucks to designated locations. ➢ Facility staff will monitor trucks visually and record drivers that do not follow protocol. Drivers will be assessed penalties for coming on to the site will uncovered vehicles. ➢ Fallen waste will be recovered and moved to the Tipping Building as soon as possible. Sweeper will be sent out to sweep the road.
Waste Storage	➢ Outside storage ➢ Unacceptable waste	➢ Waste will not be store outside of the Tipping building ➢ Unacceptable waste or waste under examination will be diverted to the Tipping Building. The waste will be reclaimed and transfer to a suitable location in a covered truck or container based on Regional/Facility SOPs
Tipping Building/Refuse Storage Building	➢ Fugitive odours	➢ Tipping building entrance and exit doors will be closed during non-delivery of waste ➢ ID Fans will be running drawing combustion air from the tipping area/Refuse storage to the combustion trains. ➢ Tipping/Refuse building will be under negative pressure to minimize the potential of fugitive odour escaping.
Both combustion trains have unexpected outage expected for prolonged period	➢ Both the facility combustion units are off-line for an extended period	➢ Facility staff will communicate with transfer stations to divert trucks from the Facility ➢ Trucks on-site will be diverted to appropriate locations ➢ Entrance and exit doors to the Tipping Building will be closed to reduce the potential for fugitive odour to escape. ➢ ID Fans will continue to operate and convey air from the tipping area to the stack. ➢ In unusual case with no reasonable expectation to return to service, waste in the pit will be recovered and transfer in a closed haul truck to appropriate disposal areas.

4.3 Inspection, Maintenance and Documentation

An inspection of the conformity with the BMPs will be documented using the Odour Control Inspection Form (Appendix A). Corrective action will be taken to eliminate the causes of the non-conformance. All deficiencies identified in inspections will be addressed immediately.

Table 4 provide a summary of the inspections that take place at the site under this Plan and the inspection frequency.

Table 4: Inspection Frequency

Inspection Type	Frequency
Odour Control Inspection Form	Periodic
Haul truck Inspection Form	Periodic
Waste Storage Inspection Form	Periodic
Activity Logs	Maintain log of operations

Table 5 presents all the inspection and maintenance procedures that will be in place and the respective documentation to support ongoing conformity with preventative and control measures described in Table 3 for each emission type.

Table 5: Inspection Documentation

Documentation	Document Control / Recordkeeping
Odour Control Inspection Form	3 years
Haul Truck Inspection Forms	
Waste Storage Inspection Forms	
Activity Logs	

As part of recordkeeping procedures, the above information should be recorded in electronic files and hard copies and maintained on-site for a minimum period of three (3) years. The Environmental Manager at the Facility will be responsible for recordkeeping.

In addition, the Facility will have routine equipment maintenance inspection for the operation of the facility as part of the facility Operating and Maintenance Manual.

4.4 BMP Plan Review and Continuous Improvement

Inspections and monitoring procedures will assist Facility personnel in maintaining of an effective BMP Plan. The BMP Plan should be monitored and updated, as follows:

- when there are significant changes in the odour emissions sources;
- periodically, every five years (minimum); and
- when there are verified complaints associated with odour emissions from the Facility.

Review of the BMP Plan is intended to evaluate the effectiveness of the odour control practices and focus on the identification of improvement opportunities that can reduce the risk of complaints related to odour emissions.

5.0 MONITORING

During normal operating hours, all staff are responsible to report any abnormal odour emissions at the site. If an odour is observed by staff, the supervisor will implement reactive measures to determine the root cause of the odour. Durham-York Energy Centre will develop a Standard Operating Procedure (SOP) to react and mitigate the situation as well as to record complaints (Appendix B).

REFERENCES

Ontario Ministry of the Environment. Proposed Revisions to Odour-based Ambient Air Quality Criteria and Development of an Odour Policy Framework. March 2005

Ontario Ministry of the Environment. Procedure for Preparing an Emission Summary and Dispersion Modelling Report – Version 3.0. March 2009.

Report Signature Page

GOLDER ASSOCIATES LTD.

Anthony Ciccone, Ph.D., P.Eng.
Principal

n:\active\2010\1151\10-1151-0343 covanta-efw facility-y-d region\air\report\final\att 3 - esdm\app e - odour\5. bmp\covanta bmp odour 20110213.docx

APPENDIX A

Periodic Inspection Sheets – To Be Developed Prior to Construction

APPENDIX B

Standard Operating Practice - Complaint Resolution Protocol

STANDARD OPERATING PRACTICE – COMPLAINT RESOLUTION PROTOCOL

The Durham York Energy Centre will follow the **Durham/York Energy from Waste Complaint Protocol for Design, Construction & Operations.**

Sample Complaint Form

Durham-York Energy Centre Odour Complaint Form

Complainant Details

Date	Time	Complainant Name	Address	Phone Number

*Note: Person may choose to remain anonymous

Operating Conditions During Complaint Conditions

Weather Conditions

Wind Speed	
Wind Direction	
Data Source	

Operating Conditions

Follow-up/Comments

APPENDIX C

Odour Mitigation Log

Odour Mitigation Log (Sample Form)

Date	Activity Reviewed	Implemented (yes/no)	Rationale

APPENDIX F

Correspondence with the MOE

Ministry of the Environment

Environmental Monitoring and Reporting Branch

125 Resources Road
Toronto ON M9P 3V6
Tel.: 416 235-6300
Fax: 416 235-6235

Ministère de l'Environnement

Direction de la surveillance environnementale

125, chemin Resources
Toronto ON M9P 3V6
Tél. : 416 235-6300
Téléc. : 416 235-6235

Ontario

Joey Neuhoff, Director, Business Development
Covanta Energy –Covanta Holding Corporation
40 Lane Road, Fairfield, NJ 07004
USA

August 24, 2010

Dear Sir;

Re: Request for Approval under S7(1) and S13(1) of Regulation 419/05 for use of Alternative Dispersion Model and Use of Site-Specific Meteorological Data for York/Durham's Energy from Waste Facility, Clarington, Durham

I have reviewed the S7 and S13 requests submitted by Golder Associates Ltd. The methodology proposed to develop the meteorological data and justification for using CALMET/CALPUFF is acceptable for the following reasons:

1. The methodology proposed in this request is exactly the same as in a previous EA for this facility which has gone through an extensive pre-consultations and thorough reviews.
2. The site is located over complex terrain near Lake of Ontario shoreline of which impacts are taken into account in CALMET/CALPUFF.
3. The regional scale meteorological data proposed as key input to CALMET come from the accepted meso-scale meteorological model, Weather Research and Forecasting (WRF) model.
4. Correct land use file was provided by the Ministry of Environment under a confidential memorandum.
5. The proponent used EMRB-suggested lake temperatures and WRF grids for pseudo buoy stations for lake temperature.
6. Adequate number of surface weather stations from Environment Canada will be included in the input to CALMET.
7. Precipitation data were correctly processed.
8. The options chosen in the CALMET input are reasonable and the CALMET results, especially winds, were reasonable.
9. Dry deposition velocity and wet scavenging rates were calculated correctly.
10. The options chosen in the CALPUFF input file are reasonable.

Please note that in accordance with the above-referenced request, this modelling methodology can only be used to model discharges from York/Durham's Energy from Waste Facility at 72 Osborne Road, Clarington, Ontario.

This request for notice was submitted with an application for a Certificate of Approval under Section 9 of the Environmental Protection Act (EPA) as part of an ESDM assessment and is subsequently approved for use in the Certificate of Approval application corresponding to this project.

Yours truly,

Robert B Bloxam

Dr. Robert Bloxam
Senior Leader, Modelling
Director, Sections 7 and 13, O. Reg. 419

cc: District Manager, York-Durham District Office
Director, Standards Development Branch
Environmental Assessment and Approvals Branch

APPENDIX G

Sample Dispersion Modelling Files (on CD)

APPENDIX H

Summary of Ambient Air Quality Monitoring (Taken from Environmental Assessment)

REPORT

Air Quality Assessment -
Technical Study Report

DURHAM YORK
RESIDUAL WASTE STUDY

REPORT NO. 1009497

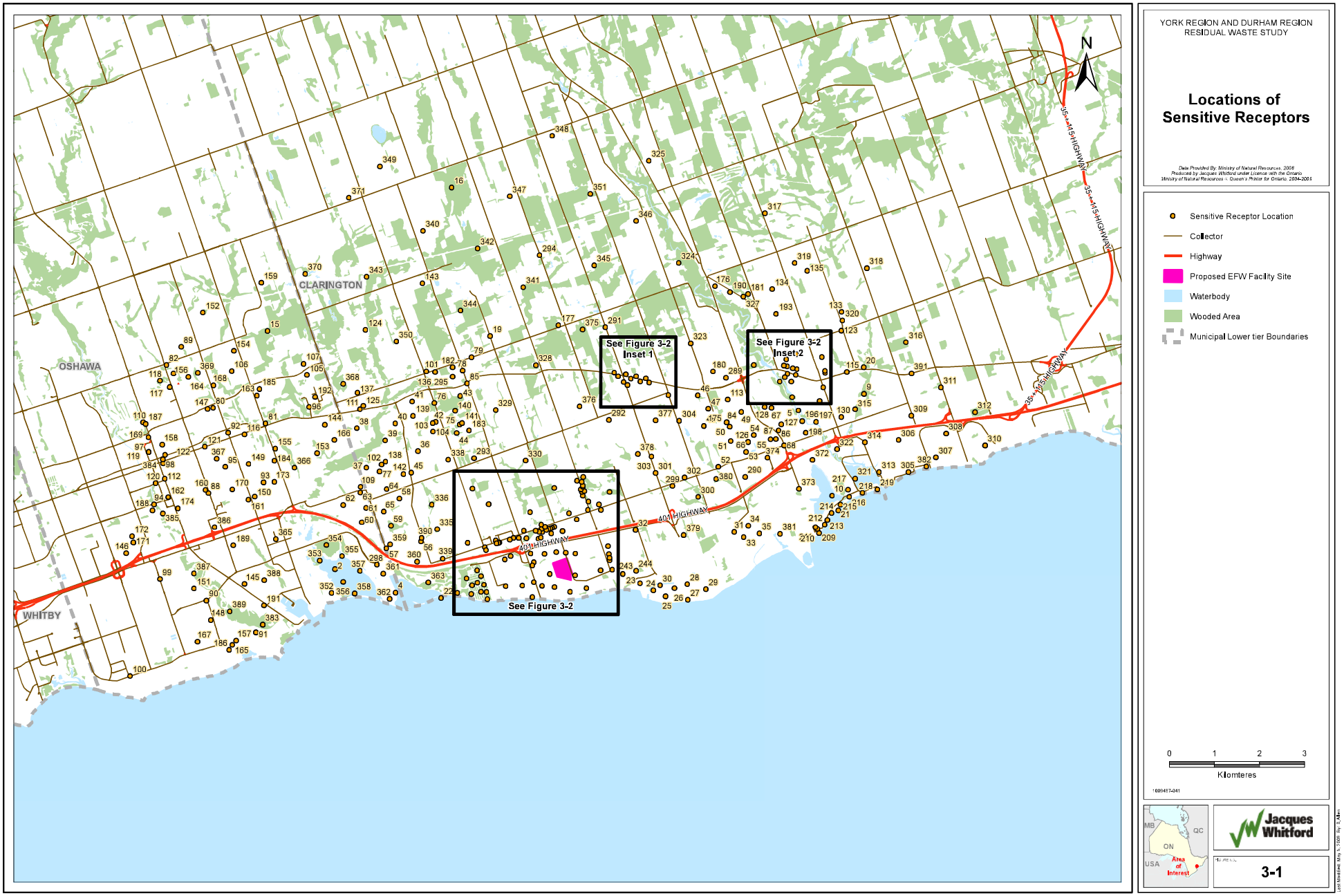
Table 3-9 Summary of Special Receptors Considered in the Dispersion Modelling

ID	Description	UTM Easting (km)	UTM Northing (km)
380	Darlington 6	683.95	4862.36
381	Darlington 7	685.36	4861.14
382	Bennett ECO/HH	688.61	4862.63
383	Oshawa ECO/HH	673.88	4859.13
384	Oshawa Creek 1	671.67	4862.79
385	Oshawa Creek 2	671.67	4861.59
386	Oshawa Creek 3	672.82	4861.29
387	Oshawa Creek 4	672.36	4860.26
388	Oshawa Creek 5	673.92	4860.12
389	Oshawa Creek 6	673.15	4859.42
390	Farm Q	677.41	4861.05
391	Commercial Market	688.28	4864.70

3.2.4 Local Air Quality

Jacques Whitford Stantec Limited conducted ambient air quality monitoring in the vicinity of the Site from September 2007 to 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. The location was approximately 2 km southwest from the Site. The purpose of the monitoring program was to develop a long-term ambient data set at the Site, which is required to develop suitable background ambient concentrations for use in the Environmental Assessment, Air Quality permitting, and Human Health and Ecological Risk Assessment.

Continuous ambient air quality monitoring of Criteria Air Contaminants (CACs) was conducted at the Courtice Road station for Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_X), Carbon Monoxide (CO), Ozone (O_3), and Particulate Matter smaller than 2.5 microns ($PM_{2.5}$). Hi-volume air samplers were installed to collect 24-hour average samples of Total Suspended Particulate (TSP) and metals, Polycyclic Aromatic Hydrocarbons (PAHs), and Dioxins and Furans (D/Fs). Ambient monitoring data from the Courtice Road station were compared with monitoring data collected at available monitoring stations operated by the Ontario Ministry of the Environment (MOE) to compare the levels in the vicinity of the Facility to other locations in Ontario.



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Locations of Sensitive Receptors

- Sensitive Receptor Location
- Collector
- Highway
- Proposed EFW Facility Site
- Waterbody
- Wooded Area
- Municipal Lower tier Boundaries

0 1 2 3
Kilometers

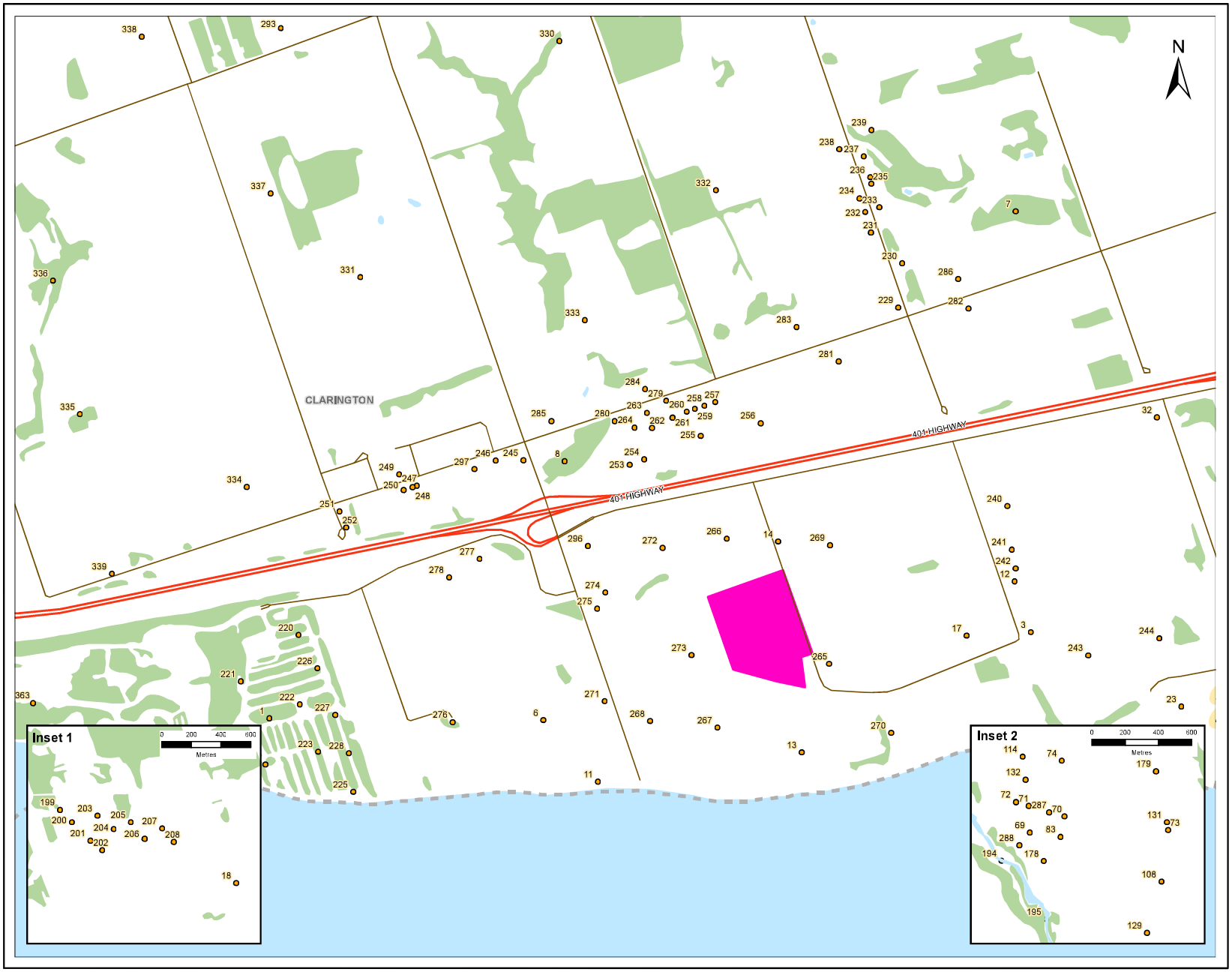
1009487-041

MB QC ON USA Area of Interest

Jacques Whitford

3-1

Last Modified: May 5, 2009, By: S.Allen



YORK REGION AND DURHAM REGION
RESIDUAL WASTE STUDY

Detailed Locations of Sensitive Receptors as Indicated on Figure 3-2

- Sensitive Receptor Location
- Collector
- Highway
- Waterbody
- Proposed EFW Facility Site

0 150 300 450
Metres

1009487-042

Jacques Whitford

3-2

Last Modified: May 5, 2009, By: S.Allen

In addition to the ambient monitoring data collected at the Courtice Road station, data from monitoring stations operated under the National Air Pollution Surveillance (NAPS) Network by Environment Canada were used to characterize regional air quality and to develop background concentration levels for volatile organic compounds (VOCs), chlorinated monocyclic aromatics (CMAs), and Polychlorinated Biphenyls (PCB).

A detailed review of available ambient monitoring data is presented in **Appendix A** and is summarized below.

3.2.4.1 Sulphur Dioxide (SO_2)

Based on ambient monitoring at the Courtice monitoring station, hourly, daily and annual average SO_2 concentrations were well below the applicable ambient air quality criteria. The maximum hourly, 24-hour and annual average concentrations measured at the station were 115, 63 and 6 µg/m^3 respectively which are 17%, 23% and 11% of the applicable ambient air quality criteria.

The measured annual average SO_2 concentration of 6 µg/m^3 at the Courtice station is relatively low (less than 55%) when compared with MOE monitoring stations at various Ontario cities including Sarnia, Hamilton and Windsor. SO_2 monitoring at the MOE Oshawa station was discontinued in 2000.

3.2.4.2 Nitrogen Dioxide (NO_2)

NO_2 concentrations measured at the Courtice monitoring station were below the applicable AAQC for all averaging periods. The maximum hourly and 24-hour concentrations measured at the station were 202 and 105 µg/m^3, respectively, which are 51% and 53% of the MOE air quality criteria. Elevated NO_2 levels occur infrequently - hourly average NO_2 concentrations above 150 µg/m^3 occurred less than 0.1% of the time during the monitoring period, and daily average NO_2 concentrations above 100 µg/m^3 occurred approximately 0.2% of the time.

The measured annual average NO_2 level at the Courtice Road station was similar to that in other urbanized area of Ontario such as Toronto, Hamilton and Windsor, and was well below the annual NAAQO maximum desirable level of 60 µg/m^3. The Courtice monitoring station was situated about 1.5-km south of Highway 401, whose vehicle traffic is a significant source of nitrogen oxides. Stationary sources in the vicinity of the monitoring station that may contribute to the measured NO_2 levels include St. Marys Cement and the new water pollution control plant to the east of the monitoring station (which contains a ground-based flare). It is likely that the NO_2 levels measured at the station reflect its proximity to the highway and these stationary sources.

3.2.4.3 Particulate Matter less than 2.5 Microns ($PM_{2.5}$)

$PM_{2.5}$ monitoring was conducted at the Courtice Road monitoring station, and has been conducted at the MOE Oshawa station since 2001. The maximum daily average concentration measured at the MOE Oshawa station in 2007 was 38 µg/m^3 (microgram per cubic metre) while the average concentration was 6.8 µg/m^3. The 98th percentile, annual ambient measurement averaged over 3 years (2005 to 2007) for the MOE Oshawa station is 29 µg/m^3 and is just less than the CWS criteria of 30 µg/m^3.

The 98th percentile, annual ambient measurement averaged over the 15 month monitoring period at the Courtice Road station is 29 µg/m^3, which is indicative that $PM_{2.5}$ levels in the vicinity of the Facility are slightly below the CWS.

3.2.4.4 Ozone (O_3)

Ground level O_3 concentrations in Oshawa are generally high. The maximum measured O_3 concentration measured at the MOE Oshawa station was above the eight hour average CWS during 2007. Annual mean levels have an increasing trend from 1998 to 2007 and have exceeded the NAAQC of 30 µg/m^3, varying from 42 to 56 µg/m^3.

The maximum hourly, 8-hour, 24-hour and annual average concentrations measured at the station were 115.7, 86, 78.0 and 29.9 µg/m^3 respectively which are 70%, 67%, 156% and 99.7 % of the air quality criteria. The daily average O_3 concentrations were above the NAAQO approximately 6% of the time.

The MOE also reports that in 2007 the 24-hour NAAQO maximum acceptable level of 50 µg/m^3 was exceeded at all 40 stations where ozone measurements were taken. There were no exceedances recorded for the hourly NAAQO. As ozone is generated by complex chemical reactions in the atmosphere which occur over distances of 10s to 100s of kilometres from precursor emissions sources, this points to ozone as being a regional rather than local air quality issue.

3.2.4.5 Dioxins and Furans

Dioxins and furans (D/Fs) were monitored at the Courtice Station using a using a manually operated hi-volume sampler to collect 24-hour average samples. The total maximum measured toxic equivalent D/F concentration (0.041 pg TEQ/m^3) was well below the applicable criteria (less than 2% of the criteria).

3.2.4.6 Polycyclic Aromatic Hydrocarbons

Polycyclic Aromatic Hydrocarbons (PAHs) were monitored at the Courtice Station using a hi-volume sampler to collect 24-hour average samples. All PAHs were below their respective MOE criteria, at the most 0.3% of the criteria (acenaphthylene).

3.2.4.7 Metals

Metals and total suspended particulates (TSP) were monitored at the Courtice Station using a hi-volume sampler to collect 24-hour average samples. The maximum measured concentrations of all metals with MOE air quality criteria were below their applicable criteria. Of all the metals in the CoPC list, aluminum had the highest measured ambient concentration relative to its air quality criteria (9% of the criteria).

3.2.4.8 Volatile Organic Compounds (VOCs)

VOCs data from the years 2006 to 2008, primarily from three NAPS Toronto stations and the NAPs Newmarket station, were reviewed and used to conservatively characterise ambient VOC levels in the vicinity of the Facility. All maximum measured VOC concentrations were below their applicable air quality criteria.

3.2.4.9 Chlorinated Monocyclic Aromatics (CMAs)

Data for CMAs from the years 2006 to 2008 were extracted from three NAPs Toronto stations and the NAPs Newmarket station and used to conservatively characterise ambient CMA levels in the vicinity of the Facility. Hexachlorobenzene (HCB) and pentachlorophenol (PCP) data were only available at one of the Toronto NAPs station. All maximum measured CMA concentrations were below their applicable air quality criteria.

3.2.4.10 Polychlorinated Biphenyls (PCBs)

PCB monitoring data from the years 2006 to 2008 were extracted from two Toronto NAPs stations for use in conservatively representing ambient PCB levels in the vicinity of the Facility. The maximum measured PCB concentrations were below their applicable air quality criteria.

3.2.4.11 Background Concentration Levels

Background concentrations are used in dispersion modelling to represent the cumulative effect of other emissions sources (i.e., both anthropogenic and biogenic) in addition to the sources being included in the dispersion modelling. The MOE requires that 90th percentile ambient monitoring data be added to the dispersion model predictions to conservatively account for existing ambient concentrations. The background levels used in this study were therefore the 90^{th} percentile values for short-term averages. For annual averages, an annual average value was used as the background level.

Background concentrations for criteria air contaminants, PAHs, D/Fs and metals were developed from the Courtice Road ambient monitoring data. For VOCs, CMAs and PCB, background concentrations were developed using monitoring data from Environment Canada NAPs stations. Details of the methodology used to develop the background concentrations are presented in **Appendix A**.

A summary of background ambient concentrations developed for use in the Air Quality and Human Health and Ecological Risk Assessments is presented in Table 3-10.

Table 3-10 Summary of Background Concentrations used in the Air Quality Assessment

Contaminant Criteria Air Contaminants	1 Hour – Average ($\mu g/m^3$)	8 - Hour – Average ($\mu g/m^3$)	24 Hour Average ($\mu g/m^3$)	Annual Average ($\mu g/m^3$)
Sulphur Dioxide (SO_2)	19.5	N/A	19.3	5.9
Nitrogen Dioxide (NO_2)	64.6	N/A	58.2	37
Carbon Monoxide (CO)	1035	1036	1029	632
Particulate Matter PM_{10}	N/A	N/A	N/A	N/A
Particulate Matter $PM_{2.5}$	22.8	N/A	20.4	9.8
Total Particulate Matter	86.2	N/A	35.4	21.3
Polycyclic Aromatic Hydrocarbons and Dioxins and Furans	**1 Hour – Average ($\mu g/m^3$)**		**24 Hour Average ($\mu g/m^3$)**	**Annual Average ($\mu g/m^3$)**
Acenaphthylene	7.53E-04		3.09E-04	1.58E-04
Acenaphthene	3.04E-03		1.25E-03	5.48E-04
Anthracene	3.97E-04		1.63E-04	8.00E-05
Benzo(a)anthracene	1.65E-04		6.77E-05	5.63E-05
Benzo(b)fluoranthene	3.45E-04		1.42E-04	7.56E-05
Benzo(k)fluoranthene	1.65E-04		6.77E-05	5.63E-05
Benzo(a)fluorine	3.30E-04		1.35E-04	1.13E-04
Benzo(b)fluorine	3.30E-04		1.35E-04	1.13E-04
Benzo(ghi)perylene	1.72E-04		7.07E-05	5.85E-05
Benzo(a)pyrene	1.65E-04		6.77E-05	5.63E-05
Benzo(e)pyrene	3.30E-04		1.35E-04	1.13E-04
Biphenyl	3.32E-03		1.36E-03	5.21E-04
2-chloro0phthalene	3.30E-04		1.35E-04	1.13E-04
Chrysene	2.35E-04		9.64E-05	6.47E-05
Coronene	3.30E-04		1.35E-04	1.13E-04
Dibenzo(a,c)anthracene	N/A		N/A	N/A
Dibenzo(a,h)anthracene	1.65E-04		6.77E-05	5.63E-05
Dibenzo(a,e)pyrene	6.60E-04		2.71E-04	2.25E-04
9,10 – dimethylanthracene	1.32E-03		5.42E-04	4.51E-04
7,12 – dimethylbenzo(a)anthracene	3.30E-04		1.35E-04	1.13E-04
Fluoranthene	1.46E-03		6.01E-04	3.93E-04
Fluorine	N/A		N/A	N/A
Indeno(1,2,3 – cd)pyrene	1.65E-04		6.77E-05	5.63E-05
2 – methylanthracene	3.30E-04		1.35E-04	1.13E-04
3 – methylcholanthrene	6.60E-03		2.71E-03	2.25E-03
1 – methyl0phthalene	3.17E-03		1.30E-03	4.43E-04
2 – methyl0phthalene	5.33E-03		2.19E-03	7.56E-04
1 – methylphe0nthrene	3.30E-04		1.35E-04	1.13E-04
9 – methylphe0nthrene	N/A		N/A	N/A

Table 3-10 Summary of Background Concentrations used in the Air Quality Assessment

Polycyclic Aromatic Hydrocarbons and Dioxins and Furans	1 Hour – Average (µg/m^3)	24 Hour Average (µg/m^3)	Annual Average (µg/m^3)
Naphthalene	5.91E-03	2.43E-03	8.59E-04
Perylene	3.30E-04	1.35E-04	1.13E-04
Phenanthrene	6.26E-03	2.57E-03	1.71E-03
Picene	N/A	N/A	N/A
Pyrene	6.88E-04	2.83E-04	1.83E-04
Quinoline	1.32E-03	5.42E-04	4.51E-04
Tetralin	3.30E-04	1.35E-04	1.13E-04
Triphenylene	N/A	N/A	N/A
O-terphenyl	3.30E-04	1.35E-04	1.13E-04
M-terphenyl	3.30E-04	1.35E-04	1.13E-04
P-terphenyl	3.30E-04	1.35E-04	1.13E-04
Dioxins (as TEQ Toxic Equivalents)	5.77E-08	2.37E-08	1.66E-08
Metals	**1 Hour – Average (µg/m^3)**	**24 Hour Average (µg/m^3)**	**Annual Average (µg/m^3)**
Aluminum	5.17E-01	2.13E-01	1.14E-01
Antimony	7.35E-03	3.02E-03	2.93E-03
Arsenic	4.41E-03	1.81E-03	1.80E-03
Barium	1.99E-02	8.18E-03	4.95E-03
Beryllium	7.35E-04	3.02E-04	2.98E-04
Boron	1.85E-01	7.60E-02	1.54E-02
Cadmium (Cd)	1.47E-03	6.04E-04	6.01E-04
Cadmium and Thallium (Cd + Th)	N/A	N/A	N/A
Chromium (hexavalent)	N/A	N/A	N/A
Total Chromium (and compounds)	6.72E-03	2.76E-03	1.71E-03
Cobalt	1.47E-03	6.04E-04	5.96E-04
Lead (Pb)	1.21E-02	4.98E-03	3.29E-03
Mercury (Hg) - Vapour/Particulate phase	N/A	N/A	N/A
Nickel	1.09E-02	4.49E-03	2.24E-03
Phosphorus	1.75E-01	7.19E-02	4.67E-02
Silver	8.33E-04	3.42E-04	3.43E-04
Selenium	7.35E-03	3.02E-03	2.93E-03
Thallium	N/A	N/A	N/A
Tin	7.35E-03	3.02E-03	2.93E-03
Vanadium	3.77E-03	1.55E-03	7.70E-04
Zinc	1.03E-01	4.24E-02	2.54E-02
Sum of (As, Ni, Co, Pb, Cr, Cu, V, Mn, Sb)	5.15E-01	2.12E-01	1.05E-01

Table 3-10 Summary of Background Concentrations used in the Air Quality Assessment

VOCs	1 Hour – Average (µg/m^3)	24 Hour Average (µg/m^3)	Annual Average (µg/m^3)
Acetaldehyde	4.3E+00	1.8E+00	1.0E+00
Acetone	1.1E+01	4.7E+00	3.4E+00
Benzene	2.9E+01	1.2E+01	3.9E+00
Bromodichloromethane	4.2E-02	1.7E-02	1.1E-02
Bromoform	7.2E-02	2.9E-02	2.3E-02
Bromomethane	2.2E-01	8.8E-02	9.8E-02
Butadiene, 1,3 -	4.8E-01	2.0E-01	1.2E-01
Butanone, 2 -	1.0E+01	4.1E+00	2.4E+00
Carbon tetrachloride	1.8E+00	7.4E-01	6.1E-01
Chloroform	5.5E-01	2.3E-01	1.6E-01
Cumene	1.7E-01	6.9E-02	3.8E-02
Dibromochloromethane	2.3E-02	9.4E-03	6.7E-03
Dichlorodifluoromethane	7.9E+00	3.2E+00	2.8E+00
Dichloroethane, 1,2 -	1.6E-01	6.6E-02	5.6E-02
Dichloroethane, trans – 1,2 -	2.1E-02	8.8E-03	2.8E-03
Dichloroethene, 1,1 -	6.1E-03	2.5E-03	5.8E-04
Dichloropropane, 1,2 -	4.6E-02	1.9E-02	1.5E-02
Ethylbenzene	3.0E+00	1.2E+00	6.9E-01
Ethylene Dibromide	1.3E-02	5.2E-03	1.8E-03
Formaldehyde	8.2E+00	3.4E+00	1.7E+00
Mesitylene	9.0E-01	3.7E-01	2.0E-01
Methylene chloride	3.1E+00	1.3E+00	7.6E-01
Styrene	5.6E+00	2.3E+00	1.3E+00
Tetrachloroethene	1.2E+00	4.9E-01	2.6E-01
Toluene	2.3E+01	9.5E+00	4.4E+00
Trichloroethane, 1,1,1 -	2.8E-01	1.1E-01	9.8E-02
Trichloroethene1	1.3E+00	5.4E-01	2.7E-01
Trichloroethylene, 1,1,2 -1	1.3E+00	5.4E-01	2.7E-01
Trichlorofluoromethane	5.2E+00	2.1E+00	1.9E+00
Trichlorotrifluoroethane	2.0E+00	8.1E-01	6.9E-01
Vinyl chloride	1.4E-02	5.9E-03	3.6E-03
Xylenes, m-, p- and o-	1.2E+01	4.8E+00	2.8E+00

Table 3-10 Summary of Background Concentrations used in the Air Quality Assessment

Chlorinated monocyclic aromatics	1 Hour – Average (µg/m^3)	24 Hour Average (µg/m^3)	Annual Average (µg/m^3)
1,2-Dichlorobenzene	2.63E-02	1.08E-02	4.66E-03
1,2,4,5-Tetrachlorobenzene	N/A	N/A	N/A
1,2,4-Trichlorobenzene	1.12E-01	4.58E-02	1.69E-02
2,3,4,6-Tetrachlorophenol	N/A	N/A	N/A
2,4,6-Trichlorophenol	N/A	N/A	N/A
2,4-Dichlorophenol	N/A	N/A	N/A
Pentachlorophenol	2.13E-03	8.76E-04	4.10E-04
Hexachlorobenzene	1.52E-04	6.25E-05	5.27E-05
Pentachlorobenzene	N/A	N/A	N/A
Polychlorinated Biphenyls	**1 Hour – Average (µg/m^3)**	**24 Hour Average (µg/m^3)**	**Annual Average (µg/m^3)**
Polychlorinated Biphenyls (PCB)	1.0E-04	4.2E-05	1.9E-05

Notes:
1. N/A – No background ambient monitoring data available for this contaminant.

ATTACHMENT 4

Acoustic Assessment Report

March 2011
Report No. 10-1151-0343

Golder Associates

March 2011

DURHAM YORK ENERGY CENTRE

Acoustic Assessment Report in support of Environmental Protection Act Section 9 Certificate of Approval (Air and Noise) Application

Submitted to:
Ontario Ministry of the Environment
Director Section 9
Environmental Assessment and Approvals Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

REPORT

Report Number: 10-1151-0343 (2000)

Golder Associates

Version Control

Rev.	Date	Revision Description	Reviewer Initials
1.0	March 2011	Original Acoustic Assessment Report in support of a Basic Comprehensive Certificate of Approval (Air and Noise) application	JT

Executive Summary

The Regional Municipalities of Durham and York ("Durham-York") propose to develop an Energy from Waste (EfW) facility (the Facility) located in an industrial zoned area, on the west side of Osbourne Road, south of Highway 401 and north of a CN Rail Corridor in the Municipality of Clarington. The Facility will be a Thermal Treatment Facility, capable of processing post-diversion residual waste and recovering materials and energy to export to the marketplace. Durham-York will be designated as the owners of the Facility, to be named the Durham York Energy Centre.

Covanta Energy Corporation (Covanta) will design, build and operate the Facility. Covanta and Durham-York are applying for a Basic Comprehensive Certificate of Approval (Air and Noise) (CofA (Air and Noise)), pursuant to Section 9 of the *Environmental Protection Act*, to allow for the approval of the Facility. The Facility will use Martin GmbH® combustion technology to process approximately 140,000 tonnes/year of municipal solid waste (MSW) and will capture its energy content in the form of superheated steam used to generate electricity and potentially provide district heating to the neighbouring Courtice Water Pollution Control Plant and Clarington Energy Park. The Facility will have a steam-turbine generator with a nameplate rating of approximately 20MW. The Facility is proposed to be in full operation year-round and will typically operate 24 hours per day, seven (7) days per week.

Golder Associates Ltd. (Golder) was retained by Covanta to prepare an Acoustic Assessment Report (AAR) in support of the CofA (Air and Noise) application for the Facility. The purpose of this AAR is to evaluate the overall noise emissions of the Facility with respect to the Ontario Ministry of Environment (MOE) noise guidelines.

An Environmental Assessment (EA) was completed, submitted and approved in accordance with the Ontario Environmental Assessment Act (EAA). The EA included an Acoustic Assessment which demonstrated compliance with MOE noise guidelines at 140,000 tonnes/year. The MOE has issued a Notice to Proceed with conditions which include noise monitoring. Since the completion of this study, there have been minor modifications to the Facility. This AAR incorporates the proposed changes and includes additional noise sources and refinements relative to the EA due to the additional design detail available at this time. There are two (2) access routes to the site. Vehicles will either enter from an entrance on Osbourne Road or Courtice Road. Both options are presented in this report.

The proposed equipment to be used at the Facility includes: HVAC units, roof ventilation units, closed-loop cooling water cooler, transformer, silo filling using truck mounted blower, silo vent dust collector, main exhaust stack, on-site truck and front end loader traffic, air cooled condenser, process louvers, bay doors, standby diesel generator and diesel fire pumps. On-site MSW trucking, and periodic testing of the standby diesel generator and diesel fire pumps will be limited to daytime hours only.

Golder's database of similar sources and engineering calculations, based on data provided by Covanta from experience with similar projects, were used as inputs to a predictive acoustical model to quantify outdoor noise emissions associated with the Facility. Acoustic Assessment criteria were established in accordance with MOE publications NPC-205 and NPC-233. Due to the nature of the sources, the Facility will not be a significant source of vibration.

Three (3) locations have been identified as being representative of the most sensitive Point(s) of Reception (POR(s)) in the vicinity of the Facility.

Golder predicted sound levels from the Facility at identified PORs that are at or below the applicable sound level limits during the predictable worst case hour of the Facility during normal operation and during the periodic testing of the standby diesel generator or diesel fire pumps. Therefore the proposed Facility is predicted to operate in compliance with MOE noise guidelines as specified in NPC-205.

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Nomenclature

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Sample Calculation (on CD)

Ministry of the Environment

Minisètre de l'Environnement

Ontario

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Company Name: The Regional Municipality of Durham

Company Address: 605 Rossland Road East

Whitby, Ontario, L1N 6A3

Location of Facility: Lot 27, Broken Front Concession, Part 1

Clarington, ON

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC 233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

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Title: Commissioners of Works

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Date: March 2, 2011

Technical Contact:

Name: Paul Niejadlik

Representing: Golder Associates Ltd.

Phone Number: (905) 567-4444 x 1287

Signature: Paul Niejadlik

Date: March 2, 2011

Recreated by Golder Associates Ltd. from Ontario Ministry of Environment Publication PIBS 5356e

Ministry of the Environment

Minisètre de l'Environnement

Ontario

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Company Name: The Regional Municipality of York

Company Address: 17250 Yonge Street

Newmarket, ON L3Y 6Z1

Location of Facility: Lot 27, Broken Front Concession, Part 1

Clarington, ON

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC 233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

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Title: Commissioner of Environmental Services

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Signature:

Date: March 2, 2011

Technical Contact:

Name: Paul Niejadlik

Representing: Golder Associates Ltd.

Phone Number: (905) 567-4444 x 1287

Signature: Paul Niejadlik

Date: March 2, 2011

Recreated by Golder Associates Ltd. from Ontario Ministry of Environment Publication PIBS 5356e

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Ontario

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Company Name: Covanta Durham York Renewable Energy Limited Partnership

Company Address: 445 South Street
Morristown, New Jersey, USA 07960

Location of Facility: Lot 27, Broken Front Concession, Part 1
Clarington, ON

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC 233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact:

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Title: Senior Vice President, Business Development

Phone Number: (862) 345-5445

Signature: Matthew R. Mulcahy

Date: March 2, 2011

Technical Contact:

Name: Paul Niejadlik

Representing: Golder Associates Ltd.

Phone Number: (905) 567-4444 x 1287

Signature: Paul Niejadlik

Date: March 2, 2011

Recreated by Golder Associates Ltd. from Ontario Ministry of Environment Publication PIBS 5356e

ACOUSTIC ASSESSMENT REPORT CHECKLIST

	Required Information		
		Submitted	Explanation/Reference
1.0	**Introduction**	☒ Yes	Section 1.0
2.0	**Facility Description**		
	2.1 Operating hours of facility and significant Noise Sources	☒ Yes	Sections 2.0 and 3.0
	2.2 Site Plan identifying all significant Noise Sources	☒ Yes	Figures 2A and 2B
3.0	**Noise Source Summary**		
	3. 1 Noise Source Summary Table	☒ Yes	Table 3
	3. 2 Source noise emissions specifications	☐ Yes	N/A
	3. 3 Source power/capacity ratings	☒ Yes	Table 3
	3. 4 Noise control equipment description and acoustical specifications	☒ Yes	Section 3.0
4.0	**Point of Reception Noise Impact Calculations**		
	4. 1 Point of Reception Noise Impact Table	☒ Yes	Section 6.2, Table 5 and Section 6.3, Table 7
	4.2 Point(s) of Reception (POR) list and description	☒ Yes	Section 4.0
	4. 3 Land-use Zoning Plan	☒ Yes	Appendix B
	4. 4 Scaled Area Location Plan	☒ Yes	Figure 1
	4.5 Procedure used to assess noise impacts at each POR	☒ Yes	Sections 5.0 and 6.1
	4.6 List of parameters/assumptions used in calculations	☒ Yes	Section 6.0
5.0	**Acoustics Assessment Summary**		
	5. 1 Acoustic Assessment Summary Table	☒ Yes	Section 6.2, Table 6 and Section 6.3, Table 8
	5.2 Rationale for selecting applicable noise guideline limits	☒ Yes	Section 5.0
	5.3 Predictable Worst Case Impacts Operating Scenario	☒ Yes	Sections 2.0 and 3.0
6.0	**Conclusions**		
	Statement of compliance with the selected noise performance limits	☒ Yes	Section 7.0
7. 0	**Appendices** (Provide details such as)	☐ Yes	
	Listing of Insignificant Noise Sources	☐ Yes	N/A
	Manufacturer's Noise Specifications	☐ Yes	N/A
	Calculations	☒ Yes	Appendix F
	Instrumentation	☐ Yes	N/A
	Meteorology during Sound Level Measurements	☐ Yes	N/A
	Raw Data from Measurements	☐ Yes	N/A
	Drawings (Facility / Equipment)	☐ Yes	N/A

Recreated by Golder Associates Ltd., from Ontario Ministry of Environment Publication PIBS 5356e

1.0 INTRODUCTION

The Regional Municipalities of Durham and York ("Durham-York") propose to develop an Energy from Waste (EfW) facility (the Facility) located in an industrial zoned area, on the west side of Osbourne Road, south of Highway 401 and north of a CN Rail Corridor in the Municipality of Clarington. The Facility will be a Thermal Treatment Facility, capable of processing post-diversion residual waste and recovering materials and energy to export to the marketplace. Durham-York will be designated as the owners of the Facility, to be named the Durham York Energy Centre.

Covanta Energy Corporation (Covanta) will design, build and operate the Facility. Covanta and Durham-York are applying for a Basic Comprehensive Certificate of Approval (Air and Noise) (CofA (Air and Noise)), pursuant to Section 9 of the *Environmental Protection Act*, to allow for the approval of the Facility. The Facility will use Martin GmbH® combustion technology to process approximately 140,000 tonnes/year of municipal solid waste (MSW) and will capture its energy content in the form of superheated steam used to generate electricity and potentially provide district heating to the neighbouring Courtice Waste Pollution Control Plant and Clarington Energy Park. The Facility will have a steam-turbine generator with a nameplate rating of approximately 20MW. The Facility is proposed to be in full operation year-round and will typically operate 24 hours per day, seven (7) days per week.

An Environmental Assessment (EA) was completed, submitted and approved in accordance with the Ontario Environmental Assessment Act (EAA). The EA included an Acoustic Assessment which demonstrated compliance with MOE noise guidelines at 140,000 tonnes/year. The MOE has issued a Notice to Proceed (Appendix A) with conditions which include noise monitoring. Since the completion of this study, there have been minor modifications to the Facility. This AAR incorporates the proposed changes and includes additional noise sources and refinements relative to the EA due to the additional design detail available at this time. There are two (2) access routes to the site. Vehicles will either enter from an entrance on Osbourne Road or Courtice Road. Both options are presented in this report.

Golder Associates Ltd. (Golder) was retained by Covanta to prepare an Acoustic Assessment Report (AAR) in support of the CofA (Air and Noise) application for the Facility. The purpose of this AAR is to evaluate the overall noise emissions of the Facility with respect to the Ontario Ministry of Environment (MOE) noise guidelines.

The site location and surrounding area can be best described as Class 2 (Urban), as per MOE guideline publications NPC-205 and NPC-233. Sound level limits for the proposed Facility operations on Point(s) of Reception (POR(s)) were established in accordance with the MOE guidelines. Noise sensitive PORs were selected that are representative of sensitive PORs in all directions around the Facility. For the purpose of this assessment three (3) residential locations have been selected to represent the sensitive PORs labelled POR001 through POR003. The closest POR (POR001) is located approximately 480 metres from the property line west of the Facility.

Noise predictions were completed to determine the possible noise impact of the predictable worst case hour of Facility onto PORs. The predictive analysis was carried out in accordance with ISO 9613 (part 2), which is the current standard used for outdoor sound propagation predictions. The noise prediction results were compared with the exclusionary sound level limits given in NPC-205.

A site location plan showing the location of the Facility and its surroundings, including the most sensitive PORs is provided in Figure 1. A site layout plan showing the locations of significant sources of noise for both entrance options are provided in Figures 2A and 2B. The surrounding lands are designated for the Energy Park (Industrial) and Agricultural use. A zoning plan for the property and surrounding areas is provided in Appendix B.

The Facility was not considered a significant source of vibration; therefore a vibration assessment was not considered warranted. A description of the Facility is provided in Section 2. The sound sources associated with this Facility are described in Section 3 and the identified PORs are described in Section 4. Section 5 provides the assessment criteria and Section 6 provides the noise impact assessment results. For easy comprehension and understanding of this report, some of the acoustic technical terms used in this report are explained in Appendix C.

2.0 FACILITY DESCRIPTION

The Facility will provide a safe and environmentally acceptable method of waste disposal through thermal waste treatment and generate electrical power via a steam-turbine generator. The net electricity produced by the Facility will be sent out to the local grid and distributed by Hydro One Inc. The Facility will also have provisions to extract steam from the process to supply heat to a future hot water district heating loop that could service the neighbouring Courtice Water Pollution Control Plant (WPCP) and the surrounding Energy Park. Additionally, the Facility will recover ferrous and non-ferrous metals from the ash residue stream for recycling. Figure 3 shows a simplified process flow diagram that depicts the major components of the system and indicates associated process flows.

The Facility will consist of two (2) identical combustion trains, each designed to handle up to 218 tonnes/day of MSW referenced at 13MJ/kg. Each train will have identical boilers/furnaces and air pollution control equipment such as carbon injection, dry scrubbers and fabric filters. The treated exhaust gases are vented to a common 87.6 m stack and released into the atmosphere.

Solid waste delivered to the facility will be received within an enclosed tipping building and discharged into a concrete solid waste storage pit. Refuse mixing and handling in the refuse pit and refuse feeding into the boilers will be handled by two overhead grapple cranes.

After being charged into the feed chute hopper, the refuse will be metered onto the surface of the Martin® stoker from the bottom of the feed chute by hydraulic feed rams. The feed rams will be designed to provide an even distribution of refuse over the entire width of the grate. The proprietary reverse reciprocating action of the Martin® stoker grate agitates the fuel bed in a manner which continually mixes the combusting refuse, resulting in thorough burnout of combustible matter.

Natural gas shall be used for one (1) auxiliary burner in each furnace during start-up conditions to raise the temperature in the furnace to above 1000°C. This process will take about six (6) hours prior to MSW being fed into the system. The residue from the combustion process that remains on the grate, referred to as bottom ash, is removed from the grate and quenched with water in an ash discharger. Bottom ash is removed from the ash discharger by a hydraulic ram that moves the bottom ash up an inclined surface that promotes dewatering of the bottom ash.

The conveyor will transport the material to the ferrous and non-ferrous metals recovery systems, with the remaining residue discharged to the residue storage building where it will await transport to a licensed disposal facility. Fly ash and reaction products from the scrubber and baghouse hoppers will be transported to the fly ash conditioners by a dedicated enclosed screw and drag chain conveyor system. The fly ash conditioners thoroughly mix and stabilize the ash and deposit the conditioned material in a dedicated bunker in the residue building. Residue will be loaded into vehicles for transport to a licensed disposal site.

The Facility will consist of two (2) waste steam generators and one (1) steam turbine generator with a maximum gross output of approximately 20 MW. The turbine generator set will be designed to accept 72,000 kg/hr of steam.

The turbine will exhaust to the direct air cooled condenser package including condenser complete with duct from turbine, isolation valves, blanking plate, steam jet air ejectors, relief valves and other required accessories.

Condenser shall be designed to accept full turbine bypass flow and must be isolatable from the turbine under this mode of operation.

Flue gases from the boiler will be directed through the air pollution control system consisting of a scrubber in series with a fabric filter (baghouse). The Covanta VLN™ process will be incorporated into the boiler and grate design to control and reduce NOx emissions. In addition, an ammonia-based SNCR system will provide for further NOx reduction. A single stack and flue (common to both thermal treatment units) will be erected according to good engineering practice for safe distribution of the flue gas.

All major equipment not requiring direct contact with the environment will be enclosed in buildings providing a controlled working environment and process isolation from the environment. All major structures, excluding the Visitor's Centre and the Residue Building, will be combined into a common enclosed structure.

The Facility is designed to prevent transmission of noise and odour between the control room/administration area and the remainder of the facility.

The Facility will operate on a continuous basis; 24 hours/day, seven (7) days/weeks, 365 days/year. MSW may be delivered six (6) days per week between 7:00am to 7:00pm. The proposed operating schedule may vary depending on demand and Facility needs.

A detailed project description can be found in Appendix D.

3.0 NOISE SOURCE SUMMARY

The primary noise sources of concern are summarized in Table 3 and a brief description of the nature and type of sources are included below. Noise data is provided in Appendix F. In preparing the assessment, efforts were taken to ensure that the source numbering convention was consistent with the information submitted by Covanta to the MOE, as part of the documentation provided in the Emission Summary and Dispersion Modelling (ESDM) Report.

Facility Sources

- HVAC units – (S001 – S003)

  HVAC units serve the Administration and Control Room (S001, S002) and Visitor Centre (S003) buildings. Sound power data was from obtained Golder's database of similar sources and each unit was modelled as a point source.

- Roof ventilation units – (SS004 – S018, S038, S039)

  There are 15 roof ventilation units (S004 – S018) on the main Facility roof and two (2) roof ventilation units (S038, S039) on the Residue building. Sound power data was obtained from Golder's database of similar sources and each unit was modelled as a point source.

- Closed-loop cooling water cooler – (S019)

  The closed-loop cooling water system will utilize an air cooled heat exchanger, including fans, supports, access platforms and other required auxiliaries. Sound power data was from Golder's database of similar sources based on information provided by Covanta. This noise source was modelled as a point source.

- Switchyard – (S020)

  The electrical connection to the utility consists of a step-up transformer, circuit breakers and other equipment and auxiliaries to convert the generator output voltage. The Generator step-up transformer (GSUT) [S020] and the startup/standby transformer (SUT) are located on the east side of the Facility. The GSUT is connected to the steam turbine generator and terminates in a switchyard where it connects to the SUT and the transmission system. The SUT provides power to the electrical auxiliary system during startup until the unit generator is synchronized and producing sufficient electrical energy to meet the Facility load. During normal operation, or during island operation, the electrical auxiliary system power requirements are supplied from the generator main leads through the unit auxiliary transformer (UAT). As the normal operations are assumed to be the worst case Facility operations, the SUT was not included as a noise source. A sound power level was selected from Golder's database of similar sources based on information provided by Covanta. The noise source was modelled as a point source.

- Silo filling and silo vent dust collectors – (S021, S022)

  Three (3) silos are located outside the Facility building (Carbon, Pozzolan and Cement) and one (1) silo is located inside (Lime). For the purpose of this assessment, the predictable worst case hour has one (1) silo being filled (Carbon storage). The following are descriptions of each silo.

  - Carbon storage – (S021, S022)

    The activated carbon system will consist of one (1) storage silo having a pneumatic truck unloading station. A pneumatic feed system injecting activated carbon directly into the flue gas duct-work, downstream of the economizer will be fed from a common activated carbon storage silo. The silo will be located on the southeast corner of the APC building. A truck fill panel, fill pipe and vent filter will be provided to convey carbon from the bulk delivery truck to the silo using the truck's conveying blower.

    The truck unloading and silo vent type dust collector sound powers were obtained from Golder's database of similar noise sources and were modelled as a point sources.

  - Pozzolan and Cement storage

    There are one (1) pozzolan silo and one (1) cement silo located to the north of the Residue building. The silos are designed such that the delivery truck mounted blower will be capable of unloading the pozzolan or cement directly into the silo by means of a positive pressure conveying system through a fill pipe to the top of the silo. The conveying air will be exhausted from the bin through a silo vent type dust collector.

  - Lime storage

    Lime for the APC system will be delivered to the Facility in self-unloading trucks and stored in a storage silo. One (1) silo will be equipped with vibrators and other provisions designed to prevent the lime from plugging under its own weight, thereby restricting flow (bridging) or forming a central core channel with material stuck to the silo walls (rat-holing). The lime storage will be located inside the APC building with the dust collector vented out the exterior.

- Main exhaust stack – (S023)

  A single round outer shell chimney will be provided with a common insulated steel flue. The shell material will be made of steel. The two (2) mass-burn thermal treatment units (2 x 218 Tonne/day units) will share a common flue. The flue will be 87.6 m in height and 1.7 m in diameter.

  The main exhaust stack is serviced by the two (2) ID fans which are both designed for 54,000 Nm^3/hr and 160 HP. Engineering calculations were carried out to determine the exhaust stack sound power level. The exhaust stack was modelled as a point source. Directivity was included in the sound power level.

- Trucking activities – (S024, S025)

  The Facility is designed to receive up to 140,000 tonnes of post-diversion residual waste per year. Refuse will be delivered to the Facility in standard packer vehicles or fully enclosed transfer trailers. The Regions will be controlling truck sizes. There are two (2) access routes to the site. Vehicles will either enter from an

entrance on Osbourne Road or Courtice Road. The entrances are illustrated in Figures 2A and 2B. Results are presented for both options. All deliveries go through the gate and scale-house.

Based on the annual processing capacity and trucking, there would be an average of approximately 31 trucks per day arriving at the site to drop off waste, and nine (9) trucks per day taking residual materials from the site. Therefore, an average of approximately 40 trucks is expected daily, excluding delivery trucks. For a conservative assessment, it was assumed that there would be ten (10) trucks on site during a worst case hour.

The trucks were modelled as line sources. Data for the trucking was obtained from Golder's database of similar sources which were measured at various sites throughout Ontario.

- Front-end loader (S026, S027):

  Two (2) loaders handle both MSW and residue on site. The sound power level was obtained from Golder's database of similar noise sources. The noise source was modelled as a line source.

- Air cooled condenser (ACC) – (S028, S029)

  A direct air cooled condenser (ACC) package including: a condenser (complete with duct from turbine), isolation valves, blanking plate, steam jet air ejectors, relief valves and other required accessories. The ACC will be capable of performing both the function of condensing turbine exhaust and operating as a dump (bypass) condenser operation under in-house load with the majority of steam being desuperheated and dumped directly into the condenser. The bypass operation would be considered an upset scenario and has not been considered in this assessment. Sound power data was from Golder's database of similar sources based on information provided by Covanta's experience based on previous projects. The noise source was modelled as two (2) area sources (i.e., top and bottom of the ACC).

- Tipping hall – Louvers and bay doors – (S030 – S033)

  Following weighing at the scale house, trucks will enter the tipping building. Tipping bays will be provided at the pit to allow simultaneous discharge of waste from multiple vehicles. Barriers will be provided at each tipping bay to prevent vehicles from backing into the refuse pit.

  The tipping floor shall be completely enclosed with an overhead entrance door and sliding exit door. The exit door will be on the opposite side of the tipping floor from the entrance. Doors will remain closed except when vehicles enter and exit the tipping building. The tipping hall will use uninsulated exterior walls.

  Suitably sized manually operable wall louvers will be provided in the front wall of the tipping building to provide infiltration of air for combustion when the tipping building doors are closed.

  For this assessment, the louvers (S030, S031) and bay doors (S032, S033) were assumed to be open during the daytime while the Facility is accepting MSW and in the evening/night-time periods the bay doors were assumed to be closed with the louvers open. The sound power levels for the bay doors and louvers were calculated based on the loader and truck traffic use within the tipping hall. The bay doors and louvers were modelled as vertical area sources.

- Grizzly building – Bay door – (S034)

  A bay door will be located on the west side of the Grizzly building, it was assumed to be open during all periods of the day. The Grizzly houses one (1) Grizzly screen. The sound power level for the bay door was calculated based on the operation of the screen within the building. The bay door was modelled as vertical area source.

- Residue building – Bay doors and louver – (S035 – S037)

  The Residue building will have two (2) screens and a truck loading area serviced by a loader. The Residue building will have two (2) bay doors (S035, S036) located on opposite sides of the building and a louver (S037) on the south facade. The sound power levels for the bay doors and louver were calculated based on the equipment operational within the building. The louver and bay doors were modelled as vertical area sources.

- Boiler, Air Pollution Control and Turbine Process louvers – (S040 – S044)

  Process louvers for the Boiler (S040, S041), Air Pollution Control (S042, S043) and Turbine (S044) areas will provide necessary air circulation for the buildings.

  The sound power level for each louver was developed based on the internal noise sources with the associated area. Internal noise sources included combustion fans, ID fan and steam turbine. The louvers were modelled as vertical area sources.

- Standby diesel generator – (S045 – S047)

  A 250 kW standby diesel generator will be located on the west side of the Facility. The periodic testing of the standby diesel generator was assessed. The standby diesel generator was modelled as three (3) separate noise sources representing the combustion exhaust stack (S045 – point source) and two (2) louvers (S046, S047 – vertical area sources). The standby diesel generator was assessed both separately and with the other daytime Facility operations. The standby diesel generator noise emissions were based on Golder's database of similar noise sources. A muffler or acoustically equivalent treatment for the standby diesel generator will be inherent in the design of the Facility. Table 1 provides the minimum insertion loss performance requirements for the muffler. The standby diesel generator will be tested up to once a month at a separate time from the diesel fire pumps testing.

Table 1: Muffler Minimum Dynamic Insertion Loss Performance – Standby diesel generator

Source	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
S045	0	14	25	27	20	15	15	15

- Diesel fire pumps – (S048 – S050, S051 – S053)

  Two (2) diesel fire pumps will be located on the east side of the Facility. The periodic testing of the diesel fire pumps was assessed. Each diesel fire pump was modelled as three (3) separate noise sources representing the combustion exhaust stack (S048 and S051 – point source) and two (2) louvers (S049, S050, S052 and S053 – vertical area sources). The diesel fire pumps were assessed both separately and with the other daytime Facility operations. The diesel fire pumps noise emissions were based on Golder's database of similar noise sources. A muffler or acoustically equivalent treatment for the diesel fire pumps will be inherent in the design of the Facility. Table 2 provides the minimum insertion loss performance requirements for the muffler. The diesel fire pumps will be tested up to once a month at separate times from the standby diesel generator testing and one another.

Table 2: Muffler Minimum Dynamic Insertion Loss Performance – Diesel fire pumps

Source	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
S048 and S051	0	14	25	27	20	15	15	15

Table 3 summarizes the primary noise sources of concern.

Table 3: Noise Source Summary

Source ID	Source Description (ESDM ID)	Overall Sound Power (dBA)	Source Location [1]	Sound Characteristics[1]	Noise Control Measures[1]
S001	Admin HVAC 1 (ESDM ID – 4)	98	O	S	U
S002	Admin HVAC 2 (ESDM ID – 4)	98	O	S	U
S003	Visitor Centre HVAC (ESDM ID – 4)	98	O	S	U
S004	Roof ventilation unit 1	93	O	S	U
S005	Roof ventilation unit 2	93	O	S	U
S006	Roof ventilation unit 3	93	O	S	U
S007	Roof ventilation unit 4	93	O	S	U
S008	Roof ventilation unit 5	93	O	S	U
S009	Roof ventilation unit 6	93	O	S	U
S010	Roof ventilation unit 7	93	O	S	U
S011	Roof ventilation unit 8	93	O	S	U
S012	Roof ventilation unit 9	93	O	S	U
S013	Roof ventilation unit 10	93	O	S	U
S014	Roof ventilation unit 11	93	O	S	U
S015	Roof ventilation unit 12	93	O	S	U
S016	Roof ventilation unit 13	93	O	S	U
S017	Roof ventilation unit 14	93	O	S	U
S018	Roof ventilation unit 15	93	O	S	U
S019	Closed-loop cooling water cooler top	96	O	S	U
S020[2]	GSU Transformer	105	O	T	U
S021[2,3]	Truck silo filling	119	O	T	U
S022[3]	Carbon silo dust collector (ESDM ID – 2)	102	O	S	U
S023[4]	Main stack exhaust (ESDM ID – 1)	118 (112)	O	S	U
S024[3]	On-site truck traffic – truck entrance	98	O	S	U
S025[3]	On-site truck traffic – truck exit	99	O	S	U
S026	Loader 1	94	O	S	U
S027	Loader 2	92	O	S	U
S028	Air Cooled Condenser – Top	111	O	S	U
S029	Air Cooled Condenser – Bottom	111	O	S	U
S030	Tipping floor louver 1	96	O	S	U
S031	Tipping floor louver 2	96	O	S	U
S032[3]	Tipping floor bay door – entrance	104	O	S	U

Source ID	Source Description (ESDM ID)	Overall Sound Power (dBA)	Source Location [1]	Sound Characteristics[1]	Noise Control Measures[1]
S033[3]	Tipping floor bay door – exit	107	O	S	U
S034	Grizzly bay door	106	O	S	U
S035	Residue building bay door 1	102	O	S	U
S036	Residue building bay door 2	102	O	S	U
S037	Residue building louver	96	O	S	U
S038	Residue building roof ventilation unit 1	93	O	S	U
S039	Residue building roof ventilation unit 2	93	O	S	U
S040	Boiler building louver 1	103	O	S	U
S041	Boiler building louver 2	107	O	S	U
S042	APC building louver 1	98	O	S	U
S043	APC building louver 2	94	O	S	U
S044	Turbine building louver	88	O	S	U
S045[3]	Standby diesel generator (ESDM ID – 3)	108	O	S	S
S046[3]	Standby diesel generator intake (ESDM ID – 3)	103	O	S	U
S047[3]	Standby diesel generator discharge (ESDM ID – 3)	103	O	S	U
S048[3]	Diesel fire pump 1 (ESDM ID – 5)	108	O	S	S
S049[3]	Diesel fire pump 1 intake (ESDM ID – 5)	103	O	S	U
S050[3]	Diesel fire pump 1 discharge (ESDM ID – 5)	103	O	S	U
S051[3]	Diesel fire pump 2 (ESDM ID – 5)	108	O	S	S
S052[3]	Diesel fire pump 2 intake (ESDM ID – 5)	103	O	S	U
S053[3]	Diesel fire pump 2 discharge (ESDM ID – 5)	103	O	S	U

Notes:
[1] Refer to Appendix E for nomenclature.
[2] Includes 5 dB tonal penalty.
[3] Equipment operates during the daytime hours only. Standby generator and diesel fire pump testing occur during daytime hours.
[4] Value in brackets includes directivity.

As mentioned, since the completion of the EA study, there have been minor modifications to the Facility. This AAR incorporates these changes and includes additional noise sources and refinements relative to the EA due to the additional design detail available at the time of AAR completion. Noise sources included in this AAR that were not in the EA study include: roof ventilation units on main building and residue building, closed-loop cooling water cooler, silo filling, silo dust collector, loader operations, bay doors and process louvers (which take the

place of the EA study internal noise sources). Noise sources that are similar in both this AAR and the EA study which include: HVAC units, transformer, main stack exhaust, on-site truck traffic, air cooled condenser, standby diesel generator and diesel fire pumps, have been modified in quantity and sound power data to reflect the currently available information.

Worst Case Operation Scenarios:

Daytime

The worst case daytime operation scenario has all sources operating simultaneously (both trains operating). This includes ten (10) trucks entering and exiting the Facility in a given hour. Each piece of standby equipment is tested in a separate hour during the daytime only.

Evening / Night-time

The worst case evening / night-time operation scenario has all sources operating simultaneously (both trains operating) but does not include silo filling and dust collector operations, on-site truck traffic, tipping hall bay doors (closed) and standby equipment (testing limited to daytime period only).

4.0 POINT(S) OF RECEPTION

Three (3) PORs were identified in the AAR, as being representative of the most sensitive PORs in the vicinity of the Facility. These PORs are shown on the site location plan in Figure 1 and described below:

- POR001 – two-storey single family dwelling located approximately 480 metres from the property line west of the Facility.
- POR002 – two-storey single family dwelling approximately 690 metres from the property line east of the Facility.
- POR003 – one-storey single family dwelling approximately 870 metres from the property line north of the Facility.

5.0 ASSESSMENT CRITERIA

The three (3) PORs in the area were all conservatively defined as Class 2 as per MOE publication NPC-205. The subject area is defined as Class 2 urban, as per, MOE publications NPC-205 and NPC-233.

A Class 2 area can best be described as an urban/suburban blend; whereby sound levels are moderately high during the day (typically 07:00-19:00) but decrease during the evening (typically 19:00-23:00) and night-time hours (typically 23:00-07:00).

The MOE exclusionary sound level limits for residential receptors in a Class 2 area is described as follows:

The energy averaged sound level (Leq) produced by a source at a receptor location in any one hour period should not exceed the greater of; the energy averaged sound level produced by road traffic in the same hour period, or 50 dBA in the daytime period of 07:00-19:00, or 45 dBA in the evening period of 19:00-23:00 and 45 dBA in the night-time period of 23:00-07:00.

Table 4 below summarizes the exclusionary MOE performance limits for a Class 2 area.

Table 4: Assessment Criteria

Time Period	Sound Level Limit – L_{eq} [1 hour] (dBA)
Daytime (07:00-19:00)	50
Evening (19:00-23:00)	45
Night-time (23:00-07:00)	45

6.0 IMPACT ASSESSMENT

6.1 Analysis Methodology

Golder generated noise impact predictions for the identified most sensitive PORs using Golder's database of similar sources and engineering calculations based on information provided by Covanta experience based on similar projects.

The predictive analysis was carried out using the commercially available software package Cadna/A. Geometrical spreading, attenuation from barriers, ground effects and air absorption were included in the analysis as determined from ISO 9613 (part 2), which is the current standard used for outdoor sound propagation predictions. It should be noted that this standard makes provisions to include a correction to address for downwind or ground based temperature inversion conditions. Noise predictions have been made assuming a downwind or moderate temperature inversion condition for all PORs, a design condition consistent with the accepted practice of the MOE.

As described in ISO 9613 (part 2), ground factor values that represent the effect of ground absorption on sound levels range between 0 and 1. Based on the specific site conditions, the ground factor values used in the modelling were 0 for acoustically hard surfaces (roadways, site property roads and surrounding areas), such as asphalt and concrete, and 1 for acoustically soft surfaces, such as grassed or treed areas.

Based on a review of the surrounding area, various buildings are located between the PORs and the Facility. These buildings could provide shielding and mitigate sound levels from the Facility to the PORs. As such, the prediction model included these buildings.

There are two (2) access routes to the site. Vehicles will either enter from an entrance on Osbourne Road or Courtice Road. Both options are presented in this report.

6.2 Results – Osbourne Road Entrance

6.2.1 Predictable worst case operation at the Facility – Osbourne Road Entrance

The Facility's noise emissions associated with Osbourne Road entrance were modelled to predict the sound levels on the identified PORs during a predictable worst case 1-hour operation, as described in Section 3. Table 5 provides detailed noise impact predictions from each source at each POR. The table also includes the approximate distance to each source. A sample calculation is provided in Appendix F. The sample calculation includes the sound level library of the noise sources in 1/1 octave band level format.

Table 5: Point of Reception Noise Impact – Facility Operations – Osbourne Road Entrance

Source ID	POR001			POR002			POR003		
	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)
S001	664	6	7	844	19	20	965	19	19
S002	667	4	5	841	20	20	973	19	19
S003	733	15	16	776	25	27	1009	18	18
S004	643	21	24	862	16	21	984	14	14
S005	647	21	24	858	18	21	994	14	14
S006	653	21	24	853	18	21	1007	14	14
S007	658	21	23	849	19	21	1018	14	14
S008	663	21	23	845	19	21	1030	0	0
S009	656	19	19	849	18	21	988	14	14
S010	660	19	19	845	18	21	998	14	14
S011	665	18	19	840	19	21	1011	14	14
S012	670	18	19	836	19	21	1022	14	14
S013	675	10	15	832	19	22	1034	0	0
S014	674	1	2	832	11	12	991	12	12
S015	676	1	2	829	19	22	998	12	12
S016	680	1	2	825	19	22	1008	13	13
S017	676	0	0	829	19	22	1014	0	0
S018	681	0	1	825	20	22	1026	0	0
S019	704	4	4	802	22	25	1017	18	18
S020	735	11	12	771	30	35	1027	9	9
S021	694	31	n/a	813	41	n/a	1052	20	n/a
S022	690	0	n/a	818	16	n/a	1047	0	n/a
S023	678	42	42	832	40	41	1050	38	38
S024	637 – 841	24	n/a	666 – 899	24	n/a	935 – 1202	18	n/a
S025	552 – 843	26	n/a	665 – 954	23	n/a	912 – 1203	20	n/a
S026	567 – 658	23	24	866 – 940	11	16	962 – 1082	18	18
S027	682 – 724	9	12	792 – 838	14	20	1016 – 1102	2	2
S028	685	25	26	795	34	35	989	32	32
S029	685	18	18	795	37	40	989	32	32
S030	615	21	21	893	0	0	921	17	17
S031	636	20	21	873	0	2	928	17	17
S032	640	15	0	869	17	0	932	7	0
S033	614	35	0	890	11	0	922	29	0
S034	602	35	36	902	11	11	971	29	29
S035	659	30	32	863	12	13	1082	25	25
S036	679	12	12	839	28	31	1086	2	2

Source ID	POR001			POR002			POR003		
	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)
S037	672	8	9	849	22	24	1090	0	0
S038	661	21	23	857	19	22	1069	16	16
S039	659	21	23	858	19	22	1066	16	16
S040	639	29	30	865	9	10	987	18	18
S041	643	33	34	862	14	14	996	24	24
S042	648	26	27	856	6	6	1008	19	19
S043	654	21	22	852	4	4	1023	15	15
S044	685	0	0	819	13	13	997	0	0

Table 6 provides a summary of the noise impact from the Facility's predictable worst case operation at the identified PORs. Noise contour figures have been provided in Figures 4A and 4B.

Table 6: Noise Impact Summary – Facility Operations – Osbourne Road Entrance

POR ID	POR Description	Time Period	SPL at POR (dBA)	Verified by Acoustic Audit (Yes/No)	Performance Limit (dBA)	Compliance with Performance Limit (Yes/No)
POR001	Two-storey single family dwelling	Daytime	45	No	50	Yes
		Evening / Night-time	45	No	45	Yes
POR002	Two-storey single family dwelling	Daytime	45	No	50	Yes
		Evening / Night-time	45	No	45	Yes
POR003	One-storey single family dwelling	Daytime	41	No	50	Yes
		Evening / Night-time	41	No	45	Yes

6.3 Results – Courtice Road Entrance

6.3.1 Predictable worst case operation at the Facility – Courtice Road Entrance

The Facility's noise emissions associated with Courtice Road entrance were modelled to predict the sound levels on the identified PORs during a predictable worst case 1-hour operation, as described in Section 3. Table 7 provides detailed noise impact predictions from each source at each POR. The table also includes the approximate distance to each source.

Table 7: Point of Reception Noise Impact – Facility Operations – Courtice Road Entrance

Source ID	POR001			POR002			POR003		
	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)
S001	664	6	7	844	19	20	965	19	19
S002	667	5	6	841	20	20	973	19	19
S003	733	15	16	776	25	27	1009	18	18
S004	643	21	24	862	16	21	984	14	14
S005	647	21	24	858	18	21	994	14	14
S006	653	21	24	853	18	21	1007	14	14
S007	658	21	24	849	19	21	1018	14	14
S008	663	21	23	845	19	21	1030	0	0
S009	656	19	19	849	18	21	988	14	14
S010	660	19	19	845	18	21	998	14	14
S011	665	18	19	840	19	21	1011	14	14
S012	670	18	19	836	19	21	1022	14	14
S013	675	10	15	832	19	22	1034	0	0
S014	674	1	2	832	11	12	991	12	12
S015	676	1	2	829	19	22	998	12	12
S016	680	1	2	825	19	22	1008	13	13
S017	676	0	0	829	19	22	1014	0	0
S018	681	0	1	825	20	22	1026	0	0
S019	704	4	5	802	22	25	1017	18	18
S020	735	11	12	771	30	35	1027	9	9
S021	694	31	n/a	813	41	n/a	1052	20	n/a
S022	690	0	n/a	818	16	n/a	1047	0	n/a
S023	678	42	42	832	40	41	1050	38	38
S024	579 – 802	24	n/a	734 – 969	21	n/a	934 – 1203	16	n/a
S025	553 – 804	27	n/a	734 – 968	19	n/a	913 – 1212	20	n/a
S026	567 – 658	23	24	866 – 940	11	15	962 – 1082	18	18
S027	682 – 724	9	12	792 – 838	14	20	1016 – 1102	2	2
S028	685	25	26	795	34	35	989	32	32
S029	685	18	18	795	37	40	989	32	32
S030	615	21	22	893	0	0	921	17	17
S031	636	21	21	873	0	2	928	17	17
S032	640	16	n/a	869	17	n/a	932	7	n/a
S033	614	36	n/a	890	11	n/a	922	29	n/a
S034	602	36	37	902	11	11	971	29	29
S035	659	30	32	863	12	12	1082	25	25
S036	679	12	12	839	27	30	1086	2	2
S037	672	9	10	849	22	24	1090	0	0

Source ID	POR001			POR002			POR003		
	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)
S038	661	21	23	857	19	22	1069	16	16
S039	659	21	23	858	19	22	1066	16	16
S040	639	29	30	865	9	10	987	18	18
S041	643	33	34	862	14	14	996	24	24
S042	648	26	27	856	6	6	1008	19	19
S043	654	21	22	852	4	4	1023	15	15
S044	685	0	0	819	8	13	997	0	0

Table 8 provides a summary of the noise impact from the Facility's predictable worst case operation at the identified PORs. Noise contour figures have been provided in Figures 5A and 5B.

Table 8: Noise Impact Summary – Facility Operations – Courtice Road Entrance

POR ID	POR Description	Time Period	SPL at POR (dBA)	Verified by Acoustic Audit (Yes/No)	Performance Limit (dBA)	Compliance with Performance Limit (Yes/No)
POR001	Two-storey single family dwelling	Daytime	45	No	50	Yes
		Evening / Night-time	45	No	45	Yes
POR002	Two-storey single family dwelling	Daytime	45	No	50	Yes
		Evening / Night-time	45	No	45	Yes
POR003	One-storey single family dwelling	Daytime	41	No	50	Yes
		Evening / Night-time	41	No	45	Yes

6.3.2 Standby Diesel Generator and Diesel Fire Pumps Testing

6.3.2.1 Standby Diesel Generator

As discussed in Section 3, the Facility includes one (1) standby diesel generator, which is tested periodically. The standby operation of the generator does not require a CofA; however, the periodic testing will require a CofA from the MOE. The standby diesel generator will be tested at a separate time from the diesel fire pumps and the standby diesel generator could be tested for up to an hour during the daytime hours. The noise impact from the periodic testing of the standby diesel generator on to the surrounding critical receptors were predicted and summarised in Table 9. Table 10 provides a summary of the noise impact from the standby generator testing at the identified PORs.

Table 9: Point of Reception Noise Impact – Standby Diesel Generator

Source ID	POR001			POR002			POR003		
	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)
S045	608	42	n/a	897	19	n/a	954	33	n/a
S046	606	24	n/a	900	6	n/a	954	20	n/a
S047	611	19	n/a	894	6	n/a	953	9	n/a

Table 10: Noise Impact Summary – Standby Diesel Generator

POR ID	POR Description	Time Period	SPL at POR (dBA)	Verified by Acoustic Audit (Yes/No)	Performance Limit (dBA)	Compliance with Performance Limit (Yes/No)
POR001	Two-storey single family dwelling	Daytime	42	No	50	Yes
POR002	Two-storey single family dwelling	Daytime	19	No	50	Yes
POR003	One-storey single family dwelling	Daytime	33	No	50	Yes

6.3.2.2 Diesel Fire Pumps

As discussed in Section 3, the Facility includes two (2) diesel fire pumps, which are tested periodically. The standby operation of the diesel fire pumps does not require a CofA; however, the periodic testing will require a CofA from the MOE. The diesel fire pumps will be tested separately and at a separate time from the standby diesel generator and could be tested for up to an hour each during the daytime hours. The noise impact from the periodic testing of individual diesel fire pumps on to the surrounding critical receptors were predicted and summarised in Table 11. Table 12 provides a summary of the noise impact from the diesel fire pump testing at the identified PORs.

Table 11: Point of Reception Noise Impact – Diesel Fire Pumps

Source ID	POR001			POR002			POR003		
	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)	Distance (m)	Daytime (dBA)	Evening / Night-time (dBA)
Diesel Fire Pump 1									
S048	725	39	n/a	786	39	n/a	1085	23	n/a
S049	720	26	n/a	789	7	n/a	1082	0	n/a
S050	728	4	n/a	782	10	n/a	1086	0	n/a
Diesel Fire Pump 2									
S051	727	39	n/a	784	39	n/a	1089	23	n/a
S052	723	28	n/a	788	8	n/a	1088	0	n/a
S053	730	5	n/a	780	15	n/a	1089	0	n/a

Table 12: Noise Impact Summary – Diesel Fire Pumps

POR ID	POR Description	Time Period	SPL at POR (dBA)	Verified by Acoustic Audit (Yes/No)	Performance Limit (dBA)	Compliance with Performance Limit (Yes/No)
Diesel Fire Pump 1						
POR001	Two -storey single family dwelling	Daytime	40	No	50	Yes
POR002	Two -storey single family dwelling	Daytime	39	No	50	Yes
POR003	One-storey single family dwelling	Daytime	23	No	50	Yes
Diesel Fire Pump 2						
POR001	Two -storey single family dwelling	Daytime	40	No	50	Yes
POR002	Two -storey single family dwelling	Daytime	39	No	50	Yes
POR003	One-storey single family dwelling	Daytime	23	No	50	Yes

The standby diesel generator and diesel fire pumps will be tested separately. The testing can occur any given hour during the daytime period. However, if that one (1) hour testing period occurs during the predictable worst case operation of the Facility, the sound levels could be higher than those presented in Tables 6 and 8. The combined sound levels with predictable worst case Facility operations and the periodic testing of the standby diesel generator and diesel fire pumps, at the PORs, are given in Table 13. As the predictable worst case from the Courtice Road entrance is either equal to or greater than those for the Osbourne Road entrance, this table conservatively presents the Courtice Road results.

Table 13: Predictable Worst Case of the Facility with Standby Equipment Testing

POR ID	Sound Level Facility Operation [dBA]	Sound Level during Testing [dBA]	Sound Level Combined [dBA]	Sound Limit [dBA]	Compliance with the Limit?
Standby Diesel Generator					
POR001	45	42	47	50	Yes
POR002	45	19	45	50	Yes
POR003	41	33	42	50	Yes
Diesel Fire Pump 1					
POR001	45	40	46	50	Yes
POR002	45	39	46	50	Yes
POR003	41	23	41	50	Yes
Diesel Fire Pump 2					
POR001	45	40	46	50	Yes
POR002	45	39	46	50	Yes
POR003	41	23	41	50	Yes

6.4 Noise Mitigation

Noise control measures will be inherent within the design of the Facility to mitigate possible noise impacts of the Facility. The Facility will be designed such that it meets the MOE noise guidelines for either the Osbourne Road or Courtice Road entrances.

Currently the noise controls discussed in this AAR are limited to silencers for the standby diesel generator and the two (2) diesel fire pumps.

As it is understood that the MOE review engineers' desire sound levels be verified, it is proposed that a study be completed within six (6) months (weather permitting) of commissioning and once the Facility reaches and sustains normal operations.

6.5 Discussion

1) Results presented in Sections 6.2.1 and 6.3.1 show that the normal operation of the Facility will meet the MOE sound level limit during a predictable worst case operation.

2) Results presented in Section 6.3.2 show that the periodic testing of the standby diesel generator and two (2) diesel fire pumps operated at the Facility will meet the MOE sound level limit.

3) Results presented in Section 6.3.2 show that if the standby diesel generator and diesel fire pumps are tested during the predictable worst case hour of the Facility operation, the sound level still meets the sound level limit at the PORs for either entrance option. The likelihood of the Facility operating at its predictable worst case mode continually during the periodic testing on the standby diesel generator and diesel fire pumps is considered remote.

4) Overall the Facility is predicted to operate in compliance with the MOE sound level limits.

7.0 CONCLUSION

Golder Associates Ltd. was retained by Covanta Energy Corporation (Covanta) to carry out an Acoustic Assessment to support the application for a CofA (Air and Noise) for the Facility located in Clarington, Ontario. Using Golder's database of similar sources and engineering calculations based on information provided by Covanta from previous experience with similar projects, Golder has predicted worst case noise impact levels that are at or below the MOE exclusionary sound level limits at identified PORs for both the Osbourne Road or Courtice Road entrances. As well, during the periodic testing of the standby diesel generator and diesel fire pumps, Golder has predicted sound levels below the MOE exclusionary sound level limits at the identified PORs. Therefore, the proposed Facility is predicted to operate in compliance with MOE sound level limits.

Report Signature Page

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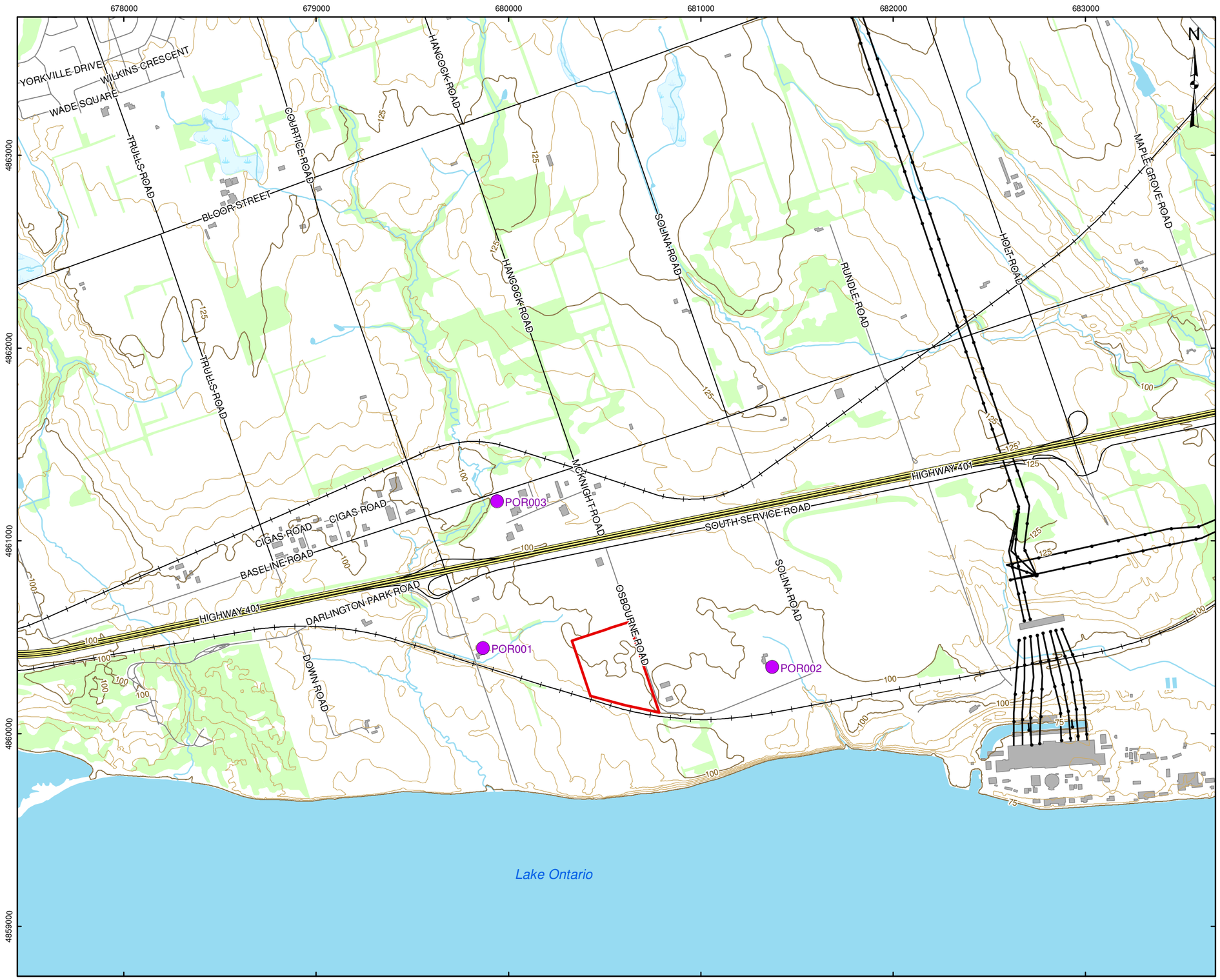
FIGURES



LEGEND

- Point of Reception
- Major Contour (25 m)
- Minor Contour (5 m)
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Utility Line
- Watercourse
- Waterbody
- Wetland
- Woodlot
- Building Footprint
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.5 0.25 0 0.5 1
SCALE 1:20,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
SITE LOCATION PLAN

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	**FIGURE: 1**	
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

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680250 680500 680750

4860500 4860250

Energy Park Drive

OSBOURNE ROAD

S030 S031 S032 S033 S001 S002 S003 S014 S028 S029 S047 S046 S045 S009 S015 S044 S019 S020 S004 S010 S016 S040 S025 S005 S011 S017 S041 S034 S006 S018 S042 S012 S013 S022 S007 S043 S008 S021 S023 S048 S050 S024 S049 S053 S052 S051 S039 S038 S026 S036 S027 S037 S035

N

LEGEND

- Point Source
- Line Source
- Vertical Area Source
- Site Road (Paved)
- Site Road (Gravel)
- Railway
- Roof Plan
- Area Source
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions, obtained on December 16, 2010, 20 cm resolution.
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

50 25 0 50 100
SCALE 1:2,000 METERS

PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

SITE LAYOUT PLAN – OSBOURNE ROAD ENTRANCE

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	FIGURE: 2A	
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

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680250 680500 680750

4860500 4860250

Energy Park Drive

OSBOURNE ROAD

S030 S031 S032 S033 S034 S035 S036 S037 S038 S039 S040 S041 S042 S043 S044 S045 S046 S047 S048 S049 S050 S051 S052 S053 S001 S002 S003 S004 S005 S006 S007 S008 S009 S010 S011 S012 S013 S014 S015 S016 S017 S018 S019 S020 S021 S022 S023 S024 S025 S026 S027 S028 S029

N

LEGEND

- Point Source
- Line Source
- Vertical Area Source
- Site Road (Paved)
- Site Road (Gravel)
- Railway
- Roof Plan
- Area Source
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions, obtained on December 16, 2010, 20 cm resolution.
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

50 25 0 50 100
SCALE 1:2,000 METERS

PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

SITE LAYOUT PLAN – COURTICE ROAD ENTRANCE

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	FIGURE: 2B	
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CofA\NoiseSite_Layout_Plan.mxd

High Pressure Steam Out

Feedwater In

In–Plant Steam

Electric Power Out

Turbine Generator

Future District Heating Extraction

Air Cooled Condenser

SNCR

Solid Waste In

Boiler–Stoker

Air Pollution Control

Dirty Flue Gas In

Clean Gas Out

Scrubber Water

Stack

Internal Recirulcation Gas Fan

Air In

Air Heaters & Misc.

Combustion Air Fan

Boiler Blowdown Water

Bottom Ash

To WWHT

Quench Water

Fly Ash

Induced Draft Fan

Make–up Water

Boiler Feedwater Heating

Over Sized

Grizzly

Portland Cement

Pozzolan

Fly Ash Conditioner

Non–Ferrous Metals

Metals Recovery

Bottom Ash

Bottom Ash Storage

Fly Ash Storage

Reverse Osmosis System

To Scrubber

To Ash Discharger

Waste Water Holding Tank (WWHT)

Boiler Blowdown Water

Ferrous Metals

To Bottom Ash Residue Trucks

To Fly Ash Residue Trucks

Water Supply

PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

SIMPLIFIED PROCESS FLOW DIAGRAM

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	13 Jan. 2011		
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 3

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679500 680000 680500 681000 681500

4861000 4860500 4860000

POR003 POR001 POR002

BASELINE-ROAD MARINE-DRIVE COURTICE-COURT MCKNIGHT-ROAD HIGHWAY-401 SOUTH-SERVICE-ROAD SONNA-ROAD Energy Park Drive OSBOURNE-ROAD COURTICE-ROAD

N

LEGEND

- Point of Reception
- Road
- Site Road
- Railway
- Waterbody
- Approximate Site Boundary

Predicted Daytime Noise Level (dBA)

- < 30
- 30
- 35
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85
- 90
- > 90

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
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Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

100 50 0 100 200 300 400
SCALE 1:7,250 METERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
PREDICTED NOISE CONTOURS, OSBOURNE ROAD ENTRANCE (DAYTIME)

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 4A

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679500 680000 680500 681000 681500

4861000 4860500 4860000

BASELINE-ROAD
PROGRESS-DRIVE
COURTICE-COURT
MCKNIGHT-ROAD
MARINE-DRIVE
HIGHWAY-401
SOUTH-SERVICE-ROAD
OSBOURNE-ROAD
SOLINA-ROAD
DARLINGTON-PARK-ROAD
COURTICE-ROAD
Energy Park Drive

POR001
POR002
POR003

40 45 50 55 60 65 70 75 80

N

LEGEND

- Point of Reception
- Road
- Site Road
- Railway
- Waterbody
- Approximate Site Boundary

Predicted Night Time Noise Level (dBA)

- < 30
- 30
- 35
- 40
- 45
- 50
- 55
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- 65
- 70
- 75
- 80
- 85
- 90
- > 90

REFERENCE

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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

100 50 0 100 200 300 400
SCALE 1:7,250 METERS

PROJECT
DURHAM YORK ENERGY CENTRE

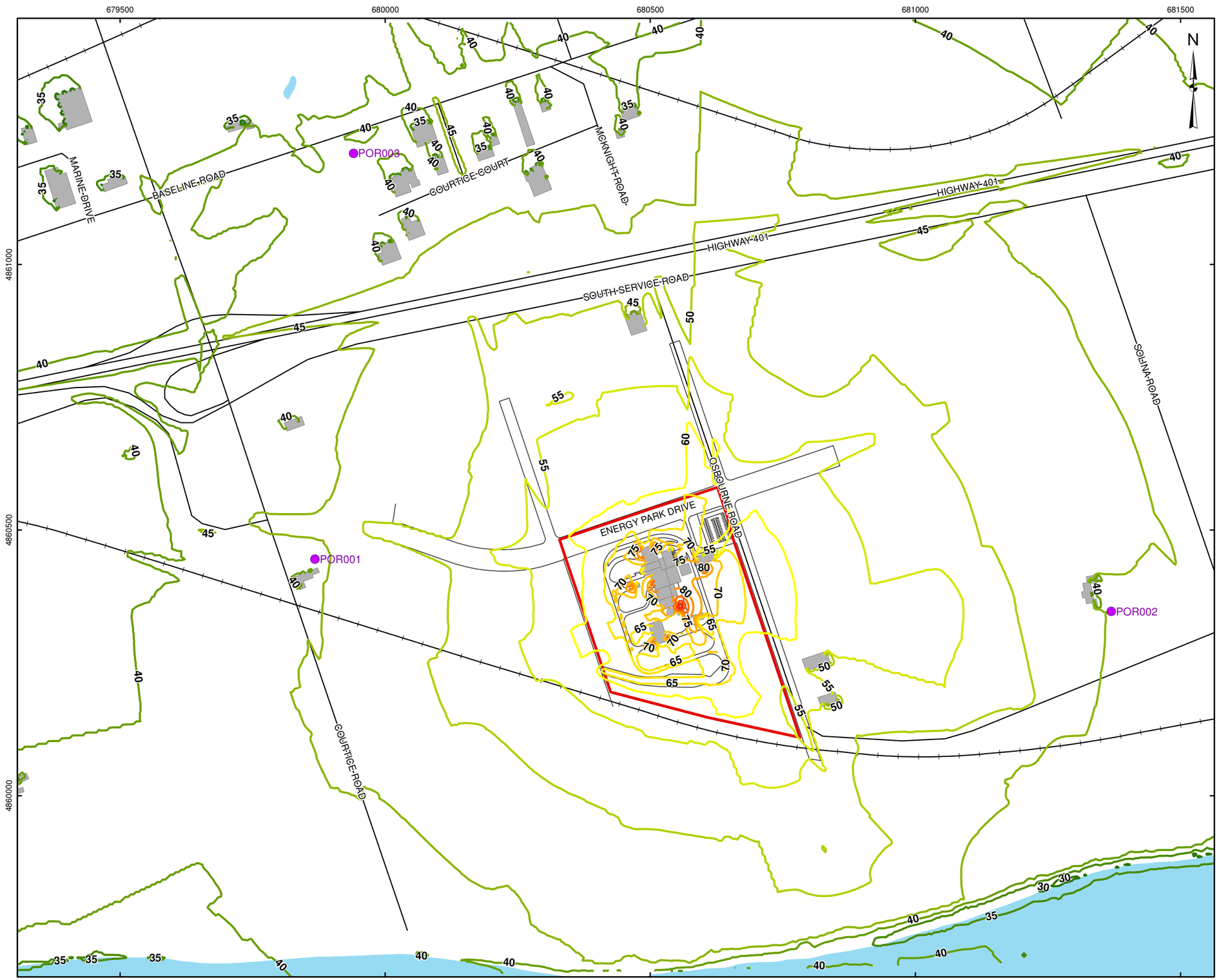
TITLE
PREDICTED NOISE CONTOURS, OSBOURNE ROAD ENTRANCE (NIGHT-TIME)

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 4B

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\Cof A\Noise\Predicted_Noise_Contours_Nighttime_LayoutB.mxd



LEGEND

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- Waterbody
- Approximate Site Boundary

Predicted Daytime Noise Level (dBA)

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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

100 50 0 100 200 300 400
SCALE 1:7,250 METERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
PREDICTED NOISE CONTOURS, COURTICE ROAD ENTRANCE (DAYTIME)

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	FIGURE: 5A	
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

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679500 680000 680500 681000 681500

4861000 4860500 4860000

BASELINE ROAD
PROGRESS DRIVE
COURTICE COURT
MCKNIGHT ROAD
MARINE DRIVE
HIGHWAY 401
SOUTH SERVICE ROAD
DARLINGTON PARK ROAD
COURTICE ROAD
ENERGY PARK DRIVE
OSBOURNE ROAD
SOLINA ROAD

POR001
POR002
POR003

40 45 50 55 60 65 70 75 80 85

N

LEGEND

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Predicted Night Time Noise Level (dBA)

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100 50 0 100 200 300 400
SCALE 1:7,250 METERS

PROJECT

DURHAM YORK ENERGY CENTRE

TITLE

PREDICTED NOISE CONTOURS, COURTICE ROAD ENTRANCE (NIGHT-TIME)

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	1 Feb. 2011		
CHECK	PN	1 Feb. 2011		
REVIEW	PN	1 Feb. 2011		

FIGURE: 5B

G:\Projects\2010\10-1151-0343_Covanta\GIS\MXDs\Reporting\CofA\Noise\Predicted_Noise_Contours_Nighttime.mxd

APPENDIX A

Environmental Assessment Notice of Approval

ENVIRONMENTAL ASSESSMENT ACT

SECTION 9

NOTICE OF APPROVAL TO PROCEED WITH THE UNDERTAKING

RE: The Amended Environmental Assessment for Durham and York Residual Waste Study

Proponent: The Regional Municipalities of Durham and York

EA File No.: 04-EA-02-08

TAKE NOTICE that the period for requiring a hearing, provided for in the Notice of Completion of the Review for the above-noted undertaking, expired on April 2, 2010. I received 185 submissions requesting a hearing by the Environmental Review Tribunal before the expiration date.

I consider a hearing to be unnecessary in this case. Having considered the purpose of the *Environmental Assessment Act*, the approved terms of reference, the environmental assessment, the ministry Review of the environmental assessment and submissions received, I hereby give approval to proceed with the undertaking, subject to the conditions set out below.

REASONS

My reasons for giving approval are:

(1) The proponent has complied with the requirements of the *Environmental Assessment Act*.

(2) The environmental assessment has been prepared in accordance with the approved Terms of Reference.

(3) On the basis of the proponent's environmental assessment and the ministry Review, the proponent's conclusion that, on balance, the advantages of this undertaking outweigh its disadvantages appears to be valid.

(4) No other beneficial alternative method of implementing the undertaking was identified.

(5) The proponent has demonstrated that the environmental effects of the undertaking can be appropriately prevented, changed, mitigated or remedied.

(6) On the basis of the proponent's environmental assessment, the ministry Review and the conditions of approval, the construction, operation and maintenance of the undertaking will be consistent with the purpose of the *Environmental Assessment Act* (section 2).

(7) The ministry's review of: the government, public and Aboriginal community submissions on the environmental assessment; the environmental assessment; and the ministry Review has indicated no outstanding concerns that have not been addressed or that cannot be addressed through commitments made during the environmental assessment process, through the conditions set out below or through future approvals that will be required.

(8) The submissions received after the Notice of Completion of ministry Review was published are being addressed through commitments made during the environmental assessment process, through the conditions set out below or through future approvals that will be required, where appropriate. I am not aware of any significant outstanding issues with respect to this undertaking which suggest that a hearing should be required.

CONDITIONS

The approval is subject to the following conditions:

1. Definitions

For the purposes of these conditions:

"advisory committee" means the committee established pursuant to Condition 8 of this Notice of Approval.

"CEM" means an air emissions monitoring system which continually monitors concentrations of certain contaminants emitted by the facility.

"date of approval" means the date on which the Order in Council was approved by the Lieutenant Governor in Council.

"Director" means the Director of the Environmental Assessment and Approvals Branch.

"District Manager" means the Manager of the Ministry of the Environment's York-Durham Office.

"EAAB" means the Environmental Assessment and Approvals Branch of the Ministry of the Environment.

"environmental assessment" means the document titled Durham/York Residual Waste Study Environmental Assessment Study Document (As Amended November 27, 2009).

"ministry" means the Ontario Ministry of the Environment, or successor, unless specific reference is made to another Ministry.

"non-hazardous municipal solid waste" means the waste that is generated within the municipalities of Durham and York and collected as part of the proponents municipal collection process.

"proponent" means the Regional Municipality of Durham and the Regional Municipality of York.

"Qualified, Independent Professional Engineer" means a person who holds a licence, limited licence or temporary licence under the *Professional Engineers Act* who is not an employee of the Regional Municipality of Durham, the Regional Municipality of York, the operator of the undertaking, or the ministry, who has not been involved in the design of the undertaking or preparation of documentation as part of an application for approval of the undertaking but who is knowledgeable about the *Environmental Protection Act*, Regulation 347 and Ontario Regulation 419/05, ministry guidelines affecting thermal treatment facilities, any other ministry approval issued for the undertaking as well as being experienced at assessing compliance with environmental legislation and requirements of certificates of approval issued under the *Environmental Protection Act*.

"receipt" means the arrival and acceptance of waste at the site, whether remaining in the vehicles used to transport the waste to the site or unloaded from the vehicles used to transport the waste to the site.

"Regional Director" means the Director of the ministry's Central Regional Office.

"site" means the 12.1 hectare parcel of land referred to as Clarington 01 in the environmental assessment and is located south of Highway 401 on the west side of Osbourne Road and north of the CN Rail corridor in the Municipality of Clarington.

"start of construction" means physical construction activities including, site preparation works, but does not include the tendering of contracts.

"undertaking" means the construction and operation of a thermal treatment waste management facility on the site, as set out in the environmental assessment.

2. General Requirements

2.1 The proponent shall comply with the provisions in the environmental assessment which are hereby incorporated in this Notice of Approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site or the undertaking.

2.2 These conditions do not prevent more restrictive conditions being imposed under other statutes.

2.3 A statement must accompany the submission of any documents, reporting requirements or written notices required by this Notice of Approval to be submitted to the Director or Regional Director identifying which conditions the submission is intended to address in this Notice of Approval.

3. Public Record

3.1 Where a document, plan or report is required to be submitted to the ministry, the proponent shall provide two copies of the final document, plan or report to the Director: a copy for filing in the specific public record file maintained for the undertaking and a copy for staff use.

3.2 The proponent shall provide additional copies of the documents required for the public record file to the following for access by the public:

a) Regional Director;

b) District Manager;

c) Clerks of the Regional Municipality of Durham, the Regional Municipality of York, and the Municipality of Clarington; and,

d) Advisory Committee (as required in Condition 8 of this Notice of Approval).

3.3 The EAAB file number EA-08-02 shall be quoted on all documents submitted by the proponent pursuant to this Condition.

4. Compliance Monitoring Program

4.1 The proponent shall prepare and submit to the Director a Compliance Monitoring Program outlining how it will comply with conditions in the Notice of Approval and other commitments made in the environmental assessment.

4.2 A statement shall accompany the submission of the Compliance Monitoring Program indicating that the submission is intended to fulfil Condition 4 of this Notice of Approval.

4.3 The Compliance Monitoring Program shall be submitted within one year from the date of approval, or a minimum of 60 days prior to the start of construction, whichever is earlier.

4.4 The Compliance Monitoring Program shall describe how the proponent will monitor its fulfilment of the provisions of the environmental assessment pertaining to mitigation measures, public consultation, and additional studies and work to be carried out; the fulfilment of all other commitments made by the proponent during the environmental assessment process; and the conditions included in this Notice of Approval.

4.5 The Compliance Monitoring Program shall contain an implementation schedule.

4.6 The Director may require amendments to the Compliance Monitoring Program, including the implementation schedule. If any amendments are required by the Director, the Director will notify the proponent of the required amendments in writing.

4.7 The proponent shall implement the Compliance Monitoring Program, as it may be amended by the Director.

4.8 The proponent shall make the documentation pertaining to the Compliance Monitoring Program available to the ministry or its designate in a timely manner when requested to do so by the ministry.

5. Compliance Reporting

5.1 The proponent shall prepare an annual Compliance Report which describes its compliance with the conditions of approval set out in this Notice of Approval and which describes the results of the proponent's environmental assessment Compliance Monitoring Program required by Condition 4.

5.2 The annual Compliance Report shall be submitted to the Director within one year from the date of approval, with the first report being due in 2011, and shall cover all activities of the previous 12 month period.

5.3 Subsequent compliance reports shall be submitted to the Director on or before the anniversary of the date of approval each year thereafter. Each Compliance Report shall cover all activities of the previous 12 month period.

5.4 The proponent shall submit annual Compliance Reports until all conditions in this Notice of Approval and the commitments in the environmental assessment are satisfied.

5.5 Once all conditions in this Notice of Approval have been satisfied, or have been incorporated into any other ministry approval, the proponent shall indicate in its annual Compliance Report that the Compliance Report is its final Compliance Report and that all conditions in this Notice of Approval have been satisfied.

5.6 The proponent shall retain either on site or in another location approved by the Director, a copy of each of the annual Compliance Reports and any associated documentation of compliance monitoring activities.

5.7 The proponent shall make the Compliance Reports and associated documentation available to the ministry or its designate in a timely manner when requested to do so by the ministry.

6. Complaint Protocol

6.1 The proponent shall prepare and implement a Complaint Protocol setting out how it will deal with and respond to inquiries and complaints received during the design, construction and operation of the undertaking.

6.2 The Complaint Protocol shall be provided to the advisory committee for review prior to submission to the Director.

6.3 The proponent shall submit the Complaint Protocol to the Director within one year from the date of approval or a minimum of 60 days prior to the start of construction, whichever is earlier.

6.4 The Director may require the proponent to amend the Complaint Protocol at any time. Should an amendment be required, the Director will notify the proponent in writing of the required amendment and date by which the amendment must be completed.

6.5 The proponent shall submit the amended Complaint Protocol to the Director within the time period specified by the Director in the notice.

7. Community Involvement

7.1 The proponent shall prepare and implement a Community Communications Plan. The plan shall be prepared, in consultation with the EAAB and to the satisfaction of the Director.

7.2 The proponent shall finalize and submit the Community Communications Plan to the Director prior to the initial receipt of non-hazardous municipal solid waste at the site.

7.3 The Community Communications Plan shall include at a minimum details on:

a) How the proponent plans to disseminate information to interested members of the public and any Aboriginal communities;

b) How interested members of the public and any Aboriginal communities will be notified and kept informed about site operations; and,

c) The procedures for keeping interested members of the public and Aboriginal communities informed about information on documents related to the undertaking, and when and how the information will be made available.

7.4 The proponent shall give notice of and provide information about the undertaking to interested members of the public and Aboriginal communities through an internet web site and by other means. Such information shall include:

a) Activities that are part of the undertaking, including monitoring activities;

b) Reports and records related to the undertaking that are required to be submitted under this Notice of Approval or under any other ministry approvals that apply to the undertaking; and,

c) Information on the Complaint Protocol required by Condition 6 of this Notice of Approval.

7.5 The proponent shall hold public meetings to discuss the design, construction and operation of the undertaking, including, but not limited to:

a) At least one meeting prior to the start of construction;

b) At least one meeting prior to the receipt of non-hazardous municipal solid waste on site; and,

c) At least one meeting a minimum of six months but not later than 12 months after the initial receipt of non-hazardous municipal solid waste on the site.

7.6 The proponent shall provide notice of the public meetings a minimum of 15 days prior to the meeting.

7.7 The proponent shall give the Director written notice of the time, date and location of each of the required community meetings a minimum of 15 days prior to the meeting.

8. Advisory Committee

8.1 The proponent shall establish an advisory committee to ensure that concerns about the design, construction and operation of the undertaking are considered and mitigation measures are implemented where appropriate.

8.2 The proponent shall provide administrative support for the advisory committee including, at a minimum:

a) Providing a meeting space for advisory committee meetings;

b) Recording and distributing minutes of each meeting;

c) Preparing and distributing meeting notices; and,

d) Preparing an annual report about the advisory committee's activities to be submitted as part of the Compliance Reports required by Condition 5 of this Notice of Approval.

8.3 The proponent shall invite one representative from each of the following to participate on the advisory committee:

a) Each of the lower tier municipalities in the Regional Municipality of Durham; and,

b) Each of the lower tier municipalities in the Regional Municipality of York.

8.4 The proponent shall invite one representative from Central Lake Ontario Conservation Authority, and any other local conservation authorities that may have an interest in the undertaking to participate on the advisory committee.

8.5 The proponent shall invite one representative from each of the following local community groups to participate on the advisory committee:

a) DurhamCLEAR;

b) Durham Environmental Watch; and,

c) Zero Waste 4 Zero Burning.

8.6 The proponent may also invite other stakeholders to participate in the advisory committee, including, but not limited to, interested members of the public, Aboriginal communities, and other federal or provincial agencies.

8.7 A representative from the ministry shall be invited to attend meetings as an observer.

8.8 The advisory committee shall be provided with a copy of the documents listed below for information and may review the documents as appropriate and provide comments to the proponent about the documents, including the:

a) Compliance Monitoring Program required by Condition 4;

b) Annual Compliance Report required by Condition 5;

c) Complaint Protocol required by Condition 6;

d) Community Communications Plan required by Condition 7;

e) The annual reports required by Condition 10;

f) Ambient Air Monitoring and Reporting Plan and the results of the ambient air monitoring program required by Condition 11;

g) Air Emissions Monitoring Plan required by Condition 12;

h) Written report prepared and signed by the qualified professional required by Condition 16.5;

i) Spill Contingency and Emergency Response Plan required by Condition 17;

j) Odour Management and Mitigation Plan and the Odour Management and Mitigation Monitoring Reports required by Condition 18;

k) Noise Monitoring and Reporting Plan as required by Condition 19;

l) Groundwater and Surface Water Monitoring Plan, the results of the groundwater and surface water monitoring program, and the annual report on the results of the groundwater and surface water monitoring program required by Condition 20; and,

m) Notice in writing of the date that municipal solid waste is first received as required by Condition 23.

8.9 The proponent shall hold the first advisory committee meeting within three months of the date of approval. At the first meeting, the advisory committee shall develop a Terms of Reference outlining the governance and function of the advisory committee.

8.10 The Terms of Reference shall, at a minimum, include:

a) Roles and responsibilities of the advisory committee members;

b) Frequency of meetings;

c) Member code of conduct;

d) Protocol for dissemination and review of information including timing; and,

e) Protocol for dissolution of the advisory committee.

8.11 The proponent shall submit the advisory committee's Terms of Reference to the Director and Regional Director.

9. Consultation With Aboriginal Communities

9.1 The proponent shall continue to consult with any interested Aboriginal communities during the detailed design and implementation of the undertaking.

10. Waste Diversion

10.1 The proponent shall make a reasonable effort to work cooperatively with all lower tier municipalities to ensure that waste diversion programs, policies and targets set by the Regional Municipalities are being met.

10.2 The proponent shall prepare and implement a Waste Diversion Program Monitoring Plan.

10.3 The Waste Diversion Program Monitoring Plan shall provide a description of monitoring and reporting which shall at minimum include:

a) Results of at source diversion programs and policies to determine the waste diversion rates and practices at both the regional and lower tier municipal level within the Regional Municipalities of Durham and York.

b) Progress in the diversion programs, policies, practices and targets described in the environmental assessment, at both the regional and lower tier municipal level within the Regional Municipalities of Durham and York.

c) Monitoring results for any additional diversion programs, policies, practices and targets carried out within the Regional Municipalities of Durham and York, which are not described in the environmental assessment.

10.4 The proponent shall prepare and submit to the Director and Regional Director, commencing one year after the approval of the undertaking, annual reports detailing the results of the Waste Diversion Program Monitoring Plan.

10.5 The proponent shall post the Waste Diversion Program Monitoring Plan and the annual reports required on the proponent's web site for the undertaking.

11. Ambient Air Monitoring and Reporting

11.1 The proponent shall prepare, in consultation with the ministry's Central Region Office and to the satisfaction of the Regional Director, an Ambient Air Monitoring and Reporting Plan for the undertaking.

11.2 The proponent shall submit the Ambient Air Monitoring and Reporting Plan to the Director and Regional Director a minimum of nine months prior to the start of construction or by such other date as agreed to in writing by the Regional Director.

11.3 The proponent shall establish a working group that will provide advice on the development of the Ambient Air Monitoring and Reporting Plan. The Regions will, at a minimum, extend an invitation to Health Canada, the Durham Region Health Department, York Region Public Health Services, one participant from the advisory committee, and any other relevant federal or provincial government agencies including the ministry.

11.4 The Ambient Air Monitoring and Reporting Plan shall include at minimum:

a) An ambient air monitoring program which includes an appropriate number of sampling locations. Siting of the sampling locations shall be done in accordance with the Ministry of the Environment's Operations Manual for Air Quality Monitoring in Ontario, March 2008, as amended from time to time;

b) The proposed start date for and frequency of the ambient air monitoring and reporting to be carried out;

c) The contaminants that shall be monitored as part of the Ambient Air Monitoring and Reporting Plan; and,

d) At least one meeting on an annual basis between the proponent and the Regional Director to discuss the plan, the results of the ambient air monitoring program and any changes that are required to be made to the plan by the Regional Director.

11.5 The proponent shall implement the ambient air monitoring program prior to the receipt of non-hazardous municipal solid waste on the site or at such other time that may be determined by the Regional Director and communicated to the proponent in writing and shall continue the monitoring until such time as the Regional Director notifies the proponent in writing that the Ambient Air Monitoring Program is no longer required.

11.6 The Regional Director may require changes to be made to the Ambient Air Monitoring and Reporting Plan and the proponents shall implement the plan in accordance with the required changes.

11.7 The proponent shall report the results of the ambient air monitoring program to the Regional Director in accordance with the Ambient Air Monitoring and Reporting Plan.

11.8 Audits will be conducted by the ministry, as outlined in the Ministry of the Environment's Audit Manual for Air Quality Monitoring in Ontario, March 2008 to confirm that siting and performance criteria outlined in the Operations Manual are met. The proponent shall implement any recommendations set out in the audit report regarding siting of the sampling locations and performance criteria. The proponent shall implement the recommendations in the audit report within three months of the receipt of an audit report from the ministry.

11.9 The proponent shall post the Ambient Air Monitoring and Reporting Plan and the results of the ambient air monitoring program on the proponent's web site for the undertaking upon submission of the plan or results of the program to the ministry.

12. Emissions Monitoring

12.1 The proponent shall install, operate and maintain air emissions monitoring systems that will record the concentrations of the contaminants arising from the incineration of waste.

12.2 The air emissions monitoring systems shall be installed and operational prior to the receipt of non-hazardous municipal solid waste at the site.

12.3 The proponent shall prepare and implement an Air Emissions Monitoring Plan. The Plan shall be prepared, in consultation with the ministry and to the satisfaction of the Director.

12.4 The Air Emissions Monitoring Plan shall include, at a minimum:

a) Identification of all sources of air emissions at the site to be monitored;

b) Identification of which contaminants will be monitored by continuous emissions monitoring and which by stack testing;

c) The proposed start date for and frequency of air emissions monitoring;

d) The frequency of and format for reporting the results of air emissions monitoring;

e) The contaminants that shall be monitored, which shall include at a minimum those contaminants set out in Schedule 1 to this Notice of Approval; and,

f) A notification, investigation and reporting protocol to be used in the event that the concentration(s) of one or more of the contaminants released from an emission source that requires approval under Section 9 of the *Environmental Protection Act* exceed the relevant limits.

12.5 The proponent shall submit the Air Emissions Monitoring Plan to the Director, a minimum of six months prior to the start of construction or by such other date as agreed to in writing by the Director

12.6 The proponent shall implement the Air Emissions Monitoring Plan such that the monitoring commences when the first discharges are emitted from the facility to the air or at such other time as the Director may agree to in writing and shall continue until such time as the Director notifies the proponent in writing that the Air Emissions Monitoring Plan is no longer required.

12.7 The proponent shall post the reports of the air emissions monitoring systems on the proponent's web site for the undertaking.

12.8 For those contaminants that are monitored on a continuous basis, the proponent shall post on the proponent's website for the undertaking the results of the monitoring for each of those contaminants in real time.

13. Air Emissions Operational Requirements

13.1 The proponent is expected to operate the undertaking in accordance with Schedule 1 of this Notice of Approval. If the facility is not operating in accordance with Schedule 1, the operator is required to take steps to bring the facility back within these operational requirements.

13.2 Schedule 1 sets out the operational requirements the ministry expects the facility to meet during the normal operating conditions of the facility when operating under a steady state but does not include start up, shut down, or malfunction.

13.3 The timing and frequency of monitoring for a contaminant in Schedule 1 shall be as required by the approval granted to the facility under the *Environmental Protection Act*, should approval be granted.

14. Daily Site Inspection

14.1 The proponent shall conduct a daily inspection of the site including the non-hazardous municipal solid waste received at the site, each day the undertaking is in operation to confirm that:

a) The site is secure;

b) The operation of the undertaking is not causing any nuisance impacts;

c) The operation of the undertaking is not causing any adverse effects on the environment;

d) The undertaking is being operated in compliance with the conditions in this Notice of Approval and any other ministry approvals issued for the undertaking; and,

e) Only non-hazardous waste is being received at the site.

14.2 If, as a result of the daily inspection, any deficiencies are noted by the employee in regard to the factors set out in Condition 14.1 above, the deficiency shall be remedied immediately by the proponent. If necessary to remedy the deficiency, the proponent shall cease operations at the site until the deficiency has been remedied.

14.3 A record of the daily inspections shall be kept in the daily log book required in Condition 15. The information below must be recorded in the daily log book by the person completing the inspection and includes the following information:

a) The name and signature of the person that conducted the daily inspection;

b) The date and time of the daily inspection;

c) A list of any deficiencies discovered during the daily inspection;

d) Any recommendations for action; and,

e) The date, time and description of actions taken.

14.4 The proponent shall retain either on site or in another location approved by the District Manager, a copy of the daily log book and any associated documentation regarding the daily site inspections.

15. Daily Record Keeping

15.1 The proponent shall maintain a written daily log which shall include the following information:

a) Date;

b) Types, quantities and source of non-hazardous municipal solid waste received;

c) Quantity of unprocessed, processed and residual non-hazardous municipal solid waste on the site;

d) Quantities and destination of each type of residual material shipped from the site;

e) The record of daily site inspections required to be maintained by Condition 14.3;

f) A record of any spills or process upsets at the site, the nature of the spill or process upset and the action taken for the clean up or correction of the spill or process upset, the time and date of the spill or process upset, and for spills, the time that the ministry and other persons were notified of the spill pursuant to the reporting requirements of the *Environmental Protection Act*;

g) A record of any waste that was refused at the site, including: amounts, reasons for refusal and actions taken; and,

h) The name and signature of the person completing the report.

15.2 The proponent shall retain, either on site or in another location approved by the District Manager, a copy of the daily log book and any associated documentation.

15.3 The proponent shall make the daily log book and any associated documentation available to the ministry or its designate in a timely manner when requested to do so by the ministry.

16. Third Party Audits

16.1 The proponent shall retain the services of a Qualified, Independent Professional Engineer to carry out an independent audit of the undertaking.

16.2 Within six months from the date of approval or other such date as agreed to in writing by the Regional Director, the proponent shall submit to the Director and the Regional Director, the name of the Qualified, Independent Professional Engineer and the name of the company where he/she is employed.

16.3 The proponent shall submit an audit plan to the satisfaction of the Regional Director that sets out the timing of and frequency for the audits, as well as the manner in which the audits are to be carried out.

16.4 The audit shall include, at a minimum, the following:

a) A detailed walkthrough of the entire site;

b) A review of all operations used in connection with the undertaking; and,

c) A detailed review of all records required to be kept by this Notice of Approval or under any other ministry approvals for the undertaking.

d) The proponent shall obtain from the Qualified, Independent Professional Engineer, a written report of the audit prepared and signed by the Qualified, Independent Professional Engineer that summarizes the results of the audit.

16.5 The proponent shall submit the written report summarizing the result of the audit to the Regional Director no later than 10 business days following the completion of the audit.

16.6 The proponent shall retain either on site or in another location approved by the Regional Director, a copy of the written audit report and any associated documentation.

16.7 The proponent shall make the written audit report and any associated documentation available to the ministry or its designate in a timely manner when requested to do so by the ministry.

16.8 The proponent shall post the written audit report on the proponent's web site for the undertaking following submission of the report to the ministry.

17. Spill Contingency and Emergency Response Plan

17.1 The proponent shall prepare and implement a Spill Contingency and Emergency Response Plan.

17.2 The proponent shall submit to the Director, the Spill Contingency and Emergency Response Plan a minimum of 60 days prior to the receipt of non-hazardous municipal solid waste at the site or such other date as agreed to in writing by the Director.

17.3 The Spill Contingency and Emergency Response Plan shall include, but is not limited to:

a) Emergency response procedures, including notification procedures in case of a spill, fires, explosions or other disruptions to the operations of the facility;

b) Cell and business phone numbers and work locations for all person(s) responsible for the management of the site;

c) Emergency phone numbers for the local ministry office, the ministry's Spills Action Centre, and the local Fire Department;

d) Measures to prevent spills, fires and explosions;

e) Procedures for use in the event of a fire;

f) Details regarding equipment for spill clean-up and all control and safety devices;

g) Shut down procedures for all operations associated with the undertaking including alternative waste disposal site locations;

h) Maintenance and testing program for spill clean-up equipment and fire fighting equipment;

i) Training for site operators and emergency response personnel; and,

j) A plan, identifying the location and nature of wastes on site.

17.4 The proponent shall provide the Spill Contingency and Emergency Response Plan to the District Manager, the local Municipality of Clarington and the local Municipality of Clarington Fire Department a minimum of 30 days prior to the initial receipt of non-hazardous municipal solid waste at the site or such other date as agreed to in writing by the Director.

17.5 The proponent shall take all necessary steps to contain and clean up a spill on the site. A spill or upset shall be reported immediately to the ministry's Spills Action Centre at (416) 325-3000 or 1-800-268-6060.

18. Odour Management and Mitigation

18.1 The proponent shall prepare, in consultation with the ministry's Central Region Office and to the satisfaction of the Regional Director, and implement an Odour Management and Mitigation Plan for the undertaking.

18.2 The proponent shall submit the Odour Management and Mitigation Plan to the Regional Director a minimum of six months prior to the start of construction or at such other time as agreed to in writing by the Regional Director.

18.3 The Odour Management and Mitigation Plan shall include at a minimum:

a) Standard operating and shut down procedures;

b) Maintenance schedules;

c) Ongoing monitoring for and reporting of odour;

d) Corrective action measures and other best management practices for ongoing odour control and for potential operational malfunctions;

e) A schedule for odour testing at sensitive receptors; and,

f) A section that specifically addresses odour control measures should operation of the undertaking be disrupted or cease.

18.4 The proponent shall prepare and submit the Odour Management and Mitigation Monitoring Reports annually to the Regional Director with the first report submitted beginning six months following the initial receipt of non-hazardous municipal solid waste at the site or such other date as agreed to in writing by the Regional Director.

18.5 The Odour Management and Mitigation Monitoring Reports shall be submitted every 12 months from the date of the submission of the first report or until such time as the Regional Director notifies the proponent in writing that the Odour Management and Mitigation Monitoring Reports are no longer required.

18.6 The proponent shall post the Odour Management and Mitigation Monitoring Reports on the proponent's web site for the undertaking following submission of the reports to the Regional Director.

19. Noise Monitoring and Reporting

19.1 The proponent shall prepare and implement a Noise Monitoring and Reporting Plan for the undertaking.

19.2 The proponent shall submit the Noise Monitoring and Reporting Plan to the Director a minimum of 90 days prior to the start of construction or such other date as agreed to in writing by the Director.

19.3 The Noise Monitoring and Reporting Plan shall include a protocol to ensure that the noise emissions from the facility comply with the limits set out in the Ministry of the Environment's Publication NPC-205 "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)", October 1995, as amended from time to time.

19.4 The proponent shall post the Noise Monitoring and Reporting Plan and on the proponent's web site for the undertaking following submission of the plan to the Director.

20. Groundwater and Surface Water Monitoring and Reporting

20.1 Prior to the start of construction, the proponent shall identify any areas where the undertaking may affect groundwater or surface water. For those areas, the proponent shall prepare and implement, in consultation with the ministry's

Central Region Office and to the satisfaction of the Regional Director, a Groundwater and Surface Water Monitoring Plan.

20.2 The proponent shall provide the Groundwater and Surface Water Monitoring Plan to other any government agencies for review and comment, as may be appropriate.

20.3 The Groundwater and Surface Water Monitoring Plan shall include at a minimum:

a) A groundwater and surface water monitoring program;

b) The proposed start date and frequency of groundwater and surface water monitoring;

c) The contaminants that shall be monitored as part of the groundwater and surface water monitoring program; and,

d) At least one meeting each year between the proponent and the Regional Director to discuss the plan, the results of the monitoring program and any changes that are required to be made to plan by the Regional Director.

20.4 The proponent shall submit the Groundwater and Surface Water Monitoring Plan to the Regional Director a minimum of 90 days prior to the start of construction or such other date as agreed to in writing by the Regional Director.

20.5 The Regional Director may require changes to be made to the Groundwater and Surface Water Monitoring Plan and the proponent shall implement the plan in accordance with the required changes.

20.6 The groundwater and surface water monitoring program shall commence prior to the receipt of non-hazardous municipal solid waste at the site or such other time as agreed to in writing by the Regional Director, and shall continue until such time as the Regional Director notifies the proponent in writing that the groundwater and surface water monitoring program is no longer required.

20.7 Thirty days after waste is first received on site, the proponent shall prepare and submit to the Director and Regional Director, a report containing all of the results of the groundwater and surface water monitoring program.

20.8 The proponent shall prepare and submit to the Director and Regional Director, an annual report containing the results of the groundwater and surface water monitoring program. The first report shall be submitted 12 months from the start of the monitoring program and every year thereafter.

20.9 The proponent shall prepare and submit to the Director and Regional Director, a report containing the results of the groundwater and surface water monitoring program within 30 days of any of the following events:

a) A spill occurs on site;

b) A fire or explosion occurs on site;

c) A process upset; or

d) Any disruption to normal operations that may directly or indirectly have an impact on groundwater or surface water.

20.10 The proponent shall post the Groundwater and Surface Water Monitoring Plan and all reports required by this condition on the proponent's web site for the undertaking following submission of the plan and reports to the ministry.

21. Types of Waste and Service Area

21.1 Only non-hazardous municipal solid waste from municipal collection within the jurisdictional boundaries of the Regional Municipality of Durham and the Regional Municipality of York may be accepted at the site.

21.2 Materials which have been source separated for the purposes of diversion shall not be accepted at this site. This prohibition does not apply to the non-recyclable residual waste remaining after the separation of the recyclable materials from the non-recyclable materials at a materials recycling facility or other processing facility.

21.3 The proponent shall ensure that all incoming waste is inspected prior to being accepted at the site to ensure that only non-hazardous municipal solid waste is being accepted.

21.4 If any materials other than non-hazardous municipal solid waste are found during inspection or operation, the proponent shall ensure that management and disposal of the material is consistent with ministry guidelines and legislation.

22. Amount of Waste

22.1 The maximum amount of non-hazardous municipal solid waste that may be processed at the site is 140,000 tonnes per year.

23. Notice of the Date Waste First Received

23.1 Within 15 days of the receipt of the first shipment of waste on site, the proponent shall give the Director and Regional Director written notice that the waste has been received.

24. Construction and Operation Contracts

24.1 In carrying out the undertaking, the proponent shall require that its contractors, subcontractors and employees:

a) fulfil the commitments made by the proponent in the environmental assessment process, including those made in the environmental assessment and in the proponent's responses to comments received during the environmental assessment comment periods;

b) meet applicable regulatory standards, regarding the construction and operation of the undertaking;

c) obtain any necessary approvals, permits or licenses; and,

d) have the appropriate training to perform the requirements of their position.

25. Amending procedures

25.1 Prior to implementing any proposed changes to the undertaking, the proponent shall determine what *Environmental Assessment Act* requirements are applicable to the proposed changes and shall fulfill those *Environmental Assessment Act* requirements.

Dated the 21ST day of October 2010 at TORONTO.

Minister of the Environment
77 Wellesley Street West
11th Floor, Ferguson Block
Toronto, Ontario
M7A 2T5

Approved by O.C. No. 1514/2010

Date O.C. Approved NOVEMBER 3, 2010

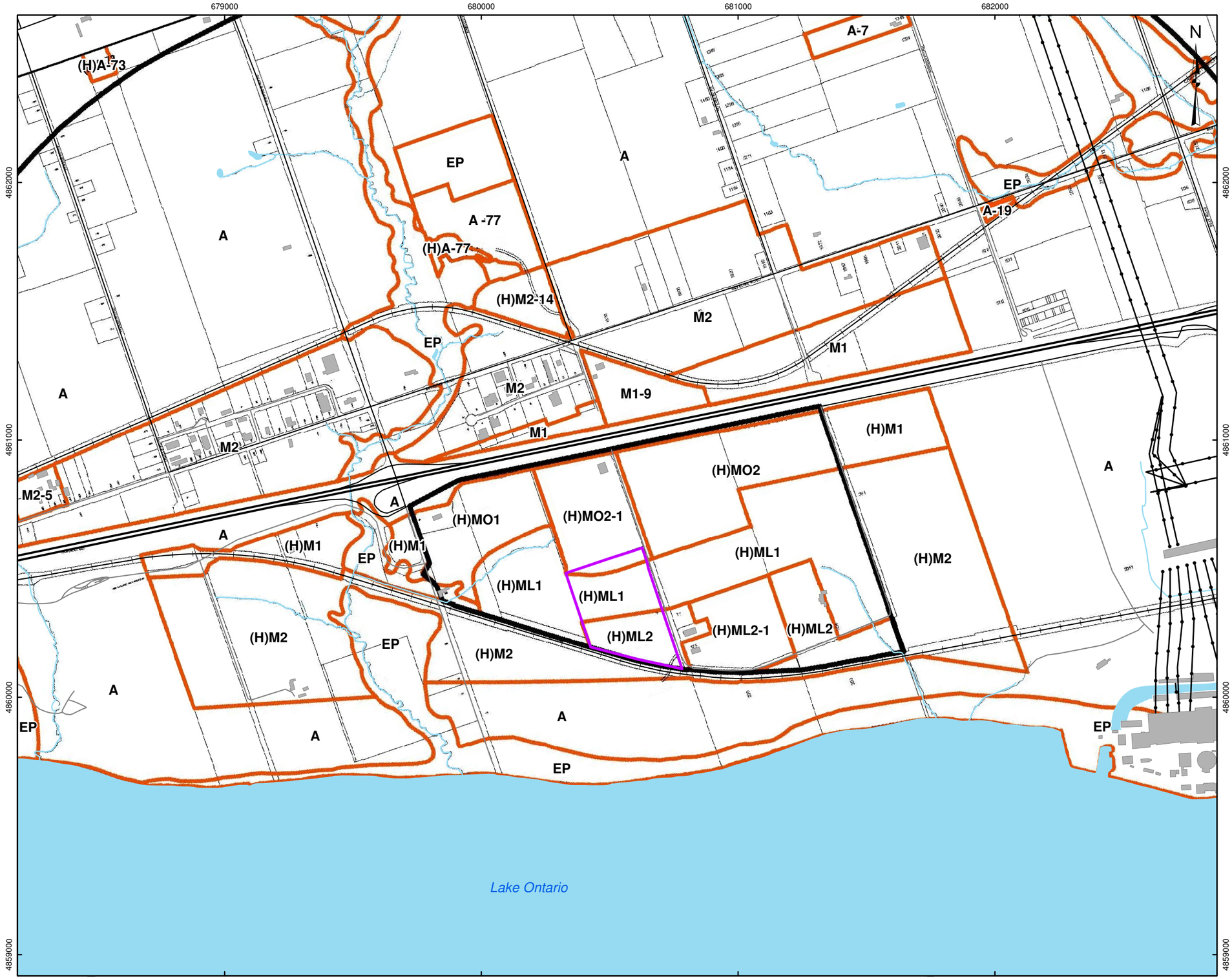
Schedule 1 –Air Emissions Operational Requirements

Item	Contaminant	Operational Requirements
1.	Particulate Matter	9 mg/Rm3
2.	Cadmium	7 ug/Rm3
3.	Lead	50 ug/Rm3
4.	Mercury	15 ug/Rm3
5.	Dioxins & Furans	60 pg/Rm3
6.	Hydrogen Chloride	9 mg/Rm3
7.	Sulphur Dioxide	35 mg/Rm3
8.	Nitrogen Oxides	121 mg/Rm3
9.	Organic Matter .	50 ppmdv (33 mg/Rm3)
10.	Carbon Monoxide	35 ppmdv (40 mg/Rm3)
11.	Opacity	5% (2-hour average) 10% (6-minute average)

Notes:
mg/Rm^3-milligrams per reference cubic metre; µg/Rm^3-micrograms per reference cubic metre; pg/Rm^3-picograms per reference cubic metre; ppmdv-parts per million by dry volume

APPENDIX B

Zoning Designation Plan



LEGEND

- Highway
- Major Road
- Local Road
- Railway
- Utility Line
- Watercourse
- Waterbody
- Building Footprint
- Approximate Site Boundary
- Zoning

A - Agricultural
M1 - Light Industrial
M2 - Eeneral Industrial
MO1 - Energy Park Office
MO2 - Energy Park Prestige
ML1 - Energy Park Light Industrial
ML2 - Energy Park General Industrial
EP - Environmental Protection

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Zoning - The Town of Newcastle Zoning By-Law 84-63
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2008
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

0.25 0 0.25 0.5 0.75
SCALE 1:15,000 KILOMETERS

PROJECT
DURHAM YORK ENERGY CENTRE

TITLE
ZONING DESIGNATION PLAN

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0343			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010	**APPENDIX: B1**	
GIS	PRM	2 Feb. 2011		
CHECK	PN	2 Feb. 2011		
REVIEW	PN	2 Feb. 2011		

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APPENDIX C

Description of Technical Terms

APPENDIX C
Description of Technical Terms

To help understand the analysis and recommendations made in this report, the following is a brief discussion of technical noise terms.

Sound pressure level is expressed on a logarithmic scale in units of decibels (dB). Since the scale is logarithmic, a sound that is twice the sound pressure level as another will be three decibels (3 dB) higher.

The noise data and analysis in this report have been given in terms of frequency distribution. The levels are grouped into octave bands. Typically, the centre frequencies for each octave band are 31.5, 63, 125, 250, 500, 1000, 2000, 4000 and 8000 Hertz (Hz.). The human ear responds to the pressure variations in the atmosphere that reach the ear drum. These pressure variations are composed of different frequencies that give each sound we hear its unique character.

It is common practice to sum sound levels over the entire audible spectrum (i.e., 20 Hz to 20 kHz) to give an overall sound level. However, to approximate the hearing response of humans, each octave band measured has a weighting applied to it. The resulting "A-weighted" sound level is often used as a criterion to indicate a maximum allowable sound level. In general, low frequencies are weighted higher, as human hearing is less sensitive to low frequency sound.

Environmental noise levels vary over time, and are described using an overall sound level known as the L_{eq}, or energy averaged sound level. The L_{eq} is the equivalent continuous sound level, which in a stated time, and at a stated location, has the same energy as the time varying noise level. It is common practice to measure L_{eq} sound levels in order to obtain a representative average sound level. The L90 is defined as the sound level exceeded for 90% of the time and is used as an indicator of the "ambient" noise level.

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APPENDIX D

Project Description

APPENDIX D
Project Description

Detailed project description can be found in *Design and Operations Report in Support of Environmental Protection Act Section 27 Certificate of Approval (Waste) Application, February 2011*.

APPENDIX E

Nomenclature

NOISE SOURCE SUMMARY TABLE NOMENCLATURE

Source Location

O – located/installed outside the building, including on the roof

I – located/installed inside the building

Sound Characteristics

S – Steady

Q – Quasi Steady Impulsive

I – Impulsive

B – Buzzing

T – Tonal

C – Cyclic

Noise Control Measures

S – silencer, acoustic louver, muffler

A – acoustic lining, plenum

B – barrier, berm, screening

L – lagging

E – acoustic enclosure

O – other

U – uncontrolled

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APPENDIX F

Sample Calculation (on CD)

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

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Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
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South America	+ 55 21 3095 9500

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