Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre – May-June 2013

Durham York Energy Centre

Prepared for:
The Region of Durham
605 Rossland Rd
Whitby, ON
L1N 6A3

Prepared by:
Stantec Consulting Ltd.
300-675 Cochrane Dr., West Tower,
Markham, ON L3R 0B8

Project No.: 160950528

April 28, 2014

Sign-off Sheet

This document entitled Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre – May-June 2013 was prepared by Stantec Consulting Ltd. for the account of The Region of Durham. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

ORIGINAL SIGNATURE ON FILE

Prepared by _____
(signature)

Connie Lim, B.A.Sc.

ORIGINAL SIGNATURE ON FILE

Reviewed by _____
(signature)

Gregory Crooks M.Eng., P.Eng.

V:\01609\Active\160950528\planning\report\fina\2013\quarterly report Q2\Q2_March2014_v2\160950528_rpt_Q2_Apr25_2014_Ver2.2.docx

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

Summary of Report Revisions

The November 29, 2013 version of this Quarterly report was submitted to the Ministry of Environment (MOE) for review and comment on December 9, 2013. The Ministry of Environment performs routine audits of air quality monitoring conducted by emitters as noted in the MOE Ambient Monitoring Operations Manual. This April 2014 report version includes the following primary revisions based on, or as a result of, the comments and recommendations received from the MOE during their normal audit process:

- The November 29, 2014 version of the report expressed concentration results following the convention specified by the US EPA in 40 CFR Part 50 Appendix B, which is a reference method provided in the MOE Operations Manual. Following their review, MOE has requested a different reporting basis be utilized in all the reports for this project (concentration results to be expressed in actual rather than normal cubic metres). Both methods are widely used and accepted in various jurisdictions. Revising the reporting basis has the result of altering the reported concentration values as they are based on cubic metres of air at the temperature at the time of the measurement (actual conditions), rather than expressing concentrations based on an equivalent volume of air at a single set temperature (normal conditions).

- Revising a calibrator constant used in the flow calculations for non-continuous monitors to address actual versus normal conditions.

- Reporting PAHs in nanograms per cubic metre (ng/m^3) rather than micrograms per cubic metre (µg/m^3).

The previous version of the report provided 90th percentile concentrations for the various monitoring parameters. This information is not a mandatory MOE reporting requirement, and is not required for assessment of compliance with any applicable standard. Due to the already large volume of data presented in the report, and the potential for misinterpretation, this additional information has been removed.

Executive Summary

The Regional Municipalities of Durham and York are constructing the Durham York Energy Centre (DYEC) which is an Energy from Waste (EFW) Facility intended to provide long-term, sustainable solution to manage municipal solid waste remaining after diversion from the Regions.

The Ambient Air Quality Monitoring Plan - Durham York Residual Waste Study (Stantec, May 8, 2012), was developed based on the Regional Council's mandate to provide ambient air quality monitoring in the area of the DYEC for a three year period. An ambient air quality monitoring and reporting program was also a requirement laid out in the Provincial Minister's Notice of Approval to Proceed with the Undertaking, detailed in Condition 11 of the Notice of Approval (MOE, 2010). Two monitoring stations in the vicinity of the DYEC were set up in April 2013. The downwind station is located along Rundle Road, south of Baseline Road. The upwind station is sited at the Courtice Water Pollution Control Plant (WPCP). Since May 2013, the two stations have measured the following air contaminants:

- Sulphur Dioxide (SO_2);
- Nitrogen Oxides (NO_X);
- Particulate Matter smaller than 2.5 microns ($PM_{2.5}$);
- Metals in total suspended particulate matter (TSP);
- Polycyclic Aromatic Hydrocarbons (PAHs); and,
- Dioxins and Furans.

Meteorological data is also measured at the two stations. The downwind Rundle Road station measures horizontal wind speed, wind direction, atmospheric temperature, relative humidity and rainfall. The upwind Courtice station measures atmospheric temperature, relative humidity, rainfall and barometric pressure. Wind speed and wind direction data at the upwind location are available from the Courtice Water Pollution Control Plant.

This quarterly report provides a summary of the ambient air quality data collected at these two stations for the period May to June 2013. During this initial monitoring period two significant instrumentation issues were encountered which affected air quality monitoring data recovery for the first two months of station operation. Issues were encountered with both Thermo Sharpe 5030 $PM_{2.5}$ monitors that necessitated removing both monitors and shipping them back to the supplier for repair. Since re-installation of the $PM_{2.5}$ monitors in June the issue appears to have rectified. At the Rundle Road station, an unusual data logger issue was encountered in which data for almost the entire month of June was found to be missing from the downloaded data logger file. The root cause of this issue was not ascertained, but to mitigate against this issue occurring again in the future, the station datalogger files are now being backed-up on a weekly basis to separate computer directories to ensure that any datalogger/software download issues will not overwrite any data already stored in the computer files. Monitoring in the months following the May-June period has seen few instrumentation issues and acceptable data recovery rates for all

parameters. Additional details on instrumentation issues are presented in Section 3.2 of this report.

The following observations and conclusions were made from a review of the measured ambient air quality monitoring data:

1. Measured levels of all CACs (SO_2, NO_2, $PM_{2.5}$) were below the applicable O.Reg. 419/05 criteria or human health risk assessment (HHRA) health-based standards presented in Table 2.2 of this report;

2. Since the Canada Wide Standard (CWS) for $PM_{2.5}$ is based on a 98th percentile level over 3 years, whereas the $PM_{2.5}$ measurement period at Courtice WPCP station was about one month, there is insufficient data collected to determine with any certainty if exceedances of the CWS would occur. Therefore no comparison of the measured $PM_{2.5}$ data to the CWS was conducted for this report;

3. The maximum measured concentrations of TSP and all metals with MOE air quality criteria were well below their applicable criteria (presented in Table 2.3 in this report);

4. The maximum measured concentrations of all PAHs with MOE air quality criteria were well below their applicable criteria shown in Table 2.4, with the exception of the 24-hour benzo(a)pyrene concentration in one sample collected at the Rundle Road Station on June 21, 2013, which exceeded the applicable Ontario Ambient Air Quality Criteria by 3%. This measurement was however, well below the MOE Schedule 6 Upper Risk Threshold, the MOE O. Reg. 419 24-hour average guideline, and the HHRA health based standard;

5. The maximum measured toxic equivalent dioxin and furan concentration was well below the applicable criteria (presented in Table 2.4); and,

6. All monitored contaminants were below their applicable MOE criteria during the monitoring period between May and June, 2013 with the exception of one benzo(a)pyrene measurement. All measured levels of all monitored contaminants were below their applicable HHRA health-based standards.

Abbreviations

AAQC	Ambient Air Quality Criteria
CAC	Criteria Air Contaminants
D/Fs	Dioxins and Furans
DYEC	Durham York Energy Centre
EFW	Energy from Waste
MOE	Ontario Ministry of the Environment
SO_2	Sulphur Dioxide
NO_x	Nitrogen Oxides
PAH	Polycyclic aromatic hydrocarbons
Particulate	A particle of a solid or liquid that is suspended in air.
PCB	Polychlorinated biphenyl
PCDD/PCDF	Polychlorinated dibenzo-p-dioxins and dibenzofurans
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter smaller than 2.5 microns
TEQ	Toxic equivalent quotient
TEQs	Toxic Equivalents
TSP	Total Suspended Particulate
WPCP	Water Pollution Control Plant
Elements	
Cd	Cadmium
Hg	Mercury
Pb	Lead
Al	Aluminum
As	Arsenic
Be	Beryllium
Cr	Chromium
Cu	Copper
Mn	Manganese
Ni	Nickel
Si	Silver
Tl	Thallium
Sn	Tin
V	Vanadium
Zn	Zinc

Miscellaneous	
°C	temperature in degrees Celsius
N/A	not available
%	percent
ppm (part per million)	mg/L, µg/mL, ng/µL
ppb (part per billion)	µg/L, ng/mL, pg/µL
ppt (part per trillion)	ng/L, pg/mL, fg/µL
min	minimum
max	maximum
µg/m^3	microgram per cubic metre

1.0 Introduction

1.1 BACKGROUND AND OBJECTIVES

The Regional Municipalities of Durham and York are constructing the Durham York Energy Centre (DYEC) which is an Energy from Waste (EFW) Facility intended to provide a long-term, sustainable solution to manage municipal solid waste remaining after diversion from the Regions. The site location of the DYEC is shown in Figure 1-1 below.

A monitoring plan, Ambient Air Quality Monitoring Plan - Durham York Residual Waste Study (Stantec, May 8, 2012), was developed based on the Regional Council's mandate to provide ambient air quality monitoring in the area of the DYEC for a three year period.

The purposes of the ambient air quality monitoring program are to:

1. Quantify any measureable ground level concentrations resulting from emissions from the DYEC cumulative to local air quality, including validating the predicted concentrations from the dispersion modelling conducted in the Environmental Assessment (Jacques Whitford, 2009);

2. Monitor concentration levels of EFW-related air contaminants in nearby residential areas; and,

3. Quantify background ambient levels of air contaminants in the area.

Two monitoring stations in the vicinity of the DYEC were set up in April 2013. Since May 2013, the two stations have measured the following air contaminants:

- Sulphur Dioxide (SO_2);
- Nitrogen Oxides (NO_X);
- Particulate Matter smaller than 2.5 microns ($PM_{2.5}$);
- Metals in Total Suspended Particulate matter (TSP);
- Polycyclic Aromatic Hydrocarbons (PAHs); and,
- Dioxins and Furans.

This quarterly report provides a summary of the ambient air quality data collected at these two stations for the period May to June 2013.

1.2 LOCATIONS OF AMBIENT AIR QUALITY MONITORING STATIONS

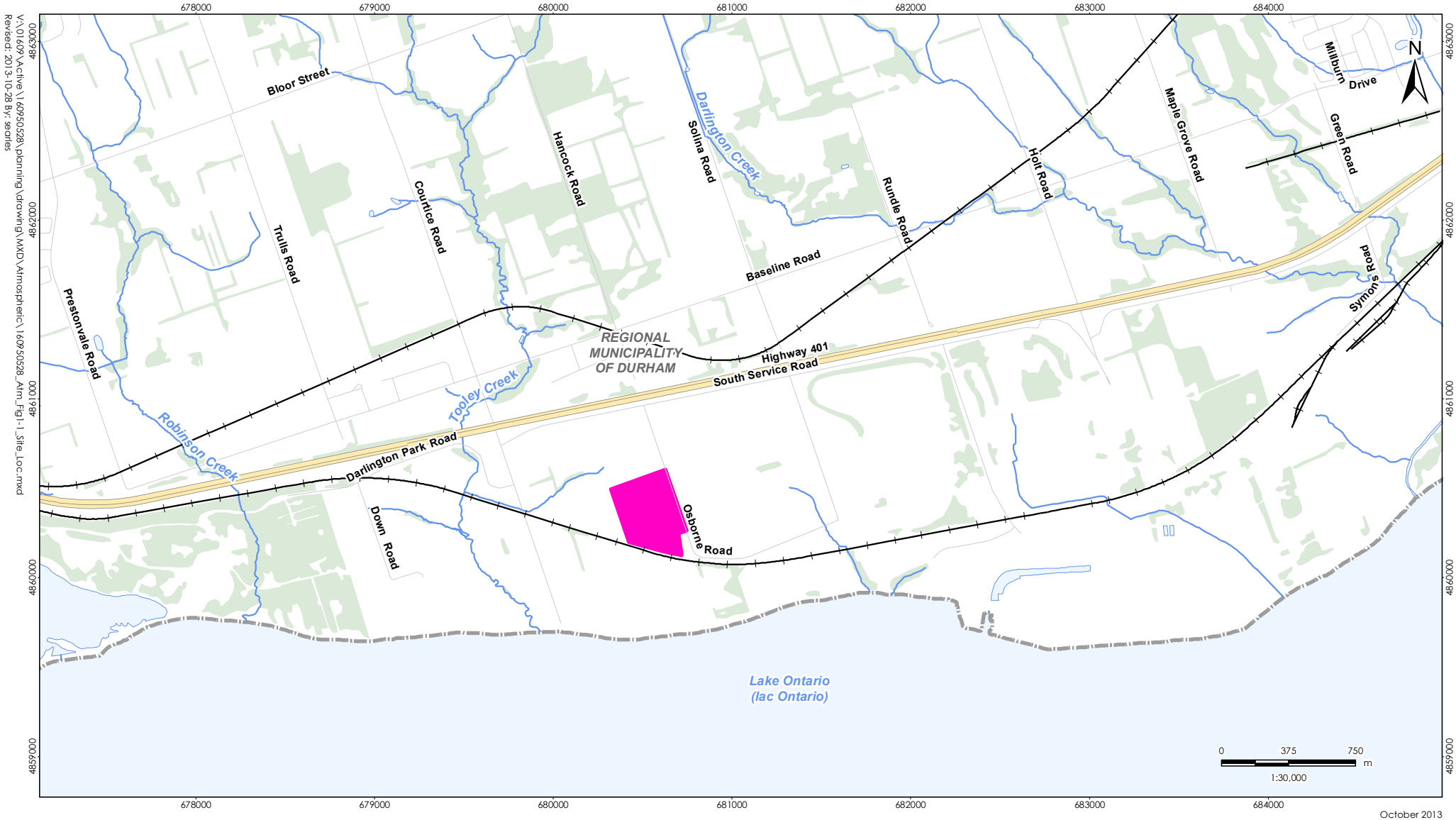
The selection of sites for the monitoring stations was done in consultation with the Ontario Ministry of Environment (MOE) and Durham/York representatives based on the results of air quality modelling done in support of the environmental assessment for the project, the locations of nearby sensitive receptors, and general MOE siting criteria. Two monitoring stations (one downwind and one upwind) were chosen for the ambient air quality monitoring program. The final locations of the monitoring stations were influenced by the availability of electrical power, accessibility of each location, and security. Details of the siting requirements are detailed in the Monitoring Plan.

The selected downwind location is sited northeast of the DYEC in the vicinity of residential receptors downwind of the DYEC in this direction, and falls in the area where maximum annual concentrations are predicted to occur. The downwind station is located along Rundle Road, south of Baseline Road. Its location is shown in Figure 1-2. The monitoring station measures all the air contaminants listed in Section 1.1 and meteorological data. This station is referred to as the Rundle Road Station.

The upwind station is sited at the Courtice Water Pollution Control Plant (WPCP), located to the southwest of the DYEC in order to measure background air quality in the predominantly upwind direction. The location is presented in Figure 1-2. This monitoring station measures the air contaminants presented in Section1.1, as well as meteorological data, with the exception of wind speed and wind direction, which are measured by and available from the Courtice Water Pollution Control Plant.

A third fence line station, which will measure metals in total particulate matter will be installed prior to full operation of the DYEC in 2014 and run for a one-year period.

Photographs of the Rundle Road and Courtice WPCP ambient air quality monitoring stations are shown in Figures 1-3 and 1-4 respectively.



V:\01609\Active\160950528\planning\drawing\MXD\Atmospheric\160950528_Atm_Fig1-1_Site_Loc.mxd
Revised: 2013-10-28 By: seorles

October 2013
160950528

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Legend

- Durham York Energy Centre Site
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Wooded Area

Client/Project

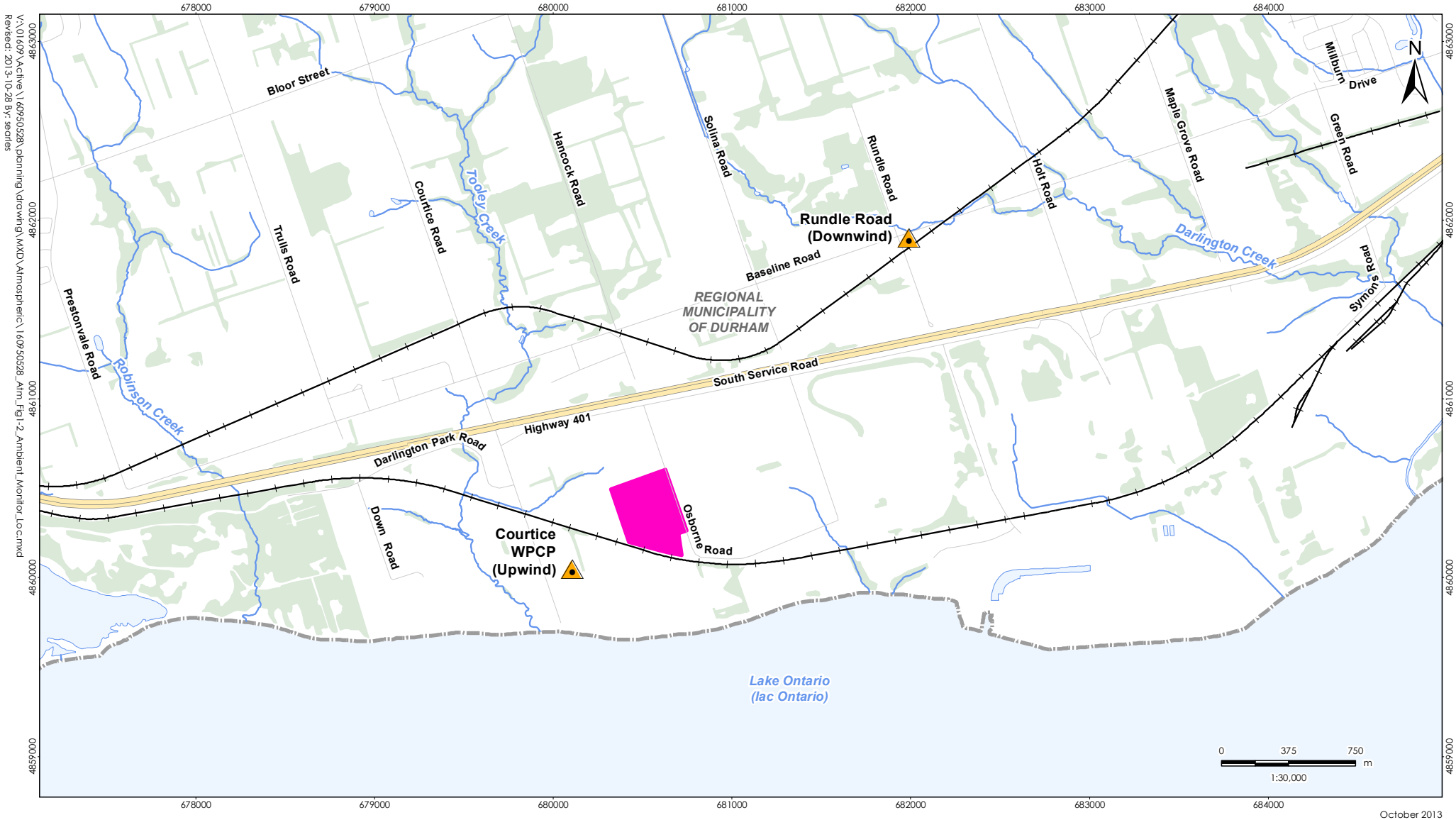
The Region of Durham
Durham York Energy Centre

Figure No.

1-1

Title

Site Location Plan



V:\01609\Active\160950528\planning\drawing\MXD\Atmospheric\160950528_Atm_Fig1-2_Ambient_Monitor_Loc.mxd
Revised: 2013-10-28 By: searles

October 2013
160950528

Stantec

Legend

- Station Location
- Durham York Energy Centre Site
- Railway
- Road
- Highway
- Watercourse
- Waterbody
- Wooded Area

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.

Client/Project

The Region of Durham
Durham York Energy Centre

Figure No.

1-2

Title

Locations of Ambient Monitoring Stations

Figure 1-3 View of Rundle Road Ambient Air Quality Monitoring Station

Figure 1-4 View of Courtice WPCP Ambient Air Quality Monitoring Station

2.0 Key Components Assessed

2.1 METEOROLOGY

The following meteorological parameters are measured at the Rundle Road and Courtice WPCP monitoring stations.

Table 2-1 Summary of Meteorological Parameters Measured at Each Station

Courtice WPCP (Upwind) Ambient Air Quality Monitoring Station	Rundle Road (Downwind) Ambient Air Quality Monitoring Station
Wind Speed and Direction @ 20-m	Wind Speed and Direction @10-m
Ambient Temperature @ 2-m	Ambient Temperature @ 2-m
Relative Humidity	Relative Humidity
Rainfall	Rainfall
Barometric Pressure	

2.2 AIR QUALITY CONTAMINANTS OF CONCERN

The ambient air quality monitoring program for the DYEC includes the following contaminants specified in the Ambient Air Quality Monitoring Plan:

- Nitrogen Oxides (NO_X);
- Sulphur Dioxide (SO_2);
- Particulate Matter smaller than 2.5 microns ($PM_{2.5}$);
- Total Suspended Particulate (TSP) matter and metals;
- Polycyclic Aromatic Hydrocarbons (PAHs); and,
- Dioxins and Furans (D/Fs).

The following are lists of the specific metals, PAHs, and dioxins and furans being measured. Rationales for the choice of contaminants being monitored are provided in the Ambient Air Quality Monitoring Plan.

<u>Metals:</u>

- Aluminum (Al)
- Antimony (Sb)
- Arsenic (As)
- Barium (Ba)
- Beryllium (Be)
- Bismuth (Bi)
- Boron (B)
- Cadmium (Cd)
- Cobalt (Co)
- Copper (Cu)
- Chromium (Cr) (Total)
- Iron (Fe)
- Lead (Pb)
- Magnesium (Mg)
- Manganese (Mn)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Phosphorus (Ph)
- Selenium (Se)
- Silver (Ag)

- Strontium (Sr)
- Thallium (Tl)
- Tin (Sn)
- Titanium (Ti)
- Uranium (U)
- Vanadium (V)
- Zinc (Zn)
- Zirconium (Zr)

Polycyclic Aromatic Hydrocarbons:

- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Acenaphthene
- Acenaphthylene
- Anthracene
- Benzo(a)anthracene
- Benzo(a)fluorene
- Benzo(a)pyrene
- Benzo(b)fluorene
- Benzo(b)fluoranthene
- Benzo(e)pyrene
- Benzo(g,h,i)perylene
- Benzo(k)fluoranthene
- Biphenol
- Chrysene
- Dibenz(a,h)anthracene
- Dibenz(a,c)anthracene
- Fluoranthene
- Indeno(1,2,3-cd)pyrene
- Naphthalene
- Perylene
- Phenanthrene
- Pyrene
- Tetralin
- o-Terphenyl
- Total PAHs

Dioxins and furans:

- 2,3,7,8-Tetra CDD
- 1,2,3,7,8-Penta CDD
- 1,2,3,4,7,8-Hexa CDD
- 1,2,3,6,7,8-Hexa CDD
- 1,2,3,7,8,9-Hexa CDD
- 1,2,3,4,6,7,8-Hepta CDD
- Octa CDD
- Total Tetra CDD
- Total Penta CDD
- Total Hexa CDD
- Total Hepta CDD
- 2,3,7,8-Tetra CDF
- 1,2,3,7,8-Penta CDF
- 2,3,4,7,8-Penta CDF
- 1,2,3,4,7,8-Hexa CDF
- 1,2,3,6,7,8-Hexa CDF
- 2,3,4,6,7,8-Hexa CDF
- 1,2,3,7,8,9-Hexa CDF
- 1,2,3,4,6,7,8-Hepta CDF
- 1,2,3,4,7,8,9-Hepta CDF
- Octa CDF
- Total Tetra CDF
- Total Penta CDF
- Total Hexa CDF
- Total Hepta CDF
- Total toxic equivalency (I-TEQ)

2.3 AIR QUALITY CRITERIA

Two sets of standards were used for comparison to the air quality data as specified in the Ambient Air Monitoring Plan. The first set of standards is the limits reported in O.Reg.419/05 (Schedules 3 and 6). These are compliance based standards used through the province of Ontario. However, not all chemicals have O.Reg.419/05 criteria, or in some instances updated health-based standards were used in the human health risk assessment (HHRA) conducted in support of the Environmental Assessment (July 31, 2009 - December 10, 2009). These health-based values, which were reported in Table 7-2 (Summary of Inhalation TRVs and Inhalation Benchmarks Selected for CACs) and Table 7-3 (Inhalation TRVs and Inhalation Benchmarks for Selected COPCs) of the HHRA (Stantec, 2009b) were used as the second set of standards.

The currently applicable Canada-Wide Standard (CWS) for $PM_{2.5}$ of 30 µg/m^3 (98th percentile averaged over 3 consecutive years), is noted in Table 2-2. New Canadian Ambient Air Quality Standards (CAAQS) are being proposed as objectives to replace the existing CWS. The proposed CAAQS for PM2.5 would be 28 µg/m^3 by 2015 and 27 µg/m^3 by 2020

A summary of the relevant air quality criteria is presented in Tables 2-2 to 2-4 for CACs, metals and PAHs/dioxins and furans respectively.

Table 2-2 Summary of Air Quality Criteria for CACs

Contaminant	CAS	O. Reg 419/05 – Schedule 3			HHRA Health-Based Standards		
		1-Hour (µg/m^3)	24-Hour (µg/m^3)	Other time Period (µg/m^3)	1-Hour (µg/m^3)	24-Hour (µg/m^3)	Annual (µg/m^3)
Sulphur dioxide	7446095	690	275		690	275	29
Nitrogen oxides [A]	10102-44-0	400	200		400	200	60

Contaminant	CAS	Canada-Wide Standard			HHRA Health-Based Standards		
		1-Hour (µg/m^3)	24-Hour (µg/m^3)	Other time Period (µg/m^3)	1-Hour (µg/m^3)	24-Hour (µg/m^3)	Other time Period (µg/m^3)
$PM_{2.5}$	N/A		30 [B]			30	

Notes:

A. The Schedule 3 standards for NO_X are based on health effects of NO_2, as NO_2 has adverse health effects at much lower concentrations than NO. Therefore the standard was compared to NO_2 in this report. However, as per the current April 2012 version of O. Reg. 419 Summary of Standards and Guidelines, the standard was also compared to the monitored NO_X.

B. CCME (2000), Canada-Wide Standards for Respirable Particulate Matter and Ozone, effective by 2010. The Respirable Particulate Matter Objective is referenced to the 98th percentile over 3 consecutive years.

Table 2-3 Summary of Air Quality Criteria for Metals

Contaminant	CAS	O. Reg 419/05 – Schedule 3			HHRA Health-Based Standards		
		1-Hour (µg/m³)	24-Hour (µg/m³)	Other time Period (µg/m³)	1-Hour (µg/m³)	24-Hour (µg/m³)	Annual (µg/m³)
Total Particulate	NA		120			120	60
Aluminum	7429-90-5		4.8				
Antimony	7440-36-0		25		5	25	0.2
Arsenic	7440-38-2		0.3		0.2	0.3	0.015 [A] 0.0043 [B]
Barium	7440-39-3		10		5	10	1
Beryllium	7440-41-7		0.01		0.02	0.01	0.007 [A] 0.0024 [B]
Bismuth	7440-69-9	-					
Boron	7440-42-8		120		50		5
Cadmium	7440-43-9		0.025	0.005; annual	0.1	0.025	0.005 [A] 0.0098 [B]
Chromium (Total)	7440-47-3		0.5		1		60
Cobalt	7440-48-4		0.1		0.2	0.1	0.1
Copper	8440-50-8		50				
Iron	15438-31-0		4				
Lead	7439-92-1		0.5	0.2; 30-day	1.5	0.5	0.5
Magnesium	7439-95-4	-					
Manganese	7439-96-5		0.4				
Mercury	7439-97-6		2		0.6	2	0.3
Molybdenum	7439-87-7		120				
Nickel	7440-02-0		0.2	0.04; annual	6		0.05
Phosphorus	7723-14-0						6.4×10^7
Selenium	7782-49-2		10		2	10	0.2
Silver	7440-22-4		1		0.1	1	0.01
Strontium	7440-24-6		120				
Thallium	7440-28-0				1		0.1
Tin	7440-31-5		10		20	10	2

Table 2-3 Summary of Air Quality Criteria for Metals

Contaminant	CAS	O. Reg 419/05 – Schedule 3			HHRA Health-Based Standards		
		1-Hour (µg/m³)	24-Hour (µg/m³)	Other time Period (µg/m³)	1-Hour (µg/m³)	24-Hour (µg/m³)	Annual (µg/m³)
Titanium	7440-32-6		120				
Vanadium	7440-62-2		2		0.5	1	1
Uranium	7440-61-1		1.5	0.03; annual			
Zinc	7440-66-6		120		50		5
Zirconium	7440-67-7		20				

Notes:

A. Annual Average

B. Carcinogenic Annual Average

Table 2-4 Summary of Air Quality Criteria for PAHs and D/Fs

Contaminant	CAS	O. Reg 419/05 – Schedule 3			HHRA Health-Based Standards			
		1-Hour (ng/m³)	24-Hour (ng/m³)	Other time Period (ng/m³)	1-Hour (ng/m³)	24-Hour (ng/m³)	Annual (ng/m³)	Toxic Equivalency Factor Annual [A, G] (ng/m³)-1
1-Methylnaphthalene	90-12-0		12,000				3,000	
2-Methylnaphthalene	91-57-6		10,000				3,000	
Acenaphthene	83-32-9				1,000			1
Acenaphthylene	208-96-8		3,500		1,000			10
Anthracene	120-12-7		200		500		50	
Benzo(a)anthracene	56-55-3				500			100
Benzo(b)fluoranthene	205-99-2				500			100
Benzo(k)fluoranthene	207 -08-9				500			100
Benzo(a)fluorene	238-84-6				500		50	
Benzo(b)fluorene	243-17-4				500		50	
Benzo (g,h,i) perylene	191-24-2				500			100

Table 2-4 Summary of Air Quality Criteria for PAHs and D/Fs

Contaminant	CAS	O. Reg 419/05 – Schedule 3			HHRA Health-Based Standards			
		1-Hour (ng/m^3)	24-Hour (ng/m^3)	Other time Period (ng/m^3)	1-Hour (ng/m^3)	24-Hour (ng/m^3)	Annual (ng/m^3)	Toxic Equivalency Factor Annual [A, G] $(ng/m^3)^{-1}$
Benzo(a)pyrene	50-32-8		0.05 [B] 5 [C] 1.1 [D]	0.01; annual		1	87 [A]	
Benzo(e)pyrene	192-97-2				500			10
Biphenyl	92-52-4						224,000	
Chrysene	218-01-9	-						
Dibenzo(a,c)anthracene	215-58-7							100
Dibenzo(a,h)anthracene	53-70-3				500			1,000
Fluoranthene	206-44-0				500			1
Indeno(1,2,3-cd)pyrene	193-39-5				500			100
Naphthalene	91-20-3		22,500			22,500	3,000	
o-Terphenyl	84-15-1				50,000		5,000	
Perylene	198-55-0				500			1
Phenanthrene	85-01-8				500			1
Pyrene	129-00-0				500			1
Tetralin	119-64-2	-						
Dioxins and Furans Total Toxic Equivalency [E]	NA		0.1 (pg TEQ/m^3) [F] 1 (pg TEQ/m^3) [C]					

Notes:

A. Carcinogenic Annual Average. Units in $(ng/m^3)^{-1}$.
B. Ontario Ambient Air Quality Criteria - The standard for benzo(a)pyrene (B(a)P) is for B(a)P as a surrogate for PAHs.
C. O. Reg. 419 Schedule 6 Upper Risk Thresholds
D. O. Reg. 419 24 Hour Guideline
E. Application of the air standard for dioxins, furans, and dioxin-like PCBs requires the calculation of the total toxicity equivalent (TEQ) concentration contributed by all dioxin-like compounds in the mixture. TEQ is calculated using the methodology as per the O. Reg.419 Summary of Standards and Guidelines, and the corresponding WHO_{2005} toxic equivalency factors (TEFs).
F. Ontario Ambient Air Quality Criteria
G. Toxic Equivalency Factors (TEFs) are shown as benzo(a)pyrene equivalents.

3.0 Instrumentation Summary

3.1 INSTRUMENTATION

The measurement program at the monitoring sites includes both continuous and non-continuous monitors to sample air contaminant concentrations. The monitors were set up in April 2013, and monitoring started in May 2013.

Monitoring for respirable particulate matter ($PM_{2.5}$), nitrogen oxides (NO_X) and sulphur dioxide (SO_2) are conducted on a continuous basis. A summary of the continuous monitors and a brief description of their principle of operation are provided in Table 3-1 below.

Table 3-1 Summary of Continuous Ambient Air Quality Monitors

Contaminant	Monitor	Principle of Operation	Range	Time Interval
$PM_{2.5}$	Thermo Sharp 5030 Synchronized Hybrid Ambient Real-time Particulate Monitor	Light Scattering Photometry / Beta Attenuation – Consists of a carbon14 source, detector and light scattering Nephelometer in a rack-mountable enclosure. The Thermo Sharp utilizes a continuous (non-step wise) hybrid mass measurement and a combination of beta attenuation and light scattering technology. The unit's filter tape is automatically advanced based upon a user defined frequency or particulate loading.	0-10 mg/m^3	1 minute
NO, NO_2, NO_X	API Model 200E Chemiluminescence Analyzer	Chemiluminescence – Uses a chemiluminescence detection principle and microprocessor technology for ambient continuous emissions monitoring (CEM). Measurements are automatically compensated for temperature and pressure changes.	0 – 1000 ppb	1 second

Table 3-1 Summary of Continuous Ambient Air Quality Monitors

Contaminant	Monitor	Principle of Operation	Range	Time Interval
SO_2	Teledyne Monitor Labs Sulphur Dioxide Analyzer Model T100	Pulsed Florescence –SO_2 levels are measured based on the principle that SO_2 has a strong ultraviolet (UV) absorption at a wavelength between 200 and 240 nanometres (nm). The absorption of photons at these wavelengths results in the emission of fluorescence photons at a higher wavelength. The amount of fluorescence measured is directly proportional to the concentration of SO_2.	0 – 1000 ppb	1 second

Monitoring for metals in total suspended particulates (TSP), polycyclic aromatic hydrocarbons (PAHs) and dioxins and furans are conducted at both the Courtice WPCP (upwind) and Rundle Road (downwind) monitoring stations with non-continuous monitors, per the methodology and analyses described in the ambient air quality monitoring plan (Stantec 2012) as presented in Table 3-2.

Table 3-2 Summary of Non-Continuous Ambient Air Monitors

Contaminant	Sampler	Filter Media	Lab Analysis	Sampling Schedule
TSP and metals	Tisch Environmental TE-5170 mass-flow high volume sampler	Pre-weighed, conditioned Teflon coated glass fibre filters	Weighed for particulate loading and analysed using the Atomic Emission Spectroscopy / Inductively Coupled Plasma (AES/ICP) technique to determine metals content	24 hour sample taken every 6 days
PAHs	Tisch Environmental TE-1000 mass-flow high volume air sampler	Dual chambered sampling module with a Teflon-coated glass fibre filter and a Poly-Urethane Foam (PUF) cartridge	Gas Chromatography/Mass Spectrometry (GC/MS)	24 hour sample taken every 12 days
Dioxins / Furans				24 hour sample taken every 24 days

The downwind Rundle Road station measures horizontal wind speed, wind direction, atmospheric temperature, relative humidity and rainfall. The upwind Courtice station measures atmospheric temperature, relative humidity, rainfall and barometric pressure. Wind speed and wind direction data at the upwind location are available from the Courtice Water Pollution Control Plant. The meteorological sensors at the Rundle Road station are mounted on an external 10-m aluminum tower and are logged using a digital data acquisition system (DAS). The meteorological equipment includes the following:

Table 3-3 Summary of Meteorological Equipment

Parameter	Equipment
Wind Speed/Wind Direction	Met One Instruments Inc. Model 034B
Temperature	Campbell Scientific Model 107
Relative Humidity	Campbell Scientific Model HMP60
Atmospheric Pressure	Campbell Scientific Model CS106
Rainfall	Texas Electronic TE525M

A Campbell Scientific CRX1000 station data acquisition system is used to collect continuous instrument monitoring data and status codes from the ambient air monitors. Continuous station data is maintained in the data loggers, and data is viewed locally using a laptop and the relevant DAS software applications. Remote data transmission is accomplished by the periodic transmission of collected station air quality data via cellular phone.

3.2 INSTRUMENTATION ISSUES

The monitors were set up in April 2013 and monitoring started in May 2013. Some issues were encountered with the $PM_{2.5}$ particulate monitor during the initial shake-down period for the monitoring stations in May to June. Issues were encountered with both Thermo Sharpe 5030 $PM_{2.5}$ monitors (vacuum pumps tripping off and monitors going off-line) which necessitated removing both monitors and shipping them back to the supplier for repair. The manufacturer replaced a circuit board in one monitor and upon re-installation the vacuum pumps were connected to uninterruptible power supplies (UPS) which appear to have rectified the issues with these monitors.

At the Rundle Road station, an unusual data logger issue was encountered in which data for almost the entire month of June was found to be missing from the downloaded data logger file. Data from the stations was remotely downloaded on a routine basis from each station during the monitoring period with Campbell Scientific software configured to append the data to a file for each station located on a PC in the Stantec office. Following the month of June, it was found that the PC file did not contain any data for the month, although the datalogger was checked

frequently during the month and the software appeared to remotely download the data correctly from the datalogger. The data was not recoverable from the data logger and the cause of this issue has not been ascertained. To mitigate against this issue occurring again in the future, the station datalogger files are now being backed-up on a weekly basis to separate computer directories to ensure that any datalogger/software download issues will not overwrite any data already stored in the PC files.

Summaries of operational issues for each measurement parameter during the monitoring period at each station are presented in Tables 3-4 and 3-5.

Table 3-4 Summary of Instrument Issues at Courtice WPCP Station (Upwind)

Parameter	Issues	Time Frame	Remedial Action
SO_2	Thermocouple failure causing internal daily calibration to not perform properly.	May 30, 2013	Replaced thermocouple with new unit from supplier.
NO_X	None		
$PM_{2.5}$	Vacuum pumps tripping off and monitors going off-line.	April 13 to June 11, 2013	Monitor was shipped back to the supplier for repair. The monitor was re-installed on June 11th, with the vacuum pump connected to an uninterruptible power supply (UPS).
TSP/Metals Hi-Vol.	None		
PAH/ D/F Hi-Vol	None		
Met tower	None		

Table 3-5 Summary of Instrument Issues at Rundle Road (Downwind)

Parameter	Issues	Time Frame	Remedial Action
SO_2	Monitor off-line due to power outage.	May 31, 2013	Replaced back-up power.
NO_X	Monitor off-line due to power outage.	May 31, 2013	Replaced back-up power.

Table 3-5 Summary of Instrument Issues at Rundle Road (Downwind)

Parameter	Issues	Time Frame	Remedial Action
$PM_{2.5}$	Vacuum pumps tripping off, monitors going off-line, and circuit board failure.	April 29 to June 20, 2013	Monitor was shipped back to the supplier for repair. The manufacturer replaced the circuit board in the monitor. The monitor was re-installed on June 20, with the vacuum pump connected to an uninterruptible power supply (UPS).
	Ants inside pod causing UPS to trip.	June 26, 2013	Installed ant traps and sprayed to remove ants.
TSP/Metals Hi-Vol.	None		
PAH/ D/F Hi-Vol	Elapsed timer not working.	June 12-20, 2013	Replaced elapsed timer.
Met tower	Wind head was not functioning properly due to an internal problem.	May 10 – 31 2013	Wind head was sent back to supplier to repair and was re-installed on May 31.
	Rain bucket was plugged.	June 20, 2013	Cleaned out rain bucket.
Data Logger	Unexpected loss of data records	May 31 – June 30, 2013	Data for this period missing from datalogger download file. No clear explanation found. Corrective Action - routine file back-up to second location to avoid any file overwriting implemented to avoid this issue in the future.

Monitoring in the months following the May-June period has seen few instrumentation issues and acceptable data recovery rates for all parameters.

3.3 INSTRUMENTATION RECOVERY RATES

Data recovery rates for each continuous monitor at the two monitoring stations during Quarter 2 (May to June 2013) are presented in Tables 3-6 and 3-7.

Table 3-6 Summary of Data Recovery Rates for the Courtice WPCP Station (Upwind) - May to June 2013

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
SO_2	1400	96%
NO_X	1401	96%
$PM_{2.5}$	106	7%
Temperature	1464	100%
Rainfall	1464	100%
Relative Humidity	1464	100%
Pressure	1403	96%
Wind Speed/Direction	1464	100%
TSP/Metals	10 [A]	100%
PAHs	5 [A]	100%
Dioxins and Furans	2 [A]	100%

Note:

A. Number of filters/24-hour average samples.

Table 3-7 Summary of Data Recovery Rates for the Rundle Road Station (Downwind) - May to June 2013

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
SO_2	721	49%
NO_X	720	49%
$PM_{2.5}$	19	1%
Temperature	753	51%
Rainfall	753	51%
Relative Humidity	753	51%
Wind Speed/Direction	281	19%
TSP/Metals	10 [A]	100%
PAHs	5 [A]	100%
Dioxins and Furans	2 [A]	100%

Note:

A. Number of filters/24-hour average samples.

4.0 Summary of Ambient Measurements

The following sections provide summaries of the validated data and the validation done on each parameter.

4.1 METEOROLOGICAL DATA

A summary of the maximum, minimum, arithmetic mean, and standard deviation of the hourly average meteorological parameters measured at the two monitoring stations for the May to June 2013 period are presented in Table 4-1. There are no reported data for the month of June at the Rundle Road Station due to loss of data records from the datalogger download file.

Table 4-1 Summary of Hourly Meteorological Measurements - May to June 2013

Parameter		Courtice WPCP (Upwind)	Rundle Road (Downwind)	Units
Temperature	Max	25.1	25.0	C
	Min	0.3	0.2	C
	Mean (May)	13.0	13.2	C
	Mean (June)	16.7	N/A	C
	Mean (Period)	14.8	13.3	C
	Standard Deviation	4.4	5.0	C
Rainfall	Max	16.9	11.6	mm
	Min	0.0	0.0	mm
	Mean (May)	0.05	0.10	mm
	Mean (June)	0.11	N/A	mm
	Mean (Period)	0.08	0.10	mm
	Standard Deviation	0.71	0.70	mm
Relative Humidity	Max	100.0	100.0	%
	Min	25.9	20.7	%
	Mean (May)	69.2	70.1	%
	Mean (June)	79.1	N/A	%
	Mean (Period)	74.1	70.1	%
	Standard Deviation	17.6	20.0	%

Table 4-1 Summary of Hourly Meteorological Measurements - May to June 2013

Parameter		Courtice WPCP (Upwind)	Rundle Road (Downwind)	Units
Pressure [A]	Max	30.1	-	in Hg
	Min	29.2	-	in Hg
	Mean (May)	29.7	-	in Hg
	Mean (June)	29.6	-	in Hg
	Mean (Period)	29.7	-	in Hg
	Standard Deviation	0.2	-	in Hg
Wind Speed [B]	Max	33.9	50.7	km/hr
	Min	0.5	0.6	km/hr
	Mean (May)	12.1	8.8	km/hr
	Mean (June)	8.7	N/A	km/hr
	Mean (Period)	10.4	8.7	km/hr
	Standard Deviation	6.4	5.1	km/hr

Notes:

A. Pressure is not measured at Rundle Road Station.

B. Wind speed at Courtice WPCP Station measured at 20-m and at Rundle Road Station at 10-m.

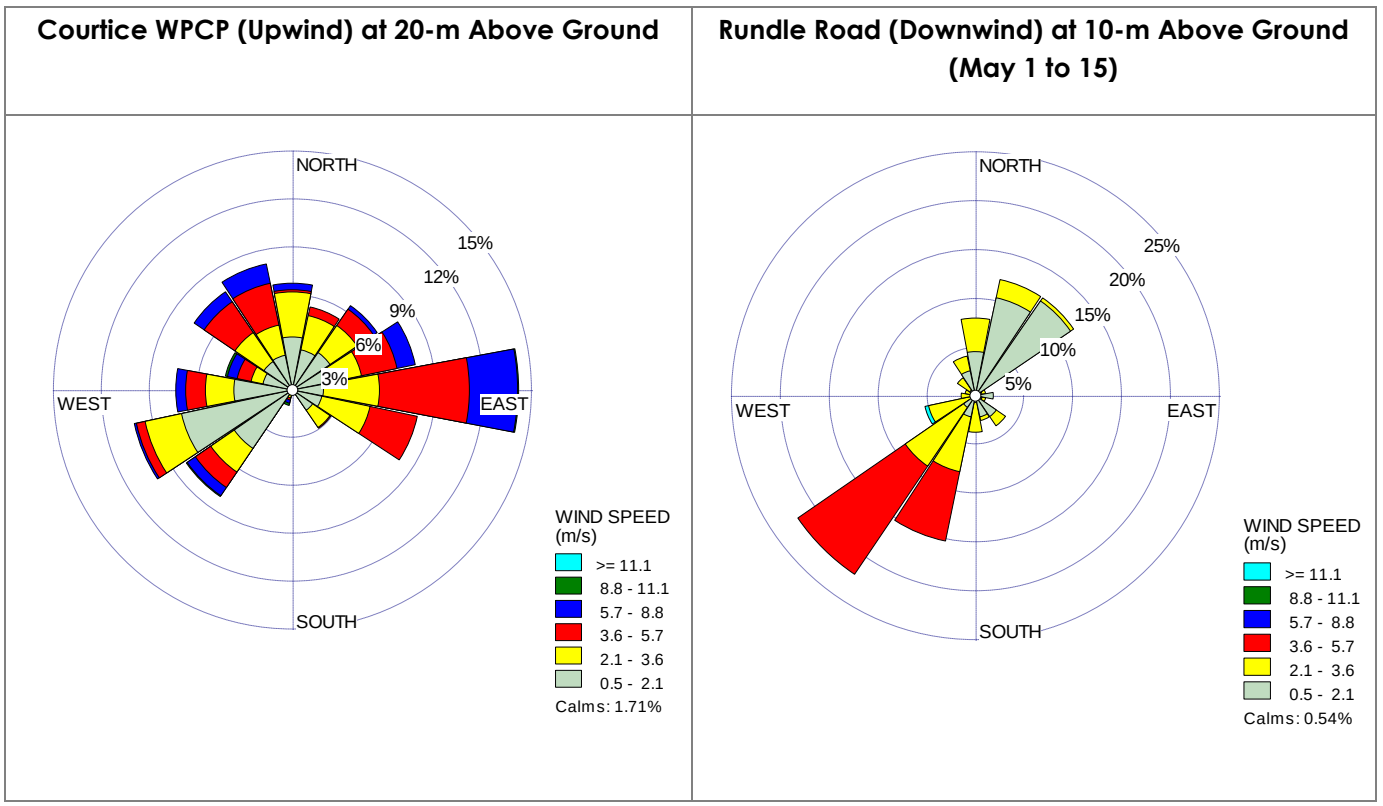
At the Courtice WPCP (Upwind) Station (located near Lake Ontario), wind data were measured and provided by the Courtice Water Pollution Control Plant on a 20-m tower, while at the Rundle Road (Downwind) Station they are measured on a 10-m tower.

Wind roses showing the directionality and speed at each location are presented in Figure 4-1. The length of the radial barbs gives the total percent frequency of winds from the indicated direction, while portions of the barbs of different widths indicate the frequency associated with each wind speed category.

Winds over the two-month period at the Courtice WPCP Station occurred predominantly from the east as well as from westerly directions. The wind rose for the first two-months of monitoring showed winds predominantly from the east, northwest and southwest. Slightly higher wind speeds occurred from the east and northwest directions, and lower wind speeds from the southwest. Wind contribution from the south was low.

At the Rundle Road Station, due to loss of data records from the data logger in June, the wind rose in Figure 4-1 shows only wind data from May. Due to an internal problem with the wind head only about fifteen days of measurements were available, thus the wind data at the Rundle Road Station is not expected to be representative of actual conditions over the month nor directly comparable to the Courtice WPCP Station.

Figure 4-1 Wind Roses for May to June 2013



4.2 CAC AMBIENT AIR QUALITY MEASUREMENTS

A summary of the maximum, minimum, arithmetic mean and standard deviation of the CAC pollutant concentrations measured at each station are presented in Table 4-2. Also presented in this table is the number of exceedances of the relevant Ontario ambient air quality criteria (AAQC) or health-based standard for each contaminant, if available. For the monitoring period between May and June, 2013, measured levels of all monitored contaminants were below their applicable O.Reg. 419/05 criteria or HHRA health-based standard.

Nitric oxide (NO) has no regulatory criteria as discussed in Section 4.2.2 below. The hourly and daily AAQC for NO_X are based on health effects of NO_2, therefore the AAQC were compared to measured NO_2 concentrations in this report. However, as per the current April 2012 version of O. Reg. 419 Summary of Standards and Guidelines, the AAQC was also compared to the monitored NO_X levels.

A comparison of the maximum measured data to their respective air quality criteria is presented graphically in Figure 4-2. Only May data is reported for Rundle Road station for this quarter as data for June was missing from the datalogger download file.

Table 4-2 Summary of Ambient CAC Monitoring Data - May to June 2013

Pollutant	Averaging Period	AAQC / HHRA Health-Based Standards			Courtice WPCP (Upwind)		Rundle Road (Downwind)	
		µg/m³	ppb		Concentration (µg/m³)	Concentration (ppbv)	Concentration (µg/m³)	Concentration (ppbv)
SO_2	1	690	250	Maximum	92.4	34.5	51.6	19.3
				Minimum	0.0	0.0	0.0	0.0
				Mean (May)	2.6	0.9	0.8	0.3
				Mean (June)	4.7	1.7	0.8	0.3
				Mean (Period)	3.6	1.3	0.8	0.3
				Standard Deviation	9.0	3.3	3.0	1.1
				# of Exceedances	0.0	0.0	0.0	0.0
	24	275	100	Maximum	36.8	13.8	5.2	1.9
				Minimum	0.0	0.0	0.0	0.0
				Mean (May)	2.6	1.0	0.8	0.3
				Mean (June)	4.4	1.7	0.8	0.3
				Mean (Period)	3.5	1.3	0.8	0.3
				Standard Deviation	5.1	1.9	1.1	0.4
				# of Exceedances	0.0	0.0	0.0	0.0
$PM_{2.5}$	24	30 [A]	NA	Maximum	10.8	N/A	12.4	N/A
				Minimum	3.6	N/A	6.2	N/A
				Mean (May)	N/A	N/A	N/A	N/A
				Mean (June)	7.3	N/A	9.7	N/A
				Mean (Period)	7.3	N/A	9.7	N/A
				Standard Deviation	3.0	N/A	3.2	N/A
				# of Exceedances	N/A	N/A	N/A	N/A

Table 4-2 Summary of Ambient CAC Monitoring Data - May to June 2013

Pollutant	Averaging Period	AAQC / HHRA Health-Based Standards			Courtice WPCP (Upwind)		Rundle Road (Downwind)	
		µg/m³	ppb		Concentration (µg/m³)	Concentration (ppbv)	Concentration (µg/m³)	Concentration (ppbv)
NO_2	1	400 [B]	200 [B]	Maximum	93.8	48.0	78.3	39.3
				Minimum	0.0	0.0	0.0	0.0
				Mean (May)	13.1	6.7	17.1	8.8
				Mean (June)	8.4	4.4	4.3	2.3
				Mean (Period)	10.8	5.6	16.7	8.6
				Standard Deviation	14.4	7.4	11.3	5.8
				# of Exceedances	N/A	N/A	0.0	0.0
	24	200	100	Maximum	30.9	15.9	30.7	15.7
				Minimum	0.9	0.5	4.3	2.3
				Mean (May)	13.1	6.7	17.3	8.8
				Mean (June)	8.5	4.4	4.3	2.3
				Mean (Period)	10.8	5.6	17.2	8.8
				Standard Deviation	7.0	3.6	6.7	3.4
				# of Exceedances	N/A	N/A	0.0	N/A
NO [C]	1	NA	NA	Maximum	87.0	65.6	41.4	32.3
				Minimum	0.0	0.0	0.0	0.0
				Mean (May)	3.1	2.4	4.5	3.5
				Mean (June)	3.0	2.4	3.7	3.0
				Mean (Period)	3.0	2.4	4.5	3.5
				Standard Deviation	6.0	4.7	4.0	3.2
				# of Exceedances	N/A	N/A	N/A	N/A
	24	NA	NA	Maximum	12.8	10.1	8.6	6.9
				Minimum	0.0	0.0	2.3	1.9
				Mean (May)	3.1	2.4	4.5	3.6
				Mean (June)	3.0	2.4	3.8	3.0
				Mean (Period)	3.0	2.4	4.5	3.6
				Standard Deviation	2.4	1.9	1.5	1.2
				# of Exceedances	N/A	N/A	N/A	N/A

Table 4-2 Summary of Ambient CAC Monitoring Data - May to June 2013

Pollutant	Averaging Period	AAQC / HHRA Health-Based Standards			Courtice WPCP (Upwind)		Rundle Road (Downwind)	
		µg/m³	ppb		Concentration (µg/m³)	Concentration (ppbv)	Concentration (µg/m³)	Concentration (ppbv)
NO_X	1	400 [B]	200 [B]	Maximum	200.2	98.4	121.1	61.8
				Minimum	0.0	0.0	0.0	0.0
				Mean (May)	17.5	9.0	20.3	10.4
				Mean (June)	12.9	6.7	5.6	2.9
				Mean (Period)	15.2	7.9	19.9	10.2
				Standard Deviation	21.1	10.9	16.0	8.2
				# of Exceedances	0.0	0.0	0.0	0.0
	24	200 [B]	100 [B]	Maximum	47.9	24.7	36.9	18.9
				Minimum	0.3	0.1	5.6	2.9
				Mean (May)	17.5	9.0	20.5	10.5
				Mean (June)	13.0	6.8	5.6	3.0
				Mean (Period)	15.3	7.9	20.5	10.5
				Standard Deviation	9.6	5.0	8.7	4.5
				# of Exceedances	0.0	0.0	0.0	0.0

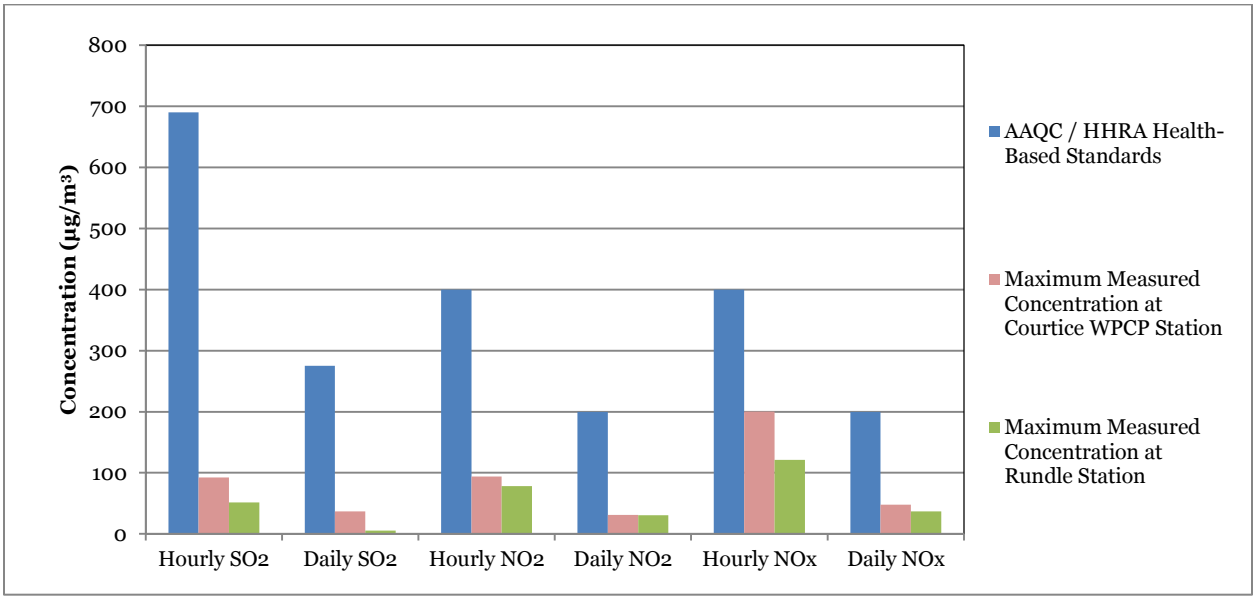
Note:

A. Canada-Wide Standards for Respirable Particulate Matter. It should be noted that the CWS for $PM_{2.5}$ is based on a 98th percentile level not to be exceeded each year over a 3 year period.

B. As per current version (April 2012) of Reg. 419 Summary of Standards and Guidelines, the air standard for NO_X is compared to a monitored NO_X concentration, although the Reg. 419 Schedule 3 standard for NO_X is based on health effects of NO_2.

C. NO has no regulatory criteria.

Figure 4-2 Comparison of NO_X / NO_2 and SO_2 Ambient Monitoring Data to Applicable Criteria



Detailed discussion for each measured contaminant is presented in the following sections.

4.2.1 Sulphur Dioxide (SO_2)

Data summaries are presented in Appendix A for sulphur dioxide for each station and month as well as time history plots of the hourly and daily average SO_2 concentrations. For the hourly and daily averages, the Ontario AAQCs of 690 µg/m³ and 275 µg/m³ are shown as blue lines on each plot. As shown in these figures, measured ambient SO_2 concentrations at both stations were well below the criteria.

The maximum hourly and 24-hour average concentrations measured at the Courtice WPCP station during May and June were 93 and 37 µg/m³ respectively, which are each13% of the applicable ambient 1-hour and 24-hour air quality criteria.

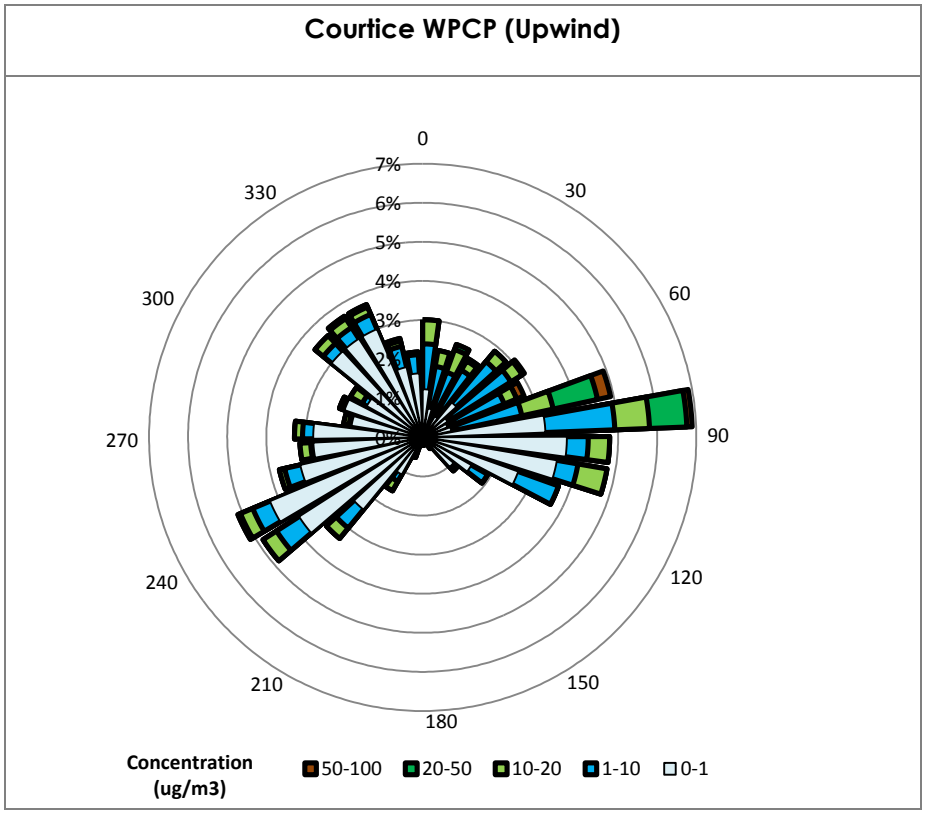
The maximum hourly and 24-hour average concentrations measured at the Rundle Road during May were 52 and 5 µg/m³ respectively, which are 8% and 2% of the applicable ambient 1-hour and 24-hour air quality criteria. As data for June was missing from datalogger download file, only May data is reported for Rundle Road station for this quarter.

A pollution rose of hourly average SO_2 concentrations measured at the Courtice WPCP Station is presented in Figure 4-3. The pollution rose plot measured average hourly contaminant concentrations versus measured wind direction (over 10^0 wind sectors). Due to the internal problem with the wind head and loss of data from the datalogger download files at the Rundle Road Station, only about fifteen days of wind measurements were available for this quarter, thus

the data at the Rundle Road Station is not expected to be representative of actual conditions and pollution roses for SO_2, NO_2, NO_X, and $PM_{2.5}$ are not presented in this report.

For the Courtice WPCP Station, the maximum measured hourly concentration occurred for east/northeasterly winds.

Figure 4-3 Pollution Roses for Hourly SO_2 Concentrations – May to June 2013



4.2.2 Nitrogen Dioxide (NO_2)

Nitrogen oxides (NO_X) are almost entirely made up of nitric oxide (NO) and nitrogen dioxide (NO_2). Together, they are often referred to as NO_X. Most NO_2 in the atmosphere is formed by the oxidation of NO, which is emitted directly by combustion processes, particularly those at high temperature and pressure. Exposure to both NO and NO_2 can result in adverse health effects to an exposed population. NO_2 is the regulated form of NO_X. Similar to other jurisdictions (e.g., Alberta Environment, World Health Organization),the O. Reg. 419/05 Schedule 3 standards for NO_X are based on health effects of NO_2, as health effects are seen at much lower concentrations of NO_2 than NO. In this report, because NO_2 is the regulated form of NO_X, the AAQC were compared to measured NO_2 concentrations. However, as per the current April 2012

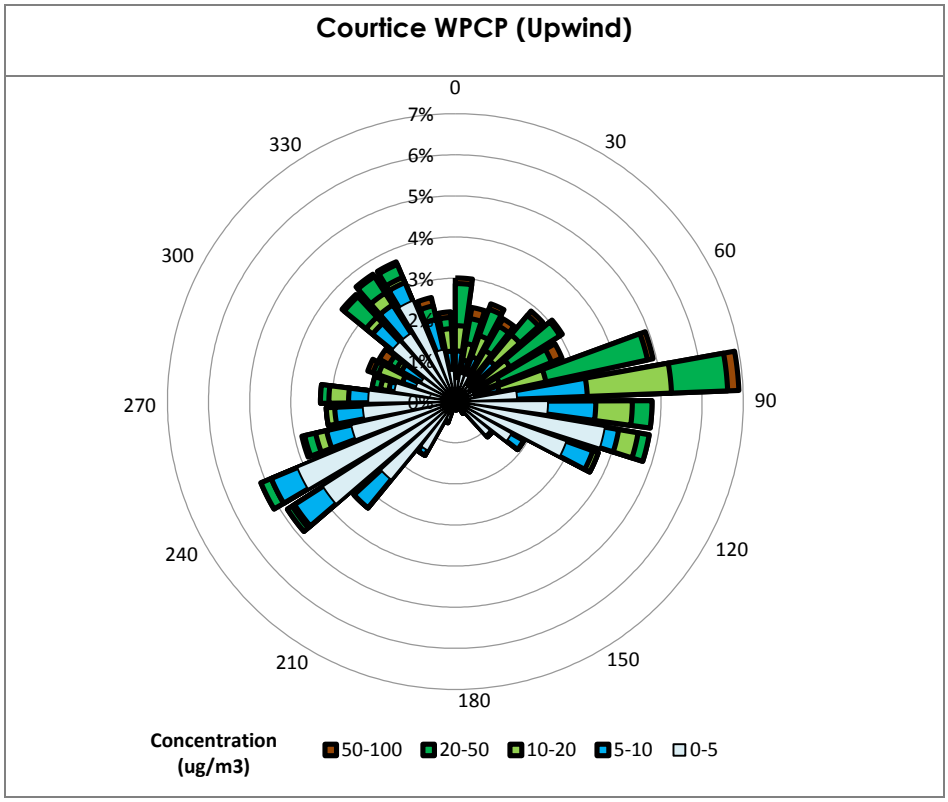
version of O. Reg. 419 Summary of Standards and Guidelines, the AAQC was also compared to the monitored NO_X concentrations (see Section 4.2.3 below).

Data summaries are presented in Appendix B for nitrogen dioxide for each station and month as well as time history plots of the hourly and daily average NO_2 concentrations. For the hourly and daily averages, the Ontario AAQCs of 400 µg/m³ and 200 µg/m³ are shown as blue lines on each plot. As shown in these figures, measured ambient NO_2 concentrations at both stations were well below the criteria.

The maximum hourly and 24-hour average NO_2 concentrations measured at the Courtice WPCP station during May and June were 94 and 31 µg/m³ respectively, which are 23% and 15% of the applicable ambient 1-hour and 24-hour air quality criteria. At Rundle Road, the maximum hourly and 24-hour average concentrations measured during May were 78 and 31 µg/m³, which are 20% and 15% of the applicable ambient 1-hour and 24-hour air quality criteria.

A pollution rose of hourly NO_2 concentrations is presented in Figure 4-4. The maximum measured hourly average concentrations for the Courtice WPCP Station shown in Figure 4-4 occur for winds blowing from the east/northeast.

Figure 4-4 Pollution Roses for Hourly NO_2 Concentrations – May to June 2013



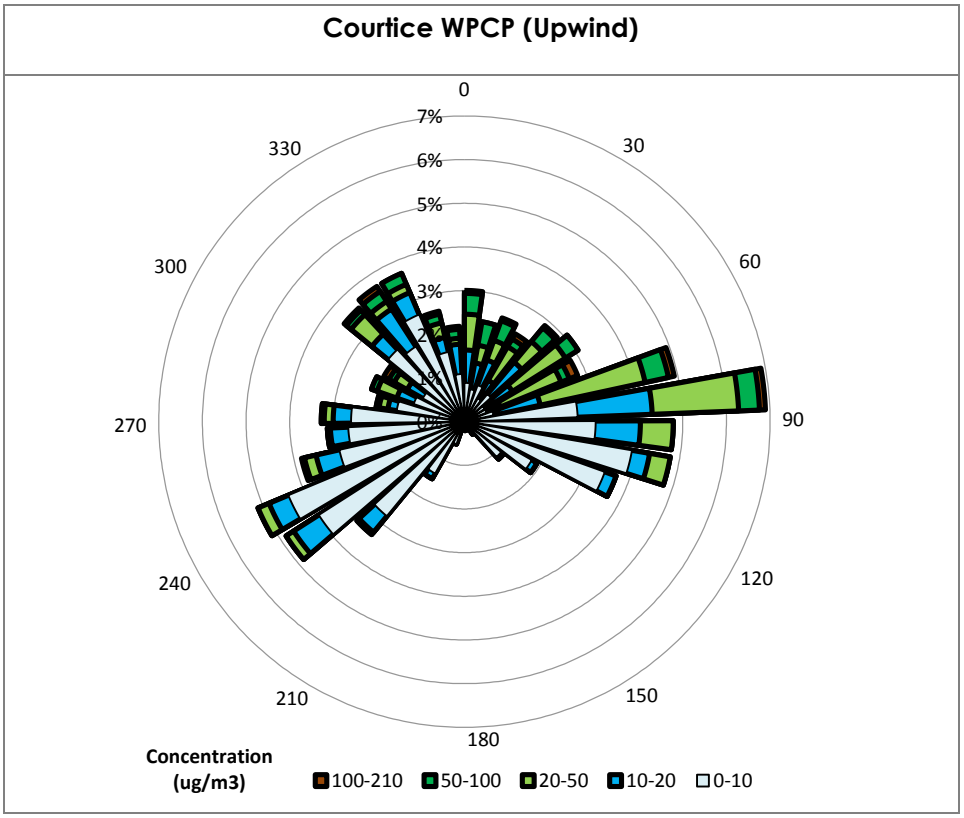
4.2.3 Nitrogen Oxides (NO_x)

Data summaries are presented in Appendix C for nitrogen oxides for each station and month as well as time history plots of the hourly and daily average NO_X concentrations. For the hourly and daily averages, the Ontario AAQCs of 400 µg/m^3 and 200 µg/m^3 are shown as blue lines on each plot. As shown in these figures, measured ambient NO_X concentrations at both stations were well below the criteria.

The maximum hourly and 24-hour average NO_X concentrations measured at the Courtice WPCP station during May and June were 200 and 48 µg/m^3 respectively, which are 50% and 24% of the applicable ambient 1-hour and 24-hour air quality criteria. At the Rundle Road Station, the maximum hourly and 24-hour average concentrations measured during May were 121 and 37 µg/m^3, which are 30% and 18% of the applicable air quality criteria.

A pollution rose of hourly average NO_X concentrations is presented in Figure 4-5. The maximum measured hourly average concentrations for Courtice WPCP occur for southwesterly winds.

Figure 4-5 Pollution Roses for Hourly NO_X Concentrations – May to June 2013



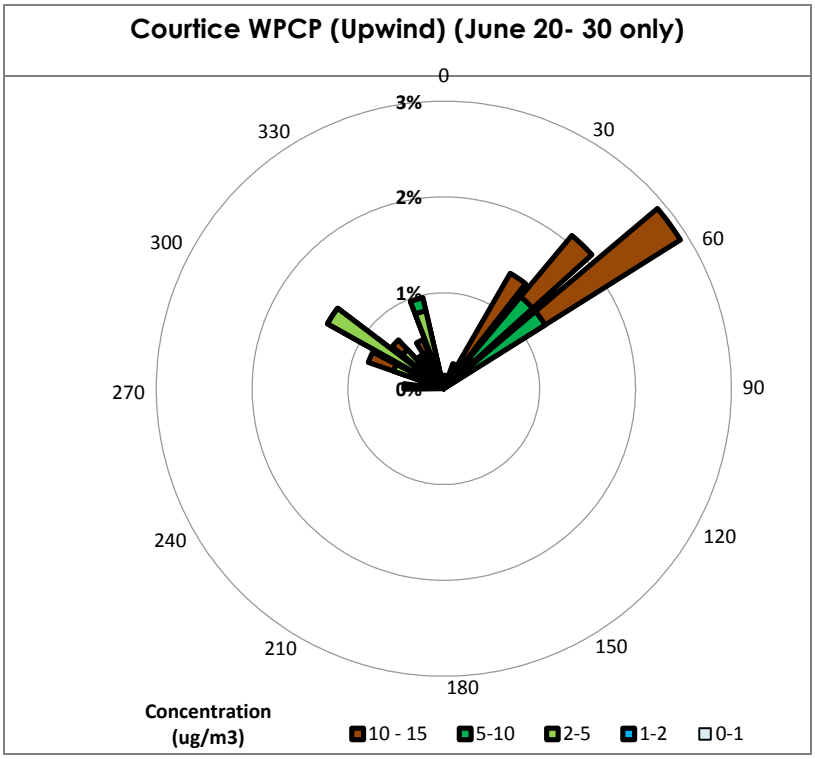
4.2.4 Particulate Matter Smaller than 2.5 Microns ($PM_{2.5}$)

Data summaries are presented in Appendix D for $PM_{2.5}$ for the Courtice WPCP station for June only as well as time history plots of the hourly and 24-hour average $PM_{2.5}$ concentrations. Due to the issues encountered with both Thermo Sharpe 5030 $PM_{2.5}$ monitors was no data collected for May or up to June 20. Data was also missing for the month of June from the datalogger download file at the Rundle Road Station, therefore $PM_{2.5}$ data was not reported for this station for this quarter.

It should be noted that since the CWS for $PM_{2.5}$ is based on a 98th percentile level not to be exceeded each year over a 3 year period, whereas the $PM_{2.5}$ measurement period at Courtice WPCP was less than 1 month, there is insufficient data collected to determine with any certainty if exceedances of the CWS would occur. As noted in Table 4-2, the maximum concentration at the station over the data collected in this quarter was 11 µg/m^3, which is well below the 30 µg/m^3 criteria. Discussion of $PM_{2.5}$ measurements with respect to the CWS will be provided in the 2013 annual report, at which time sufficient data will have been collected to make preliminary comparisons.

A pollution rose showing the 24-hour average measured ambient $PM_{2.5}$ concentrations versus direction is shown in Figure 4-6 for the Courtice WPCP monitoring station. Maximum measured concentrations occur for northeasterly winds.

Figure 4-6 Pollution Roses for Daily $PM_{2.5}$ Concentrations –June 2013



4.2.5 Ambient TSP / Metals Concentrations

A summary of the maximum and minimum ambient TSP and metals concentrations (for a daily averaging period) are presented in Table 4-3. A detailed summary of the concentrations measured for each sample is presented in Appendix F.

The maximum measured concentrations of TSP and all metals with MOE air quality criteria were well below their applicable 24-hour criteria (shown in Table 4-3 below) at both stations.

4.2.6 Ambient PAH Concentrations

A summary of the maximum and minimum ambient PAH concentrations (for a daily averaging period) are presented in Table 4-4. In this summary, both individual PAHs as well as a total PAH concentration are reported. A detailed summary of the concentrations measured for each sample is presented in Appendix F.

The maximum measured concentrations of all PAHs with MOE air quality criteria were well below their applicable 24-hour criteria, with the exception of a single benzo(a)pyrene (B(a)P) sample at the Rundle Road Station.

The current Ontario 24-hour B(a)P AAQC was introduced in 2011 and levels above this recently enacted AAQC are commonly measured throughout Ontario. B(a)P measurement data available from the National Air Pollutant Surveillance (NAPS) network for Ontario in 2012 (for Windsor, Toronto and Hamilton), all had maximum levels above the AAQC (varying between 716% -2920% of the criteria). In 2010-2011, NAPS data available for seven Ontario stations (Windsor, Toronto, Etobicoke, Hamilton, Simcoe, Pt. Petrie and Burnt Island) showed exceedances at all seven stations in 2010 and six of the seven stations in 2011, with only the remote Burnt Island Ontario station reporting a maximum level below the MOE AAQC.

Benzo(a)pyrene (B(a)P) is a byproduct of a wide variety of natural and man-made combustion processes (including motor vehicles, natural gas, wood, refuse, oil, forest fires, etc) and is widely present in the environment (including being present in soil and water).

One (1) B(a)P sample at the Rundle Road Station exceeded the Ontario 24-hour average B(a)P AAQC by 3%. This sample was however, well below the MOE Schedule 6 Upper Risk Threshold, the MOE O. Reg. 419 24-hour average guideline, and the HHRA health based standard. A review of the continuous monitoring data showed that the predominant wind direction on that day was winds blowing from the northeast. Land use in this upwind direction is primarily agricultural.

Based on the air quality assessments completed during the Environmental Assessment Study and the Environmental Compliance Approval application for the DYEC, the facility will not be a significant contributor of B(a)P. Therefore, ambient B(a)P levels are not expected to be substantially impacted by the operation of the DYEC.

4.2.7 Ambient Dioxin and Furan Concentrations

A summary of the maximum and minimum ambient D/F concentrations (for a daily averaging period) are presented in Table 4-5. In this summary both individual dioxin and furan concentrations (pg/m^3) as well as the total toxic equivalency concentration (TEQ) are reported. A detailed summary of the concentrations measured for each sample is presented in Appendix G.

The maximum measured toxic equivalent dioxin and furan concentrations at both stations were well below the applicable 24-hour AAQC of 0.1 pg TEQ/m^3 (as shown in Table 4-5).

Table 4-3 Summary of Measured Ambient TSP/Metals Concentrations

Contaminant	Units	MOE Criteria	HHRA Health Based Standard	Courtice WPCP (Upwind)			Rundle Road (Downwind)		
				Max	Min	No. of Exceedances	Max	Min	No. of Exceedances
Particulate	µg/m³	120	120	53	19	0	78	25	0
Total Mercury (Hg)	µg/m³	2	2	2.55E-05	4.42E-06	0	2.16E-05	4.51E-06	0
Aluminum (Al)	µg/m³	4.8	-	3.34E-01	6.55E-02	0	4.54E-01	7.35E-02	0
Antimony (Sb)	µg/m³	25	25	2.31E-03	2.05E-03	0	2.34E-03	2.16E-03	0
Arsenic (As)	µg/m³	0.3	0.3	1.39E-03	1.23E-03	0	1.40E-03	1.30E-03	0
Barium (Ba)	µg/m³	10	10	1.04E-02	3.99E-03	0	9.83E-03	4.18E-03	0
Beryllium (Be)	µg/m³	0.01	0.01	2.31E-04	2.05E-04	0	2.34E-04	2.16E-04	0
Bismuth (Bi)	µg/m³	-	-	1.39E-03	1.23E-03	-	1.40E-03	1.30E-03	-
Boron (B)	µg/m³	120	-	7.12E-03	1.23E-03	0	6.15E-03	1.30E-03	0
Cadmium (Cd)	µg/m³	0.025	0.025	4.62E-04	4.10E-04	0	4.68E-04	4.33E-04	0
Chromium (Cr)	µg/m³	0.5	-	3.56E-03	1.16E-03	0	4.95E-03	1.17E-03	0
Cobalt (Co)	µg/m³	0.1	0.1	4.62E-04	4.10E-04	0	4.68E-04	4.33E-04	0
Copper (Cu)	µg/m³	50	-	3.95E-02	1.78E-02	0	1.03E-01	2.92E-02	0
Iron (Fe)	µg/m³	4	-	9.06E-01	2.15E-01	0	1.30E+00	2.70E-01	0
Lead (Pb)	µg/m³	0.5	0.5	4.18E-03	6.50E-04	0	4.44E-03	6.89E-04	0
Magnesium (Mg)	µg/m³	-	-	4.85E-01	1.34E-01	-	5.24E-01	8.91E-02	-
Manganese (Mn)	µg/m³	0.4	-	2.44E-02	8.41E-03	0	3.03E-02	9.00E-03	0
Molybdenum (Mo)	µg/m³	120	-	1.43E-03	6.23E-04	0	3.79E-03	6.50E-04	0
Nickel (Ni)	µg/m³	0.2	-	2.31E-03	6.50E-04	0	2.97E-03	6.89E-04	0
Phosphorus (P)	µg/m³	-	-	1.45E-01	4.22E-02	-	1.59E-01	5.22E-02	-

Table 4-3 Summary of Measured Ambient TSP/Metals Concentrations

Contaminant	Units	MOE Criteria	HHRA Health Based Standard	Courtice WPCP (Upwind)			Rundle Road (Downwind)		
				Max	Min	No. of Exceedances	Max	Min	No. of Exceedances
Selenium (Se)	µg/m³	10	10	2.31E-03	2.05E-03	0	2.34E-03	2.16E-03	0
Silver (Ag)	µg/m³	1	1	4.62E-04	4.10E-04	0	4.68E-04	4.33E-04	0
Strontium (Sr)	µg/m³	120	-	1.10E-02	2.69E-03	0	1.95E-02	2.62E-03	0
Thallium (Tl)	µg/m³	-	-	2.31E-03	2.05E-03	-	2.34E-03	2.16E-03	-
Tin (Sn)	µg/m³	10	10	2.31E-03	2.05E-03	0	2.34E-03	2.16E-03	0
Titanium (Ti)	µg/m³	120	-	1.73E-02	3.81E-03	0	2.03E-02	5.37E-03	-
Vanadium (V)	µg/m³	2	1	1.92E-03	4.15E-04	0	2.07E-03	4.46E-04	0
Zinc (Zn)	µg/m³	120	-	2.98E-02	1.41E-02	0	3.70E-02	1.34E-02	-
Zirconium (Zr)	µg/m³	20	-	1.07E-03	2.09E-04	0	7.79E-04	2.17E-04	-
Total Uranium (U)	µg/m³	1.5	-	1.04E-04	9.24E-05	0	1.05E-04	9.73E-05	-

Table 4-4 Summary of Measured Ambient PAH Concentrations

Contaminant	Units	MOE Criteria	HHRA Health Based Standard	Courtice WPCP (Upwind)			Rundle Road (Downwind)		
				Max	Min	No. of Exceedances	Max	Min	No. of Exceedances
Benzo(a)pyrene	ng/m³	0.05 [A] 5 [B] 1.1 [C]	1	1.88E-02	6.35E-03	0 0 0	5.14E-02	9.11E-03	1 0 0
1-Methylnaphthalene	ng/m³	12,000	-	1.27E+01	6.96E+00	0	1.13E+01	4.19E+00	0
2-Methylnaphthalene	ng/m³	10,000	-	2.57E+01	1.41E+01	0	2.08E+01	8.29E+00	0
Acenaphthene	ng/m³	-	-	1.48E+01	7.15E+00	-	1.44E+01	2.82E+00	-
Acenaphthylene	ng/m³	3500	-	1.06E+00	1.13E-01	0	1.21E-01	7.77E-02	0
Anthracene	ng/m³	200	-	9.53E-01	1.13E-01	0	1.16E+00	1.14E-01	0
Benzo(a)anthracene	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Benzo(a)fluorene	ng/m³	-	-	2.38E-01	1.65E-01	-	2.41E-01	1.55E-01	-
Benzo(b)fluoranthene	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Benzo(b)fluorene	ng/m³	-	-	2.38E-01	1.65E-01	-	2.41E-01	1.55E-01	-
Benzo(e)pyrene	ng/m³	-	-	2.38E-01	1.65E-01	-	2.41E-01	1.55E-01	-
Benzo(g,h,i)perylene	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Benzo(k)fluoranthene	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Biphenyl	ng/m³	-	-	7.39E+00	3.62E+00	-	5.31E+00	1.82E+00	-
Chrysene	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Dibenz(a,h) anthracene [D]	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Fluoranthene	ng/m³	-	-	1.99E+00	8.46E-01	-	5.50E+00	4.55E-01	-
Indeno (1,2,3-cd)pyrene	ng/m³	-	-	1.19E-01	8.25E-02	-	1.21E-01	7.77E-02	-
Naphthalene	ng/m³	22,500	22,500	5.64E+01	2.96E+01	0	4.22E+01	1.74E+01	0

Table 4-4 Summary of Measured Ambient PAH Concentrations

Contaminant	Units	MOE Criteria	HHRA Health Based Standard	Courtice WPCP (Upwind)			Rundle Road (Downwind)		
				Max	Min	No. of Exceedances	Max	Min	No. of Exceedances
o-Terphenyl	ng/m^3	-	-	2.38E-01	1.65E-01	-	2.41E-01	1.55E-01	-
Perylene	ng/m^3	-	-	2.38E-01	1.65E-01	-	2.41E-01	1.55E-01	-
Phenanthrene	ng/m^3	-	-	1.24E+01	7.80E+00	-	2.17E+01	2.92E+00	-
Pyrene	ng/m^3	-	-	6.32E-01	3.76E-01	-	2.41E+00	2.73E-01	-
Tetralin	ng/m^3	-	-	2.91E+00	2.00E+00	-	4.44E+00	1.68E+00	-
Total PAH [E]	ng/m^3	-	-	1.35E+02	7.73E+01	-	1.27E+02	4.23E+01	-

Notes:

A. Ontario Ambient Air Quality Criteria. The standard for benzo(a)pyrene (B(a)P) is for B(a)P as a surrogate for PAHs.

B. O. Reg. 419 Schedule 6 Upper Risk Thresholds

C. O. Reg. 419 24 Hour Guideline

D. Dibenzo(a,c)anthracene was not reported. Based on the laboratory analyses reports, dibenzo(a,c)anthracene co-elutes with dibenz(a,h)anthracene.

E. The reported total PAH is the sum of all analysed PAH species.

Table 4-5 Summary of Measured Ambient Dioxin and Furan Concentrations

Contaminant	Units	MOE Criteria	HHRA Health Based Standard	Courtice WPCP (Upwind)			Rundle Road (Downwind)		
				Max	Min	No. of Exceedances	Max	Min	No. of Exceedances
2,3,7,8-Tetra CDD *	pg/m^3			2.54E-02	4.70E-03		4.86E-03	4.69E-03	
1,2,3,7,8-Penta CDD	pg/m^3			5.08E-03	4.70E-03		5.00E-03	4.86E-03	
1,2,3,4,7,8-Hexa CDD	pg/m^3			5.64E-03	5.24E-03		5.31E-03	4.53E-03	
1,2,3,6,7,8-Hexa CDD	pg/m^3			4.70E-03	4.45E-03		1.56E-02	4.40E-03	
1,2,3,7,8,9-Hexa CDD	pg/m^3			8.14E-03	4.61E-03		8.29E-03	4.55E-03	
1,2,3,4,6,7,8-Hepta CDD	pg/m^3			1.44E-01	2.54E-02		1.66E-01	3.34E-02	
Octa CDD	pg/m^3			5.86E-01	1.65E-01		8.79E-01	1.76E-01	
Total Tetra CDD	pg/m^3			2.54E-02	1.55E-02		2.73E-02	1.56E-02	
Total Penta CDD	pg/m^3			1.75E-02	1.72E-02		2.35E-02	1.97E-02	
Total Hexa CDD	pg/m^3			6.83E-02	3.13E-02		6.88E-02	6.38E-02	
Total Hepta CDD	pg/m^3			3.04E-01	2.54E-02		3.97E-01	3.34E-02	
2,3,7,8-Tetra CDF **	pg/m^3			4.92E-03	4.70E-03		4.85E-03	4.55E-03	
1,2,3,7,8-Penta CDF	pg/m^3	-	-	4.92E-03	4.85E-03	N/A	5.00E-03	4.86E-03	N/A
2,3,4,7,8-Penta CDF	pg/m^3			4.77E-03	4.70E-03		4.85E-03	4.71E-03	
1,2,3,4,7,8-Hexa CDF	pg/m^3			6.11E-03	4.77E-03		6.57E-03	5.01E-03	
1,2,3,6,7,8-Hexa CDF	pg/m^3			4.13E-03	4.07E-03		9.38E-03	4.25E-03	
2,3,4,6,7,8-Hexa CDF	pg/m^3			1.88E-02	4.92E-03		1.25E-02	5.01E-03	
1,2,3,7,8,9-Hexa CDF	pg/m^3			5.40E-03	5.32E-03		1.56E-02	5.47E-03	
1,2,3,4,6,7,8-Hepta CDF	pg/m^3			3.44E-02	4.45E-03		3.13E-02	4.25E-03	
1,2,3,4,7,8,9-Hepta CDF	pg/m^3			1.57E-02	5.72E-03		9.38E-03	5.47E-03	
Octa CDF	pg/m^3			4.70E-02	6.99E-03		4.06E-02	5.01E-03	
Total Tetra CDF	pg/m^3			6.51E-03	5.17E-03		7.14E-03	6.10E-03	
Total Penta CDF	pg/m^3			4.85E-03	4.77E-03		5.00E-03	4.86E-03	
Total Hexa CDF	pg/m^3			1.88E-02	4.77E-03		3.75E-02	4.86E-03	
Total Hepta CDF	pg/m^3			9.08E-02	5.08E-03		5.63E-02	4.86E-03	
TOTAL TOXIC EQUIVALENCY [A]	pg TEQ/m^3	0.1 [B] 1 [C]	-	0.036	0.019	0 0	0.021	0.016	0 0

Note:
A. Total Toxicity Equivalent (TEQ) concentration contributed by all dioxins, furans and dioxin-like PCBs calculated as per O. Reg. 419 methodology using corresponding WHO_{2005} toxic equivalency factors (TEFs) and a value of half the minimum detection limit (MDL) substituted for concentrations less than the MDL.
B. Ontario Ambient Air Quality Criteria.
C. O. Reg. 419 Schedule 6 Upper Risk Thresholds

* CDD - Chloro Dibenzo-p-Dioxin, ** CDF - Chloro Dibenzo-p-Furan

5.0 Conclusions

This interim report provides a summary of the ambient air quality data collected at the two monitoring stations located upwind and downwind in the vicinity of the DYEC for the period May to June 2013. The following observations and conclusions were made from a review of the measured ambient air monitoring data:

1. Measured levels of all CACs (SO_2, NO_X, $PM_{2.5}$) were below the applicable O.Reg. 419/05 criteria or human health risk assessment (HHRA) health-based standards presented in Table 2.2 of this report;

2. Since the Canada Wide Standard (CWS) for $PM_{2.5}$ is based on a 98th percentile level over 3 years, whereas the $PM_{2.5}$ measurement period at Courtice WPCP station was about one month, there is insufficient data collected to determine with any certainty if exceedances of the CWS would occur. Therefore no comparison of the measured $PM_{2.5}$ data to the CWS was conducted for this report;

3. The maximum measured concentrations of TSP and all metals with MOE air quality criteria were well below their applicable criteria as presented in Table 2.3 in this report;

4. The maximum measured concentrations of all PAHs with MOE air quality criteria were well below their applicable criteria shown in Table 2.4, with the exception of the 24-hour benzo(a)pyrene concentration in one sample collected at the Rundle Road Station on June 21, 2013, which exceeded the applicable Ontario Ambient Air Quality Criteria by 3%. This measurement was however, well below the MOE Schedule 6 Upper Risk Threshold, the MOE O. Reg. 419 24-hour average guideline, and the HHRA health based standard;

5. The maximum measured toxic equivalent dioxin and furan concentration was well below the applicable criteria presented in Table 2.4; and,

6. All monitored contaminants were below their applicable MOE criteria during the monitoring period between May and June, 2013 with the exception of one benzo(a)pyrene measurement. All measured levels of all monitored contaminants were below their applicable HHRA health-based standards.

Appendix A
SO_2 Data Summaries and Time History Plots

SO2 - May (ug/m3) COURTICE 2013

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>690	Days>275
1	C	1.0	2.9	0.0	2.2	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	26.5	10.3	1.3	1.1	0.9	1.0	1.1	23	26.5	0.0	2.2	0	0
2	C	11.4	0.6	0.1	0.1	3.9	0.1	0.3	0.8	0.7	0.7	0.0	0.5	1.0	1.9	1.2	0.8	0.8	2.6	5.5	0.9	0.5	0.0	0.0	23	11.4	0.0	1.5	0	0
3	C	7.0	10.8	8.0	4.9	8.4	3.2	0.8	0.5	0.2	0.1	0.0	0.0	0.2	0.3	0.3	0.0	1.4	28.8	24.1	10.4	8.2	11.3	7.8	23	28.8	0.0	5.9	0	0
4	C	0.1	0.8	4.2	3.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	15.0	4.0	3.7	13.1	8.6	1.0	23	15.0	0.0	2.4	0	0
5	C	17.7	8.7	2.7	4.9	2.5	0.6	0.4	1.0	0.7	0.4	0.1	0.5	1.3	2.5	3.0	2.3	1.1	0.6	1.8	12.1	9.5	0.4	0.3	23	17.7	0.1	3.3	0	0
6	C	7.6	3.9	3.9	7.1	2.1	4.3	0.4	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.7	0.9	7.8	1.3	5.5	4.4	0.8	0.6	1.6	23	7.8	0.0	2.3	0	0
7	C	0.0	0.5	5.9	1.4	0.6	0.7	0.0	0.0	0.1	1.4	0.8	0.7	2.7	2.3	1.1	2.2	0.0	0.3	3.3	2.5	3.4	1.6	0.1	23	5.9	0.0	1.4	0	0
8	C	4.5	1.5	0.0	4.9	4.4	1.3	0.4	3.5	38.5	25.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	1.7	1.7	1.6	0.3	23	38.5	0.0	4.1	0	0
9	C	0.0	0.2	0.3	0.1	0.0	0.4	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.4	0.0	3.3	5.2	23	5.2	0.0	0.5	0	0
10	C	1.6	3.9	3.7	5.1	5.3	1.8	0.6	2.1	10.3	0.0	12.1	6.1	0.0	0.0	31.4	37.3	14.2	3.0	0.0	0.0	0.0	0.0	0.0	23	37.3	0.0	6.0	0	0
11	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
12	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
13	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
14	C	0.0	0.0	0.0	0.4	2.9	0.0	0.0	0.0	0.9	1.4	4.7	1.6	1.6	1.7	1.0	2.7	2.7	3.7	2.0	0.0	0.0	0.0	0.0	23	4.7	0.0	1.2	0	0
15	C	0.0	0.0	14.4	30.8	3.8	3.0	2.5	0.1	0.0	5.1	21.3	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	30.8	0.0	3.8	0	0
16	C	0.0	0.0	0.0	0.0	0.9	3.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	3.5	1.9	0.8	0.0	0.0	23	3.5	0.0	0.6	0	0
17	C	0.0	0.0	1.3	2.2	0.0	0.6	0.5	C	5.6	0.0	0.0	0.0	0.9	7.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	5.6	4.2	22	7.6	0.0	1.3	0	0
18	C	1.8	3.9	4.3	0.8	4.0	7.0	80.4	23.8	11.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	4.1	5.7	2.0	11.7	23	80.4	0.0	7.1	0	0
19	C	23.5	6.0	11.9	22.2	23.8	16.3	10.3	44.4	19.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.6	25.9	19.1	9.3	1.4	1.3	23	44.4	0.0	11.2	0	0
20	C	0.0	0.5	0.6	0.4	0.0	0.0	0.0	0.6	0.4	2.1	7.0	5.8	3.6	1.1	0.0	0.0	0.0	0.6	22.5	47.9	2.7	1.0	0.0	23	47.9	0.0	4.2	0	0
21	C	0.0	0.0	0.0	0.0	0.4	0.7	0.5	0.0	0.0	0.2	0.3	1.1	1.6	0.6	4.4	0.1	0.2	1.4	0.5	2.4	0.0	0.0	0.0	23	4.4	0.0	0.6	0	0
22	C	4.2	6.3	5.2	7.8	4.8	0.3	14.8	0.1	0.0	1.8	0.0	0.0	0.0	0.5	0.5	0.2	0.2	11.0	6.2	5.1	3.0	0.5	0.3	23	14.8	0.0	3.2	0	0
23	C	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	1.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.3	0.3	0.2	23	1.5	0.0	0.2	0	0
24	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.4	0.1	0.0	23	0.4	0.0	0.0	0	0
25	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.4	0.0	0.0	0.0	23	1.3	0.0	0.1	0	0
26	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.1	0.6	0.0	23	1.1	0.0	0.1	0	0
27	C	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	2.6	2.3	1.3	0.5	0.0	0.0	0.0	0.0	9.8	35.4	4.0	10.7	4.6	23	35.4	0.0	3.2	0	0
28	C	21.7	8.1	4.5	5.5	11.3	67.4	3.8	0.0	0.0	7.4	21.4	7.5	21.0	1.3	0.0	1.3	9.9	7.5	5.5	0.0	10.2	24.7	0.4	23	67.4	0.0	10.5	0	0
29	C	0.0	0.8	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.9	0.7	0.0	0.0	0.0	0.0	0.2	4.7	8.8	1.4	0.0	23	8.8	0.0	0.9	0	0
30	C	1.1	0.5	1.6	0.4	0.0	0.8	0.5	0.0	0.9	1.5	2.4	1.4	1.7	2.4	2.0	1.8	1.4	1.1	0.1	0.4	0.5	0.5	0.4	23	2.4	0.0	1.0	0	0
31	C	5.3	2.8	1.3	2.4	5.7	1.4	0.6	0.5	0.9	0.8	0.4	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	5.7	0.0	1.0	0	0
Count	0	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	712	31	0	30		
Maximum	0.0	23.5	10.8	14.4	30.8	23.8	67.4	80.4	44.4	38.5	25.5	21.4	7.5	21.0	7.6	31.4	37.3	26.5	28.8	25.9	47.9	13.1	24.7	11.7	23	80.4	0.0	27.7		
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	0	0.0	0.0		
Average		3.5	2.0	2.4	3.4	2.8	3.7	3.8	2.6	2.9	1.7	2.4	1.1	1.2	0.8	1.5	1.6	2.1	3.7	4.2	5.2	2.7	2.5	1.3	23	18		2.6		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													80.4
													11.2
Data	0.0	0.0	0.0	0.0	0.1	0.6	1.3	2.9	7.0	12.0	31.4	80.4	2.6

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

SO2 - June (ug/m3) COURTICE 2013

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>690	Days>275
1	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.0	0.0	0.0	1.1	0.4	0.0	0.0	0.2	0.1	0.0	23	1.1	0.0	0.1	0	0
2	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.4	0.0	0.0	0	0
3	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
4	C	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	2.5	0.0	0.5	0.6	0.1	0.0	0.7	4.5	0.5	0.0	0.0	1.5	2.6	23	4.5	0.0	0.6	0	0
5	C	1.8	0.5	0.0	1.1	10.9	9.2	6.5	2.5	8.6	5.0	0.0	0.0	1.1	0.0	0.0	11.2	0.0	0.0	5.4	0.1	2.4	4.6	13.6	23	13.6	0.0	3.7	0	0
6	C	3.4	0.0	2.3	5.8	5.6	4.1	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	60.7	21.0	0.8	78.8	48.0	1.2	1.3	23	78.8	0.0	10.3	0	0
7	C	2.8	3.4	2.1	0.7	0.0	0.0	2.5	0.7	0.6	2.6	2.9	2.4	2.2	0.9	2.5	2.7	2.3	3.8	3.8	0.1	0.0	0.0	0.0	23	3.8	0.0	1.7	0	0
8	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	1.7	0.5	23	1.7	0.0	0.1	0	0
9	C	0.0	0.0	0.0	12.8	0.0	0.5	0.1	1.8	1.6	2.3	0.5	2.2	5.2	3.9	4.0	3.1	2.2	3.1	0.9	1.7	0.0	0.0	6.3	23	12.8	0.0	2.3	0	0
10	C	16.6	66.6	92.4	75.5	62.7	85.0	4.0	1.6	11.5	19.7	29.5	47.9	87.1	42.4	3.1	0.0	0.8	7.2	4.8	42.8	79.2	26.1	33.7	23	92.4	0.0	36.5	0	0
11	C	22.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	23	23.8	0.0	2.1	0	0
12	C	0.0	0.1	0.0	0.4	3.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	8.7	5.2	23	8.7	0.0	1.0	0	0
13	C	8.2	1.5	0.9	0.2	0.7	2.1	3.1	0.9	3.7	3.6	2.1	0.8	1.9	0.0	0.0	0.0	0.0	0.0	2.6	9.6	0.0	0.8	0.1	23	9.6	0.0	1.9	0	0
14	C	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	1.2	0.0	0.1	0	0
15	C	3.3	3.2	1.6	0.8	0.6	0.5	0.0	0.0	0.0	0.3	1.6	10.4	5.4	0.8	1.8	1.2	0.5	1.6	1.9	0.9	0.3	0.3	3.6	23	10.4	0.0	1.8	0	0
16	C	0.2	0.5	1.5	0.5	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	1.5	0.0	0.2	0	0
17	C	0.0	1.1	1.9	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.1	1.6	23	2.2	0.0	0.4	0	0
18	C	3.7	4.4	5.0	6.0	2.7	1.7	3.3	1.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	23	6.0	0.0	1.3	0	0
19	C	6.0	12.5	17.9	8.7	0.1	6.6	3.9	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	12.6	4.0	1.3	0.0	23	17.9	0.0	3.3	0	0
20	C	2.7	3.1	0.8	4.3	1.6	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	4.4	0.0	0.0	0.0	4.5	1.0	3.8	1.7	23	6.3	0.0	1.5	0	0
21	C	13.3	2.4	2.0	2.5	4.4	5.0	0.2	0.0	0.0	0.0	0.0	0.6	1.6	1.1	5.0	2.6	3.4	1.9	0.3	0.5	4.1	9.2	9.8	23	13.3	0.0	3.0	0	0
22	C	7.4	10.9	11.5	3.9	0.5	0.7	0.5	0.6	0.4	0.6	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.5	23	11.5	0.0	1.7	0	0
23	C	0.0	0.2	0.7	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	1.6	0.0	0.1	0	0
24	C	0.0	0.0	0.3	0.4	0.3	0.2	1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	1.1	0.0	0.1	0	0
25	C	0.0	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.4	0.0	0.1	0	0
26	C	0.0	0.0	0.1	0.0	0.0	0.0	4.0	C	C	13.2	12.8	12.8	13.4	12.6	12.3	12.3	11.9	12.5	12.6	13.0	13.6	12.8	12.9	21	13.6	0.0	8.7	0	0
27	C	14.3	15.1	20.3	14.6	16.6	15.6	14.7	14.6	14.1	13.2	15.2	13.9	14.7	14.6	15.2	15.4	16.5	14.0	13.5	21.8	21.9	15.8	15.7	23	21.9	13.2	15.7	0	0
28	C	14.2	14.5	17.4	14.3	19.5	16.9	17.2	15.3	14.6	13.8	12.9	12.9	13.4	12.9	12.8	13.6	13.2	12.9	12.8	12.9	12.9	13.6	12.9	23	19.5	12.8	14.2	0	0
29	C	13.4	12.9	16.2	14.4	13.8	13.5	13.2	12.9	12.8	12.7	12.7	12.7	12.7	12.8	12.7	13.9	13.3	12.7	12.8	12.8	12.8	12.9	13.1	23	16.2	12.7	13.2	0	0
30	C	12.7	13.1	13.1	13.1	14.2	14.1	16.2	14.2	12.7	12.6	12.6	12.3	12.6	12.4	12.5	12.6	12.5	12.3	12.6	18.4	19.6	22.5	20.4	23	22.5	12.3	14.3	0	0
31																									0	0.0	0.0		0	0
Count	0	30	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	688	30	0	29		
Maximum	0.0	22.5	66.6	92.4	75.5	62.7	85.0	17.2	15.3	14.6	19.7	29.5	47.9	87.1	42.4	15.2	15.4	60.7	21.0	13.5	78.8	79.2	26.1	33.7	23	92.4	0.0	42.6		
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0			
Average		4.9	5.6	6.9	6.1	5.3	6.0	3.1	2.4	2.8	3.3	3.5	4.3	5.7	4.6	2.9	3.2	4.7	3.6	2.8	7.8	7.4	4.6	5.3	22	13		4.7		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													92.4
													36.5
Data	0.0	0.0	0.0	0.0	0.2	0.9	2.6	10.7	13.5	16.4	63.2	92.4	4.7

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

SO2 - May (ug/m3) RUNDLE 2013

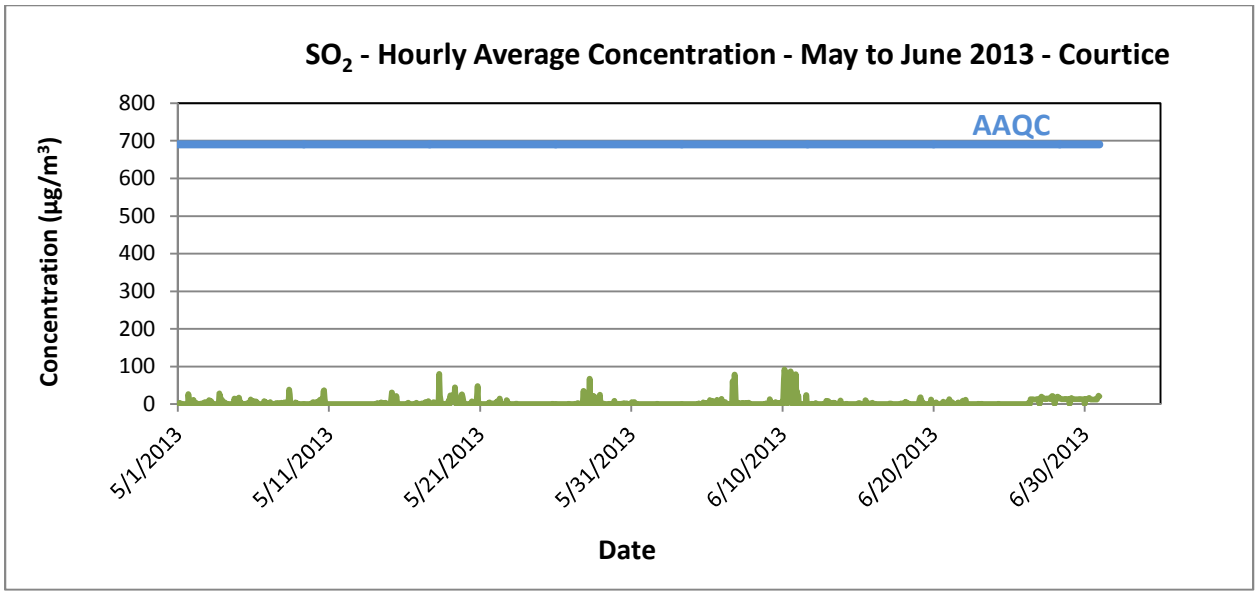
Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>690	Days>275
1	C	0.0	0.0	0.0	0.0	0.0	0.0	6.7	2.2	0.7	0.5	0.0	6.2	0.6	0.0	0.4	0.9	0.4	0.0	0.0	0.0	0.0	0.2	0.0	23	6.7	0.0	0.8	0	0
2	C	0.0	0.0	0.0	0.0	0.3	1.9	0.7	0.7	1.4	1.6	2.6	1.9	8.1	18.9	1.1	1.3	1.0	0.0	0.0	0.0	0.0	0.0	2.0	23	18.9	0.0	1.9	0	0
3	C	0.0	0.0	0.0	0.0	0.0	0.2	1.0	2.3	0.5	0.5	0.6	0.4	0.2	0.4	0.6	0.1	0.1	0.0	0.3	0.1	0.0	0.0	0.4	23	2.3	0.0	0.3	0	0
4	C	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.5	0.3	1.3	16.1	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	16.1	0.0	0.9	0	0
5	C	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.0	2.6	0.9	2.2	2.3	5.1	3.3	3.1	12.5	3.6	0.9	0.3	0.0	0.0	0.0	0.0	23	12.5	0.0	1.7	0	0
6	C	0.0	0.0	0.0	0.0	0.0	1.2	0.6	0.6	1.4	3.1	3.1	3.5	8.7	24.1	51.6	17.0	0.3	1.1	0.3	0.0	0.0	0.0	0.0	23	51.6	0.0	5.1	0	0
7	C	0.0	1.5	0.0	0.0	0.0	0.2	0.3	0.0	0.4	1.9	2.5	5.4	6.4	4.3	0.8	5.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	23	6.4	0.0	1.3	0	0
8	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	5.2	4.2	0.5	0.0	0.0	0.9	12.2	3.1	0.0	0.0	0.0	0.0	0.0	0.0	23	12.2	0.0	1.1	0	0
9	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
10	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	23	4.1	0.0	0.2	0	0
11	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	23	0.3	0.0	0.0	0	0
12	C	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.6	0.0	0.1	0	0
13	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
14	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4	7.7	5.4	2.0	2.0	2.1	2.6	6.1	4.7	12.5	8.3	5.8	0.2	0.2	0.0	23	12.5	0.0	2.7	0	0
15	C	0.0	0.0	0.5	0.0	0.0	0.0	13.2	1.9	0.8	0.4	0.9	5.1	3.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	13.2	0.0	1.2	0	0
16	C	0.0	0.0	0.6	0.0	1.6	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.6	1.9	1.0	0.0	0.0	23	3.7	0.0	0.7	0	0
17	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	0.3	0.0	0.0	0	0
18	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.7	0.0	0.0	0	0
19	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	1.2	0.0	0.1	0	0
20	C	0.0	0.0	0.0	0.0	0.0	1.8	8.5	11.2	8.8	3.5	1.9	3.3	2.4	26.3	3.4	1.1	0.0	0.0	0.3	0.3	2.5	1.6	0.0	23	26.3	0.0	3.3	0	0
21	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.6	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	23	3.9	0.0	0.4	0	0
22	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.0	0.3	1.4	0.3	0.6	3.5	3.6	0.8	0.0	0.0	0.0	0.0	23	3.6	0.0	0.5	0	0
23	C	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	1.7	0.0	0.2	0	0
24	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.0	0.0	0.0	0	0
25	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	23	0.5	0.0	0.0	0	0
26	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.1	0.0	23	0.7	0.0	0.0	0	0
27	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23	0.5	0.0	0.0	0	0
28	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	1.9	1.0	0.0	0.0	0.0	23	1.9	0.0	0.2	0	0
29	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.2	0.5	0.3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	23	0.7	0.0	0.1	0	0
30	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.5	2.9	1.3	1.9	1.8	1.1	1.0	0.3	0.0	0.1	0.1	0.3	0.0	23	2.9	0.0	0.6	0	0
31	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	1.4	1.1	0.5	0.5	M	M	M	M	M	M	M	M	M	M	M	12	1.4	0.0		0	0
Count	0	31	31	31	31	31	31	31	31	31	31	31	31	30	30	29	30	30	30	30	30	30	30	30	701	31	0	29		
Maximum	0.0	0.3	1.5	0.6	0.0	1.6	3.2	13.2	11.2	8.8	7.7	5.4	6.2	16.1	26.3	51.6	17.0	4.7	12.5	8.3	5.8	2.5	3.9	2.0	23	51.6	0.0	8.8		
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12	0.0	0.0	0.0		
Average		0.0	0.0	0.0	0.0	0.1	0.3	1.0	0.7	0.7	1.0	0.9	1.2	1.9	2.9	2.3	2.0	0.6	0.9	0.5	0.3	0.1	0.2	0.1	23	7		0.8		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.9	3.6	12.5	51.6

	Regs	Acceptable	Desirable	Violations	Maximum
	Hour				51.6
	Day				5.1
	Month				0.8

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

Figure A-1 Time History Plots – SO_2 – Courtice (WPCP) Station



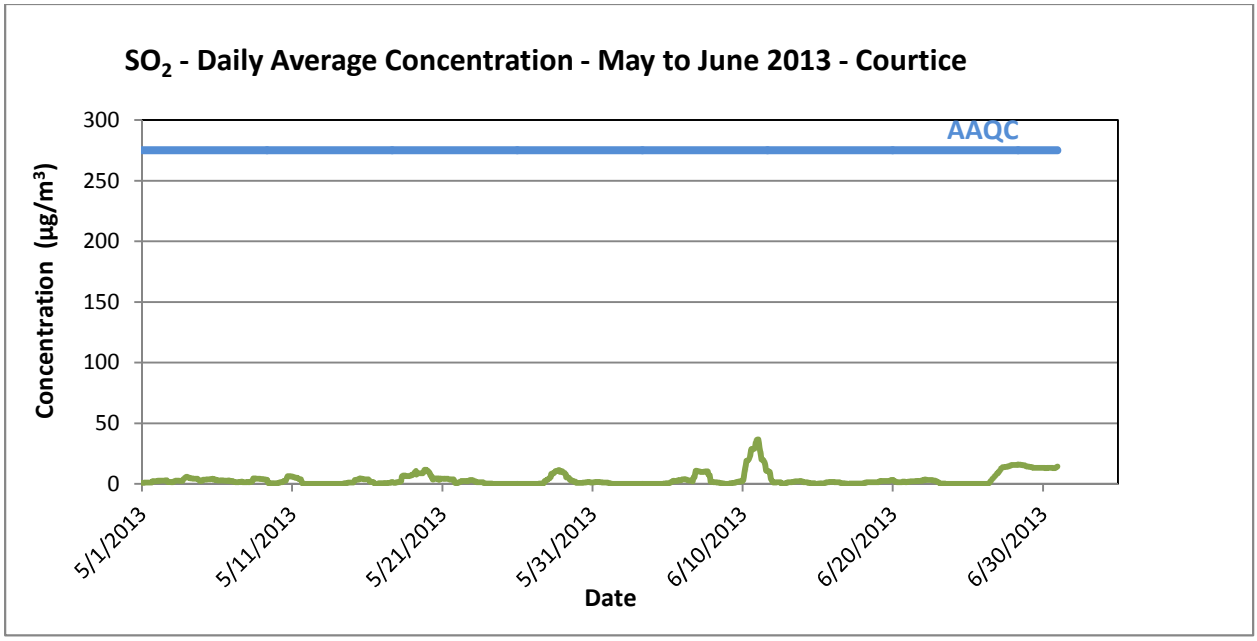
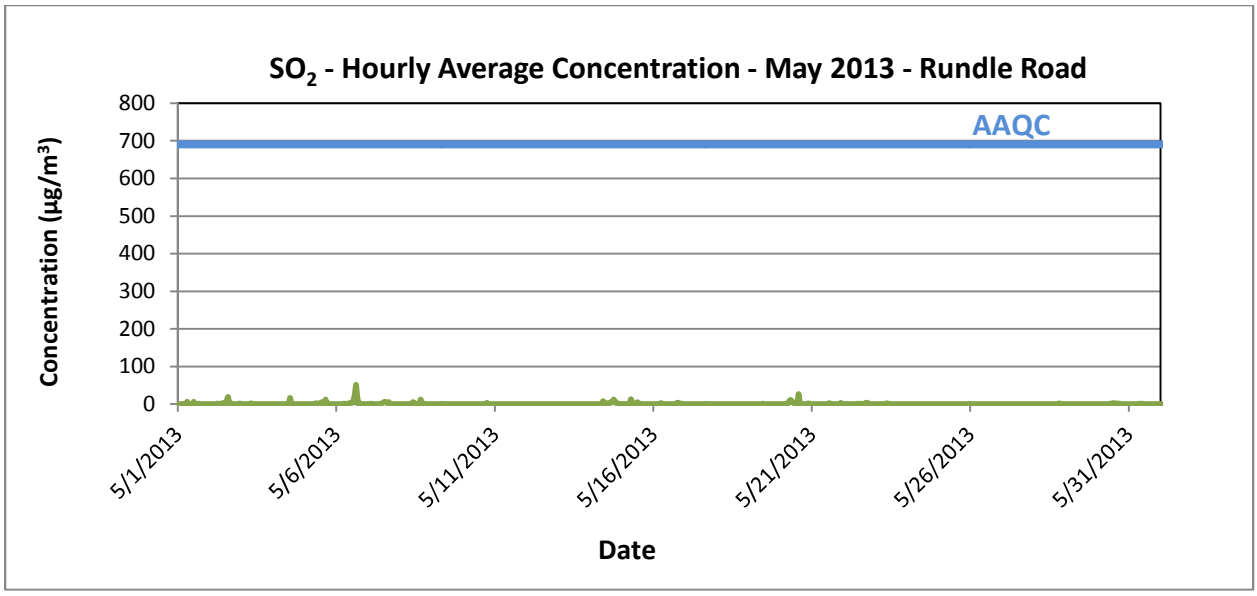
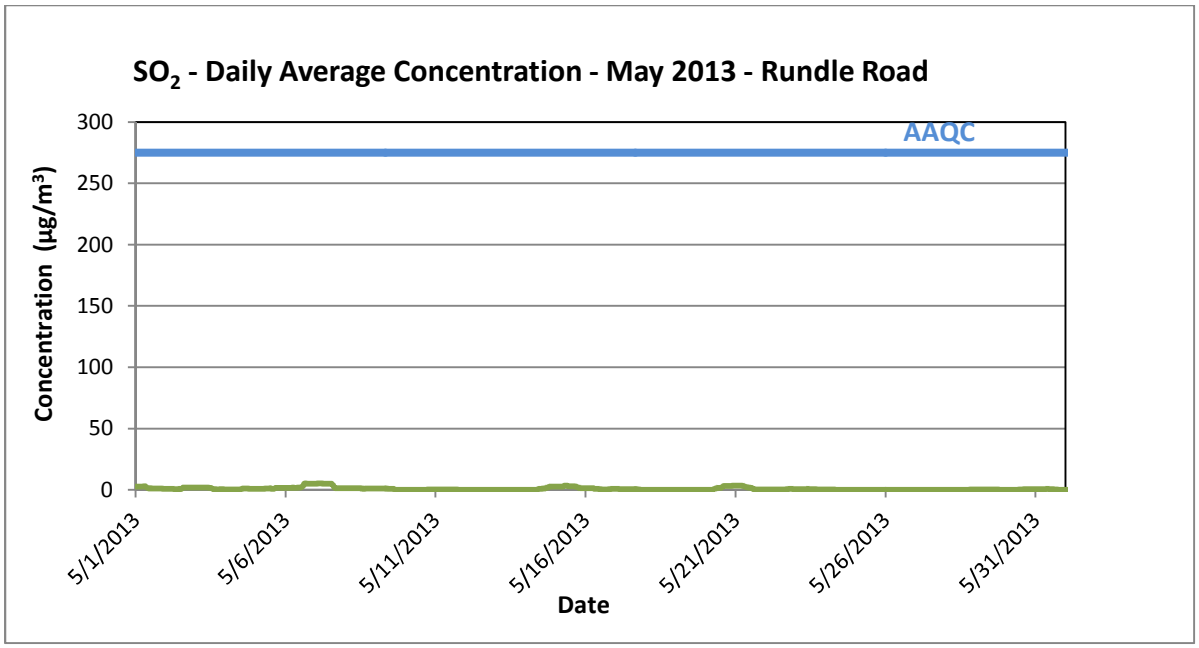


Figure A-2 Time History Plots – SO_2 – Rundle Road Station





Appendix B
NO_2 Data Summaries and Time History Plots

NO_2 - May (ug/m3) COURTICE 2013

Day	Hour	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	C	18.2	39.3	19.7	39.9	24.4	12.5	2.2	1.7	9.0	5.4	3.3	4.0	3.6	4.1	3.1	2.7	49.3	35.9	36.6	45.8	41.9	38.9	26.7	23	49.3	1.7	20.4	0	0
2	C	91.1	31.7	4.6	17.5	28.8	4.6	8.7	9.7	5.6	4.9	2.5	4.0	9.2	8.9	5.4	4.2	19.0	21.5	32.0	43.6	26.8	1.2	2.6	23	91.1	1.2	16.9	0	0
3	C	20.3	22.2	35.7	72.6	67.1	45.4	23.3	17.3	24.3	5.1	4.1	4.1	3.9	4.9	8.2	4.0	6.2	59.6	60.5	38.0	32.0	35.9	22.5	23	72.6	3.9	26.8	0	0
4	C	3.3	9.5	14.0	33.8	18.2	8.8	2.6	1.8	2.1	1.5	1.2	0.9	0.9	0.7	0.8	2.1	0.1	21.4	17.0	47.2	15.7	8.2	0.5	23	47.2	0.1	9.2	0	0
5	C	10.8	10.7	11.3	13.5	16.8	13.7	6.7	3.4	2.5	5.4	2.7	1.5	1.2	1.2	1.0	1.6	3.0	15.1	26.8	58.9	47.4	38.7	0.4	23	58.9	0.4	12.8	0	0
6	C	22.4	17.1	29.1	45.9	52.4	29.3	19.9	8.1	3.5	2.1	2.1	1.4	1.0	1.8	2.1	3.2	8.5	12.5	10.4	93.8	89.4	57.1	42.4	23	93.8	1.0	24.2	0	0
7	C	37.3	54.8	56.4	60.8	50.5	33.3	19.7	8.7	8.2	9.9	6.5	3.1	3.8	3.5	2.2	0.8	0.0	10.8	49.6	92.2	81.8	60.5	46.6	23	92.2	0.0	30.5	0	0
8	C	47.8	22.7	29.4	33.8	35.5	26.5	15.8	14.0	23.4	15.2	3.8	2.8	2.3	0.9	2.3	0.8	8.7	5.6	12.1	28.9	20.2	24.7	19.2	23	47.8	0.8	17.2	0	0
9	C	13.1	9.5	13.5	11.6	15.1	15.0	12.6	7.0	5.9	4.3	1.9	5.1	3.2	2.3	4.6	6.8	7.6	2.9	4.0	32.3	30.6	50.0	45.3	23	50.0	1.9	13.2	0	0
10	C	37.8	39.2	41.5	33.5	25.7	21.2	10.2	21.5	17.2	5.3	31.0	11.3	4.6	11.4	52.6	64.6	41.0	17.7	6.7	3.7	3.5	2.2	1.7	23	64.6	1.7	22.0	0	0
11	C	5.4	2.4	1.8	5.2	6.9	4.0	2.1	2.4	2.0	1.5	1.6	0.8	0.5	0.4	1.1	2.2	3.1	1.4	0.9	2.4	0.7	1.1	2.0	23	6.9	0.4	2.3	0	0
12	C	0.4	2.3	1.2	1.1	1.6	1.6	2.4	1.2	0.0	0.0	0.7	0.0	0.0	0.1	0.3	0.2	5.2	2.5	2.7	1.1	2.2	1.2	1.8	23	5.2	0.0	1.3	0	0
13	C	0.4	0.6	1.4	11.9	6.5	5.4	4.2	2.0	0.8	2.4	0.0	1.2	0.3	2.1	0.9	1.4	3.3	2.9	11.6	28.4	56.0	58.7	62.8	23	62.8	0.0	11.5	0	0
14	C	44.2	39.7	38.2	36.3	66.4	53.0	25.7	11.4	4.4	6.2	5.3	2.8	4.1	2.3	3.0	3.1	2.2	3.6	3.3	4.4	4.9	4.2	7.8	23	66.4	2.2	16.4	0	0
15	C	3.8	11.5	27.3	35.0	15.9	11.3	16.9	6.5	9.3	19.5	43.7	15.7	2.4	1.8	3.7	2.9	4.6	4.1	19.0	22.1	11.1	26.4	18.7	23	43.7	1.8	14.5	0	0
16	C	12.3	9.9	5.5	3.5	8.3	24.1	23.9	22.0	4.5	2.1	1.4	2.3	1.9	3.8	2.3	2.7	3.3	3.5	8.1	12.7	12.2	6.9	6.3	23	24.1	1.4	8.0	0	0
17	C	8.0	5.8	6.6	12.4	20.1	16.0	5.1	2.6	C	9.3	3.7	0.5	0.0	1.6	0.0	0.0	0.0	0.0	14.5	65.5	43.3	43.0	44.3	22	65.5	0.0	13.7	0	0
18	C	36.4	28.1	31.0	28.5	15.8	19.6	41.2	35.6	12.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	4.7	16.7	12.7	17.4	25.6	23	41.2	0.0	14.4	0	0
19	C	30.4	12.2	29.8	33.6	30.4	27.8	19.5	19.6	2.8	2.2	1.8	1.4	1.4	2.4	0.7	1.4	1.9	42.9	23.2	29.2	14.4	2.9	8.4	23	42.9	0.7	14.8	0	0
20	C	6.6	0.6	14.4	19.5	2.9	1.2	0.6	6.8	2.5	1.8	4.5	2.6	1.0	0.9	0.0	0.4	2.8	7.6	16.6	27.3	4.5	8.8	7.6	23	27.3	0.0	6.2	0	0
21	C	3.9	6.1	8.0	18.0	29.4	26.2	24.4	10.3	7.7	9.2	7.2	22.2	33.8	23.8	20.0	13.3	10.6	29.2	27.2	24.7	7.0	16.9	8.9	23	33.8	3.9	16.9	0	0
22	C	16.8	18.0	16.2	26.3	27.2	8.5	19.3	3.9	7.2	16.0	1.6	6.5	3.4	3.0	2.9	6.5	27.3	22.4	28.2	43.9	36.5	26.7	11.1	23	43.9	1.6	16.5	0	0
23	C	2.7	1.8	2.0	1.6	1.7	2.5	2.6	2.8	3.6	3.4	4.8	4.0	5.4	6.4	4.2	2.7	2.0	3.8	3.3	2.8	2.4	2.0	3.4	23	6.4	1.6	3.1	0	0
24	C	1.4	3.0	1.9	2.4	2.9	4.0	1.8	1.6	1.3	1.2	1.0	1.2	1.1	2.4	1.0	3.2	2.1	2.1	3.8	4.1	5.7	9.6	12.9	23	12.9	1.0	3.1	0	0
25	C	7.7	9.1	5.8	1.9	4.4	0.9	0.9	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.6	0.0	0.3	1.3	1.3	1.1	1.0	1.4	1.7	23	9.1	0.0	1.8	0	0
26	C	0.8	6.2	4.2	7.6	6.1	3.8	0.0	0.0	1.8	0.2	0.0	0.0	0.0	0.2	1.3	1.5	0.9	2.0	8.6	9.2	10.5	10.3	3.7	23	10.5	0.0	3.4	0	0
27	C	4.6	4.1	4.2	6.5	7.1	3.9	9.7	7.1	8.9	9.7	9.2	6.4	2.8	0.8	0.1	0.0	4.1	2.8	1.4	65.4	73.0	55.4	55.8	23	73.0	0.0	14.9	0	0
28	C	40.5	34.9	31.3	24.6	30.1	52.3	18.4	22.4	8.4	8.7	16.9	11.5	16.0	8.6	10.6	5.7	12.9	18.2	8.1	6.1	12.1	20.6	7.0	23	52.3	5.7	18.5	0	0
29	C	3.7	12.9	41.6	30.7	6.2	15.1	11.9	2.0	1.5	2.6	3.0	4.7	5.0	3.2	4.0	3.2	2.4	2.4	2.6	34.2	38.4	46.6	9.2	23	46.6	1.5	12.5	0	0
30	C	43.7	13.1	3.4	1.7	1.8	2.2	2.8	2.7	2.6	3.5	2.4	3.5	2.8	2.5	4.7	2.1	1.5	2.3	4.6	4.8	3.6	3.7	2.9	23	43.7	1.5	5.2	0	0
31	C	36.5	47.1	40.6	46.4	58.1	29.0	10.8	2.5	2.6	2.2	2.2	1.8	1.7	1.3	0.6	0.7	0.2	1.8	6.6	7.1	2.3	2.5	2.0	23	58.1	0.2	13.3	0	0
Count	0	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	712	31	0	30		
Maximum	0.0	91.1	54.8	56.4	72.6	67.1	53.0	41.2	35.6	24.3	19.5	43.7	22.2	33.8	23.8	52.6	64.6	49.3	59.6	60.5	93.8	89.4	60.5	62.8	23	93.8	0.0	51.3		
Minimum	0.0	0.4	0.6	1.2	1.1	1.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.1	0.7	1.1	0.4	22	5.2	0.0	0.4		
Average		19.8	17.0	18.4	23.1	22.1	16.9	11.8	8.3	6.2	5.2	5.5	4.1	3.8	3.5	4.7	4.6	7.6	11.7	14.7	29.0	24.0	22.0	16.5	23	47		13.1		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													93.8
													30.5
Data	0.9	1.8	2.5	3.7	5.4	8.7	14.4	23.9	37.8	47.3	67.0	93.8	13.1

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

NO_2 - June (ug/m3) COURTICE 2013

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	C	1.9	2.6	1.6	1.4	1.8	1.9	5.0	6.6	5.5	2.3	1.1	0.8	0.6	0.5	1.1	3.9	14.9	5.0	3.2	3.3	6.0	4.0	2.5	23	14.9	0.5	3.4	0	0
2	C	1.3	1.3	1.5	1.3	1.8	2.3	2.8	2.7	1.1	1.0	1.1	0.8	1.0	2.0	1.4	1.9	2.4	2.7	4.6	2.3	5.5	2.4	8.3	23	8.3	0.8	2.3	0	0
3	C	3.3	5.3	5.8	5.3	5.3	6.1	3.3	2.8	1.9	2.0	5.7	2.7	1.0	0.5	0.3	0.6	2.8	3.7	6.0	17.0	15.7	11.5	22.8	23	22.8	0.3	5.7	0	0
4	C	21.7	10.8	10.8	17.5	13.2	8.2	4.0	1.2	2.1	0.7	1.7	8.8	9.2	6.0	3.7	1.6	1.7	2.6	11.0	10.9	9.9	7.6	6.1	23	21.7	0.7	7.4	0	0
5	C	1.7	3.3	6.9	11.7	7.2	14.1	10.5	15.1	14.2	7.5	0.0	0.0	3.1	0.0	12.2	12.6	1.3	7.8	40.8	39.9	23.2	29.4	12.2	23	40.8	0.0	12.0	0	0
6	C	2.8	2.2	5.7	11.6	8.1	8.1	10.7	8.8	10.1	8.4	3.9	8.2	9.3	5.9	6.5	10.1	26.8	13.0	4.8	39.7	26.0	8.2	10.8	23	39.7	2.2	10.9	0	0
7	C	3.6	5.2	9.7	11.1	11.5	10.6	4.6	2.2	3.4	2.2	3.4	4.6	4.3	3.0	3.3	4.9	4.9	5.5	6.0	8.4	7.5	3.8	5.9	23	11.5	2.2	5.6	0	0
8	C	5.4	3.4	3.0	3.7	6.0	4.0	3.8	1.2	0.9	2.7	0.5	3.2	5.1	2.9	1.7	0.0	1.4	1.7	1.5	2.0	1.8	7.5	32.2	23	32.2	0.0	4.2	0	0
9	C	11.9	9.9	8.3	8.7	18.7	14.9	5.2	5.0	9.3	8.9	4.9	3.1	3.8	3.0	0.6	0.0	0.0	0.0	6.1	7.3	3.8	11.4	20.0	23	20.0	0.0	7.2	0	0
10	C	17.7	41.9	56.5	44.7	35.5	32.6	5.9	7.2	20.8	23.6	35.4	31.6	44.1	31.4	7.4	4.1	3.9	13.6	9.2	34.1	51.1	19.3	22.6	23	56.5	3.9	25.8	0	0
11	C	16.2	2.2	3.4	1.3	11.5	7.7	5.4	3.4	2.3	2.2	2.6	2.0	1.9	2.1	2.8	2.1	4.4	4.3	4.5	23.2	47.2	36.3	38.1	23	47.2	1.3	9.9	0	0
12	C	31.8	20.0	20.2	31.4	18.1	10.2	1.9	0.4	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.0	0.5	5.6	16.6	31.4	49.0	38.2	23	49.0	0.0	12.0	0	0
13	C	13.3	6.9	8.8	8.3	13.8	17.4	13.2	16.9	9.6	7.3	4.3	5.3	2.9	0.0	0.0	0.0	0.0	0.0	16.8	21.1	25.3	54.4	42.3	23	54.4	0.0	12.5	0	0
14	C	8.3	8.0	12.0	4.6	3.1	2.7	1.2	0.0	0.3	0.0	0.0	0.0	0.0	1.8	0.3	0.9	2.0	2.1	3.5	7.2	6.6	5.0	8.1	23	12.0	0.0	3.4	0	0
15	C	2.8	2.5	2.5	6.3	4.7	2.8	1.6	2.1	4.4	9.0	7.4	12.6	6.3	1.1	0.2	0.1	0.0	0.0	1.3	0.5	3.9	3.7	22.5	23	22.5	0.0	4.3	0	0
16	C	7.8	1.1	5.6	0.8	0.8	1.1	0.7	2.5	1.5	2.0	1.0	0.8	1.4	0.5	0.4	0.0	0.0	0.0	2.7	4.4	4.8	3.0	22.2	23	22.2	0.0	2.8	0	0
17	C	3.6	23.6	21.2	42.4	23.3	0.5	0.9	2.5	7.7	5.5	5.9	4.8	9.6	8.7	8.3	5.4	3.1	3.2	6.1	28.2	37.6	15.5	8.5	23	42.4	0.5	12.0	0	0
18	C	2.3	2.4	6.3	17.7	13.7	11.8	8.7	2.4	0.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	5.0	11.6	6.4	7.2	23	17.7	0.0	4.3	0	0
19	C	1.9	1.8	4.0	15.0	14.6	7.9	7.7	0.7	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	27.8	50.7	42.4	35.8	23	50.7	0.0	9.2	0	0
20	C	26.2	29.6	27.9	28.4	27.1	28.6	14.3	7.4	4.2	2.4	2.6	0.5	0.0	0.0	0.0	1.9	0.0	0.2	0.0	35.3	65.4	49.3	42.6	23	65.4	0.0	17.1	0	0
21	C	33.8	32.7	34.2	41.2	36.7	32.4	18.0	8.8	8.5	4.5	3.3	2.6	1.7	1.1	1.5	1.6	2.5	25.4	14.0	26.6	33.3	30.9	18.3	23	41.2	1.1	18.0	0	0
22	C	10.8	11.2	19.8	13.0	6.2	15.6	9.0	3.1	4.8	6.4	9.7	15.1	14.0	9.4	2.6	2.0	1.5	3.5	5.4	6.3	7.2	13.0	16.4	23	19.8	1.5	9.0	0	0
23	C	7.5	4.8	13.7	16.2	13.8	1.3	0.3	0.0	0.0	0.5	1.2	1.4	1.4	0.4	0.0	0.0	0.0	0.0	11.7	2.0	0.6	0.7	1.1	23	16.2	0.0	3.4	0	0
24	C	0.5	0.4	1.4	1.7	0.4	1.2	2.0	2.5	2.7	3.6	2.2	0.5	0.8	0.4	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.5	0.6	23	3.6	0.0	1.0	0	0
25	C	1.4	0.5	1.1	0.4	4.0	3.4	3.3	30.0	2.4	9.4	7.3	6.6	3.3	2.2	0.8	0.3	6.9	2.1	3.4	3.4	30.2	24.4	1.9	23	30.2	0.3	6.5	0	0
26	C	3.7	6.9	6.8	9.2	6.2	3.9	2.9	7.3	C	3.2	3.3	2.9	2.7	0.6	0.9	0.0	0.0	0.7	1.7	1.9	3.6	7.1	49.4	22	49.4	0.0	5.7	0	0
27	C	30.2	37.7	27.1	28.1	31.2	28.5	24.4	28.9	24.0	7.1	13.8	5.6	6.8	18.8	23.8	17.2	11.4	2.7	0.8	6.0	54.9	59.8	48.1	23	59.8	0.8	23.3	0	0
28	C	8.2	5.9	17.5	19.3	10.3	13.1	8.7	12.6	9.2	7.2	3.8	2.0	3.7	1.6	1.1	2.7	1.3	0.5	1.1	0.4	1.5	16.7	21.0	23	21.0	0.4	7.4	0	0
29	C	10.4	8.6	8.6	10.2	8.1	10.1	9.5	7.2	3.8	2.0	0.1	0.0	0.0	0.0	0.0	0.2	1.9	1.0	2.9	8.4	9.6	8.0	9.9	23	10.4	0.0	5.2	0	0
30	C	7.1	7.0	1.8	2.8	2.3	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	9.8	2.5	4.8	23	9.8	0.0	2.1	0	0
31																									0	0.0	0.0		0	0
Count	0	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	689	30	0	29		
Maximum	0.0	33.8	41.9	56.5	44.7	36.7	32.6	24.4	30.0	24.0	23.6	35.4	31.6	44.1	31.4	23.8	17.2	26.8	25.4	40.8	39.9	65.4	59.8	49.4	23	65.4	0.0	35.0		
Minimum	0.0	0.5	0.4	1.1	0.4	0.4	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.5	0.6	0	0	0.0			
Average		10.0	10.0	11.8	13.8	12.0	10.1	6.3	6.4	5.4	4.4	4.2	4.2	4.6	3.5	2.7	2.5	3.2	3.4	5.8	13.3	19.5	17.8	19.3	22	29		8.4		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													65.4
													25.8
Data	0.0	0.8	1.8	2.7	3.9	6.1	8.5	13.0	24.6	34.0	49.5	65.4	8.4

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

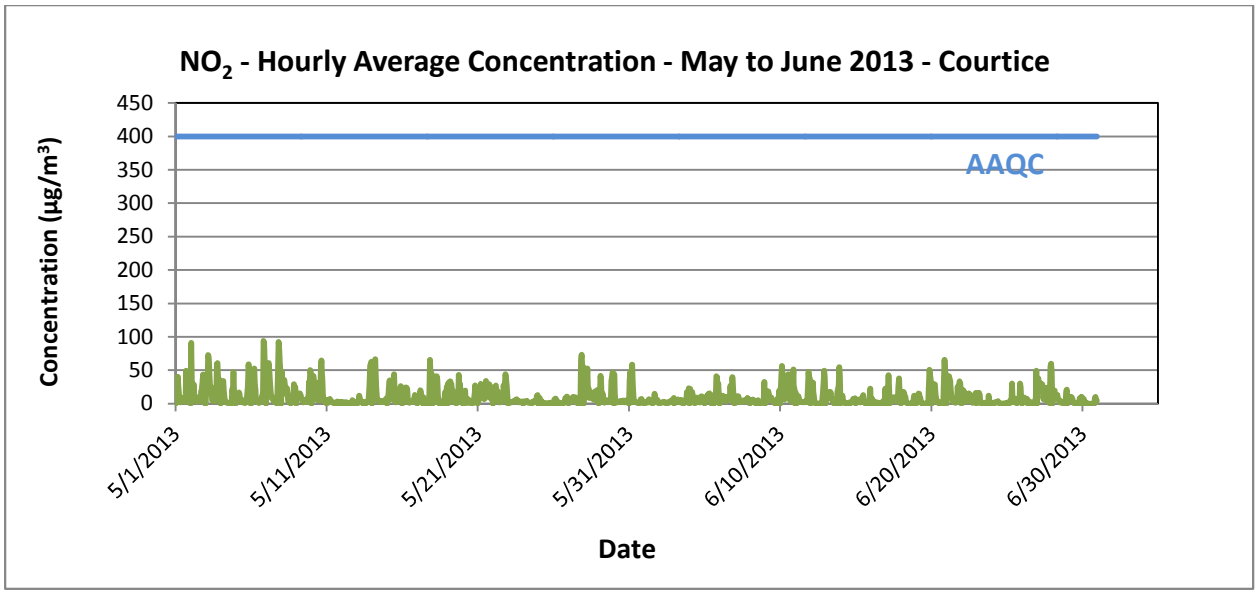
NO_2 - May (ug/m3)	RUNDLE 2013																													
Hour																														
Day	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	C	12.2	19.5	29.7	15.7	29.3	43.1	40.7	24.7	27.2	18.6	14.2	37.7	24.7	21.5	14.4	19.7	20.7	26.0	19.9	17.9	14.5	38.8	19.1	23	43.1	12.2	23.9	0	0
2	C	13.9	17.0	35.1	62.7	62.9	36.1	34.3	27.6	21.2	21.1	24.4	14.9	46.8	53.2	21.8	27.5	23.9	24.6	29.5	21.7	17.2	30.9	38.8	23	62.9	13.9	30.7	0	0
3	C	10.8	10.9	9.8	8.2	13.1	18.8	37.3	40.0	22.4	18.9	21.4	17.7	14.0	12.2	21.2	12.0	15.8	27.0	29.5	28.2	31.7	19.5	21.4	23	40.0	8.2	20.1	0	0
4	C	15.9	16.4	18.4	32.4	28.6	24.7	16.1	14.5	11.1	12.2	10.2	9.9	28.1	14.2	9.7	8.5	7.5	17.4	23.7	15.1	12.3	9.9	9.4	23	32.4	7.5	15.9	0	0
5	C	8.7	11.4	10.2	8.0	7.0	8.5	11.6	12.2	13.1	11.7	13.3	9.3	10.2	13.1	11.1	34.7	15.4	15.2	19.5	23.7	15.7	12.4	17.3	23	34.7	7.0	13.6	0	0
6	C	13.2	10.6	11.2	10.9	9.7	37.2	32.8	19.1	18.8	18.3	18.4	16.8	24.4	36.8	58.6	44.1	26.2	25.9	43.0	37.9	26.1	15.7	8.8	23	58.6	8.8	24.5	0	0
7	C	32.4	44.8	28.0	15.1	11.4	28.8	41.2	26.9	27.6	21.1	16.6	17.5	17.8	30.0	12.9	23.0	27.9	27.1	30.5	16.7	15.9	17.0	12.0	23	44.8	11.4	23.6	0	0
8	C	38.5	17.8	12.9	11.0	9.8	13.8	26.7	22.6	17.9	18.8	23.5	13.7	12.4	13.5	18.2	34.0	24.5	24.0	32.4	34.8	10.5	9.5	8.5	23	38.5	8.5	19.5	0	0
9	C	7.3	7.4	7.6	7.6	6.7	7.5	7.6	6.5	7.4	18.2	16.2	19.7	20.6	18.9	21.4	22.8	21.8	33.1	58.4	42.7	34.8	23.8	11.7	23	58.4	6.5	18.7	0	0
10	C	12.3	12.5	13.6	13.4	23.4	15.7	17.5	16.4	14.2	16.6	11.3	14.9	12.8	11.7	13.5	18.5	17.3	39.8	21.9	29.9	20.7	17.1	18.2	23	39.8	11.3	17.5	0	0
11	C	12.5	6.7	6.1	6.1	6.5	6.6	6.3	6.7	6.6	6.9	7.3	8.6	8.4	7.3	9.1	11.3	12.9	11.2	9.3	10.8	10.1	9.3	9.4	23	12.9	6.1	8.5	0	0
12	C	6.2	6.1	6.6	8.3	8.6	8.5	9.5	7.7	8.6	6.4	7.4	7.0	5.3	5.2	7.2	5.5	5.8	6.0	6.2	6.5	7.6	7.8	8.4	23	9.5	5.2	7.1	0	0
13	C	5.7	5.4	5.9	6.6	10.4	12.9	9.6	8.2	7.8	11.3	6.6	11.7	13.4	14.4	12.1	14.4	5.7	6.1	6.5	7.0	11.0	14.0	11.8	23	14.4	5.4	9.5	0	0
14	C	9.8	8.1	11.7	37.8	26.3	22.6	34.4	26.6	20.1	17.1	13.0	13.4	14.1	14.5	20.1	39.6	26.9	78.3	66.5	43.6	16.3	17.4	11.1	23	78.3	8.1	25.6	0	0
15	C	8.8	9.9	18.0	18.5	17.9	14.7	33.9	21.1	19.8	13.4	21.2	41.2	31.6	16.1	8.3	6.9	6.6	7.5	9.0	9.6	11.1	13.3	15.3	23	41.2	6.6	16.3	0	0
16	C	61.5	52.5	68.3	55.1	42.9	51.6	30.8	16.4	7.6	6.6	6.5	6.6	6.6	6.1	5.7	6.4	6.2	6.5	7.2	7.7	6.9	6.3	6.4	23	68.3	5.7	20.8	0	0
17	C	6.3	5.9	6.2	6.8	7.8	6.7	8.2	9.3	17.3	15.5	13.7	8.0	C	C	10.1	6.7	10.9	21.1	34.4	18.7	16.1	17.9	C	20	34.4	5.9	12.4	0	0
18	11.0	11.2	12.7	17.9	29.7	23.2	20.7	20.5	20.6	15.8	8.7	19.5	9.9	9.8	9.3	15.0	8.1	11.1	7.7	20.6	13.2	19.3	13.2	19.2	24	29.7	7.7	15.3	0	0
19	C	8.3	12.9	10.5	15.3	15.8	13.4	14.6	15.5	13.9	11.9	14.7	11.6	15.7	11.2	13.4	15.1	8.2	12.6	18.5	17.6	21.6	23.0	19.7	23	23.0	8.2	14.6	0	0
20	C	23.9	26.7	14.4	14.3	15.3	16.2	23.2	16.2	13.9	9.4	8.8	14.5	12.3	39.0	14.6	12.9	12.8	12.5	21.6	30.5	32.2	16.6	29.4	23	39.0	8.8	18.8	0	0
21	C	17.7	13.7	17.7	12.0	14.2	17.9	22.0	33.3	13.3	17.9	14.8	13.5	25.1	22.3	14.0	17.0	16.7	12.3	15.4	47.4	33.6	35.8	18.7	23	47.4	12.0	20.3	0	0
22	C	10.4	16.2	22.7	33.9	22.1	22.6	20.5	19.3	16.9	26.0	29.3	34.2	30.5	38.4	30.3	27.4	30.2	29.4	29.2	31.5	19.0	26.0	20.1	23	38.4	10.4	25.5	0	0
23	C	36.6	15.3	18.1	21.3	16.9	21.0	19.5	14.3	16.5	14.2	17.8	14.5	11.0	7.4	7.0	6.0	6.0	5.9	5.9	6.5	6.5	7.0	7.0	23	36.6	5.9	13.1	0	0
24	C	6.9	6.4	6.1	6.0	6.1	6.0	6.1	5.6	5.6	5.4	5.8	6.1	5.4	6.2	5.8	5.8	6.3	6.1	6.2	6.6	6.5	7.5	6.7	23	7.5	5.4	6.1	0	0
25	C	7.0	5.9	5.6	5.0	4.9	5.2	5.5	5.3	4.9	5.0	5.1	5.7	6.6	5.8	5.8	6.2	6.1	5.7	6.2	5.9	5.9	7.5	7.0	23	7.5	4.9	5.8	0	0
26	C	5.8	5.7	5.5	5.3	5.6	6.2	5.1	4.9	4.8	5.1	5.3	5.4	5.7	5.3	5.4	5.3	5.1	6.3	6.9	7.1	6.4	6.3	5.8	23	7.1	4.8	5.7	0	0
27	C	5.4	5.8	5.5	5.7	9.5	22.9	14.6	19.1	17.7	20.0	17.9	23.3	15.4	9.6	10.2	8.9	13.6	20.8	23.5	20.1	19.6	17.5	17.8	23	23.5	5.4	15.0	0	0
28	C	31.8	35.8	27.6	24.0	21.2	20.3	26.4	19.0	12.9	15.5	21.8	16.4	14.8	12.6	14.2	14.0	21.6	16.2	24.0	16.3	16.8	18.1	26.5	23	35.8	12.6	20.3	0	0
29	C	19.7	16.1	35.0	35.5	21.4	32.2	23.8	31.4	20.6	22.8	22.3	20.1	21.0	17.3	18.0	15.4	18.2	30.6	67.0	50.7	10.0	7.5	15.1	23	67.0	7.5	24.9	0	0
30	C	37.9	23.2	37.8	34.3	26.0	22.5	33.7	29.1	21.6	15.7	14.8	18.0	13.5	15.0	20.6	16.0	15.1	22.0	25.2	28.8	24.0	27.1	43.7	23	43.7	13.5	24.6	0	0
31	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	14.8	13.7	14.0	21.1	M	M	M	M	M	M	M	M	M	M	M	12	21.1	0.0		0	0
Count	1	31	31	31	31	31	31	31	31	31	31	31	31	29	29	30	30	30	30	30	30	30	30	29	700	31	1	29		
Maximum	11.0	61.5	52.5	68.3	62.7	62.9	51.6	41.2	40.0	27.6	26.0	29.3	41.2	46.8	53.2	58.6	44.1	30.2	78.3	67.0	50.7	34.8	38.8	43.7	24	78.3	11.0	46.7		
Minimum	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	4.8	5.0	5.1	5.4	5.3	5.2	5.4	5.3	5.1	5.7	5.9	5.9	5.9	6.3	5.8	12	7.1	0.0	4.1		
Average	11.0	16.1	14.8	16.9	18.3	16.9	18.9	20.4	17.8	14.9	14.3	14.7	15.6	16.5	16.8	15.0	16.5	14.9	19.5	23.9	21.8	16.7	16.5	16.0	23	37	8	17.3		

Percentiles		10		20		30		40		50		60		70		80		90		95		99		100						
Data		6.1		7.1		9.8		12.5		14.7		17.3		20.1		23.9		32.2		37.9		58.6		78.3						

Regs	Acceptable	Desirable	Violations	Maximum
Hour				78.3
Day				30.7
Month				17.3

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

Figure B-1 Time History Plots – NO_2 – Courtice (WPCP) Station



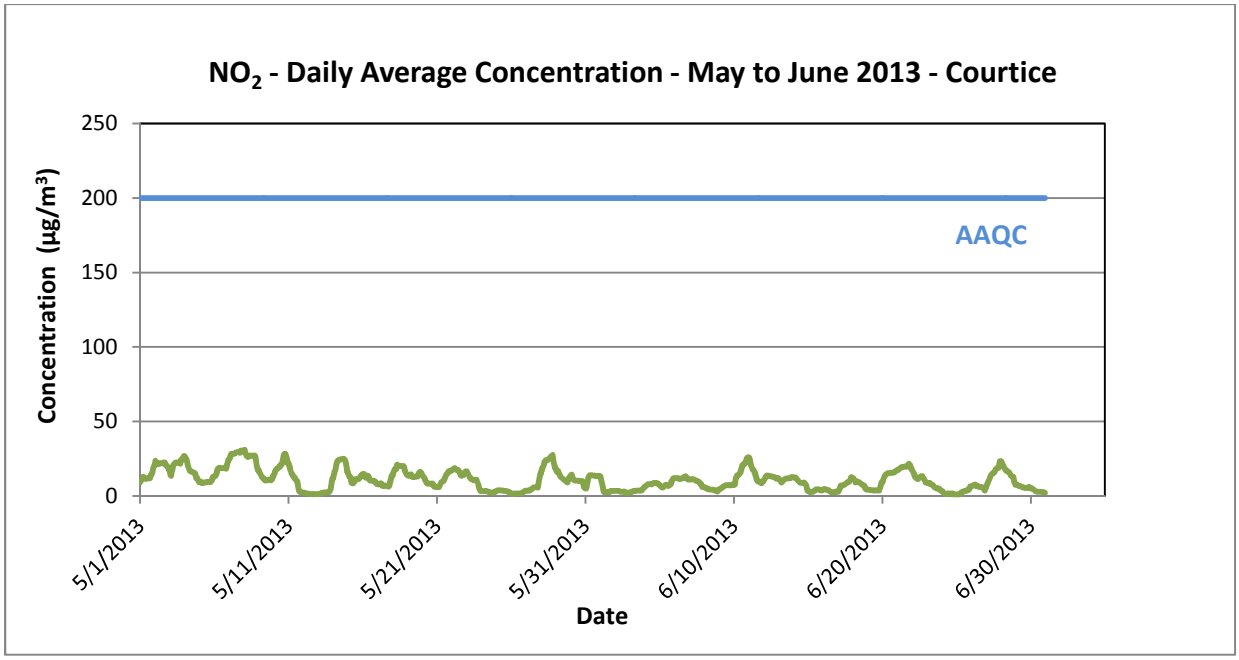
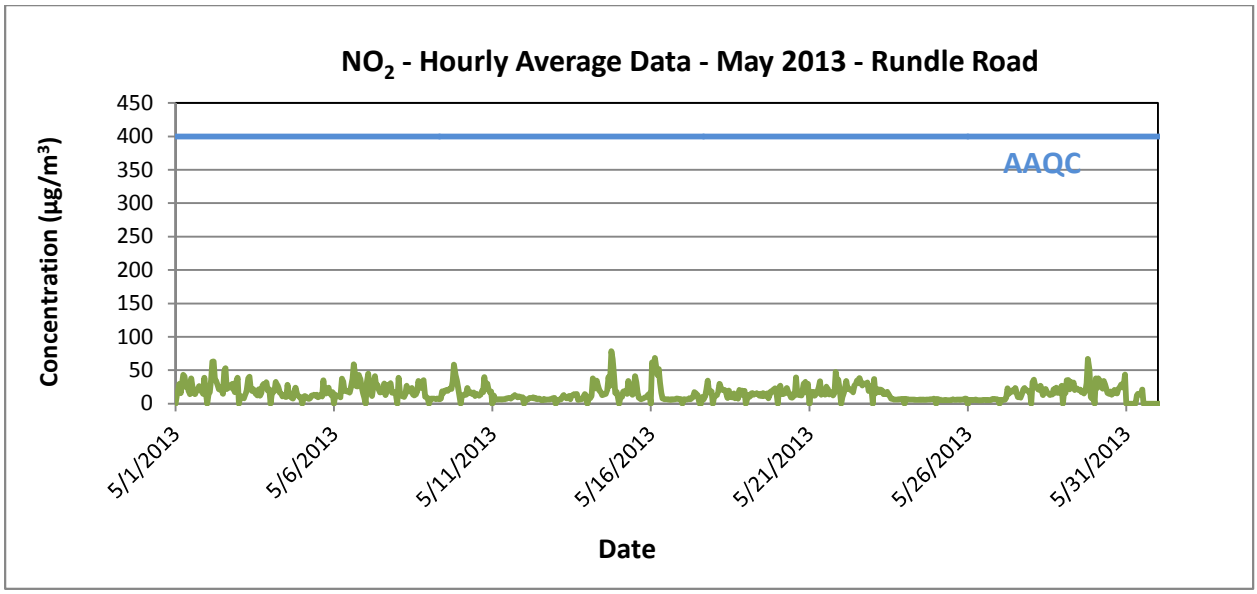
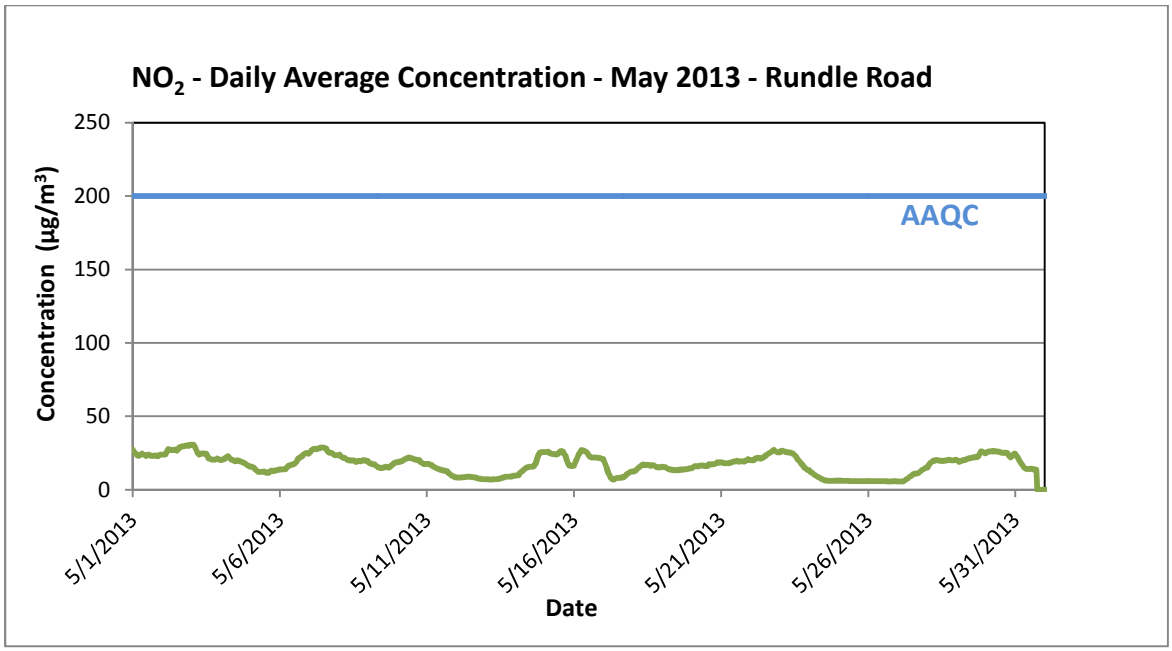


Figure B-2 Time History Plots – NO_2 – Rundle Road Station





Appendix C
NO_X Data Summaries and Time History Plots

NOx May (ug/m3) COURTICE 2013

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	C	16.2	39.2	19.6	39.3	25.8	12.2	1.5	0.0	9.5	5.1	1.7	2.4	2.1	3.0	1.2	1.1	63.1	39.2	37.3	45.9	41.8	39.5	27.3	23	63.1	0.0	20.6	0	0
2	C	97.7	34.0	3.4	20.2	31.9	3.4	10.2	11.0	5.8	4.4	2.1	3.1	9.8	9.0	4.3	2.9	24.0	22.5	31.4	42.7	25.3	0.0	0.9	23	97.7	0.0	17.4	0	0
3	C	20.7	21.3	38.4	78.5	84.1	56.3	27.4	28.2	38.9	4.8	3.6	2.9	2.9	3.7	8.6	2.6	4.8	68.4	68.9	36.8	31.7	36.3	21.1	23	84.1	2.6	30.0	0	0
4	C	1.4	8.1	12.7	32.2	20.1	9.1	0.9	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.8	0.0	24.6	16.2	49.6	14.6	6.2	0.0	23	49.6	0.0	8.5	0	0
5	C	10.8	10.0	9.7	11.7	18.7	17.0	6.9	2.3	2.5	5.9	1.6	0.0	0.0	0.0	0.0	0.7	1.1	15.6	25.9	60.2	49.2	37.8	0.0	23	60.2	0.0	12.5	0	0
6	C	20.8	17.1	27.9	50.5	76.4	38.3	27.5	9.3	2.6	0.9	0.4	0.0	0.0	0.0	0.5	1.0	7.9	12.5	9.2	124.3	115.9	62.4	43.7	23	124.3	0.0	28.2	0	0
7	C	37.7	55.5	83.6	87.4	55.6	41.7	25.2	9.5	9.0	12.4	6.5	1.9	2.6	1.9	0.1	0.0	0.0	10.1	49.1	116.7	100.8	117.7	55.8	23	117.7	0.0	38.3	0	0
8	C	48.4	21.0	30.3	37.2	39.7	32.3	22.9	15.7	43.6	28.9	2.1	0.1	0.0	0.0	0.0	0.0	10.7	3.2	9.3	27.3	18.3	23.5	16.3	23	48.4	0.0	18.7	0	0
9	C	10.0	6.2	12.0	9.7	14.7	14.8	12.1	6.1	6.1	3.1	1.0	2.8	1.8	0.0	3.2	6.3	6.2	1.4	1.2	60.7	45.4	75.4	75.0	23	75.4	0.0	16.3	0	0
10	C	69.9	64.5	65.0	41.6	32.9	41.2	12.4	49.1	39.3	4.6	62.6	22.3	4.0	13.9	135.1	112.2	54.8	16.4	4.0	0.7	0.9	0.0	0.0	23	135.1	0.0	36.8	0	0
11	C	3.3	0.1	0.0	3.7	6.9	3.0	0.5	1.6	1.1	0.5	0.3	0.7	0.0	0.0	0.0	0.4	1.6	0.0	0.0	0.1	0.0	0.0	0.0	23	6.9	0.0	1.0	0	0
12	C	0.0	1.6	0.0	0.0	0.0	0.3	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.3	1.4	1.5	0.0	0.9	0.4	1.8	23	4.3	0.0	0.6	0	0
13	C	0.0	0.0	0.4	11.3	6.2	8.4	5.7	2.8	1.3	3.1	0.0	1.4	1.7	2.4	1.1	1.7	4.1	3.4	15.0	30.4	60.2	71.5	108.7	23	108.7	0.0	14.8	0	0
14	C	50.3	43.1	57.0	57.8	200.2	115.1	39.8	18.2	7.3	11.7	9.3	4.9	6.1	3.3	4.3	4.5	3.8	4.9	4.1	5.6	6.1	5.5	9.8	23	200.2	3.3	29.2	0	0
15	C	5.3	12.8	34.1	50.3	19.4	14.1	23.6	10.2	12.6	35.6	107.5	29.4	3.8	3.8	5.6	4.7	7.1	5.8	20.6	23.8	13.4	28.5	20.9	23	107.5	3.8	21.4	0	0
16	C	13.6	11.3	6.5	5.8	10.8	35.3	39.2	37.4	8.1	4.0	4.0	4.5	3.9	7.4	4.6	4.9	5.6	6.3	9.9	14.5	14.3	9.0	8.0	23	39.2	3.9	11.7	0	0
17	C	10.7	7.8	8.4	15.4	27.9	27.9	9.7	7.2	C	57.3	8.0	2.8	1.7	4.4	0.4	0.0	0.0	0.6	16.8	80.4	53.5	65.9	75.7	22	80.4	0.0	21.9	0	0
18	C	71.5	36.1	41.7	43.2	21.3	31.1	122.7	69.7	22.8	3.7	1.3	1.2	0.4	0.2	0.1	1.6	1.2	7.6	7.2	18.7	14.7	21.7	29.5	23	122.7	0.1	24.7	0	0
19	C	36.9	14.8	36.5	38.1	36.9	47.1	29.3	40.5	5.6	3.6	3.1	2.7	2.7	3.8	2.1	3.9	3.6	61.7	33.3	38.8	17.3	3.9	11.2	23	61.7	2.1	20.8	0	0
20	C	8.0	2.3	17.9	23.2	4.6	4.3	2.8	11.9	4.8	3.7	7.5	4.4	3.1	2.4	1.2	1.5	5.1	9.9	20.1	30.3	6.0	10.1	8.8	23	30.3	1.2	8.4	0	0
21	C	5.1	7.4	10.5	19.8	32.1	32.7	32.9	15.0	10.9	12.9	11.2	31.0	42.0	28.2	26.7	16.8	13.1	32.9	28.6	26.2	8.5	18.7	10.9	23	42.0	5.1	20.6	0	0
22	C	20.4	20.5	23.1	33.0	36.9	13.4	34.2	7.5	11.7	31.5	3.4	10.6	6.2	6.4	5.1	10.0	31.9	25.5	30.2	46.2	40.7	29.3	12.7	23	46.2	3.4	21.3	0	0
23	C	4.0	3.1	3.0	3.6	3.0	3.7	4.2	4.8	6.4	5.9	8.3	6.5	8.2	14.2	9.0	6.3	5.2	9.3	7.0	4.7	4.5	3.9	7.5	23	14.2	3.0	5.9	0	0
24	C	4.0	6.9	4.0	4.7	5.9	10.4	5.6	6.2	5.7	4.8	4.3	4.4	4.6	6.7	4.1	8.1	5.1	4.4	6.1	6.0	7.6	12.7	20.7	23	20.7	4.0	6.6	0	0
25	C	10.2	19.7	10.1	3.5	12.0	4.2	5.0	1.6	2.2	2.1	3.9	2.0	2.1	3.7	3.6	2.1	2.3	4.0	3.3	2.9	2.9	2.8	4.8	23	19.7	1.6	4.8	0	0
26	C	2.2	10.3	5.8	11.2	8.7	7.4	1.9	1.1	4.8	3.5	2.1	1.4	2.0	2.3	4.5	5.1	3.1	4.0	10.6	10.8	12.3	12.4	6.5	23	12.4	1.1	5.8	0	0
27	C	9.0	5.6	5.9	10.0	11.4	8.1	19.5	14.8	18.3	19.3	18.0	12.2	6.5	3.0	2.1	1.6	6.4	4.3	2.9	121.0	113.1	67.7	67.5	23	121.0	1.6	23.8	0	0
28	C	44.3	37.5	34.4	27.4	36.0	66.1	24.6	31.5	12.7	13.2	26.0	16.3	23.0	13.4	15.8	7.9	16.7	23.5	10.4	7.9	13.9	23.0	9.1	23	66.1	7.9	23.2	0	0
29	C	5.3	14.8	49.5	37.6	7.9	18.0	15.9	3.8	3.0	4.1	5.0	7.2	7.1	6.0	5.7	4.6	3.5	3.6	3.6	42.3	52.6	116.4	10.5	23	116.4	3.0	18.6	0	0
30	C	46.7	14.9	4.7	3.9	3.2	3.5	4.5	4.4	4.1	5.7	4.6	5.0	4.2	4.3	6.8	3.4	2.8	4.3	6.0	6.0	4.9	4.9	4.1	23	46.7	2.8	6.8	0	0
31	C	53.0	76.8	50.8	112.3	122.6	53.4	15.2	5.2	4.1	3.5	3.7	3.3	3.0	2.8	3.0	2.3	2.0	3.4	8.3	8.6	3.4	4.7	3.7	23	122.6	2.0	23.9	0	0
Count	0	31	31	31	31	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31	712	31	0	30		
Maximum	0.0	97.7	76.8	83.6	112.3	200.2	115.1	122.7	69.7	43.6	57.3	107.5	31.0	42.0	28.2	135.1	112.2	63.1	68.4	68.9	124.3	115.9	117.7	108.7	23	200.2	0.0	87.6		
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22	4.3	0.0	0.0		
Average		23.8	20.1	22.8	29.8	32.7	25.0	18.9	13.8	10.2	9.7	10.1	6.1	5.0	4.8	8.3	7.1	9.7	14.0	16.1	35.2	28.9	29.4	21.7	23	72		17.5		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													200.2
													38.3
Data	0.5	2.4	3.8	5.0	7.3	10.8	17.7	30.2	46.2	66.7	116.6	200.2	17.5

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

NOx June (ug/m3) COURTICE 2013

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	C	3.4	4.1	3.0	2.7	4.1	3.5	7.2	9.0	9.3	4.5	2.5	3.4	2.2	2.1	2.7	5.8	17.7	6.2	5.3	4.9	7.4	5.3	3.9	23	17.7	2.1	5.2	0	0
2	C	2.8	3.3	3.0	2.7	3.1	3.5	4.2	4.3	3.4	2.8	2.5	2.3	2.8	3.4	2.9	4.5	4.3	5.3	11.4	3.9	8.4	3.9	11.2	23	11.4	2.3	4.3	0	0
3	C	5.2	7.0	7.8	7.1	7.8	11.3	7.2	6.4	4.4	5.1	11.3	5.8	3.8	2.9	2.2	2.4	6.4	6.6	7.9	20.0	18.2	13.6	25.1	23	25.1	2.2	8.5	0	0
4	C	24.9	12.5	14.0	19.9	17.5	14.2	9.0	4.1	5.9	4.3	5.2	17.6	17.5	11.3	7.4	3.8	4.7	4.6	13.4	12.9	14.1	10.8	10.0	23	24.9	3.8	11.3	0	0
5	C	3.3	4.8	10.7	16.7	10.0	19.7	16.8	21.9	22.7	14.0	1.8	1.2	6.4	1.9	20.9	19.1	3.5	11.5	48.0	51.8	29.9	36.2	14.3	23	51.8	1.2	16.8	0	0
6	C	4.2	3.4	7.1	18.5	12.1	11.7	15.1	13.3	15.7	12.3	7.3	11.3	12.8	8.8	10.0	14.4	30.7	16.9	6.8	44.4	28.4	9.7	14.1	23	44.4	3.4	14.3	0	0
7	C	5.8	7.2	11.5	14.0	14.1	14.5	7.4	5.4	6.7	4.4	6.0	9.4	7.3	5.6	6.7	8.0	7.8	8.2	8.2	13.1	10.8	6.7	7.8	23	14.5	4.4	8.5	0	0
8	C	6.8	4.9	4.7	5.2	8.8	6.3	6.9	3.2	2.5	5.7	2.5	8.5	8.8	5.9	3.4	1.2	2.8	2.8	3.1	3.3	3.0	8.9	43.2	23	43.2	1.2	6.6	0	0
9	C	20.9	13.3	10.2	10.7	38.9	27.6	10.7	10.0	17.8	15.6	8.8	5.6	6.7	5.1	1.9	2.1	1.6	1.0	8.4	8.8	5.2	13.0	22.9	23	38.9	1.0	11.6	0	0
10	C	19.8	46.4	68.6	53.0	46.1	51.7	8.9	10.7	32.7	35.7	51.0	47.3	69.3	45.7	10.8	6.3	5.5	17.4	11.3	41.5	65.5	22.8	28.0	23	69.3	5.5	34.6	0	0
11	C	20.8	3.6	5.6	3.0	13.4	10.3	10.0	6.2	4.5	5.0	5.0	4.0	4.1	4.9	6.3	4.5	8.3	6.5	6.5	25.9	59.9	43.2	44.5	23	59.9	3.0	13.3	0	0
12	C	49.0	25.1	26.2	42.6	25.0	18.2	6.1	2.9	2.6	1.6	0.7	3.2	0.0	0.8	0.0	2.1	0.3	1.7	7.1	19.1	34.6	60.7	45.8	23	60.7	0.0	16.3	0	0
13	C	15.0	8.6	11.3	10.7	16.9	22.2	17.4	21.6	16.9	15.7	8.6	11.4	5.9	1.5	1.0	0.4	0.2	1.4	19.0	22.9	27.0	64.2	54.1	23	64.2	0.2	16.3	0	0
14	C	11.1	10.2	14.1	6.9	5.2	6.2	4.1	3.0	3.3	2.4	2.2	2.3	2.2	4.5	3.2	3.2	4.4	4.4	5.4	10.3	8.4	7.3	15.2	23	15.2	2.2	6.1	0	0
15	C	4.4	4.1	4.2	12.0	10.0	5.6	4.0	5.5	9.0	16.5	13.6	21.8	11.3	3.2	1.9	2.0	1.4	1.4	3.6	2.2	5.2	5.1	33.9	23	33.9	1.4	7.9	0	0
16	C	9.3	3.0	7.1	2.2	1.9	2.3	2.2	3.8	3.6	3.5	2.6	2.1	2.8	1.9	1.9	2.2	0.8	1.4	3.8	5.9	6.3	4.3	27.4	23	27.4	0.8	4.4	0	0
17	C	5.2	32.2	24.5	49.6	28.1	3.1	2.6	4.9	12.3	10.3	10.0	8.5	13.9	12.4	11.4	7.8	5.7	5.7	8.0	31.2	42.8	17.6	12.2	23	49.6	2.6	15.7	0	0
18	C	3.7	3.8	8.6	21.4	16.3	19.7	16.9	6.6	3.1	3.3	0.9	0.4	0.3	0.7	0.3	0.1	3.3	0.0	0.0	7.1	13.9	8.3	10.1	23	21.4	0.0	6.5	0	0
19	C	3.5	3.4	5.8	24.5	20.7	14.0	16.1	3.9	1.4	0.7	0.2	0.1	1.3	2.7	0.3	0.5	1.4	0.5	0.0	35.7	115.9	77.9	55.2	23	115.9	0.0	16.8	0	0
20	C	35.3	48.6	57.2	95.4	95.7	72.2	27.5	14.6	9.3	5.8	7.1	2.7	0.9	0.6	1.0	4.2	1.5	2.4	1.3	38.8	78.2	61.9	56.7	23	95.7	0.6	31.3	0	0
21	C	51.4	40.8	49.6	84.2	84.5	55.8	27.6	15.5	15.2	8.1	6.1	4.1	3.0	2.3	3.8	3.3	4.1	30.7	16.2	30.8	35.4	33.9	21.0	23	84.5	2.3	27.3	0	0
22	C	12.7	12.9	22.7	14.9	8.8	19.1	12.0	5.2	6.8	8.3	12.0	19.6	16.9	11.9	3.9	3.1	2.8	4.9	7.7	7.8	8.4	14.5	18.8	23	22.7	2.8	11.1	0	0
23	C	9.1	7.1	16.4	18.7	16.7	2.9	2.0	1.4	1.8	2.3	2.5	2.9	3.0	1.7	1.0	1.5	0.5	0.7	13.4	3.4	2.2	2.1	3.0	23	18.7	0.5	5.1	0	0
24	C	2.0	1.6	3.0	3.1	1.8	3.3	3.3	4.3	4.9	6.3	3.9	1.8	2.8	2.1	1.6	1.6	1.2	1.8	1.8	2.7	2.0	1.9	2.1	23	6.3	1.2	2.6	0	0
25	C	3.0	1.9	3.1	2.0	5.7	5.1	4.7	37.2	4.2	13.7	11.2	10.1	5.4	3.7	2.3	2.1	9.6	3.7	4.8	4.6	32.8	26.3	3.2	23	37.2	1.9	8.7	0	0
26	C	5.6	8.6	8.5	10.8	8.1	5.6	5.5	11.0	C	5.8	5.9	4.9	4.5	2.7	2.7	1.5	1.5	2.1	3.2	3.1	6.1	8.8	53.4	22	53.4	1.5	7.7	0	0
27	C	32.7	64.7	53.4	77.0	58.4	54.3	37.3	47.7	43.2	10.1	22.6	8.5	9.7	24.2	30.2	21.4	14.9	5.1	2.2	7.8	93.3	103.8	106.9	23	106.9	2.2	40.4	0	0
28	C	10.8	7.7	22.9	23.5	13.2	20.5	15.5	20.6	13.5	10.7	6.5	3.8	7.9	3.8	3.6	6.0	3.7	2.7	2.9	2.3	3.2	23.3	35.1	23	35.1	2.3	11.5	0	0
29	C	15.0	12.0	12.0	25.7	30.3	30.2	21.2	17.6	10.5	5.7	2.0	1.7	1.0	0.9	1.1	1.8	4.5	3.0	5.5	11.2	12.1	10.1	13.5	23	30.3	0.9	10.8	0	0
30	C	10.2	22.5	3.5	5.0	5.0	3.4	4.0	2.3	2.7	1.6	1.1	1.1	1.1	0.6	0.4	1.1	0.3	0.1	1.4	10.7	11.8	4.2	9.6	23	22.5	0.1	4.5	0	0
31																									0	0.0	0.0		0	0
Count	0	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	689	30	0	29		
Maximum	0.0	51.4	64.7	68.6	95.4	95.7	72.2	37.3	47.7	43.2	35.7	51.0	47.3	69.3	45.7	30.2	21.4	30.7	30.7	48.0	51.8	115.9	103.8	106.9	23	115.9	0.0	56.9		
Minimum	0.0	2.0	1.6	3.0	2.0	1.8	2.3	2.0	1.4	1.4	0.7	0.2	0.1	0.0	0.6	0.0	0.1	0.2	0.0	0.0	2.2	2.0	1.9	2.1	0	0	0.0			
Average		13.6	14.3	16.7	22.8	20.9	17.9	11.1	10.8	10.0	8.1	7.5	7.6	7.9	6.0	4.9	4.6	5.2	5.4	7.9	16.3	26.4	23.7	26.7	22	42		12.9		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													115.9
													40.4
Data	1.8	2.7	3.6	5.0	6.7	9.0	12.3	17.7	32.7	49.6	84.2	115.9	12.9

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

NOx - May (ug/m3) RUNDLE 2013

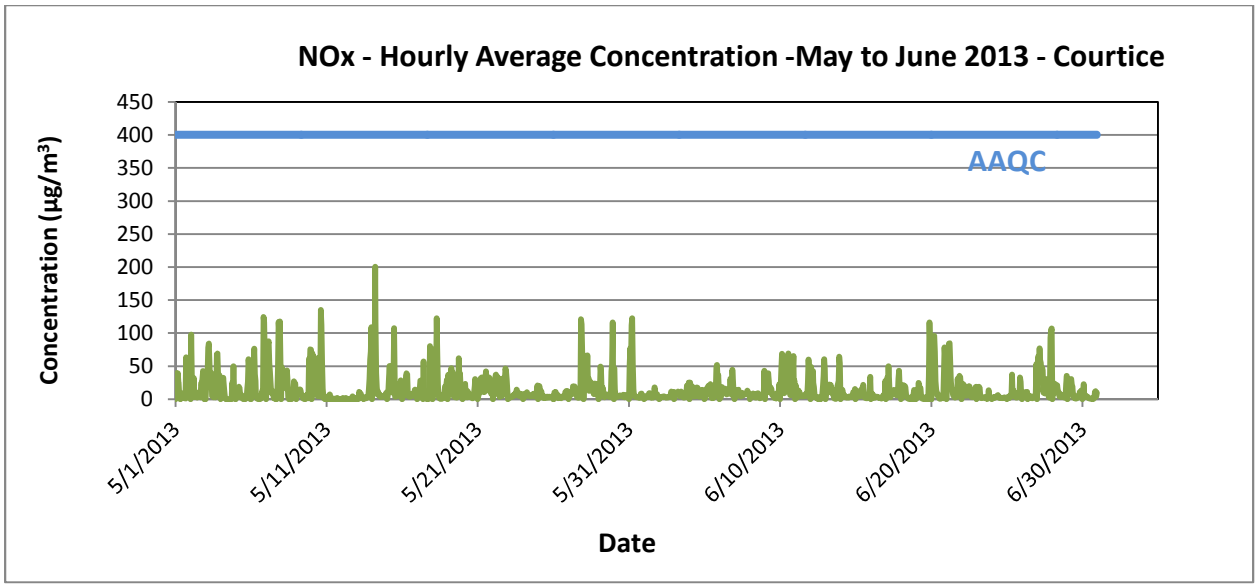
Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	C	10.8	18.5	29.6	16.5	29.3	47.4	54.8	34.0	34.8	22.8	16.5	63.4	31.2	25.2	15.1	27.7	21.6	26.9	19.9	18.5	14.8	56.4	19.1	23	63.4	10.8	28.5	0	0
2	C	13.6	17.0	39.4	68.9	80.0	40.1	42.9	34.5	26.9	25.6	36.5	16.4	62.8	79.7	24.4	34.7	32.6	25.3	30.9	21.8	17.2	34.4	C	22	80.0	13.6	36.6	0	0
3	13.5	10.3	10.5	8.9	7.9	13.4	21.3	46.0	53.8	30.0	27.8	33.6	26.1	15.0	12.1	30.0	12.0	15.9	27.0	30.6	38.5	36.8	19.2	29.8	24	53.8	7.9	23.8	0	0
4	C	15.3	19.5	18.1	39.0	31.8	26.9	17.7	17.0	13.6	12.8	10.7	10.3	38.9	18.0	10.2	8.8	7.8	20.3	26.0	14.6	11.4	9.4	8.7	23	39.0	7.8	17.7	0	0
5	C	8.4	10.7	9.7	7.4	6.8	9.8	13.4	13.7	14.7	13.1	20.2	9.3	10.3	15.8	12.5	45.6	18.2	16.6	19.2	23.2	15.1	11.6	17.0	23	45.6	6.8	14.9	0	0
6	C	12.2	10.5	11.4	10.9	9.8	97.0	51.7	25.7	23.4	22.9	21.9	19.8	33.1	49.2	117.5	58.4	33.1	27.4	44.5	39.6	28.2	15.5	8.2	23	117.5	8.2	33.6	0	0
7	C	31.8	44.7	27.9	15.2	11.7	37.4	56.9	34.3	36.1	25.4	18.9	23.2	20.2	45.8	14.2	26.5	31.7	29.8	32.3	15.7	14.5	16.8	11.1	23	56.9	11.1	27.0	0	0
8	C	39.5	17.2	11.8	11.1	10.1	14.5	34.6	50.7	20.9	23.8	30.8	14.2	12.4	14.1	20.8	47.9	27.2	23.8	35.2	45.1	8.6	7.6	6.1	23	50.7	6.1	23.0	0	0
9	C	5.1	5.3	6.3	6.8	5.0	6.2	6.8	5.3	7.0	23.2	18.9	21.7	26.6	27.2	24.5	26.7	22.8	33.7	80.9	59.2	52.8	25.5	11.3	23	80.9	5.0	22.1	0	0
10	C	11.4	12.9	13.4	13.0	37.8	19.5	20.8	19.8	21.3	20.2	10.7	15.1	12.5	10.9	18.0	24.7	17.5	44.6	23.7	28.4	19.9	19.1	20.4	23	44.6	10.7	19.8	0	0
11	C	11.1	5.1	5.0	5.5	5.6	6.1	6.2	6.8	6.9	6.9	7.6	11.9	11.8	7.8	8.7	11.5	16.6	13.3	8.9	12.5	11.4	12.9	8.7	23	16.6	5.0	9.1	0	0
12	C	5.4	5.5	6.1	8.1	8.7	8.9	11.1	9.3	9.8	7.3	8.3	7.7	5.3	5.4	7.7	5.8	5.6	5.7	5.8	6.3	7.5	7.4	7.7	23	11.1	5.3	7.2	0	0
13	C	5.2	4.8	5.4	6.0	10.3	14.7	11.1	9.9	9.7	13.9	7.4	14.5	17.6	19.2	13.5	17.1	5.8	6.0	6.5	6.4	10.9	16.3	11.5	23	19.2	4.8	10.6	0	0
14	C	9.8	8.4	12.2	39.1	31.1	30.3	58.6	39.4	28.5	21.9	15.4	16.2	16.3	17.2	24.5	52.3	31.6	111.5	73.7	51.2	15.9	18.5	10.5	23	111.5	8.4	31.9	0	0
15	C	8.3	9.4	24.3	20.8	20.4	13.4	71.4	29.8	24.5	14.9	28.0	63.6	41.6	16.8	7.7	6.1	6.2	7.1	9.0	9.0	10.1	12.1	15.4	23	71.4	6.1	20.4	0	0
16	C	71.7	70.5	121.1	69.0	50.2	79.3	45.0	20.8	8.0	6.6	6.5	6.7	6.6	6.5	5.9	5.9	5.6	5.9	6.4	7.4	6.0	5.4	5.4	23	121.1	5.4	27.1	0	0
17	C	5.2	5.3	5.0	6.4	8.0	6.3	8.9	13.5	25.4	26.5	21.1	9.1	C	C	13.3	5.9	11.6	24.5	38.4	18.8	17.3	18.4	C	20	38.4	5.0	14.4	0	0
18	10.0	10.2	12.6	21.7	30.1	30.7	31.2	27.7	32.2	25.4	9.5	30.3	11.4	11.6	10.8	23.0	8.1	17.4	7.1	24.8	12.7	19.1	12.6	18.4	24	32.2	7.1	18.7	0	0
19	C	7.2	12.5	8.9	13.6	14.7	12.3	14.4	16.9	23.9	12.9	21.1	11.7	36.0	10.9	19.5	22.8	6.8	11.3	23.1	21.3	19.5	21.5	22.6	23	36.0	6.8	16.8	0	0
20	C	24.4	25.9	12.7	13.1	14.1	16.7	28.9	19.2	16.2	9.3	7.9	19.1	12.7	65.4	15.7	14.0	13.7	13.0	25.6	35.4	38.5	14.7	27.6	23	65.4	7.9	21.0	0	0
21	C	15.5	11.8	15.7	10.0	13.6	17.5	26.2	55.7	12.6	25.7	15.0	13.5	26.9	23.2	14.0	16.7	15.6	11.0	14.2	49.2	34.9	44.8	18.7	23	55.7	10.0	21.8	0	0
22	C	9.5	14.7	27.4	34.3	27.8	27.4	26.4	30.2	19.7	39.5	45.0	51.1	44.8	64.5	39.8	33.7	31.1	30.2	29.8	33.4	24.1	28.7	19.3	23	64.5	9.5	31.8	0	0
23	C	37.7	14.4	17.6	20.6	16.3	21.2	21.7	15.9	19.7	15.6	22.2	15.8	11.1	6.8	7.1	6.3	6.1	6.0	5.8	6.0	6.6	7.0	7.1	23	37.7	5.8	13.7	0	0
24	C	6.6	6.1	6.1	5.9	5.9	6.5	6.6	5.9	6.0	6.1	6.5	6.9	6.6	9.0	6.6	6.4	8.4	6.9	6.6	7.1	6.9	8.1	6.7	23	9.0	5.9	6.7	0	0
25	C	6.8	5.8	5.4	4.8	5.1	5.5	6.2	6.2	5.9	5.8	5.5	6.7	7.7	6.5	6.8	7.4	6.9	6.2	6.7	6.3	6.1	7.8	6.9	23	7.8	4.8	6.3	0	0
26	C	6.2	6.1	5.7	5.3	5.9	6.8	5.4	5.2	5.3	5.1	6.1	5.9	6.7	5.7	5.4	5.6	5.5	6.8	6.7	7.1	6.8	6.5	5.6	23	7.1	5.1	6.0	0	0
27	C	4.9	5.4	4.8	5.5	9.9	30.0	20.6	28.7	26.5	30.2	25.7	36.6	20.7	11.5	12.0	10.4	15.6	22.4	25.2	21.5	19.6	18.0	18.2	23	36.6	4.8	18.4	0	0
28	C	31.9	45.1	33.8	35.8	27.5	22.8	33.6	21.5	15.2	18.2	35.4	19.3	17.5	15.0	16.8	20.8	23.9	17.9	32.4	18.6	22.9	21.2	28.8	23	45.1	15.0	25.0	0	0
29	C	31.6	18.2	40.4	41.8	24.5	38.1	28.3	44.0	28.2	27.7	29.2	26.2	25.8	22.9	23.5	18.8	22.0	35.5	78.8	56.0	13.4	12.0	26.8	23	78.8	12.0	31.0	0	0
30	C	42.1	29.9	44.6	43.9	29.9	28.1	47.9	43.4	29.3	20.5	19.6	28.1	17.3	19.3	26.4	23.7	18.4	26.1	28.5	32.3	27.1	30.4	47.4	23	47.9	17.3	30.6	0	0
31	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.1	19.0	18.0	18.3	30.0	M	M	M	M	M	M	M	M	M	M	M	12	30.0	0.0		0	0
Count	2	31	31	31	31	31	31	31	31	31	31	31	31	29	29	30	30	30	30	30	30	30	30	28	700	31	2	29		
Maximum	13.5	71.7	70.5	121.1	69.0	80.0	97.0	71.4	55.7	36.1	39.5	45.0	63.6	62.8	79.7	117.5	58.4	33.1	111.5	80.9	59.2	52.8	56.4	47.4	24	121.1	13.5	66.4		
Minimum	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	5.3	5.1	5.5	5.9	5.3	5.4	5.4	5.6	5.5	5.7	5.8	6.0	6.0	5.4	5.4	12	7.1	0.0	4.1		
Average	11.7	16.4	15.6	19.4	19.9	19.2	24.0	27.5	24.6	19.2	18.1	19.4	20.4	20.9	22.2	19.5	20.4	16.8	21.7	26.7	24.1	18.1	18.0	15.9	23	51	8	20.5		

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	6.0	7.0	10.1	13.0	16.4	19.7	24.5	29.8	39.1	50.3	79.3	121.1

	Regs	Acceptable	Desirable	Violations	Maximum
	Hour				121.1
	Day				36.6
	Month				20.5

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

Figure C-1 Time History Plots – NO_X – Courtice (WPCP) Station



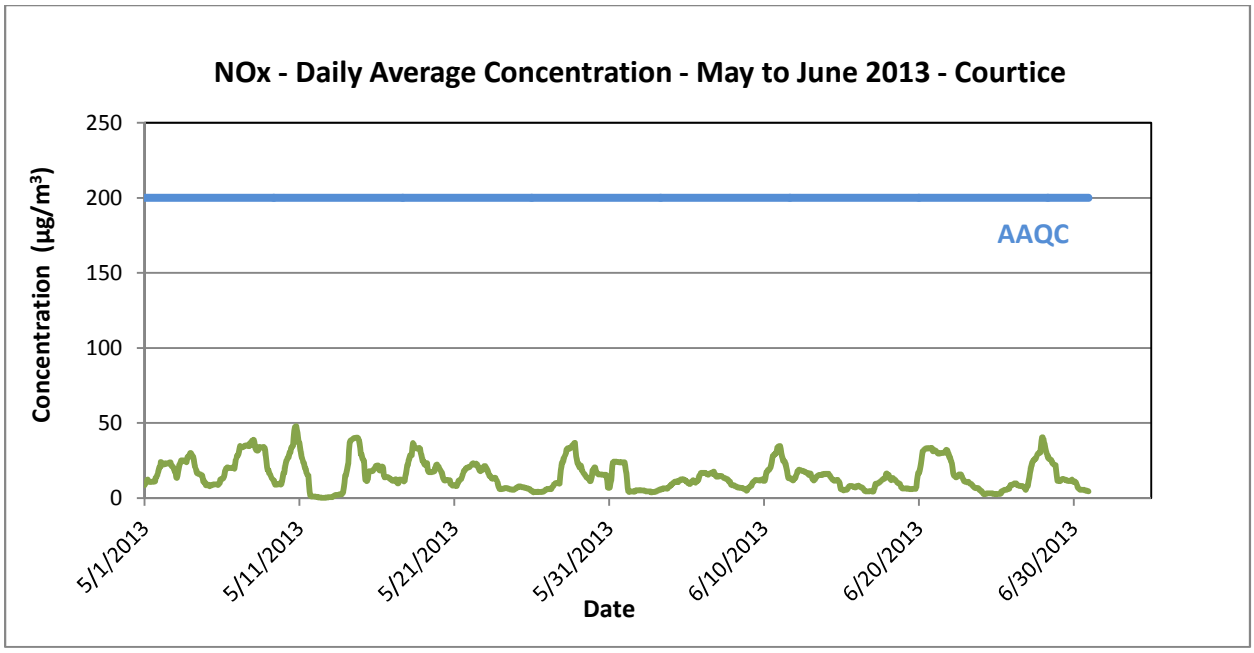
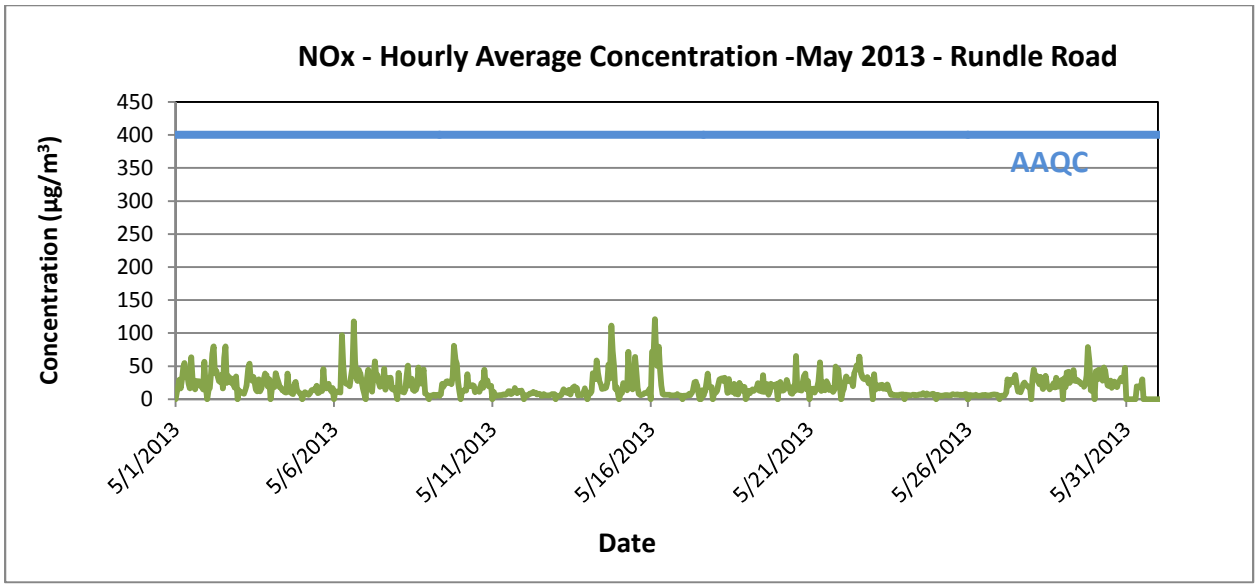
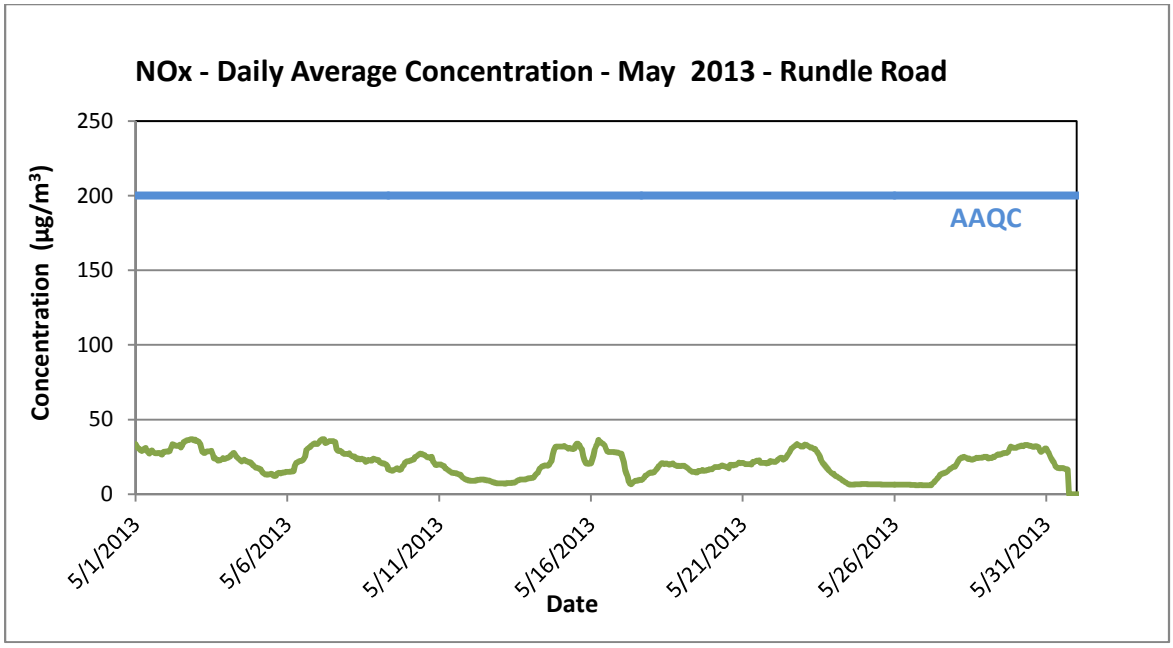


Figure C-2 Time History Plots – NO_X – Rundle Road Station





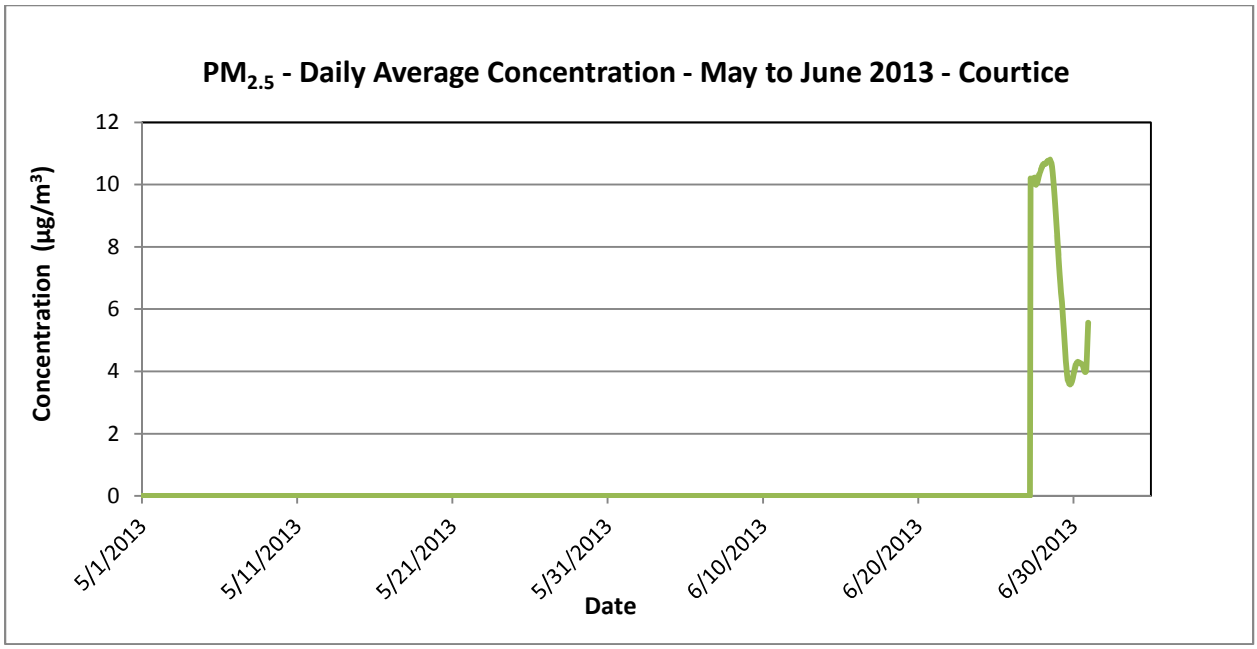
Appendix D
$PM_{2.5}$ Data Summaries and Time History Plots

$PM_{2.5}$ - June (ug/m3)	COURTICE 2013																												
Hour																													
Day	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average		
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
25	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0			
26	M	M	M	M	M	M	M	M	M	C	C	C	C	14.7	11.7	9.6	9.5	9.4	8.8	9.2	9.9	10.0	9.4	10.3	11	14.7	8.8			
27	10.0	10.4	10.4	10.1	9.9	9.9	10.1	10.1	10.1	10.2	10.4	10.7	10.6	9.9	10.8	10.5	11.0	11.2	10.8	11.0	11.2	11.2	11.4	11.5	24	11.5	9.9	10.6		
28	11.5	11.3	10.9	10.3	9.7	10.0	10.4	10.7	11.2	10.1	10.9	10.9	11.1	8.5	9.1	7.8	6.6	5.6	4.8	4.5	4.0	3.6	3.7	4.2	24	11.5	3.6	8.4		
29	3.4	3.1	3.0	3.2	3.3	3.2	3.3	3.3	3.5	3.2	3.0	3.4	3.3	3.3	3.5	3.8	5.4	4.3	3.9	4.2	4.5	4.5	5.5	6.4	24	6.4	3.0	3.8		
30	5.7	5.2	5.0	5.2	5.0	4.3	3.8	3.5	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	4.1	5.3	16.0	18.9	18.7	24	18.9	2.9	5.6		
31																									0	0.0	0.0			
Count	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	107	5	4	4		
Maximum	11.5	11.3	10.9	10.3	9.9	10.0	10.4	10.7	11.2	10.2	10.9	10.9	11.1	14.7	11.7	10.5	11.0	11.2	10.8	11.0	11.2	16.0	18.9	18.7	24	18.9	9.9	11.9		
Minimum	3.4	3.1	3.0	3.2	3.3	3.2	3.3	3.3	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	4.1	4.0	3.6	3.7	4.2	0	0	2.9			
Average	7.6	7.5	7.3	7.2	7.0	6.8	6.9	6.9	6.9	6.6	6.8	7.0	7.0	7.9	7.6	6.9	7.1	6.7	6.2	6.6	7.0	9.1	9.8	10.2	3	2	1	7.1		

																	Maximum
Percentiles	10	20	30	40	50	60	70	80	90	95	99	100					18.9
																	10.6
Data	3.0	3.3	4.0	5.0	7.8	9.9	10.1	10.7	11.2	11.5	18.6	18.9					7.1

Notes C - Span Cycle NA - No Data Available T - Test A- MOE Audit

Figure D-1 Time History Plot – $PM_{2.5}$ – Courtice (WPCP) Station



Appendix E
Continuous Parameter Edit Logs

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**							
Contact	**Greg Crooks / Connie Lim / Tim Hung**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com**		
Station number:	**N/A**		**Station Name:**	**Courtice WPCP Station (Upwind)**				
Station address:	**Courtice Water Pollution Control Plant**		**Emitter Address:**	**The Region of Durham, 605 Rossland Rd, Whitby, ON**				
Pollutant or parameter:	**SO2**	**Instrument make & model:**		**Teledyne Monitor Labs Sulphur Dioxide Analyzer Model T100**			**Serial Number:**	**565**
Data edit period	**Start date:**	**13-Apr-13**	**End date:**	**31-Jul-13**		**Time Zone : EST**		
Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	18-Sep-13	CL	Invalidate data	17-May-13	09:00	17-May-13	09:00	Monthly calibration
2	18-Sep-13	CL	Invalidate data	26-Jun-13	09:00	26-Jun-13	10:00	Monthly calibration
3	23-Sep-13	CL	Invalidate data	1-May-13	01:00	1-Jul-13	01:00	Daily auto calibration occurs at hour 01:00.

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**							
Contact	**Greg Crooks / Connie Lim / Tim Hung**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com**		
Station number:	**N/A**		**Station Name:**	**Courtice WPCP Station**				
Station address:	**Courtice Water Pollution Control Plant**		**Emitter Address:**	**The Region of Durham, 605 Rossland Rd, Whitby, ON**				
Pollutant or parameter:	**NOx**	**Instrument make & model:**		**API Model 200E Chemiluminescence Analyzer**			**Serial Number:**	**675**
Data edit period	**Start date:**	**13-Apr-13**	**End date:**	**31-Jul-13**		**Time Zone : EST**		
Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	18-Sep-13	CL	Invalidate data	17-May-13	10:00	17-May-13	10:00	Monthly calibration
2	18-Sep-13	CL	Invalidate data	26-Jun-13	10:00	26-Jun-13	10:00	Monthly calibration
3	23-Sep-13	CL	Invalidate data	1-May-13	01:00	1-Jul-13	01:00	Daily auto calibration occurs at hour 01:00.
4	2-Oct-13	CL	Invalidate data	1-May-13	00:00	30-Jun-13	23:59	Invalidate calibration minutes for daily auto calibration which occurs every 7th hour.

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**							
Contact	**Greg Crooks / Connie Lim / Tim Hung**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com**		
Station number:	**N/A**		**Station Name:**	**Courtice WPCP Station**				
Station address:	**Courtice Water Pollution Control Plant**		**Emitter Address:**	**The Region of Durham, 605 Rossland Rd, Whitby, ON**				
Pollutant or parameter:	**PM2.5**	**Instrument make & model:**		**Thermo Sharp 5030 Synchronized Hybrid Ambient Real-time Particulate Monitor**			**Serial Number:**	**E-1569**
Data edit period	**Start date:**	**13-Apr-13**	**End date:**	**31-Jul-13**	**Time Zone : EST**			
Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	18-Sep-13	CL	Invalidate data	26-Jun-13	10:00	26-Jun-13	13:00	Monthly calibration
2	23-Sep-13	CL	Invalidate data	13-Apr-13	13:00	20-Jun-13	12:00	Equipment malfunction
3	2-Oct-13	CL	Invalidate data	20-Jun-13	12:00	26-Jun-13	10:00	Equipment re-installed on Jun 20. Data invalidated until calibration day to allow for the equipment to stabilize.

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**						
Contact	**Greg Crooks / Connie Lim / Tim Hung**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com**	
Station number:	**N/A**		**Station Name:**	**Rundle Road Station**			
Station address:	**Rundle Road, south of Baseline Road**		**Emitter Address:**	**The Region of Durham, 605 Rossland Rd, Whitby, ON**			
Pollutant or parameter:	**SO2**	**Instrument make & model:**		**Teledyne Monitor Labs Sulphur Dioxide Analyzer Model T100**		**Serial Number:**	**566**
Data edit period	**Start date:**	**25-Apr-13**	**End date:**	**4-Sep-13**	**Time Zone : EST**		
Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	27-Sep-13	CL	Invalidate data	25-Apr-13	18:00	17-May-13	19:00	Setup calibration
2	27-Sep-13	CL	Invalidate data	17-May-13	16:00	17-May-13	16:00	Monthly calibration
3	27-Sep-13	CL	Invalidate data	26-Apr-13	01:00	4-Sep-13	01:00	Daily auto calibration occurs at hour 00:01.
4	27-Sep-13	CL	Invalidate data	31-May-13	14:00	30-Jun-13	04:00	Data logger malfunction
5	27-Sep-13	CL	Invalidate data	31-Jul-13	09:00	31-Jul-13	10:00	Monthly calibration and MOE site audit
6	27-Sep-13	CL	Invalidate data	4-Sep-13	15:00	4-Sep-13	15:00	Monthly calibration

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**						
Contact	**Greg Crooks / Connie Lim / Tim Hung**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com**	
Station number:	**N/A**		**Station Name:**	**Rundle Road Station**			
Station address:	**Rundle Road, south of Baseline Road**		**Emitter Address:**	**The Region of Durham, 605 Rossland Rd, Whitby, ON**			
Pollutant or parameter:	**NOx**	**Instrument make & model:**		**API Model 200E Chemiluminescence Analyzer**		**Serial Number:**	**676**
Data edit period	**Start date:**	**25-Apr-13**	**End date:**	**4-Sep-13**	**Time Zone : EST**		
Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	27-Sep-13	CL	Invalidate data	25-Apr-13	18:00	17-May-13	19:00	Setup calibration
2	27-Sep-13	CL	Invalidate data	17-May-13	14:00	17-May-13	15:00	Monthly calibration
3	27-Sep-13	CL	Invalidate data	26-Apr-13	01:00	4-Sep-13	01:00	Daily auto calibration occurs at hour 00:01.
4	27-Sep-13	CL	Invalidate data	31-May-13	14:00	30-Jun-13	04:00	Data logger malfunction
5	27-Sep-13	CL	Invalidate data	31-Jul-13	11:00	31-Jul-13	11:00	Monthly calibration and MOE site audit
6	27-Sep-13	CL	Invalidate data	4-Sep-13	14:00	4-Sep-13	14:00	Monthly calibration

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

EDIT LOG TABLE

Project Name	Durham York Energy Centre Ambient Air Monitoring Program							
Contact	Greg Crooks / Connie Lim / Tim Hung		Phone:	905-944-7777	E-mail:	greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com		
Station number:	N/A		Station Name:	Rundle Road Station				
Station address:	Rundle Road, south of Baseline Road		Emitter Address:	The Region of Durham, 605 Rossland Rd, Whitby, ON				
Pollutant or parameter:	PM2.5	Instrument make & model:		Thermo Sharp 5030 Synchronized Hybrid Ambient Real-time Particulate Monitor			Serial Number:	E-1563
Data edit period	Start date:	25-Apr-13	End date:	4-Sep-13	Time Zone : EST			
Edit #	Edit date	Editor's Name	Edit Action	Starting		Ending		Reason
				Date (dd/mm/yyyy)	Hour (xx:xx)	Date (dd/mm/yyyy)	Hour (xx:xx)	
1	27-Sep-13	CL	Invalidate data	25-Apr-13	18:00	17-May-13	19:00	Setup calibration
2	27-Sep-13	CL	Invalidate data	29-Apr-13	15:00	20-Jun-13	12:00	Monitor malfunction
3	27-Sep-13	CL	Invalidate data	20-Jun-13	12:00	30-Jun-13	04:00	Data logger malfunction
4	18-Oct-13	CL	Invalidate data	31-Jul-13	11:00	31-Jul-13	11:00	Monthly calibration and MOE site audit
5	18-Oct-13	CL	Invalidate data	4-Sep-13	14:00	4-Sep-13	14:00	Monthly calibration

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

EDIT LOG TABLE

Project Name	**Durhma York Energy Centre Ambient Air Monitoring Program**							
Contact	**Greg Crooks / Connie Lim / Tim Hung**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, tim.hung@stantec.com**		
Station number:	**N/A**		**Station Name:**	**Rundle Road Station**				
Station address:	**Rundle Road, south of Baseline Road**		**Emitter Address:**	**The Region of Durham, 605 Rossland Rd, Whitby, ON**				
Pollutant or parameter:	**Wind Speed/Wind Direction**	**Instrument make & model:**		**Met One Instruments Inc. Model 034B**			**Serial Number:**	
Data edit period	**Start date:**	**25-Apr-13**	**End date:**	**30-Jun-13**	**Time Zone : EST**			
Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	30-Sep-13	CL	Invalidate data	10-May-13	21:00	31-May-13	13:00	Wind head malfunctioning due to internal problem.

Examples of Acceptable Edit Actions:
Add offset of
Delete hours
Zero Correction
Slope Correction
Manual data entry for missing, but collected data
Invalidating span & zero check data
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line
Marking data as out-of-range

Appendix F
Metals Data Summary

Metals and Total Particulates	Courtice WPCP Station			May - June 2013																	
Location				Courtice		Courtice		Courtice		Courtice		Courtice		Courtice		Courtice		Courtice		Courtice	
Date	dd/mm/yyyy			5/4/2013		5/10/2013		16/05/2013		22/05/2013		28/05/2013		6/3/2013		6/9/2013		6/15/2013		6/21/2013		6/27/2013	
Start Time	hh:mm			0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00	
Sample Duration	minutes			23.39		23.74		23.65		23.68		23.32		23.32		23.49		23.45		23.64		23.62	
Technician				GJC/TZ/TH		TH		TH		TZ		TZ		TZ		TH		TZ		TH		TH	
Filter Number				13021996		13021995		13021992		13021991		13021989		13032540		13032542		13032544		13032551		13032549	
Analytical Report #				B371574		B373987		B377971		B380285		B384475		B389130		B393267		B397600		B3A1806		B3A3955	
Total Volumetric Flow	Am^3/sample			2163.02		2324.96		2192.82		2260.77		2247.88		2307.10		2392.82		2407.14		2348.60		2436.26	
Analytical Results	**Units**			**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**
Particulate	mg			115	5	84.4	5	100	5	81	5	85	5	44.2	5	69.2	5	91.4	5	115	5	104	5
Total Mercury (Hg)	ug			0.04	0.02	0.03	0.02	0.02	0.02	<0.02	0.02	0.05	0.02	0.02	0.02	0.03	0.02	0.05	0.02	0.06	0.02	0.06	0.02
Aluminum (Al)	ug			723	20	356	20	526	20	369	20	512	20	151	20	277	20	191	20	492	20	506	20
Antimony (Sb)	ug			<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Arsenic (As)	ug			<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6
Barium (Ba)	ug			17.5	1	12	1	15.4	1	9.6	1	13.6	1	11.3	1	10.4	1	9.6	1	21	1	25.3	1
Beryllium (Be)	ug			<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1
Bismuth (Bi)	ug			<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6
Boron (B)	ug			12.2	6	<6.0	6	<6.0	6	<6.0	6	16	6	<6.0	6	<6.0	6	13.6	6	6.2	6	<6.0	6
Cadmium (Cd)	ug			<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2
Chromium (Cr)	ug			7.7	2	2.8	2	4.4	2	2.7	2	4.5	2	3.4	2	4.5	2	2.8	2	6.1	2	5.7	2
Cobalt (Co)	ug			<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2
Copper (Cu)	ug			71.2	2	63.3	2	61.5	2	65.9	2	40	2	66	2	91.2	2	55.9	2	92.8	2	64.1	2
Iron (Fe)	ug			1960	10	886	10	1270	10	878	10	1150	10	495	10	842	10	571	10	1710	10	1850	10
Lead (Pb)	ug			7.4	3	5	3	5.1	3	3.3	3	9.4	3	<3.0	3	5.1	3	7.2	3	8.6	3	5.7	3
Magnesium (Mg)	ug			786	20	437	20	693	20	486	20	509	20	337	20	320	20	408	20	1140	20	576	20
Manganese (Mn)	ug			52.8	1	25.9	1	49.2	1	28.1	1	35.8	1	19.4	1	20.3	1	23.7	1	51.4	1	44	1
Molybdenum (Mo)	ug			3.1	3	<3.0	3	<3.0	3	<3.0	3	<3.0	3	<3.0	3	<3.0	3	<3.0	3	3.1	3	3.3	3
Nickel (Ni)	ug			5	3	3.4	3	4.7	3	3.1	3	3.5	3	<3.0	3	4.5	3	3.8	3	4.8	3	4.4	3
Phosphorus (P)	ug			314	25	156	25	157	25	106	25	98	25	100	25	101	25	105	25	137	25	117	25
Selenium (Se)	ug			<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Silver (Ag)	ug			<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2
Strontium (Sr)	ug			23.8	1	13.2	1	14.5	1	12.5	1	14.5	1	6.2	1	12.9	1	8.1	1	19.6	1	20.2	1
Thallium (Tl)	ug			<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Tin (Sn)	ug			<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Titanium (Ti)	ug			37.5	1	19.3	1	32	1	20.5	1	28.6	1	8.8	1	18.8	1	11	1	30	1	28.4	1
Vanadium (V)	ug			3	2	2.5	2	4.2	2	<2.0	2	<2.0	2	<2.0	2	3	2	<2.0	2	2.6	2	2.2	2
Zinc (Zn)	ug			54.9	5	62.9	5	50.4	5	56.3	5	47.9	5	32.6	5	67.5	5	65.7	5	57.5	5	72.5	5
Zirconium (Zr)	ug			1.8	1	<1.0	1	<1.0	1	<1.0	1	2.4	1	<1.0	1	<1.0	1	1.2	1	1.3	1	1.4	1
Total Uranium (U)	ug			<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45

Calculated Concentrations	Units	Quarter 2 2013 Maximum	Quarter 2 2013 Minimum	Courtice 5/4/2013	Courtice 5/10/2013	Courtice 16/05/2013	Courtice 22/05/2013	Courtice 28/05/2013	Courtice 6/3/2013	Courtice 6/9/2013	Courtice 6/15/2013	Courtice 6/21/2013	Courtice 6/27/2013
Particulate	ug/m^3	53.2	19.2	53.2	36.3	45.6	35.8	37.8	19.2	28.9	38.0	49.0	42.7
Total Mercury (Hg)	ug/m^3	2.55E-05	4.42E-06	1.85E-05	1.29E-05	9.12E-06	4.42E-06	2.22E-05	8.67E-06	1.25E-05	2.08E-05	2.55E-05	2.46E-05
Aluminum (Al)	ug/m^3	3.34E-01	6.55E-02	3.34E-01	1.53E-01	2.40E-01	1.63E-01	2.28E-01	6.55E-02	1.16E-01	7.93E-02	2.09E-01	2.08E-01
Antimony (Sb)	ug/m^3	2.31E-03	2.05E-03	2.31E-03	2.15E-03	2.28E-03	2.21E-03	2.22E-03	2.17E-03	2.09E-03	2.08E-03	2.13E-03	2.05E-03
Arsenic (As)	ug/m^3	1.39E-03	1.23E-03	1.39E-03	1.29E-03	1.37E-03	1.33E-03	1.33E-03	1.30E-03	1.25E-03	1.25E-03	1.28E-03	1.23E-03
Barium (Ba)	ug/m^3	1.04E-02	3.99E-03	8.09E-03	5.16E-03	7.02E-03	4.25E-03	6.05E-03	4.90E-03	4.35E-03	3.99E-03	8.94E-03	1.04E-02
Beryllium (Be)	ug/m^3	2.31E-04	2.05E-04	2.31E-04	2.15E-04	2.28E-04	2.21E-04	2.22E-04	2.17E-04	2.09E-04	2.08E-04	2.13E-04	2.05E-04
Bismuth (Bi)	ug/m^3	1.39E-03	1.23E-03	1.39E-03	1.29E-03	1.37E-03	1.33E-03	1.33E-03	1.30E-03	1.25E-03	1.25E-03	1.28E-03	1.23E-03
Boron (B)	ug/m^3	7.12E-03	1.23E-03	5.64E-03	1.29E-03	1.37E-03	1.33E-03	7.12E-03	1.30E-03	1.25E-03	5.65E-03	2.64E-03	1.23E-03
Cadmium (Cd)	ug/m^3	4.62E-04	4.10E-04	4.62E-04	4.30E-04	4.56E-04	4.42E-04	4.45E-04	4.33E-04	4.18E-04	4.15E-04	4.26E-04	4.10E-04
Chromium (Cr)	ug/m^3	3.56E-03	1.16E-03	3.56E-03	1.20E-03	2.01E-03	1.19E-03	2.00E-03	1.47E-03	1.88E-03	1.16E-03	2.60E-03	2.34E-03
Cobalt (Co)	ug/m^3	4.62E-04	4.10E-04	4.62E-04	4.30E-04	4.56E-04	4.42E-04	4.45E-04	4.33E-04	4.18E-04	4.15E-04	4.26E-04	4.10E-04
Copper (Cu)	ug/m^3	3.95E-02	1.78E-02	3.29E-02	2.72E-02	2.80E-02	2.91E-02	1.78E-02	2.86E-02	3.81E-02	2.32E-02	3.95E-02	2.63E-02
Iron (Fe)	ug/m^3	9.06E-01	2.15E-01	9.06E-01	3.81E-01	5.79E-01	3.88E-01	5.12E-01	2.15E-01	3.52E-01	2.37E-01	7.28E-01	7.59E-01
Lead (Pb)	ug/m^3	4.18E-03	6.50E-04	3.42E-03	2.15E-03	2.33E-03	1.46E-03	4.18E-03	6.50E-04	2.13E-03	2.99E-03	3.66E-03	2.34E-03
Magnesium (Mg)	ug/m^3	4.85E-01	1.34E-01	3.63E-01	1.88E-01	3.16E-01	2.15E-01	2.26E-01	1.46E-01	1.34E-01	1.69E-01	4.85E-01	2.36E-01
Manganese (Mn)	ug/m^3	2.44E-02	8.41E-03	2.44E-02	1.11E-02	2.24E-02	1.24E-02	1.59E-02	8.41E-03	8.48E-03	9.85E-03	2.19E-02	1.81E-02
Molybdenum (Mo)	ug/m^3	1.43E-03	6.23E-04	1.43E-03	6.45E-04	6.84E-04	6.63E-04	6.67E-04	6.50E-04	6.27E-04	6.23E-04	1.32E-03	1.35E-03
Nickel (Ni)	ug/m^3	2.31E-03	6.50E-04	2.31E-03	1.46E-03	2.14E-03	1.37E-03	1.56E-03	6.50E-04	1.88E-03	1.58E-03	2.04E-03	1.81E-03
Phosphorus (P)	ug/m^3	1.45E-01	4.22E-02	1.45E-01	6.71E-02	7.16E-02	4.69E-02	4.36E-02	4.33E-02	4.22E-02	4.36E-02	5.83E-02	4.80E-02
Selenium (Se)	ug/m^3	2.31E-03	2.05E-03	2.31E-03	2.15E-03	2.28E-03	2.21E-03	2.22E-03	2.17E-03	2.09E-03	2.08E-03	2.13E-03	2.05E-03
Silver (Ag)	ug/m^3	4.62E-04	4.10E-04	4.62E-04	4.30E-04	4.56E-04	4.42E-04	4.45E-04	4.33E-04	4.18E-04	4.15E-04	4.26E-04	4.10E-04
Strontium (Sr)	ug/m^3	1.10E-02	2.69E-03	1.10E-02	5.68E-03	6.61E-03	5.53E-03	6.45E-03	2.69E-03	5.39E-03	3.36E-03	8.35E-03	8.29E-03
Thallium (Tl)	ug/m^3	2.31E-03	2.05E-03	2.31E-03	2.15E-03	2.28E-03	2.21E-03	2.22E-03	2.17E-03	2.09E-03	2.08E-03	2.13E-03	2.05E-03
Tin (Sn)	ug/m^3	2.31E-03	2.05E-03	2.31E-03	2.15E-03	2.28E-03	2.21E-03	2.22E-03	2.17E-03	2.09E-03	2.08E-03	2.13E-03	2.05E-03
Titanium (Ti)	ug/m^3	1.73E-02	3.81E-03	1.73E-02	8.30E-03	1.46E-02	9.07E-03	1.27E-02	3.81E-03	7.86E-03	4.57E-03	1.28E-02	1.17E-02
Vanadium (V)	ug/m^3	1.92E-03	4.15E-04	1.39E-03	1.08E-03	1.92E-03	4.42E-04	4.45E-04	4.33E-04	1.25E-03	4.15E-04	1.11E-03	9.03E-04
Zinc (Zn)	ug/m^3	2.98E-02	1.41E-02	2.54E-02	2.71E-02	2.30E-02	2.49E-02	2.13E-02	1.41E-02	2.82E-02	2.73E-02	2.45E-02	2.98E-02
Zirconium (Zr)	ug/m^3	1.07E-03	2.09E-04	8.32E-04	2.15E-04	2.28E-04	2.21E-04	1.07E-03	2.17E-04	2.09E-04	4.99E-04	5.54E-04	5.75E-04
Total Uranium (U)	ug/m^3	1.04E-04	9.24E-05	1.04E-04	9.68E-05	1.03E-04	9.95E-05	1.00E-04	9.75E-05	9.40E-05	9.35E-05	9.58E-05	9.24E-05

Metals and Total Particulates	Rundle Road Station	May - June 2013																	
Location		Rundle		Rundle		Rundle		Rundle		Rundle		Rundle		Rundle		Rundle		Rundle	
Date	dd/mm/yyyy	4/5/2013		10/5/2013		16/05/2013		22/05/2013		28/05/2013		3/6/2013		9/6/2013		15/06/2013		21/06/2013		27/06/2013	
Start Time	hh:mm	0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00	
Sample Duration	minutes	23.95		24.24		23.84		24.06		23.37		23.44		23.57		23.71		23.41		23.46	
Technician		GC, TH, TZ		TH		TH		TZ		TZ		TZ		TH		TZ		TH		TH	
Filter Number		13021987		13021994		13021993		13021990		13021988		13032541		13032543		13032545		13032550		13032548	
Analytical Report #		B371574		B373987		B377971		B380285		B384475		B389130		B393267		B397600		B3A1806		B3A3955	
Total Volumetric Flow	Am^3/sample	2222.40		2307.67		2277.16		2219.01		2164.20		2178.39		2243.84		2214.08		2137.26		2311.56	
Analytical Results	**Units**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**
Particulate	mg	173	5	76.9	5	121	5	148	5	82.3	5	63.5	5	56.4	5	101	5	121	5	98.6	5
Total Mercury (Hg)	ug	0.04	0.02	0.02	0.02	0.03	0.02	<0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.04	0.02	0.05	0.02
Aluminum (Al)	ug	1010	20	253	20	732	20	901	20	408	20	218	20	165	20	183	20	751	20	483	20
Antimony (Sb)	ug	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Arsenic (As)	ug	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6
Barium (Ba)	ug	21.6	1	12.6	1	20.2	1	20.8	1	14.4	1	9.1	1	10.2	1	9.6	1	21	1	22.5	1
Beryllium (Be)	ug	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1	<1.0	1
Bismuth (Bi)	ug	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6	<6.0	6
Boron (B)	ug	11.3	6	<6.0	6	<6.0	6	<6.0	6	13.3	6	<6.0	6	<6.0	6	11.6	6	8.4	6	<6.0	6
Cadmium (Cd)	ug	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2
Chromium (Cr)	ug	11	2	6.2	2	6.8	2	4.9	2	5	2	4.5	2	4.8	2	2.6	2	7.1	2	6.1	2
Cobalt (Co)	ug	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2
Copper (Cu)	ug	70.8	2	69.1	2	123	2	66.6	2	63.3	2	71.3	2	230	2	97.7	2	198	2	147	2
Iron (Fe)	ug	2880	10	1040	10	1990	10	2060	10	1370	10	589	10	1200	10	624	10	1960	10	1940	10
Lead (Pb)	ug	7.6	3	4.2	3	6	3	4.9	3	9.3	3	<3.0	3	4.6	3	6.2	3	9.5	3	5.2	3
Magnesium (Mg)	ug	1150	20	391	20	788	20	960	20	444	20	360	20	200	20	380	20	1120	20	557	20
Manganese (Mn)	ug	67.4	1	27.3	1	64.9	1	58	1	38.8	1	25.5	1	20.2	1	24.5	1	59.4	1	47.5	1
Molybdenum (Mo)	ug	<3.0	3	<3.0	3	<3.0	3	3.8	3	<3.0	3	4	3	6	3	4.6	3	8.1	3	5.9	3
Nickel (Ni)	ug	6.6	3	5.8	3	5.5	3	5.3	3	4	3	<3.0	3	5.9	3	4.3	3	5.4	3	5.7	3
Phosphorus (P)	ug	353	25	184	25	230	25	150	25	113	25	131	25	128	25	137	25	170	25	132	25
Selenium (Se)	ug	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Silver (Ag)	ug	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2
Strontium (Sr)	ug	43.4	1	9.4	1	17.2	1	41.1	1	11.6	1	7.1	1	6.3	1	5.8	1	28	1	21.9	1
Thallium (Tl)	ug	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Tin (Sn)	ug	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Titanium (Ti)	ug	42.2	1	12.6	1	43.3	1	43.5	1	21.6	1	12.4	1	13.7	1	11.9	1	43.3	1	25.1	1
Vanadium (V)	ug	2.3	2	2	2	4.5	2	4.6	2	<2.0	2	<2.0	2	<2.0	2	<2.0	2	3.5	2	2.9	2
Zinc (Zn)	ug	60.9	5	66	5	66.9	5	82.1	5	61.4	5	29.1	5	60.6	5	60	5	67.5	5	83.3	5
Zirconium (Zr)	ug	<1.0	1	<1.0	1	<1.0	1	1.4	1	1.3	1	<1.0	1	<1.0	1	1.2	1	1.1	1	1.8	1
Total Uranium (U)	ug	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45

Calculated Concentrations	Units	Quarter 2 2013 Maximum	Quarter 2 2013 Minimum	Rundle 4/5/2013	Rundle 10/5/2013	Rundle 16/05/2013	Rundle 22/05/2013	Rundle 28/05/2013	Rundle 3/6/2013	Rundle 9/6/2013	Rundle 15/06/2013	Rundle 21/06/2013	Rundle 27/06/2013
Particulate	ug/m^3	78	25	77.8	33.3	53.1	66.7	38.0	29.1	25.1	45.6	56.6	42.7
Total Mercury (Hg)	ug/m^3	2.16E-05	4.51E-06	1.80E-05	8.67E-06	1.32E-05	4.51E-06	1.39E-05	9.18E-06	8.91E-06	1.81E-05	1.87E-05	2.16E-05
Aluminum (Al)	ug/m^3	4.54E-01	7.35E-02	4.54E-01	1.10E-01	3.21E-01	4.06E-01	1.89E-01	1.00E-01	7.35E-02	8.27E-02	3.51E-01	2.09E-01
Antimony (Sb)	ug/m^3	2.34E-03	2.16E-03	2.25E-03	2.17E-03	2.20E-03	2.25E-03	2.31E-03	2.30E-03	2.23E-03	2.26E-03	2.34E-03	2.16E-03
Arsenic (As)	ug/m^3	1.40E-03	1.30E-03	1.35E-03	1.30E-03	1.32E-03	1.35E-03	1.39E-03	1.38E-03	1.34E-03	1.35E-03	1.40E-03	1.30E-03
Barium (Ba)	ug/m^3	9.83E-03	4.18E-03	9.72E-03	5.46E-03	8.87E-03	9.37E-03	6.65E-03	4.18E-03	4.55E-03	4.34E-03	9.83E-03	9.73E-03
Beryllium (Be)	ug/m^3	2.34E-04	2.16E-04	2.25E-04	2.17E-04	2.20E-04	2.25E-04	2.31E-04	2.30E-04	2.23E-04	2.26E-04	2.34E-04	2.16E-04
Bismuth (Bi)	ug/m^3	1.40E-03	1.30E-03	1.35E-03	1.30E-03	1.32E-03	1.35E-03	1.39E-03	1.38E-03	1.34E-03	1.35E-03	1.40E-03	1.30E-03
Boron (B)	ug/m^3	6.15E-03	1.30E-03	5.08E-03	1.30E-03	1.32E-03	1.35E-03	6.15E-03	1.38E-03	1.34E-03	5.24E-03	3.93E-03	1.30E-03
Cadmium (Cd)	ug/m^3	4.68E-04	4.33E-04	4.50E-04	4.33E-04	4.39E-04	4.51E-04	4.62E-04	4.59E-04	4.46E-04	4.52E-04	4.68E-04	4.33E-04
Chromium (Cr)	ug/m^3	4.95E-03	1.17E-03	4.95E-03	2.69E-03	2.99E-03	2.21E-03	2.31E-03	2.07E-03	2.14E-03	1.17E-03	3.32E-03	2.64E-03
Cobalt (Co)	ug/m^3	4.68E-04	4.33E-04	4.50E-04	4.33E-04	4.39E-04	4.51E-04	4.62E-04	4.59E-04	4.46E-04	4.52E-04	4.68E-04	4.33E-04
Copper (Cu)	ug/m^3	1.03E-01	2.92E-02	3.19E-02	2.99E-02	5.40E-02	3.00E-02	2.92E-02	3.27E-02	1.03E-01	4.41E-02	9.26E-02	6.36E-02
Iron (Fe)	ug/m^3	1.30E+00	2.70E-01	1.30E+00	4.51E-01	8.74E-01	9.28E-01	6.33E-01	2.70E-01	5.35E-01	2.82E-01	9.17E-01	8.39E-01
Lead (Pb)	ug/m^3	4.44E-03	6.89E-04	3.42E-03	1.82E-03	2.63E-03	2.21E-03	4.30E-03	6.89E-04	2.05E-03	2.80E-03	4.44E-03	2.25E-03
Magnesium (Mg)	ug/m^3	5.24E-01	8.91E-02	5.17E-01	1.69E-01	3.46E-01	4.33E-01	2.05E-01	1.65E-01	8.91E-02	1.72E-01	5.24E-01	2.41E-01
Manganese (Mn)	ug/m^3	3.03E-02	9.00E-03	3.03E-02	1.18E-02	2.85E-02	2.61E-02	1.79E-02	1.17E-02	9.00E-03	1.11E-02	2.78E-02	2.05E-02
Molybdenum (Mo)	ug/m^3	3.79E-03	6.50E-04	6.75E-04	6.50E-04	6.59E-04	1.71E-03	6.93E-04	1.84E-03	2.67E-03	2.08E-03	3.79E-03	2.55E-03
Nickel (Ni)	ug/m^3	2.97E-03	6.89E-04	2.97E-03	2.51E-03	2.42E-03	2.39E-03	1.85E-03	6.89E-04	2.63E-03	1.94E-03	2.53E-03	2.47E-03
Phosphorus (P)	ug/m^3	1.59E-01	5.22E-02	1.59E-01	7.97E-02	1.01E-01	6.76E-02	5.22E-02	6.01E-02	5.70E-02	6.19E-02	7.95E-02	5.71E-02
Selenium (Se)	ug/m^3	2.34E-03	2.16E-03	2.25E-03	2.17E-03	2.20E-03	2.25E-03	2.31E-03	2.30E-03	2.23E-03	2.26E-03	2.34E-03	2.16E-03
Silver (Ag)	ug/m^3	4.68E-04	4.33E-04	4.50E-04	4.33E-04	4.39E-04	4.51E-04	4.62E-04	4.59E-04	4.46E-04	4.52E-04	4.68E-04	4.33E-04
Strontium (Sr)	ug/m^3	1.95E-02	2.62E-03	1.95E-02	4.07E-03	7.55E-03	1.85E-02	5.36E-03	3.26E-03	2.81E-03	2.62E-03	1.31E-02	9.47E-03
Thallium (Tl)	ug/m^3	2.34E-03	2.16E-03	2.25E-03	2.17E-03	2.20E-03	2.25E-03	2.31E-03	2.30E-03	2.23E-03	2.26E-03	2.34E-03	2.16E-03
Tin (Sn)	ug/m^3	2.34E-03	2.16E-03	2.25E-03	2.17E-03	2.20E-03	2.25E-03	2.31E-03	2.30E-03	2.23E-03	2.26E-03	2.34E-03	2.16E-03
Titanium (Ti)	ug/m^3	2.03E-02	5.37E-03	1.90E-02	5.46E-03	1.90E-02	1.96E-02	9.98E-03	5.69E-03	6.11E-03	5.37E-03	2.03E-02	1.09E-02
Vanadium (V)	ug/m^3	2.07E-03	4.46E-04	1.03E-03	8.67E-04	1.98E-03	2.07E-03	4.62E-04	4.59E-04	4.46E-04	4.52E-04	1.64E-03	1.25E-03
Zinc (Zn)	ug/m^3	3.70E-02	1.34E-02	2.74E-02	2.86E-02	2.94E-02	3.70E-02	2.84E-02	1.34E-02	2.70E-02	2.71E-02	3.16E-02	3.60E-02
Zirconium (Zr)	ug/m^3	7.79E-04	2.17E-04	2.25E-04	2.17E-04	2.20E-04	6.31E-04	6.01E-04	2.30E-04	2.23E-04	5.42E-04	5.15E-04	7.79E-04
Total Uranium (U)	ug/m^3	1.05E-04	9.73E-05	1.01E-04	9.75E-05	9.88E-05	1.01E-04	1.04E-04	1.03E-04	1.00E-04	1.02E-04	1.05E-04	9.73E-05

Appendix G
PAHs Data Summary

Polycyclic Aromatic Hydrocarbons	Courtice WPCP Station	May - June 2013									
Location		Courtice		Courtice		Courtice		Courtice		Courtice	
Date	dd/mm/yyyy	4/5/2013		16/05/2013		28/05/2013		9/6/2013		21/06/2013	
Start Time	hh:mm	0:00		0:00		0:00		0:00		0:00	
Sample Duration	minutes	22.71		23.68		23.39		24.05		23.61	
Technician		GC, TH, TZ		TH		TZ		TH		TH	
Filter Number		RA3085-01		RRL1919-01		R05866-01		RT1359-01		RU3790-01	
Maxaam ID		RM1721		RP5122		RS7064		RW9389		SB0125	
Analytical Report #		B371552		B377965		B384483		B393402		B3A1814	
Total Volumetric Flow	Am^3/sample	303.16		314.73		316.11		319.33		332.10	
Analytical Results	**Units**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**
Benzo(a)pyrene	µg	<0.01	0.01	0.002	0.000099	0.003	0.00037	0.006	0.0026	0.006	0.0031
1-Methylnaphthalene	µg	3.86	0.1	2.19	0.15	2.79	0.15	2.88	0.15	3.42	0.15
2-Methylnaphthalene	µg	7.8	0.1	4.44	0.15	5.19	0.15	5.7	0.15	6.3	0.15
Acenaphthene	µg	4.48	0.05	2.25	0.075	3.12	0.075	3.42	0.075	4.35	0.075
Acenaphthylene	µg	0.32	0.05	0.27	0.075	<0.075	0.075	0.12	0.075	<0.075	0.075
Anthracene	µg	0.16	0.05	0.3	0.075	0.12	0.075	<0.075	0.075	<0.075	0.075
Benzo(a)anthracene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Benzo(a)fluorene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Benzo(b)fluoranthene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Benzo(b)fluorene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Benzo(e)pyrene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Benzo(g,h,i)perylene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Benzo(k)fluoranthene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Biphenyl	µg	2.24	0.1	1.14	0.15	1.86	0.15	1.77	0.15	2.07	0.15
Chrysene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Dibenz(a,h)anthracene [1]	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Fluoranthene	µg	0.38	0.05	0.36	0.075	0.63	0.075	0.27	0.075	0.51	0.075
Indeno(1,2,3-cd)pyrene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Naphthalene	µg	17.1	0.072	9.33	0.11	12.8	0.11	16.4	0.11	16.9	0.11
o-Terphenyl	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Perylene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Phenanthrene	µg	3.46	0.05	2.67	0.075	3.72	0.075	2.49	0.075	4.11	0.075
Pyrene	µg	0.14	0.05	0.12	0.075	0.18	0.075	0.12	0.075	0.21	0.075
Tetralin	µg	0.62	0.1	0.63	0.15	0.66	0.15	0.93	0.15	0.87	0.15

Calculated Concentrations	Quarter 2 2013			Courtice	Courtice	Courtice	Courtice	Courtice
	Units	Maximum	Minimum	4/5/2013	16/05/2013	28/05/2013	9/6/2013	21/06/2013
Benzo(a)pyrene	ng/m^3	1.88E-02	6.35E-03	1.65E-02	6.35E-03	9.49E-03	1.88E-02	1.81E-02
1-Methylnaphthalene	ng/m^3	1.27E+01	6.96E+00	1.27E+01	6.96E+00	8.83E+00	9.02E+00	1.03E+01
2-Methylnaphthalene	ng/m^3	2.57E+01	1.41E+01	2.57E+01	1.41E+01	1.64E+01	1.78E+01	1.90E+01
Acenaphthene	ng/m^3	1.48E+01	7.15E+00	1.48E+01	7.15E+00	9.87E+00	1.07E+01	1.31E+01
Acenaphthylene	ng/m^3	1.06E+00	1.13E-01	1.06E+00	8.58E-01	1.19E-01	3.76E-01	1.13E-01
Anthracene	ng/m^3	9.53E-01	1.13E-01	5.28E-01	9.53E-01	3.80E-01	1.17E-01	1.13E-01
Benzo(a)anthracene	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Benzo(a)fluorene	ng/m^3	2.38E-01	1.65E-01	1.65E-01	2.38E-01	2.37E-01	2.35E-01	2.26E-01
Benzo(b)fluoranthene	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Benzo(b)fluorene	ng/m^3	2.38E-01	1.65E-01	1.65E-01	2.38E-01	2.37E-01	2.35E-01	2.26E-01
Benzo(e)pyrene	ng/m^3	2.38E-01	1.65E-01	1.65E-01	2.38E-01	2.37E-01	2.35E-01	2.26E-01
Benzo(g,h,i)perylene	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Benzo(k)fluoranthene	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Biphenyl	ng/m^3	7.39E+00	3.62E+00	7.39E+00	3.62E+00	5.88E+00	5.54E+00	6.23E+00
Chrysene	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Dibenz(a,h)anthracene [1]	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Fluoranthene	ng/m^3	1.99E+00	8.46E-01	1.25E+00	1.14E+00	1.99E+00	8.46E-01	1.54E+00
Indeno(1,2,3-cd)pyrene	ng/m^3	1.19E-01	8.25E-02	8.25E-02	1.19E-01	1.19E-01	1.17E-01	1.13E-01
Naphthalene	ng/m^3	5.64E+01	2.96E+01	5.64E+01	2.96E+01	4.05E+01	5.14E+01	5.09E+01
o-Terphenyl	ng/m^3	2.38E-01	1.65E-01	1.65E-01	2.38E-01	2.37E-01	2.35E-01	2.26E-01
Perylene	ng/m^3	2.38E-01	1.65E-01	1.65E-01	2.38E-01	2.37E-01	2.35E-01	2.26E-01
Phenanthrene	ng/m^3	1.24E+01	7.80E+00	1.14E+01	8.48E+00	1.18E+01	7.80E+00	1.24E+01
Pyrene	ng/m^3	6.32E-01	3.76E-01	4.62E-01	3.81E-01	5.69E-01	3.76E-01	6.32E-01
Tetralin	ng/m^3	2.91E+00	2.00E+00	2.05E+00	2.00E+00	2.09E+00	2.91E+00	2.62E+00
Total PAH	ng/m^3	1.35E+02	7.73E+01	1.35E+02	7.73E+01	1.00E+02	1.09E+02	1.19E+02

Note:
RDL = Reportable Detection Limit

1. Dibenzo(a,c)anthracene was not reported for May and June, 2013 samples. Based on laboratory analyses, dibenzo(a,c)anthracene co-elutes with dibenz(a,h)anthracene and a value is below estimated minimum detection limit.

Polycyclic Aromatic Hydrocarbons	Rundle Road Station	May - June 2013									
Location		Rundle		Rundle		Rundle		Rundle		Rundle	
Date	dd/mm/yyyy	04/05/2013		16/05/2013		28/05/2013		09/06/2013		21/06/2013	
Start Time	hh:mm	0:00		0:00		0:00		0:00		0:00	
Sample Duration	minutes	24.23		23.43		24		24		23.24	
Technician		GC, TH, TZ		TH		TZ		TH		TH	
Filter Number		RA3084-01		RRL1918-01		R05865-01		RT1358-01		RU3791-01	
Maxaam ID		RM1722		RP5123		RS7065		RW9390		SB0126	
Analytical Report #		B371552		B377965		B384483		B393402		B3A1814	
Total Volumetric Flow	Am^3/sample	321.75		329.31		311.07		319.83		311.02	
Analytical Results	**Units**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**
Benzo(a)pyrene	µg	<0.01	0.01	0.003	0.00014	0.004	0.00036	0.003	0.0024	0.016	0.0034
1-Methylnaphthalene	µg	1.96	0.1	1.38	0.15	2.25	0.15	3.00	0.15	3.51	0.15
2-Methylnaphthalene	µg	3.78	0.1	2.73	0.15	4.32	0.15	5.82	0.15	6.48	0.15
Acenaphthene	µg	2.76	0.05	0.93	0.075	1.32	0.075	3.57	0.075	4.47	0.075
Acenaphthylene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Anthracene	µg	0.14	0.05	<0.075	0.075	<0.075	0.075	0.21	0.075	0.36	0.075
Benzo(a)anthracene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Benzo(a)fluorene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Benzo(b)fluoranthene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Benzo(b)fluorene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Benzo(e)pyrene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Benzo(g,h,i)perylene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Benzo(k)fluoranthene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Biphenyl	µg	1.18	0.1	0.6	0.15	1.14	0.15	1.5	0.15	1.65	0.15
Chrysene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Dibenz(a,h)anthracene [1]	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Dibenzo(a,c) anthracene + Picene [2]	µg	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg	0.66	0.05	0.15	0.075	0.42	0.075	1.08	0.075	1.71	0.075
Indeno(1,2,3-cd)pyrene	µg	<0.050	0.05	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075
Naphthalene	µg	8.12	0.072	5.73	0.11	11.1	0.11	13.5	0.11	11.8	0.11
o-Terphenyl	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Perylene	µg	<0.10	0.1	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15
Phenanthrene	µg	2.88	0.05	0.96	0.075	1.86	0.075	4.23	0.075	6.75	0.075
Pyrene	µg	0.24	0.05	0.09	0.075	0.15	0.075	0.45	0.075	0.75	0.075
Tetralin	µg	0.54	0.1	0.63	0.15	0.93	0.15	0.87	0.15	1.38	0.15

Calculated Concentrations	Quarter 2 2013			Rundle	Rundle	Rundle	Rundle	Rundle
	Units	Maximum	Minimum	04/05/2013	16/05/2013	28/05/2013	09/06/2013	21/06/2013
Benzo(a)pyrene	ng/m^3	5.14E-02	9.11E-03	1.55E-02	9.11E-03	1.29E-02	9.38E-03	5.14E-02
1-Methylnaphthalene	ng/m^3	1.13E+01	4.19E+00	6.09E+00	4.19E+00	7.23E+00	9.38E+00	1.13E+01
2-Methylnaphthalene	ng/m^3	2.08E+01	8.29E+00	1.17E+01	8.29E+00	1.39E+01	1.82E+01	2.08E+01
Acenaphthene	ng/m^3	1.44E+01	2.82E+00	8.58E+00	2.82E+00	4.24E+00	1.12E+01	1.44E+01
Acenaphthylene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Anthracene	ng/m^3	1.16E+00	1.14E-01	4.35E-01	1.14E-01	1.21E-01	6.57E-01	1.16E+00
Benzo(a)anthracene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Benzo(a)fluorene	ng/m^3	2.41E-01	1.55E-01	1.55E-01	2.28E-01	2.41E-01	2.35E-01	2.41E-01
Benzo(b)fluoranthene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Benzo(b)fluorene	ng/m^3	2.41E-01	1.55E-01	1.55E-01	2.28E-01	2.41E-01	2.35E-01	2.41E-01
Benzo(e)pyrene	ng/m^3	2.41E-01	1.55E-01	1.55E-01	2.28E-01	2.41E-01	2.35E-01	2.41E-01
Benzo(g,h,i)perylene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Benzo(k)fluoranthene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Biphenyl	ng/m^3	5.31E+00	1.82E+00	3.67E+00	1.82E+00	3.66E+00	4.69E+00	5.31E+00
Chrysene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Dibenz(a,h)anthracene [1]	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Fluoranthene	ng/m^3	5.50E+00	4.55E-01	2.05E+00	4.55E-01	1.35E+00	3.38E+00	5.50E+00
Indeno(1,2,3-cd)pyrene	ng/m^3	1.21E-01	7.77E-02	7.77E-02	1.14E-01	1.21E-01	1.17E-01	1.21E-01
Naphthalene	ng/m^3	4.22E+01	1.74E+01	2.52E+01	1.74E+01	3.57E+01	4.22E+01	3.79E+01
o-Terphenyl	ng/m^3	2.41E-01	1.55E-01	1.55E-01	2.28E-01	2.41E-01	2.35E-01	2.41E-01
Perylene	ng/m^3	2.41E-01	1.55E-01	1.55E-01	2.28E-01	2.41E-01	2.35E-01	2.41E-01
Phenanthrene	ng/m^3	2.17E+01	2.92E+00	8.95E+00	2.92E+00	5.98E+00	1.32E+01	2.17E+01
Pyrene	ng/m^3	2.41E+00	2.73E-01	7.46E-01	2.73E-01	4.82E-01	1.41E+00	2.41E+00
Tetralin	ng/m^3	4.44E+00	1.68E+00	1.68E+00	1.91E+00	2.99E+00	2.72E+00	4.44E+00
Total PAH	ng/m^3	1.27E+02	4.23E+01	7.06E+01	4.23E+01	7.78E+01	1.09E+02	1.27E+02

Note:
RDL = Reportable Detection Limit
1. Dibenzo(a,c)anthracene was not reported for May and June, 2013 samples. Based on laboratory analyses, dibenzo(a,c)anthracene co-elutes with dibenz(a,h)anthracene and a value is below estimated minimum detection limit.

Concentration exceeding the applicable criteria.

Appendix H
Dioxins and Furans Data Summary

Dioxins and Furans	Courtice WPCP Station	May - June 2013	
Location		Courtice	Courtice
Date	dd/mm/yyyy	16/05/2013	9/6/2013
Start Time	hh:mm	0:00	0:00
Sample Duration	minutes	23.68	24.05
Technician		TH	TH
Filter Number		RRL1919-01	RT1359-01
Maxaam ID		RP5122	RW9389
Analytical Report #		B377965	B393402
Total Volumetric Flow	Am^3/sample	314.73	319.33

Analytical Results	Units	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF
2,3,7,8-Tetra CDD *	pg	8	3	1	<3.0	3	1
1,2,3,7,8-Penta CDD	pg	<3.2	3.2	1	<3.0	3	1
1,2,3,4,7,8-Hexa CDD	pg	<3.3	3.3	0.1	<3.6	3.6	0.1
1,2,3,6,7,8-Hexa CDD	pg	<2.8	2.8	0.1	<3.0	3	0.1
1,2,3,7,8,9-Hexa CDD	pg	<2.9	2.9	0.1	<5.2 (1)	5.2	0.1
1,2,3,4,6,7,8-Hepta CDD	pg	8	3.1	0.01	46	3	0.01
Octa CDD	pg	52	3.2	0.0003	187	3	0.0003
Total Tetra CDD	pg	<16 (1)	16		<9.9 (1)	9.9	
Total Penta CDD	pg	<11 (1)	11		<11 (1)	11	
Total Hexa CDD	pg	<43 (1)	43		10	3.2	
Total Hepta CDD	pg	8	3.1		97	3	
2,3,7,8-Tetra CDF **	pg	<3.1	3.1	0.1	<3.0	3	0.1
1,2,3,7,8-Penta CDF	pg	<3.1	3.1	0.03	<3.1	3.1	0.03
2,3,4,7,8-Penta CDF	pg	<3.0	3	0.3	<3.0	3	0.3
1,2,3,4,7,8-Hexa CDF	pg	<3.0	3	0.1	<3.9 (1)	3.9	0.1
1,2,3,6,7,8-Hexa CDF	pg	<2.6	2.6	0.1	<2.6	2.6	0.1
2,3,4,6,7,8-Hexa CDF	pg	<3.1	3.1	0.1	6	3.1	0.1
1,2,3,7,8,9-Hexa CDF	pg	<3.4	3.4	0.1	<3.4	3.4	0.1
1,2,3,4,6,7,8-Hepta CDF	pg	<2.8	2.8	0.01	11	2.8	0.01
1,2,3,4,7,8,9-Hepta CDF	pg	<3.6	3.6	0.01	5	3.6	0.01
Octa CDF	pg	<4.4 (1)	4.4	0.0003	15	3	0.0003
Total Tetra CDF	pg	<4.1 (1)	4.1		<3.3 (1)	3.3	
Total Penta CDF	pg	<3.0	3		<3.1	3.1	
Total Hexa CDF	pg	<3.0	3		6	3	
Total Hepta CDF	pg	<3.2	3.2		29	3.1	
Toxic Equivalency	pg	8.1	3.1		<3.0	3	

Calculated Concentrations	Units	Quarter 2 2013 Maximum	Quarter 2 2013 Minimum	Courtice 16/05/2013	Courtice 9/6/2013
2,3,7,8-Tetra CDD *	pg/m^3	2.54E-02	4.70E-03	2.54E-02	4.70E-03
1,2,3,7,8-Penta CDD	pg/m^3	5.08E-03	4.70E-03	5.08E-03	4.70E-03
1,2,3,4,7,8-Hexa CDD	pg/m^3	5.64E-03	5.24E-03	5.24E-03	5.64E-03
1,2,3,6,7,8-Hexa CDD	pg/m^3	4.70E-03	4.45E-03	4.45E-03	4.70E-03
1,2,3,7,8,9-Hexa CDD	pg/m^3	8.14E-03	4.61E-03	4.61E-03	8.14E-03
1,2,3,4,6,7,8-Hepta CDD	pg/m^3	1.44E-01	2.54E-02	2.54E-02	1.44E-01
Octa CDD	pg/m^3	5.86E-01	1.65E-01	1.65E-01	5.86E-01
Total Tetra CDD	pg/m^3	2.54E-02	1.55E-02	2.54E-02	1.55E-02
Total Penta CDD	pg/m^3	1.75E-02	1.72E-02	1.75E-02	1.72E-02
Total Hexa CDD	pg/m^3	6.83E-02	3.13E-02	6.83E-02	3.13E-02
Total Hepta CDD	pg/m^3	3.04E-01	2.54E-02	2.54E-02	3.04E-01
2,3,7,8-Tetra CDF **	pg/m^3	4.92E-03	4.70E-03	4.92E-03	4.70E-03
1,2,3,7,8-Penta CDF	pg/m^3	4.92E-03	4.85E-03	4.92E-03	4.85E-03
2,3,4,7,8-Penta CDF	pg/m^3	4.77E-03	4.70E-03	4.77E-03	4.70E-03
1,2,3,4,7,8-Hexa CDF	pg/m^3	6.11E-03	4.77E-03	4.77E-03	6.11E-03
1,2,3,6,7,8-Hexa CDF	pg/m^3	4.13E-03	4.07E-03	4.13E-03	4.07E-03
2,3,4,6,7,8-Hexa CDF	pg/m^3	1.88E-02	4.92E-03	4.92E-03	1.88E-02
1,2,3,7,8,9-Hexa CDF	pg/m^3	5.40E-03	5.32E-03	5.40E-03	5.32E-03
1,2,3,4,6,7,8-Hepta CDF	pg/m^3	3.44E-02	4.45E-03	4.45E-03	3.44E-02
1,2,3,4,7,8,9-Hepta CDF	pg/m^3	1.57E-02	5.72E-03	5.72E-03	1.57E-02
Octa CDF	pg/m^3	4.70E-02	6.99E-03	6.99E-03	4.70E-02
Total Tetra CDF	pg/m^3	6.51E-03	5.17E-03	6.51E-03	5.17E-03
Total Penta CDF	pg/m^3	4.85E-03	4.77E-03	4.77E-03	4.85E-03
Total Hexa CDF	pg/m^3	1.88E-02	4.77E-03	4.77E-03	1.88E-02
Total Hepta CDF	pg/m^3	9.08E-02	5.08E-03	5.08E-03	9.08E-02
Toxic Equivalency	pg/m^3			2.57E-02	4.70E-03
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	3.63E-02	1.88E-02	3.63E-02	1.88E-02

Calculated TEQ Concentrations	Units	Courtice 16/05/2013	Courtice 9/6/2013
2,3,7,8-Tetra CDD *	pg TEQ/m^3	2.54E-02	4.70E-03
1,2,3,7,8-Penta CDD	pg TEQ/m^3	5.08E-03	4.70E-03
1,2,3,4,7,8-Hexa CDD	pg TEQ/m^3	5.24E-04	5.64E-04
1,2,3,6,7,8-Hexa CDD	pg TEQ/m^3	4.45E-04	4.70E-04
1,2,3,7,8,9-Hexa CDD	pg TEQ/m^3	4.61E-04	8.14E-04
1,2,3,4,6,7,8-Hepta CDD	pg TEQ/m^3	2.54E-04	1.44E-03
Octa CDD	pg TEQ/m^3	4.96E-05	1.76E-04
Total Tetra CDD	pg TEQ/m^3		
Total Penta CDD	pg TEQ/m^3		
Total Hexa CDD	pg TEQ/m^3		
Total Hepta CDD	pg TEQ/m^3		
2,3,7,8-Tetra CDF **	pg TEQ/m^3	4.92E-04	4.70E-04
1,2,3,7,8-Penta CDF	pg TEQ/m^3	1.48E-04	1.46E-04
2,3,4,7,8-Penta CDF	pg TEQ/m^3	1.43E-03	1.41E-03
1,2,3,4,7,8-Hexa CDF	pg TEQ/m^3	4.77E-04	6.11E-04
1,2,3,6,7,8-Hexa CDF	pg TEQ/m^3	4.13E-04	4.07E-04
2,3,4,6,7,8-Hexa CDF	pg TEQ/m^3	4.92E-04	1.88E-03
1,2,3,7,8,9-Hexa CDF	pg TEQ/m^3	5.40E-04	5.32E-04
1,2,3,4,6,7,8-Hepta CDF	pg TEQ/m^3	4.45E-05	3.44E-04
1,2,3,4,7,8,9-Hepta CDF	pg TEQ/m^3	5.72E-05	1.57E-04
Octa CDF	pg TEQ/m^3	2.10E-06	1.41E-05
Total Tetra CDF	pg TEQ/m^3		
Total Penta CDF	pg TEQ/m^3		
Total Hexa CDF	pg TEQ/m^3		
Total Hepta CDF	pg TEQ/m^3		
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	3.63E-02	1.88E-02

Notes:
EDL = Estimated Detection Limit
* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

Dioxins and Furans	Rundle Road Station	May - June 2013					
Location		Rundle			Rundle		
Date	dd/mm/yyyy	5/16/2013			6/9/2013		
Start Time	hh:mm	0:00			0:00		
Sample Duration	minutes	23.43			24		
Technician		TH			TH		
Filter Number		RRL1918-01			RT1358-01		
Maxaam ID		RP5123			RW9390		
Analytical Report #		B377965			B393402		
Total Volumetric Flow	Am^3/sample	329.31			319.83		
Analytical Results	Units	Value	RDL	WHO_{2005} TEF	Value	RDL	WHO_{2005} TEF
2,3,7,8-Tetra CDD *	pg	<3.2	3.2	1	<3.0	3	1
1,2,3,7,8-Penta CDD	pg	<3.2	3.2	1	<3.2	3.2	1
1,2,3,4,7,8-Hexa CDD	pg	<3.5	3.5	0.1	<2.9 (1)	2.9	0.1
1,2,3,6,7,8-Hexa CDD	pg	<2.9	2.9	0.1	5	3	0.1
1,2,3,7,8,9-Hexa CDD	pg	<3.0	3	0.1	<5.3 (1)	5.3	0.1
1,2,3,4,6,7,8-Hepta CDD	pg	11	3.1	0.01	53	3.2	0.01
Octa CDD	pg	58	3.3	0.0003	281	3.1	0.0003
Total Tetra CDD	pg	<18 (1)	18		<10 (1)	10	
Total Penta CDD	pg	<13 (1)	13		<15 (1)	15	
Total Hexa CDD	pg	<42 (1)	42		22	3.2	
Total Hepta CDD	pg	11	3.1		127	3.2	
2,3,7,8-Tetra CDF **	pg	<3.0	3	0.1	<3.1	3.1	0.1
1,2,3,7,8-Penta CDF	pg	<3.2	3.2	0.03	<3.2	3.2	0.03
2,3,4,7,8-Penta CDF	pg	<3.1	3.1	0.3	<3.1	3.1	0.3
1,2,3,4,7,8-Hexa CDF	pg	<3.3	3.3	0.1	<4.2 (1)	4.2	0.1
1,2,3,6,7,8-Hexa CDF	pg	<2.8	2.8	0.1	3	2.7	0.1
2,3,4,6,7,8-Hexa CDF	pg	<3.3	3.3	0.1	4	3.2	0.1
1,2,3,7,8,9-Hexa CDF	pg	<3.6	3.6	0.1	5	3.5	0.1
1,2,3,4,6,7,8-Hepta CDF	pg	<2.8	2.8	0.01	10	2.8	0.01
1,2,3,4,7,8,9-Hepta CDF	pg	<3.6	3.6	0.01	<6.0 (1)	6	0.01
Octa CDF	pg	<3.3	3.3	0.0003	13	3.1	0.0003
Total Tetra CDF	pg	<4.7 (1)	4.7		<3.9 (1)	3.9	
Total Penta CDF	pg	<3.2	3.2		<3.2	3.2	
Total Hexa CDF	pg	<3.2	3.2		12	3.1	
Total Hepta CDF	pg	<3.2	3.2		18	3.2	
Toxic Equivalency	pg	<3.0	3		<3.1	3.1	

Calculated Concentrations	Quarter 2 2013			Rundle	Rundle
	Units	Maximum	Minimum	5/16/2013	6/9/2013
2,3,7,8-Tetra CDD *	pg/m3	4.86E-03	4.69E-03	4.86E-03	4.69E-03
1,2,3,7,8-Penta CDD	pg/m3	5.00E-03	4.86E-03	4.86E-03	5.00E-03
1,2,3,4,7,8-Hexa CDD	pg/m3	5.31E-03	4.53E-03	5.31E-03	4.53E-03
1,2,3,6,7,8-Hexa CDD	pg/m3	1.56E-02	4.40E-03	4.40E-03	1.56E-02
1,2,3,7,8,9-Hexa CDD	pg/m3	8.29E-03	4.55E-03	4.55E-03	8.29E-03
1,2,3,4,6,7,8-Hepta CDD	pg/m3	1.66E-01	3.34E-02	3.34E-02	1.66E-01
Octa CDD	pg/m3	8.79E-01	1.76E-01	1.76E-01	8.79E-01
Total Tetra CDD	pg/m3	2.73E-02	1.56E-02	2.73E-02	1.56E-02
Total Penta CDD	pg/m3	2.35E-02	1.97E-02	1.97E-02	2.35E-02
Total Hexa CDD	pg/m3	6.88E-02	6.38E-02	6.38E-02	6.88E-02
Total Hepta CDD	pg/m3	3.97E-01	3.34E-02	3.34E-02	3.97E-01
2,3,7,8-Tetra CDF **	pg/m3	4.85E-03	4.55E-03	4.55E-03	4.85E-03
1,2,3,7,8-Penta CDF	pg/m3	5.00E-03	4.86E-03	4.86E-03	5.00E-03
2,3,4,7,8-Penta CDF	pg/m3	4.85E-03	4.71E-03	4.71E-03	4.85E-03
1,2,3,4,7,8-Hexa CDF	pg/m3	6.57E-03	5.01E-03	5.01E-03	6.57E-03
1,2,3,6,7,8-Hexa CDF	pg/m3	9.38E-03	4.25E-03	4.25E-03	9.38E-03
2,3,4,6,7,8-Hexa CDF	pg/m3	1.25E-02	5.01E-03	5.01E-03	1.25E-02
1,2,3,7,8,9-Hexa CDF	pg/m3	1.56E-02	5.47E-03	5.47E-03	1.56E-02
1,2,3,4,6,7,8-Hepta CDF	pg/m3	3.13E-02	4.25E-03	4.25E-03	3.13E-02
1,2,3,4,7,8,9-Hepta CDF	pg/m3	9.38E-03	5.47E-03	5.47E-03	9.38E-03
Octa CDF	pg/m3	4.06E-02	5.01E-03	5.01E-03	4.06E-02
Total Tetra CDF	pg/m3	7.14E-03	6.10E-03	7.14E-03	6.10E-03
Total Penta CDF	pg/m3	5.00E-03	4.86E-03	4.86E-03	5.00E-03
Total Hexa CDF	pg/m3	3.75E-02	4.86E-03	4.86E-03	3.75E-02
Total Hepta CDF	pg/m3	5.63E-02	4.86E-03	4.86E-03	5.63E-02
Toxic Equivalency	pg/m3			4.55E-03	4.85E-03
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	2.14E-02	1.56E-02	1.56E-02	2.14E-02
Calculated TEQ Concentrations	**Units**			**Rundle**	**Rundle**
				41410	**41434**
2,3,7,8-Tetra CDD *	pg TEQ/m^3			4.86E-03	4.69E-03
1,2,3,7,8-Penta CDD	pg TEQ/m^3			4.86E-03	5.00E-03
1,2,3,4,7,8-Hexa CDD	pg TEQ/m^3			5.31E-04	4.53E-04
1,2,3,6,7,8-Hexa CDD	pg TEQ/m^3			4.40E-04	1.56E-03
1,2,3,7,8,9-Hexa CDD	pg TEQ/m^3			4.55E-04	8.29E-04
1,2,3,4,6,7,8-Hepta CDD	pg TEQ/m^3			3.34E-04	1.66E-03
Octa CDD	pg TEQ/m^3			5.28E-05	2.64E-04
Total Tetra CDD	pg TEQ/m^3				
Total Penta CDD	pg TEQ/m^3				
Total Hexa CDD	pg TEQ/m^3				
Total Hepta CDD	pg TEQ/m^3				
2,3,7,8-Tetra CDF **	pg TEQ/m^3			4.55E-04	4.85E-04
1,2,3,7,8-Penta CDF	pg TEQ/m^3			1.46E-04	1.50E-04
2,3,4,7,8-Penta CDF	pg TEQ/m^3			1.41E-03	1.45E-03
1,2,3,4,7,8-Hexa CDF	pg TEQ/m^3			5.01E-04	6.57E-04
1,2,3,6,7,8-Hexa CDF	pg TEQ/m^3			4.25E-04	9.38E-04
2,3,4,6,7,8-Hexa CDF	pg TEQ/m^3			5.01E-04	1.25E-03
1,2,3,7,8,9-Hexa CDF	pg TEQ/m^3			5.47E-04	1.56E-03
1,2,3,4,6,7,8-Hepta CDF	pg TEQ/m^3			4.25E-05	3.13E-04
1,2,3,4,7,8,9-Hepta CDF	pg TEQ/m^3			5.47E-05	9.38E-05
Octa CDF	pg TEQ/m^3			1.50E-06	1.22E-05
Total Tetra CDF	pg TEQ/m^3				
Total Penta CDF	pg TEQ/m^3				
Total Hexa CDF	pg TEQ/m^3				
Total Hepta CDF	pg TEQ/m^3				
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3			1.56E-02	2.14E-02

Notes:
RDL = Reportable Detection Limit
* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds