

**Quarterly Ambient Air Quality
Monitoring Report for the Durham
York Energy Centre (Crago Road
Station) – April to June 2017**

Durham York Energy Centre



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Sign-off Sheet

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**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2017**

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QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2017

Executive Summary

The Regional Municipalities of Durham and York operate the Durham York Energy Centre (DYEC) which is an Energy from Waste (EFW) facility intended to provide a long-term, sustainable solution to manage the remaining municipal solid waste after waste diversion from the Regions. The facility commenced commercial operation on February 1, 2016.

An Ambient Air Quality Monitoring Plan – Durham York Residual Waste Study (Ambient Monitoring Plan) was developed and included two monitoring stations referred to as the Courtice Water Pollution Control Plant (WPCP) Station and the Rundle Road Station (as well as a temporary Fence Line Station). The plan developed for these 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.

Subsequently, the Region decided to add a third ambient air monitoring station located near the corner of Crago and Osborne Roads (referred to as the Crago Road Station), which was installed in October/November 2014. The Crago Road Station is not part of the Ambient Monitoring Plan; however, it is operated following the same protocols as the other two stations. Results from the Crago Road Station are reported separately from the Courtice WPCP and Rundle Road Stations.

The Crago Road Station is equipped to measure concentrations of several air contaminants either continuously or at scheduled intervals (non-continuously) as outlined below:

- Contaminants monitored continuously:
 - Sulphur Dioxide (SO_2)
 - Nitrogen Oxides (NO_x), and
 - Particulate Matter smaller than 2.5 microns ($\text{PM}_{2.5}$).
- Contaminants monitored non-continuously:
 - Metals in Total Suspended Particulate (TSP) matter
 - Polycyclic Aromatic Hydrocarbons (PAHs), and
 - Dioxins and Furans.

Meteorological data is also measured at the station. The predominantly downwind Crago Road Station measures horizontal wind speed, wind direction, atmospheric temperature, relative humidity, and rainfall.

This quarterly report provides a summary of the ambient air quality data collected at the Crago Road Station for the period April to June 2017 (Calendar Quarter 2). All measured air quality parameters had acceptable data recovery rates during this quarter. Instrumentation recovery rates are presented in Section 3.2 of this report.

Site personnel noted ongoing Highway 418 construction on the north and south sides of Highway 401 between Courtice and Crago Roads during Quarter 2 2017.

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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 Standards or human health risk assessment (HHRA) health-based criteria 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.
3. The maximum measured concentrations of TSP and all metals with Ministry of Environment and Climate Change (MOECC) air quality Standards were below their applicable Standards (as presented in **Table 2-2** in this report).
4. The maximum measured concentrations of PAHs with MOECC air quality Standards were below their applicable criteria shown in **Table 2-3**.
5. The maximum measured toxic equivalent dioxin and furan concentration was below the applicable Standard presented in **Table 2-3**.

In summary, the measured concentrations of the air contaminants monitored were below their applicable MOECC Standards and HHRA criteria during the monitoring period between April and June 2017.

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
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Abbreviations

AAQC	Ambient Air Quality Criteria
ACB List	Air Contaminants Benchmarks List: Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants
CAAQS	Canadian Ambient Air Quality Standard
CAC	Criteria Air Contaminants
CDD	Chlorinated Dibenzo-p-dioxins
CDF	Chlorinated Dibenzo-p-furans
D/Fs	Dioxins and Furans
DYEC	Durham York Energy Centre
EFW	Energy from Waste
HHRA	Human Health Risk Assessment
MOECC	Ontario Ministry of the Environment and Climate Change
SO ₂	Sulphur Dioxide
NO _x	Nitrogen Oxides
O ₃	Ozone
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
Q1, Q2, Q3, Q4	Quarter 1 (January, February, and March); Quarter 2 (April, May, and June); Quarter 3 (July, August, and September); and Quarter 4 (October, November, and December)
TEQ	Toxic Equivalent Quotient
TEQs	Toxic Equivalents
TSP	Total Suspended Particulate
VES	Valley Environmental Services
WPCP	Water Pollution Control Plant

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
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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
Miscellaneous	
°C	Temperature in degrees Celsius
N/A	Not Available
%	Percent
ppm	Parts per million
ppb	Parts per billion
ppbv	Parts per billion by volume
ppt	Parts per trillion
min	Minimum
max	Maximum
mm	Millimetre
m	Metre
km/hr	Kilometre per hour
mg/m ³	Milligrams per cubic metre
µg/m ³	Micrograms per cubic metre
ng/m ³	Nanograms per cubic metre
pg/m ³	Picograms per cubic metre
pg TEQ/m ³	Picograms toxic exposure equivalents per cubic metre

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2017

Introduction
August 29, 2017

1.0 INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

The Regional Municipalities of Durham and York operate 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 location of the DYEC is shown in **Figure 1-1**. The facility commenced commercial operation on February 1, 2016.

An Ambient Air Quality Monitoring Plan – Durham York Residual Waste Study (Ambient Monitoring Plan) was developed and included two monitoring stations referred to as the Courtice Water Pollution Control Plant (WPCP) Station and the Rundle Road Station (as well as a temporary Fence Line Station). The plan developed for these 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 measurable 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.

At the request of 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 Monitoring Plan, is operated following the same protocols as the other two stations (Courtice WPCP and Rundle Road Stations) already in operation.

The Crago Road Station is equipped to measure concentrations of several air contaminants either continuously or at scheduled intervals (non-continuously) as outlined below:

- Contaminants monitored 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 2017

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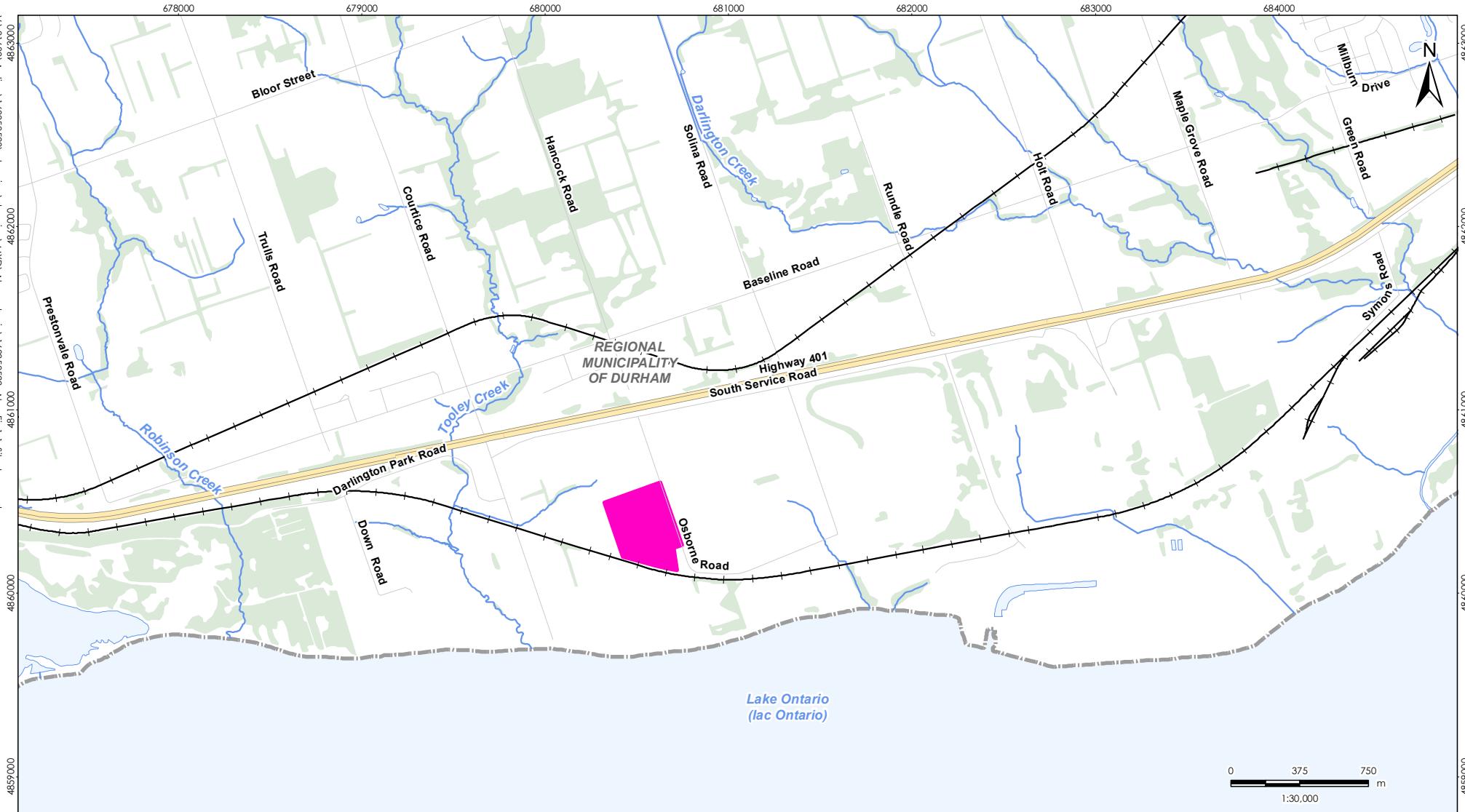
- Contaminants monitored non-continuously:
 - Metals in Total Suspended Particulate (TSP) matter
 - Polycyclic Aromatic Hydrocarbons (PAHs), and
 - Dioxins and Furans.

This quarterly report provides a summary of the ambient air quality data collected at this station for the period April to June 2017 (Q2).

1.2 LOCATION OF AMBIENT AIR QUALITY MONITORING STATION

The selection of the site for the monitoring station was accomplished in consultation with Regional Municipality of Durham 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 Crago Road Station is sited east of the DYEC near the Darlington Hydro Upper and Lower Soccer Fields on the east side of Crago Road, north of Osborne Road. Its location is shown in **Figure 1-2** and **Figure 1-3**. The monitoring station measures all the air contaminants listed in Section 1.1 and meteorological data.



October 2013
160950528



Legend

- The legend consists of seven entries, each with a colored square followed by its name:
 - Durham York Energy Centre Site (pink)
 - Railway (black line)
 - Road (grey line)
 - Highway (yellow line)
 - Watercourse (blue line)
 - Waterbody (light blue square)
 - Wooded Area (light green square)

Notes

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



Client/Project

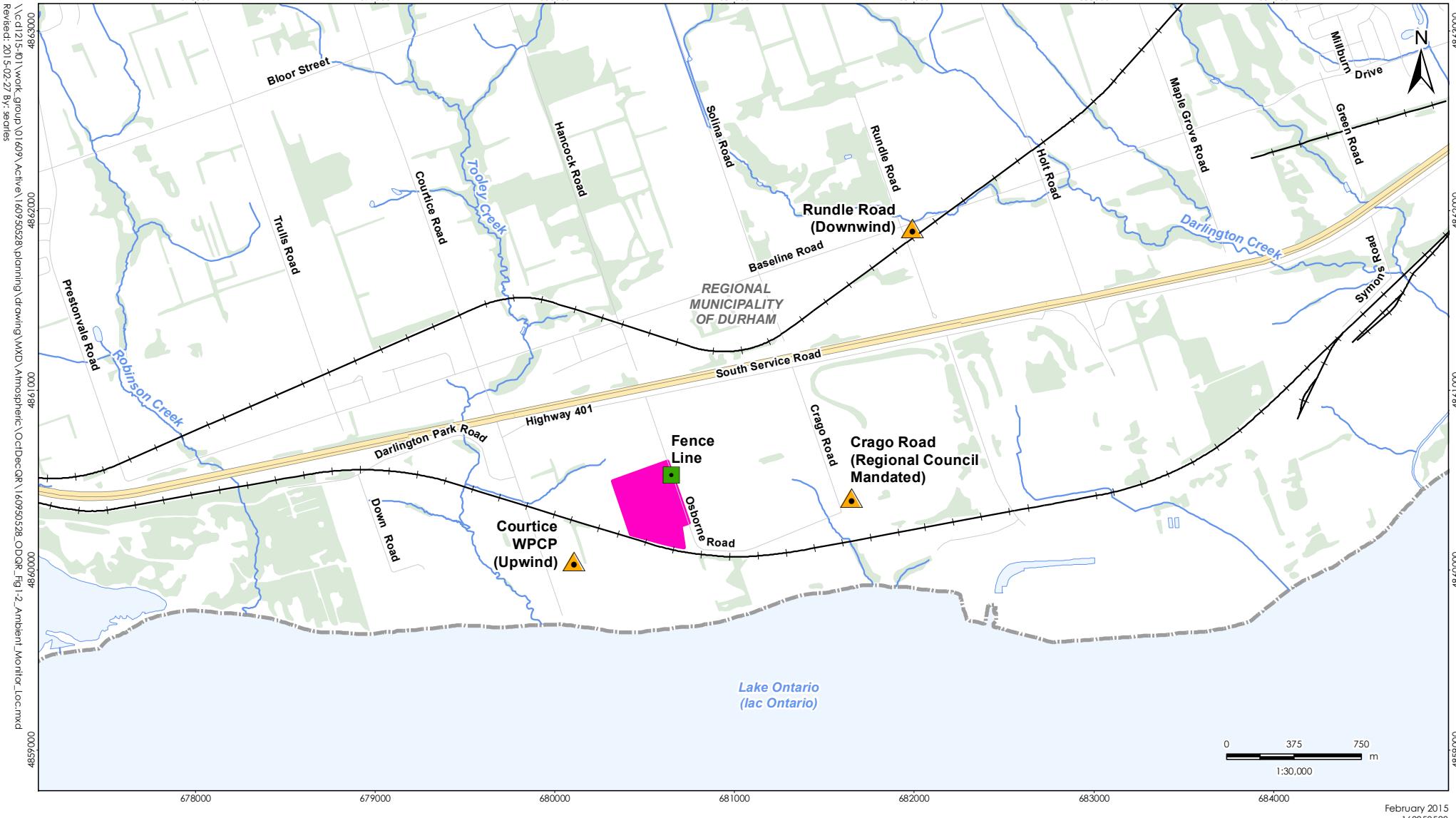
The Region of Durham Durham York Energy Centre

Figure No.

1-1

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

2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2013.



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Introduction
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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 2017

Key Components Assessed
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2.0 KEY COMPONENTS ASSESSED

2.1 METEOROLOGY

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

- Wind Speed and direction at a height of 10 m
- Ambient temperature at a height of 2 m
- Relative humidity, and
- Rainfall.

2.2 AIR QUALITY CONTAMINANTS OF CONCERN

The ambient air quality monitoring program for the Crago Road Station includes the following contaminants specified in the Ambient Monitoring Plan (Stantec, 2012):

- Continuously monitored criteria air contaminants (CACs)
 - Sulphur Dioxide (SO_2)
 - Nitrogen Oxides (NO_x), and
 - Particulate Matter smaller than 2.5 microns ($\text{PM}_{2.5}$).
- Non-continuously monitored
 - Metals in Total Suspended Particulate (TSP) matter
 - Polycyclic Aromatic Hydrocarbons (PAHs), and
 - Dioxins and Furans.

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 Monitoring Plan (Stantec, 2012).

Metals:

- | | | |
|-------------------------|-------------------|------------------|
| • Aluminum (Al) | • Iron (Fe) | • Thallium (Tl) |
| • Antimony (Sb) | • Lead (Pb) | • Tin (Sn) |
| • Arsenic (As) | • Magnesium (Mg) | • Titanium (Ti) |
| • Barium (Ba) | • Manganese (Mn) | • Uranium (U) |
| • Beryllium (Be) | • Mercury (Hg) | • Vanadium (V) |
| • Bismuth (Bi) | • Molybdenum (Mo) | • Zinc (Zn) |
| • Boron (B) | • Nickel (Ni) | • Zirconium (Zr) |
| • Cadmium (Cd) | • Phosphorus (Ph) | |
| • Cobalt (Co) | • Selenium (Se) | |
| • Copper (Cu) | • Silver (Ag) | |
| • Chromium (Cr) (Total) | • Strontium (Sr) | |

QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE (CRAGO ROAD STATION) – APRIL TO JUNE 2017

Key Components Assessed
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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 criteria were used for comparison to the air quality data as specified in the Ambient Monitoring Plan (Stantec, 2012). The first set of criteria was the Standards reported in O. Reg. 419/05 (Schedules 3 and 6). These are compliance based Standards used throughout the province of Ontario. These criteria, along with O. Reg. 419/05 Guidelines and Jurisdictional Screening Levels are unchanged but were consolidated in December 2016 into a new format known as the “Air Contaminants Benchmarks List: Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants” (MOECC, 2016) (ACB List).

Not all chemicals have O. Reg. 419/05 Standards, or in some instances updated health-based criteria 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 criteria.

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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 three consecutive years) and an annual objective of 10 µg/m³ as noted in **Table 2-1**. The proposed CAAQS 24-hour objective for 2020 is 27 µg/m³.

Summaries of the relevant air quality criteria for the contaminants monitored are presented in **Table 2-1** to **Table 2-3**.

Table 2-1 Summary of Air Quality Criteria for CACs

Contaminant	CAS	O. Reg. 419/05 – Schedule 3 Standards			HHRA Health-Based Criteria		
		1-Hour (ppb / µg/m ³)	24-Hour (ppb / µg/m ³)	Annual (ppb / µg/m ³)	1-Hour (ppb / µg/m ³)	24-Hour (ppb / µg/m ³)	Annual (ppb / µg/m ³)
Sulphur dioxide	7446095	250 / 690	100 / 275	20 / 55	250 / 690	100 / 275	11 / 29
Nitrogen oxides ^A	10102-44-0	200 / 400	100 / 200	-	200 / 400	100 / 200	30 / 60
Contaminant	CAS	Canadian Ambient Air Quality Standards (CAAQS)			HHRA Health-Based Criteria		
		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 Standard for NO_x is 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 (December 2016) version of the ACB List, 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 criterion for PM_{2.5} was selected referencing CCME (2006).

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Key Components Assessed
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Table 2-2 Summary of Air Quality Criteria for Metals

Contaminant	CAS	O. Reg. 419/05 – Schedule 3 Standards, Guidelines, and Screening Levels			HHRA Health-Based Criteria		
		1-Hour ($\mu\text{g}/\text{m}^3$)	24-Hour ($\mu\text{g}/\text{m}^3$)	Other time Period ($\mu\text{g}/\text{m}^3$)	1-Hour ($\mu\text{g}/\text{m}^3$)	24-Hour ($\mu\text{g}/\text{m}^3$)	Annual ($\mu\text{g}/\text{m}^3$)
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
Titanium	7440-32-6	-	120	-	-	-	-

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Table 2-2 Summary of Air Quality Criteria for Metals

Contaminant	CAS	O. Reg. 419/05 – Schedule 3 Standards, Guidelines, and Screening Levels			HHRA Health-Based Criteria		
		1-Hour ($\mu\text{g}/\text{m}^3$)	24-Hour ($\mu\text{g}/\text{m}^3$)	Other time Period ($\mu\text{g}/\text{m}^3$)	1-Hour ($\mu\text{g}/\text{m}^3$)	24-Hour ($\mu\text{g}/\text{m}^3$)	Annual ($\mu\text{g}/\text{m}^3$)
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 2-3 Summary of Air Quality Criteria for PAHs and D/Fs

Contaminant	CAS	O. Reg. 419/05 – Schedule 3 Standards			HHRA Health-Based Criteria			Toxic Equivalency Factor Annual A, F (ng/m^{3}) ⁻¹
		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)	
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
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

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Table 2-3 Summary of Air Quality Criteria for PAHs and D/Fs

Contaminant	CAS	O. Reg. 419/05 – Schedule 3 Standards			HHRA Health-Based Criteria				Toxic Equivalency Factor Annual A, F (ng/m ³) ⁻¹
		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)		
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) ^E 1 (pg TEQ/m ³) ^C	-	-	-	-	-	-

Notes:

- A. Carcinogenic Annual Average. Units in (ng/m³)⁻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. 419/05 Schedule 6 Upper Risk Thresholds
- D. O. Reg. 419/05 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. 419/05 Summary of Standards and Guidelines, and the corresponding WHO₂₀₀₅ toxic equivalency factors (i-TEFs).
- F. Toxic Equivalency Factors (TEFs) are shown as benzo(a)pyrene equivalents.

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3.0 INSTRUMENTATION SUMMARY AND FIELD CONDITIONS

3.1 INSTRUMENTATION

The measurement program at the monitoring site includes both continuous and non-continuous monitors to sample air contaminant concentrations.

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	Teledyne 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 API 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

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Two manually operated, hi-volume air samplers are installed at the Crago Road Station to collect metals in total suspended particulate (TSP), polycyclic aromatic hydrocarbons (PAHs), and dioxins and furans. Sampling for these contaminants is conducted following the methodology and analyses described in the Ambient Monitoring Plan (Stantec, 2012), as presented in **Table 3-2**. The samples were submitted to Maxxam Analytics Inc., a Canadian Association for Laboratory Accreditation Inc. (CALA) / Standards Council of Canada (SCC) accredited laboratory, for analysis.

Table 3-2 Summary of Non-Continuous Ambient Air Quality 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 and Furans				24 hour sample taken every 24 days.

Horizontal wind speed, wind direction, atmospheric temperature, relative humidity, and rainfall are measured at the predominantly downwind Crago Road Station. 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 at the Crago Road Station is summarized in **Table 3-3**.

Table 3-3 Summary of Meteorological Equipment

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

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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

Some operational issues at the station were encountered this quarter. During the MOECC audit of the Courtice and Rundle Road Stations on June 20, 2017, it was determined that the certified concentration of the gas used to calibrate all NOx analyzers was low, resulting in the span setting of the Rundle and Courtice monitors being low by 8.9 and 13.3% respectively. A conservative span adjustment of 13.3% was therefore applied to the Crago Road NOx data to account for this discrepancy. A summary of the operational issues for each measurement parameter during the monitoring period is presented in **Table 3-4**.

Table 3-4 Summary of Instrument Issues at the Crago Road Station

Parameter	Issues	Timeframe	Remedial Action
SO ₂	Perm Tube performance degraded.	28-Apr-17 6:00	Perm Tube replaced.
NOx	Measured concentration low due to off-specification calibration gas.	5-Apr-17 13:00 – 30-Jun-17 23:00	Conservatively applied a span correction of 13.3% to all data from 5-Apr-17 (the time of the MOECC audit of other stations previous to the June 20 th audit).
	Faulty perm tube for instrument auto zeros.	28-Apr-17 8:00 – 30-Jun-17 23:00	Replacement perm tube ordered and installed as soon as received. All data intact.
	Monitor taken offline to diagnose perm tube performance issue.	28-Apr-17 6:00 – 8:00	Maintenance performed.
	Analyzer offline to diagnose auto zero performance.	10-May-17 9:00 - 14:00	Leak check performed.
PM _{2.5}	Sharp inlet pump malfunctioned, causing it to shut down.	30-May-17 7:00 – 31-May-17 14:00	Pump restarted. Data during the malfunction was invalidated.
	Crago Sharp moved to the Courtice WPCP Station after a pump issue at Courtice required the Courtice unit be sent for repair.	8-Jun-17 13:00 – 9-Jun-17 9:00	Once repair was completed, the Courtice Sharp was installed at Crago until the next monthly calibration, when both units were returned to their respective stations.
TSP/Metals Hi-Vol.	None	-	-
PAH/ D/F Hi-Vol	None	-	-

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Instrumentation Summary and Field Conditions
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Table 3-4 Summary of Instrument Issues at the Crago Road Station

Parameter	Issues	Timeframe	Remedial Action
Other	Unable to download data remotely due to modem malfunction	15-Jun-17 8:00 – 16-Jun-17 14:00	Remote connection re-established. All data intact.

3.3 INSTRUMENTATION RECOVERY RATES

Data recovery rates for each monitor at the station during this quarter are presented in **Table 3-5**.

Table 3-5 Summary of Data Recovery Rates for the Crago Road Station – April to June 2017

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
SO ₂	2176	99.6% ^B
NO _x	2166	99.2% ^B
PM _{2.5}	2126	97.3% ^B
Temperature	2184	100.0% ^B
Rainfall	2184	100.0% ^B
Relative Humidity	2184	100.0% ^B
Wind Speed/Direction	2184	100.0% ^B
TSP/Metals	16 ^A	100%
PAHs	8 ^A	100%
Dioxins and Furans	4 ^A	100%

Notes:

- A. Number of filters/24-hour average samples.
- B. Includes instrumentation issues summarized in Table 3-4 and monthly calibrations.

3.4 FIELD CONDITION OBSERVATIONS

During Q2 2017, activities in the vicinity of the Crago ambient air monitoring station were observed that had the potential to be affecting air quality levels. These observations were noted by Stantec and Valley Environmental Services (VES) personnel during field visits.

Construction of Highway 418, which will connect with Highway 401 between Courtice Road and Crago Road was ongoing during this quarter. Highway 418 will provide a north-south link between Highway 401 and the Phase 2 expansion of Highway 407. The Highway 401/418 interchange will be located almost directly north of the DYEC. Throughout the quarter, excavator/dump truck crews were observed working in a large area immediately north of the DYEC between Energy Drive and Hwy 401 for the relocation/re-alignment of South Service Road.

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The new South Service Road will be located immediately south of the existing South Service Road and run between Courtice Road and Crago Road. A photograph of South Service Road realignment construction is shown in **Figure 3-1**.

Figure 3-1 Looking South from Existing South Service Road at South Service Road Realignment Construction (June 1, 2017)



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4.0 SUMMARY OF AMBIENT MEASUREMENTS

The following sections provide summaries of the validated data and the validation completed 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 2017 period are presented in **Table 4-1**.

Table 4-1 Summary of Hourly Meteorological Measurements – April to June 2017

Parameter	Crago Road Station (Predominately Downwind)	Units
Temperature	Maximum	24.4
	Minimum	-1.7
	Mean (April)	7.2
	Mean (May)	10.5
	Mean (June)	16.1
	Mean (Period)	11.3
	Standard Deviation	5.3
Rainfall	Maximum	11.3
	Minimum	0.0
	Mean (April)	0.14
	Mean (May)	0.20
	Mean (June)	0.16
	Mean (Period)	0.17
	Standard Deviation	0.69
Relative Humidity	Maximum	97.8
	Minimum	24.9
	Mean (April)	71.2
	Mean (May)	74.3
	Mean (June)	76.0
	Mean (Period)	73.9
	Standard Deviation	15.8

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Table 4-1 Summary of Hourly Meteorological Measurements – April to June 2017

Parameter	Crago Road Station (Predominately Downwind)	Units
Wind Speed ^A	Maximum	44.6
	Minimum	0.0
	Mean (April)	14.4
	Mean (May)	12.4
	Mean (June)	9.4
	Mean (Period)	12.1
	Standard Deviation	7.0

Note:

A. Wind speed is measured at 10 m.

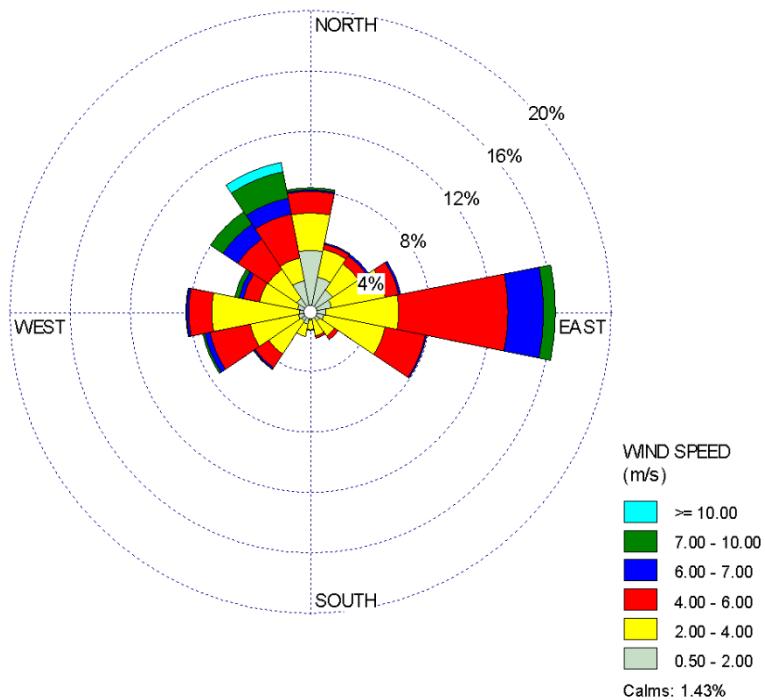
A wind rose showing directionality and speed is presented in **Figure 4-1**. The length of the radial barbs gives the total percent frequency of winds from the indicated direction, while portions of the barbs of different widths indicate the frequency associated with each wind speed category.

Winds over the three-month period occurred predominantly from easterly and north-northwesterly directions. Wind contribution from the northeast and south was low. Higher wind speeds occurred from north-northwesterly directions.

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Summary of Ambient Measurements
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Figure 4-1 Wind Rose for April to June 2017



4.2 CAC AMBIENT AIR QUALITY MEASUREMENTS

A summary of the maximum, minimum, arithmetic mean, and standard deviation of the measured CAC pollutant concentrations are presented in **Table 4-2**. Also presented in this table are the number of exceedances (if any occurred) of the relevant O. Reg. 419/05 Schedule 3 Standards, Ontario Ambient Air Quality Criteria (AAQC) or health-based criteria for each contaminant. All monitored contaminants were below their applicable criteria during the period April to June 2017.

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 O. Reg. 419/05 Schedule 3 Standards for NO_x which are based on health effects of NO₂, therefore the AAQC were compared to measured NO₂ concentrations in this report. As per the current (December 2016) version of the ACB List, the Schedule 3 Standard for NO_x was also compared to the monitored NO_x levels.

The maximum concentration levels measured at the Crago Road Station in this quarter are compared in **Figure 4-2** to their respective air quality criteria along with the levels measured at the Courtice WPCP and Rundle Road Stations (Stantec, 2017).

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Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2017

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Criteria			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
SO ₂	1	250	690	Maximum	66.1	178.1
				Minimum	0.0	0.0
				Mean (April)	1.2	3.4
				Mean (May)	0.9	2.3
				Mean (June)	0.5	1.3
				Mean (Period)	0.9	2.3
				Standard Deviation	2.4	6.6
				# of Exceedances	0	0
	24	100	275	Maximum	14.9	40.6
				Minimum	0.1	0.3
				Mean (April)	1.2	3.4
				Mean (May)	0.9	2.4
				Mean (June)	0.5	1.3
				Mean (Period)	0.9	2.4
				Standard Deviation	1.5	4.0
				# of Exceedances	0	0

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Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2017

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Criteria			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
PM _{2.5}	24	N/A	28 ^	Maximum	-	19.0
				Minimum	-	0.3
				Mean (April)	-	4.9
				Mean (May)	-	5.2
				Mean (June)	-	5.3
				Mean (Period)	-	5.1
				Standard Deviation	-	3.3
				# of Exceedances	-	N/A
NO ₂	1	200	400	Maximum	36.2	73.7
				Minimum	0.0	0.0
				Mean (April)	7.6	15.2
				Mean (May)	4.1	8.1
				Mean (June)	3.7	7.1
				Mean (Period)	5.1	10.1
				Standard Deviation	5.6	11.0
				# of Exceedances	0	0
	24	100	200	Maximum	19.3	37.9
				Minimum	0.0	0.0
				Mean (April)	7.7	15.3
				Mean (May)	4.2	8.2
				Mean (June)	3.7	7.1

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Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2017

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Criteria			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
NO _C	1	NA	NA	Mean (Period)	5.2	10.2
				Standard Deviation	3.3	6.5
				# of Exceedances	0	0
NO _C	1	NA	NA	Maximum	41.7	52.6
				Minimum	0.0	0.0
				Mean (April)	1.1	1.4
				Mean (May)	1.3	1.7
				Mean (June)	2.1	2.6
				Mean (Period)	1.5	1.9
				Standard Deviation	3.5	4.4
				# of Exceedances	N/A	N/A
	24	NA	NA	Maximum	8.9	11.3
				Minimum	0.0	0.0
				Mean (April)	1.1	1.5
				Mean (May)	1.4	1.8
				Mean (June)	2.1	2.6
				Mean (Period)	1.5	2.0
				Standard Deviation	1.7	2.2
				# of Exceedances	N/A	N/A

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Table 4-2 Summary of Ambient CAC Monitoring Data – April to June 2017

Pollutant	Averaging Period	AAQC / Schedule 3 / HHRA Health-Based Criteria			Crago Road Station (Predominately Downwind)	
		ppb	µg/m³		Concentration (ppbv)	Concentration (µg/m³)
NO _x	1	200 ^B	400 ^B	Maximum	61.0	119.6
				Minimum	0.0	0.0
				Mean (April)	8.6	17.1
				Mean (May)	5.3	10.4
				Mean (June)	5.7	10.9
				Mean (Period)	6.5	12.8
				Standard Deviation	8.0	15.8
				# of Exceedances	0	0
	24	100 ^C	200 ^C	Maximum	28.1	55.2
				Minimum	0.0	0.0
				Mean (April)	8.7	17.3
				Mean (May)	5.4	10.6
				Mean (June)	5.7	10.9
				Mean (Period)	6.6	12.9
				Standard Deviation	4.4	8.7
				# of Exceedances	0	0

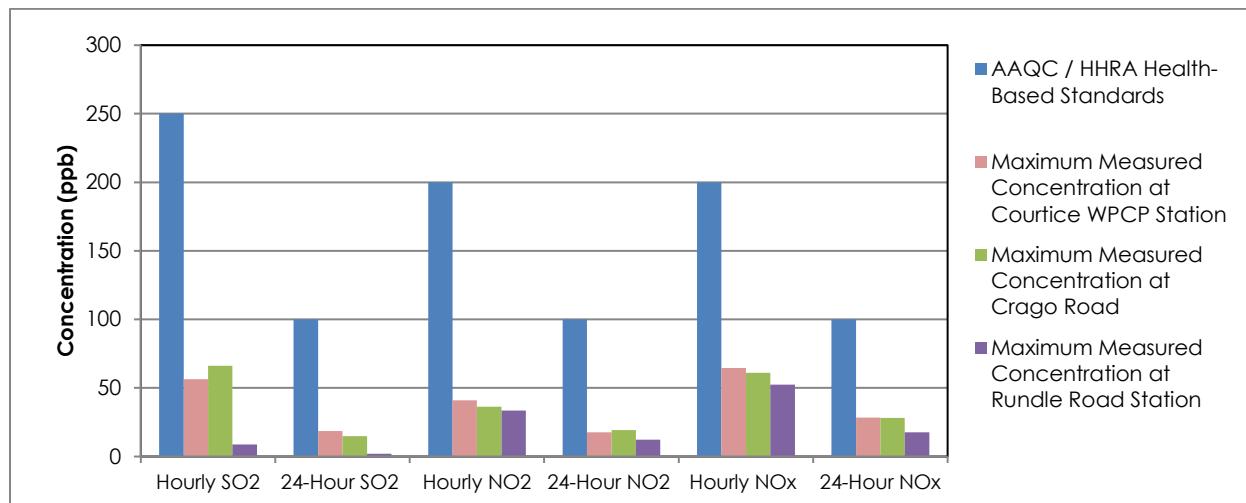
Notes:

- 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 (December 2016) of the ACB List, the air standard for NO_x is compared to a monitored NO_x concentration, although the O. Reg. 419/05 Schedule 3 Standard for NO_x is based on health effects of NO₂.
- C. NO has no regulatory criteria.

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Figure 4-2 Comparison of NO₂, NOx and SO₂ Ambient Air Quality Monitoring Data to Applicable Criteria at the 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 hourly and 24-hour average SO₂ concentrations. For hourly and 24-hour averages, the Ontario AAQCs of 250 ppb and 100 ppb (690 µg/m³ and 275 µg/m³) are shown with blue lines on the respective plot. As shown in these figures, measured ambient SO₂ concentrations at the station were well below the Ontario AAQCs.

The maximum hourly and 24-hour average SO₂ concentrations measured at the Crago Road Station during April to June 2017 were 66.1 and 14.9 ppb (178.1 and 40.6 µg/m³) respectively, which are 26% and 15% of the applicable 1-hour and 24-hour Ontario AAQCs.

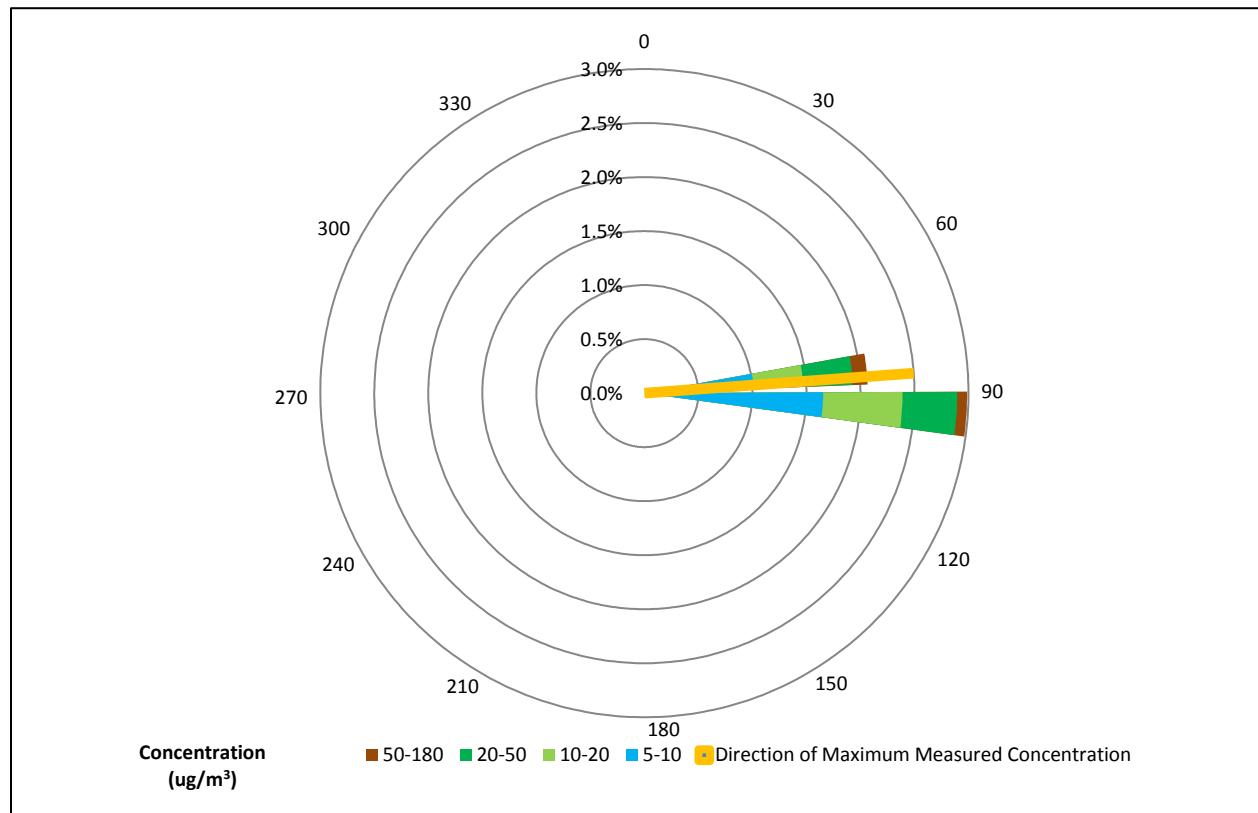
A pollution rose of hourly average SO₂ concentrations measured at the Crago Road Station is presented in **Figure 4-3**. The pollution rose plot presents measured hourly average contaminant concentrations versus measured wind direction (over 10° wind sectors). Concentrations less than 5 µg/m³, which account for 94% of the measurements, have been removed from the plot to allow the distribution of maximum levels to be more clearly shown in the figure. In this period, the Crago Road Station generally measured higher hourly concentrations for winds blowing from easterly directions.

The maximum hourly average concentration of SO₂ occurred on April 3, 2017 at 20:00, with winds blowing from the east (the direction of the St. Mary's Cement facility). The maximum 24-hour average SO₂ concentration occurred for winds blowing from the direction of St. Mary's Cement on April 4, 2017.

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Figure 4-3 Pollution Rose of Measured Hourly Average SO₂ Concentrations – April to June 2017



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. However, as per the current (December 2016) version of the ACB List, the Schedule 3 NO_x criteria were also compared to the monitored NO_x concentrations (see Section 4.2.3 below).

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Data summaries are presented in **Appendix B** for nitrogen dioxide for the station for 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 200 ppb and 100 ppb (400 µg/m³ and 200 µg/m³) are shown with blue lines on the respective plot. As shown in these figures, measured ambient NO₂ concentrations were well below the Ontario AAQCs.

The maximum measured hourly and 24-hour average concentrations were 36.2 and 19.3 ppb (73.7 and 37.9 µg/m³), which are 18% and 19% respectively, of the applicable 1-hour and 24-hour Ontario AAQCs.

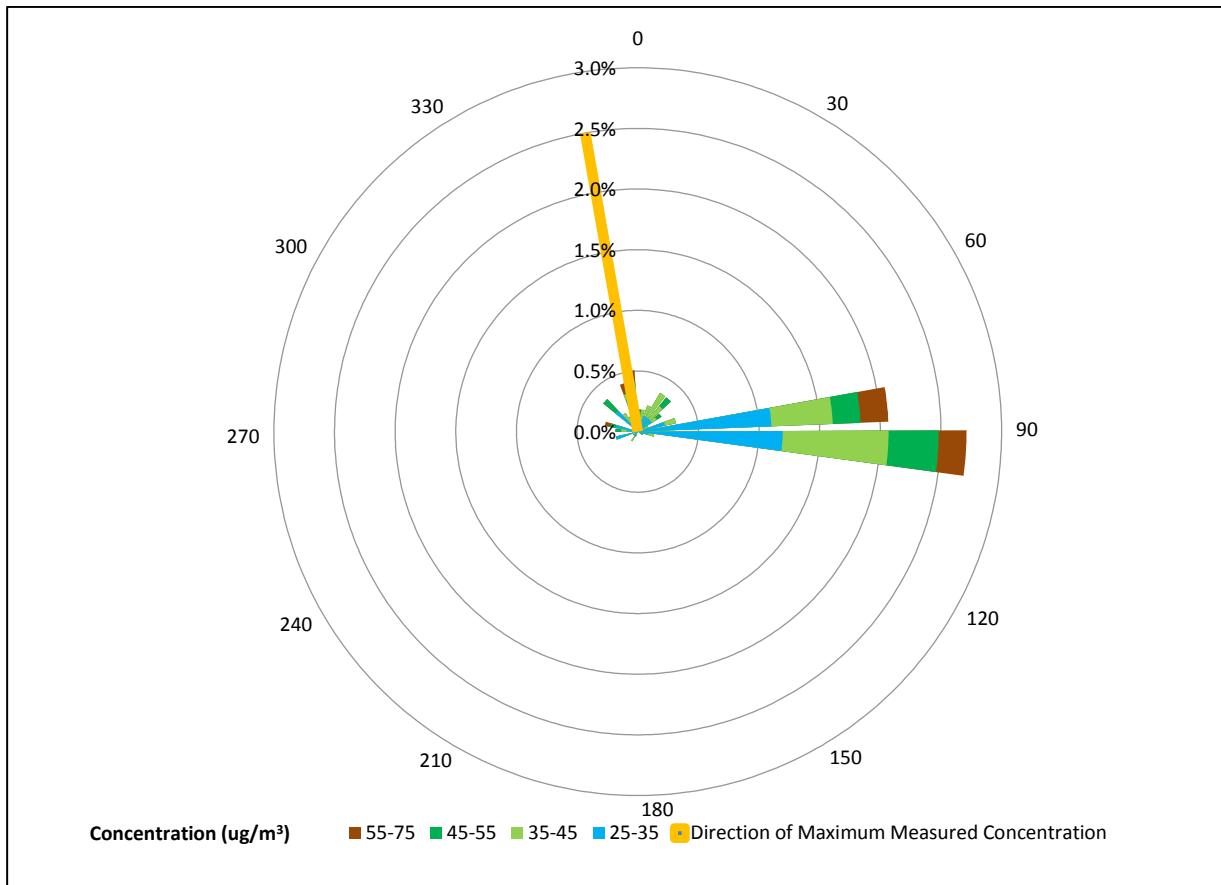
A pollution rose of measured hourly average NO₂ concentrations is presented in **Figure 4-4**. Concentrations less than 25 µg/m³, which account for 89% of the measurements, have been removed from the plot to allow the distribution of maximum levels to be more clearly shown in the figure. Higher measured hourly average concentrations generally occurred from the east.

The highest measured hourly average NO₂ concentration occurred on April 13, 2017 at 22:00. During this hour winds were blowing from the north-northwest for which Highway 401 and Highway 418 construction activities were upwind. The highest 24-hour average concentration occurred when winds were blowing from the northwest on April 4, 2017, for which Highway 401 and Highway 418 construction activities were upwind.

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Figure 4-4 Pollution Rose of Measured Hourly Average NO₂ – April to June 2017



4.2.3 Nitrogen Oxides (NO_x)

Data summaries are presented in **Appendix C** for nitrogen oxides for each month as well as time history plots of the hourly and 24-hour average NO_x concentrations. For the hourly and 24-hour averages, the O. Reg. 419/05 Schedule 3 Standards of 200 ppb and 100 ppb ($400 \mu\text{g}/\text{m}^3$ and $200 \mu\text{g}/\text{m}^3$) are shown with blue lines on the respective plot.

The maximum hourly NO_x concentration measured at the Crago Road Station was 61.0 ppb ($119.6 \mu\text{g}/\text{m}^3$), which is 30% of the 1-hour Ontario AAQCs. The maximum 24-hour average NO_x concentration measured at this station was 28.1 ppb ($55.2 \mu\text{g}/\text{m}^3$), which is 28% of the applicable 24-hour Ontario AAQCs. See **Table 4-2** for detailed results.

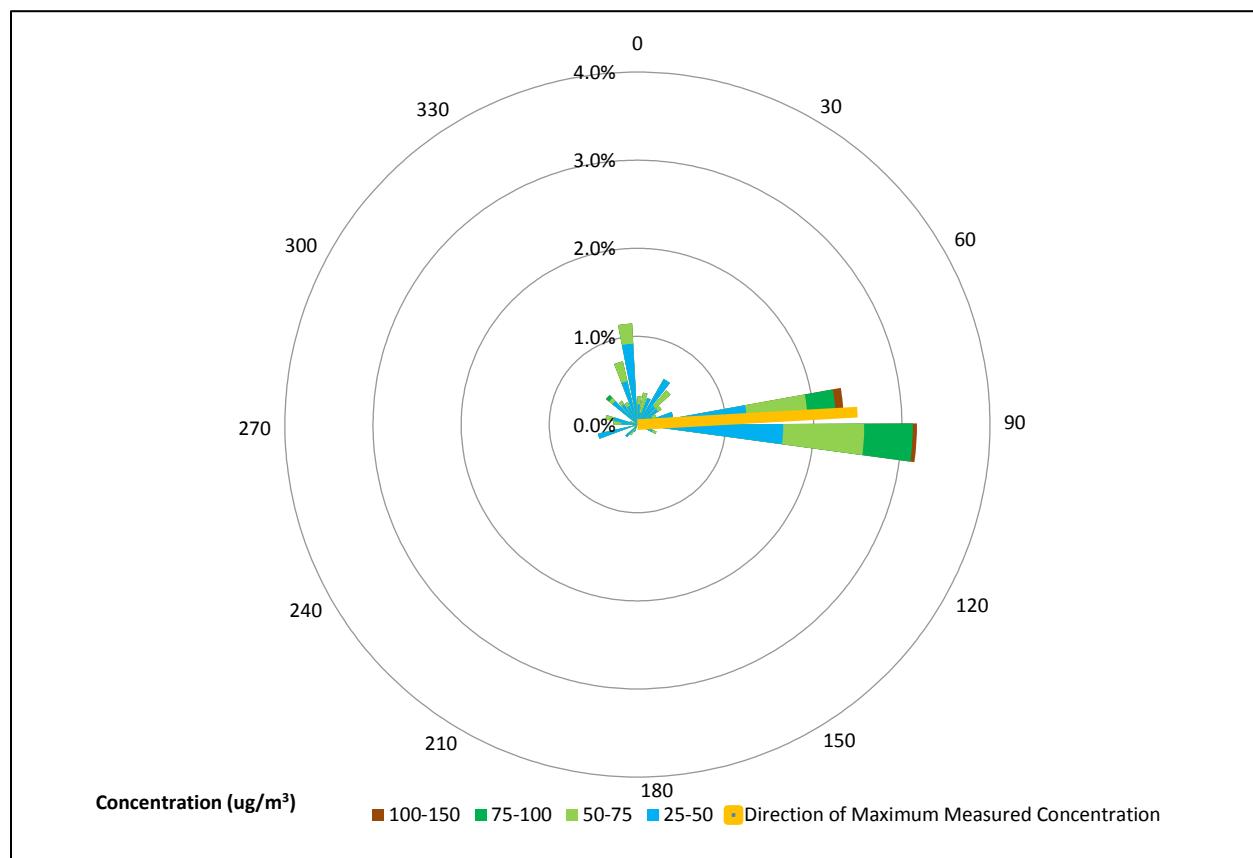
A pollution rose of measured hourly average NO_x concentrations is presented in **Figure 4-5**. Concentrations less than $25 \mu\text{g}/\text{m}^3$, which account for 83% of the measurements, have been removed from the plot to allow the distribution of maximum levels to be more clearly shown. In **Figure 4-5**, higher measured hourly average NO_x concentrations typically occurred for winds blowing from the east.

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The highest measured hourly average NO_x concentration occurred for a wind blowing from the east (from the direction of St. Mary's Cement and CN rail) on April 4, 2017 at 00:00. The maximum 24-hour average NO_x concentration was also measured on April 4, 2017 when winds were blowing from the east for which St. Mary's Cement and CN Rail are upwind.

Figure 4-5 Pollution Rose of Measured Hourly Average NO_x Concentrations – April to June 2017



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}.

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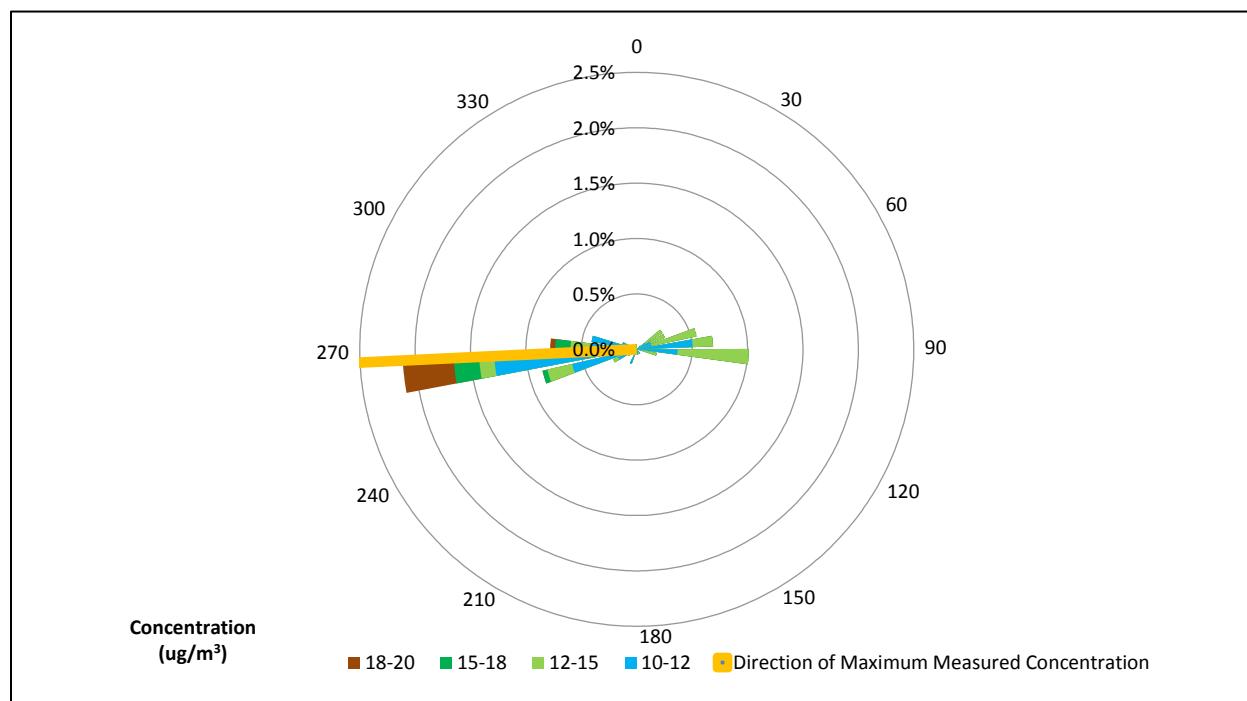
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The maximum measured 24-hour average PM_{2.5} concentration was 19.0 µg/m³ during this quarter. It should be noted that since an exceedance of the 24-hour CAAQS for PM_{2.5} requires the average of the 98th percentile levels in each of three consecutive calendar years to be greater than 28 µg/m³ whereas the PM_{2.5} measurements in this report consisted of 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 2017 annual report, at which time sufficient data will have been collected to make comparisons.

A pollution rose showing the measured 24-hour average ambient PM_{2.5} concentrations versus direction is shown in **Figure 4-6**. Concentrations less than 10 µg/m³, which account for 88% of the measurements, have been removed from the plot to allow the distribution of maximum levels to be more clearly shown in the figure. Higher measured concentrations typically occurred from westerly directions.

The highest measured 24-hour average PM_{2.5} concentration occurred on May 18, 2017 with winds originating from the west. For this wind direction, agricultural fields, the DYEC and local roads were upwind of the Crago Road Station.

Figure 4-6 Pollution Rose of Measured 24-Hour Average PM_{2.5} Concentrations – April to June 2017



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4.3 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 MOECC AAQCs were below their applicable 24-hour criteria (shown in **Table 4-3** below).

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

Contaminant	Units	MOECC Standard	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Particulate	µg/m³	120	120	89.5	11.1	0
Total Mercury (Hg)	µg/m³	2	2	1.96E-05	6.35E-06 ^	0
Aluminum (Al)	µg/m³	4.8	-	5.97E-01	1.65E-02 ^	0
Antimony (Sb)	µg/m³	25	25	3.64E-03 ^	3.07E-03 ^	0
Arsenic (As)	µg/m³	0.3	0.3	2.18E-03 ^	1.84E-03 ^	0
Barium (Ba)	µg/m³	10	10	1.18E-02	3.44E-04 ^	0
Beryllium (Be)	µg/m³	0.01	0.01	3.64E-04 ^	3.07E-04 ^	0
Bismuth (Bi)	µg/m³	-	-	2.18E-03 ^	1.84E-03 ^	-
Boron (B)	µg/m³	120	-	2.18E-03 ^	1.84E-03 ^	0
Cadmium (Cd)	µg/m³	0.025	0.025	7.27E-04 ^	6.14E-04 ^	0
Chromium (Cr)	µg/m³	0.5	-	6.14E-03	1.53E-03 ^	0
Cobalt (Co)	µg/m³	0.1	0.1	7.27E-04 ^	6.14E-04 ^	0
Copper (Cu)	µg/m³	50	-	6.66E-02	1.72E-03 ^	0
Iron (Fe)	µg/m³	4	-	1.35E+00	1.72E-02 ^	0
Lead (Pb)	µg/m³	0.5	0.5	4.64E-03	9.53E-04 ^	0
Magnesium (Mg)	µg/m³	-	-	7.84E-01	1.72E-02 ^	-
Manganese (Mn)	µg/m³	0.4	-	5.46E-02	3.44E-04 ^	0
Molybdenum (Mo)	µg/m³	120	-	1.09E-03 ^	9.20E-04 ^	0
Nickel (Ni)	µg/m³	0.2	-	2.94E-03	9.20E-04 ^	0
Phosphorus (P)	µg/m³	-	-	1.10E-01	8.60E-03 ^	-
Selenium (Se)	µg/m³	10	10	3.64E-03 ^	3.07E-03 ^	0
Silver (Ag)	µg/m³	1	1	1.82E-03 ^	1.53E-03 ^	0
Strontium (Sr)	µg/m³	120	-	1.60E-02	3.44E-04 ^	0

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

Contaminant	Units	MOECC Standard	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Thallium (Tl)	µg/m ³	-	-	3.64E-03 ^A	3.07E-03 ^A	-
Tin (Sn)	µg/m ³	10	10	3.64E-03 ^A	3.07E-03 ^A	0
Titanium (Ti)	µg/m ³	120	-	3.01E-02	3.23E-03 ^A	0
Vanadium (V)	µg/m ³	2	1	1.82E-03 ^A	1.53E-03 ^A	0
Zinc (Zn)	µg/m ³	120	-	4.02E-02	1.72E-03 ^A	0
Zirconium (Zr)	µg/m ³	20	-	1.82E-03 ^A	1.53E-03 ^A	0
Total Uranium (U)	µg/m ³	1.5	-	1.64E-04 ^A	1.38E-04 ^A	0

Note:

A. Measured concentration was less than the laboratory method detection limit.

4.4 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 G**.

The maximum measured concentrations of the PAHs with MOECC AAQCs were below their applicable 24-hour criteria.

Table 4-4 Summary of Measured Ambient PAH Concentrations

Contaminant	Units	MOECC Standard	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Benzo(a)pyrene	ng/m ³	0.05 ^A	1	3.02E-02	7,65E-03	0
		5 ^B				0
		1.1 ^C				0
1-Methylnaphthalene	ng/m ³	12,000	-	5.81	1.17	0
2-Methylnaphthalene	ng/m ³	10,000	-	9.98	2.00	0
Acenaphthene	ng/m ³	-	-	4.05E+00	6.28E-01	-
Acenaphthylene	ng/m ³	3500	-	0.12 ^F	0.07 ^F	0
Anthracene	ng/m ³	200	-	3.07	0.07 ^F	0
Benzo(a)anthracene	ng/m ³	-	-	1.15E-01 ^F	7.34E-02 ^F	-
Benzo(a)fluorene	ng/m ³	-	-	2.31E-01 ^F	1.47E-01 ^F	-

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Table 4-4 Summary of Measured Ambient PAH Concentrations

Contaminant	Units	MOECC Standard	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Benzo(b)fluoranthene	ng/m ³	-	-	1.15E-01 F	7.34E-02 F	-
Benzo(b)fluorene	ng/m ³	-	-	2.31E-01 F	1.47E-01 F	-
Benzo(e)pyrene	ng/m ³	-	-	2.31E-01 F	1.47E-01 F	-
Benzo(g,h,i)perylene	ng/m ³	-	-	1.15E-01 F	7.34E-02 F	-
Benzo(k)fluoranthene	ng/m ³	-	-	1.15E-01 F	7.34E-02 F	-
Biphenyl	ng/m ³	-	-	2.44E+00	2.31E-01 F	-
Chrysene	ng/m ³	-	-	1.15E-01 F	7.34E-02 F	-
Dibenz(a,h)anthracene D	ng/m ³	-	-	1.15E-01 F	7.34E-02 F	-
Dibenzo(a,c)anthracene + Picene	ng/m ³	-	-	2.31E-01 F	7.63E-02 F	-
Fluoranthene	ng/m ³	-	-	1.45E+00	1.15E-01 F	-
Indeno (1,2,3-cd)pyrene	ng/m ³	-	-	1.15E-01 F	7.34E-02 F	-
Naphthalene	ng/m ³	22,500	22,500	32.0	4.71	0
o-Terphenyl	ng/m ³	-	-	2.31E-01 F	1.47E-01 F	-
Perylene	ng/m ³	-	-	2.31E-01 F	1.47E-01 F	-
Phenanthrene	ng/m ³	-	-	5.93E+00	9.14E-01	-
Pyrene	ng/m ³	-	-	5.34E-01	7.54E-02 F	-
Tetralin	ng/m ³	-	-	3.38E+00	7.39E-01	-
Total PAH E	ng/m ³	-	-	6.43E+01	1.31E+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. 419/05 Schedule 6 Upper Risk Thresholds.
- C. O. Reg. 419/05 24 Hour Guideline
- D. Based on laboratory analyses, dibenzo(a,c)anthracene co-elutes with dibenz(a,h)anthracene. Picene elutes after dibenz(a,h)anthracene
- E. The reported total PAH is the sum of all analyzed PAH species.
- F. Measured concentration was less than the laboratory method detection limit.

4.5 AMBIENT DIOXINS AND FURANS CONCENTRATIONS

A summary of the maximum and minimum ambient dioxins and furans concentrations (for a daily averaging period) are presented in **Table 4-5**. In this summary, both individual dioxin and furan concentrations (pg/m³) 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 H**.

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The maximum measured toxic equivalent dioxin and furan concentration was below the applicable 24-hour Ontario AAQC of 0.1 pg TEQ/m³ (as shown in **Table 4-5**).

Table 4-5 Summary of Measured Ambient Dioxins and Furans Concentrations

Contaminant	Units	MOECC Standard	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
2,3,7,8-Tetra CDD *	pg/m ³	-	-	6.00E-03 A	4.62E-03 A	N/A
1,2,3,7,8-Penta CDD	pg/m ³			6.22E-03 A	4.90E-03 A	
1,2,3,4,7,8-Hexa CDD	pg/m ³			6.36E-03 A	4.62E-03 A	
1,2,3,6,7,8-Hexa CDD	pg/m ³			6.92E-03 A	4.77E-03 A	
1,2,3,7,8,9-Hexa CDD	pg/m ³			6.07E-03 A	4.31E-03 A	
1,2,3,4,6,7,8-Hepta CDD	pg/m ³			2.65E-02	4.48E-03 A	
Octa CDD	pg/m ³			1.03E-01	3.05E-02	
Total Tetra CDD	pg/m ³			1.48E-02 A	4.62E-03 A	
Total Penta CDD	pg/m ³			1.22E-02 A	4.90E-03 A	
Total Hexa CDD	pg/m ³			3.35E-02 A	4.62E-03 A	
Total Hepta CDD	pg/m ³			4.69E-02	4.48E-03 A	
2,3,7,8-Tetra CDF **	pg/m ³			5.37E-03 A	4.31E-03 A	
1,2,3,7,8-Penta CDF	pg/m ³			6.22E-03 A	4.90E-03 A	
2,3,4,7,8-Penta CDF	pg/m ³			6.22E-03 A	4.90E-03 A	
1,2,3,4,7,8-Hexa CDF	pg/m ³			4.76E-03 A	3.11E-03 A	
1,2,3,6,7,8-Hexa CDF	pg/m ³			4.76E-03 A	3.11E-03 A	
2,3,4,6,7,8-Hexa CDF	pg/m ³			4.90E-03 A	3.25E-03 A	
1,2,3,7,8,9-Hexa CDF	pg/m ³			7.06E-03	3.81E-03 A	
1,2,3,4,6,7,8-Hepta CDF	pg/m ³			5.93E-03 A	3.22E-03 A	
1,2,3,4,7,8,9-Hepta CDF	pg/m ³			6.78E-03 A	3.64E-03 A	
Octa CDF	pg/m ³			5.65E-03 A	4.57E-03 A	
Total Tetra CDF	pg/m ³			6.39E-03 A	4.31E-03 A	
Total Penta CDF	pg/m ³			6.22E-03 A	4.90E-03 A	
Total Hexa CDF	pg/m ³			4.90E-03 A	3.25E-03 A	
Total Hepta CDF	pg/m ³			6.36E-03 A	3.36E-03 A	

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Table 4-5 Summary of Measured Ambient Dioxins and Furans Concentrations

Contaminant	Units	MOECC Standard	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
TOTAL TOXIC EQUIVALENCY ^B	pg TEQ/m ³	0.1	-	1.81E-02	1.51E-02	0
		1 C				0

Notes:

- A. Measured concentration was less than the laboratory method detection limit.
- B. Total Toxicity Equivalent (TEQ) concentration contributed by all dioxins, furans and dioxin-like PCBs calculated as per O. Reg. 419/05 methodology using corresponding WHO₂₀₀₅ toxic equivalency factors (TEFs) and a value of half the minimum detection limit (MDL) substituted for concentrations less than the MDL.
- C. O. Reg. 419/05 Schedule 6 Upper Risk Thresholds

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

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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 for the period April to June 2017.

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 Standards or human health risk assessment (HHRA) health-based criteria 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.
3. The maximum measured concentrations of TSP and all metals with Ministry of Environment and Climate Change (MOECC) air quality Standards were below their applicable Standards (as presented in **Table 2-2** in this report).
4. The maximum measured concentrations of PAHs with MOECC air quality Standards were below their applicable criteria shown in **Table 2-3**.
5. The maximum measured toxic equivalent dioxin and furan concentration was below the applicable Standards presented in **Table 2-3**.

In summary, the measured concentrations of the air contaminants monitored were below their applicable MOECC Standards and HHRA criteria during the monitoring period between April and June 2017.

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References
August 29, 2017

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Appendix A SO₂ Data Summaries and Time History Plots
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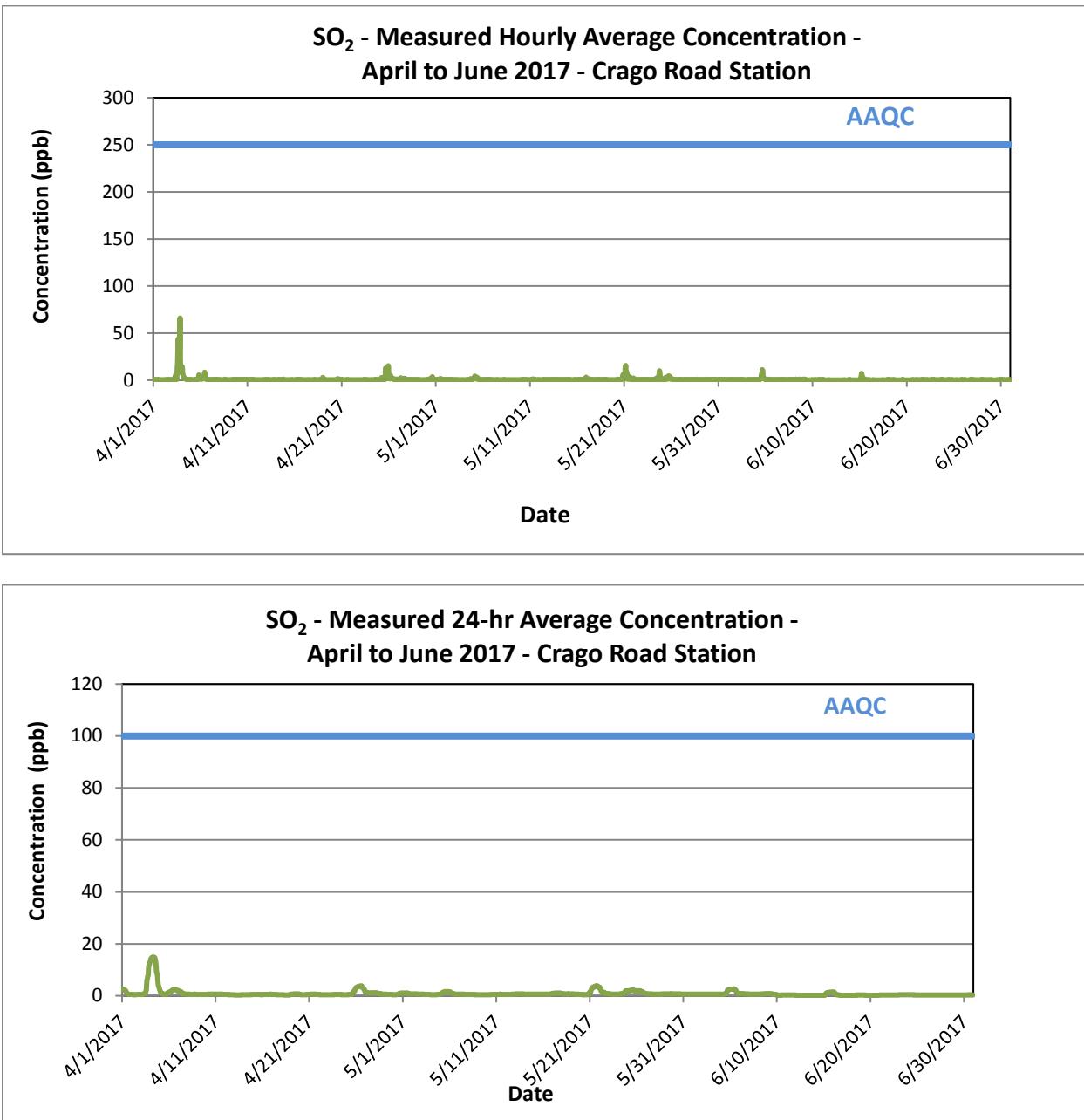
**APPENDIX A SO₂ DATA SUMMARIES AND TIME HISTORY
PLOTS**

		SO ₂ - Crago Road April 2017 (ppb)																														
		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>250	Days>100	
1		0.6	0.6	0.7	0.4	0.5	0.5	0.5	0.4	0.6	0.5	0.6	0.4	0.6	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	24	0.7	0.4	0.5	0	0		
2		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.5	0.7	0.6	0.7	0.7	0.8	0.8	0.7	0.5	0.5	0.4	0.4	0.4	24	0.8	0.4	0.5	0	0		
3		0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.8	1.7	5.7	2.8	1.3	0.9	14.3	17.1	43.6	43.8	22.9	17.5	14.5	66.1	22.6	8.1	14.9	24	66.1	0.4	12.7	0	0
4		12.9	10.7	14.2	7.3	4.9	4.5	2.7	2.2	1.8	1.7	1.3	1.3	1.0	0.8	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	24	14.2	0.7	3.1	0	0	
5		0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.6	C	C	0.8	0.9	0.9	0.7	1.1	1.3	1.0	2.2	5.6	3.5	4.3	1.3	21	5.6	0.4	1.3	0	0	
6		1.0	1.0	0.9	3.3	2.4	2.6	1.5	2.0	3.0	2.6	4.3	8.5	2.3	1.4	1.2	1.1	1.0	0.9	0.9	0.9	0.9	0.8	0.7	0.7	24	8.5	0.7	1.9	0	0	
7		0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	0.8	0.6	0.7	0	0		
8		0.6	0.6	0.5	0.5	0.6	0.5	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.8	0.9	0.9	0.9	0.7	0.5	0.6	0.5	0.6	0.5	24	0.9	0.3	0.6	0	0		
9		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	0.7	0.4	0.5	0	0		
10		0.6	0.6	0.5	0.7	0.6	0.6	0.6	0.6	0.8	0.6	0.8	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.8	0.7	0.6	0.6	0.6	24	0.8	0.5	0.6	0	0	
11		0.6	0.6	0.6	0.6	0.5	0.4	0.7	0.5	0.4	0.6	0.6	0.5	0.6	0.7	0.6	0.6	0.6	0.4	0.3	0.5	0.4	0.4	0.4	24	0.7	0.3	0.5	0	0		
12		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.2	0.3	24	0.5	0.2	0.4	0	0	
13		0.4	0.3	0.3	0.3	0.2	0.3	0.5	0.3	0.3	0.3	0.6	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.7	0.5	0.4	0.4	0.2	24	0.7	0.2	0.4	0	0	
14		0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.4	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.8	1.0	1.0	0.8	0.5	24	1.0	0.3	0.5	0	0	
15		0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.6	0.4	0.4	0.4	0.5	0.4	0.4	0.5	24	0.6	0.3	0.5	0	0		
16		0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.4	0.3	0.5	24	0.7	0.3	0.6	0	0	
17		0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.5	0.5	0.4	0.5	0.4	0.4	0.3	24	0.5	0.3	0.4	0	0		
18		0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.3	0.2	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.5	0.8	0.4	0.4	1.2	24	1.2	0.2	0.4	0	0	
19		3.0	2.6	1.5	0.7	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4	0.4	0.4	0.3	0.5	24	3.0	0.3	0.7	0	0		
20		0.3	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.6	0.4	0.4	0.4	1.8	0.6	0.5	0.4	0.4	0.7	1.1	0.6	0.8	0.7	24	1.8	0.3	0.5	0	0	
21		0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.7	0.6	0.5	0.5	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	24	0.7	0.4	0.5	0	0		
22		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	24	0.4	0.3	0.4	0	0		
23		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	0.7	0.4	0.5	0	0		
24		0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.9	0.7	0.4	0.4	0.6	0.6	24	0.9	0.2	0.4	0	0		
25		0.4	0.4	0.4	0.4	0.4	0.4	2.9	0.7	0.4	0.4	0.4	0.4	0.6	0.5	0.9	1.9	12.5	7.6	2.8	2.1	5.1	3.5	9.1	15.2	24	15.2	0.4	2.9	0	0	
26		6.0	2.5	1.6	1.5	2.3	4.5	1.8	1.9	1.9	1.5	1.3	1.2	1.2	1.1	1.4	1.4	1.0	0.9	0.9	1.1	0.9										

		SO ₂ - Crago Road May 2017 (ppb)																													
		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>250	Days>100
1		0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.7	1.2	0.7	0.7	1.2	1.6	1.2	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	24	1.6	0.5	0.8	0	0	
2		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	0.6	0.6	0.6	0	0	
3		0.5	0.6	0.8	0.4	0.4	0.3	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	24	0.8	0.3	0.5	0	0	
4		0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.7	0.6	0.5	0.4	0.4	0.9	1.5	0.6	0.8	0.6	0.6	0.5	0.8	24	1.5	0.4	0.6	0	0
5		1.4	1.7	2.7	4.5	3.9	2.6	1.7	1.3	2.0	3.1	3.0	1.3	0.9	1.0	0.9	0.7	0.9	0.6	0.7	0.7	0.8	0.7	0.7	0.7	24	4.5	0.6	1.6	0	0
6		0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	24	0.7	0.6	0.7	0	0	
7		0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.5	0.5	0.5	0.6	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.5	0.4	0.4	24	0.6	0.4	0.5	0	0	
8		0.5	0.4	0.5	0.4	0.5	0.7	0.5	0.3	0.3	0.5	0.4	0.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	24	0.7	0.3	0.4	0	0	
9		0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	24	0.5	0.3	0.4	0	0	
10		0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	24	0.9	0.4	0.5	0	0	
11		0.7	0.5	0.5	0.4	0.4	0.6	0.5	0.7	1.4	0.7	0.7	0.4	0.4	0.5	0.5	0.6	0.5	0.4	0.5	0.6	0.7	24	1.4	0.4	0.6	0	0			
12		0.6	0.5	0.4	0.5	0.4	0.5	0.5	0.6	0.7	0.6	C	C	0.9	0.9	0.7	0.7	0.7	0.9	0.7	0.7	0.8	0.7	21	0.9	0.4	0.7	0	0		
13		0.7	0.6	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.8	0.7	0.6	0.7	0.6	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.7	24	0.8	0.6	0.7	0	0	
14		0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	24	0.8	0.5	0.7	0	0	
15		0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.5	0.5	0.6	0.6	24	0.7	0.5	0.6	0	0	
16		0.6	0.6	0.6	0.6	0.5	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.8	0.6	0.6	0.6	0.6	0.6	0.7	1.1	1.8	3.2	24	3.2	0.5	0.9	0	0		
17		1.7	1.4	0.9	0.7	0.7	0.8	0.8	1.1	1.4	1.1	0.9	0.8	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	24	1.7	0.7	0.9	0	0	
18		0.8	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.8	0.8	0.7	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.7	0.8	0.6	24	0.9	0.6	0.7	0	0	
19		0.7	0.7	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.6	0.4	0.4	0.4	0.4	24	0.7	0.4	0.5	0	0	
20		0.4	0.4	0.4	0.4	0.4	0.3	0.3	1.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.4	2.0	4.4	4.2	6.1	1.9	24	6.1	0.3	1.1	0	0	
21		3.2	1.1	1.2	13.6	15.6	3.9	5.6	8.2	3.5	1.1	1.1	1.2	1.1	2.5	3.8	3.0	1.2	1.6	2.0	0.9	0.9	0.7	1.9	24	15.6	0.7	3.3	0	0	
22		2.2	1.3	0.9	0.9	0.9	0.8	0.9	0.7	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	2.2	0.6	0.8	0	0	
23		0.6	0.7	0.6	0.6	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.9	0.7	0.6	0.7	0.6	0.7	0.6	0.7	0.6	0.7	0.7	0.7	24	0.9	0.6	0.7	0	0	
24		0.7	0.7	0.7	0.7	0.7	0.7	1.3	1.5	0.8	1.2	2.4	1.1	0.9	0.9	0.9	0.8	5.4	10.0	7.8	2.1	1.4	1.2	1.2	24	10.0	0.7	1.9	0	0	
25		1.1	1.0	1.0	0.9	0.8	1.0	0.9	0.9	1.5	2.7	2.8	3.1	1.9	1.2	1.2	1.1	2.1	3.1	4.7	3.3	3.5	3.7	1.5	1.3	24	4.7	0.8	1.9	0	0
26		1.3	1.0	1.1	0.9	1.0	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	24	1.3	0.6	0.9	0	0	
27		0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.																	

		SO ₂ - Crago Road June 2017 (ppb)																													
		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>250	Days>100
1		0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.4	0.6	0.6	0.7	0.6	24	0.7	0.4	0.6	0	0
2		0.7	0.7	0.9	0.7	0.7	0.8	0.6	0.7	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	24	0.9	0.5	0.6	0	0
3		0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.5	0.5	0.6	0.6	24	0.7	0.5	0.6	0	0
4		0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	1.5	1.3	3.7	6.2	7.2	11.0	9.9	3.9	2.1	1.8	1.4	1.3	1.2	24	11.0	0.5	2.5	0	0
5		1.3	1.2	1.0	1.1	1.0	1.0	0.8	0.8	1.0	0.9	0.9	0.9	0.9	0.8	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.9	0.7	0.7	24	1.3	0.7	0.9	0	0
6		0.9	0.8	0.8	0.7	0.7	0.9	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.7	0.5	0.7	0.5	0.6	0.6	0.6	0.6	24	0.9	0.5	0.7	0	0
7		0.7	0.6	0.7	0.7	0.6	0.6	0.5	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	24	0.7	0.4	0.6	0	0
8		0.7	0.7	0.7	0.7	0.7	0.9	0.9	1.0	0.9	0.8	0.7	0.8	0.9	1.0	1.0	0.9	0.8	0.8	0.8	0.7	0.7	0.8	0.9	1.0	24	1.0	0.7	0.8	0	0
9		0.8	0.7	1.1	1.0	0.9	0.8	0.4	C	0.4	0.0	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3	23	1.1	0.0	0.4	0	0	
10		0.3	0.3	0.3	0.4	0.1	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.3	0.3	0.3	24	0.4	0.1	0.3	0	0
11		0.3	0.3	0.2	0.3	0.3	0.2	0.4	0.3	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	24	0.4	0.1	0.3	0	0
12		0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	24	0.3	0.1	0.2	0	0
13		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.4	0.1	0.4	0.3	24	0.4	0.1	0.2	0	0
14		0.5	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.2	0.2	0.2	0.2	24	0.5	0.0	0.1	0	0
15		0.1	0.2	0.1	1.2	3.5	7.4	6.8	2.5	1.6	2.7	1.0	0.8	0.5	1.0	1.0	1.2	0.6	0.4	0.3	0.3	0.4	0.3	24	7.4	0.1	1.4	0	0		
16		0.4	0.2	0.3	0.1	0.3	0.3	0.2	0.2	0.1	0.0	0.1	0.5	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	24	0.5	0.0	0.2	0	0
17		0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.1	0.0	0.1	0.2	0.0	0.5	0.3	0.2	0.2	0.3	0.2	0.1	0.2	0.2	0.4	0.3	0.4	24	0.5	0.0	0.2	0	0
18		0.2	0.3	0.2	0.2	0.4	0.0	0.0	0.4	0.3	0.2	0.3	0.3	0.6	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.1	0.1	0.1	0.1	24	0.6	0.0	0.3	0	0
19		0.1	0.2	0.3	0.1	0.2	0.3	0.2	0.1	0.2	0.3	0.1	0.1	0.2	0.6	0.3	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.2	24	0.6	0.1	0.2	0	0
20		0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.3	0.8	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.3	24	0.8	0.1	0.3	0	0	
21		0.2	0.3	0.3	0.3	0.4	0.4	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.2	0.9	0.4	0.4	0.3	0.4	0.3	0.3	0.3	24	0.9	0.2	0.3	0	0
22		0.2	0.3	0.4	0.2	0.2	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.9	0.4	0.4	0.3	0.3	0.4	0.4	24	0.9	0.2	0.3	0	0
23		0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.9	0.5	0.6	0.4	0.4	0.4	0.4	24	0.9	0.3	0.5	0	0
24		0.4	0.3	0.3	0.3	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.7	0.4	0.4	0.4	0.2	24	0.7	0.2	0.3	0	0
25		0.2	0.1	0.2	0.3	0.4	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.8	0.2	0.3	0.3	0.3	24	0.8	0.1	0.3	0	0
26		0.3	0.4	0.3	0.3	0.5	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.3	0.2	0.3</															

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 2017**

Appendix B NO₂ Data Summaries and Time History Plots
August 29, 2017

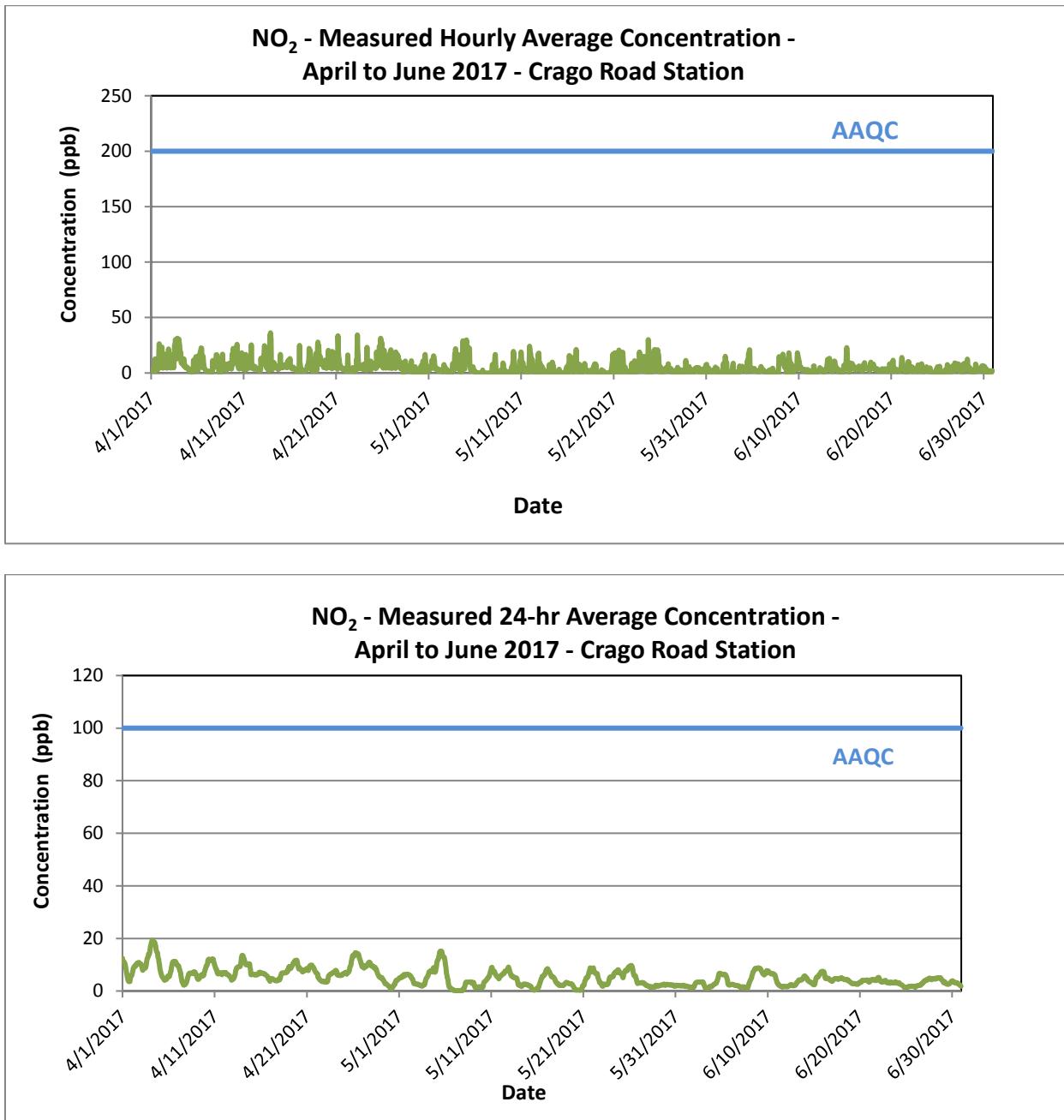
**APPENDIX B NO₂ DATA SUMMARIES AND TIME HISTORY
PLOTS**

		NO ₂ - Crago Road April 2017 (ppb)																												
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>200	Days>100
1	2.9	3.0	2.2	2.2	2.5	2.3	2.4	1.8	1.6	1.4	12.7	7.2	3.9	3.1	2.3	3.8	3.6	4.0	3.4	4.9	20.2	26.5	14.9	4.7	24	26.5	1.4	5.7	0	0
2	10.3	8.9	16.5	20.2	23.5	13.3	5.2	4.4	5.3	8.9	6.9	16.9	11.1	9.4	6.8	6.2	4.6	4.2	5.8	6.7	9.6	21.7	14.3	5.7	24	23.5	4.2	10.3	0	0
3	9.2	5.2	4.6	4.9	4.5	7.4	13.5	16.4	8.2	15.6	8.7	4.5	14.4	25.1	23.0	30.1	26.9	16.0	12.7	12.7	31.2	19.7	16.9	30.1	24	31.2	4.5	15.1	0	0
4	30.5	27.1	24.5	17.6	19.7	17.7	9.4	8.5	8.7	8.9	9.5	7.5	6.6	12.8	9.5	7.7	5.5	4.9	5.5	5.1	5.6	4.8	4.0	4.5	24	30.5	4.0	11.1	0	0
5	4.7	3.7	2.5	2.2	2.9	3.0	2.4	2.1	2.3	2.2	C	C	1.8	11.5	7.5	6.9	9.9	3.6	6.8	14.8	9.4	13.8	3.4	21	14.8	1.8	5.6	0	0	
6	3.7	2.0	2.6	15.2	11.3	16.2	12.9	16.7	19.4	20.7	22.6	22.2	9.4	4.8	4.6	15.2	9.1	6.3	4.4	4.0	3.6	2.9	2.2	1.7	24	22.6	1.7	9.7	0	0
7	1.8	1.4	1.3	1.4	1.6	1.6	1.5	1.5	1.4	1.2	1.1	1.0	0.9	0.9	0.7	0.8	11.4	6.0	4.4	5.9	7.9	7.4	10.2	11.3	24	11.4	0.7	3.5	0	0
8	11.9	16.4	16.4	15.5	13.7	7.2	7.1	2.6	0.9	0.5	0.5	0.6	0.9	2.3	3.8	3.5	16.9	11.4	6.5	6.8	4.0	3.2	3.9	24	16.9	0.5	6.5	0	0	
9	6.1	6.4	3.4	2.4	8.1	7.0	4.0	8.1	4.2	6.3	6.4	8.9	8.0	5.3	4.7	4.0	3.5	3.7	17.3	8.4	7.8	22.0	17.8	17.2	24	22.0	2.4	8.0	0	0
10	18.7	14.3	17.9	9.7	9.7	16.3	23.8	26.0	11.6	7.1	5.8	4.0	4.3	3.7	4.1	8.5	7.7	6.9	4.6	18.2	11.0	6.7	6.0	5.7	24	26.0	3.7	10.5	0	0
11	3.0	4.6	4.7	4.1	5.1	2.6	16.7	11.0	3.2	3.6	5.5	6.1	6.6	7.2	6.5	8.5	5.0	6.0	4.7	4.4	25.3	8.4	6.6	7.6	24	25.3	2.6	7.0	0	0
12	5.3	5.1	3.9	3.3	3.3	4.4	5.7	4.7	3.9	3.8	4.2	3.9	3.8	2.9	2.7	3.2	2.7	2.5	2.3	2.2	3.2	13.3	7.5	8.2	24	13.3	2.2	4.4	0	0
13	8.7	7.6	7.7	13.6	15.5	15.5	24.6	23.5	13.5	15.2	11.0	5.2	6.9	3.9	3.6	3.1	2.6	2.3	5.0	6.3	33.8	29.1	36.2	30.2	24	36.2	2.3	13.5	0	0
14	10.9	5.2	3.1	3.1	4.8	5.6	9.5	7.8	8.5	6.4	6.5	6.5	6.3	5.0	4.7	4.3	6.4	3.6	3.2	4.4	6.1	5.6	4.4	16.7	24	16.7	3.1	6.2	0	0
15	10.8	7.1	5.1	4.5	5.0	5.1	6.9	6.9	5.2	6.8	6.1	5.8	6.9	5.2	6.5	5.4	4.8	10.2	10.5	11.6	5.8	5.8	5.5	24	11.6	4.5	6.7	0	0	
16	13.0	7.6	5.3	4.8	5.0	5.2	3.5	4.2	4.5	5.3	4.7	4.4	3.9	3.0	3.6	3.5	2.7	1.9	2.4	2.6	2.4	2.3	1.9	24	13.0	1.9	4.2	0	0	
17	2.2	24.9	10.4	6.8	4.6	4.5	3.1	2.9	2.5	2.4	1.7	1.8	1.6	1.9	2.3	1.9	1.9	2.0	2.3	2.9	4.5	6.5	6.4	24	24.9	1.6	4.5	0	0	
18	9.0	12.4	22.2	12.0	20.6	19.6	12.4	7.3	2.5	3.0	2.0	2.1	1.9	2.4	2.7	2.4	2.0	1.6	8.2	17.6	4.5	2.4	12.8	24	22.2	1.6	7.7	0	0	
19	25.8	27.7	16.1	24.9	11.6	8.4	13.3	14.8	9.4	7.9	9.1	10.8	10.4	8.6	7.3	6.0	4.9	11.2	6.2	7.2	11.6	9.2	5.1	4.2	24	27.7	4.2	11.3	0	0
20	5.2	5.1	6.6	20.3	12.3	7.7	7.8	5.4	4.8	7.1	5.0	4.2	3.9	19.5	6.6	4.6	9.3	5.0	10.1	18.2	8.0	10.1	10.5	24	20.3	3.9	8.5	0	0	
21	9.1	4.5	5.4	3.5	3.6	33.5	17.7	14.7	11.7	8.6	5.9	5.8	6.3	5.1	4.4	4.4	3.5	3.3	2.7	2.9	3.7	4.1	3.3	24	33.5	2.7	7.1	0	0	
22	3.5	2.0	2.9	1.9	2.0	1.7	16.3	9.4	5.0	3.5	3.0	2.6	2.2	2.0	1.7	2.6	2.6	3.1	4.8	3.2	2.5	2.1	1.5	24	16.3	1.5	3.5	0	0	
23	1.7	1.5	1.7	1.7	4.3	12.1	8.3	34.3	22.4	13.8	8.7	6.2	5.0	4.1	4.8	4.2	4.3	5.3	4.3	6.3	7.1	3.4	3.8	24	34.3	1.5	7.2	0	0	
24	3.8	8.4	5.4	4.1	5.9	6.0	4.4	2.4	23.2	11.8	6.8	5.6	4.2	4.0	4.4	3.6	3.3	7.6	10.8	2.8	5.2	9.0	7.5	24	23.2	2.4	6.5	0	0	
25	8.6	6.6	6.8	8.4	8.3	6.0	6.6	3.9	4.3	19.0	12.7	8.2	7.3	6.4	13.3	11.6	24.2	21.1	14.9	17.2	31.2	21.2	27.3	27.1	24	31.2	3.9	13.4	0	0
26	13.2	4.9	4.2	4.8	19.7	20.4	5.9	8.3	5.7	4.4	15.0	11.5	7.8	6.4	8.1	7.														

		NO ₂ - Crago Road																													
		May 2017																													
		(ppb)																													
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>200	Days>100
1		5.7	2.4	2.6	5.1	3.9	5.2	5.4	8.4	7.7	11.8	5.3	4.3	9.6	15.5	13.2	11.4	7.6	5.5	3.7	4.1	3.2	3.5	4.1	2.7	24	15.5	2.4	6.3	0	0
2		1.9	3.0	2.3	2.6	1.7	2.9	3.1	1.7	1.9	2.3	1.9	1.8	1.2	0.8	1.6	2.9	7.6	4.3	3.1	2.7	2.3	4.3	2.7	2.9	24	7.6	0.8	2.6	0	0
3		2.6	0.8	0.6	0.0	0.5	1.8	1.9	0.2	0.5	0.2	0.0	0.0	0.0	2.6	8.4	8.0	8.1	2.7	2.5	9.1	17.0	17.0	21.9	8.7	24	21.9	0.0	4.8	0	0
4		7.9	4.3	6.4	6.3	11.2	16.8	10.8	5.3	3.3	1.9	0.9	2.4	3.2	1.3	1.5	2.1	15.4	29.1	10.2	9.3	5.2	3.8	3.6	13.3	24	29.1	0.9	7.3	0	0
5		28.5	27.1	29.9	27.6	23.7	23.8	17.4	13.4	18.7	22.7	22.2	8.2	4.8	2.9	1.9	1.8	2.7	3.4	2.2	5.5	2.9	1.7	1.6	1.3	24	29.9	1.3	12.3	0	0
6		1.6	0.9	0.4	0.1	0.3	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	24	2.6	0.0	0.3	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	7.5	0.0	0.9	0	0
8		2.3	0.2	4.6	8.3	15.6	16.8	11.3	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	24	16.8	0.0	2.8	0	0
9		1.2	9.0	7.8	1.6	1.5	3.2	0.3	0.0	0.4	1.0	0.7	0.0	0.0	0.0	0.0	0.6	1.4	0.0	0.0	0.0	0.4	1.1	0.7	5.5	24	9.0	0.0	1.5	0	0
10		4.9	4.6	6.2	11.8	19.5	16.8	8.8	2.6	0.7	M	M	M	M	M	4.1	3.8	3.7	3.1	1.6	10.5	11.5	12.4	11.3	18	19.5	0.7	7.7	0	0	
11		19.0	11.6	8.3	5.7	8.7	9.3	3.0	2.7	5.1	1.0	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	13.7	24.2	19.9	24	24.2	0.0	5.6	0	0	
12		18.1	17.3	11.8	9.2	9.9	12.4	9.3	6.4	3.0	1.5	C	C	C	0.4	1.6	1.1	0.9	0.9	4.2	5.3	17.0	16.0	18.0	10.0	21	18.1	0.4	8.3	0	0
13		0.9	9.0	4.0	1.2	3.6	5.7	6.2	4.7	1.5	3.8	3.3	1.0	0.7	1.9	0.7	0.7	0.9	0.5	0.7	0.8	0.0	0.5	1.3	1.8	24	9.0	0.0	2.3	0	0
14		1.8	7.5	2.4	3.0	0.6	1.3	2.5	1.8	4.2	9.8	8.0	5.1	5.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	9.8	0.0	2.4	0	0	
15		0.0	0.0	1.8	3.3	1.9	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	1.7	2.7	2.8	5.5	24	5.5	0.0	1.1	0	0	
16		2.2	0.4	0.0	7.9	8.3	15.7	12.6	7.1	10.2	14.4	10.9	6.9	7.3	11.2	1.7	0.4	3.5	2.1	5.5	4.8	9.5	14.9	9.0	21.3	24	21.3	0.0	7.8	0	0
17		5.6	6.4	6.9	8.5	5.6	0.2	2.1	7.8	7.2	4.0	1.6	0.9	0.6	0.6	1.4	2.5	0.9	2.3	1.3	2.1	3.2	8.5	3.8	4.0	24	8.5	0.2	3.7	0	0
18		2.9	2.9	1.8	1.9	1.5	1.1	0.6	1.6	1.0	2.0	0.6	1.6	2.2	1.2	0.6	0.7	0.6	1.6	1.7	4.9	6.2	6.6	7.1	24	8.3	0.6	2.5	0	0	
19		7.9	6.3	7.8	5.2	0.4	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	0.2	0.1	0.0	1.8	0.8	24	7.9	0.0	1.5	0	0	
20		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	5.6	8.9	10.0	17.0	2.5	24	17.0	0.0	2.0	0	0	
21		6.5	0.3	0.1	18.3	18.0	5.0	9.5	11.4	4.7	0.5	0.6	3.4	2.9	14.0	20.6	13.1	6.4	11.6	19.0	2.0	1.0	1.2	1.6	12.8	24	20.6	0.1	7.7	0	0
22		18.7	10.5	3.3	1.3	1.2	2.9	5.3	2.7	2.2	1.4	2.1	2.2	1.4	1.3	0.5	0.0	1.0	0.5	0.4	0.0	0.0	0.2	8.8	24	18.7	0.0	2.8	0	0	
23		3.8	4.5	0.8	1.3	9.2	7.1	11.0	1.8	1.3	0.9	0.5	1.0	3.5	1.1	1.2	1.8	3.0	11.1	8.9	18.9	14.7	5.3	7.2	3.7	24	18.9	0.5	5.1	0	0
24		1.7	8.3	3.1	1.9	8.8	14.8	11.9	15.1	10.5	2.6	5.4	9.8	1.5	1.8	0.9	0.3	0.7	14.9	30.1	18.1	2.0	0.2	0.0	1.0	24	30.1	0.0	6.9	0	0
25		2.5	2.8	1.0	1.2	1.0	6.7	2.8																							

		NO ₂ - Crago Road June 2017 (ppb)																													
		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>200	Days>100
1		5.4	1.4	1.1	1.2	2.5	4.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	4.7	8.5	6.3	0.9	24	8.5	0.0	1.6	0	0	
2		1.8	10.7	14.9	8.9	7.4	9.6	3.6	2.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	4.1	7.0	8.9	2.0	24	14.9	0.0	3.5	0	0	
3		0.0	0.0	0.0	0.5	0.0	0.9	0.8	0.0	0.0	0.0	0.0	0.1	0.1	0.0	1.6	6.2	4.0	1.8	3.9	2.2	4.5	4.4	6.2	5.1	24	6.2	0.0	1.8	0	0
4		4.7	4.7	3.2	3.5	2.6	2.7	2.2	1.9	3.4	1.1	2.0	11.3	5.7	9.2	17.4	14.6	20.9	20.8	7.0	2.8	4.0	3.2	2.3	4.3	24	20.9	1.1	6.5	0	0
5		3.9	1.6	1.6	2.4	3.3	4.1	1.8	1.6	2.2	2.1	1.7	1.8	1.4	1.4	1.8	1.8	1.1	1.0	1.6	3.2	2.0	3.4	5.9	5.6	24	5.9	1.0	2.4	0	0
6		3.9	3.8	2.1	2.5	2.4	2.6	1.3	0.8	0.6	0.6	0.7	1.0	0.9	0.8	0.3	0.6	1.2	1.1	1.2	2.4	2.7	1.8	0.5	2.2	24	3.9	0.3	1.6	0	0
7		3.1	1.3	3.0	2.2	2.7	4.4	2.3	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0	1.8	14.8	13.4	13.4	24	14.8	0.0	2.7	0	0
8		13.0	11.7	9.1	11.3	8.5	8.9	13.8	17.1	14.5	12.5	8.8	5.1	5.0	8.0	7.9	4.8	1.0	0.3	3.1	1.9	1.9	8.0	15.9	18.2	24	18.2	0.3	8.8	0	0
9		13.0	8.8	9.2	8.9	9.1	7.9	C	C	C	3.8	2.3	1.8	2.8	3.7	3.0	3.0	4.2	6.5	6.4	3.0	13.1	18.2	16.0	12.6	21	18.2	1.8	7.5	0	0
10		12.6	8.6	9.6	5.4	3.7	5.1	5.3	4.1	2.7	3.3	2.8	2.3	2.4	2.7	3.3	2.7	3.0	2.9	1.7	1.6	1.3	0.6	2.5	3.1	24	12.6	0.6	3.9	0	0
11		1.0	1.5	0.8	1.1	2.1	1.5	0.6	1.4	0.6	1.1	1.1	0.9	0.5	1.1	6.3	6.3	1.5	2.2	2.3	0.6	0.5	0.7	0.7	24	6.3	0.5	1.6	0	0	
12		1.2	1.2	1.9	2.1	2.1	2.7	3.5	4.8	3.1	2.8	3.0	2.8	2.2	3.3	1.3	1.6	0.9	1.7	1.9	0.9	1.0	1.4	1.9	2.3	24	4.8	0.9	2.1	0	0
13		3.1	5.4	8.9	12.3	4.3	5.5	6.1	9.3	13.3	5.4	3.2	2.9	2.6	2.0	3.6	1.1	1.8	3.3	3.8	5.0	4.6	10.7	10.3	6.6	24	13.3	1.1	5.6	0	0
14		6.3	4.1	3.8	4.3	3.3	2.5	1.6	1.4	3.0	1.7	0.7	0.5	0.6	0.5	0.4	0.2	1.7	0.0	0.7	1.1	2.9	6.9	5.7	5.7	24	6.9	0.0	2.5	0	0
15		3.9	4.3	5.1	12.3	19.8	23.0	17.2	4.6	3.2	6.3	1.2	3.0	1.0	9.0	8.9	6.8	3.7	3.7	7.9	8.6	6.4	6.9	4.5	6.0	24	23.0	1.0	7.4	0	0
16		5.2	4.0	3.7	2.6	3.0	2.9	3.4	2.8	3.3	4.7	3.7	3.4	4.4	6.3	4.7	3.6	2.6	2.7	4.4	2.2	4.8	3.6	3.8	2.0	24	6.3	2.0	3.7	0	0
17		7.6	5.9	7.6	9.4	6.5	5.9	4.6	3.9	4.9	5.2	4.0	3.9	3.3	3.0	3.1	2.8	1.7	4.6	3.2	9.8	4.6	4.3	4.1	5.2	24	9.8	1.7	5.0	0	0
18		5.4	6.4	8.0	5.5	4.3	3.4	2.9	3.7	3.1	2.8	3.7	3.2	3.9	3.0	2.3	2.4	2.7	1.7	3.0	2.3	1.6	1.7	2.3	24	8.0	1.3	3.4	0	0	
19		2.7	3.8	3.3	3.4	3.2	3.3	3.0	2.7	3.7	3.9	3.3	2.9	1.9	1.8	2.8	1.7	1.8	1.4	1.5	2.0	8.1	8.3	3.6	3.8	24	8.3	1.4	3.2	0	0
20		5.2	3.6	1.7	2.9	10.0	11.6	6.9	5.3	2.6	2.4	2.3	2.8	3.1	2.2	3.1	3.0	1.3	2.2	1.7	2.4	2.0	1.5	2.2	2.2	24	11.6	1.3	3.5	0	0
21		3.2	3.3	7.1	11.6	14.0	10.8	9.1	4.1	4.4	4.3	4.0	2.4	1.1	0.9	0.4	0.6	1.5	1.3	0.6	2.3	10.4	9.1	9.7	5.6	24	14.0	0.4	5.1	0	0
22		4.1	4.3	3.7	2.4	1.9	4.7	5.5	2.0	1.0	1.7	2.6	3.3	4.0	3.0	2.9	2.4	3.7	3.5	2.3	1.2	1.3	2.7	7.2	5.6	24	7.2	1.0	3.2	0	0
23		5.6	4.8	3.1	1.3	2.1	1.6	2.2	8.2	5.5	1.7	1.3	1.4	1.6	1.3	2.0	2.7	4.6	4.5	3.6	3.6	5.5	3.0	3.2	2.9	24	8.2	1.3	3.2	0	0
24		3.4	1.9	1.7	2.5	3.3	4.5	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.3	3.4	1.6	3.3	24	4.5	0.0	1.3	0	0	
25		5.5	0.7	3.4	2.7	3.6	4.6	6.1	1.9	0.5	1.0	0.8	0.2	0.1	0.4	0.0	0.0	0.0	0.0	0.0	2.8	2.0	1.0	1.1	24	6.1	0.0	1.6	0	0	
26		1.3	5.1	7.6	6.5	3.5	4.9	5.5	4.6	1.8	0.5	0.7	0.2	0.9	1.4																

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

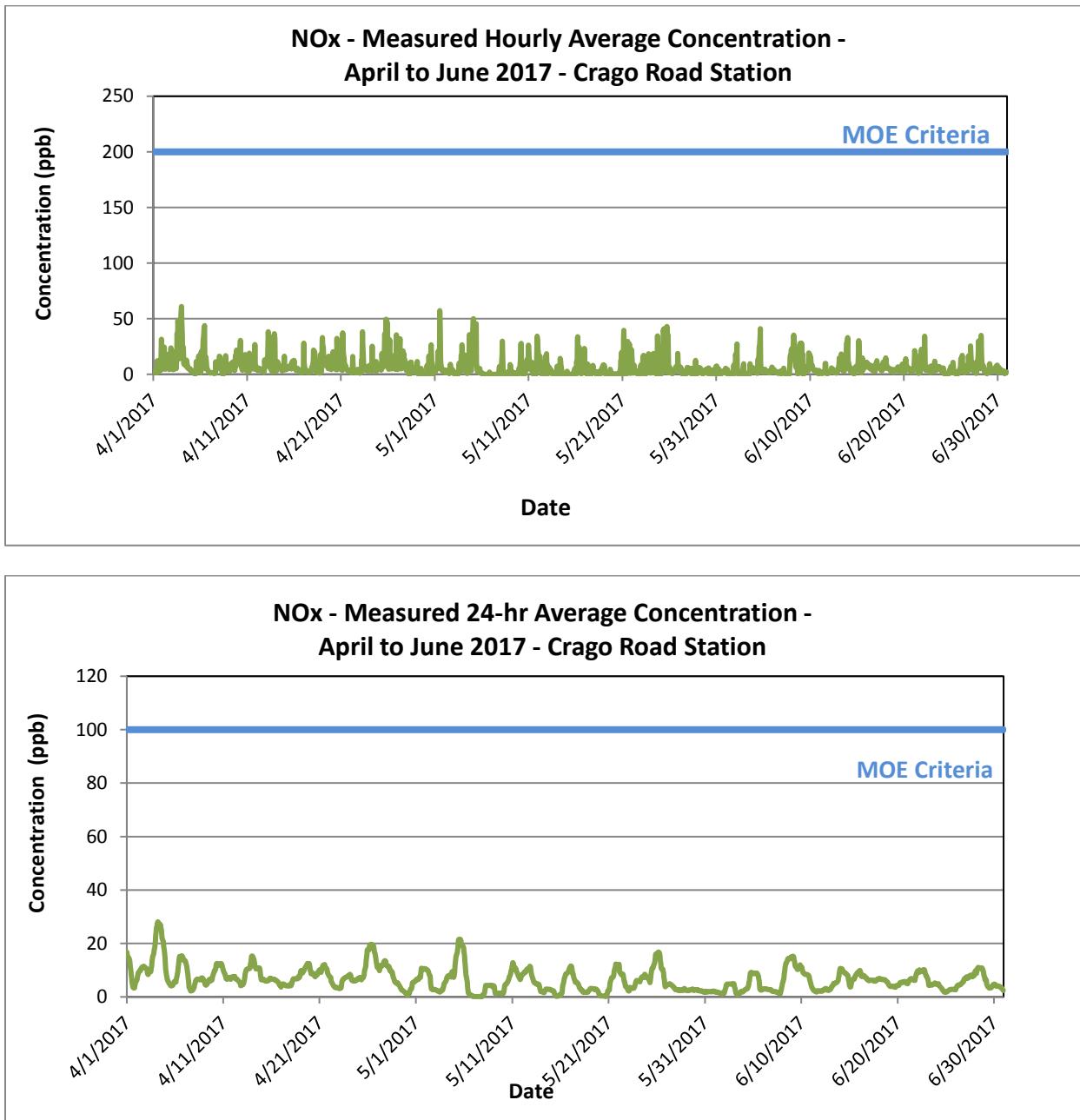


**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2017**

Appendix C NOX Data Summaries and Time History Plots
August 29, 2017

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 2017**

Appendix D PM2.5 Data Summaries and Time History Plots
August 29, 2017

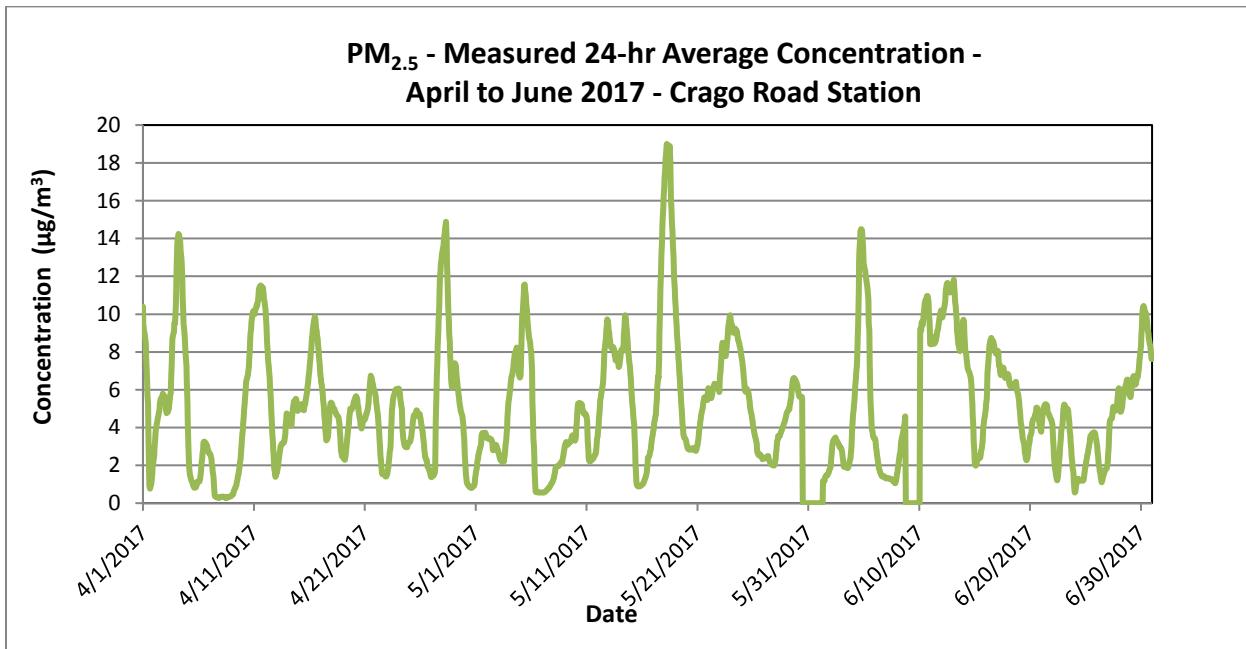
APPENDIX D PM_{2.5} DATA SUMMARIES AND TIME HISTORY PLOTS

PM _{2.5} - Crago Road April 2017 (µg/m ³)																													
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	
1	0.4	0.4	0.5	0.8	1.2	1.4	1.5	1.3	1.1	1.1	0.9	0.7	0.7	0.8	0.8	1.9	2.7	2.7	2.4	3.8	8.6	9.4	5.6	3.4	24	9.4	0.4	2.2	
2	6.2	10.1	10.8	8.0	6.8	5.7	5.2	4.9	4.3	4.2	3.6	4.3	4.9	6.8	5.1	3.5	3.2	3.5	4.7	6.1	7.0	7.1	4.6	4.7	24	10.8	3.2	5.6	
3	4.7	3.2	2.5	3.3	7.8	6.3	5.8	6.4	6.1	9.9	10.3	9.1	8.5	23.4	25.3	22.4	15.7	8.2	7.1	7.8	18.3	6.7	11.2	21.9	24	25.3	2.5	10.5	
4	24.7	26.4	32.5	11.2	13.8	9.2	4.4	3.0	3.0	2.4	2.3	2.0	2.7	2.1	2.2	2.4	1.4	1.1	1.4	1.4	1.2	0.8	0.6	0.9	24	32.5	0.6	6.4	
5	0.7	0.9	0.6	0.5	0.6	0.5	0.5	0.6	0.4	0.4	C	C	0.5	0.6	0.9	1.3	1.5	1.4	1.2	2.2	3.6	2.1	3.0	0.7	22	3.6	0.4	1.1	
6	0.8	0.8	0.9	2.9	3.1	6.6	5.6	5.6	5.8	6.0	8.1	11.8	1.6	0.5	0.4	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.1	24	11.8	0.1	2.7
7	0.4	0.2	0.2	0.5	0.2	0.2	0.4	0.6	0.6	0.5	0.5	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.6	24	0.6	0.1	0.3	
8	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	1.0	24	1.0	0.1	0.4	
9	0.9	1.2	1.1	1.0	1.7	2.8	2.1	1.4	1.2	1.9	2.0	3.1	3.4	3.1	2.9	3.6	3.6	5.2	5.7	4.7	6.7	11.5	7.3	6.7	24	11.5	0.9	3.5	
10	8.1	9.5	10.3	9.3	10.5	10.2	10.6	11.1	4.7	3.7	4.3	5.8	7.5	9.1	12.8	16.4	14.9	13.0	12.3	13.3	13.0	13.8	12.2	7.4	24	16.4	3.7	10.2	
11	7.4	7.4	9.0	14.4	12.5	11.2	14.0	10.8	7.8	7.2	10.3	12.5	11.2	10.1	13.0	17.6	12.9	12.2	11.4	14.3	12.8	5.9	5.2	5.1	24	17.6	5.1	10.7	
12	2.6	1.8	1.6	1.0	0.9	1.1	1.2	1.4	1.2	0.9	0.9	1.2	1.0	1.3	1.3	1.4	1.7	1.7	1.4	1.4	1.4	1.5	1.5	2.2	24	2.6	0.9	1.4	
13	4.4	3.7	3.5	4.2	4.9	5.5	7.3	4.8	4.2	6.4	4.1	2.6	2.5	1.9	1.9	1.7	1.9	2.0	4.0	4.0	7.0	12.5	10.1	8.6	24	12.5	1.7	4.7	
14	3.8	2.6	2.6	2.6	3.1	3.4	3.1	2.2	3.7	6.2	9.4	9.2	6.9	6.3	5.2	1.9	3.0	4.9	5.5	5.9	5.6	5.2	5.8	24	9.4	1.9	4.9		
15	5.4	4.7	4.1	3.4	3.3	3.4	3.3	4.0	3.6	4.1	6.2	7.3	8.8	10.6	8.6	7.1	5.9	7.3	8.0	9.9	11.5	10.8	10.3	10.2	24	11.5	3.3	6.7	
16	11.5	11.6	11.3	10.0	10.0	10.3	10.3	9.9	9.9	9.4	10.3	11.1	10.8	7.4	2.2	1.9	2.2	2.5	2.7	3.7	3.4	2.6	2.8	3.7	24	11.6	1.9	7.2	
17	4.3	5.5	6.0	6.4	5.3	3.6	3.4	2.9	2.9	2.7	2.0	2.0	2.5	2.7	2.9	3.2	4.4	7.2	10.0	13.8	13.5	9.1	6.3	5.2	24	13.8	2.0	5.3	
18	3.9	4.0	4.4	3.4	4.0	3.9	2.8	1.5	0.8	0.8	1.0	1.0	1.4	2.0	2.4	2.1	1.8	1.7	2.0	3.2	4.1	2.4	2.1	2.9	24	4.4	0.8	2.5	
19	3.4	3.4	2.8	2.6	3.0	3.6	5.9	6.3	6.6	8.6	6.2	8.3	6.4	6.2	7.1	9.0	7.7	5.9	2.0	2.7	4.0	3.5	3.7	4.9	24	9.0	2.0	5.2	
20	6.5	5.8	4.5	4.4	4.8	4.8	4.4	5.2	3.9	3.0	3.6	2.3	1.9	2.5	4.1	3.1	5.1	4.2	3.9	6.1	7.3	5.1	5.4	4.4	24	7.3	1.9	4.4	
21	6.3	7.5	7.8	6.0	5.5	7.2	6.7	8.6	9.9	11.6	10.9	7.9	7.4	10.1	2.4	1.4	1.4	1.4	1.6	2.1	4.6	4.6	3.1	2.4	24	11.6	1.4	5.8	
22	1.8	1.8	1.8	1.3	0.9	0.9	0.4	0.4	0.4	0.3	0.4	0.6	0.8	1.1	1.2	1.4	1.4	1.2	1.6	2.5	3.0	3.1	3.3	2.7	24	3.3	0.3	1.4	
23	3.2	4.3	5.0	5.4	7.0	8.0	6.4	4.6	5.6	14.6	17.6	13.3	7.2	7.0	5.5	3.4	2.6	3.0	3.8	4.0	3.9	2.2	2.9	3.3	24	17.6	2.2	6.0	
24	3.7	5.2	4.4	3.8	3.0	1.7	1.4	1.1	1.2	2.0	4.3	3.9	3.3	2.8	2.5	2.1	2.0	3.1	3.4	3.4	4.5	6.7	3.6	3.2	24	6.7	1.1	3.2	
25	4.1	5.7	5.4	5.1	5.5	5.6	6.4	5.5	7.5	8.2	7.3	5.5	2.8	2.5	2.4	5.2	5.2	2.7	1.7	1.9	4.3	2.8	5.1	4.7	24	8.2	1.7	4.7	
26	1.8	1.2	1.1	1.2	2.0	2.3	1.0	2.3	1.1	0.8	0.9	1.2	1.2	1.1	1.8	1.6	1.2	1.0	1.1	1.4	1.4	1.9	1.5	24	2.3	0.8	1.4		
27	1.3	1.6	2.0	2.3	2.1	2.1	2.6	3.1	4.7	28.2	36.7	32.0	23.7	21.9	23.3	18.8	15.8	19.8	20.9	15.3	12.9	9.7	6.8	24	36.7	1.3	13.1		
28	6.3	3.9	6.3	6.7																									

		PM _{2.5} - Crago Road																											
		May 2017																											
		(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		6.4	4.0	3.7	5.1	5.5	3.8	5.1	3.7	3.1	3.3	2.9	3.2	4.0	9.7	3.4	1.7	1.1	1.0	1.5	1.6	2.0	2.7	3.5	2.9	24	9.7	1.0	3.5
2		4.0	4.6	3.9	4.3	4.8	4.3	4.3	3.9	3.1	2.6	2.5	2.1	1.5	1.7	1.7	2.0	2.4	2.9	3.0	3.5	2.1	1.8	1.4	1.5	24	4.8	1.4	2.9
3		1.8	1.8	2.8	1.4	1.6	2.3	3.4	3.6	2.4	1.9	1.9	1.7	1.9	1.9	5.8	7.1	8.2	8.6	8.2	10.0	13.0	14.6	13.5	8.1	24	14.6	1.4	5.3
4		6.8	5.9	5.9	6.3	8.6	8.9	6.7	4.8	5.1	6.5	6.9	7.4	7.0	6.1	8.2	7.6	10.5	10.9	4.7	8.6	4.2	3.6	3.1	6.2	24	10.9	3.1	6.7
5		5.6	7.8	17.8	39.0	25.3	22.4	13.1	13.0	19.0	18.6	7.7	1.3	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	24	39.0	0.6	8.2	
6		0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	24	0.6	0.5	0.6	
7		0.5	0.5	0.5	0.5	0.8	0.8	1.0	1.0	1.0	1.2	1.3	1.2	1.3	1.1	1.0	1.1	1.5	1.8	1.8	1.4	1.4	1.5	1.6	2.1	24	2.1	0.5	1.2
8		2.2	2.2	4.0	3.6	3.3	4.3	3.3	1.3	1.3	1.3	1.4	1.6	1.6	1.7	1.9	2.7	2.1	1.8	1.9	2.0	4.6	5.3	4.1	5.5	24	5.5	1.3	2.7
9		5.5	6.2	6.6	4.9	4.8	1.4	2.4	1.5	2.0	2.4	2.2	1.9	2.0	2.2	2.9	5.8	4.1	3.4	2.6	1.9	1.6	2.8	3.2	5.0	24	6.6	1.4	3.3
10		7.7	9.8	16.5	14.2	14.3	11.6	5.1	1.7	1.6	2.7	2.0	1.7	2.0	1.9	1.6	1.4	1.2	1.2	1.5	2.3	2.4	2.5	2.6	24	16.5	1.2	4.6	
11		7.8	4.1	2.3	2.0	2.0	1.7	2.2	1.8	2.2	2.7	2.1	2.3	2.2	2.3	2.2	2.8	2.6	2.9	5.1	12.3	9.2	24	12.3	1.7	3.4			
12		10.9	10.1	10.2	10.9	10.0	9.9	9.0	5.7	5.7	6.4	C	C	16.3	12.4	11.8	7.4	5.8	9.2	10.8	9.7	10.4	10.0	6.3	21	16.3	5.7	9.5	
13		5.0	6.4	5.3	5.7	6.1	7.5	8.3	6.1	6.1	6.9	8.1	6.3	6.7	9.8	8.7	8.6	8.2	10.9	9.6	8.1	6.7	4.6	6.8	8.7	24	10.9	4.6	7.3
14		9.4	11.5	11.2	8.7	7.7	7.0	6.9	8.1	12.0	20.3	18.6	16.0	10.5	5.6	1.2	1.6	1.5	1.0	0.9	1.1	1.3	1.1	0.9	24	20.3	0.9	6.9	
15		0.6	0.6	0.6	0.7	0.5	0.6	0.8	0.9	0.9	0.8	0.8	0.9	0.9	1.2	1.2	1.1	1.1	0.9	1.0	1.3	1.4	1.5	1.2	24	1.5	0.5	0.9	
16		1.1	1.0	1.2	1.7	1.9	2.5	2.8	2.1	2.1	3.1	3.6	5.2	8.4	9.0	1.9	1.6	3.1	2.8	3.5	4.1	6.1	7.8	5.1	4.9	24	9.0	1.0	3.6
17		4.6	5.0	6.1	5.3	5.4	5.7	6.0	11.1	13.1	16.3	13.5	10.6	5.9	31.6	37.0	32.9	27.6	24.2	23.2	23.4	21.7	20.1	19.4	18.2	24	37.0	4.6	16.2
18		17.8	17.1	17.3	17.2	14.1	12.1	10.6	10.1	10.9	11.6	11.6	11.9	12.0	12.2	12.3	10.4	10.0	11.1	9.5	9.7	6.7	5.4	5.3	5.5	24	17.8	5.3	11.3
19		5.0	5.1	5.6	4.7	3.1	2.5	1.7	1.8	1.6	1.7	1.8	1.9	2.1	2.4	2.4	2.0	2.8	3.8	6.1	6.1	5.0	4.4	3.7	24	6.1	1.6	3.3	
20		2.7	2.6	2.3	2.2	2.2	1.6	1.5	1.6	1.6	1.9	2.4	2.7	2.4	1.8	1.7	1.6	3.3	3.2	4.9	4.2	4.6	4.2	6.5	6.7	24	6.7	1.5	3.0
21		4.6	6.0	7.8	7.3	7.6	5.7	7.4	6.5	6.0	5.6	4.7	5.6	5.8	6.2	5.6	4.2	3.5	3.2	4.2	3.8	4.2	3.5	5.1	20.3	20.3	3.2	6.0	
22		5.9	5.0	4.2	4.6	4.2	5.0	6.0	8.0	10.2	9.4	9.3	4.4	9.4	8.1	4.0	3.7	3.8	3.7	3.5	3.8	4.6	5.1	5.1	10.1	24	10.2	3.5	5.9
23		15.7	14.9	10.8	12.3	15.2	16.3	12.4	7.3	4.8	4.8	5.9	6.6	6.5	6.0	9.2	9.0	9.9	10.6	9.9	11.2	8.9	8.6	11.0	10.8	24	16.3	4.8	9.9
24		9.0	10.1	10.4	11.5	11.7	11.9	10.7	7.6	6.7	6.4	7.0	5.6	6.1	5.4	5.1	5.2	5.9	8.5	8.9	7.4	6.3	6.6	6.7	24	11.9	5.1	7.8	
25		6.1	5.8	5.9	4.9	4.5	4.4	3.9	3.9	4.6	10.1	7.2	5.4	4.5	3.9	3.2	3.0	2.6	2.5	2.8	2.7	3.6	4.1	2.4	24	10.1	2.4	4.3	
26		1.8	2.5	2.2	1.6	1.6	1.7	1.4	1.4	1.4	1.5	4.3	3.7	3.1	3.2	4.6													

PM _{2.5} - Crago Road June 2017 (µg/m ³)																													
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	
1	1.5	0.9	0.6	0.6	0.7	1.2	0.5	0.4	0.4	0.6	1.2	1.9	4.4	3.3	2.2	1.9	2.4	1.6	2.7	2.1	2.6	4.4	3.1	2.8	24	4.4	0.4	1.8	
2	3.4	5.7	7.4	8.9	7.5	6.1	2.0	1.8	1.3	1.3	2.0	2.5	1.6	1.5	1.8	1.4	1.0	0.7	0.9	0.8	2.5	2.7	3.2	1.6	24	8.9	0.7	2.9	
3	1.9	2.6	2.8	3.2	2.9	2.6	1.9	1.2	1.3	1.4	1.9	1.7	1.3	1.4	2.2	2.9	3.2	3.5	3.4	3.7	7.5	11.4	13.4	12.3	24	13.4	1.2	3.8	
4	16.1	9.5	8.8	9.2	11.3	11.3	9.8	9.4	9.7	8.9	12.8	33.2	11.5	42.6	43.9	14.1	17.2	13.8	6.4	3.9	5.8	4.7	2.6	2.4	24	43.9	2.4	13.3	
5	2.6	4.6	5.7	7.1	6.7	6.1	5.8	4.6	5.6	5.1	2.6	2.4	2.9	2.8	2.5	1.9	2.3	1.1	1.2	1.5	1.4	1.7	1.9	2.8	24	7.1	1.1	3.5	
6	2.1	1.7	1.9	1.7	1.6	1.6	0.9	1.1	1.0	1.2	0.9	0.7	1.1	1.3	0.9	1.2	1.3	1.1	1.6	1.6	1.5	1.2	1.5	1.5	24	2.1	0.7	1.3	
7	1.8	1.8	1.8	1.7	1.7	1.4	1.1	0.9	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.7	0.5	0.7	0.6	1.3	2.3	4.3	4.5	24	4.5	0.5	1.4		
8	5.5	5.1	6.1	6.3	6.4	6.7	4.6	4.3	6.4	7.2	5.1	2.8	3.2	M	M	M	M	M	M	M	M	M	M	13	7.2	2.8			
9	M	M	M	M	M	M	C	C	0.9	1.1	1.0	1.6	2.6	2.9	5.4	7.3	4.4	6.5	8.2	11.0	17.2	17.4	19.9	15	19.9	0.9			
10	28.3	16.1	14.0	8.7	7.8	17.8	10.6	7.2	8.4	9.2	7.8	8.3	6.6	5.6	4.6	5.4	8.1	8.2	6.5	6.0	5.3	5.2	6.4	7.4	24	28.3	4.6	9.1	
11	11.0	15.7	14.9	13.8	11.7	10.3	9.2	8.5	7.9	8.1	9.2	9.0	8.5	8.6	8.9	10.0	10.0	9.6	11.0	10.8	9.6	8.9	8.8	10.9	24	15.7	7.9	10.2	
12	11.0	9.8	11.8	15.3	15.5	13.9	12.7	11.2	12.7	15.5	17.1	13.3	11.7	10.0	8.3	7.0	6.9	7.5	8.6	9.4	10.0	10.2	11.1	10.9	24	17.1	6.9	11.3	
13	11.6	13.4	17.7	17.8	7.5	2.9	3.5	4.8	6.5	4.7	3.6	6.7	5.6	5.6	5.2	4.8	3.7	10.0	12.3	14.5	17.1	17.9	18.3	14.7	24	18.3	2.9	9.6	
14	14.3	7.9	4.3	2.9	1.4	0.6	0.0	0.0	0.0	0.0	1.2	5.7	4.3	3.9	3.0	2.2	2.7	0.9	0.9	1.7	2.2	2.5	2.1	1.6	24	14.3	0.0	2.8	
15	2.3	2.8	2.7	3.0	3.5	3.0	2.2	2.0	1.9	2.0	1.7	3.3	3.3	7.4	8.0	5.0	6.2	7.4	9.9	10.7	8.1	6.5	5.8	5.5	24	10.7	1.7	4.8	
16	7.9	9.6	8.6	16.5	21.9	14.2	6.2	14.1	9.9	6.4	4.0	4.9	5.0	5.0	4.7	6.2	6.8	5.6	6.4	6.2	5.2	3.1	5.6	24	21.9	3.1	7.9		
17	7.2	9.4	12.8	14.7	10.9	7.7	8.1	7.1	4.3	5.6	7.4	7.9	6.5	5.7	5.3	3.6	2.6	2.1	3.8	6.3	7.1	5.6	5.9	6.5	24	14.7	2.1	6.8	
18	7.0	8.4	9.2	8.2	8.3	7.6	6.1	7.0	6.8	5.9	5.9	6.7	7.5	6.4	4.8	4.6	5.5	3.1	1.4	1.5	2.7	3.6	3.6	2.9	24	9.2	1.4	5.6	
19	1.7	1.6	1.8	2.2	2.2	2.7	2.0	0.8	1.6	2.9	4.0	3.6	2.2	1.1	0.8	1.3	3.3	3.4	4.2	5.5	9.6	8.4	5.1	6.4	24	9.6	0.8	3.3	
20	7.9	3.5	2.3	6.0	9.0	7.4	4.6	2.6	2.4	3.0	5.2	7.5	3.3	3.0	6.1	1.5	1.0	1.1	1.4	1.5	2.2	3.2	4.1	3.7	24	9.0	1.0	3.9	
21	5.2	9.3	11.3	13.6	12.4	12.0	5.4	3.8	3.8	4.3	5.3	5.3	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.9	2.9	1.7	24	13.6	0.0	4.3
22	1.4	1.7	1.5	1.0	2.0	2.3	0.2	0.0	0.0	0.4	2.2	4.5	8.3	4.9	9.6	6.0	8.9	8.7	9.3	7.0	7.0	4.4	4.1	11.9	24	11.9	0.0	4.5	
23	12.3	6.8	3.6	0.0	0.0	0.0	0.0	0.0	0.6	0.6	0.0	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	12.3	0.0	1.1	
24	2.5	3.7	4.9	5.1	4.4	4.3	2.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.3	6.4	5.0	24	6.4	0.0	1.8	
25	5.7	6.7	8.1	8.7	8.0	6.8	5.2	5.1	3.1	3.7	5.0	2.5	0.7	0.0	0.8	1.7	0.5	0.2	0.0	0.6	1.4	1.9	1.8	2.5	24	8.7	0.0	3.4	
26	2.1	2.0	1.7	1.8	2.0	2.2	2.0	0.0	0.1	0.1	0.2	0.1	3.4	2.4	4.0	2.4	2.5	2.2	2.0	1.9	1.9	2.2	2.7	4.8	24	4.8	0.0	1.9	
27	7.2	10.6	12.7	15.7	18.9	5.1	2.6	1.7	0.0	0.8	3.0	7.8	7.3	2.4	2.8	1.0	1.1	1.6	2.4	3.6	5.4	9.2	10.8	11.2	24	18.9	0.0	6.0	
28	8.2	7.0	8.0	6.7	6.3	6.1	4.8	4.4	5.3	5.6	7.6	10.1</																	

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 2017**

Appendix E Continuous Parameter Edit Log
August 29, 2017

APPENDIX E CONTINUOUS PARAMETER EDIT LOG

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:	SO2	Instrument make & model:	Teledyne Monitor Labs Sulphur Dioxide	Serial Number:	1228		
Data edit period	Start date:	1-Jan-17	End date:	31-Mar-17	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)
8	1-Jun-17	BB	Invalidate	5-Apr-17 10:00	5-Apr-17 12:00	Monthly Calibration	
9	1-Jun-17	BB	Invalidate	12-May-17 10:00	12-May-17 12:00	Monthly Calibration	
10	1-Jun-17	BB	Data Review	3-Apr-17 19:00	3-Apr-17 22:00	An elevated SO ₂ concentration was noted. Elevated SO ₂ was also measured at the Courtice WPCP. Winds were blowing from the east. Possible emission sources include St. Mary's Cement. Data determined to be valid.	
11	1-Jun-17	BB	Invalidate	28-Apr-17 06:00	28-Apr-17 06:00	Perm Tube replacement during this hour. Data invalidated.	
12	19-Jun-17	BB	Data Review	21-May-17 03:00	21-May-17 09:00	An elevated SO ₂ concentration was noted. Elevated SO ₂ was also measured at the Courtice WPCP. Winds were blowing from the east. Possible emission sources include St. Mary's Cement. Data determined to be valid.	
13	11-Jul-17	BB	Invalidate	9-Jun-17 06:00	9-Jun-17 08:00	Monthly Calibration	
14	11-Jul-17	BB	Data Review	4-Jun-17 14:00	4-Jun-17 18:00	An elevated SO ₂ concentration was noted. Elevated concentrations were also measured at the Courtice WPCP during this time and were higher than at Crago. Winds were blowing from the east. A possible source could be emissions from CN rail traffic or earthworks. Data determined to be valid.	

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:	Crago Road							
Station address:	Crago 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:	1424				
Data edit period	Start date:	1-Jan-17	End date:	31-Mar-17	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)				
10	1-Jun-17	BB	Invalidate	5-Apr-17	10:00	5-Apr-17	12:00	Monthly Calibration			
11	1-Jun-17	BB	Invalidate	12-May-17	10:00	12-May-17	12:00	Monthly Calibration			
12	1-Jun-17	BB	Invalidate	28-Apr-17	06:00	28-Apr-17	08:00	Perm Tube replacement during this hour. Data invalidated.			
13	1-Jun-17	BB	Zero Correction	28-Apr-17	08:00	3-May-17	16:00	A negative zero drift was observed after the perm tube replacement. Instrument was re-zeroed on May 3. Zero corrections of -1.2, -7.7, and -8.9 ppb were made to the NO, NO2, and NOX measurements, respectively.			
14	1-Jun-17	BB	Data Review	17-Apr-17	00:00	17-Apr-17	03:00	An elevated NO _x concentration of 24 ppb was noted on 17-Apr-17. For this hour, the measured NO ₂ concentration was much higher than NO suggesting a relatively distant emissions source. Winds were blowing from the northwest. Elevated NO _x concentrations were not observed at either Courtice WPCP or Rundle stations. Possible sources include Highway 401, the CP rail line, or the DYEC. Data determined to be valid.			
15	19-Jun-17	BB	Invalidate	10-May-17	09:00	10-May-17	13:00	Maintenance completed to repair 3 small leaks in NOX analyzer system. Data invalidated.			
16	19-Jun-17	BB	Data Review	1-May-17	11:00	1-May-17	15:00	An elevated NO _x concentration was noted. Elevated NO _x was also measured at the Courtice WPCP during this time. Winds were blowing from the east. Concentrations of NO were higher than concentrations of NO ₂ , indicating a nearby combustion source. A possible source could be emissions from CN rail traffic. Data determined to be valid.			
17	11-Jul-17	BB	Invalidate	9-Jun-17	06:00	9-Jun-17	08:00	Monthly Calibration			
18	11-Jul-17	BB	Data Review	4-Jun-17	14:00	4-Jun-17	18:00	An elevated NO _x concentration was noted. Elevated NO _x was also measured at the Courtice WPCP during this time. Winds were blowing from the east. Concentrations of NO ₂ were higher than concentrations of NO, indicating an intermediate combustion source. A possible source could be emissions from CN rail traffic or earthworks. Data determined to be valid.			
19	11-Jul-17	BB	Zero Correction	5-Apr-17	12:00	30-Jun-17	23:00	adjustment of -0.696, -2.133, and -2.755 ppb for NO, NO ₂ , and NOX, respectively to account for drift in calibration gas cannister used during April, May, and June calibrations.			

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:	Crago Road					
Station address:	Crago 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	Serial Number:	CM 0269			
Data edit period	Start date: 1-Jan-17	End date: 31-Mar-17			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)	
9	1-Jun-17	BB	Invalidate	5-Apr-17	10:00	5-Apr-17	11:00	Monthly Calibration
10	1-Jun-17	BB	Invalidate	12-May-17	10:00	12-May-17	12:00	Monthly Calibration
11	1-Jun-17	BB	Data Review	27-Apr-17	08:00	27-Apr-17	18:00	Elevated PM2.5 concentrations between 15 and 37 $\mu\text{g}/\text{m}^3$ were noted on 27-Apr-17 between 8:00 AM and 18:00 PM. Concentrations were not elevated at the Courtice WPCP, Rundle or Oshawa Stations during this time suggesting a local source. Winds were from the east. Possible local sources would include St. Mary's Cement. Data determined to be valid.
12	19-Jun-17	BB	Data Review	17-May-17	12:00	17-May-17	23:00	Elevated PM2.5 concentrations were noted. Concentrations were not elevated at the Courtice WPCP, Rundle or Oshawa Stations during this time suggesting a local source. Winds were from the west-southwest. Possible local sources include agricultural activities. Data determined to be valid.
13	11-Jul-17	BB	Invalidate	30-May-17	06:00	31-May-17	14:00	Sharp removed from Crago Road station and installed at Courtice WPCP. During this time, no Sharp was active at Crago Road. Data invalidated. Courtice Sharp installed on May 31 to continue monitoring PM2.5.
14	11-Jul-17	BB	Invalidate	8-Jun-17	13:00	9-Jun-17	06:00	Contamination in Sharp leading to erroneously high measurements. Data invalidated.
15	11-Jul-17	BB	Invalidate	9-Jun-17	07:00	9-Jun-17	08:00	Monthly Calibration
16	11-Jul-17	BB	Zero Correction	9-Jun-17	09:00	27-Jun-17	08:00	Sharp zero check occurred on June 27 indicating a zero of 2.0 $\mu\text{g}/\text{m}^3$. Zero correction applied back to previous calibration.
17	11-Jul-17	BB	Data Review	4-Jun-17	14:00	4-Jun-17	18:00	An elevated PM _{2.5} concentration was noted. Elevated concentrations were also measured at the Courtice WPCP during this time. Winds were blowing from the east. A possible source could be emissions from St. Mary's cement, CN rail traffic or earthworks. Data determined to be valid.

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.

Marking data as out-of-range

EDIT LOG TABLE

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

Invalidating data when instrumentation off-line

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-17	End date:	31-Mar-17	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:	Wind Speed/Wind Direction	Instrument make & model:	Met One Instruments Inc. Model 034B				
Data edit period	Start date:	1-Jan-17	End date:	31-Mar-17	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
Invalidating 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

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2017**

Appendix F Metals Data Summary
August 29, 2017

APPENDIX F METALS DATA SUMMARY

Metals and Total Particulates Location Date	Crago Road Station																		
	dd/mm/yyyy		Crago 01/04/2017	Crago 07/04/2017	Crago 13/04/2017	Crago 19/04/2017	Crago 25/04/2017	Crago 01/05/2017	Crago 07/05/2017	Crago 13/05/2017	Crago 19/05/2017	Crago 25/05/2017	Crago 31/05/2017	Crago 06/06/2017	Crago 12/06/2017	Crago 18/06/2017	Crago 24/06/2017	Crago 30/06/2017	
Start Time	hh:mm	Hours	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
Sample Duration			22.92	23.81	23.23	23.83	23.33	23.18	23.24	24.08	23.2	23.37	23.85	23.37	23.23	23.43	22.79	24.26	
Technician			TH																
Filter Number	17020745	B768320	17020749	B773592	17031579	B776844	16121511	B782888	17032809	B785630	17041903	B793851	17041907	B7A1834	17050433	B7A5829	17051566	B7B1625	17051572
Analytical Report #																			
Total Volumetric Flow	Am³/sample		1450.92	1474.57	1452.80	1437.56	1375.14	1543.11	1511.48	1494.38	1573.58	1509.05	1629.68	1548.13	1530.52	1557.60	1489.03	1631.43	
Analytical Results	Units	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL
Particulate	mg	17.3	5.0	26.8	5.0	59.3	5.0	44.3	5.0	33.4	5.0	16.8	5.0	66.0	5.0	76.2	5.0	42.9	5.0
Total Mercury (Hg)	µg	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	0.02	0.02	<0.02	0.02
Aluminum (Al)	µg	76	50	110	50	<50	50	267	50	216	50	50	50	339	50	378	50	142	50
Antimony (Sb)	µg	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Arsenic (As)	µg	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0
Barium (Ba)	µg	10.3	1.0	6.0	1.0	<1.0	1.0	10.5	1.0	8.2	1.0	6.6	1.0	5.2	1.0	11.1	1.0	6.4	1.0
Beryllium (Be)	µg	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0	<1.0	1.0
Bismuth (Bi)	µg	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0
Boron (B)	µg	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0	<6.0	6.0
Cadmium (Cd)	µg	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0
Chromium (Cr)	µg	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Cobalt (Co)	µg	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0	<2.0	2.0
Copper (Cu)	µg	28.9	5.0	22.0	5.0	<5.0	5.0	45.5	5.0	29.3	5.0	38.3	5.0	16.7	5.0	50.6	5.0	90.6	5.0
Iron (Fe)	µg	348	50	245	50	<50	50	731	50	460	50	261	50	142	50	700	50	887	50
Lead (Pb)	µg	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0
Magnesium (Mg)	µg	121	50	147	50	<50	50	298	50	233	50	113	50	57	50	337	50	422	50
Manganese (Mn)	µg	6.9	1.0	7.5	1.0	<1.0	1.0	15.8	1.0	10.4	1.0	7.6	1.0	3.5	1.0	20.1	1.0	25.4	1.0
Molybdenum (Mo)	µg	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0
Nickel (Ni)	µg	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0	<3.0	3.0
Phosphorus (P)	µg	<25	25	32	25	<25	25	106	25	74	25	76	25	26	25	114	25	163	25
Selenium (Se)	µg	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Silver (Ag)	µg	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Strontium (Sr)	µg	4.1	1.0	3.9	1.0	<1.0	1.0	10.8	1.0	8.3	1.0	3.7	1.0	1.5	1.0	11.4	1.0	11.0	1.0
Thallium (Tl)	µg	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Tin (Sn)	µg	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10
Titanium (Ti)	µg	<10	10	<10	10	<10	10	13	10	11	10	<10	10	10	<10	10	<10	10	<10
Vanadium (V)	µg	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Zinc (Zn)	µg	17.2	5.0	27.0	5.0	<5.0	5.0	32.4	5.0	18.5	5.0	17.2	5.0	10.1	5.0	26.1	5.0	33.6	5.0
Zirconium (Zr)	µg	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0	<5.0	5.0
Total Uranium (U)	µg/m³	1.64E-04	1.38E-04	1.55E-04	1.53E-04	1.55E-04	1.57E-04	1.57E-04	1.64E-04	1.49E-04	1.51E-04	1.43E-04	1.49E-04	1.51E-04	1.49E-04	1.38E-04	1.45E-04	1.44E-04	1.51E-04

Calculated Concentrations	Quarter 2			Crago 16	Crago 17	Crago 18	Crag

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2017**

Appendix G PAHs Data Summary
August 29, 2017

APPENDIX G PAHS DATA SUMMARY

Polycyclic Aromatic Hydrocarbons		Crago Station			Crago 1/04/2017		Crago 13/04/2017		Crago 25/04/2017		Crago 7/05/2017		Crago 19/05/2017		Crago 31/05/2017		Crago 12/06/2017		Crago 24/06/2017	
Location Date		dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	dd/mm/yyyy	hh:mm	
Start Time			00:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00	
Sample Duration		hours			242		23.29		23.42		22.84		24.09		24.09		23.45		23.81	
Technician			TH		TH		TZ		TH		TH		TH		TH		TZ		TH	
Filter Number		DWR872-01			EAZ419-01		EA2423-01		EGN444-01		EGN451-01		EGN481-01		EJC333-01		EJC615-01			
Maxaam ID		EGA153			EH5H70		EIS369		EVK203		EBM863		B7A5376		B784077		EQO150			
Maxxam Job #		B778869			B785636		B798384		B7A5376		B7A5376		B7A5376		B7D5649		B7C5012			
Total Volumetric Flow	Am ³ /sample		327.74		328.50		331.38		324.82		313.78		353.92		340.75		357.39			
Analytical Results		Units	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	
Benzo(a)pyrene	µg	0.0057	0.020	0.0063	0.030	0.0044	0.020	0.0035	0.030	0.0024	0.020	0.0085	0.030	0.0103	0.020	0.0046	0.030			
1-Methylnaphthalene	µg	0.85	0.10	1.91	0.15	1.06	0.10	0.38	0.15	0.99	0.10	1.25	0.15	1.43	0.10	1.22	0.15	1.15		
2-Methylnaphthalene	µg	1.41	0.10	3.28	0.15	1.61	0.10	0.65	0.15	1.64	0.10	2.09	0.15	2.44	0.10	2.16	0.15			
Acenaphthene	µg	0.234	0.050	0.621	0.075	0.240	0.050	0.204	0.075	0.640	0.050	0.951	0.075	1.38	0.050	0.917	0.075			
Acenaphthylene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Anthracene	µg	<0.050	0.050	1.01	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Benzo(a)anthracene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Benzo(a)fluorene	µg	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15			
Benzo(b)fluoranthene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Benzo(b)fluorene	µg	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15			
Benzo(e)pyrene	µg	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15			
Benzo(g,h,i)perylene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Benzo(k)fluoranthene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Biphenyl	µg	0.42	0.10	0.68	0.15	0.47	0.10	0.15	0.15	0.40	0.10	0.60	0.15	0.83	0.10	0.47	0.15			
Chrysene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Dibenz(a,h)anthracene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Dibenzo(a,c)anthracene + Picene ¹	µg	<0.050	0.050	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15			
Fluoranthene	µg	0.100	0.050	0.237	0.075	0.108	0.050	<0.075	0.075	0.190	0.050	0.345	0.075	0.494	0.050	0.272	0.075			
Indeno(1,2,3-cd)pyrene	µg	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075			
Naphthalene	µg	4.80	0.072	10.5	0.11	3.42	0.072	1.53	0.11	3.50	0.072	5.11	0.11	8.44	0.072	4.26	0.11			
o-Terphenyl	µg	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15			
Perylene	µg	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.15	0.15			
Phenanthrene	µg	0.456	0.050	0.990	0.075	0.464	0.050	0.297	0.075	0.916	0.050	1.34	0.075	2.02	0.050	1.26	0.075			
Pyrene	µg	0.056	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	0.092	0.050	0.120	0.075	0.182	0.050	<0.075	0.075			
Tetralin	µg	0.46	0.10	1.11	0.15	0.53	0.10	0.24	0.15	0.43	0.10	0.70	0.15	0.55	0.10	0.48	0.15			
Calculated Concentrations		Quarter 2			Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	Crago	
			8		9		10		11		12		13		14		15			
Units	Maximum	Minimum																		
Benzo(a)pyrene	ng/m ³	3.02E-02	7.65E-03	1.74E-02		1.92E-02		1.33E-02		1.08E-02		7.65E-03		2.40E-02		3.02E-02		1.29E-02		
1-Methylnaphthalene	ng/m ³	5.81	1.17	2.59E+00		5.81E+00		3.20E+00		1.17E+00		3.16E+00		3.53E+00		4.20E+00		3.41E+00		
2-Methylnaphthalene	ng/m ³	9.98	2.00	4.30E+00		9.98E+00		4.86E+00		2.00E+00		5.23E+00		5.91E+00		7.16E+00		6.04E+00		
Acenaphthene	ng/m ³	4.05E+00	6.28E-01	7.14E-01		1.89E+00		7.24E-01		6.28E-01		2.04E+00		2.69E+00		4.05E+00		2.57E+00		
Acenaphthylene	ng/m ³	0.12	0.07	7.63E-02		1.14E-01		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Anthracene	ng/m ³	3.07	0.07	7.63E-02		3.07E+00		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Benzo(a)anthracene	ng/m ³	1.15E-01	7.34E-02	7.63E-02		1.14E-01		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Benzo(a)fluorene	ng/m ³	2.31E-01	1.47E-01	1.53E-01		2.28E-01		1.51E-01		2.31E-01		1.59E-01		2.12E-01		1.47E-01		2.10E-01		
Benzo(b)fluoranthene	ng/m ³	1.15E-01	7.34E-02	7.63E-02		1.14E-01		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Benzo(b)fluorene	ng/m ³	2.31E-01	1.47E-01	1.53E-01		2.28E-01		1.51E-01		2.31E-01		1.27E+00		1.70E+00		2.44E+00		1.32E+00		
Chrysene	ng/m ³	1.15E-01	7.34E-02	7.63E-02		1.14E-01		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Dibenzo(a,h)anthracene	ng/m ³	1.15E-01	7.34E-02	7.63E-02		1.14E-01		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Dibenzo(a,c)anthracene + Picene ¹	ng/m ³	2.31E-01	7.34E-02	7.63E-02		2.28E-01		1.51E-01		2.31E-01		1.59E-01		2.12E-01		1.47E-01		2.10E-01		
Fluoranthene	ng/m ³	1.45E+00	1.15E-01	3.05E-01		7.21E-01		3.26E-01		1.15E-01		6.06E-01		9.75E-01		1.45E+00		7.61E-01		
Indeno(1,2,3-cd)pyrene	ng/m ³	1.15E-01	7.34E-02	7.63E-02		1.14E-01		7.54E-02		1.15E-01		7.97E-02		1.06E-01		7.34E-02		1.05E-01		
Naphthalene	ng/m ³	32.0	4.71	1.46E+01		3.20E+01		1.03E+01		4.71E+00		1.12E+01		1.44E+01		2.48E+01		1.19E+01		
o-Terphenyl	ng/m ³	2.31E-01	1.47E-01	1.53E-01		2.28E-01		1.51E-01		2.31E-01		1.59E-01		2.12E-01		1.47E-01		2.10E-01		
Perylene	ng/m ³	2.31E-01	1.47E-01	1.53E-01		2.28E-01		1.51E-01		2.31E-01		1.59E-01		2.12E-01		1.47E-01		2.10E-01		
Phenanthrene	ng/m ³	5.92E+00	9.14E-01	1.39E+00		3.01E+00		1.40E+00		9.14E-01		2.92E+00		3.79E+00		5.93E+00		3.53E+00		
Pyrene	ng/m ³	5.34E-01	7.54E-02	1.71E-01		1.14E-01		7.54E-02		1.15E-01		2.93E-01		3.39E-01		5.34E-01		1.05E-01		
Tetralin	ng/m ³	3.38E-00	7.39E-01	1.40E+00		3.38E-00		1.60E+00		7.39E-01		1.37E+00		1.98E+00		1.61E+00		1.34E+00		
Total PAH	ng/m ³	6.43E+01	1.31E+01	2.84E+01		6.43E+01		2.55E+01		1.31E+01		2.97E+01		3.74E+01		5.37E+01		3.32E+01		

Note:

RDL = Reportable Detection Limit

1. These parameters have not been subjected to Maxxam's standard validation process nor has it been accredited for the submitted matrix

**QUARTERLY AMBIENT AIR QUALITY MONITORING REPORT FOR THE DURHAM YORK ENERGY CENTRE
(CRAGO ROAD STATION) – APRIL TO JUNE 2017**

Appendix H Dioxins and Furans Data Summary
August 29, 2017

APPENDIX H DIOXINS AND FURANS DATA SUMMARY

Dioxins and Furans		Crago Station											
Location Date	dd/mm/yyyy	Crago			Crago			Crago			Crago		
Start Time	hh:mm	13/04/2017		7/05/2017		31/05/2017		24/06/2017					
Sample Duration	hours	0:00	23.29	0:00	22.84	0:00	24.09	0:00	23.81	TH	TH	EOO150	EJC615-01
Technician		EA2419-01	EGN444-01	EGN481-01	B78869	EGN481-01	EML893	EGN481-01	B784077	B784077	B784077	B784077	B784077
Filter Number		EGA153	EIS369	EML893	B793834	EOO150	B784077	EOO150	B784077	B784077	B784077	B784077	B784077
Maxxam ID		8778869											
Maxxam Job #													
Total Volumetric Flow	Am ³ /sample	328.50		324.82		353.92		357.39					
Analytical Results	Units	Value	EDL	WHO₂₀₀₈ TEF	Value	EDL	WHO₂₀₀₈ TEF	Value	EDL	WHO₂₀₀₈ TEF	Value	EDL	WHO₂₀₀₈ TEF
2,3,7,8-Tetra CDD *	pg	<3.1	3.1	1	<3.9	3.9	1	<3.8	3.8	1	<3.3	3.3	1
1,2,3,7,8-Penta CDD *	pg	<3.5	3.5	1	<3.4	3.4	1	<4.4	4.4	1	<3.5	3.5	1
1,2,3,4,7,8-Hexa CDD *	pg	<3.3	3.3	0.1	<3.0	3.0	0.1	<4.5	4.5	0.1	<3.4	3.4	0.1
1,2,3,6,7,8-Hexa CDD *	pg	<3.6	3.6	0.1	<3.1	3.1	0.1	<4.9	4.9	0.1	<3.6	3.6	0.1
1,2,3,7,8,9-Hexa CDD *	pg	<3.2	3.2	0.1	<2.8	2.8	0.1	<4.3	4.3	0.1	<3.2	3.2	0.1
1,2,3,4,6,7,8-Hepta CDD *	pg	8.7	2.1	0.01	5.4	4.2	0.01	8.2	4.6	0.01	<3.2	3.2	0.01
Octa CDD *	pg	34.0	3.2	0.0003	13.1	4.0	0.0003	27.2	5.3	0.0003	10.9	3.2	0.0003
Total Tetra CDD *	pg	<0.7 (1)	9.7		<3.9	3.9		<3.8	3.8		<3.3	3.3	
Total Penta CDD *	pg	<0.0 (1)	8.0		<3.4	3.4		<4.4	4.4		<3.5	3.5	
Total Hexa CDD *	pg	<22 (1)	22		<3.0	3.0		<4.6	4.6		<6.4 (1)	6.4	
Total Hepta CDD *	pg	8.7	2.1		9.7	4.2		16.6	4.6		<3.2	3.2	
2,3,7,8-Tetra CDE **	pg	<3.0	3.0	0.1	<2.8	2.8	0.1	<3.8	3.8	0.1	<3.2	3.2	0.1
1,2,3,7,8-Penta CDE **	pg	<3.5	3.5	0.03	<4.0	4.0	0.03	<4.4	4.4	0.03	<3.5	3.5	0.03
2,3,4,7,8-Penta CDF **	pg	<3.5	3.5	0.3	<3.8	3.8	0.3	<4.4	4.4	0.3	<3.5	3.5	0.3
1,2,3,4,7,8-Hexa CDF **	pg	<2.3	2.3	0.1	<2.8	2.8	0.1	<2.2	2.2	0.1	<3.4	3.4	0.1
1,2,3,6,7,8-Hexa CDF **	pg	<2.3	2.3	0.1	<2.7	2.7	0.1	<2.2	2.2	0.1	<3.4	3.4	0.1
2,3,4,6,7,8-Hexa CDF **	pg	<2.4	2.4	0.1	<3.1	3.1	0.1	<2.3	2.3	0.1	<3.5	3.5	0.1
1,2,3,7,8,9-Hexa CDF **	pg	<2.5	2.5	0.1	<3.1	3.1	0.1	2.5	2.4	0.1	<3.7	3.7	0.1
1,2,3,4,6,7,8-Hepta CDF **	pg	<3.0	3.0	0.01	<2.7	2.7	0.01	<4.2	4.2	0.01	<2.3	2.3	0.01
1,2,3,4,7,8,9-Hepta CDF **	pg	<3.5	3.5	0.01	<3.3	3.3	0.01	<4.8	4.8	0.01	<2.6	2.6	0.01
Octa CDF **	pg	<3.0	3.0	0.0003	<3.1	3.1	0.0003	<4.0	4.0	0.0003	<3.4	3.4	0.0003
Total Tetra CDF **	pg	<4.2 (1)	4.2		<2.8	2.8		<3.8	3.8		<3.2	3.2	
Total Penta CDF **	pg	<3.5	3.5		<3.9	3.9		<4.4	4.4		<3.5	3.5	
Total Hexa CDF **	pg	<2.4	2.4		<2.9	2.9		<2.3	2.3		<3.5	3.5	
Total Hepta CDF **	pg	<3.2	3.2		<3.0	3.0		<4.5	4.5		<2.4	2.4	
Toxic Equivalency	pg												

Notes:
* CDD = Chloro Dibenzo-p-Dioxin ** CDF = Chloro Dibenzo-p-Furan

Calculated Concentrations	Quarter 2			Crago	Crago	Crago	Crago
	Units	Maximum	Minimum	5	6	7	8
2,3,7,8-Tetra CDD *	pg/m ³	6.00E-03	4.62E-03	0.005	0.006	0.005	0.005
1,2,3,7,8-Penta CDD *	pg/m ³	6.22E-03	4.90E-03	0.005	0.005	0.006	0.005
1,2,3,4,7,8-Hexa CDD *	pg/m ³	6.36E-03	4.62E-03	0.005	0.005	0.006	0.005
1,2,3,6,7,8-Hexa CDD *	pg/m ³	6.92E-03	4.77E-03	0.005	0.005	0.007	0.005
1,2,3,7,8,9-Hexa CDD *	pg/m ³	6.07E-03	4.31E-03	0.005	0.004	0.006	0.004
1,2,3,4,6,7,8-Hepta CDD *	pg/m ³	2.65E-02	4.48E-03	0.026	0.017	0.023	0.004
Octa CDD *	pg/m ³	1.03E-01	3.05E-02	0.103	0.040	0.077	0.030
Total Tetra CDD *	pg/m ³	1.48E-02	4.42E-03	0.015	0.006	0.005	0.005
Total Penta CDD *	pg/m ³	1.22E-02	4.90E-03	0.012	0.005	0.006	0.005
Total Hexa CDD *	pg/m ³	3.35E-02	4.62E-03	0.033	0.005	0.006	0.009
Total Hepta CDD *	pg/m ³	4.69E-02	4.48E-03	0.026	0.030	0.047	0.004
2,3,7,8-Tetra CDE **	pg/m ³	5.37E-03	4.31E-03	0.005	0.004	0.005	0.004
1,2,3,7,8-Penta CDF **	pg/m ³	6.22E-03	4.90E-03	0.005	0.006	0.006	0.005
2,3,4,7,8-Penta CDF **	pg/m ³	6.22E-03	4.90E-03	0.005	0.006	0.006	0.005
1,2,3,4,7,8-Hexa CDF **	pg/m ³	4.76E-03	3.11E-03	0.004	0.004	0.003	0.005
1,2,3,6,7,8-Hexa CDF **	pg/m ³	4.76E-03	3.11E-03	0.004	0.004	0.003	0.005
2,3,4,6,7,8-Hexa CDF **	pg/m ³	4.90E-03	3.25E-03	0.004	0.005	0.003	0.005
1,2,3,7,8,9-Hexa CDF **	pg/m ³	7.06E-03	3.81E-03	0.004	0.005	0.007	0.005
1,2,3,4,6,7,8-Hepta CDF **	pg/m ³	5.93E-03	3.22E-03	0.005	0.004	0.006	0.003
1,2,3,4,7,8-Hepta CDF **	pg/m ³	6.78E-03	3.64E-03	0.005	0.005	0.007	0.004
Octa CDF **	pg/m ³	5.65E-03	4.57E-03	0.005	0.005	0.006	0.005
Total Tetra CDF **	pg/m ³	6.39E-03	4.31E-03	0.006	0.004	0.005	0.004
Total Penta CDF **	pg/m ³	6.22E-03	4.90E-03	0.005	0.006	0.006	0.005
Total Hexa CDF **	pg/m ³	4.90E-03	3.25E-03	0.004	0.004	0.003	0.005
Total Hepta CDF **	pg/m ³	3.36E-03	3.36E-03	0.005	0.004	0.003	0.005
Toxic Equivalency	pg TEQ/m ³	1.81E-02	1.51E-02	0.016	0.017	0.018	0.015
Calculated TEQ Concentrations	Units			Crago	Crago	Crago	Crago
				13/04/2017	07/05/2017	31/05/2017	24/06/2017
2,3,7,8-Tetra CDD *	pg TEQ/m ³			0.005	0.006	0.005	0.005
1,2,3,7,8-Penta CDD	pg TEQ/m ³			0.005	0.006	0.005	0.005
1,2,3,4,7,8-Hexa CDD	pg TEQ/m ³			0.0005	0.0005	0.0007	0.0005
1,2,3,6,7,8-Hexa CDD	pg TEQ/m ³			0.0005	0.0004	0.0006	0.0004
1,2,3,7,8,9-Hexa CDD	pg TEQ/m ³			0.0005	0.0002	0.0002	0.0000
1,2,3,4,6,7,8-Hepta CDD	pg TEQ/m ³			0.0003	0.0002	0.0001	0.00001
Octa CDD	pg TEQ/m ³			0.00003	0.00001	0.00002	0.00001
Total Tetra CDD	pg TEQ/m ³			0.0005	0.0004	0.0005	0.0004
Total Penta CDD	pg TEQ/m ³			0.0002	0.0002	0.0002	0.0001
Total Hexa CDD	pg TEQ/m ³			0.0002	0.0002	0.0002	0.0001
Total Hepta CDD	pg TEQ/m ³			0.0004	0.0004	0.0003	0.0005
2,3,7,8-Tetra CDE **	pg TEQ/m ³			0.0004	0.0005	0.0006	0.0005
1,2,3,7,8-Penta CDF	pg TEQ/m ³			0.0004	0.0004	0.0003	0.0005
2,3,4,7,8-Hexa CDF	pg TEQ/m ³			0.0004	0.0005	0.0003	0.0005
1,2,3,6,7,8-Hexa CDF	pg TEQ/m ³			0.0004	0.0004	0.0003	0.0005
1,2,3,7,8,9-Hexa CDF	pg TEQ/m ³			0.0004	0.0005	0.0007	0.0005
1,2,3,4,6,7,8-Hepta CDF	pg TEQ/m ³			0.0005	0.0004	0.0006	0.0003
1,2,3,4,7,8-Hepta CDF	pg TEQ/m ³			0.0005	0.0005	0.0007	0.0005
Octa CDF	pg TEQ/m ³			0.00005	0.00005	0.00007	0.00004
Total Tetra CDF	pg TEQ/m ³			0.00001	0.00001	0.00002	0.00001
Total Penta CDF	pg TEQ/m ³			0.00001	0.00001	0.00001	0.00001
Total Hexa CDF	pg TEQ/m ³			0.00001	0.00001	0.00001	0.00001
Total Hepta CDF	pg TEQ/m ³			0.00001	0.00001	0.00001	0.00001
TOTAL TOXIC EQUIVALENCY	pg TEQ/m ³			0.016	0.017	0.018	0.015

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