If this information is required in an accessible format, please contact The Regional Municipality of Durham at 1-800-372-1102 extension 3560.

Durham York Energy Centre

ECA Annual Report

2015

ECA No. 7306-8FDKNX

1835 Energy Drive
Courtice, ON L1E 2R2
March 31, 2016

Table of Contents

List of Tables

Appendices

1. Executive Summary

The Regional Municipality of Durham, the Regional Municipality of York (Regions), and Covanta respectfully submit the 2015 Durham York Energy Centre (DYEC) Annual Report, covering operations during the 2015 calendar year.

This report is being submitted in accordance with Condition 15(1) of the Environmental Compliance Approval (ECA), which requires:

> *By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year.*

Items 15(1) a through 15(1) r have been included in this Annual Report, in fulfillment of the ECA requirement. Refer to Appendix 1: ECA 7306-8FDKNX Condition 15 Reporting Requirements – Annual Report

The DYEC is a thermal treatment facility with a maximum thermal treatment rate of 140,000 tonnes/year of municipal solid waste (MSW), as established by the ECA. The maximum continuous rating (MCR) for the facility is defined as 218 tonnes per day, per unit, of MSW with a design heat content of 13 MJ/kg per train. Due to the variability of waste the range of heat content the facility is capable of processing is between 8.4 MJ/kg and 15 MJ/kg.

The facility was built to operate on a continuous basis; 24 hours/day seven days/weeks, 365 days/year. Waste may be delivered six days per week between 7:00 am to 7:00 pm. The proposed operating schedule may be adjusted depending on demand and facility needs within the established setup indicated in the ECA.

The first load of waste was received at the DYEC on February 9th, 2015 and first fire occurred on February 13th, 2015. The Regions, Covanta and the MOECC established a weekly meeting schedule, which included periodic site inspections to review facility operations.

In accordance with the Acceptance Test Protocol, tests were performed at the DYEC from September 27th through November 3rd, 2015, for the purpose of demonstrating the Reliability, Throughput Capacity, Energy Production, Residue Quality & Quantity, Metals Recovery, and Environmental Compliance as set forth in the Project Agreement.

Tests conducted for the purposes of ECA compliance included emission source tests, boiler combustion time and temperature tests, acoustic audits, an odour test and bottom ash and fly ash characterization tests. After the completion of the Acceptance Test, Covanta forwarded all compliance test results to the Owners and the MOECC on November 26th, 2015. Following a review of the results of this testing, MOECC concluded that the CEM system is certified to provide traceable and reliable emissions information and that the DYEC is capable of operating in compliance with all ECA limits as identified by correspondence of December 15th, 2015[1]. A summary of emission source test results, odour test results and modelling results are included in Appendix 2 of this Annual Report. In addition, the MOECC accepted the fly ash and bottom ash characterization report by correspondence of December 17th, 2016[2]. Subsequently, on January 29th,

[1] https://www.durhamyorkwaste.ca/Assets/Documents/MonitoringPlansReports/AirEmissionMonitoring/Correspondence/MOECC_Approval_SourceTestReport.pdf

[2] https://www.durhamyorkwaste.ca/Assets/Documents/FacilityManagement/Ash/MOECC_Approval_2015_Ash_Test_Report.pdf

2016, the Regions issued an Acceptance Test Certificate to allow the DYEC to formally commence commercial operations and officially complete the commissioning phase of the facility.

2. Quality and Quantity of Waste - ECA 15 (1) (a)

On June 28th 2011, the Regions and Covanta were issued Environmental Compliance Approval Number 7306-8FDKNX (ECA), formerly referred to as a Certificate of Approval, for the operation of a thermal treatment facility for the processing of solid non-hazardous, post-diversion municipal waste, abatement of the emissions from the processes and activities, the handling, and/or conditioning of the residual wastes and management of the wastewater and the non-contact stormwater generated at the facility.

Quality of waste being received at the Facility is achieved by implementing the following:

- Robust Regional promotion and education programs to inform the public on how to source separate at the household level first
- Regional By-Laws that restrict generators from placing recyclable or hazardous materials in the waste stream
- Regional waste contractors are required under contract to inspect and reject unacceptable waste if necessary at the curbside
- Waste picked up curbside is dumped and inspected at transfer stations before being repacked into highway haulers for delivery to DYEC
- During each hour of operation, a truck is unloaded onto the tipping hall floor for a detailed visual inspection before being pushed into the pit

The Higher Heating Value (HHV or calorific heat content) of post-diversion municipal waste as processed by the DYEC was measured during the October 2015 acceptance test period using the boiler-as-a-calorimeter method in accordance with ASME Performance Test Code PTC 34, Waste Combustors with Energy Recovery. The results varied in a narrow range of the design value of 13 MJ/kg, by ±500 kJ/kg or ±~4%. These results agree with visual observations of the waste as being consistent, relatively homogenous with low moisture content regardless of weather conditions. Refuse HHV has subsequently been monitored using a specific steam correlation developed during the acceptance tests showing consistent results. In general, the refuse is considered to be well sorted, consistent in make-up and has good combustion qualities.

There was one load rejected from the Facility due to radiation. Following the identification of the location of the item in the trailer (front quarter of trailer, passenger side), the truck was rejected and diverted back to the transfer station of origin.

Waste is collected and inspected at the following four transfer stations prior to reloading and transport to the DYEC:

1. Pebblestone Transfer Station – Durham
2. Pickering Transfer Station – Durham
3. York Region Waste Management Centre – York
4. Markham Transfer Station (Earl Turcotte Waste Management Centre) – York

Table 1: Total MSW Received (Tonnes)

	Total MSW Received	Durham	York
January	N/A	N/A	N/A
February	4,776.66	4,010.10	766.56
March	8,891.09	7,039.13	1,851.96
April	12,948.32	10,108.35	2,839.97
May	10,775.10	8,522.20	2,252.90
June	8,125.86	6,553.37	1,572.49
July	7,959.40	6,721.58	1,237.82
August	5,915.77	4,639.92	1,275.85
September	12,033.67	9,575.28	2,458.39
October	13,785.26	9,944.38	3,840.88
November	7,692.02	5,911.60	1,780.42
December	7,888.98	6,042.04	1,846.94
Total	**100,792.13**	**79,067.95**	**21,724.18**

The ECA limits the annual waste thermal treatment rate to 140,000 tonnes. In 2015, (a partial year of operation) the DYEC received 100,792.13 tonnes and thermally treated 98,493.13 tonnes of Waste. Refer to Table 1.

Condition 2(4) of the ECA limits the amount of waste that can be accepted at the facility to 1,520 tonnes per day. The maximum amount of waste received in one day was 889.04 tonnes on October 29th, 2015.

Condition 2(5)(a) limits the maximum amount of waste that can be stored in the Waste pit to 7,350 cubic metres. The maximum amount of waste stored in the Waste pit was 5,632 cubic metres (approximately 2,337 tonnes) on December 14th, 2015.

3. Quality and Quantity of Residual Waste - ECA 15 (1) (b)

There are four main streams of residual waste (materials) shipped from the DYEC after the combustion process is complete:

1. Bottom Ash
2. Fly Ash
3. Ferrous Metal
4. Non-ferrous Metal

Fly ash is treated onsite with Pozzolan, cement and water as part of the conditioning process before being shipped off site. All reported weights for this material are inclusive of these reagents.

Table 2 provides a summary of the streams of residual waste that were shipped from the DYEC in 2015 for final disposal (bottom and fly ash) or for recycling (ferrous and non-ferrous metal):

Table 2: Annual Residual Waste Quantity Summary

Bottom Ash	Fly Ash	Ferrous Metal	Non-ferrous Metal
19,578.08	9,317.60	2,250.87	331.15

Bottom and fly ash are sent for final disposal at South Landfill and Atlas Landfill, both operated by Walker Environmental in Niagara Falls, Ontario. Bottom and fly ash are mixed with soil and used as daily/interim cover at the landfill. Ferrous metals are sent to Gerdau Ameristeel in Whitby, Ontario for recycling. Non-ferrous metals, from February through June 1st, 2015 were sent to Triple M in Hamilton, Ontario for recycling. Since June 1st, 2015 non-ferrous metals have been sent to Gerdau Ameristeel in Whitby, Ontario.

3.1. Ash Characterization - Pre-Commissioning (February 2015)

Bottom Ash

In accordance with ECA Condition 7(7)(d), the MOECC approved the Ash Sampling and Testing Protocol dated June 2014 (the Protocol) which was implemented on the Commencement Date of Operation, February 9th, 2015. Hourly sampling of bottom ash commenced with the initial generation of bottom ash which occurred at approximately 21:00 on February 13th, 2015.

A consolidated summary for the fifteen (15) composite samples representing the first three shipments of bottom ash is presented in Table 3. Sampling was undertaken by Covanta, and analyses were completed by an accredited laboratory using the method ASTM D5468 Gross Calorific and Ash Value of Waste Materials. These analyses conclude that the bottom ash meets the definition of "incinerator ash" as set out in Regulation 347. As a result, loading and appropriate shipment of bottom ash within Ontario began on March 2nd, 2015 in accordance with Sections 4.3.2.1 and 7 .0 of the Protocol.

Table 3: Bottom Ash Summary Pre-Commissioning (ASTM D5468)

	COMBUSTIBLE CONTENT (Wt. %)
SAMPLE MEAN (1)	0.76
MAXIMUM	1.48
MINIMUM	0.69
REGULATORY THRESHOLD	**10**

(1) Based on 15 samples representing the first three truckloads of bottom ash.

In addition to the ASTM D5468 Gross Calorific and Ash Value of Waste Materials method, bottom ash was also tested utilizing a Loss on Ignition (LOI) test procedure. The additional test results of this methodology were also below the 10 percent regulatory threshold.

Fly Ash

In accordance with ECA Condition 7(7)(d), the MOECC approved the Ash Sampling and Testing Protocol dated June 2014 (the Protocol) which was implemented on the Commencement Date of Operation, February 9th, 2015. Sampling of conditioned fly ash commenced on February 19th, 2015, which was the day of initial operation of the fly ash conditioning pug mills to generate conditioned fly ash.

Toxicity Characteristic Leaching Procedure (TCLP) testing for 88 constituents was conducted on composite samples representing the first three shipments of conditioned fly ash. Sampling was undertaken by Covanta, and analyses were completed by an accredited laboratory. All constituents were reported as non-detect with the exception of Barium and Dioxins and Furans which were less than 2% of the Regulation 347 limit as summarised in Table 4.

These analyses concluded that no constituent identified in Schedule 4 of Regulation 347 exceeds their respective TCLP threshold for all fifteen (15) samples subject to analyses both one (1) day and five (5) days following the composite sample creation date. As a result, loading and appropriate shipment of conditioned fly ash within Ontario was begun on March 13th, 2015 in accordance with Sections 5.3.2.1 and 7.0 of the Protocol.

Table 4: Fly Ash Characterization Pre-Commissioning

	Barium (mg/L)	Dioxins/Furans (pg/L)
SAMPLE MEAN (1)	1.19	2.89
MAXIMUM	1.59	15.3
MINIMIM	0.96	1.18
REGULATORY THRESHOLD	100	1500

(1) Based on 15 samples representing the first three truckloads of fly ash

3.2. Ash Characterization – Commissioning (October 2015)

Bottom Ash

Bottom ash generated between October 15th and October 19th, 2015 was sampled and analyzed in accordance with DYEC Ash Sampling and Testing Protocol (Report. 11-1151-0132, dated June 2014). All bottom ash, generated during the sampling period and the subsequent time period to receive the laboratory analyses was quarantined at the DYEC site. Utilizing the Loss of Ignition (LOI) testing procedure, the statistical analysis of the bottom ash data resulted in a combustible materials content of 2.85% by weight is presented in Table 5. Utilizing the ASTM D5468 Gross Calorific and Ash Value of Waste Materials method, all results were below the detection level of 0.69% for combustible materials content. These results demonstrated that the bottom ash meets the Regulation 347 definition of incinerator ash and that it should be managed as a non-hazardous solid waste. A review of these analyses by the receiving landfill concurred with this conclusion. As a result all quarantined bottom ash during testing was released for disposal as a nonhazardous solid waste.

Table 5: Bottom Ash Characterization – Commissioning (LOI Test Procedure)

	COMBUSTIBLE CONTENT (Wt. %)
SAMPLE MEAN (1)	2.3
STATISTICAL UPPER LIMIT	2.85
MAXIMUM	5.6
MINIMUM	0.9
REGULATORY THRESHOLD	**10**

(1) Based on 20 samples representing the first three truckloads of fly ash

Fly Ash

Two individual fly ash characterizations were independently conducted in different weeks utilizing different conditioning reagent set points. The first characterization using higher levels of conditioning reagents was conducted between September 29th and October 3rd, 2015. The second fly ash characterization using reduced levels of conditioning reagents was conducted between October 22nd and 26th, 2015. The characterizations successfully confirmed that all quarantined fly ash was not leachate toxic following reagent conditioning at each operating condition which was subsequently released for disposal. This has enabled continued operation at the lower level of conditioning reagents for all fly ash sent for disposal.

During the first characterization period during Commissioning, Toxicity Characteristic Leaching Procedure (TCLP) testing for 88 constituents was conducted on composite samples for representative conditioned fly ash generated between September 29th and October 3rd, 2015. Sampling was undertaken by Covanta, and analyses were completed by an accredited laboratory. All constituents were reported as non-detect with the exception of Barium and Dioxins and Furans which were less than 2% of the Regulation 347 limit as summarised in Table 6 below.

Table 6: Fly Ash Characterization – Initial Commissioning Period

	Barium (mg/L)	Dioxins/Furans (pg/L) (1)
SAMPLE MEAN (2)	1.58	5.42
MAXIMUM	2.11	12.10
MINIMIM	1.13	2.53
REGULATORY THRESHOLD	100	1500

(1) Reported as TEQ using WHO 2005 TEF
(2) Based on 15 samples collected over 5 days

During the second characterization period during Commissioning using a lower level of conditioning reagents, Toxicity Characteristic Leaching Procedure (TCLP) testing for 88 constituents was conducted

on composite samples for representative conditioned fly ash generated between October 22 and October 26, 2015. Sampling was undertaken by Covanta, and analyses were completed by an accredited laboratory. All constituents were reported as non-detect with the exception of Barium, Lead and Dioxins and Furans which were not greater than 8% of the Regulation 347 limit as summarised in Table 7.

Table 7: Fly Ash Characterization - Second Commissioning Period

	Barium (mg/L)	Lead (mg/L)	Dioxins/Furans (pg/L) (1)
SAMPLE MEAN	2.04	0.182	3.13
MAXIMUM	2.51	0.407	6.65
MINIMIM	1.63	0.05	1.13
REGULATORY THRESHOLD	100	5	1500

(1) Reported as TEQ using WHO 2005 TEF
(2) Based on 15 samples collected over 5 days

For further information, refer to Commissioning Period Facility Ash Report – Bottom Ash and Fly Ash Characterizations COVANTA REPORT NUMBER: 4060
https://www.durhamyorkwaste.ca/Assets/Documents/FacilityAcceptance/EnvironmentalReports/ResidueReport.pdf

3.3. Other Residual Waste Streams

There are no analytical requirements for the Ferrous and Non-ferrous metal streams leaving DYEC. Other residual waste streams leaving the DYEC are summarised in Table 8.

Table 8: Other Residual Waste Streams

	Description	Tonnes Shipped	Destination
Waste Water	Excess Settling Basin water produced during outages	367.86	GFL Environmental Inc. (Waste disposal site (transfer and processing) of municipal solid waste and select subject waste)
Untreated Fly Ash	Fly ash removed from the boilers and Air Pollution Control (APC) during outages	137.14	Stablex Canada Inc. (Treatment and disposal for hazardous inorganic materials)
HWIN[1] Wastes	Oils, Glycol, Oily solids, batteries, light bulbs etc.	2.16	GFL Environmental Inc.

	Description	Tonnes Shipped	Destination
			(Waste disposal site (transfer and processing) of municipal solid waste and select subject waste)
Landfill Material	Solid non-hazardous wastes (construction wastes etc.)	41.18	Waste Management – The Miller Group (Solid non-hazardous waste disposal)
Unacceptable Waste	Tipping Floor items from incoming MSW	0.89	Photech Environmental (Non-hazardous and hazardous liquid and solid waste transfer facility)

[1] Hazardous Waste Information Network

4. Material Balance - ECA 15 (1) (c)

Daily maximum storage of all wastes on a monthly basis was estimated from a material balance of facility operations and records of shipments of waste to and from the DYEC and is summarized in Table 9. Material balance records indicate the DYEC was in compliance for storage requirements set forth by the ECA except for bottom ash in February which coincided with the initial pre-commissioning ash testing period. During the ash sampling and characterization testing period, all generated ash is required to be quarantined in the Residue Building until all characterization analyses data is received and meets the respective standards pursuant to the MOECC approved ash sampling and testing protocol.

Table 9: Estimated Daily Maximum Onsite Storage

	MSW (cubic metres)	Bottom Ash (tonnes)	Fly Ash (tonnes)	Ferrous Metal (tonnes)	Non-ferrous Metal (tonnes)
January	NA	NA	NA	NA	NA
February	4,802	759	362	24.5	7.5
March	3,301	428	580	57.7	7.6
April	3,219	446	423	43.8	10.4
May	4,246	297	425	42.9	8.8
June	4,889	326	465	51.3	13.6
July	5,130	339	480	42.4	26.4
August	5,055	295	461	22.9	28.2

	MSW (cubic metres)	Bottom Ash (tonnes)	Fly Ash (tonnes)	Ferrous Metal (tonnes)	Non-ferrous Metal (tonnes)
September	4,395	296	523	38.2	12.6
October	4,911	455	535	58.6	14.2
November	5,046	289	546	48.0	11.8
December	5,632	296	469	63.5	18.2
ECA Limits	**7,350**	**630**	**700**	**77**	**120**

5. Annual Water Usage - ECA 15 (1) (d)

The DYEC is a zero waste water discharge facility, and as such, no water from the process is sent to the sanitary sewer system or discharged into the environment. Under normal operations, the DYEC operates at a water deficit and requires a water supply from the Region of Durham's municipal water system to maintain water for the process. Waste water generated by the facility (with the exception of sanitary discharges) is re-used in the process to cool flue gas and condition bottom and fly ash. Make up water is required in order to replenish these processes

During 2015, approximately 34,260 m^3 of water was drawn from the municipal water system.

6. Electricity - ECA 15 (1) (e)

The Regions obtained final approval to connect the turbine to the grid through IESO (Independent Electricity System Operator) on August 24th, 2015. During the remainder of 2015, the turbine generated 30,581 MWh of electricity, of which 26,787 MWh was exported to the grid. The remainder was used to power the Facility.

7. Summaries and Conclusions from ECA 14 (3) through 14 (8) - ECA 15 (1) (f)

7.1. Daily Activities

Daily records of activities are written or digital and include the date of record and the name and signature of the person completing the written record.

All records are available at the site and will be retained on site for a minimum of seven years from the date of their creation as per Condition 14 (2).

For details regarding the following daily activity records, refer to the Section of this report listed in Table 10.

Table 10: Daily Activity Records

	Section	
Incoming Waste	2	Quality and Quantity of Waste - ECA 15(1)(a)
Waste Thermally Treated	2	Quality and Quantity of Waste - ECA 15(1)(a)
Unacceptable Waste	3.3	Other Residual Waste Streams
Residual Waste Shipped/Destination	3	Quality and Quantity of Residual Waste - ECA 15(1)(b)
Residual Waste Destination	3	Quality and Quantity of Residual Waste - ECA 15(1)(a)
Rejected Waste and Destination	2	Quality and Quantity of Waste – ECA 15)1)(a)
Electricity Produced and Exported	6	Electricity – ECA 15 (1)(e)

7.2. Monitoring and Testing Records

Activities undertaken at DYEC are written or digital, are available at the site and will be retained on site for a minimum of seven years from the date of their creation as per Condition 14 (2).

Continuous Emission Monitoring

The Continuous Emission Monitoring System (CEMS) and Data Acquisition System (DAS) measure and record concentrations on a dry-basis for carbon monoxide (CO), carbon dioxide (CO_2), oxygen (O_2), sulfur dioxide (SO_2), nitric oxide (NOx), ammonia (NH_3), hydrogen chloride (HCL), hydrogen fluoride (HF), total hydrocarbons (THC) and Mass Flow. The DAS will also measure and record concentrations for moisture (H_2O) and Opacity for the boiler. Analysis sampling points are located in such a fashion that the efficiency of the air pollution control system can be closely monitored. Flue gas is analyzed prior to entering the APC evaporative cooler (economizer outlet) and in the APC outlet/ ID Fan inlet duct for each boiler.

The CEMS installed at the DYEC meets the Installation Parameters and Performance Parameters listed in Schedule F of ECA 7360—8FDKNX. ORTECH Consulting Inc. completed a relative accuracy and system bias performance evaluation (RATA) of the CEMS according to the procedures described in "Protocols and Performance Specifications for Continuous Monitoring of Gaseous Emissions from Thermal Power Generation", Environment Canada Report EPS 1/PG/7, December, 2005 and the QA/QC manual developed for the CEM system in September 2015. The RATA on Boiler No. 1 CEMS was completed on September 24th, 2015 and Boiler No. 2 CEMS RATA was completed on September 23rd, 2015.

With the start of operations, the CEMS was calibrated and the monitoring data was communicated to the MOECC on a weekly basis. The RATA was completed on the DYEC CEMS on September 24th, 2015. With the completion of the RATA, the posting of the emissions monitoring data on the Owners' website commenced. There were no emission excursions reported in 2015.

For further information, refer to Ortech Report 21546-2: Covanta Durham York Renewable Energy Limited Partnership Compliance Relative Accuracy and System Bias Performance Evaluation of the Continuous Emission Monitoring Systems (CEMS) October 19th, 2015.
https://www.durhamyorkwaste.ca/Assets/Documents/FacilityAcceptance/EnvironmentalReports/Covanta_DYEC_ComplianceRATA.pdf

Records regarding CEMS include daily minimum and maximum average readings for carbon monoxide (4-hour average); oxygen and temperature (one hour average); organic matter (10-minute average); sulphur dioxide, nitrogen oxides, and hydrogen chloride (24-hour average); and opacity (6-minute and 2-hour average). For live and archived CEMS data, refer to the DYEC website Emissions Data page: https://www.durhamyorkwaste.ca/EmissionsData/EmissionsData.aspx

Acoustic Audit

The Acoustic Audit Report is established by ECA Condition 7(5) and the Noise Monitoring and Reporting Plan as approved by the MOECC

Pre-operational (November 2014) and post-operational (April and October 2015) sound level measurements were completed on and off-site of the facility. The MOECC concluded that the facility is in compliance with NPC-205 and NPC-300 in a letter dated December 11th, 2015 titled RE: Durham York Energy Center – Acoustic Audit Reports.
https://www.durhamyorkwaste.ca/Assets/Documents/MonitoringPlansReports/Noise/2015/Correspondence/MOECC_Approval_2015_Acoustic_Audit_Report.pdf

For further information refer to Section 8.2 Acoustic Assessment Summary Table for more details.

Source Testing

ORTECH Consulting Inc. completed an emission testing program that included three test events at the DYEC between September 29th and October2nd, on October 21st and October 22nd, and on October 28th and October 29th 2015 to satisfy the requirements of the ECA. Concurrently, odour source sampling was conducted in conformance with an Odour Source Testing Plan. Modelling of Odour Test results demonstrated compliance with the ECA. These reports satisfy the Odour Management and Mitigation Monitoring Report required by the Odour Management and Mitigation Plan.

In December 2015, the DYEC received a letter from the MOECC stating the emission testing report was deemed acceptable to the ministry and that the ministry is satisfied the DYEC is capable of operating in compliance with its ECA limits.
https://www.durhamyorkwaste.ca/Assets/Documents/MonitoringPlansReports/AirEmissionMonitoring/Correspondence/MOECC_Approval_SourceTestReport.pdf

For further information refer to Section 8.1 Emission Summary Table.

Long Term Sampling Program for Dioxins and Furans

The long term dioxin and furan sampling system, referred to as the AMESA (Adsorption Method for the Sampling of Dioxins and Furans) sampler, has been installed as required by condition 7(3)(a) of the ECA.

The MOECC stated that the monitoring data collected during the Source Test is considered inconclusive. Additional evaluation is required to be gathered when the next source testing program takes place in 2016. Covanta and the MOECC Technology Standards Section are required to harmonize the strategy that will be used to assess the reliability of the AMESA monitoring system.

For further information refer to Section 11 Long-Term Sampling System (LTSS)

Residual Waste Compliance Testing

Bottom ash and fly ash are sampled and analysed according to the MOECC approved Ash Sampling and Testing Protocol dated June 2014 (the Protocol). These results demonstrated that the bottom ash and fly ash can be managed as a non-hazardous solid waste.

There are no analytical requirements for the Ferrous and Non-ferrous metal streams leaving DYEC.

For further information refer to Section 3 Quality and Quantity of Residual Waste.

Soil Testing

Soil testing is required by Condition 7(10), 13(4) and 15(4) of the ECA for the DYEC. Soil Testing is undertaken in accordance with the Soil Testing Plan approved by the MOECC in March 2013. In accordance with the approved plan the parameters tested include metals, polycyclic aromatic hydrocarbons (PAHs), and dioxins and furans (PCDDs/PCDFs). Soil samples are evaluated against the Table 1 Full Depth Background Site Condition Standards-Soil, of the Ground Water and Sediment Standards for Use Under part XV.1 of the *Environmental Protection Act*.

Soil testing commenced in August 2013 to quantify baseline contaminant concentrations prior to DYEC operations. Soil sampling and ambient air monitoring occur at the same locations as required by Condition 13(4)(a) of the ECA. Soil testing will be performed once during each of the first three years of operation, and every three years thereafter until notification is received from the Ministry of Environment and Climate Change (MOECC) advising that soil monitoring is no longer required. Soil testing for 2015, the first year of facility operations, was carried out on August 25, 2015.

Results from the 2013 and 2015 soil testing events are available to the public on the DYEC website: https://www.durhamyorkwaste.ca/Documents/MonitoringPlansReports/Soils.aspx. All sampling results satisfied the Table 1 requirements as noted above. There was no significant difference between the 2013 and 2015 sampling results. Variations observed are attributed to natural variability within soil and are not due to the operation of the DYEC.

Groundwater and Surface Water Monitoring

Groundwater and surface water monitoring is a requirement of Condition 20 the EA and Condition 7(14) of the ECA. To date, groundwater and surface water monitoring results show no adverse effects, trends or anomalies to further investigate.

The groundwater quality within the groundwater monitors satisfies the Ontario Drinking Water Quality Standards, Objectives, and Guidelines (ODWQS) for the tested parameters.

The surface water sondes indicate that there is no measurable influence on surface water quality within Tooley Creek from the DYEC operations.

For further information refer to Section 15 Groundwater and Surface Water Monitoring.

Ambient Air Monitoring

Ambient air monitoring is a requirement of Condition 11 of the EA and Condition 7(4) of the ECA for the DYEC. Ambient air monitoring is undertaken in accordance with the Ambient Air Monitoring Plan approved by the MOECC in May 2012. There are three ambient air monitoring stations: an upwind station located to the southwest of the DYEC at the Courtice Water Pollution Control Plant (Courtice WPCP), a downwind station located northeast of the DYEC near the intersection of Baseline Road and Rundle Road, and a property line station located at the northeast corner of the DYEC property.

Monitoring at the upwind and downwind monitoring stations started in May 2013 to collect at least one year of background data prior to the commencement of facility operations. In June 2014, monitoring of non-continuous parameters was temporarily discontinued in accordance with Section 1.2 of the Ambient Air Monitoring Plan. In February 2016, following the completion of facility commissioning, the

property line monitoring station commenced operations and monitoring of the non-continuous parameters at the upwind and downwind stations was resumed.

Quarterly and annual ambient air monitoring reports have been submitted to the MOECC since the start of the monitoring program in 2013. All reports are publically available on the DYEC website: https://www.durhamyorkwaste.ca/Documents/MonitoringPlansReports/AmbientAir.aspx For the 2015 reporting year, all contaminant concentrations were below their applicable MOECC criteria as well as the applicable health-based standards used in the facility's Human Health Risk Assessment (HHRA).

Radiation Monitoring

The DYEC scale is equipped with a LFM-3 Radiation Detection System. It is a multipurpose, modular system with two remote Radiation Detector assemblies. The detector assemblies oppose each other so that incoming vehicles can pass between them. Radiation detected includes low, medium and high energy gammas and X-rays. (>20keV). An Alarming Personal Radiation Detector (handheld) is also available for use when the mounted detectors are being serviced/calibrated and for a precise locator of the radioactive material within the truck. All records associated with the radiation monitoring of incoming waste are available on site.

In 2015, there was one load rejected from the Facility due to radiation.

Containment Testing

Initial containment testing (including negative pressure/smoke test of the Tipping Building) was conducted in 2014. The Durham York Energy Centre Containment Test Protocol Revised September 2014 lists additional subsequent periodic inspections to be conducted.

All subsequent periodic inspections were conducted in conjunction with Table 11.

No issues were identified during the periodic inspections with the exception of July 17th, 2015. During a Method 22 Observation, approximately 7 kg of airborne dry cement was noted exiting the top of the cement silo for a total of 12 minutes and 26 seconds. According to ECA Condition 12 Emergency Situation Response and Reporting, this incident was reported to the Spills Action Centre. Refer to Section 14 Emergency Situation Summary.

Table 11: Containment Periodic Inspections

Containment Enclosure	Periodic Inspection
Tipping Building	Calibration of Boiler Combustion Air Flow Venturi Transmitter
	Daily Inspection for Dust/Odour Leaks
Refuse Pit	Groundwater monitoring
Grizzly and Residue Bldgs.	Daily General Inspections
	Quarterly USEPA Method 22
Ammonia Tank	Daily general inspection
	Annual calibration of alarm systems
Cement and Pozzolan Silos	Daily General Inspections
	Quarterly USEPA Method 22
Lime and Carbon Silos	Daily General Inspection
	Quarterly USEPA Method 22
Diesel Fuelling Station	Daily General Visual Inspections
Fire Pump Diesel Tanks	Daily General Visual Inspections
Exterior Bottom and Fly Ash Conveyors	Daily General Inspection
	Quarterly USEPA Method 22
Settling Basin	Daily Visual Inspections
	Groundwater Monitoring

7.3. Inspections/Maintenance/Repairs

Covanta uses the PeopleSoft Asset Lifecycle Management system to track all maintenance and preventative maintenance activities for equipment at the DYEC. These activities include: work identification, planning, scheduling, execution, detailing and cost-control, inventory management, preventive maintenance, purchasing, and equipment asset management. All critical equipment is systematically and repetitively inspected and tested. Critical equipment is also subjected to a systematic and detailed program of preventive maintenance repair and replacement. The system auto-generates work orders for all scheduled maintenance activities.

In 2015, scheduled preventative maintenance activities were completed on the boilers, APC equipment, CEMS and other auxiliary systems.

Works – Stormwater Management Ponds

The Works are the storm water management system that consists of the East stormwater pond, West stormwater pond, on-site catch basins and below ground storm sewer pipes and on-site constructed stormwater conveyance ditches/swales. During 2015, there were no materials removed from the Works as defined in the ECA.

7.4. Emergency Situations

Written and digital records of emergency situations, limited to spills are kept on site. There were four spills during 2015 reported to the Spills Action Centre. There were no offsite impacts associated with any of these spills.

Refer to Section 14 Emergency Situation Summary.

7.5. Complaints Response Records

Written and digital records of complaints received at the site are kept on site. All complaints received were odour based. Investigations concluded that no odour complaints were attributed to the facility.

Refer to Section 12 Environmental Complaints.

7.6. Training

The Operator training program for the Durham York Energy Centre was developed to be a comprehensive program to ensure the facility has technically competent, safe and environmentally conscious Operators. All operators are trained with respect to Condition 9 of the ECA, as per the specific job requirements of each individual operator. All written or digital records of training including date of training, name and signature of the person who was trained and a description of the training provided will be maintained on site for seven years from the date of their creation as per Condition 14 (2). Training is ongoing including at commencement of employment, when procedures or equipment change and refresher.

8. Emission Summary and Acoustic Assessment Summary Tables - ECA 15 (1) (g)

8.1. Emission Summary Table

ORTECH Consulting Inc. completed an emission testing program that included three test events at the DYEC between September 29th and October 2nd, on October 21st and October 22nd, and on October 28th and October 29th, 2015 to satisfy the requirements of the ECA.

Source testing was performed on the Baghouse (BH) Outlet of Boiler No. 1 and BH Outlet of Boiler No. 2 for the test contaminants listed in Schedule D of the ECA. Although not required by the ECA, testing was also conducted at each location for manganese and hexavalent chromium.

The Executive Summary of the Compliance Emission Testing performed by Ortech is provided in Appendix 2 to fulfill the requirement to provide an Emission Summary Table.

For further information, refer to Ortech Report 21546-1: Covanta Durham York Renewable Energy Limited Partnership Compliance Emission Testing in Accordance with Amended Environmental Compliance Approval (air) No. 7306-8FDKNX November 25, 2015
https://www.durhamyorkwaste.ca/Assets/Documents/FacilityAcceptance/EnvironmentalReports/EnvironmentalCompliance.pdf

Following a review of the results of this testing, MOECC concluded that the CEM system is certified to provide traceable and reliable emissions information and that the DYEC is capable of operating in compliance with all ECA limits as identified by correspondence of December 15th, 2015.

8.2. Acoustic Assessment Summary Table

Acoustic Audit Report is established by ECA Condition 7(5) and the Noise Monitoring and Reporting Plan as approved by the MOECC.

Pre and post-operational sound level measurements were completed on-site and off-site of the facility. The pre-operational measurements were made November 13th to 24th, 2014 and the post-operational measurements were made April 6th to 16th, 2015 and October 5th to 15th, 2015.

The sound emissions from the DYEC were not audible during the April 2015 or October 2015 post-operational measurement period and are considered to be within the sound level limits stated in the MOE publication NPC-205. It was concluded that the facility is in compliance with NPC-205 and NPC-300. Submittal of this Supplemental Acoustic Audit demonstrates compliance with MOE ECA No. 7306-8FDKNX. The noise mitigation measures required by the March 2011 AAR have been adequately implemented.

Tables 4 and 5 from the Acoustic Audit and an Area Plan with Points of Reception and Measurement Locations are being provided in Appendix 3 to fulfill the requirement of an Acoustic Summary Table.

Refer to Valcoustic's Acoustic Audit of Durham York Energy Centre Operations, ECA 7306-8FDKNX May 8, 2015 Project: 114-318
https://www.durhamyorkwaste.ca/Assets/Documents/MonitoringPlansReports/Noise/2015/Reports/2015_Acoustic_Audit_Report.pdf

Refer to Valcoustic's Supplemental Acoustic Audit of Durham York energy Centre Operations November 23, 2015 Project: 114-318-100.
https://www.durhamyorkwaste.ca/Assets/Documents/MonitoringPlansReports/Noise/2015/Reports/2015_Supplementary_Acoustic_Audit_Report.pdf

Refer to MOECC approval letter dated December 11th, 2015, RE: Durham York Energy Center – Acoustic Audit Reports from Sandra Thomas, Issues Project Coordinator, MOECC, York Durham District Office
https://www.durhamyorkwaste.ca/Assets/Documents/MonitoringPlansReports/Noise/2015/Correspondence/MOECC_Approval_2015_Acoustic_Audit_Report.pdf

9. Environmental/Operational Problems – ECA 15 (1) (h)

The DYEC entered into two extended outages during 2015 where both boilers were offline: July 28th to August 15th and November 27th to December 13th. The initial outage was required to make modifications to achieve design steam temperatures and to make permanent repairs to sections of the air cooled condenser that were damaged by freezing during start-up in February. The second outage was required to apply additional corrosion protection to the boiler surfaces to reduce long-term maintenance.

In preparation for each outage, all waste was diverted directly for disposal at alternate locations and a plan was implemented to minimize any potential offsite impact of odours. Odour control mitigation measures were implemented to minimize any potential offsite impact of odours. Mitigation measures included misting micronutrients over the waste pit and conducting regular on-site and off-site inspections to check for fugitive odours. No odour concerns were noted, as confirmed by MOECC's independent inspections.

All incidents triggered by the Emergency Response and Contingency Plan were limited to minor spills with no offsite discharge. There were no environmental impacts associated with these incidents. Refer to Section 14 Emergency Situation Summary.

10. Performance Requirements Excursions - ECA 15 (1) (i)

There were no excursions identified by the CEMS or during the annual Source Testing.

Condition 6(c)(i) of the ECA sets out an operational target for carbon monoxide (CO) of 40mg/Rm^3 over a 4 hour rolling average for the period from and including the initial commissioning of the facility to twelve months following the completion of the first source testing program. The CO limit is currently an operational target and not a compliance limit. The CO limit for the purposes of compliance begins on October 2nd 2016.

Refer to Table 12 for information regarding the CO operational target.

Table 12: CO Operational Target Performance

Occurrence Date	Unit #	Reason
October 5, 2015	1	The 1 hour average CO during the 17:00 hour was 103.1 mg/Rm3. This CO spike affected the 4 hour rolling averages during the 17:00, 18:00 and 19:00 hours
October 19, 2015	2	Boiler tripped causing CO spikes during the period 07:54am to 08:07am causing elevated 4 hour rolling averages at 8:00am (41 mg/Rm^3) and 9:00am (41 mg/Rm^3)
December 16, 2015	2	Two CO spikes occurred causing elevated 4 hour rolling averages at 5:00pm (51 mg/Rm3) and 6:00pm (49 mg/Rm3)
December 30, 2015	2	A CO spike caused an elevated 4 hour rolling average at 9:00pm (56 mg/Rm3)

11. Long-Term Sampling System (LTSS) - ECA 15 (1) (j)

The long term dioxin and furan sampling system, referred to as the AMESA (Adsorption Method for the Sampling of Dioxins and Furans) sampler, has been installed as required by condition 7(3)(a) of the ECA. The system was initially evaluated during the September 29th, 2015 and October 28th, 2015 source testing programs and will continue to be operated and evaluated to assess the ongoing performance of the air pollution control system. The measurements obtained from the LTSS are not meant to be used for the purpose of verifying compliance with the regulatory limits for dioxins and furans. The objective is to monitor the long term variations of dioxins and furan levels.

A protocol was prepared in accordance with the Air Emissions Monitoring Plan for the testing and evaluation of the results from the AMESA system. The Regions, Covanta and their consultant, in consultation with ministry staff, are currently working on revisions to the protocol.

Initial phase of the assessment of the AMESA long term dioxins monitoring system was undertaken during this source testing program. It is the assessment that this information is considered inconclusive. More information is required to be gathered when the next source testing program takes place. Covanta and the MOECC Technology Standards Section are required to harmonize the strategy that will be used to assess the reliability of this monitoring system. This strategy should be in place by the time the 2016 source testing campaign takes place.

For further information, refer to Interim AMESA Evaluation Report, Covanta Report Number: 4053 https://www.durhamyorkwaste.ca/Assets/Documents/FacilityAcceptance/EnvironmentalReports/AMESA_Evalulation.pdf

12. Environmental Complaints - ECA 15 (1) (k)

Monitoring of Complaints and Inquiries at the Durham York Energy Centre is a requirement of Condition 6 of the EA and Condition 10 of the ECA. A Complaint and Inquiry report submission is provided to the MOECC York Durham District Office District Manager on a monthly basis in accordance with the Complaint Protocol approved by the MOECC in 2011. Hard copies and digital records of complaints and the complaint investigation and responses are maintained on site. All Complaint and Inquiry logs are available to the public on the DYEC website: www.durhamyorkwaste.ca

A complaint and Inquiry Summary is provided in Table 13.

Table 13: 2015 Complaint and Inquiry Summary

	Durham	York	Covanta	Total
Complaints to DYEC directly	6	2	0	**8**
Complaints through Regional Councils	10	0	0	**10**
Inquiries	65	0	0	**65**

Of the eighteen (18) complaints received in 2015, five (5) complaints were suspected odour emissions from the DYEC. Odour complaints were received on the following dates:

- March 3, 2015
- June 10, 2015
- June 15, 2015
- November 10, 2015
- November 24, 2015

For each odour complaint, an investigation was undertaken including:

a. Determination of activities begin undertaken at the time of the complaint
b. Weather conditions
c. Determination of whether the complaint is attributed to site activities

All five (5) odour complaints were reported to the MOECC. None of the odour complaints were found to be a result of DYEC operations.

13. Environmental/Operational Problems discovered through daily inspections - ECA 15 (1) (l)

The Outside Environmental Checklist is completed daily by an Operator. A repeat pooling of water was noted around the north and east sides of the Residue Building. As a result, two additional catch basins were installed which now successfully direct stormwater away from the Residue Building into an existing catch basin (CB-06).

14. Emergency Situation Summary - ECA 15 (1) (m)

Emergency situations at the site were limited to minor spills as summarized in Table 14. There were no off-site impacts as a result of these spills.

Table 14: Spill Summary

Date	MOE Reference Number	Material	Amount	Location	Clean Up - Preventative Measures
05-Feb-15	3535-9TGKTW	Reverse osmosis reject water	~500 Litres	From storage tank to Admin parking lot	Temporary storage tank only used during commissioning – SOP developed to monitor tank level to ensure overflow does not happen again
17-Jul-15	7578-9YHQ75	Dry cement	~ 7 kg	From cement silo to air	Blinded baghouse filters were cleaned and reinstalled – increased awareness of differential pressure during offload
30-Jul-15	3106-9YW2MU	Fly ash and water	~1,382 L of fly ash /water and clean up water	From residue building to ground	Bobcat returned ash mix/top layer of soil to Residue Bldg. – faulty water valve replaced
5-Dec-15	4237-A4XFFY	Turbine demister lube oil	Total 100 L with 10 L reaching ground	From turbine demister outlet to PDC roof to ground	Oil pads and Simple Green degreaser; stained gravel physically removed – additional operational checks added

15. Groundwater and Surface Water Monitoring - ECA 15 (1) (n)

Groundwater and surface water monitoring is a requirement of Condition 20 the EA and Condition 7(14) of the ECA. Monitoring is conducted in accordance with the Groundwater and Surface Water Monitoring Plan approved by the MOECC in October 2011. The monitoring program started in December 2011, prior to the commencement of facility operations, to collect background water quality data. Groundwater and surface water monitoring reports are submitted to the MOECC annually.

Groundwater samples are collected in the spring, summer, and fall in a series of dedicated on-site monitoring wells. The monitoring wells and parameters sampled are summarized in Table 15.

Table 15: Groundwater and Surface Water Monitoring Program Summary

Well ID	Well Location
MW1	Northwest corner
MW2A &2B (nested)	Northeast corner
MW3A &3B (nested)	Southwest corner
MW4	Southeast corner
MW5A &5B (nested)	Centre of site
Monitoring Parameters	
Field Measurements	Water level, temperature, pH, conductivity, oxidation reduction potential
Major Anions	Carbonate, bicarbonate, chloride, sulphate
Major Cations	Calcium, magnesium, potassium, sodium
Metals	Boron, cadmium, cobalt, lead, mercury

Surface water monitoring during the operations phase of the project uses continuously logging multi-parameter sondes located at upstream and downstream locations in Tooley creek, just west of the DYEC. The sondes are installed after the spring thaw and are removed in the fall prior to the winter freeze. The sondes measure and record temperature, pH, turbidity and electrical conductivity.

To date, groundwater and surface water monitoring results show no adverse effects, trends or anomalies to further investigate. In 2016, it will be necessary to review and revise the surface water monitoring plan due to construction of the new 401-407 interchange at Courtice Road. Plan revisions will be developed in consultation with the MOECC in early spring 2016.

Refer to the Durham York Energy Centre webpage for the 2015 Groundwater & Surface Water Reports covering the 2014 calendar year as well as the MOECC Approval letter.
https://www.durhamyorkwaste.ca/Documents/MonitoringPlansReports/GroundSurfaceWater/GroundSurfaceWaterReports2014.aspx

In accordance with EA Condition 20.7, thirty days after first receipt of waste, the results of the groundwater and surface water monitoring program to date, were submitted to the Director and Regional Director, in the Facility Initiation Reports for Groundwater and Surface Water. These reports are posted on the DYEC website.
https://www.durhamyorkwaste.ca/Documents/MonitoringPlansReports/GroundSurfaceWater/GroundSurfaceWaterReports2015.aspx

16. Advisory Committee Meetings - ECA 15 (1) (o)

The Energy from Waste Advisory Committee (EFWAC) is a requirement of Condition 8 of the EA and Condition 17 of the ECA. The Committee was established in 2011 with membership outlined in EA

Condition 8. The meetings are advertised in local papers in advance of upcoming meetings. EFWAC is governed by their Terms of Reference which outlines the role of the EFWAC, presents guidelines for how the committee will operate, the membership composition, and when meetings will take place. The committee is chaired by a facilitator hired by the Regions of Durham and York.

A summary of the 2015 EFWAC Committee meeting is provided in Table 16.

Table 16: 2015 EFWAC Meeting Summary

EFWAC Meeting #	Date	Time	Agenda Topics
12	April 9, 2015	6:30-8:30 PM	• Facility Acceptance Testing • Region of Durham Medical Officer of Health Report on Mobile Ambient Air Monitoring • Information provided to members from the MOECC on their mobile Air Quality TAGA unit

There are currently no outstanding motions from the committee that have not been addressed. The committee requested a presentation of the results of Facility Acceptance Testing. This presentation was held on March 16, 2016 due to the delay in Acceptance Testing.

All EFWAC meeting agendas, minutes and presentations are available to the public on the DYEC website: https://www.durhamyorkwaste.ca/PublicOutreach/EFWAC/Meetings.aspx

17. Recommendations for Improvement - ECA 15 (1) (p)

The DYEC anticipates installing equipment in early 2016 (air cannons) to enhance convection hopper fly ash flow and reduce unplanned outages to clear those hoppers.

DYEC currently continuously monitors organic matter (THC) in the undiluted gases leaving the combustion zone via the economizer outlet. Covanta recommended relocating these monitors to the APC outlet in order to provide more efficient emission data generation and higher availability of the THC CEMS. The MOECC concurred with this recommendation and subsequently issued an amendment to the ECA in early 2016. The process of relocating the monitors has begun and will conclude with RATA testing scheduled for April 2016. This movement is scheduled for March 2016.

Additionally, Covanta made several recommendations to revise the ECA to more fully correspond and provide operational flexibility in conformance with the design of the DYEC.

Thus the following specific additional modifications to the ECA were made:

- to remove the storage duration limits on storage of recovered ferrous and non-ferrous metals since such storage does not pose an environmental risk;

- to increase the amounts of cement, Pozzolan and aqueous ammonia approved for storage at the Site since the currently approved amounts result in partial filling of the tanks, necessitating more frequent deliveries resulting in increased truck traffic and a chance of interrupting fly ash and flue gas treatment;

- to revise the protocol for an emergency storage of the incoming Waste so that the Owner is able to deal more effectively with emergency situations occurring at the Site while providing more flexibility to the Districting Manager to oversee management of such situations; and

- to remove a reference to an incorrect bottom ash testing method erroneously included within the text of the DYEC Ash Sampling and Testing Protocol included as Item #4 in Schedule “A” in order to ensure that only the approved testing method for compliance testing is referenced in the supporting documentation..

18. Statement of Compliance - ECA 15 (1) (q)

The DYEC operated in compliance with its multimedia ECA No. 7306-8FDKNX, including compliance with the emission limits of Ontario Regulation 419/05, based on the final results of source testing, continuous monitoring, operational records and engineering calculations undertaken during the year and as reported to the MOECC and the Regions.

19. Comparison to Previous Years - ECA 15 (1) (r)

As the DYEC commenced operation with the commissioning of the facility on February 9th, 2015, no operational comparison to previous years can be completed as this time.

APPENDIX 1

ECA 7306-8FDKNX Condition 15 Reporting

15. **REPORTING**

Annual Report

(1) By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager and to the Advisory Committee, an Annual Report summarizing the operation of the Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:

(a) a summary of the quality and the quantity of the Wastes accepted at the Site, including the maximum amount of the Waste received annually and daily and the sources of the Waste;

(b) a summary of the quality and the quantity of the Residual Waste shipped from the Site, including the analytical data required to characterize the Residual Waste, the off-Site destinations for the Residual Waste and its subsequent use, if known;

(c) estimated material balance for each month documenting the maximum amount of wastes stored at the Site;

(d) annual water usage;

(e) annual amount of the electricity produced and the annual amount of the electricity exported to the electrical grid;

(f) summaries and conclusions from the records required by Conditions 14.(3) through 14.(8) of this Certificate;

14 RECORD KEEPING

Daily Activities
(3) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) date of record and the name and signature of the person completing the report;
(b) quantity and source of the incoming Waste received at the Site;
(c) records of the estimated quantity of Waste thermally treated in the Boilers;
(d) quantity of the Unacceptable Waste received at the Site by the end of the approved Waste receipt period and the type(s) of the Unacceptable Waste received;
(e) quantity and type of the Residual Waste shipped from the Site, including any required outgoing Residual Waste characterization results;
(f) destination and/or receiving site(s) for the Residual Waste shipped from the Site;
(g) quantity and type of any Rejected Waste accepted at the Site;
(h) destination and/or receiving site(s) for the Rejected Waste shipped from the Site;
(i) housekeeping activities, including litter collection and washing/cleaning activities, etc.
(j) amount of electricity produced;
(k) amount of excess electricity exported to the electrical grid.

Monitoring and Testing Records

(4) The Owner shall maintain an on-Site written or digital record of activities undertaken at the Site. All measurements shall be recorded in consistent metric units of measurement. As a minimum, the record shall include the following:

(a) day and time of the activity;
(b) all original records produced by the recording devices associated with the CEM Systems;
(c) a summary of daily records of readings of the CEM Systems, including:
(i) the daily minimum and maximum 4-hour average readings for carbon monoxide;
(ii) the daily minimum and maximum one hour average readings for oxygen;
(iii) the daily minimum and maximum 10-minute average readings for organic matter;
(iv) the daily minimum and maximum 24-hour average readings for sulphur dioxide;
(v) the daily minimum and maximum 24-hour average readings for nitrogen oxides;
(vi) the daily minimum and maximum 24-hour average readings for hydrogen chloride;
(vii) the daily minimum and maximum 6-minute average and 2-hour average opacity readings; and
(viii) the daily minimum and maximum one-hour average readings for temperature measurements.
(d) records of all excursions from the applicable Performance Requirements as measured by the CEM Systems, duration of the excursions, reasons for the excursions and corrective measures taken to eliminate the excursions;
(e) all records produced during any Acoustic Audit;
(f) all records produced during any Source Testing;
(g) all records produced by the long term sampling program for Dioxins and Furans required by this Certificate;
(h) all records produced during the Residual Waste compliance testing;
(i) all records produced during the Soil Testing;
(j) all records produced during the Groundwater and Surface Water Monitoring required by this Certificate;
(k) all records produced during the Ambient Air Monitoring required by this Certificate;
(l) all records associated with radiation monitoring of the incoming Waste, including but not limited to:
(i) transaction number;
(ii) hauler;
(iii) vehicle ID;
(iv) alarm level;
(v) maximum CPS;
(vi) uSv/hr;
(vii) comment;
(viii) background CPS;
(ix) driver time in and out; and
(x) name of the Trainer Personnel that carried out the monitoring.
(m) results of the containment testing carried out in the buildings, conveyors, tanks and silos, as required;
(n) results the negative pressure in the Tipping Building carried out, as required.

Inspections/Maintenance/Repairs

(5) The Owner shall maintain an on-Site written or digital record of inspections and maintenance as required by this Certificate. As a minimum, the record shall include the following:

(a) the name and signature of the Trained Personnel that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered, including the need for a maintenance or repair activity;
(d) the recommendations for remedial action;
(e) the date, time and description of actions (repair or maintenance) undertaken;
(f) the name and signature of the Trained Personnel who undertook the remedial action; and
(g) an estimate of the quantity of any materials removed during cleaning of the Works.

Emergency Situations
(6) The Owner shall maintain an on-Site written or digital record of the emergency situations. As a minimum, the record shall include the following:

(a) the type of an emergency situation;
(b) description of how the emergency situation was handled;
(c) the type and amount of material spilled, if applicable;
(d) a description of how the material was cleaned up and stored, if generated; and
(e) the location and time of final disposal, if applicable; and
(f) description of the preventative and control measures undertaken to minimize the potential for re-occurrence of the emergency situation in the future.

Complaints Response Records
(7) The Owner shall establish and maintain a written or digital record of complaints received and the responses made as required by this Certificate.

Training
(8) The Owner shall maintain an on-Site written or digital record of training as required by this Certificate. As a minimum, the record shall include the following:

(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

15. Annual Report
(1)

(g) the Emission Summary Table and the Acoustic Assessment Summary Table for the Facility as of December 31 from the previous calendar year;

(h) a summary of dates, duration and reasons for any environmental and operational problems, Boilers downtime, APC Equipment and CEM System malfunctions that may have negatively impacted the quality of the environment or any incidents triggered by the Emergency Response and Contingency Plan and corrective measures taken to eliminate the environmental impacts of the incidents;

(i) a summary of the dates, duration and reasons for all excursions from the applicable Performance Requirements as measured by the CEM Systems or as reported by the annual Source Testing, reasons for the excursions and corrective measures taken to eliminate the excursions;

(j) results of the evaluation of the performance of the long-term sampling system in determining the Dioxins and Furans emission trends and/or fluctuations for the year reported on as well as demonstrating the ongoing performance of the APC Equipment associated with the Boilers;

(k) dates of all environmental complaints relating to the Site together with cause of the Complaints and actions taken to prevent future Complaints and/or events that could lead to future Complaints;

(l) any environmental and operational problems that could have negatively impacted the environment, discovered as a result of daily inspections or otherwise and any mitigative actions taken;

(m) a summary of any emergency situations that have occurred at the Site and how they were handled;

(n) the results and an interpretive analysis of the results of the groundwater and surface water, including an assessment of the need to amend the monitoring programs;

(o) summaries of the Advisory Committee meetings, including the issues raised by the public and their current status;

(p) any recommendations to improve the environmental and process performance of the Site in the future;

(q) statement of compliance with this Certificate, including compliance with the *O. Reg. 419/05* and all air emission limits based on the results of source testing, continuous monitoring and engineering calculations, as may be appropriate; and

(r) interpretation of the results and comparison to the results from previous Annual Reports to demonstrate the Facility's impact on the environment.

Appendix 2

Emission Summary Table

EXECUTIVE SUMMARY

ORTECH Consulting Inc. (ORTECH) completed an emission testing program at the Durham York Energy Centre (DYEC) located in Courtice, Ontario between September 29 and October 29, 2015. The emission testing program was performed to satisfy the requirements of the Ontario Ministry of the Environment and Climate Change (MOECC) Amended Environmental Compliance Approval (ECA) No. 7306-8FDKNX. Section 7(1) of the ECA states that "the owner shall perform annual source testing, in accordance with the procedures and schedule outlined in the attached Schedule E, to determine the rates of emissions of the test contaminants from the stack. The program shall be conducted not later than six months after the commencement date of operation of the facility/equipment and subsequent source testing programs shall be conducted once every calendar year thereafter." This program is the initial source testing program conducted under Amended ECA No. 7306-8FDKNX.

Source testing was performed on the Baghouse (BH) Outlet of Boiler No. 1 and BH Outlet of Boiler No. 2 for the test contaminants listed in Schedule D of the ECA. Although not required by the ECA, testing was also conducted at each location for hexavalent chromium.

The initial test program was conducted from September 29 to October 2, 2015 during which triplicate tests were conducted for each parameter listed in Schedule D of the ECA. After discussions between Covanta and the MOECC, additional testing was conducted for semi-volatile organic compounds, including dioxins, furans, 12 dioxin-like PCBs, chlorobenzenes, chlorophenols and PAHs. Triplicate semi-volatile organic tests were conducted on October 21 and October 22, 2015. An additional three semi-volatile organic tests were conducted on October 28 and October 29, 2015. The results from all of the tests performed are provided in the appendices of this report. The results from the additional testing are summarized in the text of the report.

Each set of dioxin and furan results is accompanied by a laboratory report that identifies interference by certain organics with the amount of the interference being reportedly less in the second and third set of dioxin and furan results when an additional cleanup procedure was applied to reduce interference. Interference creates elevated results for toxic equivalence because there is more weight added to the sample. The second and third sets of dioxin and furan analyses are considered more representative of actual DYEC emissions due to an additional laboratory procedure to prepare the extracts for analyses and laboratory notes that identify less interference in that data in comparison to the first set.

Prior to commencing the source testing program, relative accuracy and system bias testing was conducted on the Continuous Emission Monitoring Systems (CEMS) installed at the Scrubber Inlet and BH Outlet of each Boiler. The results of the relative accuracy and system bias testing are presented in ORTECH Report No. 21546-2. The DYEC CEMS met the performance parameters detailed in Schedule F of the ECA. The data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Concentration data measured by ORTECH between September 23 and September 27, 2015 at the Scrubber Inlet sampling locations was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

Triplicate emission tests were completed for particulate matter, metals, semi-volatile organic compounds, aldehydes, acid gases, volatile organic compounds and combustion gases at the BH Outlet of each Boiler. The contaminant groups included in the emission test program and the reference test methods used are summarized below:

Test Groups	Reference Method
Metals	US EPA Method 29
$PM_{2.5}$ and PM_{10}	US EPA Methods 201A and 202
Hexavalent Chromium	US EPA SW-846 Method 0061
Semi-Volatile Organic Compounds	Environment Canada Method EPS 1/RM/2
Volatile Organic Compounds	US EPA SW-846 Method 0030
Aldehydes	CARB Method 430
Particulate, Halides and Ammonia	US EPA Method 26A
Combustion Gases:	
Oxygen and Carbon Dioxide	Facility CEM
Carbon Monoxide	Facility CEM
Sulphur Dioxide	Facility CEM
Nitrogen Oxides	Facility CEM
Total Hydrocarbons	Facility CEM/ORTECH per US EPA Method 25A

Schedule C of ECA No. 7306-8FDKNX lists in-stack limits for the emissions of various compounds. In-stack emissions limits are given for particulate matter, mercury, cadmium, lead, dioxins and furans and organic matter for comparison with the results from compliance source testing. In-stack emission limits are also given for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide calculated as the rolling arithmetic average of data measured by a CEMS.

Since relative accuracy and system bias testing demonstrated that the DYEC CEMS met the performance parameters detailed in Schedule F of the ECA, the data recorded by the DYEC CEMS was used to assess against the in-stack emissions limits detailed in Schedule C of the ECA for hydrochloric acid, sulphur dioxide, nitrogen oxides and carbon monoxide. Note the DYEC CEMS data for the four day test period (September 29 to October 2) was used to determine the minimum, average and maximum concentrations of the combustion gases listed in the ECA. Concentration data measured by ORTECH between September 23 and September 27, 2015 at the Scrubber Inlet sampling locations was used to assess against the total hydrocarbons (organic matter) in-stack emissions limit detailed in Schedule C of the ECA.

Consistent with the approach commonly required by the MOECC for compliance emission testing programs, the following results are conservative in the sense that when the analytical result is reported to be below the detection limit, the full detection limit is used to calculate emission data (with the exception of dioxin and furans which use half the detection limit) and is shown by a "<" symbol. Also, when one or both Boiler results are reported to be below the detection limit, the detection limit was used to conservatively estimate the total emission rate for the Main Stack.

The average results for the tests conducted at the Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet, along with the respective in-stack emission limits, are summarized in the following table:

Parameter	Limit	Boiler No. 1	Boiler No. 2	Combined Boilers
September 29 to October 2, 2015 Test Results:				
Power Output (MWh/day)	-	-	-	412 (7)
Average Combustion Zone Temp. (°C)	-	1127	1169	1148 (8)
Steam (tonnes/day)	-	837	838	1675 (7)
MSW Combusted (tonnes/day)	-	225	222	447 (7)
NOx Reagent Injection Rate (liters/d)	-	1333	1274	2607 (7)
Carbon Injection (kg/day)	-	95.3	91.5	187 (7)
Lime Injection (kg/day)	-	4075	3865	7940 (7)
Stack Temperature (°C)	-	135	134	135 (8)
Moisture Content (%)	-	16.5	16.3	16.4 (8)
Velocity (m/s)	-	17.3	17.4	-
Static Pressure (kPa)	-	-2.75	-2.68	-2.72 (8)
Absolute Pressure (kPa)	-	98.5	98.4	98.5 (8)
Actual Flowrate (m^3/s)	-	25.6	25.8	-
Dry Reference Flowrate (Rm^3/s) (1)	-	15.2	15.3	30.5 (7)
Oxygen (%)	-	7.69	8.00	7.85 (8)
Carbon Dioxide (%)	-	11.4	11.3	11.4 (8)
Particulate (mg/Rm^3) (2)	9	0.53	<0.41	<0.47 (8)
Mercury ($\mu g/Rm^3$) (2)	15	1.16	0.72	0.94 (8)
Cadmium ($\mu g/Rm^3$) (2)	7	0.12	0.15	0.14 (8)
Lead ($\mu g/Rm^3$) (2)	50	0.57	0.51	0.54 (8)
Hydrochloric Acid (mg/Rm^3) (4)	9	3.7	4.1	3.9 (8)
Sulphur Dioxide (mg/Rm^3) (4)	35	6.7	1.8	4.3 (8)
Nitrogen Oxides (mg/Rm^3) (4)	121	115	115	115 (8)
Total Hydrocarbons (ppm, dry) (5)	50	0	4.9	2.5 (8)
Carbon Monoxide (mg/Rm^3) (6)	40	24.4	27.0	25.7 (8)
October 21 to October 22, 2015 Test Results:				
Power Output (MWh/day)	-	-	-	358 (7)
Average Combustion Zone Temp. (°C)	-	1174	1139	1156 (8)
Steam (tonnes/day)	-	815	819	1633 (7)
MSW Combusted (tonnes/day)	-	222	220	442 (7)
NOx Reagent Injection Rate (liters/d)	-	1199	1503	2702 (7)
Carbon Injection (kg/day)	-	124	123	247 (7)
Lime Injection (kg/day)	-	5649	5749	11397 (7)
Dioxins and Furans ($pg\ TEQ/Rm^3$) (3)	60	<36.0	<32.4	<34.2 (8)
October 28 to October 29, 2015 Test Results:				
Power Output (MWh/day)	-	-	-	402 (7)
Average Combustion Zone Temp. (°C)	-	1167	1158	1162 (8)
Steam (tonnes/day)	-	821	821	1642 (7)
MSW Combusted (tonnes/day)	-	227	225	452 (7)
NOx Reagent Injection Rate (liters/d)	-	976	1499	2475 (7)
Carbon Injection (kg/day)	-	119	119	238 (7)
Lime Injection (kg/day)	-	4115	4154	8269 (7)
Dioxins and Furans ($pg\ TEQ/Rm^3$) (3)	60	<27.0	<22.2	<24.6 (8)

(1) dry at 25°C and 1 atmosphere
(2) dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
(3) calculated using the NATO/CCMS (1989) toxicity equivalence factors and the detection limit for those isomers below the analytical detection limit, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
(4) maximum calculated rolling arithmetic average of 24 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
(5) average of six half-hour tests conducted by ORTECH between September 23 and September 27, 2015 measured at an undiluted location, reported on a dry basis expressed as equivalent methane
(6) maximum calculated rolling arithmetic average of 4 hours of data measured by the DYEC CEMS, dry at 25°C and 1 atmosphere, adjusted to 11% oxygen by volume
(7) total for combined Boilers
(8) average for combined Boilers

The emission data measured at each Boiler BH Outlet during the testing program was combined and used to assess the emissions from the Main Stack against the point of impingement criteria detailed in Ontario Regulation 419/05.

The CALPUFF dispersion modelling results for the 2015 emission testing program are provided in the following tables based on calculated ground level point of impingement concentrations for the average total Main Stack emissions. As shown in the following tables, the calculated impingement concentrations were well below the allowable impingement concentrations for all of the contaminants. The point of impingement concentration was less than 26.3% of the standard, guideline or upper risk threshold limit provided in Ontario Regulation 419/05 for each contaminant.

A scenario provided in the DYEC Emission Summary and Dispersion Modelling (ESDM) Report includes emissions from silo loading and the standby generator (Scenario H). The predominant contaminants from these sources are particulate from the silo loading and nitrogen oxides from the generator. These two contaminants were assessed and it was determined that, since the Main Stack emissions presented in this report are less than those in the ESDM Report, dispersion modelling would show a decrease in the point of impingement concentration for these two contaminants. As a result, additional dispersion modelling for Scenario H was not conducted.

Odour sampling was conducted by Zorix Environmental and the results were provided to ORTECH for inclusion in the report. ORTECH performed CALPUFF dispersion modelling for a five year period to determine the odour concentrations at off property receptors. The source input data for the modelling, including flowrate, temperature and odour emission rate, was provided by Covanta based on the odour testing report prepared by Zorix Environmental. The maximum 10-minute odour concentration at the most impacted sensitive receptor was 0.28 OU occurring at a former house that was located to the west of the facility. Note this house was included as a sensitive receptor in the Emission Summary and Dispersion Modelling report but has since been demolished. This concentration is below the ECA limit of 1 odour unit at sensitive receptors.

Covanta - Durham York Energy Centre
Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for
Inorganic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.13 µg/m^3			
Base Case - 1 hour			1.00 g/s	24.2 µg/m^3			
Base Case - 1/2 hour			1.00 g/s	29.0 µg/m^3			
Base Case - 30 day			1.00 g/s	0.117 µg/m^3			
Filterable Particulate Matter	10.7 mg/s	<8.41 mg/s	<19.1 mg/s	0.022 µg/m^3	120 µg/m^3	0.018	S
Hydrogen Chloride *	131 mg/s	109 mg/s	240 mg/s	0.27 µg/m^3	20 µg/m^3	1.36	S
Hydrogen Fluoride	<1.12 mg/s	<1.13 mg/s	<2.25 mg/s	0.0025 µg/m^3	100 µg/m^3	0.0025	S
Hydrogen Fluoride	<1.12 mg/s	<1.13 mg/s	<2.25 mg/s	0.00026 µg/m^3	100 µg/m^3	0.00026	S - 30 day
Ammonia	30.1 mg/s	18.5 mg/s	48.6 mg/s	0.055 µg/m^3	100 µg/m^3	0.055	S
Sulphur Dioxide **	0.062 g/s	0.014 g/s	0.076 g/s	0.086 µg/m^3	275 µg/m^3	0.031	S
Sulphur Dioxide **	0.062 g/s	0.014 g/s	0.076 g/s	1.84 µg/m^3	690 µg/m^3	0.27	S - 1 hour
Nitrogen Oxides **	2.20 g/s	2.14 g/s	4.34 g/s	4.91 µg/m^3	200 µg/m^3	2.45	S
Nitrogen Oxides **	2.20 g/s	2.14 g/s	4.34 g/s	105 µg/m^3	400 µg/m^3	26.3	S - 1 hour
Carbon Monoxide **	0.31 g/s	0.29 g/s	0.60 g/s	17.3 µg/m^3	6000 µg/m^3	0.29	S - 1/2 hour

S - Standard
G - Guideline
URT - Upper Risk Threshold
* Measured by ORTECH using the particulate, halide and ammonia test train.
** Emission data calculated using the CEM data measured by DYEC and the volumetric flowrates measured by ORTECH between September 29 and October 2, 2015.
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

Covanta - Durham York Energy Centre
Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for
Semi-Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.13 µg/m^3			
Base Case - 1 hour			1.00 g/s	24.2 µg/m^3			
October 1 to October 2, 2015 Test Results:							
Dioxins, Furans and Dioxin-Like PCBs (TEQ)*	4.41 ng TEQ/s	1.99 ng TEQ/s	6.40 ng TEQ/s	0.0072 pg TEQ/m^3	1 pg TEQ/m^3	0.72	URT
Naphthalene	5.35 µg/s	4.19 µg/s	9.54 µg/s	0.000011 µg/m^3	22.5 µg/m^3	<0.0001	G
Biphenyl	3.09 µg/s	3.84 µg/s	6.93 µg/s	0.00017 µg/m^3	60 µg/m^3	0.00028	G - 1 hour
Benzo (a) pyrene	<0.031 µg/s	0.041 µg/s	<0.072 µg/s	0.000000081 µg/m^3	0.0011 µg/m^3	0.0074	G
1,2-Dichlorobenzene	0.55 µg/s	0.46 µg/s	1.01 µg/s	0.000024 µg/m^3	30500 µg/m^3	<0.0001	G - 1 hour
1,4-Dichlorobenzene	0.49 µg/s	0.39 µg/s	0.88 µg/s	0.00000099 µg/m^3	95 µg/m^3	<0.0001	S
1,2,4-Trichlorobenzene	0.40 µg/s	0.37 µg/s	0.77 µg/s	0.00000087 µg/m^3	400 µg/m^3	<0.0001	G
Pentachlorophenol	0.36 µg/s	<0.15 µg/s	<0.51 µg/s	0.00000058 µg/m^3	20 µg/m^3	<0.0001	G
October 21 to October 22, 2015 Test Results:							
Dioxins, Furans and Dioxin-Like PCBs (TEQ)*	0.62 ng TEQ/s	0.61 ng TEQ/s	1.23 ng TEQ/s	0.0014 pg TEQ/m^3	1 pg TEQ/m^3	0.14	URT
Naphthalene	13.3 µg/s	13.6 µg/s	26.9 µg/s	0.000030 µg/m^3	22.5 µg/m^3	<0.0001	G
Biphenyl	0.76 µg/s	1.57 µg/s	2.33 µg/s	0.000056 µg/m^3	60 µg/m^3	<0.0001	G - 1 hour
Benzo (a) pyrene	<0.036 µg/s	<0.036 µg/s	<0.072 µg/s	0.000000081 µg/m^3	0.0011 µg/m^3	0.0074	G
1,2-Dichlorobenzene	0.33 µg/s	0.22 µg/s	0.55 µg/s	0.000013 µg/m^3	30500 µg/m^3	<0.0001	G - 1 hour
1,4-Dichlorobenzene	0.25 µg/s	0.15 µg/s	0.40 µg/s	0.00000045 µg/m^3	95 µg/m^3	<0.0001	S
1,2,4-Trichlorobenzene	0.13 µg/s	<0.095 µg/s	<0.23 µg/s	0.00000025 µg/m^3	400 µg/m^3	<0.0001	G
Pentachlorophenol	0.68 µg/s	<0.18 µg/s	<0.86 µg/s	0.00000097 µg/m^3	20 µg/m^3	<0.0001	G
October 29 to October 29, 2015 Test Results:							
Dioxins, Furans and Dioxin-Like PCBs (TEQ)*	0.48 ng TEQ/s	0.42 ng TEQ/s	0.90 ng TEQ/s	0.0010 pg TEQ/m^3	1 pg TEQ/m^3	0.10	URT
Naphthalene	13.7 µg/s	12.7 µg/s	26.4 µg/s	0.000030 µg/m^3	22.5 µg/m^3	<0.0001	G
Biphenyl	0.61 µg/s	0.30 µg/s	0.91 µg/s	0.000022 µg/m^3	60 µg/m^3	<0.0001	G - 1 hour
Benzo (a) pyrene	<0.037 µg/s	<0.037 µg/s	<0.074 µg/s	0.000000084 µg/m^3	0.0011 µg/m^3	0.0076	G
1,2-Dichlorobenzene	0.38 µg/s	0.28 µg/s	0.66 µg/s	0.000016 µg/m^3	30500 µg/m^3	<0.0001	G - 1 hour
1,4-Dichlorobenzene	0.30 µg/s	0.23 µg/s	0.53 µg/s	0.00000060 µg/m^3	95 µg/m^3	<0.0001	S
1,2,4-Trichlorobenzene	0.20 µg/s	0.14 µg/s	0.34 µg/s	0.00000038 µg/m^3	400 µg/m^3	<0.0001	G
Pentachlorophenol	<0.25 µg/s	<0.19 µg/s	<0.44 µg/s	0.00000050 µg/m^3	20 µg/m^3	<0.0001	G

S - Standard
G - Guideline
URT - Upper Risk Threshold

* Calculated using the WHO (O. Reg. 419/05) toxicity equivalence factors and half the detection limit for those isomers not detected in quantities greater than the reportable detection limit.
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for Metals

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.13 $\mu g/m^3$			
Antimony	<0.0012 mg/s	<0.0029 mg/s	<0.0041 mg/s	0.0000046 $\mu g/m^3$	25 $\mu g/m^3$	<0.0001	S
Arsenic	<0.0012 mg/s	<0.0013 mg/s	<0.0026 mg/s	0.0000029 $\mu g/m^3$	0.3 $\mu g/m^3$	0.00097	G
Barium (as water soluble)	0.0039 mg/s	0.0059 mg/s	0.0098 mg/s	0.000011 $\mu g/m^3$	10 $\mu g/m^3$	0.00011	G
Beryllium	<0.0012 mg/s	<0.0012 mg/s	<0.0025 mg/s	0.0000028 $\mu g/m^3$	0.01 $\mu g/m^3$	0.028	S
Cadmium	0.0025 mg/s	0.0029 mg/s	0.0054 mg/s	0.0000061 $\mu g/m^3$	0.025 $\mu g/m^3$	0.024	S
Chromium	0.050 mg/s	0.12 mg/s	0.17 mg/s	0.00020 $\mu g/m^3$	1.5 $\mu g/m^3$	0.013	G
Cobalt	<0.0012 mg/s	<0.0014 mg/s	<0.0027 mg/s	0.0000030 $\mu g/m^3$	0.1 $\mu g/m^3$	0.0030	G
Copper	0.050 mg/s	0.061 mg/s	0.11 mg/s	0.00012 $\mu g/m^3$	50 $\mu g/m^3$	0.00025	S
Lead	0.011 mg/s	0.0099 mg/s	0.021 mg/s	0.000024 $\mu g/m^3$	0.5 $\mu g/m^3$	0.0048	S
Manganese (as compounds)	0.031 mg/s	0.070 mg/s	0.10 mg/s	0.00011 $\mu g/m^3$	2.5 $\mu g/m^3$	0.0046	G
Mercury	0.023 mg/s	0.014 mg/s	0.037 mg/s	0.000042 $\mu g/m^3$	2 $\mu g/m^3$	0.0021	S
Molybdenum	0.30 mg/s	0.30 mg/s	0.61 mg/s	0.00069 $\mu g/m^3$	120 $\mu g/m^3$	0.00057	G
Nickel	0.12 mg/s	0.15 mg/s	0.27 mg/s	0.00030 $\mu g/m^3$	2 $\mu g/m^3$	0.015	S
Selenium	<0.0062 mg/s	<0.0062 mg/s	<0.012 mg/s	0.000014 $\mu g/m^3$	10 $\mu g/m^3$	0.00014	G
Silver	<0.0012 mg/s	<0.0012 mg/s	<0.0025 mg/s	0.0000028 $\mu g/m^3$	1 $\mu g/m^3$	0.00028	S
Vanadium	<0.00062 mg/s	<0.00081 mg/s	<0.0014 mg/s	0.0000016 $\mu g/m^3$	2 $\mu g/m^3$	<0.0001	S
Zinc	0.064 mg/s	0.13 mg/s	0.19 mg/s	0.00022 $\mu g/m^3$	120 $\mu g/m^3$	0.00018	S
Hexavalent Chromium	<0.0048 mg/s	<0.0049 mg/s	<0.0097 mg/s	0.000011 $\mu g/m^3$	0.07 $\mu g/m^3$	0.016	URT

S - Standard
G - Guideline
URT - Upper Risk Threshold
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

Main Stack with Both Boilers Operating
Regulation 419 Dispersion Modeling Results using CALPUFF for
Volatile Organic Compounds

Contaminant	Boiler No. 1 BH Outlet Average Emission Rate	Boiler No. 2 BH Outlet Average Emission Rate	Total Average Emission Rate	Calculated Impingement Concentration	Allowable Impingement Concentration	Percentage of Allowable Concentration	Status of Allowable Concentration
Base Case - 24 hour			1.00 g/s	1.13 µg/m^3			
Base Case - 1 hour			1.00 g/s	24.2 µg/m^3			
Acetone	<1.21 mg/s	<0.064 mg/s	<1.27 mg/s	0.0014 µg/m^3	11880 µg/m^3	<0.0001	S
Benzene	<0.59 mg/s	<0.039 mg/s	<0.63 mg/s	0.00071 µg/m^3	100 µg/m^3	0.00071	URT
Bromoform	<0.12 mg/s	<0.0064 mg/s	<0.12 mg/s	0.00014 µg/m^3	55 µg/m^3	0.00026	G
Bromomethane	<1.07 mg/s	<0.058 mg/s	<1.13 mg/s	0.0013 µg/m^3	1350 µg/m^3	<0.0001	G
1,3-Butadiene	<0.067 mg/s	<0.013 mg/s	<0.080 mg/s	0.000090 µg/m^3	300 µg/m^3	<0.0001	URT
2-Butanone	<0.16 mg/s	<0.0064 mg/s	<0.17 mg/s	0.00019 µg/m^3	1000 µg/m^3	<0.0001	S
Carbon Tetrachloride	<0.12 mg/s	<0.0064 mg/s	<0.12 mg/s	0.00014 µg/m^3	2.4 µg/m^3	0.0058	S
Chloroform	<0.12 mg/s	<0.011 mg/s	<0.13 mg/s	0.00015 µg/m^3	1 µg/m^3	0.015	S
Cumene (Isopropylbenzene)	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00028 µg/m^3	400 µg/m^3	<0.0001	S
Dichlorodifluoromethane	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00028 µg/m^3	500000 µg/m^3	<0.0001	G
trans,1,2-Dichloroethene	<0.12 mg/s	<0.0064 mg/s	<0.12 mg/s	0.00014 µg/m^3	105 µg/m^3	0.00013	G
Ethylbenzene	<0.18 mg/s	<0.0078 mg/s	<0.19 mg/s	0.00021 µg/m^3	1000 µg/m^3	<0.0001	S
Ethylene Dibromide	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00028 µg/m^3	3 µg/m^3	0.0094	G
Mesitylene (1,3,5-Trimethylbenzene)	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00029 µg/m^3	220 µg/m^3	0.00013	S
Methylene Chloride	<1.29 mg/s	<0.092 mg/s	<1.38 mg/s	0.0016 µg/m^3	220 µg/m^3	0.00071	G
Styrene	<0.25 mg/s	<0.032 mg/s	<0.28 mg/s	0.00032 µg/m^3	400 µg/m^3	<0.0001	S
Tetrachloroethene	<0.12 mg/s	<0.0066 mg/s	<0.12 mg/s	0.00014 µg/m^3	360 µg/m^3	<0.0001	S
Toluene	<2.48 mg/s	0.062 mg/s	<2.54 mg/s	0.0029 µg/m^3	2000 µg/m^3	0.00014	G
1,1,1-Trichloroethane	<0.12 mg/s	<0.0064 mg/s	<0.12 mg/s	0.00014 µg/m^3	115000 µg/m^3	<0.0001	S
Trichloroethene	<0.12 mg/s	<0.0064 mg/s	<0.12 mg/s	0.00014 µg/m^3	12 µg/m^3	0.0012	S
Trichlorotrifluoroethane	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00028 µg/m^3	800000 µg/m^3	<0.0001	S
Trichlorofluoromethane	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00028 µg/m^3	6000 µg/m^3	<0.0001	G
Total Xylenes	<0.71 mg/s	<0.034 mg/s	<0.74 mg/s	0.00084 µg/m^3	730 µg/m^3	0.00012	S
Vinyl Chloride	<0.24 mg/s	<0.013 mg/s	<0.25 mg/s	0.00028 µg/m^3	1 µg/m^3	0.028	S
Acetaldehyde	8.40 mg/s	10.9 mg/s	19.3 mg/s	0.022 µg/m^3	500 µg/m^3	<0.0001	S
Formaldehyde	8.60 mg/s	20.2 mg/s	28.8 mg/s	0.033 µg/m^3	65 µg/m^3	0.05007	S
Acrolein	<1.52 mg/s	<1.60 mg/s	<3.12 mg/s	0.0035 µg/m^3	0.4 µg/m^3	0.88140	S
Acrolein	<1.52 mg/s	<1.60 mg/s	<3.12 mg/s	0.076 µg/m^3	4.5 µg/m^3	1.68	S - 1 hour

S - Standard
G - Guideline
URT - Upper Risk Threshold
Note: Unless otherwise stated all allowable limits are 24 hour standards or guidelines.

In summary, the key results of the emission testing program carried out as required by ECA No. 7306-8FDKNX are:

- The facility was maintained within the operational parameters defined by the amended ECA that constitutes normal operation during the stack test periods. Testing was conducted at a steam production rate of greater than 1623 tonnes of steam per day for the two Boilers combined. The maximum continuous rating for the facility is 1614.7 tonnes of steam per day for the two Boilers combined (33.64 tonnes per hour for each Boiler).
- Using CALPUFF dispersion modelling techniques, the predicted maximum point of impingement concentrations, based on the average test results, show DYEC to be operating well below the standards in Regulation 419/05 (Schedule 3) under the Ontario Environmental Protection Act and other MOECC criteria including guidelines, upper risk thresholds and "to be updated" guidelines.

Tables referenced in this report for the tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet between September 29 and October 2, 2015 are provided in Appendix 1 and Appendix 2, respectively. Tables for the triplicate semi-volatile organic tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet on October 21 and October 22, 2015 are provided in Appendix 3 and Appendix 4, respectively. Tables for the additional three semi-volatile organic tests conducted at Boiler No. 1 BH Outlet and Boiler No. 2 BH Outlet on October 28 and October 29, 2015 are provided in Appendix 5 and Appendix 6, respectively.

Appendix 3

Acoustic Assessment Summary Tables and Area Plan with points of Reception and Measurement

TABLE 4

COMPARISON OF PRE-OPERATIONAL AND POST-OPERATIONAL SOUND MEASUREMENTS (HOURLY L_{90})

APRIL 2015

Monitoring Date	M001[1]				M002b[1]				M003[1]			
	Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
Monday, April 6, 2015	52	46	–	–	54	49	–	–	59	53	–	–
Tuesday, April 7, 2015	52	46	43	48	54	48	55	51	57	53	54	45
Saturday, April 11, 2015	54	50	–	–	56	51	–	–	58	53	–	–
Sunday, April 12, 2015	51	46	49	42	54	49	53	50	57	49	55	45
Monday, April 13, 2015	55	46	53	47	58	50	55	48	61	51	58	49
Tuesday, April 14, 2015	56	49	53	45	58	50	56	52	63	48	65	52
Wednesday, April 15, 2015	58	46	58	48	59	51	61	52	58	48	51	47
Thursday, April 16, 2015	–	–	52	47	–	–	57	50	–	–	58	48
Average for Post-operational (April 2015) Monitoring Period	*54*	*47*	*53*	*46*	*56*	*50*	*56*	*51*	*59*	*51*	*57*	*48*
Average for Pre-operational (November 2014) Monitoring Period	*53*	*45*	*50*	*42*	*49*	*41*	*48*	*39*	*59*	*50*	*54*	*46*

Notes:

(1) See Figure 1.
(2) Day/Evening – 0700 to 2300 hours.
(3) Night – 2300 to 0700 hours.

TABLE 5

COMPARISON OF PRE-OPERATIONAL AND POST-OPERATIONAL SOUND MEASUREMENTS (HOURLY L_{90})

OCTOBER 2015

Monitoring Date	M001[1]				M002b[1]				M003[1]			
	Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]		Day/Evening[2]		Night[3]	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
Monday, October 5, 2015	49	37	–	–	54	45	–	–	50	43	–	–
Tuesday, October 6, 2015	54	46	52	44	56	50	52	43	54	48	53	48
Wednesday, October 7, 2015	54	46	55	47	59	50	57	52	54	47	56	49
Thursday, October 8, 2015	54	47	55	51	58	55	54	47	55	48	55	51
Friday, October 9, 2015	56	49	55	46	60	52	58	50	56	50	54	48
Saturday, October 10, 2015	57	40	57	51	57	50	57	49	57	42	57	51
Sunday, October 11, 2015	54	48	51	47	59	53	54	49	61	50	58	53
Monday, October 12, 2015	47	40	46	42	58	51	55	48	47	44	49	47
Tuesday, October 13, 2015	54	50	48	42	61	56	57	51	58	52	48	45
Wednesday, October 14, 2015	55	52	54	47	57	53	55	52	56	51	54	50
Thursday, October 15, 2015	52	51	52	48	61	60	61	53	54	53	53	50
Average for Post-operational (October 2015) Monitoring Period	*53*	*46*	*53*	*47*	*58*	*52*	*56*	*49*	*54*	*48*	*54*	*49*
Average for Pre-operational (November 2014) Monitoring Period	*53*	*45*	*50*	*42*	*49*	*41*	*48*	*39*	*59*	*50*	*54*	*46*

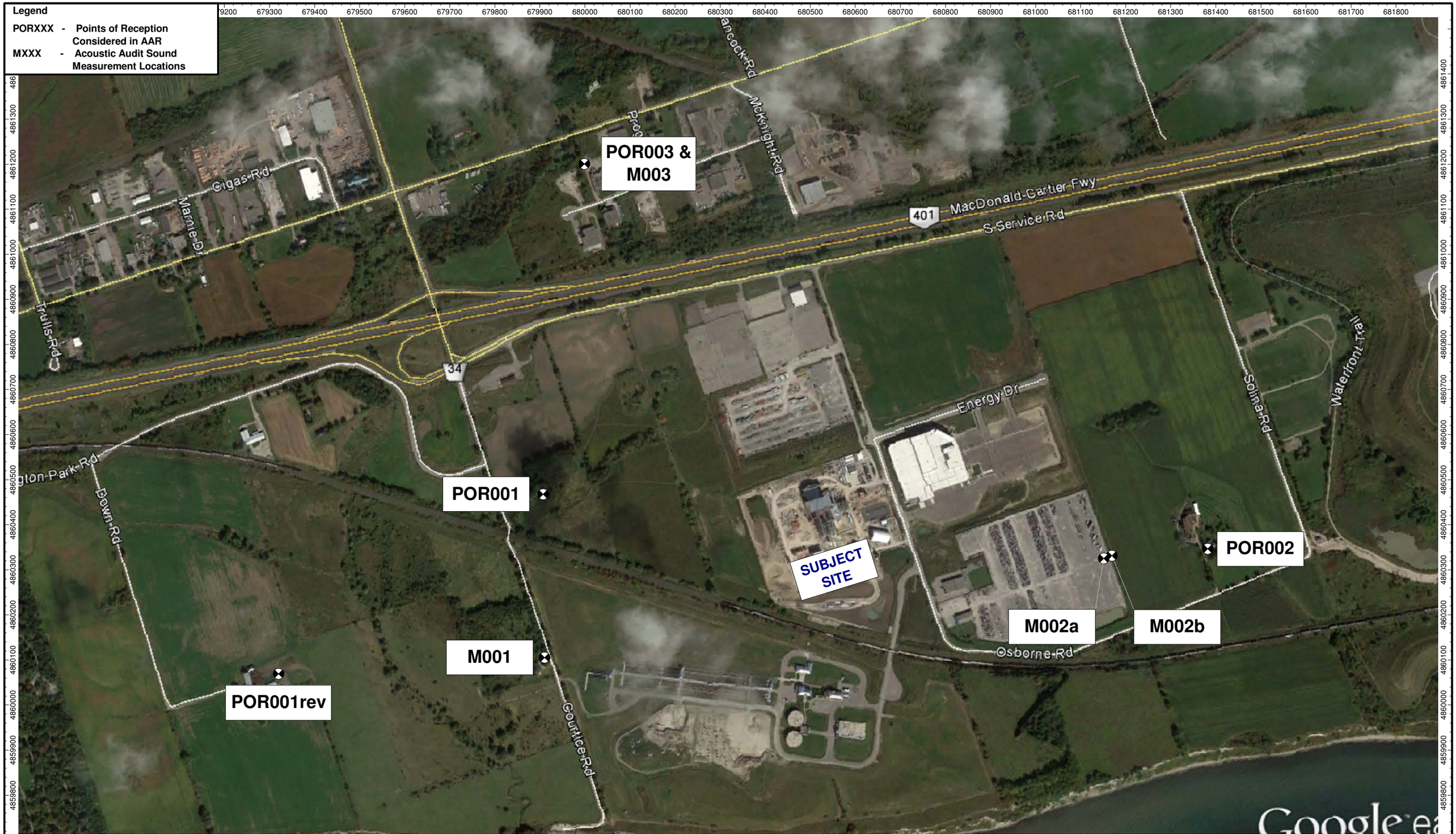
Notes:

(1) See Figure 1.
(2) Day/Evening – 0700 to 2300 hours.
(3) Night – 2300 to 0700 hours.

Legend

PORXXX - Points of Reception Considered in AAR

MXXX - Acoustic Audit Sound Measurement Locations



VALCOUSTICS Canada Ltd. consulting acoustical engineers	Title: **Area Plan with Points of Reception and Measurement Locations**	Date: **2015-05-01** / Figure: **1**
	Project Name: **DYEC - Acoustic Audit**	Project No.: **114-318**

J:\2014\114318\000\Reports\2015-04-30 Figs and Appendices\Figure 1.cna

Date Plotted: 01.05.15

Appendix 4

MOECC 2015 Report Submittals

MOECC 2015 Report Submittals

Report Type	Submission Date
Ambient Air Reports as per ECA 7(4)(b), EA 11.7, Operations Manual for AQ Monitoring in ON	
2014 Ambient Air Q4 Report	9-Feb-15
2014 Ambient Air Annual Report	15-May-15
2015 Ambient Air Q1 Report	15-May-15
2015 Ambient Air Q2 Report	11-Aug-15
2015 Ambient Air Q3 Report	13-Nov-15
Groundwater and Surface Water Monitoring Reports as per ECA 7(14)(b), EA 20.7 and EA 20.8	
2014 Annual Groundwater and Surface Water Reports	30-Apr-15
2015 Groundwater Facility Initiation Report	11-Mar-15
2015 Surface Water Facility Initiation Report	11-Mar-15
Noise Monitoring –Acoustic Audit Reports as per ECA 7(5)(b)	
2015 Acoustic Audit	8-May-15
2015 Supplementary Acoustic Audit	23-Nov-15
Odour Management and Mitigation Monitoring Reports as per EA 18.4 and ECA 8(9)(b)	
2015 Odour Test Report (2015 Odour Management & Mitigation Monitoring Report)	23-Nov-15
2015 Odour Plan Appendix A	8-Jan-15
Soil Testing Report as per ECA 15(4)	
2015 Soil Test Report	23-Oct-15
Residual Waste Testing as per ECA 7(8)(a)	
2015 Ash Test Report (Residual Waste Testing)	16-Dec-15 (Revised Date)
Compliance Monitoring Program Report as per EA 5.4	
2015 Compliance Monitoring Annual Report	30-Oct-15
Waste Diversion Program Monitoring Report as per EA 10.4	
2014 Annual Waste Diversion Report	11-Aug-15
Date Notifications as per ECA 13.1, EA 23.1 and EA 7.5(c) respectively	
Notice 60 days prior to Receipt of Waste	22-Apr-14
Notice of First Receipt of Waste	9-Feb-15
Public Meeting 6-12 Months after first receipt of waste	18-Jan-16
Source Test as per ECA 7(1), Schedule E(1), ECA Schedule E(7) and Schedule E(8) respectively	
Source Test Pre-test Plan	22-Oct-14
Notification to MOECC 15 days prior to Source test	11-Sep-15
Source Test Report	25-Nov-15
Complaint & Inquiry Logs as per ECA 10 (1), ECA 10(2), 14(7)	
January Complaint & Inquiry Log	9-Feb-15
February Complaint & Inquiry Log	17-Apr-15
March Complaint & Inquiry Log	17-Apr-15
April Complaint & Inquiry Log	22-Jun-15
May Complaint & Inquiry Log	23-Jul-15
June Complaint & Inquiry Log	10-Aug-15

July Complaint & Inquiry Log	23-Sep-15
August Complaint & Inquiry Log	23-Sep-15
September Complaint & Inquiry Log	19-Nov-15
October Complaint & Inquiry Log	19-Nov-15