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November 20, 2015
File: 160950528

Attention: Mr. Greg Borchuk, P.Eng.
Project Manager, EFW
Waste Management Services

The Region of Durham
605 Rossland Rd.,
Whitby, ON L1N 6A3

Dear Mr. Borchuk,

Reference: Q2 2015 Ambient Air Quality Monitoring Report for the Durham York Energy Centre – Crago Road Station

Please find attached with this letter the Q2 2015 quarterly report for the Durham York Energy Centre (DYEC) Crago Road Station.

This quarterly report provides a summary of the measurements collected at this station during April to June 2015 (calendar Quarter 2 of 2015). All equipment operated well during this measurement period with the exception of the continuous PM_{2.5} monitor, for which a failure of the beta detector occurred. This issue was rectified under the manufacturer's warranty, but resulted in about a 2-week period during which the monitor was not operational. The data recovery rate for the PM_{2.5} monitor was 85.1% during the April-June period, which is above the acceptable MOECC requirement with respect to editing continuous monitor data.

Regional Council has requested that 98th percentile PM_{2.5} data also be provided along with the quarterly reports, which is provided in Table 1 below. A comparison to the Canadian Ambient Air Quality Standard (CAAQS) for PM_{2.5} requires averaging the 98th percentile daily average levels in each of three consecutive years. The value presented in Table 1 corresponds to the 98th percentile over the 8 month monitoring period. Two years and 4-months of additional data will be required in order to provide an explicit comparison to the current CAAQS criteria of 28 µg/m³.



November 20, 2015
Mr. Greg Borchuk, P.Eng.
Project Manager, EFW
Waste Management Services

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Reference: Q2 2015 Ambient Air Quality Monitoring Report for the Durham York Energy Centre - Crago Road Station

Table 1 Summary of the 98th Percentile Daily Average PM_{2.5} Concentrations Measured to Date (µg/m³)

Period	Crago Road Monitoring Station
November 2014 – June 2015	22.5

Regards,

STANTEC CONSULTING LTD.

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**Quarterly Ambient Air Quality
Monitoring Report for the Durham
York Energy Centre (Crago Road
Station) – April to June 2015**

Durham York Energy Centre



Prepared for:
The Regional Municipality of
Durham
605 Rossland Rd
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Project No.: 160950528

November 20, 2015

Sign-off Sheet

This document entitled Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Crago Road Station) – April to June 2015 was prepared by Stantec Consulting Ltd. for the account of The Regional Municipality 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.

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Timothy Hung, B.A.Sc.

Reviewed by: Gregory Crooks
(signature)

For: Gregory Crooks M.Eng., P.Eng.

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**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

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**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
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QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

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 a long-term, sustainable solution to manage municipal solid waste remaining after diversion from the Regions. The facility commenced processing waste on February 13, 2015 and is currently in the commissioning phase of the project.

As requested by the Regional Municipality of Durham (the Region), a third ambient air monitoring station located near the corner of Crago and Osborne Roads was installed in October/November 2014. This station, which is not part of the Ambient Air Quality Monitoring Plan - Durham York Residual Waste Study (Stantec, May 8, 2012), is operated following the same protocols as the other two stations (Courtice WPCP and Rundle Road Stations) already in operation. The plan developed for the Courtice WPCP and Rundle Road Stations was 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 (MOECC, 2010). The air monitoring plan was also developed to satisfy the conditions of the Environmental Compliance Approval and the environmental mitigation and commitments set out in the Environmental Assessment (Jacques Whitford, 2009).

Since November 2014, the predominantly downwind Crago Road Station has measured the following air contaminants continuously:

- Sulphur Dioxide (SO_2);
- Nitrogen Oxides (NO_x); and,
- Particulate Matter smaller than 2.5 microns ($\text{PM}_{2.5}$);

Operation of non-continuous monitors at the third station was not started as per Section 1.2 of the Ambient Monitoring Plan (Stantec, 2012). When the EFW facility is fully operational, monitoring of non-continuous monitors will start (as specified in the Ambient Monitoring Plan). The following air contaminants will be measured non-continuously:

- Metals in total suspended particulate matter (TSP);
- Polycyclic Aromatic Hydrocarbons (PAHs); and,
- Dioxins and Furans.

The predominantly downwind Crago Road station also measures horizontal wind speed, wind direction, atmospheric temperature, relative humidity and rainfall.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

This quarterly report provides a summary of the ambient air quality data collected at the Crago Road station for the period April to June 2015 (Calendar Quarter 2). During this quarter, the malfunction of the sensor in the Thermo Sharpe 5030 PM_{2.5} monitor (which required a replacement part to be ordered and installed) resulted in an 85.1% data recovery rate during the April-June period. Instrumentation recovery rates 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 NO₂, SO₂ and PM_{2.5} were below the applicable O. Reg. 419/05 criteria or human health risk assessment (HHRA) health-based standards presented in **Table 2-1** of this report;
2. Since the Canadian Ambient Air Quality Standard (CAAQS) for PM_{2.5} is based on a 98th percentile level over 3 years, whereas the PM_{2.5} measurement period at the Crago Road station for this quarterly report was three months, there was insufficient data collected to determine with any certainty if exceedances of the CAAQS would occur. Therefore no comparison of the measured PM_{2.5} data during this quarter to the CAAQS was conducted for this report, as it would not be scientifically accurate or representative; and,
3. In summary, all monitored contaminants were below their applicable MOECC criteria for the monitoring data presented in this report. All measured levels of all monitored contaminants were below their applicable HHRA health-based standards.

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Abbreviations

AAQC	Ambient Air Quality Criteria
CAAQS	Canadian Ambient Air Quality Standard
CAC	Criteria Air Contaminants
D/Fs	Dioxins and Furans
DYEC	Durham York Energy Centre
EFW	Energy from Waste
MOECC	Ontario Ministry of the Environment and Climate Change
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
Ag	Silver
Tl	Thallium
Sn	Tin
V	Vanadium
Zn	Zinc

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Miscellaneous

°C	temperature in degrees Celsius
N/A	not available
%	percent
ppm	part per million
ppb	part per billion
ppt	part per trillion
min	minimum
max	maximum
µg/m ³	microgram per cubic metre

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Introduction
November 20, 2015

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 facility commenced processing waste on February 13, 2015 and is currently in the commissioning phase of the project. The site location of the DYEC is shown in **Figure 1-1**.

As requested by the Regional Municipality of Durham (the Region), a third ambient air monitoring station located near the corner of Crago and Osborne Roads was installed. This station, which is not part of the Ambient Air Quality Monitoring Plan - Durham York Residual Waste Study (Stantec, May 8, 2012), is operated following the same protocols as the other two stations (Courtice WPCP and Rundle Road Stations) already in operation. The plan developed for the Courtice WPCP and Rundle Road Stations was 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);
1. Monitor concentration levels of EFW-related air contaminants in nearby residential areas; and,
2. Quantify background ambient levels of air contaminants in the area.

Since November 2014, the predominantly downwind Crago Road station has measured the following air contaminants continuously:

- Sulphur Dioxide (SO_2);
- Nitrogen Oxides (NO_x); and,
- Particulate Matter smaller than 2.5 microns ($\text{PM}_{2.5}$);

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Introduction
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Operation of the non-continuous monitors at the third station was not started as per Section 1.2 of the Ambient Monitoring Plan (Stantec, 2012). When the EFW facility is fully operational, monitoring of non-continuous monitors will start (as specified in the Ambient Monitoring Plan). The following air contaminants will be measured non-continuously:

- 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 this station for the period April to June 2015.

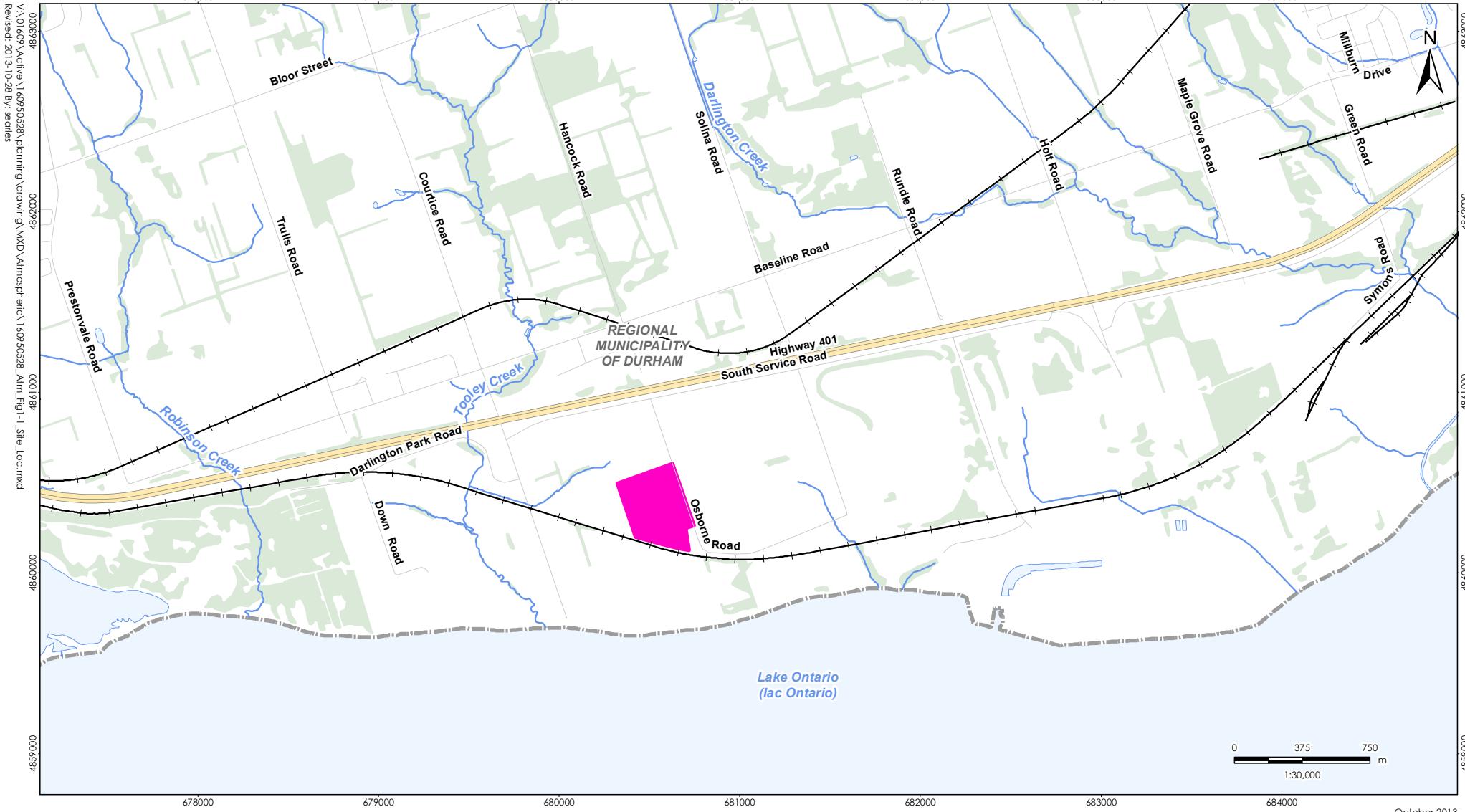
1.2 LOCATION OF AMBIENT AIR QUALITY MONITORING STATION

The selection of the site for the monitoring station was done in consultation with Durham/York representatives, with consideration of the location of the existing monitoring stations and general MOECC siting criteria. The final location of the monitoring station was influenced by the availability of electrical power, accessibility of each location, and security.

The selected location is sited east of the DYEC in the vicinity of the Darlington Hydro Upper and Lower Soccer Fields. The predominantly downwind Crago Road Station is located on the east side of Crago Road, north of Osborne 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 Crago Road Station.

A fourth Fence Line Station, which will measure non-continuous parameters (metals and total particulate matter) will be installed prior to full operation of the DYEC and run for a one-year period.

A photograph of the Crago Road ambient air quality monitoring station is shown in **Figure 1-3**.



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

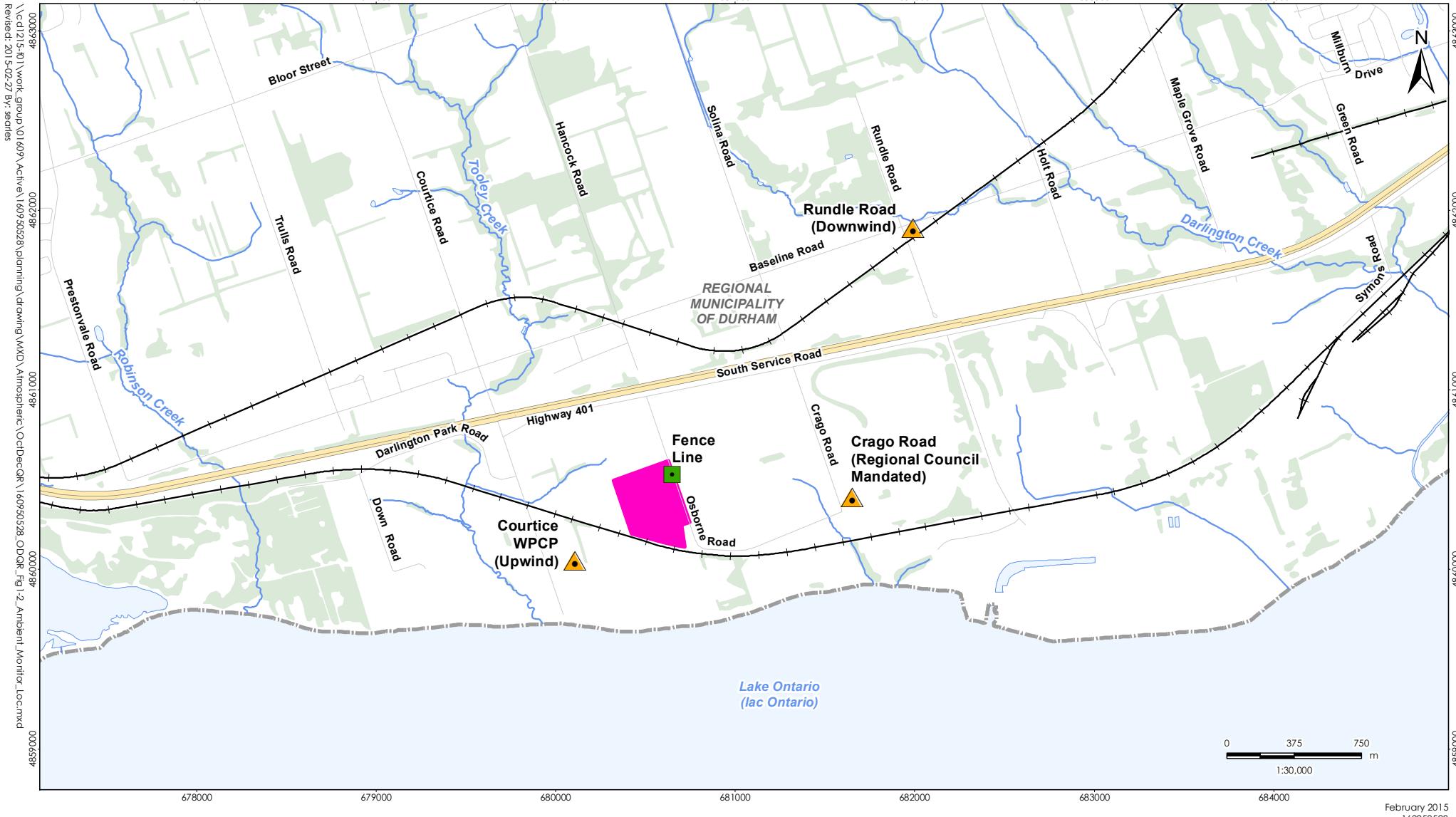
The Region of Durham
Durham York Energy Centre

Figure No.

1-1

Title

Site Location Plan



Legend

- ▲ Station Location
- Fence Line Station Location
(Monitoring to begin after DYEC commissioning period)
- Durham York Energy Centre Site
- Railway
- Road
- Highway

- Watercourse
- Waterbody
- Wooded Area

Client/Project

The Region of Durham
Durham York Energy Centre

Figure No.

1-2

Title

Locations of Ambient Monitoring Stations

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N

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**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Introduction
November 20, 2015

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



QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Key Components Assessed
November 20, 2015

2.0 KEY COMPONENTS ASSESSED

2.1 METEOROLOGY

The following meteorological parameters are measured at the Crago Road monitoring station:

- Wind Speed and Direction @10-m;
- Ambient Temperature @ 2-m;
- Relative Humidity; and,
- Rainfall.

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:

- Continuously monitored:
 - Sulphur Dioxide (SO₂);
 - Nitrogen Oxides (NO_x); and,
 - Particulate Matter smaller than 2.5 microns (PM_{2.5}).
- Non-Continuously monitored:
 - Metals in Total Suspended Particulate (TSP) matter;
 - Polycyclic Aromatic Hydrocarbons (PAHs); and,
 - Dioxins and Furans.

Operation of the non-continuous monitors at the Crago Road station was not started as per Section 1.2 of the Ambient Monitoring Plan (Stantec, 2012). When the EFW facility is fully operational, monitoring of non-continuous monitors will start (as specified in the Ambient Monitoring Plan). Therefore, the non-continuously monitored contaminants listed above were not monitored during this quarter.

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 throughout 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, 2009) were used as the second set of standards.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Key Components Assessed
November 20, 2015

The previously applicable 24-hour average Canada-Wide Standard (CWS) for PM_{2.5} of 30 µg/m³ (98th percentile averaged over 3 consecutive years), has been superseded by a new Canadian Ambient Air Quality Standard (CAAQS) of 28 µg/m³ (98th percentile averaged over 3 consecutive years) as noted in **Table 2-1**. The proposed CAAQS 24-hour objective for 2020 is 27 µg/m³.

A summary of the relevant air quality criteria for the contaminants monitored in Q2 2015 is presented in **Table 2-1**.

Table 2-1 Summary of Air Quality Criteria for CACs

Contaminant	CAS	O. Reg 419/05 – Schedule 3/AAQC			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	Canadian Ambient Air Quality Standards (CAAQS)			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		28 ^B	10 ^C		30 ^D	

Notes:

- A. The Schedule 3 standards for NO_x are based on health effects of NO₂, as NO₂ has adverse health effects at much lower concentrations than NO. Therefore the standard was compared to NO₂ 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. Canadian Ambient Air Quality Standards (CAAQS) for Respirable Particulate Matter and Ozone, effective by 2015 (CCME, 2012). The Respirable Particulate Matter Objective is referenced to the 98th percentile daily average concentration averaged over 3 consecutive years.
- C. Annual Canadian Ambient Air Quality Standard for Respirable Particulate Matter, effective by 2015. The Respirable Particulate Matter Objective is referenced to the 3-year average of the annual average concentrations.
- D. HHRA Health-Based Standard for PM_{2.5} was selected referencing CCME (2006).

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Instrumentation Summary
November 20, 2015

3.0 INSTRUMENTATION SUMMARY

3.1 INSTRUMENTATION

The measurement program at the monitoring site includes both continuous and non-continuous monitors to sample air contaminant concentrations. The analyzers were set up in October to November 2014, and monitoring started on November 15, 2014.

Monitoring for respirable particulate matter (PM_{2.5}), nitrogen oxides (NO_x) and sulphur dioxide (SO₂) 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
SO ₂	Teledyne Monitor Labs Sulphur Dioxide Analyzer Model T100	Pulsed Fluorescence - 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

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Instrumentation Summary
November 20, 2015

The predominantly downwind Crago Road Station measures horizontal wind speed, wind direction, atmospheric temperature, relative humidity and rainfall. The meteorological sensors at the Crago 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 3-2 Summary of Meteorological Equipment

Parameter	Equipment
Wind Speed/Wind Direction	Met One Instruments Inc. Model 034B
Temperature	Campbell Scientific Model CS 107
Relative Humidity	Campbell Scientific Model HMP60
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 quality 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

A few instrumentation issues were encountered during this quarter. A summary of operational issues for each measurement parameter during the monitoring period is presented in **Table 3-3**.

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CAGO ROAD STATION) – APRIL TO JUNE 2015**

Instrumentation Summary
November 20, 2015

**Table 3-3 Summary of Instrument Issues at the Crago Road Station
(Predominately Downwind)**

Parameter	Issues	Time Frame	Remedial Action
SO ₂	-	-	-
NOx	-	-	-
PM _{2.5}	Beta detector failed	April 10 – April 23, 2015	New beta detector ordered and installed/calibrated on April 23.
	Intermittent failure of the external analog output channel to CRX1000 DAS.	April 2–10, May 9–11, May 18–19, May 26–31, June 5–6, June 8–30	PM _{2.5} measurements from the instrument's internal data logger were used to replace invalid data recorded by the external CRX1000 DAS.
Other	-	-	-

3.3 INSTRUMENTATION RECOVERY RATES

Data recovery rates for each continuous monitor at the monitoring station during Quarter 2 (April to June 2015) is presented in **Table 3-4**.

**Table 3-4 Summary of Data Recovery Rates for the Crago Road Station
(Predominately Downwind) – April to June 2015**

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
SO ₂	2175	99.6%
NOx	2177	99.7%
PM _{2.5}	1859	85.1%
Temperature	2184	100.0%
Rainfall	2184	100.0%
Relative Humidity	2184	100.0%
Wind Speed/Direction	2184	100.0%
TSP/Metals	N/A ^	N/A ^
PAHs	N/A ^	N/A ^
Dioxins and Furans	N/A ^	N/A ^

Note:

- A. Monitoring of these parameters was not started. Monitoring will begin when the Facility is fully operational.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

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 monitoring station for the April to June 2015 period are presented in **Table 4-1**.

Table 4-1 Summary of Hourly Meteorological Measurements – April to June 2015

Parameter	Crago Road Station (Predominately Downwind)	Units
Temperature	Max	25.7
	Min	-3.8
	Mean (April)	5.7
	Mean (May)	13.1
	Mean (June)	15.7
	Mean (Period)	11.5
	Standard Deviation	5.7
Rainfall	Max	15.9
	Min	0.0
	Mean (April)	0.11
	Mean (May)	0.06
	Mean (June)	0.25
	Mean (Period)	0.14
	Standard Deviation	0.84
Relative Humidity	Max	%
	Min	18.4
	Mean (April)	66.5
	Mean (May)	67.7
	Mean (June)	78.8
	Mean (Period)	71.0
	Standard Deviation	17.6

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Summary of Ambient Measurements
November 20, 2015

Table 4-1 Summary of Hourly Meteorological Measurements – April to June 2015

Parameter	Crago Road Station (Predominately Downwind)	Units
Wind Speed ^A	Max	40.1
	Min	0.0
	Mean (April)	14.6
	Mean (May)	10.7
	Mean (June)	9.7
	Mean (Period)	11.7
	Standard Deviation	6.9

Notes:

A. Wind speed is measured at 10-m.

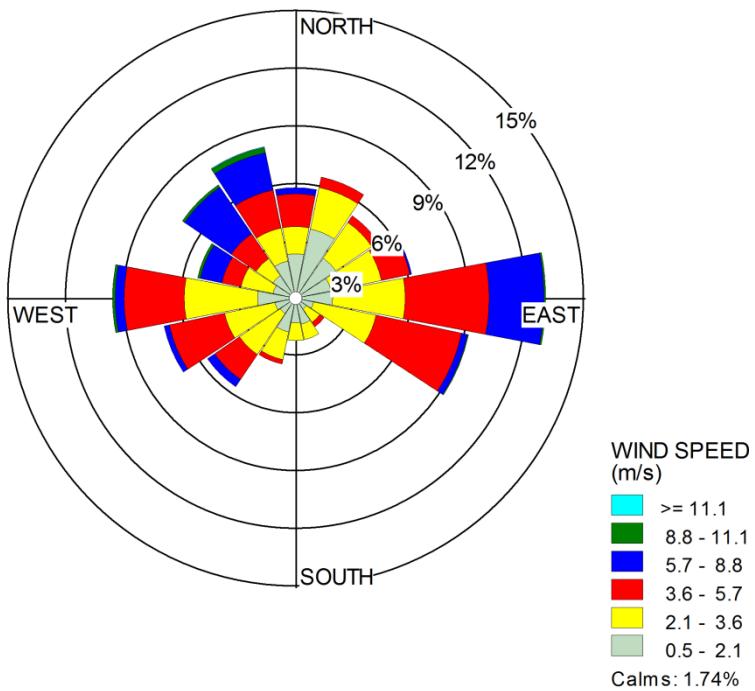
A wind rose showing the directionality and speed is presented in **Figure 4-1**. The length of the radial bars gives the total percent frequency of winds from the indicated direction, while portions of the bars of different widths indicate the frequency associated with each wind speed category.

Winds over the three-month period occurred predominantly from easterly and westerly directions. Wind contribution from the south was low. Higher wind speeds occurred from north-northwesterly to westerly directions while lower wind speeds were observed from the northeasterly directions.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

Figure 4-1 Wind Rose for April to June 2015



4.2 CAC AMBIENT AIR QUALITY MEASUREMENTS

A summary of the maximum, minimum, arithmetic mean and standard deviation of the CAC pollutant concentrations measured are presented in **Table 4-2**. Also presented in this table are the number of exceedances (if any occurred) of the relevant Ontario ambient air quality criteria (AAQC) or health-based standard for each contaminant. All monitored contaminants were below their applicable criteria during the period between April to June, 2015.

Nitric oxide (NO) has no regulatory criteria as discussed in **Section 4.2.2** below. There are both hourly and daily AAQCs as well as Reg. 419 Schedule 3 criteria for NO_x which are based on health effects of NO₂. As specified in the MOECC's listing of AAQCs (MOECC, 2012a) the AAQC were compared to measured NO₂ concentrations in this report. However, as per the current April 2012 version of O. Reg. 419 Summary of Standards and Guidelines, the Schedule 3 criterion for NO_x (MOECC, 2012b) was compared to the monitored NO_x levels.

A comparison of the maximum measured data to their respective air quality criteria and the two existing ambient air monitoring stations (Stantec, 2015) is presented graphically in **Figure 4-2**.

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Summary of Ambient Measurements
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Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2015

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Standards			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
SO ₂	1	250	690	Maximum	120.5	321.2
				Minimum	0.0	0.0
				Mean (April)	1.8	4.9
				Mean (May)	0.8	2.3
				Mean (June)	1.0	2.7
				Mean (Period)	1.2	3.3
				Standard Deviation	4.8	12.9
				# of Exceedances	0	0
	24	100	275	Maximum	19.9	53.1
				Minimum	0.0	0.0
				Mean (April)	1.8	4.9
				Mean (May)	0.9	2.3
				Mean (June)	1.0	2.6
				Mean (Period)	1.2	3.3
				Standard Deviation	2.3	6.2
				# of Exceedances	0	0

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2015

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Standards			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
PM _{2.5}	24	N/A	28 ^A	Maximum	-	19.6
				Minimum	-	0.0
				Mean (April)	-	3.2
				Mean (May)	-	7.9
				Mean (June)	-	5.0
				Mean (Period)	-	5.8
				Standard Deviation	-	3.6
				# of Exceedances	-	N/A
NO ₂	1	200	400	Maximum	43.5	85.0
				Minimum	0.0	0.0
				Mean (April)	4.1	8.3
				Mean (May)	4.7	9.2
				Mean (June)	3.2	6.3
				Mean (Period)	4.0	7.9
				Standard Deviation	6.0	11.8
				# of Exceedances	0	0
NO ₂	24	100	200	Maximum	13.4	26.3
				Minimum	0.1	0.1
				Mean (April)	4.0	8.0
				Mean (May)	4.8	9.4

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2015

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Standards			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
				Mean (June)	3.2	6.2
				Mean (Period)	4.0	7.9
				Standard Deviation	3.0	6.0
				# of Exceedances	0	0
NO _C	1	NA	NA	Maximum	46.6	60.6
				Minimum	0.0	0.0
				Mean (April)	1.3	1.7
				Mean (May)	1.0	1.3
				Mean (June)	1.2	1.5
				Mean (Period)	1.2	1.5
				Standard Deviation	3.4	4.4
				# of Exceedances	N/A	N/A
	24	NA	NA	Maximum	12.1	15.8
				Minimum	0.0	0.0
				Mean (April)	1.3	1.7
				Mean (May)	1.0	1.3
				Mean (June)	1.2	1.5
				Mean (Period)	1.1	1.5
				Standard Deviation	1.6	2.1
				# of Exceedances	N/A	N/A

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2015

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Standards			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
NOx	1	200 ^B	400 ^B	Maximum	74.9	149.3
				Minimum	0.0	0.0
				Mean (April)	5.4	10.8
				Mean (May)	5.6	11.1
				Mean (June)	4.4	8.5
				Mean (Period)	5.1	10.1
				Standard Deviation	8.5	16.9
				# of Exceedances	0	0
	24	100 ^B	200 ^B	Maximum	24.7	49.5
				Minimum	0.1	0.1
				Mean (April)	5.2	10.5
				Mean (May)	5.8	11.3
				Mean (June)	4.3	8.4
				Mean (Period)	5.1	10.1
				Standard Deviation	4.3	8.5
				# of Exceedances	0	0

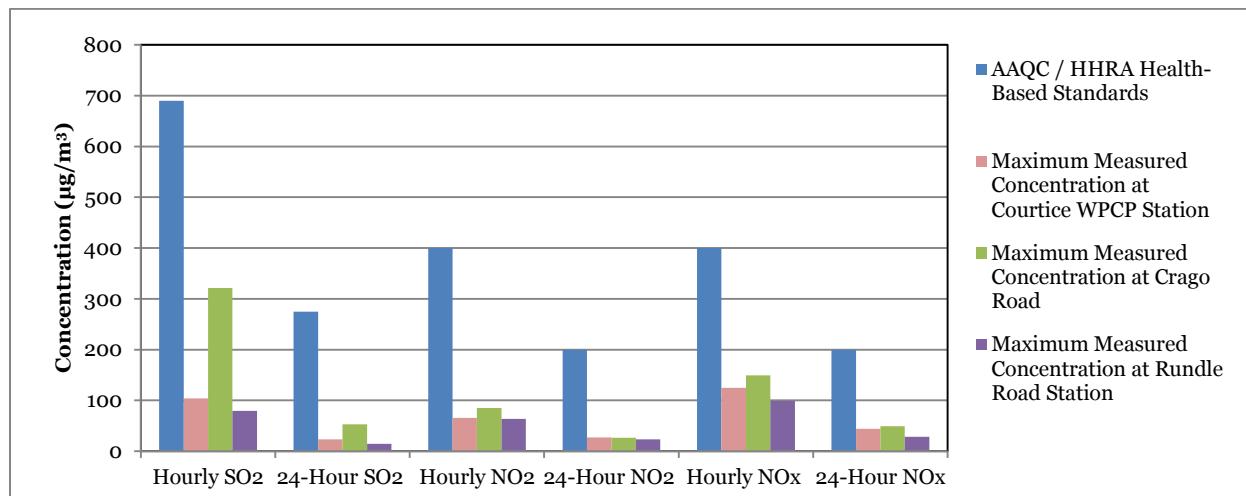
Note:

- A. Canadian Ambient Air Quality Standards (CAAQS) for Respirable Particulate Matter (CCME, 2012). The Respirable Particulate Matter Objective is referenced to the 98th percentile over 3 consecutive years.
- B. As per current version (April 2012) of Reg 419 Summary of Standards and Guidelines, the air standard for NOx is compared to a monitored NOx concentration, although the Reg419 Schedule 3 standard for NOx is based on health effects of NO₂.
- C. NO has no regulatory criteria.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

Figure 4-2 Comparison of NO₂ / NOx and SO₂ Ambient Air Quality Monitoring Data to Applicable Criteria and Existing Stations



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

4.2.1 Sulphur Dioxide (SO₂)

Data summaries are presented in **Appendix A** for sulphur dioxide for each month as well as time history plots of the hourly and 24-hour average SO₂ concentrations. For the hourly and 24-hour averages, the Ontario AAQCs of 690 $\mu\text{g}/\text{m}^3$ and 275 $\mu\text{g}/\text{m}^3$ are shown as blue lines on each plot. As shown in these figures, measured ambient SO₂ concentrations at both stations were well below the criteria.

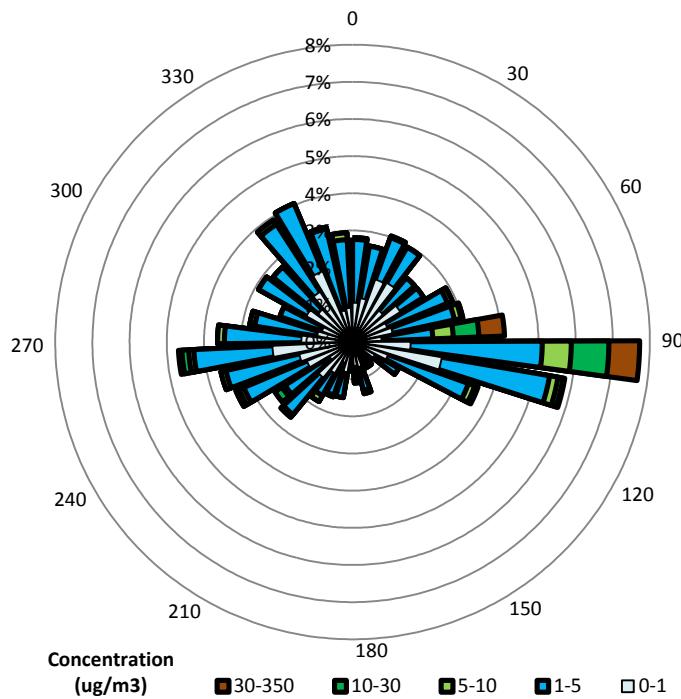
The maximum measured hourly and 24-hour average SO₂ concentrations measured at the Cago Road Station during April to June 2015 were 321.2 and 53.1 $\mu\text{g}/\text{m}^3$ respectively, which are 47% and 19% of the applicable 1-hour and 24-hour ambient air quality criteria.

A pollution rose of hourly average SO₂ concentrations measured at the Cago Road Station is presented in **Figure 4-3**. The pollution rose plot presents measured hourly average contaminant concentrations versus measured wind direction (over 10° wind sectors). In this period, the Cago Road station measured higher hourly concentrations for winds blowing from the east.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
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Figure 4-3 Pollution Rose of Measured Hourly Average SO₂ Concentrations – April to June 2015



4.2.2 Nitrogen Dioxide (NO₂)

Nitrogen oxides (NO_x) are almost entirely made up of nitric oxide (NO) and nitrogen dioxide (NO₂). Together, they are often referred to as NO_x. Most NO₂ 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 NO₂ can result in adverse health effects to an exposed population. NO₂ 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 NO₂, as health effects are seen at much lower concentrations of NO₂ than NO. In this report, because NO₂ is the regulated form of NO_x, the AAQC were compared to measured NO₂ concentrations (as per MOECC 2012a). However, as per the current April 2012 version of O. Reg. 419 Summary of Standards and Guidelines, the Schedule 3 NO_x criteria were also compared to the monitored NO_x concentrations (see **Section 4.2.3** below).

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAVO ROAD STATION) – APRIL TO JUNE 2015

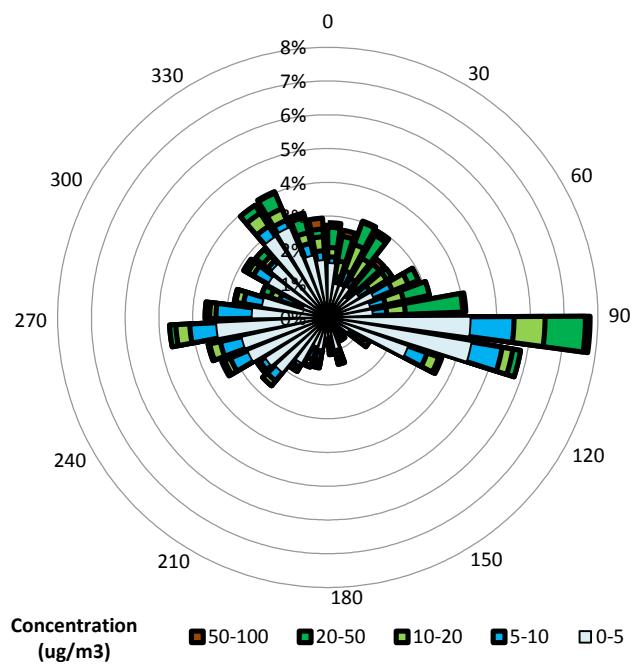
Summary of Ambient Measurements
November 20, 2015

Data summaries are presented in **Appendix B** for nitrogen dioxide for the station each month as well as time history plots of the hourly and 24-hour average NO₂ concentrations. For the hourly and 24-hour 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 NO₂ concentrations were well below the criteria.

The maximum measured hourly and 24-hour average concentrations were 85.0 and 26.3 µg/m³, which are 21% and 13% of the applicable 1-hour and 24-hour ambient air quality criteria.

A pollution rose of measured hourly average NO₂ concentrations is presented in **Figure 4-4**. Higher measured hourly average concentrations occurred from the easterly and northerly directions.

Figure 4-4 Pollution Roses of Measured Hourly Average NO₂ – April to June 2015



QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Summary of Ambient Measurements
November 20, 2015

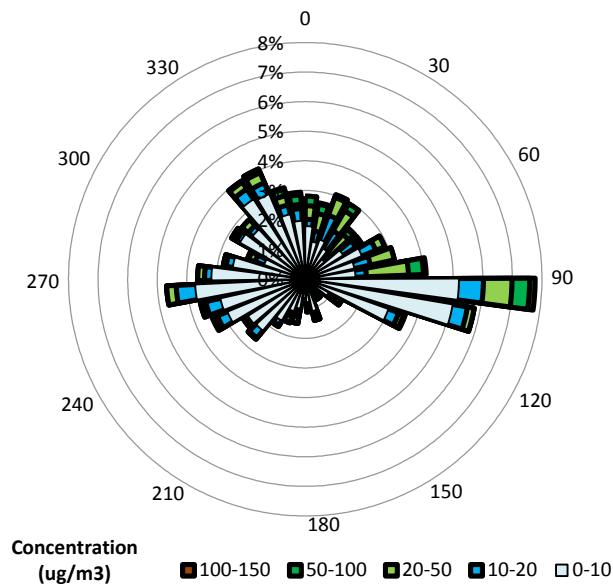
4.2.3 Nitrogen Oxides (NOx)

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 24-hour average NOx concentrations. For the hourly and 24-hour averages, the Ontario Schedule 3 criteria of $400 \mu\text{g}/\text{m}^3$ and $200 \mu\text{g}/\text{m}^3$ are shown as blue lines on each plot. As shown in these figures, the maximum measured ambient hourly and 24-hour average NOx concentrations at the Crago Road Station were below the criteria during this quarter.

As shown in **Table 4-2**, the maximum hourly NOx concentration measured at the Crago Road station was $149.3 \mu\text{g}/\text{m}^3$, which is 37% of the 1-hour ambient criteria. The 24-hour average NOX concentration measured at this station was $49.5 \mu\text{g}/\text{m}^3$, which is 25% of the applicable 24-hour criteria.

A pollution rose of measured hourly average NOx concentrations is presented in **Figure 4-5**. In Figure 4-5, higher measured hourly average NOx concentrations occurred for winds blowing from the easterly direction.

Figure 4-5 Pollution Roses of Measured Hourly Average NOx Concentrations – April to June 2015



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Summary of Ambient Measurements
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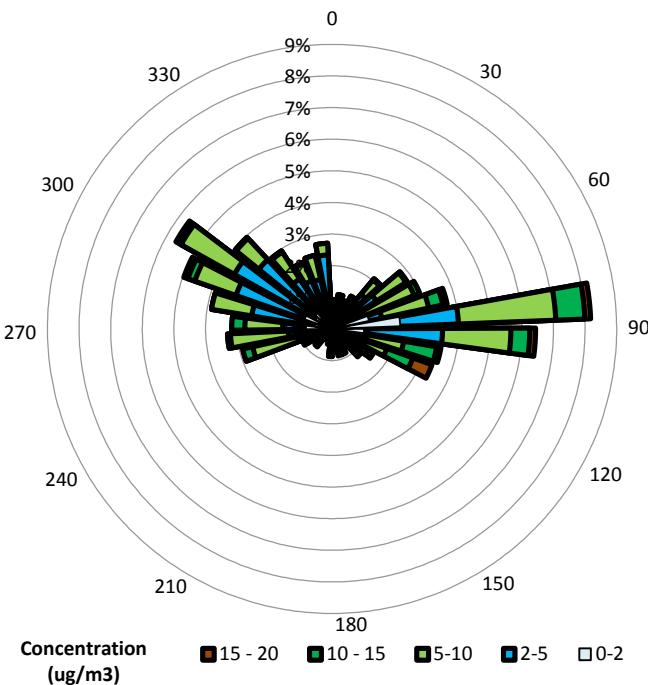
4.2.4 Particulate Matter Smaller than 2.5 Microns (PM_{2.5})

Data summaries and time history plots of measured 24-hour average concentrations are presented in **Appendix D** for PM_{2.5}.

The maximum measured 24-hour average PM_{2.5} concentration was 19.6 µg/m³ during this quarter. It should be noted that an exceedance of the 24-hour CAAQS for PM_{2.5} requires the average of the 98th percentile levels in each of three consecutive years to be greater than 28 µg/m³ whereas the PM_{2.5} measurement at this station in the report consisted of approximately 3 months of data, there is insufficient data to determine with any certainty if exceedances of the CAAQS would occur. Discussion of PM_{2.5} measurements with respect to the CAAQS will be provided in the 2015 annual report, at which time sufficient data will have been collected to make preliminary comparisons.

A pollution rose showing the measured 24-hour average ambient PM_{2.5} concentrations versus direction is shown in **Figure 4-6**. The maximum measured concentrations occurred from south-southeasterly and northwesterly directions.

Figure 4-6 Pollution Roses of Measured 24-Hour Average PM_{2.5} Concentrations – April to June 2015



QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

Conclusions
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5.0 CONCLUSIONS

This quarterly report provides a summary of the ambient air quality data collected at the Crago Road monitoring station located in the vicinity, and predominantly downwind, of the DYEC for the period April to June 2015.

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

1. Measured levels of NO₂, SO₂ and PM_{2.5} were below the applicable O. Reg. 419/05 criteria or human health risk assessment (HHRA) health-based standards presented in **Table 2-1** of this report;
2. Since the Canadian Ambient Air Quality Standard (CAAQS) for PM_{2.5} is based on a 98th percentile level over 3 years and a 3-year average of the annual average concentrations, whereas the PM_{2.5} measurement period at the Crago Road station for this quarterly report was three months, there was insufficient data collected to determine with any certainty if exceedances of the CAAQS would occur. Therefore no comparison of the measured PM_{2.5} data during this quarter to the CAAQS was conducted for this report, as it would not be scientifically accurate or representative; and,
3. In summary, all monitored contaminants were below their applicable MOECC criteria for the monitoring data presented in this report. All measured levels of all monitored contaminants were below their applicable HHRA health-based standards.

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2015

References
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6.0 REFERENCES

Canadian Council of Ministers of the Environment (CCME), (2007). Guidance Document on Achievement Determination. Canada-Wide Standards for Particulate Matter and Ozone. Revised (PN1391)(978-1-896997-74-2 PDF)

Canadian Council of Ministers of the Environment (CCME), (2012). Guidance Document on Achievement Determination. Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone (PN 1483)(978-1 896997-91-9 PDF)

Jacques Whitford, (2009). Final Environmental Assessment, December 4, 2009

Ontario Minister of the Environment (MOECC), (2010). Environmental Assessment Act, Section 9. Notice of Approval to Proceed with the Undertaking. Re: The Amended Environmental Assessment for Durham and York Residual Waste Study (EA File No: 04-EA-02-08)

Ontario Ministry of the Environment (MOECC), (2012a). Standards Development Branch, Ontario's Ambient Air Quality Criteria, April 2012. (PIBs 6570e01)

Ontario Ministry of the Environment (MOECC), (2012b). Standards Development Branch, Summary of Standards and Guidelines to support Ontario Regulation 419/05 – Air Pollution – Local Air Quality (including Schedule 6 of O. Reg 419/05 on Upper Risk Thresholds), April 2012 (PIBs 6569e01)

Stantec Consulting Limited, (2009). Final Environmental Assessment, Appendix C12: Site Specific Human Health and Ecological Risk Assessment Technical Study Report, December 4, 2009.

Stantec Consulting Limited, (2012). Ambient Air Quality Monitoring Plan – Durham York Residual Waste Study, May 8, 2012

Stantec Consulting Limited , (2015). Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre – October to December 2014, January 28, 2015.

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Appendix A SO₂ Data Summaries and Time History Plots
November 20, 2015

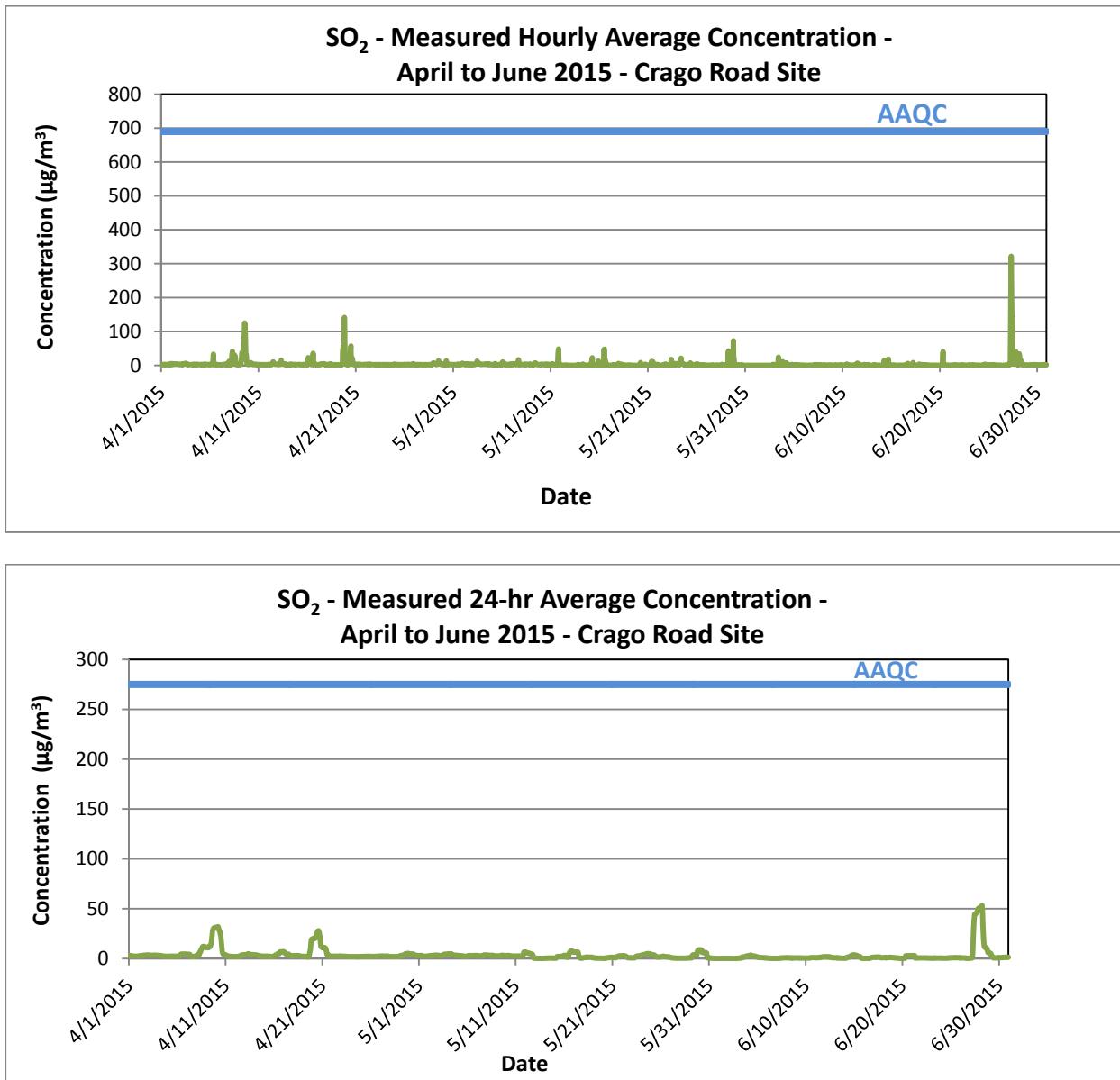
**Appendix A SO₂ DATA SUMMARIES AND TIME HISTORY
PLOTS**

		SO2 - Crago Road																													
		April 2015																													
		(µg/m³)																													
Hour																															
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	2.2	2.2	2.3	2.3	2.3	2.2	2.2	2.1	2.9	2.2	2.1	1.7	2.1	2.1	2.1	2.2	2.6	2.8	2.3	2.0	2.0	1.8	2.7	2.1	24	2.9	1.7	2.2	0	0	
2	4.9	4.0	4.0	4.8	2.9	3.2	2.7	2.8	3.3	3.5	4.4	4.1	4.0	4.1	3.9	3.1	3.2	2.8	2.7	2.9	3.2	3.2	3.1	3.1	24	4.9	2.7	3.5	0	0	
3	2.1	2.2	2.0	2.2	2.3	2.2	2.4	5.0	3.7	3.6	4.7	4.4	4.3	6.2	4.0	2.6	2.5	2.6	2.2	2.3	2.2	2.2	2.1	2.1	24	6.2	2.0	3.0	0	0	
4	2.1	2.2	2.0	2.2	2.1	2.0	1.5	2.3	2.2	2.8	2.0	1.5	1.9	2.4	2.4	2.5	3.5	2.0	2.0	2.1	2.0	2.1	2.0	2.1	24	3.5	1.5	2.2	0	0	
5	2.3	2.0	2.1	2.0	1.7	2.3	2.1	2.2	2.1	2.2	2.3	2.2	2.7	3.4	2.4	2.2	1.9	2.2	2.2	2.4	2.5	2.3	2.2	2.1	24	3.4	1.7	2.3	0	0	
6	1.6	2.2	2.1	1.9	2.2	2.1	2.1	2.5	16.8	32.8	6.4	5.4	2.7	2.7	2.6	1.9	1.6	2.1	1.9	2.1	1.8	1.8	1.5	24	32.8	1.5	4.3	0	0		
7	1.6	1.5	1.4	1.4	1.2	1.4	1.8	1.5	1.5	2.3	2.3	2.5	2.3	2.6	2.9	2.6	3.0	2.9	2.3	2.5	2.2	6.3	6.9	7.9	24	7.9	1.2	2.7	0	0	
8	12.1	2.1	2.3	1.5	2.1	2.2	2.7	32.4	41.6	14.3	8.6	31.9	21.0	22.8	28.4	23.6	8.2	2.2	2.0	1.8	1.9	2.1	1.6	24	41.6	1.5	11.3	0	0		
9	1.9	2.1	1.7	1.5	1.5	3.8	21.2	36.4	38.4	17.9	26.0	53.7	38.1	85.9	124.5	116.6	84.1	25.9	30.4	13.6	3.5	4.7	5.5	7.0	24	124.5	1.5	31.1	0	0	
10	2.4	3.0	5.3	4.1	7.3	8.2	7.1	4.7	2.8	2.8	2.9	3.2	2.7	3.0	2.5	2.3	2.3	2.6	2.2	2.4	2.5	2.2	1.7	1.9	24	8.2	1.7	3.4	0	0	
11	2.1	2.0	1.5	1.8	1.8	2.2	2.2	1.9	1.5	1.7	1.6	1.6	2.0	2.1	1.8	1.8	1.6	1.3	1.6	2.0	2.2	1.6	1.8	2.1	24	2.2	1.3	1.8	0	0	
12	2.1	2.1	2.4	2.2	1.4	1.8	2.4	2.7	3.1	3.5	6.6	10.3	9.6	6.5	4.7	3.6	3.4	3.1	3.1	2.9	3.0	3.0	2.8	24	10.3	1.4	3.7	0	0		
13	2.6	2.5	2.7	3.5	3.0	3.3	3.8	3.8	14.8	3.9	3.4	3.5	3.6	4.1	4.7	3.5	3.6	2.9	3.7	3.6	2.5	1.6	1.7	1.4	24	14.8	1.4	3.6	0	0	
14	1.5	1.9	2.1	2.0	1.7	2.2	3.1	2.8	2.8	3.4	2.0	1.9	2.0	2.2	2.4	2.6	2.6	2.3	1.9	1.4	1.8	1.9	2.1	2.0	24	3.4	1.4	2.2	0	0	
15	1.8	2.0	1.9	2.2	2.4	2.5	2.4	2.2	2.2	1.7	1.5	1.5	2.2	2.2	1.9	1.6	2.2	2.3	2.2	1.8	1.6	1.5	1.7	1.9	24	2.5	1.5	2.0	0	0	
16	1.4	1.4	11.1	22.5	6.3	10.9	10.1	6.0	9.1	3.0	3.2	3.1	2.8	2.3	12.1	35.4	2.8	2.2	2.2	2.4	2.5	3.4	3.2	2.7	24	35.4	1.4	6.8	0	0	
17	2.1	2.0	1.8	1.1	1.6	1.7	1.6	1.9	2.1	2.9	4.2	3.8	3.2	3.5	3.6	4.1	5.1	3.8	2.9	2.2	2.9	2.1	2.1	24	5.1	1.1	2.7	0	0		
18	2.6	2.2	1.0	2.0	2.1	2.4	2.3	2.1	2.8	3.3	2.8	3.6	3.1	2.3	1.7	1.5	1.7	1.8	1.8	1.4	1.9	1.7	1.4	24	3.6	1.0	2.1	0	0		
19	1.5	1.6	1.4	1.8	1.6	1.6	1.6	1.4	1.4	1.5	1.3	1.3	1.7	1.8	1.6	8.3	45.5	54.6	55.2	26.9	141.3	96.1	4.4	24	141.3	1.3	19.1	0	0		
20	4.8	16.3	5.8	2.1	2.3	2.2	3.7	10.2	2.8	22.7	29.8	48.8	57.0	8.0	3.2	20.6	16.4	5.1	3.1	2.6	2.5	2.9	2.1	24	57.0	2.1	11.5	0	0		
21	2.4	2.3	2.0	2.2	2.9	2.3	2.1	2.7	2.7	2.5	2.2	2.6	2.5	2.2	2.1	2.2	1.9	1.9	1.7	1.8	2.6	2.3	2.3	24	2.9	1.7	2.3	0	0		
22	2.5	2.6	2.5	2.4	2.2	2.3	2.2	2.1	2.9	2.8	2.3	2.7	3.2	2.4	2.2	2.0	2.2	2.2	2.0	2.1	1.9	1.6	1.9	24	3.2	1.6	2.3	0	0		
23	2.2	2.0	1.9	1.9	1.7	1.6	C	C	2.2	2.0	1.7	2.2	2.1	1.9	1.6	1.7	1.8	1.6	2.0	2.1	1.7	1.6	1.9	2.1	22	2.2	1.6	1.9	0	0	
24	1.9	1.5	1.2	1.4	1.8	1.9	2.3	2.0	2.1	1.3	2.0	1.4	1.3	1.7	1.6	1.7	2.0	1.7	2.1	2.1	2.0	2.8	3.6	24	3.6	1.2	1.9	0	0		
25	2.3	2.2	2.0	2.2	2.0	2.2	2.3	2.0	1.9	2.0	1.8	1.5	2.1	2.0	1.8	1.9	1.6	1.8	1.8	2.0	2.2	2.1	2.1	24	2.3	1.5	2.0	0	0		

		SO2 - Crago Road																													
		May 2015																													
		(µg/m³)																													
Hour																															
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	0	1.9	1.9	2.2	2.1	2.1	2.1	1.6	1.6	2.1	2.1	2.8	3.1	2.4	2.3	2.8	2.5	1.9	1.7	2.2	2.2	2.0	3.0	3.8	6.1	24	6.1	1.6	2.5	0	0
2	0	4.8	3.4	3.1	3.2	2.9	2.6	2.9	3.3	2.4	2.7	3.1	4.3	4.3	3.3	2.2	3.5	3.0	2.8	3.1	2.9	2.7	1.8	2.3	2.8	24	4.8	1.8	3.1	0	0
3	0	3.5	2.4	1.8	2.2	2.2	2.3	2.3	4.1	4.6	4.5	5.5	12.3	9.3	7.2	6.3	6.2	5.0	4.3	3.6	3.2	3.0	3.2	2.9	2.9	24	12.3	1.8	4.4	0	0
4	0	2.9	2.9	3.0	3.0	2.7	3.0	3.3	3.3	3.6	3.6	3.3	3.3	3.3	3.1	4.1	3.7	2.4	2.9	3.0	2.8	2.7	2.4	2.1	2.0	24	4.1	2.0	3.0	0	0
5	0	1.8	1.5	1.6	1.7	1.4	1.9	2.1	5.2	4.7	2.2	2.1	1.8	1.5	1.9	1.4	1.6	1.9	1.6	1.7	1.9	2.3	2.5	2.6	3.5	24	5.2	1.4	2.2	0	0
6	0	2.5	5.9	10.0	3.0	3.0	2.9	2.9	3.1	2.2	3.4	2.7	2.8	2.0	1.5	1.6	1.8	1.9	2.3	2.0	1.4	3.1	3.1	2.1	2.9	24	10.0	1.4	2.9	0	0
7	0	3.4	3.2	2.1	2.7	4.5	4.5	2.4	2.6	2.3	2.3	3.0	3.2	3.1	2.4	2.3	2.5	4.8	16.0	2.9	2.5	3.1	2.9	2.0	2.4	24	16.0	2.0	3.5	0	0
8	0	2.3	2.0	1.9	1.9	1.9	2.0	2.6	2.6	2.2	2.8	2.9	2.2	2.2	2.8	2.9	2.9	2.5	2.5	2.9	3.5	3.6	2.6	2.3	2.2	24	3.6	1.9	2.5	0	0
9	0	2.3	2.4	2.1	1.8	2.1	2.1	2.1	3.2	2.5	3.0	7.0	6.7	4.6	3.9	3.4	2.7	2.3	2.2	1.7	1.8	2.0	2.0	2.3	2.3	24	7.0	1.7	2.8	0	0
10	0	2.4	2.7	2.1	2.5	2.7	2.8	2.3	2.5	2.5	2.1	2.1	2.2	2.7	2.8	2.2	2.5	2.1	2.6	2.3	2.1	2.9	2.4	1.4	0.8	24	2.9	0.8	2.3	0	0
11	0	2.1	2.0	3.1	3.9	4.4	2.6	2.4	2.9	2.4	2.1	2.1	1.5	2.2	C	C	C	0.1	1.2	35.4	47.8	7.9	2.0	0.0	20	47.8	0.0	6.4	0	0	
12	0	0.6	0.4	0.6	0.4	0.3	0.3	0.2	0.0	0.1	0.4	0.5	0.1	0.2	0.5	0.6	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0	24	0.6	0.0	0.2	0	0	
13	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	2.5	0.0	0.2	0	0	
14	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	3.4	0.0	0.2	0	0	
15	0	0.0	0.0	0.0	0.9	1.7	8.7	9.5	21.9	1.1	0.6	0.4	0.9	0.2	0.2	0.5	0.7	0.0	0.0	0.4	1.0	1.4	1.6	12.9	24	21.9	0.0	2.8	0	0	
16	0	4.6	1.9	0.1	0.2	0.2	0.0	0.2	0.0	0.0	0.0	0.0	5.3	46.7	47.5	17.8	14.8	10.8	6.1	1.7	0.3	0.1	0.0	0.0	0.0	24	47.5	0.0	6.6	0	0
17	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	1.7	1.4	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.3	1.1	5.0	24	5.0	0.0	0.5	0	0	
18	0	5.3	4.1	2.0	1.3	1.2	0.3	2.5	3.3	0.5	0.3	0.3	0.0	0.3	0.6	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	24	5.3	0.0	1.0	0	0	
19	0	0.6	0.9	1.3	0.4	0.0	0.0	0.4	0.3	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	0.0	24	1.3	0.0	0.2	0	0	
20	0	0.0	0.0	0.4	0.1	0.0	0.6	8.2	2.1	1.2	0.3	1.7	2.2	0.7	0.1	1.7	0.6	0.9	1.7	3.1	0.0	0.0	0.0	0.0	24	8.2	0.0	1.1	0	0	
21	0	0.0	0.1	0.0	0.0	0.3	0.4	1.2	3.8	10.8	1.6	4.7	11.1	7.8	5.0	2.8	2.4	2.7	0.8	1.7	1.3	0.9	0.8	2.7	24	11.1	0.0	2.6	0	0	
22	0	1.9	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.3	1.4	0.4	2.1	3.5	1.6	0.3	0.4	24	3.5	0.0	0.7	0	0	
23	0	0.3	0.0	0.0	0.0	0.0	0.3	0.4	3.0	2.0	9.2	17.5	4.0	3.8	2.5	2.8	2.0	1.0	0.9	4.1	5.3	2.4	1.5	4.0	4.1	24	17.5	0.0	3.0	0	0
24	0	4.1	5.6	4.9	3.3	1.5	0.9	1.6	2.4	3.9	10.9	20.8	10.0	8.0	5.1	3.7	2.6	2.8	2.9	2.6	2.4	2.1	0.0	1.5	2.0	24	20.8	0.0	4.4	0	0
25	0	0.6	0.8	0.1	0.0	0.3	0.5	0.3	0.1	2.8	6.9	2.0	1.7	1.9	1.5	1.5	0.5														

		SO2 - Crago Road June 2015 ($\mu\text{g}/\text{m}^3$)																													
		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>690	Days>275
1	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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	0.1	0.0	0.0	0	0	
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	2.8	0.0	0.2	0	0	
3	0.4	1.3	0.0	0.0	0.1	0.9	0.8	0.0	0.0	0.0	23.8	2.3	0.0	0.0	0.2	0.0	0.0	0.0	8.2	11.0	2.1	3.1	0.7	24	23.8	0.0	2.3	0	0		
4	0.9	3.6	7.1	3.9	0.6	0.5	7.2	2.0	0.6	0.3	0.2	0.4	0.5	0.4	0.8	0.5	0.2	0.6	0.3	0.4	0.0	0.0	1.5	0.5	24	7.2	0.0	1.6	0	0	
5	0.0	1.3	0.7	1.1	2.1	1.2	0.0	0.0	0.0	0.7	1.1	0.0	0.1	0.6	0.3	0.5	0.2	0.6	0.3	0.4	0.0	0.0	0.0	0.2	24	2.1	0.0	0.5	0	0	
6	0.0	0.2	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	0.0	0.0	0.0	0.0	0.0	24	0.2	0.0	0.0	0	0	
7	0.0	0.0	1.2	1.2	0.2	0.1	1.8	1.6	1.2	0.5	1.1	0.9	0.9	0.0	0.3	1.0	1.6	0.3	0.1	0.6	0.6	0.4	0.8	0.5	24	1.8	0.0	0.7	0	0	
8	0.5	0.2	0.3	0.9	0.1	0.3	0.7	0.4	0.5	0.3	0.0	0.0	0.0	0.0	0.7	0.8	1.2	1.2	1.1	0.9	0.8	0.6	1.0	0.4	24	1.2	0.0	0.5	0	0	
9	0.2	0.0	0.0	0.0	0.3	0.1	0.3	0.0	0.5	0.6	0.0	0.1	0.2	0.5	0.1	0.0	0.8	0.6	0.6	0.0	0.4	0.6	1.0	1.0	24	1.0	0.0	0.3	0	0	
10	0.9	0.3	0.2	0.1	0.0	0.0	0.1	0.2	1.0	1.0	3.5	2.2	2.4	1.3	1.1	0.5	1.2	1.2	0.8	0.0	0.0	0.0	0.0	0.1	24	3.5	0.0	0.7	0	0	
11	0.4	0.2	0.4	0.6	0.8	0.8	0.6	0.8	0.5	1.9	1.9	2.9	3.9	6.2	5.0	2.8	1.6	0.9	2.8	2.7	1.5	0.6	0.3	0.3	24	6.2	0.2	1.7	0	0	
12	0.4	0.2	0.0	0.2	0.2	0.0	2.3	1.0	0.6	1.8	0.9	1.2	1.9	0.9	2.1	1.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	24	2.3	0.0	0.7	0	0	
13	0.0	0.0	0.0	0.1	0.1	0.1	0.0	2.2	1.0	0.6	0.2	0.2	0.4	0.2	0.0	0.0	0.1	0.0	0.3	0.3	0.2	0.0	0.0	0.0	24	2.2	0.0	0.3	0	0	
14	0.0	0.0	0.1	1.2	2.4	1.3	1.0	14.7	1.3	8.0	4.1	2.0	1.0	2.1	1.1	0.5	8.6	18.4	8.2	2.0	1.4	0.8	0.5	0.0	24	18.4	0.0	3.4	0	0	
15	0.0	0.0	0.0	0.2	1.0	0.1	0.0	0.1	0.3	0.4	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2	24	1.0	0.0	0.1	0	0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.4	0.3	0.0	0.0	0.1	0.8	0.0	0.3	2.6	5.6	5.0	4.3	2.4	1.2	0.8	0.3	24	5.6	0.0	1.1	0	0	
17	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	2.0	3.2	3.2	0.8	24	8.2	0.0	0.8	0	0	
18	0.2	0.0	0.1	0.3	1.3	2.6	1.8	1.0	0.7	0.6	0.2	0.6	1.0	1.2	0.8	1.4	1.2	0.8	0.9	0.8	0.4	0.1	0.4	24	2.6	0.0	0.8	0	0		
19	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0	0.0	0.2	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	0.5	0.0	0.1	0	0	
20	0.0	0.0	0.0	0.0	0.0	0.2	0.1	19.0	40.3	2.4	1.0	0.0	0.2	0.7	0.8	0.4	0.6	0.4	0.4	0.6	0.4	0.5	0.5	0.4	24	40.3	0.0	2.9	0	0	
21	0.0	0.1	0.5	0.2	0.0	0.0	0.4	0.3	0.1	0.7	1.0	1.1	0.8	0.7	0.6	0.7	0.5	0.6	0.4	0.3	0.9	0.9	0.7	0.6	24	1.1	0.0	0.5	0	0	
22	0.6	0.2	0.0	0.0	0.2	0.1	0.3	0.7	0.1	0.3	0.7	0.6	0.7	0.5	0.0	0.1	0.0	0.4	0.0	0.0	0.3	0.4	0.3	0.7	24	0.7	0.0	0.3	0	0	
23	0.0	0.4	0.8	0.9	0.9	0.5	0.3	0.8	0.3	0.0	0.8	0.2	0.7	0.2	0.3	0.3	0.6	0.3	0.5	0.3	0.0	0.0	0.2	0.2	24	0.9	0.0	0.4	0	0	
24	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.7	0.7	0.4	2.9	3.2	2.1	1.5	0.4	0.0	0.6	0.1	1.4	24	3.2	0.0	0.6	0	0	
25	0.4	0.1	0.6	0.0	0.0	0.7	0.2	0.1	0.4	1.6	0.0	1.1	2.1	1.3	1.7	1.3	0.6	0.7	0.2	0.3	0.1	0.1	0.0	0.3	24	2.1	0.0	0.6	0	0	
26	0.8	0.5	0.0	0.0	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.3	0.4	1.4	0.9	0.3	24	1.4	0.0	0.2	0	0	
27	0.7	1.6	3.1	1.3	1.6	2.5	3.4	164.4	321.2	247.6	140.9	141.0	40.8	5.7	5.1	3.4	12.2	4.9	10.8	40.5	38.8	16.0	5.7	2.4	24	321.2	0.7	50.6	0	0	
28	1.3	0.4	0.2	6.7	33.3	22.0	8.5	13.6	13.8	8.7	9.4	4.4	3.1	0.0	1.6	0.6	0.8	1.3	0.9	0.3	0.1	0.0	0.8	0.4	24	33.3	0.0	5.5	0	0	
29	0.6	0.0	0.0	0.0	0.4	0.6	0.0	0.4	0.5	0.5	0.1	0.6	1.0	0.7	1.0	0.8	1.1	1.7	2.4	1.7	1.3	1.0	0.0	1.1	24	2.4	0.0	0.7	0	0	
30	0.6	0.8	0.6	0.2	0.8	0.7	C	C	C	1.3	1.2	1.7	1.4	1.3	2.0	1.7	1.6	1.5	1.7	1.6	2.0	1.6	1.4	1.7	21	2.0	0.2	1.3	0	0	
31																								0	0.0	0.0			0		
Count	30	30	30	30	30	30	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	717	30	29	30		
Maximum	1.3	3.6	7.1	6.7	33.3	22.0	8.5	164.4	321.2	247.6	140.9	141.0	40.8	6.2	5.1	3.4	12.2	18.4	10.8	40.5	38.8	16.0	5.7	2.4	24	321.2	1.3	54.1			
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	0.0			
Average	0.3	0.4	0.5	0.7	1.5	1.2	1.3	7.8	13.3	9.4	6.4	5.5	2.1	0.9	0.9	0.8	1.4	1.5	1.3	2.3	2.2	1.1	0.9	0.6	23	16	0	2.6			
Percentiles		10	20	30	40	50				60	70	80	90	95	99															Maximum	
Data		0.0	0.0	0.0	0.2	0.3				0.5	0.8	1.2	2.3	5.2	40.1	321.2			</td												

Figure A-1 Time History Plots of Measured Hourly Average and 24-Hour Average SO₂ Concentrations- Crago Road Station



**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Appendix B NO₂ Data Summaries and Time History Plots
November 20, 2015

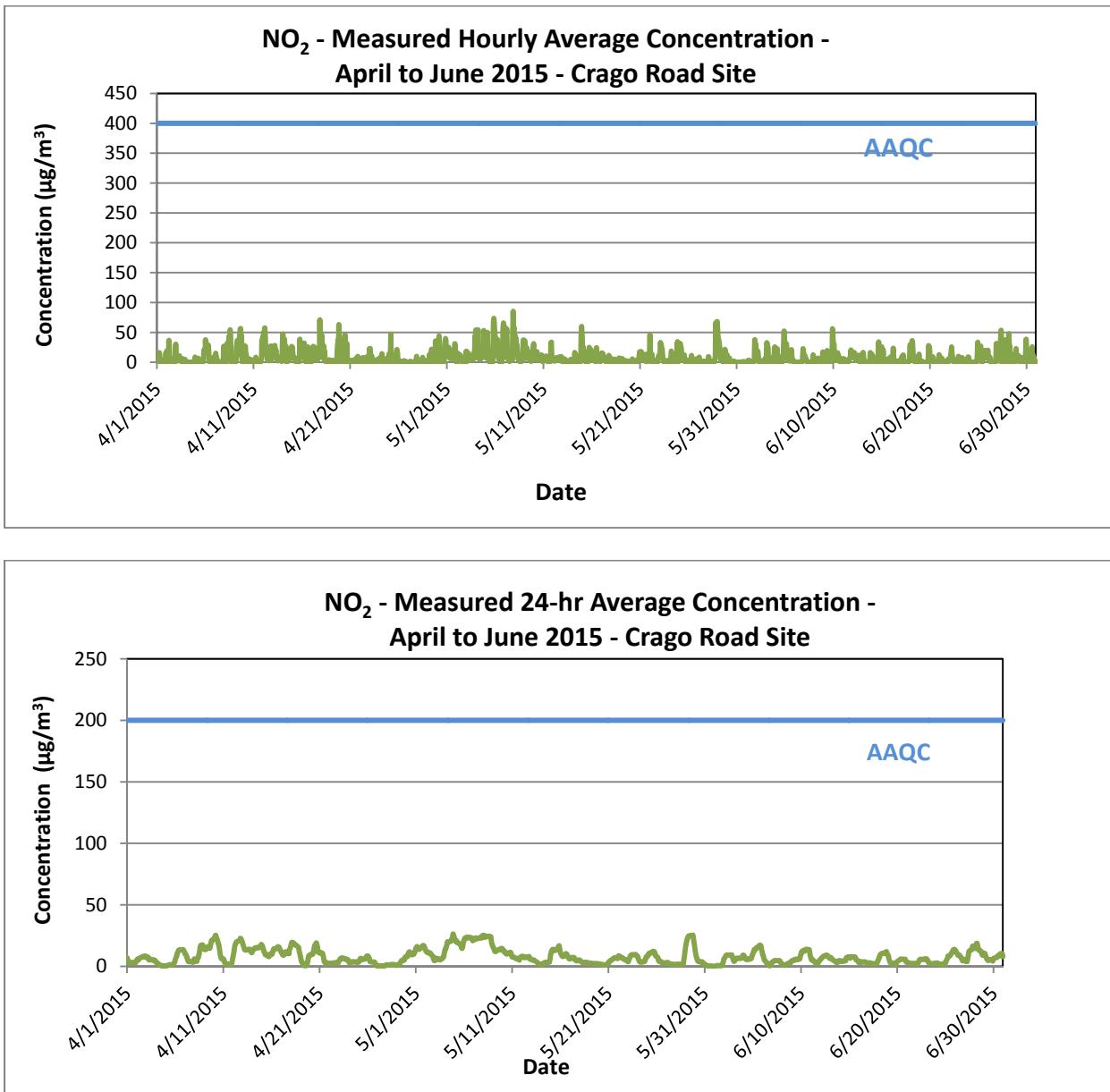
**Appendix B NO₂ DATA SUMMARIES AND TIME HISTORY
PLOTS**

		NO ₂ - Crago Road April 2015 (µg/m ³)																													
		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	0.0	0.0	0.0	5.2	10.4	11.2	16.0	13.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	4.5	2.6	0.0	15.2	15.2	24	16.0	0.0	4.1	0	0		
2	13.2	19.1	8.7	3.2	0.0	10.8	36.6	23.8	9.2	1.8	2.5	2.9	4.5	5.3	2.6	4.6	1.8	3.6	0.6	1.3	0.7	4.1	5.9	30.2	24	36.6	0.0	8.2	0	0	
3	5.7	4.6	2.0	9.0	10.0	3.2	6.9	3.0	10.6	6.3	4.6	2.8	1.6	1.7	1.2	1.2	5.8	2.0	0.0	0.0	0.4	0.0	4.7	0.0	24	10.6	0.0	3.6	0	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	0.0	0.0	0.0	0.0	3.2	8.4	24	8.4	0.0	0.5	0	0	
5	0.0	0.0	0.0	0.0	0.0	2.6	1.2	6.7	4.9	4.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.0	1.8	20.4	20.8	24	20.8	0.0	3.5	0	0		
6	24.9	37.4	20.7	18.1	25.4	29.4	29.2	19.6	28.2	18.0	2.8	2.6	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	3.0	7.3	4.9	7.7	1.6	24	37.4	0.0	11.7	0	0
7	7.7	11.8	15.1	10.3	9.1	5.2	3.0	1.7	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	5.9	26.7	27.2	24	27.2	0.0	5.3	0	0	
8	25.7	0.3	0.2	3.9	0.0	0.0	1.4	32.1	29.0	12.7	6.4	43.4	32.0	42.0	54.2	47.2	17.7	0.5	1.9	3.1	3.8	0.0	0.0	0.0	24	54.2	0.0	14.9	0	0	
9	0.0	0.0	0.0	0.0	0.7	4.4	26.5	33.2	36.3	12.3	21.9	36.9	19.5	36.4	49.2	55.9	56.3	41.0	44.5	28.7	0.8	3.2	5.5	15.0	24	56.3	0.0	22.0	0	0	
10	0.0	0.0	15.6	27.4	26.1	12.6	12.1	6.5	2.1	0.0	0.1	0.0	1.9	5.5	2.2	2.6	1.9	3.3	4.4	3.6	2.6	1.1	2.4	0.0	24	27.4	0.0	5.6	0	0	
11	1.0	0.0	0.0	0.0	0.0	3.0	8.3	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	4.1	8.6	37.1	24.8	41.9	24	41.9	0.0	5.5	0	0	
12	34.0	49.9	44.7	42.8	57.4	48.4	28.3	26.6	18.1	9.0	4.6	3.9	3.8	3.8	2.6	5.0	4.2	4.2	14.9	27.2	2.7	8.7	14.7	21.3	24	57.4	2.6	20.0	0	0	
13	20.6	15.7	14.6	22.6	28.0	27.8	23.2	17.0	20.0	10.5	4.6	4.8	2.7	2.5	8.7	6.4	8.3	7.7	3.9	3.1	2.9	2.8	1.2	5.4	24	28.0	1.2	11.0	0	0	
14	34.3	47.4	19.8	35.0	35.3	38.5	24.9	19.1	21.0	26.3	0.3	0.0	3.4	8.0	11.4	7.7	5.0	5.0	9.6	10.1	12.5	14.6	11.0	26.5	24	47.4	0.0	17.8	0	0	
15	24.9	24.9	12.9	6.8	7.0	5.3	7.9	6.9	2.5	1.2	0.0	0.0	1.4	0.0	3.7	1.0	0.6	0.0	7.9	38.5	23.6	26.5	16.7	22.7	24	38.5	0.0	10.1	0	0	
16	20.8	18.6	28.4	30.3	25.0	32.0	31.7	3.6	3.7	1.5	3.2	0.9	3.7	0.0	8.9	25.6	7.0	1.6	5.8	22.6	17.0	2.2	1.3	0.1	24	32.0	0.0	12.3	0	0	
17	13.0	14.4	8.6	5.3	26.3	13.5	24.7	17.3	5.5	24.6	19.4	9.7	6.2	3.3	3.7	4.4	5.4	7.2	7.8	10.0	13.2	71.0	22.1	20.3	24	71.0	3.3	14.9	0	0	
18	48.1	36.1	44.7	24.8	13.8	10.1	27.9	4.8	11.5	18.8	2.9	1.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	48.1	0.0	10.5	0	0	
19	0.0	0.0	0.0	0.0	0.0	3.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	28.4	36.6	21.6	62.8	38.9	0.0	24	62.8	0.0	8.6	0	0	
20	4.6	18.7	3.3	0.1	0.0	0.0	3.9	18.3	2.5	38.7	34.8	46.2	32.5	6.2	1.4	25.6	31.3	5.6	0.0	0.5	0.0	0.8	1.3	1.9	24	46.2	0.0	11.6	0	0	
21	1.5	2.5	1.3	2.8	0.1	1.0	2.5	2.3	0.6	0.0	0.0	0.0	5.3	5.2	2.6	2.9	7.0	8.2	9.6	0.7	1.3	0.9	1.3	24	9.6	0.0	2.5	0	0		
22	0.5	0.0	0.0	0.0	0.0	0.1	3.2	7.5	5.0	2.7	0.4	0.4	2.4	5.1	4.0	2.6	8.6	2.8	2.9	3.3	7.6	2.8	1.1	7.6	24	8.6	0.0	2.9	0	0	
23	22.5	16.3	22.9	5.4	6.0	10.8	9.9	C	C	1.1	0.0	0.1	0.0	0.0	0.6	1.6	1.6	4.0	1.9	0.9	1.1	4.7	0.3	1.3	22	22.9	0.0	5.1	0	0	
24	6.4	2.6	3.2	5.8	5.6	9.7	9.4	14.2	10.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.2	7.3	2.1	0.0	24	14.2	0.0	3.5	0	0	
25	0.0	14.0	7.4	7.5	15.5	46.8	21.4	3.2	0.0	0.5	2.3	0.0	4.0	0.8	0.0	0.0	0.5	1.5	6.1	15.5	21.1	16.8	16.0	0.0	24	46.8	0.0	8.4	0	0	
26	0.0	0.0	0.0	2.4	0.0</td																										

		NO ₂ - Crago Road May 2015 (µg/m ³)																													
		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	24.7	21.2	11.8	10.8	11.4	24.5	17.5	8.5	6.0	12.0	9.3	7.4	11.5	18.6	18.1	8.0	9.4	4.9	14.6	21.4	30.9	28.0	13.5	1.4	24	30.9	1.4	14.4	0	0	
2	0.4	0.5	0.0	3.9	14.9	14.3	13.6	2.5	3.8	7.8	11.8	9.1	6.6	6.7	2.3	0.7	2.2	0.8	0.6	2.8	4.8	1.6	0.0	0.4	24	14.9	0.0	4.7	0	0	
3	18.4	11.3	17.4	1.8	3.3	15.8	7.5	4.4	9.5	4.2	3.3	4.4	5.4	4.8	5.9	5.5	5.9	4.7	10.3	15.2	10.7	6.8	43.0	33.3	24	43.0	1.8	10.5	0	0	
4	54.0	53.5	23.4	19.9	23.1	46.0	54.1	29.0	7.9	5.1	4.1	5.3	7.2	5.8	10.4	11.5	21.7	23.6	30.0	17.9	52.9	48.6	15.7	10.6	24	54.1	4.1	24.2	0	0	
5	14.6	21.5	6.8	23.4	23.7	49.7	22.8	21.7	7.3	1.9	0.6	0.9	2.0	1.0	4.8	2.4	2.8	4.0	0.7	9.1	65.9	73.4	65.2	54.6	24	73.4	0.6	20.0	0	0	
6	43.7	41.9	19.5	25.8	35.7	36.0	38.2	17.9	7.8	8.2	4.0	1.0	0.5	1.1	0.0	0.0	0.0	0.0	0.0	7.9	7.1	56.0	65.7	27.9	60.1	24	65.7	0.0	21.1	0	0
7	56.4	45.9	23.9	24.7	45.0	55.9	27.2	21.3	5.4	4.7	5.2	4.5	1.5	1.7	5.0	3.8	3.6	6.4	8.8	3.5	45.2	85.0	53.7	58.7	24	85.0	1.5	24.9	0	0	
8	36.7	40.3	44.8	33.8	40.2	26.5	29.7	24.8	12.7	5.8	6.9	3.7	1.9	4.8	4.5	3.0	1.2	0.9	2.0	6.3	3.2	5.0	37.2	25.0	24	44.8	0.9	16.7	0	0	
9	24.1	17.0	35.7	11.3	6.3	19.7	24.2	24.1	19.5	18.0	10.4	8.0	5.5	5.4	5.8	7.3	2.6	1.5	8.3	5.7	8.9	19.2	20.9	24.5	24	35.7	1.5	13.9	0	0	
10	30.9	4.8	5.1	7.5	10.2	13.3	7.8	11.9	17.6	5.8	3.9	9.3	5.0	6.9	9.2	9.1	8.4	6.5	10.6	12.3	11.5	3.2	1.3	1.7	24	30.9	1.3	8.9	0	0	
11	1.4	3.1	4.4	7.1	9.5	7.8	5.4	10.1	4.2	2.1	4.0	5.7	2.5	C	C	C	C	2.7	2.6	32.9	33.5	8.3	5.5	6.0	20	33.5	1.4	7.9	0	0	
12	3.8	6.4	2.5	5.0	2.0	3.4	4.2	3.7	7.4	5.8	5.0	5.8	3.8	5.4	8.0	8.6	8.5	7.3	6.0	8.4	9.2	6.9	8.3	2.3	24	9.2	2.0	5.7	0	0	
13	0.1	0.9	0.0	0.3	1.5	2.6	5.1	3.3	0.3	0.0	0.5	0.0	0.0	0.4	0.2	0.0	0.0	0.2	1.3	2.8	5.0	3.3	2.4	3.6	24	5.1	0.0	1.4	0	0	
14	1.0	0.3	0.3	1.7	2.4	6.4	16.2	4.9	12.7	7.4	2.2	0.4	0.8	1.8	0.0	0.0	0.0	7.3	0.0	0.0	5.8	2.9	44.2	59.8	24	59.8	0.0	7.4	0	0	
15	49.3	30.7	24.9	25.3	14.0	18.9	12.9	6.5	1.8	0.6	3.3	1.5	2.0	3.0	4.9	8.1	1.3	16.1	24.7	18.5	12.9	16.5	20.8	3.2	24	49.3	0.6	13.4	0	0	
16	7.0	6.7	4.9	9.1	4.6	3.5	9.2	10.5	9.7	1.1	0.2	9.4	24.3	14.7	7.4	4.0	4.5	4.5	3.0	2.7	2.0	1.1	1.6	1.4	24	24.3	0.2	6.1	0	0	
17	4.9	15.4	4.6	13.4	14.2	9.6	4.6	7.4	8.3	5.2	2.7	1.8	0.0	0.0	1.2	0.8	1.5	0.0	2.2	11.2	4.1	0.3	1.3	6.7	24	15.4	0.0	5.1	0	0	
18	6.3	5.1	3.9	3.2	3.2	1.1	4.3	4.7	0.4	5.0	2.7	1.2	2.0	1.9	1.1	0.9	0.9	1.3	1.8	0.4	7.0	0.8	2.8	0.3	24	7.0	0.3	2.6	0	0	
19	0.4	0.4	3.7	3.8	6.1	3.6	2.9	2.0	2.1	1.7	1.1	1.4	1.2	1.6	2.7	1.8	1.6	1.9	1.3	1.4	1.1	1.5	0.8	0.8	24	6.1	0.4	1.9	0	0	
20	0.6	0.0	0.0	1.7	2.7	5.6	0.8	0.0	0.0	0.0	0.0	0.1	0.0	1.6	0.6	2.9	0.0	4.1	4.3	4.6	4.7	12.4	17.3	24	17.3	0.0	2.7	0	0		
21	4.3	5.2	11.4	17.8	6.5	6.9	5.5	9.5	5.7	7.3	2.9	2.5	4.8	3.7	13.3	8.5	1.2	0.6	2.7	3.3	10.0	7.1	3.8	5.5	24	17.8	0.6	6.3	0	0	
22	15.8	46.1	11.5	1.2	4.0	14.0	2.0	0.0	0.0	0.0	2.0	3.8	0.2	0.0	0.0	0.0	0.0	0.2	0.0	2.2	6.3	10.3	6.9	24	46.1	0.0	5.3	0	0		
23	8.3	15.6	18.1	32.9	26.7	29.4	19.9	21.6	13.1	6.4	4.9	1.2	0.4	0.0	0.0	0.0	0.0	1.9	0.8	2.4	2.6	0.0	0.0	0.0	24	32.9	0.0	8.6	0	0	
24	2.7	0.0	2.0	3.3	5.5	13.0	18.6	9.2	6.6	5.6	5.9	2.1	0.5	1.3	1.9	2.2	0.6	6.0	2.6	12.5	24.0	34.4	21.9	6.2	24	34.4	0.0	7.9	0	0	
25	1.0	8.5	10.0	13.6	31.3	20.9	25.1	17.8	5.3	6.3	3.4	2.5	4.7	12.2	12.3	6.6	2.5	1.2	3.3	0.2	0.7	3.4	0.3	2.3	24	31.3	0.2	8.1	0	0	

		NO ₂ - Crago Road June 2015 (µg/m ³)																													
		Hour																													
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	0.0	0.0	0.0	0.0	2.6	3.2	3.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.9	0.8	1.5	37.8	28.2	31.7	24	37.8	0.0	4.7	0	0	
2	27.1	15.2	10.7	15.1	16.2	18.4	11.4	1.4	1.2	0.0	0.0	0.0	0.0	0.8	0.0	2.6	0.0	0.0	0.8	0.0	0.0	4.9	2.7	24	27.1	0.0	5.4	0	0		
3	4.9	8.9	8.1	32.8	30.4	24.2	24.5	8.4	0.4	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	9.3	6.9	23.8	25.8	24	32.8	0.0	8.9	0	0	
4	2.0	3.2	11.2	7.0	7.3	22.5	9.9	0.0	0.0	1.3	0.6	0.0	1.2	0.5	0.7	8.3	0.0	0.0	7.6	6.3	8.1	29.5	52.2	36.0	24	52.2	0.0	9.0	0	0	
5	31.8	25.7	25.2	31.4	30.4	20.6	10.8	3.3	8.5	10.9	18.5	6.0	1.8	3.4	5.1	6.1	21.0	12.7	3.3	2.5	3.3	3.2	0.1	0.0	24	31.8	0.0	11.9	0	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	0.0	0.0	0.0	0.0	0.0	0.3	2.4	14.4	22.5	17.8	11.7	24	22.5	0.0	2.9	0	0	
7	4.7	7.0	10.9	4.5	6.6	4.2	2.3	0.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	12.3	3.0	24	12.3	0.0	2.4	0	0	
8	0.4	0.0	0.0	0.0	0.2	0.0	0.0	2.2	3.8	6.8	4.9	2.6	3.4	4.2	5.6	3.1	3.0	4.7	0.4	1.1	4.1	2.1	17.1	16.9	24	17.1	0.0	3.6	0	0	
9	8.2	11.4	1.9	3.7	2.9	1.9	1.5	4.2	7.9	19.5	1.9	0.8	0.0	6.8	10.0	5.6	3.5	3.1	8.7	0.3	2.3	1.4	55.8	50.2	24	55.8	0.0	8.9	0	0	
10	34.2	31.6	30.1	9.0	11.8	4.0	3.1	10.2	3.3	6.7	10.3	15.6	10.5	11.1	9.4	5.6	2.1	0.4	1.4	1.4	1.1	0.6	1.4	0.5	24	34.2	0.4	9.0	0	0	
11	5.6	5.4	1.1	5.3	2.8	3.4	2.5	0.8	1.1	3.0	2.4	1.7	0.4	0.6	1.7	2.0	6.6	6.1	7.1	6.4	20.5	9.7	16.5	15.2	24	20.5	0.4	5.3	0	0	
12	11.0	11.0	8.3	10.5	16.3	15.1	10.2	6.5	4.1	7.2	3.5	3.5	4.9	4.0	11.5	2.6	1.6	7.6	3.4	2.0	4.5	2.7	3.0	1.3	24	16.3	1.3	6.5	0	0	
13	14.3	10.1	16.3	13.0	4.2	1.3	0.3	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.5	16.1	9.4	10.6	11.4	24	16.3	0.0	4.6	0	0	
14	13.6	8.7	10.4	7.4	3.8	0.3	0.3	7.3	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	18.7	33.9	15.6	4.2	8.9	12.5	10.4	11.0	24	33.9	0.0	7.1	0	0	
15	25.5	0.8	0.2	0.7	20.6	9.0	3.5	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	6.2	4.8	6.5	3.3	1.6	9.3	24	25.5	0.0	4.2	0	0	
16	1.1	0.0	9.8	1.9	0.0	23.4	11.9	0.6	0.5	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	2.1	0.6	0.6	2.8	24	23.4	0.0	2.5	0	0	
17	5.0	1.3	1.5	9.9	5.5	4.5	12.1	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	0.9	6.5	18.6	29.5	24	29.5	0.0	4.0	0	0	
18	20.2	14.7	25.1	23.2	36.0	31.2	22.0	6.6	9.3	3.8	0.8	0.0	1.7	0.0	0.0	8.1	0.0	0.0	0.7	9.0	3.9	8.6	13.2	4.8	3.3	24	36.0	0.0	10.3	0	0
19	3.5	1.1	0.0	0.1	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	1.0	27.9	24.5	24.8	24	27.9	0.0	3.5	0	0	
20	11.5	6.9	7.6	4.5	4.6	4.3	2.6	9.1	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	1.7	8.0	12.6	24	12.6	0.0	3.4	0	0	
21	4.9	4.1	8.3	0.2	0.0	3.0	6.4	0.0	0.0	0.0	2.6	1.7	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	3.8	1.0	24	8.3	0.0	1.8	0	0	
22	4.3	4.0	7.2	8.5	14.7	21.4	25.4	16.1	10.5	7.2	2.1	1.1	0.5	1.8	0.0	0.4	0.0	1.5	2.0	0.0	0.0	1.5	1.5	0.0	9.9	24	25.4	0.0	5.9	0	0
23	7.1	3.6	0.0	0.0	0.9	2.0	5.3	7.6	7.2	0.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	5.1	5.6	2.2	24	8.8	0.0	2.4	0	0	
24	8.4	4.2	3.5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.3	0.9	10.8	33.4	24	33.4	0.0	2.6	0	0	
25	25.9	8.0	23.2	13.7	19.2	20.5	27.2	17.1	1.3	0.5	0.0	2.0	3.4	14.8	19.2	10.0	8.9	14.1	17.1	19.6	11.1	7.5	11.3	15.3	24	27.2	0.0	13.0	0	0	
26	20.0	13.8	8.9	3.0	4.4	8.5	4.7	0.2	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	12.3	31.1	13.6	7.2	24	31.1	0.0	5.3	0	0
27	8.4	3.5	3.9	3.7	4.8	2.4	1.7	28.2	44.8	53.6	42.2	30.0	10.4	0.0	3.5	8.7	8.8	2.2	8.6	37.3	36.5	15.9	5.4	0.0	24	53.6	0.0	15.2	0	0	
28	0.0	0.0	0.0	17.7	47.7	34.8	12.6	25.9	14.4	14.4	8.1	6.1	2.7	0.0	0.5	1.0	0.0	0.0	0.0	0.0	13.6	10.9	22.6	7.7	24	47.7	0.0	10.0	0	0	
29	4.7	9.4	2.6	4.4	11.2	10.7	5.5	2.4	0.0	0.0	4.2	7.5	4.1	5.1	0.7	1.1	0.0	0.0	0.0	0.0	0.0	3.5	17.1	38.3	24	38.3	0.0	5.5	0	0	
30	24.3	11.6	7.9	8.7	12.6	14.3	C	0.6	3.1	5.9	9.5	20.4	2.8	0.8	25.7	7.0	12.0	2.4	9.0	0.0	0.0	3.1	0.1	0.3	23	25.7	0.0	7.9	0	0	
31	Count	30	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	719	30	29	30		
	Maximum	34.2	31.6	30.1	32.8	47.7	34.8	27.2	28.2	44.8	53.6	42.2	30.0	10.5	14.8	25.7	10.0	21.0	33.9	17.1	37.3	36.5	37.8	55.8	50.2	24	55.8	10.0	32.8		
	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	0	0.0	0.0		
	Average	11.1	7.5	8.1	8.0	10.6	10.4	7.6	5.6	4.3	4.8	3.7	3.3	1.8	1.8	3.3	2.3	3.0	3.2	3.4	3.4	6.5	9.2	13.3	14.0	23	28	0	6.3		
	Percentiles	10	20	30	40	50	60	70	80	90	95	99	100																	Maximum	
	Data	0.0	0.0	0.0	1.1	2.5	4.2	7.2																							

Figure B-1 Time History Plots of Measured Hourly Average and 24-Hour Average NO₂ Concentrations – Crago Road Station

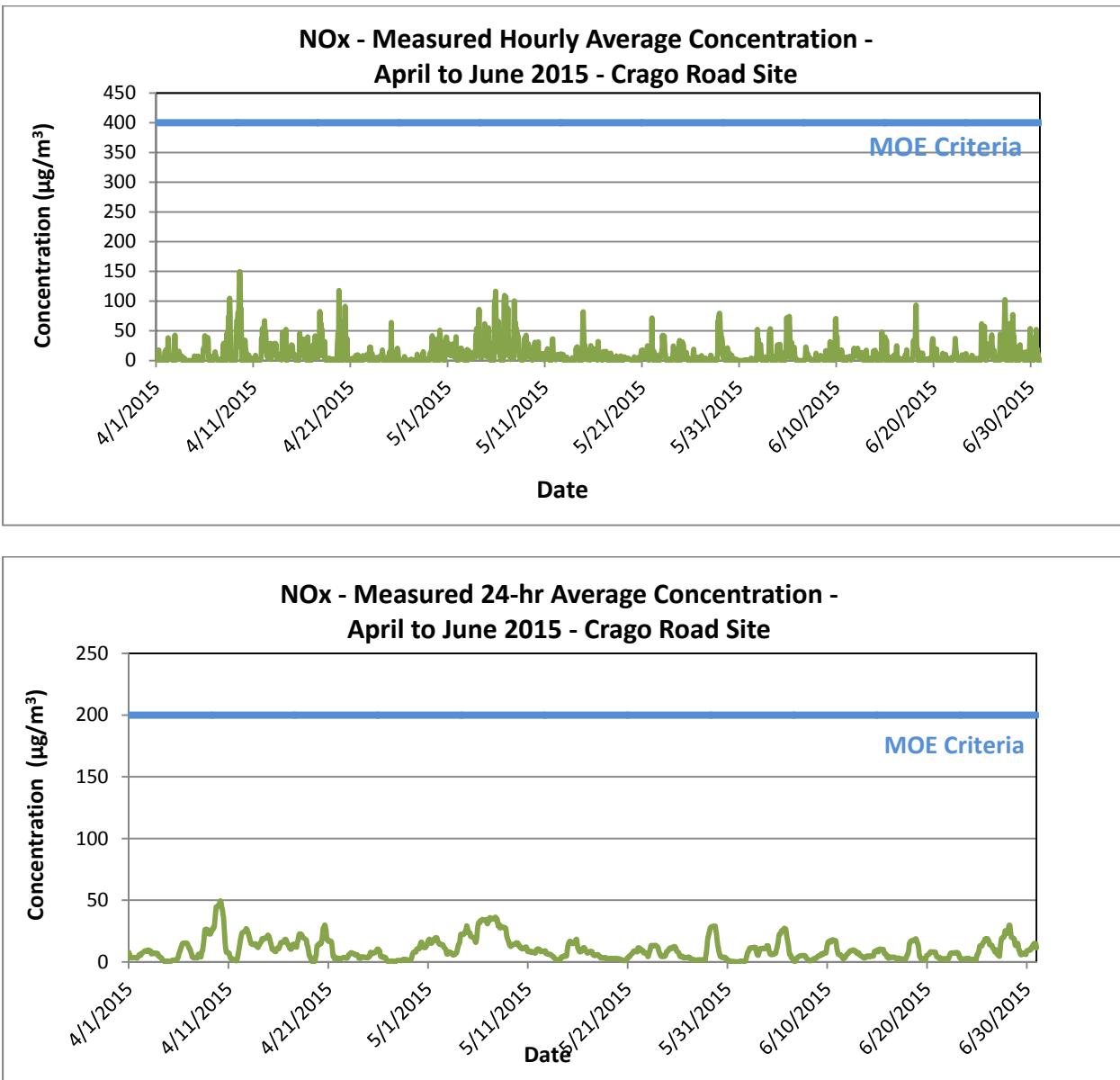


**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Appendix C NOX Data Summaries and Time History Plots
November 20, 2015

Appendix C NO_x DATA SUMMARIES AND TIME HISTORY PLOTS

Figure C-1 Time History Plots of Measured Hourly Average and 24-Hour Average NO_x Concentrations – Crago Road Station



**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

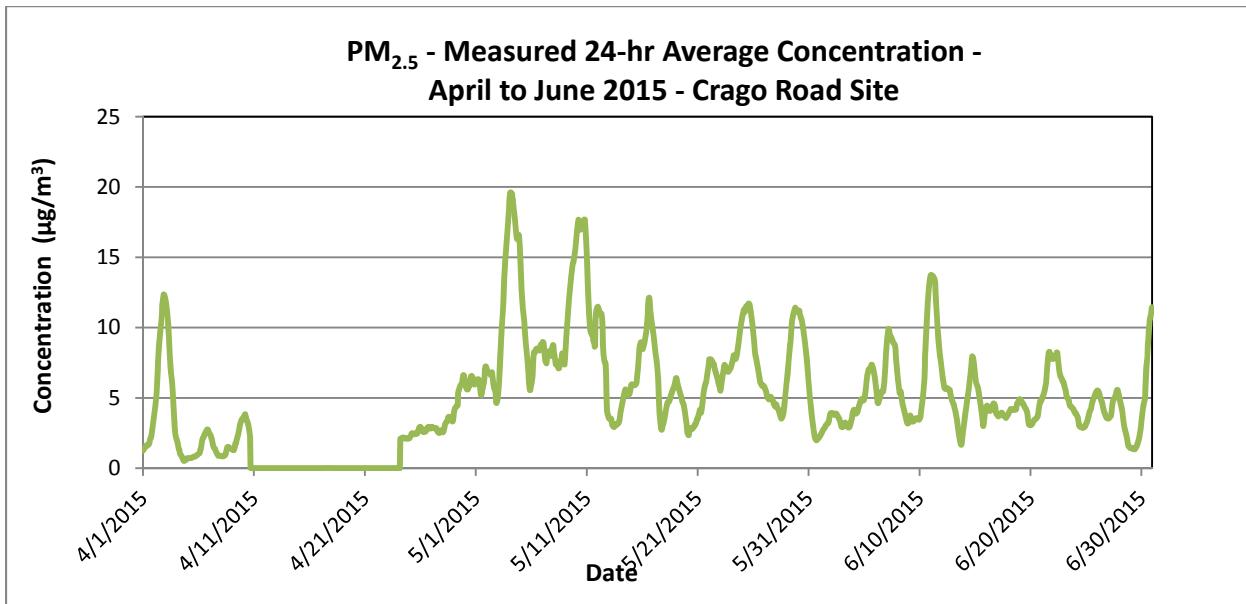
Appendix D PM2.5 Data Summaries and Time History Plots
November 20, 2015

**Appendix D PM_{2.5} DATA SUMMARIES AND TIME HISTORY
PLOTS**

		PM _{2.5} - Crago Road May 2015 (µg/m ³)																													
		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	1	6.2	5.7	4.7	4.4	5.1	4.2	5.0	4.3	4.3	5.3	6.0	8.1	12.0	13.8	13.2	6.5	6.8	3.8	6.8	11.9	19.1	7.2	3.6	3.2	24	19.1	3.2	7.1		
	2	2.9	3.1	3.3	3.9	4.4	4.5	4.2	2.5	3.3	5.7	9.6	8.7	6.9	6.4	4.5	3.2	3.0	3.2	4.5	6.0	5.1	5.6	5.8	7.2	24	9.6	2.5	4.9		
	3	9.0	9.2	12.0	18.3	21.7	23.0	19.2	17.4	20.3	19.5	20.5	22.5	22.9	21.8	20.9	20.2	19.8	18.3	15.7	15.6	13.8	12.8	17.5	17.5	24	23.0	9.0	17.9		
	4	22.7	24.4	22.1	20.8	20.6	20.7	20.3	14.7	12.3	13.0	13.5	15.1	15.9	12.4	10.6	12.9	12.9	13.7	14.9	15.8	18.1	15.9	10.7	7.1	24	24.4	7.1	15.9		
	5	7.4	5.9	3.8	4.4	4.8	6.2	6.9	7.7	6.9	5.2	4.0	3.7	3.8	4.0	3.5	2.9	3.7	4.2	4.4	4.8	8.2	9.2	10.8	12.9	24	12.9	2.9	5.8		
	6	11.0	9.8	9.0	12.0	18.6	22.5	15.1	6.9	7.7	8.2	6.0	4.7	4.5	3.5	2.8	2.4	3.0	3.5	4.0	7.0	14.2	11.4	7.4	12.9	24	22.5	2.4	8.7		
	7	14.0	14.1	8.6	9.0	9.8	10.3	7.9	5.9	5.7	6.2	13.2	11.8	7.2	4.3	3.8	4.6	2.7	2.1	2.9	4.5	11.1	25.4	9.3	15.8	24	25.4	2.1	8.8		
	8	12.9	4.5	3.4	3.4	4.1	4.4	7.2	7.5	7.4	7.6	7.9	6.6	7.0	7.5	8.2	4.7	6.0	7.1	7.9	9.0	10.3	9.4	11.3	12.3	24	12.9	3.4	7.4		
	9	12.4	14.6	15.6	17.7	17.8	16.9	17.0	18.0	14.3	17.1	18.9	20.4	18.6	14.2	12.3	12.6	12.9	13.4	12.3	11.6	13.5	14.7	15.9	18.1	24	20.4	11.6	15.4		
10	10	20.7	22.7	24.1	26.5	26.2	22.8	22.2	17.5	10.6	7.2	15.8	23.9	18.6	15.7	11.5	7.9	14.6	18.8	17.5	13.1	3.7	3.4	3.5	24	26.5	3.4	16.1			
	11	3.2	3.3	3.7	4.8	5.4	5.1	4.9	5.2	4.7	7.0	15.1	19.6	24.7	C	C	C	C	6.1	20.2	46.8	28.9	8.7	5.5	6.1	20	46.8	3.2	11.5		
	12	3.7	1.4	2.3	2.0	3.1	3.4	6.0	5.0	3.8	2.4	2.8	3.0	2.4	2.3	3.2	4.4	6.4	3.9	3.7	4.9	6.3	4.6	4.6	2.0	24	6.4	1.4	3.6		
	13	1.5	1.2	1.3	2.5	3.2	2.2	1.5	1.2	1.2	1.2	1.9	2.4	3.4	4.4	5.4	4.2	4.7	5.2	4.7	5.4	6.1	6.2	6.1	5.9	24	6.2	1.2	3.5		
	14	6.1	6.8	6.8	7.0	7.0	6.8	6.1	4.3	4.5	5.5	5.0	5.1	4.8	3.0	2.8	3.3	2.7	3.3	4.0	6.3	7.3	6.5	10.6	10.9	24	10.9	2.7	5.7		
	15	10.8	8.3	7.1	6.4	6.5	6.6	5.5	4.4	5.2	5.5	6.4	6.9	7.9	9.5	10.8	11.4	14.4	16.0	14.5	10.7	9.7	9.0	7.7	6.6	24	16.0	4.4	8.7		
	16	6.9	7.7	9.4	9.5	10.1	10.0	10.1	8.7	8.0	11.7	11.4	16.6	22.9	26.7	20.2	12.4	9.9	7.9	4.0	2.7	2.5	2.3	2.0	1.7	24	26.7	1.7	9.8		
	17	1.7	1.9	2.2	2.8	2.3	2.6	3.0	3.5	3.4	3.4	3.5	2.7	3.5	3.8	3.5	3.2	2.2	2.0	3.1	5.2	6.0	4.8	4.4	5.3	24	6.0	1.7	3.3		
	18	5.9	6.5	6.8	7.3	6.9	5.7	5.5	6.2	4.4	3.9	4.6	5.5	5.2	6.3	6.7	5.5	4.6	4.7	5.8	6.9	7.6	7.5	7.2	8.1	24	8.1	3.9	6.1		
	19	9.4	11.2	7.0	3.4	3.5	1.9	2.0	2.1	2.4	2.2	2.2	2.3	2.5	2.6	3.3	2.6	2.9	4.0	3.0	2.5	2.0	2.0	2.0	2.0	24	11.2	1.9	3.4		
20	20	2.2	2.0	2.4	2.1	1.4	2.2	9.3	5.3	3.1	1.9	1.5	1.5	3.6	4.0	3.5	3.3	4.5	4.8	5.5	3.1	3.1	4.4	4.3	4.5	24	9.3	1.4	3.5		
	21	4.1	4.3	5.4	5.1	4.7	5.0	5.3	4.3	5.6	7.2	7.9	9.0	11.8	9.3	8.2	6.7	7.7	8.1	7.2	7.5	9.2	10.0	10.1	7.6	24	11.8	4.1	7.1		
	22	9.4	13.6	5.5	4.5	4.6	5.1	3.9	4.0	4.0	4.6	6.4	9.7	6.6	5.8	5.4	4.3	4.8	5.4	4.8	4.6	5.5	6.1	6.5	6.7	24	13.6	3.0	5.9		
	23	6.7	7.6	8.3	10.4	10.6	10.6	8.4	8.6	10.2	9.4	9.4	7.0	6.3	4.2	3.3	3.2	3.4	3.5	4.1	5.6	6.9	7.6	7.4	7.3	24	10.6	3.2	7.1		
	24	8.8	10.9	12.0	12.9	13.8	14.4	12.2	8.9	7.0	6.5	9.2	9.6	8.2	8.4	8.6	8.7	9.0	9.4	9.8	12.3	14.7	13.1	12.0	12.2</td						

		PM _{2.5} - Crago Road June 2015 (µg/m ³)																														
		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	3.1	3.7	3.7	3.8	3.8	3.6	3.8	3.3	3.2	2.4	2.6	2.8	3.5	3.7	3.2	2.9	3.2	3.4	3.7	5.5	4.4	7.7	6.1	5.6	24	7.7	2.4	3.9				
2	4.4	3.3	3.5	4.0	3.8	4.2	3.1	1.6	2.6	2.9	3.5	3.5	3.2	2.4	2.0	1.6	1.7	1.6	2.9	2.8	2.4	4.4	3.5	2.6	24	4.4	1.6	3.0				
3	3.3	3.9	3.1	5.2	6.0	6.1	4.3	2.4	2.0	1.9	2.1	1.7	1.4	1.4	1.6	2.2	3.4	4.3	6.1	6.7	6.7	7.6	8.9	24	8.9	1.4	3.9					
4	6.2	5.3	5.0	4.1	4.0	4.2	2.8	2.6	2.6	3.3	3.7	4.4	4.5	4.5	4.2	3.8	4.5	6.5	5.9	5.3	5.5	5.9	7.9	8.7	24	8.7	2.6	4.8				
5	8.6	8.3	8.7	10.2	11.4	11.8	10.1	7.3	7.1	6.7	6.9	5.3	5.0	4.6	5.0	5.8	8.1	6.3	3.9	2.1	2.8	3.1	3.3	3.5	24	11.8	2.1	6.5				
6	3.2	2.4	2.3	2.3	2.2	3.1	8.6	8.5	9.9	8.8	9.1	8.8	8.4	7.4	7.1	6.7	6.9	6.3	7.2	7.7	9.6	14.4	22.6	18.4	24	22.6	2.2	8.0				
7	13.8	12.1	9.6	8.4	9.7	7.9	5.8	4.3	5.3	7.8	7.7	6.5	5.4	4.6	4.5	5.5	5.6	5.9	5.7	5.7	6.3	6.3	5.4	24	13.8	4.3	7.0					
8	6.0	5.9	3.8	1.6	1.5	3.3	6.7	6.3	2.5	2.2	2.0	1.3	1.2	2.4	2.6	2.7	2.6	1.8	1.7	2.2	2.6	3.1	4.6	8.2	24	8.2	1.2	3.3				
9	4.7	7.7	8.2	6.3	2.9	1.7	1.7	2.8	3.3	2.0	1.5	1.5	1.8	3.4	4.4	4.1	2.7	1.9	1.9	2.1	2.7	3.2	4.7	5.6	24	8.2	1.5	3.5				
10	6.6	8.8	11.2	10.6	10.6	9.2	9.2	9.3	7.3	9.4	10.7	27.2	21.7	18.6	22.4	21.8	19.3	15.4	16.3	15.6	13.4	10.2	10.0	10.3	24	27.2	6.6	13.5				
11	10.2	9.9	10.6	10.4	9.8	8.7	7.7	7.0	6.8	6.5	6.9	6.7	7.0	7.1	7.7	7.6	6.3	5.7	6.4	7.1	5.1	5.7	4.6	4.3	24	10.6	4.3	7.3				
12	4.0	3.5	3.1	5.0	4.5	3.5	4.8	5.7	7.5	7.2	6.1	5.9	7.7	7.3	6.3	5.9	6.8	5.8	4.2	1.8	1.8	1.7	1.8	2.0	24	7.7	1.7	4.7				
13	2.0	1.5	1.8	1.5	1.1	0.9	1.6	2.0	1.5	1.3	1.3	1.4	1.4	1.3	1.4	2.2	2.4	3.0	4.3	5.5	6.6	8.2	9.9	24	9.9	0.9	2.7					
14	10.0	8.6	9.5	7.8	6.3	6.1	7.1	6.9	6.0	7.6	7.2	8.0	9.5	7.8	7.5	7.9	10.1	14.5	8.1	3.1	2.5	2.1	1.3	2.1	24	14.5	1.3	7.0				
15	2.4	2.4	3.3	4.6	4.1	3.7	5.3	3.0	2.1	2.2	2.3	2.8	2.5	2.0	2.1	2.1	3.1	4.6	6.2	7.4	8.9	11.3	7.0	4.8	24	11.3	2.0	4.2				
16	6.4	3.7	4.5	2.8	1.9	2.2	2.5	2.3	2.2	2.6	3.2	4.3	4.5	4.7	4.0	4.0	4.5	4.6	4.8	5.2	5.0	4.7	4.4	4.4	24	6.4	1.9	3.9				
17	3.9	2.7	3.0	3.3	3.3	3.3	3.5	2.9	3.3	3.1	3.4	3.2	3.0	3.1	3.4	3.2	3.8	3.5	4.1	4.4	6.2	6.8	5.4	5.3	24	6.8	2.7	3.8				
18	5.0	4.9	4.5	4.4	5.0	5.4	3.5	2.1	3.1	3.1	3.9	3.2	3.0	3.0	3.1	3.4	3.7	4.4	9.1	8.5	7.4	7.4	7.8	7.9	24	9.1	2.1	4.9				
19	6.0	4.1	4.3	4.6	3.1	2.4	2.5	2.2	1.8	1.7	1.8	2.0	1.7	1.6	1.6	1.6	1.7	1.7	1.8	1.9	2.5	6.2	9.1	6.1	24	9.1	1.6	3.1				
20	5.3	5.3	4.9	4.5	4.4	4.3	4.0	3.3	3.1	2.7	2.5	2.2	2.6	2.6	2.2	2.4	4.9	5.9	8.5	7.7	6.0	10.4	7.7	7.9	24	10.4	2.2	4.8				
21	6.8	6.8	7.5	6.2	6.5	7.1	8.1	7.4	5.5	4.8	7.4	15.5	13.7	12.9	11.7	9.2	7.1	6.1	5.4	5.9	5.9	6.2	6.4	6.5	24	15.5	4.8	7.8				
22	7.0	7.1	7.1	7.1	8.1	8.5	8.9	8.4	7.9	7.8	6.8	7.1	7.7	6.1	4.1	3.4	3.8	3.3	4.0	4.1	4.4	3.9	5.1	5.7	24	8.9	3.3	6.1				
23	4.3	4.1	3.2	4.7	5.2	3.7	4.1	6.2	7.1	6.9	5.8	4.0	3.2	2.7	2.9	3.3	3.3	2.7	2.8	2.9	3.2	3.4	3.2	3.2	24	7.1	2.7	4.0				
24	3.2	3.2	3.1	3.0	3.0	2.9	2.3	2.1	2.2	2.8	3.4	2.9	3.1	2.7	2.5	2.4	2.7	2.9	2.9	3.2	3.9	3.6	4.0	5.7	24	5.7	2.1	3.1				
25	5.0	4.6	4.8	4.9	5.5	5.9	6.4	6.0	4.8	4.5	4.8	5.0	6.4	7.2	5.9	5.4	5.1	4.3	4.9	5.4	5.8	5.6	5.9	6.5	24	7.2	4.3	5.4				
26	6.5	5.0	4.4	4.0	3.6	3.5	3.6	2.7	2.5	2.2	2.3	2.7	2.7	2.9	2.7	2.7	2.8	2.5	2.3	3.0	3.8	5.1	6.1	5.6	24	6.5	2.2	3.5				
27	6.0	5.1	5.2	4.9	4.6	4.6	4.6	7.5	10.3	8.0	6.8	6.3	4.2	3.8	4.4	4.0	5.6	5.2	5.2	6.1	4.7	3.2	2.7	2.4	24	10.3	2.4	5.2				
28	2.3	1.2	1.1	1.2	1.5	2.1	1.1	1.5	2.1	1.8	1.4	1.2	1.2	1.0	1.2	1.1	1.2	1.0	1.1	1.2	1.7	2.6	2.3	1.4	24	2.6	1.0	1.5				
29	1.2	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.5	1.3	1.8	2.4	2.5	2.7	2.8	2.9	3.2	3.7	4.1	5.3	5.8	6.1	7.0	24	10.7	1.1	3.1					
30	9.0	7.3	6.7	6.8	6.3	7.1	C	C	C	15.9	20.0	16.5	9.4	9.1	21.7	11.7	17.1	10.4	11.3	8.2	8.5	10.2	14.6	12.6	21	21.7	6.3	11.5				
31																								0	0.0	0.0						
Count	30	30	30	30	30	30	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	717	30	29	30			
Maximum	13.8	12.1	11.2	10.6	11.4	11.8	10.1	9.3	10.3	15.9	20.0	27.2	21.7	18.6	22.4	21.8	19.3	15.4	16.3	15.6	13.4	14.4	22.6	18.4	24	27.2	9.3	16.0				
Minimum	1.2	1.1	1.1	1.2	1.1	0.9	1.1	1.4	1.5	1.3	1.3	1.2	1.2	1.0	1.2	1.1	1.2	1.0	1.1	1.2	1.7	1.3	1.4	1.4	0	0	0.9					
Average	5.5	5.1	5.1	5.0	4.8	4.7	4.8	4.4	4.4	4.7	5.0	5.6	5.1	4.8	5.2	4.7	5.2	4.9	5.1	5.1	5.9	6.4	6.4	23	10	2	5.2					
Percentiles	10	20	30	40	50	60	70	80	90	95	99	100																Maximum				
Data	1.8	2.5	3.1	3.5	4.4	5.2	6.1	7.2	8.9	10.6	19.2	27.2																27.2	13.5	5.2		
Notes																																

Figure D-1 Time History Plot of Measured 24-Hour Average PM_{2.5} Concentrations – Crago Road Station



**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2015**

Appendix E Continuous Parameter Edit Log
November 20, 2015

Appendix E CONTINUOUS PARAMETER EDIT LOG

EDIT LOG TABLE

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

Examples of Acceptable Edit Actions:

Add offset of

Invalidating span & zero check data

Delete hours

Invalidating data due to equipment malfunctions and power failures.

Delete neats

In invalidating data due to equipment failure

Slope Correction

EDIT LOG TABLE

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 span & zero check data
Invalidate data due to equipment

Invalidating data due to equipment malfunctions and power failures
Invalidating data when instrumentation off-line

Invalidating data when instrumentation off-

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:	Crago Road					
Station address:	Crago Road	Emitter Address:	The Region of Durham, 605 Rossland Rd, Whitby, ON					
Pollutant or parameter:	Temperature	Instrument make & model:	Campbell Scientific Model HMP60					
Data edit period	Start date:	1-Jan-15	End date:	30-Jun-15				
					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)	

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:	Crago Road					
Station address:	Crago Road	Emitter Address:	The Region of Durham, 605 Rossland Rd, Whitby, ON					
Pollutant or parameter:	Rainfall	Instrument make & model:	Texas Electronic TE525M					
Data edit period	Start date:	1-Jan-15	End date:	30-Jun-15				
					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)	

Examples of Acceptable Edit Actions:

Add offset of

Delete hours

Zero Correction

Slope Correction

Manual data entry for missing, but collected data

Invalidate span & zero check data

Invalidate data due to equipment malfunctions and power failures.

Invalidate 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:	Crago Road					
Station address:	Crago Road	Emitter Address:	The Region of Durham, 605 Rossland Rd, Whitby, ON					
Pollutant or parameter:	Relative Humidity	Instrument make & model:	Campbell Scientific Model HMP60					
Data edit period	Start date:	1-Jan-15	End date:	30-Jun-15				
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)	

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:	Crago Road					
Station address:	Crago 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					
Data edit period	Start date:	1-Jan-15	End date:	30-Jun-15				
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)	

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