

Planning Services Report

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Report To:	Planning and Development Committee		
Date of Meeting:	November 14, 2016		
Report Number:	PSD-064-16	Resolution:	
File Number:	PLN 33.3.10	By-law Number:	
Report Subject:	Durham York Energy Centre Air Quality Monitoring Results – Options for Retaining an Air Quality Expert		

Recommendations:

1. That Report PSD-064-16 be received; and
 2. Council provide direction to staff on any further actions that it deems necessary.
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Report Overview

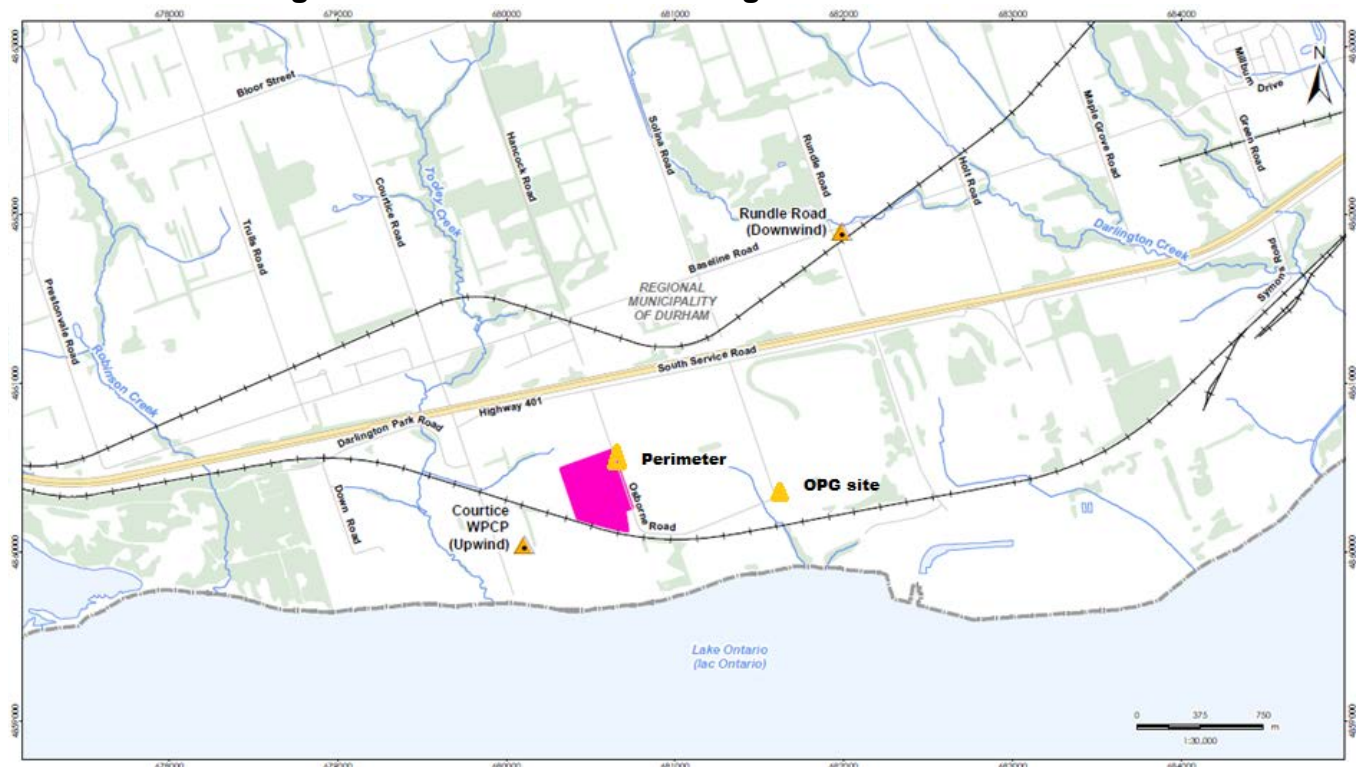
Staff were requested to report back to Committee in November 2016 on options for retaining an air quality expert, with expertise recognized in North America, to assist Council with interpreting the ambient air (off-site) and stack test reports for the Durham York Energy Centre energy from waste facility. The report outlines options and recommends that explanation of the ambient air and/or stack test results be requested from the Region of Durham and Ministry of the Environment and Climate Change staff.

1. Background

1.1. Ambient Air Monitoring Program in the Area of the Durham York Energy Centre

The Durham York Energy Centre (DYEC) Ambient Air Quality Monitoring Plan has been prepared to satisfy Condition 11 of the Environmental Assessment (EA) Notice of Approval and Condition 7(4) of the Environmental Compliance Approval (ECA). The monitoring network includes upwind and downwind stations that have been measuring air contaminants since May 2013, prior to facility start-up. Some parameters are measured continuously, while others are non-continuously monitored. A fence line station, which measures non-continuous parameters, was installed prior to full operation of the DYEC. In October 2014 the Region added an additional monitoring station at Clarington's request, which is located off of Crago Road on the Ontario Power Generation (OPG) site. The ambient air quality monitoring station locations are shown on Figure 1. A list of air emissions monitoring parameters is provided in Attachment 1.

Figure 1: Ambient Air Monitoring Stations for the DYEC



Quarterly Ambient Air Quality Monitoring Reports are submitted by the Region's consultant, Stantec, to the Ministry of the Environment and Climate Change (MOECC) for review. The results for the Crago Road station are not part of the MOECC monitoring program requirement, and are reported separately on a quarterly basis.

The ambient air monitoring program for the DYEC is scheduled to run for three years after commencement of operations. At the July 5, 2016 meeting of Council, it was resolved that the Municipality of Clarington would write to the MOECC and request the Minister order that the ambient air monitoring program be extended by two years. The response received from the MOECC is included as Attachment 2 and indicates that MOECC staff will complete an assessment and determine whether additional ambient air monitoring is required in February 2018.

The ambient air monitoring stations monitor air quality in the area of the DYEC, not exclusively DYEC emissions. The equipment is calibrated on at least a quarterly basis, with periodic equipment audits by the MOECC at their discretion. In 2015, calibrations were completed monthly. The CALPUFF computer model is an MOECC standard; as is the averaging over 36 months and using the 98th percentile for PM_{2.5}. Anomalies (spikes/lows) happen when averaged they are not considered exceedances.

There are other ambient air monitoring stations in the general area (see Attachment 3). St. Mary's Cement maintains an upwind and downwind station for its operations and monitoring program. Temporary ambient air monitoring stations have also been installed to monitor conditions as part of the 407/418 construction. In addition, the MOECC has a long-term ambient air monitoring station at the Durham College Oshawa Campus.

In 2014 and 2015, the Environmental Monitoring and Reporting Branch of the MOECC conducted an air monitoring survey (TAGA – trace atmospheric gas analyzer survey) in the vicinity of the DYEC at the request of the Ministry's York-Durham District Office. Clarington had been instrumental in making this a priority for the District Office. It was announced at the September 21, 2016 meeting of the EFW-WMAC that the MOECC would be carrying out the same testing in October 2016.

The objectives of the TAGA air monitoring were to:

- a) Measure background ambient concentrations of volatile organic compounds (VOCs) in the vicinity of the DYEC prior to its operation; and
- b) Identify and measure concentrations of VOC's in ambient air downwind of DYEC during operation.

The results were typical of urban areas in Ontario before and after DYEC operation with no marked change (see Attachment 4).

1.2. DYEC Facility Air Emissions Monitoring Program

Separate from the DYEC Ambient Air Quality Monitoring Plan, the Air Emissions Monitoring Plan has been prepared to satisfy Conditions 12 and 13 of the EA Notice of Approval and Conditions 7(1), 7(2) and 7(3) of the ECA. Air emissions monitoring started when the first discharges were emitted from the facility. The monitoring program includes:

- a) Continuous emissions monitoring systems (CEMS);

Continuous emissions monitoring (CEM) began with the commencement of boiler operations (each boiler has its own monitoring equipment). A list of CEMS monitoring parameters is provided as part of Attachment 1. Live CEM data is posted to the DYEC website and the external facility display board.

- b) Stack testing (also known as source testing);

In addition to CEM, air emissions from the facility are tested twice per year by a stack (source) test. The parameter categories tested during the stack (source) test are also listed in Attachment 1. The stack tests are carried out by a qualified air specialist team under the scrutiny of an independent (third party) consultant. The labs that analyze the samples collected are selected by Durham Region and results are submitted to the MOECC.

- c) Long term sampling for dioxins and furans;

Long-term sampling for dioxins and furans is performed by the AMESA sampler. Through continuous monitoring, the sampling is intended to determine long-term variations of dioxin and furan emissions levels over time. The system is evaluated as part of the stack testing program. When Boiler #2 failed the stack test in May 2016, the Region retained experts to ensure that the AMESA sampler was performing as anticipated.

1.3. DYEC Facility Air Pollution Control Equipment

Each boiler has its own dedicated Air Pollution Control system consisting of:

- Selective non-catalytic reduction system for control of nitrogen oxides (NO_x);
- Patented Very Low NO_xTM system for additional NO_x control;
- Evaporative cooling tower with dry lime reactor for acid gas control;
- Activated carbon injection system for mercury and dioxin control;
- Minimum temperature of 1,000°C for VOC and dioxin and furan control; and
- Fabric filter baghouse system for particulate matter control.

CEM devices monitor stack emissions on a continuous basis to ensure compliance. The DYEC is required to meet the air emissions standards set out in Ontario Regulation 419/05 Air Pollution – Local Air Quality (O.Reg. 419/05) and the MOECC Guideline A-7 Combustion and Air Pollution Control Requirements for New Municipal Waste Incinerators (A7 Guideline). One exception to this is the stack emission limit for dioxins

and furans at the DYEC, which is more stringent than the A7 Guideline limit (60 pg/Rm³ for the DYEC compared to the A7 Guideline value of 80 pg/Rm³).

2. Options for Retaining an Air Quality Consultant

2.1 Retaining a Consultant

Depending on what role is required of the consultant and the assignment, there are options within the Municipality's Purchasing By-law to retain a consultant:

- Expression of Interest (EOI) - A multi-staged process that can be used to shortlist potential bidders before seeking detailed bids from the shortlisted bidders. An EOI is generally used when the information required from bidders is specific, but the Municipality is unsure of the capability of bidders to provide the required goods or services. An EOI can also be used if the buyer is just looking to find out if there are potential bidders who may have an interest in a particular project for goods or services, or is seeking industry input into scoping requirements that will then go back out to market later on as a Request for Proposal.
- Request for Proposal (RFP) – The Municipality issues a detailed terms for reference that outlines the tasks, timeframe, background material to be reviewed to orient the consultant to the project, number of meetings, presentations to Council and public meetings they are expected to attend, and reporting requirements. The length of the assignment must be clearly stated, and whether there will be additional work beyond what can be detailed in the terms of reference and how any additional work will be paid (e.g. by task, hourly, expenses).
- Sole Source – The selection of a consultant based on their expertise. If the contract amount is \$30,000 or less, direct hiring of a consultant is allowed under the Municipality's Purchasing By-Law. If it is anticipated that a contract could exceed \$30,000, the Municipal Purchasing By-law would have to be waived by Council.

2.2 Consultant Qualifications

Council resolution #C-192-16 outlines that the consultant has to be an air quality expert with expertise recognized in North America. Such a consultant has previously been retained by the Municipality during the initial permitting stages for the DYEC. As part of the peer review for the DYEC Environmental Assessment, Clarington hired SENES Consultants for the air quality and human health and ecological risk assessment aspects; since that time SENES has been purchased by another company (Arcadis) and none of the individuals involved with our contract remain with the new company.

It may be difficult to find an air quality expert that does not have a conflict of interest given the number of consultants that are already engaged with respect to DYEC air emissions or have affiliations with previous phases of the project. In addition, recent consolidations in the consulting sector may limit the number of companies. Further, while having a consultant with expertise recognized in North America is important, it is also imperative to have a consultant who is fully cognizant of the O.Reg. 419/05 and the A7 Guideline requirements.

2.3 Consulting Assignment

A terms of reference for the consulting assignment will have to be determined for what Council would like the consultant to interpret. There is a significant difference between being able to review reports and explain them, as opposed to digging into the numbers and being able to verify the readings, check the computer model, or question the lab results. Regardless of what process is used to retain a consultant, a clear understanding of the assignment will be required in order to obtain an accurate project budget estimate in advance of hiring the consultant.

2.4 Consulting Tasks and Costs

To obtain a task outline and preliminary estimate of effort required, staff looked to similar assignments. Essentially there are three options that Council could consider to retain an air quality expert.

2.4.1 Option 1, Monitor – The consultants' role would be explanatory. The consultant would provide costing for a five year term of service. The scope of work would be limited to reviewing the annual DYEC air quality reports and explaining findings to Council. This would include:

- a) Background familiarization with the EA conditions, background reports, monitoring reports to date and other information for a consultant already familiar with the A7 Guidelines for Ontario, MOECC CALPUFF computer model and regulatory requirements - 115 to 150 hours; and
- b) Annual Presentation and Meeting with Council for 5 years, including all preparation time for presentation and report writing – 300 to 350 hours (60-70 hours annually).

Typically the charge-out rate for an experienced consultant with good standing and recognition in the field would start at \$200/hour. The cost range would be from \$83,000 to \$100,000.

Ambient Air Quality Monitoring Reports for the DYEC are issued on a quarterly basis; so if Council is seeking more frequent input this should be set out in the terms of reference, and would increase the cost range. Additional scope of work items to be considered include whether the consultant is to be on call to respond to questions or concerns from the public or individual Council members, and whether the consultant is to provide comments and/or recommendations to the MOECC. All of these interactions will need to be tracked and authorized to ensure the consultant does not exceed the budget.

Additional work beyond what can be detailed in the terms of reference could be performed on an hourly basis. The hourly basis rate should be determined at the time of retaining the consultant with an annual cost of living escalation provision, as well as an annual upset limit.

2.4.2 Option 2, Peer Review – The consultants' role would be both explanatory as noted above, and the consultant would be requested to provide their expert opinion on the process being followed and interpretations provided. If the process or interpretation are not acceptable the consultant would then be asked for a course of corrective action which

would be submitted to the Region and MOECC for their consideration. For the consultant to Peer Review the stack tests, access during the testing as part of the team will be required and at the discretion of the Region and Ministry who are responsible under the terms of the Environmental Compliance Approval. The cost range would be starting from \$100,000 to \$250,000 over the five year term, and possibly more depending on how in depth and/or the number of reports requiring peer review.

2.4.3 Option 3, As Needed Basis – The consultants' role of this assignment would be background familiarization of the project (Option 1, item a) and to provide clarification and explanation on an as needed ("on-call") basis at Council's discretion. In this case there would be a minimum amount of effort initially for limited background familiarization of less than \$30,000. When called upon, which may be on an annual basis, quarterly basis, or more frequently, an hourly rate would apply. For this option, costs could be contained by establishing an overall upset budget on an annual basis.

2.4.4 Option 4, Responsible Agencies – Council should be cognizant that the Region is paying in the range of \$450K annually on ambient air monitoring for the DYEC. In addition, each stack test is monitored by both the Region and Covanta and a third party consultant at a total of \$380K per test (currently 2 per year are required). The air pollution control equipment consultant brought in to review the AMESA sampler data was an additional \$35K. All of this information is submitted to the MOECC who review the results to ensure they meet the Air Emissions Monitoring Plan, Ambient Air Quality Monitoring Plan, the requirements of the EA Notice of Approval and ECA, and the O.Reg. 419/05 and A7 Guideline requirements.

As outlined above, more than \$1.2 million of public funds are spent annually in air monitoring at the DYEC. Council has sought and may continue to seek clarification and explanation, first from the Region of Durham and second from the MOECC. Regional staff have provided Council with presentations and explanation when requested. Clarington staff can call upon MOECC staff at any time. As the responsible agencies, the Region and MOECC are obligated to communicate the impacts on the air shed of the air emissions in an understandable and comprehensive manner.

3. Concurrence

This report has been reviewed by the Purchasing Manager.

4. Conclusion

The Region and MOECC have responsibility for the air quality monitoring program at the DYEC. The Region has retained consultants with expertise in air monitoring and the MOECC's technical staff review all the data. In addition, MOECC staff conduct quarterly audits of the air monitoring equipment to ensure they are operating properly. In the past, Council has requested the Region provide an explanation of the air monitoring results which has been complied with expeditiously. Given the willingness of Regional staff to provide explanations of the air monitoring results Clarington staff are recommending that Option 4, Responsible Agencies, the Region is the first response for air emission queries.

As a second line of response Ministry staff have indicated that they would be available to respond to inquiries.

Lastly, we note that annual air quality reports have been prepared by the Province since 1970 based on the ambient air monitoring stations that the Province has across Ontario. The general trend across the Province is a decrease in air emissions. However, given the number of ambient air monitoring stations in the Courtice/Bowmanville area for different projects and facilities and since all of this data is submitted to the MOECC; a request to the MOECC for a summary of the cumulative findings and any potential implications for Clarington residents could be made.

If Council wishes to pursue the retention of their own expert air quality consultant, then direction should be given to staff regarding the preferred work assignment, Options 1, 2 or 3 and the estimated cost be listed as an optional item for the 2017 budget deliberations.

5. Strategic Plan Application

Not applicable.



Submitted by:

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Director of Planning Services



Reviewed by:

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Interim CAO

Staff Contact: Faye Langmaid, Manager of Special Projects 905-623-3379 ext. 2407 or flangmaid@clarington.net

Attachments:

Glossary of Terms

Attachment 1 - DYEC Summary of Air Emissions Monitoring Parameters

Attachment 2 - MOECC response dated Aug 8, 2016

Attachment 3 - Ambient Air Monitoring Stations by St. Mary's Cement and for Highway 407/418 construction.

Attachment 4 - Mobile TAGA Ambient Air Monitoring by MOECC

There are no interested parties to be notified of Council's decision.

DJC/FL/tg/df

Glossary of Terms

A7 Guideline	MOECC Guideline A-7 Combustion and Air Pollution Control Requirements for New Municipal Waste Incinerators
CEM	Continuous Emissions Monitoring
CEMS	Continuous Emissions Monitoring System
DYEC	Durham York Energy Centre
EA	Environmental Assessment
ECA	Environmental Compliance Approval
EFW-WMAC	Energy from Waste – Waste Management Advisory Committee
EOI	Expression of Interest
MOECC	Ministry of the Environment and Climate Change
NO _x	Nitrogen Oxides
OPG	Ontario Power Generation
O.Reg. 419/05	Ontario Regulation 419/05 Air Pollution – Local Air Quality (O.Reg. 419/05)
PM _{2.5}	Particular Matter measuring 2.5 microns (2.5 µm) in diameter or less
RFP	Request for Proposal
TAGA	Trace Atmospheric Gas Analyzer Survey
VOCs	Volatile Organic Compounds

Durham York Energy Centre Summary of Air Emissions Monitoring Parameters

Ambient Air Monitoring – Upwind/Downwind Stations and Crago Station

Continuous emissions monitoring (CEM):

Nitrogen oxides (NO_x), Sulphur dioxide (SO₂), Particulate matter less than 2.5 microns in diameter (PM_{2.5})

Non-continuous monitoring:

Total Suspended Particulate Matter (TSP), Metals (in TSP), Polycyclic Aromatic Hydrocarbons (PAHs), Dioxins and Furans

Ambient Air Monitoring - Fence Line Station

Non-continuous monitoring:

Metals (in TSP)

Stack (Source) Testing

Metals, Chlorobenzenes and Chlorophenols, Polychlorinated Biphenyls (PCBs), Volatile Organic Matter (volatile organic compounds VOCs), Polycyclic Organic Matter (polycyclic aromatic hydrocarbons PAHs), Dioxins and Furans, CEM System parameters, Total Suspended Particulate Matter, Total PM-10, including condensables, Total PM-2.5, including condensables

Schedule D in the Environmental Compliance Approval (ECA) lists the full suite of parameters to be tested.

CEM System

nitrogen oxides (NO_x), sulphur dioxide (SO₂), carbon monoxide (CO), hydrochloric acid (HCl), hydrogen fluoride (HF), ammonia (NH₃), organic matter, oxygen (O₂), opacity, moisture, temperature

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August 8, 2016

ENV1283MC-2016-2024

June Gallagher
Deputy Clerk
The Corporation of the Municipality of Clarington
40 Temperance Street
Bowmanville, ON L1C 3A6

Ms. Gallagher,

Thank you for providing the Clarington Council Resolution to the Honourable Glen Murray, Minister of the Environment and Climate Change regarding the Durham York Energy Center located in the Municipality of Clarington. I have been asked to respond on behalf of the minister.

On May 16, 2012, the ministry approved the Ambient Air Monitoring Plan (Plan), prepared by the Regional Municipalities of Durham and York in accordance with Condition 11 of the Notice to Proceed with the Undertaking. The Plan specifies that the operational monitoring (at the upwind and downwind ambient air monitoring stations) is to be conducted for a minimum of 3 years.

The ambient air monitoring results for PM_{2.5} are compared to the Canadian Ambient Air Quality Standards (CAAQS). Though there was a slight increase in the 98th percentile of PM_{2.5} 24 hour concentrations at Courtice and Rundle stations in 2014 compared to 2015, only Rundle station was slightly above the CAAQS target value of 28 µg/m³ in 2015. However, this comparison is based on only one year of data, and three years of data is required to assess against the PM_{2.5} CAAQS. Since operational monitoring commenced on February 13th, 2015, insufficient data has been collected to determine with any certainty if elevated concentrations have resulted in an exceedance of the CAAQS.

The following table provides a summary of the number of days, both before and after operations began at the facility, where PM_{2.5} 24 hour concentrations were above 28 µg/m³ at the Courtice Station, Rundle Station and where elevated concentrations were experienced at both stations on the same day. In total, 10 events of elevated concentrations occurred before operation, and 16 occurred after.

No. of days with 24 hr PM _{2.5} concentrations greater than 28 µg/m ³		
Station	Before Operation	After Operation
Courtice	4	5
Rundle	6	11
No. of days where both stations experienced elevated concentrations	4	4

The number of days where both stations experienced elevated PM2.5 24 hour concentrations on the same day, both before and after facility operations began, suggests that both regional and local sources contributed to these elevated concentrations. On the days where only Courtice or Rundle station experienced high values, these stations were not predominantly downwind of the facility, again suggesting that local sources of particulates contributed to these elevated concentrations, rather than a single source.

PM2.5 can originate from multiple local, regional, and transboundary sources and it is typical for Southern Ontario to experience a number of days during the year where the 24 hour average of PM2.5 is greater than 28 µg/m3. Overall, the days of elevated PM2.5 concentrations observed at Courtice and Rundle stations are the result of both local and regional sources. The data does not suggest that the facility is the single source of PM2.5 in the area, and additional years of data are required to assess trends in PM2.5 to compare against the CAAQS.

The operational monitoring at these stations began in February 2015 and will continue until February 2018. At that time, ministry staff will complete an assessment of the program before determining whether additional ambient air monitoring is required.

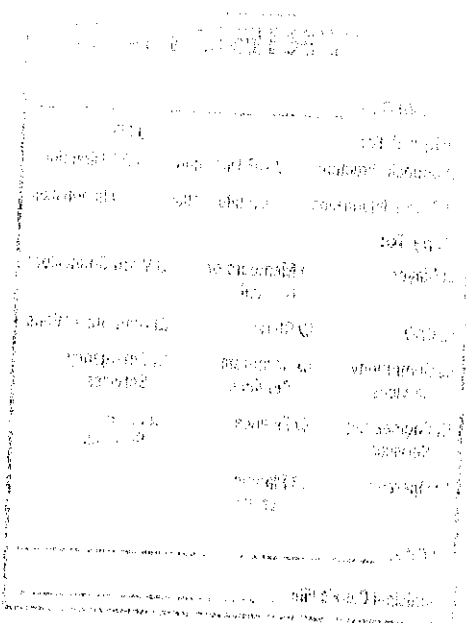
Should you have any further questions, please contact Celeste Dugas, District Manager, York Durham District Office at 905 836 7446 or by email at celeste.dugas@ontario.ca.

I trust this information is helpful in addressing your concerns.

Yours sincerely,



Dolly Goyette
Director, Central Region
Ministry of the Environment and Climate Change



St. Mary's Cement Ambient Air Emissions Monitoring Stations

St. Marys Cement air emissions are monitored using a series of sampling locations as set out in the following table.

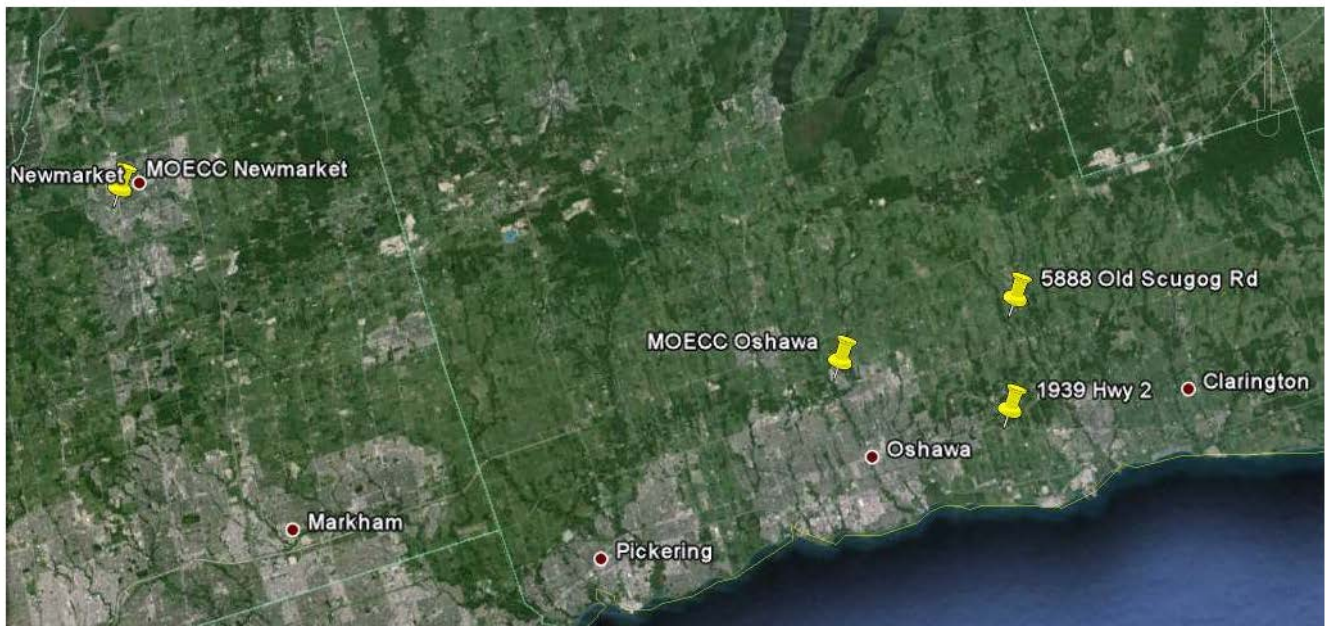
Sample Station	Location	Monitor
SMC1	OPG	PM 10 BAM, Dust fall jar
A	North East of Quarry	PM 10 Hi Vol, Dust fall jar
B	Cedar Crest	PM 10 Hi Vol, Dust fall jar
C	Cedar Crest (MOE location)	Dust fall jar
SMC 2	Cove Road	PM 10 BAM, Dust fall jar

The location of the sampling stations is shown on the aerial, below.



Highway 407 and 418 Construction Monitoring Stations

The location of the sampling stations is shown on the aerial, below.



Pre-construction monitoring of Phase 2 of the Highway 407 East extension construction at 1939 Highway 2, Courtice, ON (“the Hwy 2 location”, took place from July 1 to September 30, 2015. This program involved continuous monitoring of Inhalable Particulate Matter (PM_{10}), Fine Particulate Matter ($PM_{2.5}$), and Nitrogen Oxides (NO_x), in addition to collecting meteorological data. This sampling was conducted as required under condition 15.3 of the EA Notice of Approval to Proceed with the Undertaking, which can be found in Appendix C. The following report includes all of the data and analysis of the information collected from the site over the three month sampling period. This pre-construction air quality data set characterizes the baseline air quality of the area prior to any construction activities.

Throughout this monitoring period, none of the applicable standards and criteria was exceeded for any of the parameters measures at this station.

Mobile TAGA Ambient Air Monitoring by MOECC

Summary

In 2014 and 2015, the Environmental Monitoring and Reporting Branch (EMRB) of the Ministry of the Environment and Climate Change, conducted real time air monitoring in the vicinity of the Durham York Energy Centre (DYEC) for selected volatile organic compounds (VOCs) at the request of the Ministry's York Durham District Office. Several VOCs were identified and measured downwind of the DYEC. The VOCs for which the highest half-hour concentrations were measured include acetone ($19\mu\text{g}/\text{m}^3$ in 2014, $6.8\mu\text{g}/\text{m}^3$ in 2015) and xylenes ($7.8\mu\text{g}/\text{m}^3$ in 2014; $3.9\mu\text{g}/\text{m}^3$ in 2015). These concentrations are typical of urban areas in Ontario. Measured ambient concentrations of VOCs did not exceed their respective Ontario Regulation 419/05 Air Pollution – Local Air Quality air standards or guidelines during the 2014 and 2015 survey period.

Mobile TAGA Survey, Durham York Energy Centre, Courtice, Ontario, 2014 and 2015

Figure 1: Monitoring Sites in the Vicinity of Durham York Energy Center, Courtice, Ontario.
Mobile TAGA (EMRB, MOECC) Survey, 2014 and 2015.

