Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Crago Road Station) – January to March 2018

FINAL REPORT

June 22, 2018

File: 160950528

Prepared for:

The Regional Municipality of Durham
605 Rossland Road
Whitby, ON L1N 6A3

Prepared by:

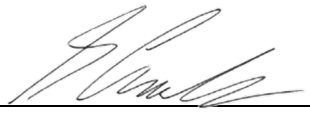
Stantec Consulting Ltd.
300W-675 Cochrane Drive
Markham, ON L3R 0B8

Sign-off Sheet

This document entitled Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre (Crago Road Station) – January to March 2018 was prepared by Stantec Consulting Ltd. ("Stantec") for the account of The Regional Municipality of Durham (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by 
(signature)

Toni Zbieranowski, M.Sc.

Reviewed by 
(signature)

Gregory Crooks, M.Eng., P.Eng.

Reviewed by 
(signature)

Kimberly Ireland, P.Eng.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

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 ($PM_{2.5}$).
- 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 January to March 2018 (Calendar Quarter 1). 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 1 2018.

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

1. Measured levels of NO_2, SO_2 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 98^{th} 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**, with the exception of the 24-hour benzo(a)pyrene (B(a)P) concentration in four (4) samples which exceeded the applicable Ontario Ambient Air Quality Criteria (AAQC) by a range of 18% to 108%. The current Ontario 24-hour B(a)P AAQC was introduced in 2011 and levels above this AAQC are commonly measured throughout Ontario. The measurements were however, well below the MOECC Schedule 6 Upper Risk Threshold, the MOECC O. Reg. 419/05 24-hour average guideline, and the HHRA health-based criterion.
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 during the monitoring period between January and March 2018, with the exception of four (4) benzo(a)pyrene samples. All measured levels of the monitored contaminants were below their applicable HHRA health-based criteria.

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
WPCP	Water Pollution Control Plant

Elements	
Cd	Cadmium
Hg	Mercury
Pb	Lead
Al	Aluminum
As	Arsenic
Be	Beryllium
Cr	Chromium
Cu	Copper
Mn	Manganese
Ni	Nickel
Ag	Silver
Tl	Thallium
Sn	Tin
V	Vanadium
Zn	Zinc
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
$\mu g/m^3$	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

1.0 INTRODUCTION

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:

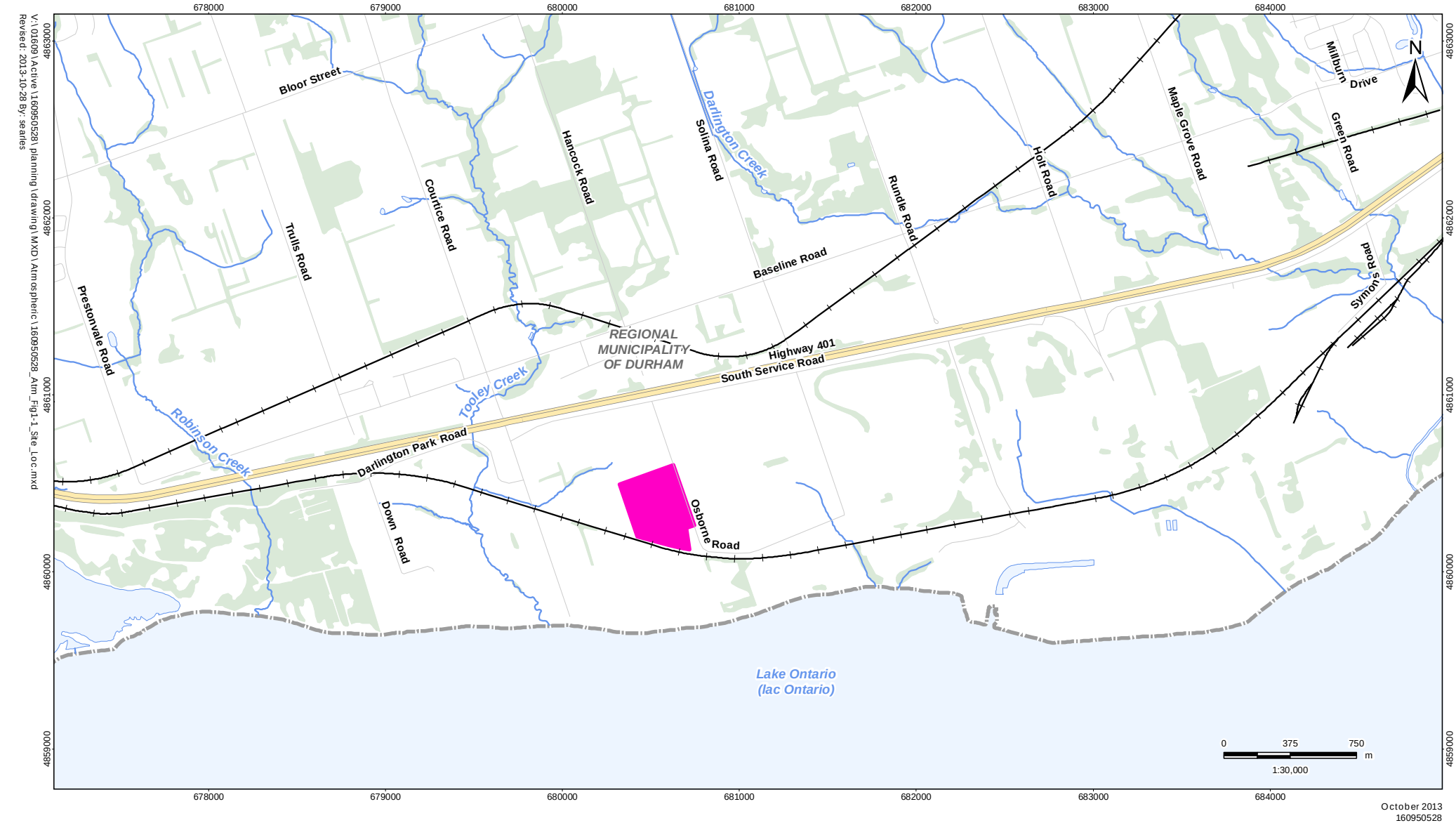
- Contaminants monitored continuously:
  - Sulphur Dioxide (SO_2);
  - Nitrogen Oxides (NO_X); and,
  - Particulate Matter smaller than 2.5 microns ($PM_{2.5}$).
- Contaminants monitored non-continuously:
  - Metals in Total Suspended Particulate (TSP) matter;
  - Polycyclic Aromatic Hydrocarbons (PAHs);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

This quarterly report provides a summary of the ambient air quality data collected at this station for the period January to March 2018 (Q1).

1.1 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.



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

October 2013
160950528

Stantec

Legend

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

Notes

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

Client/Project

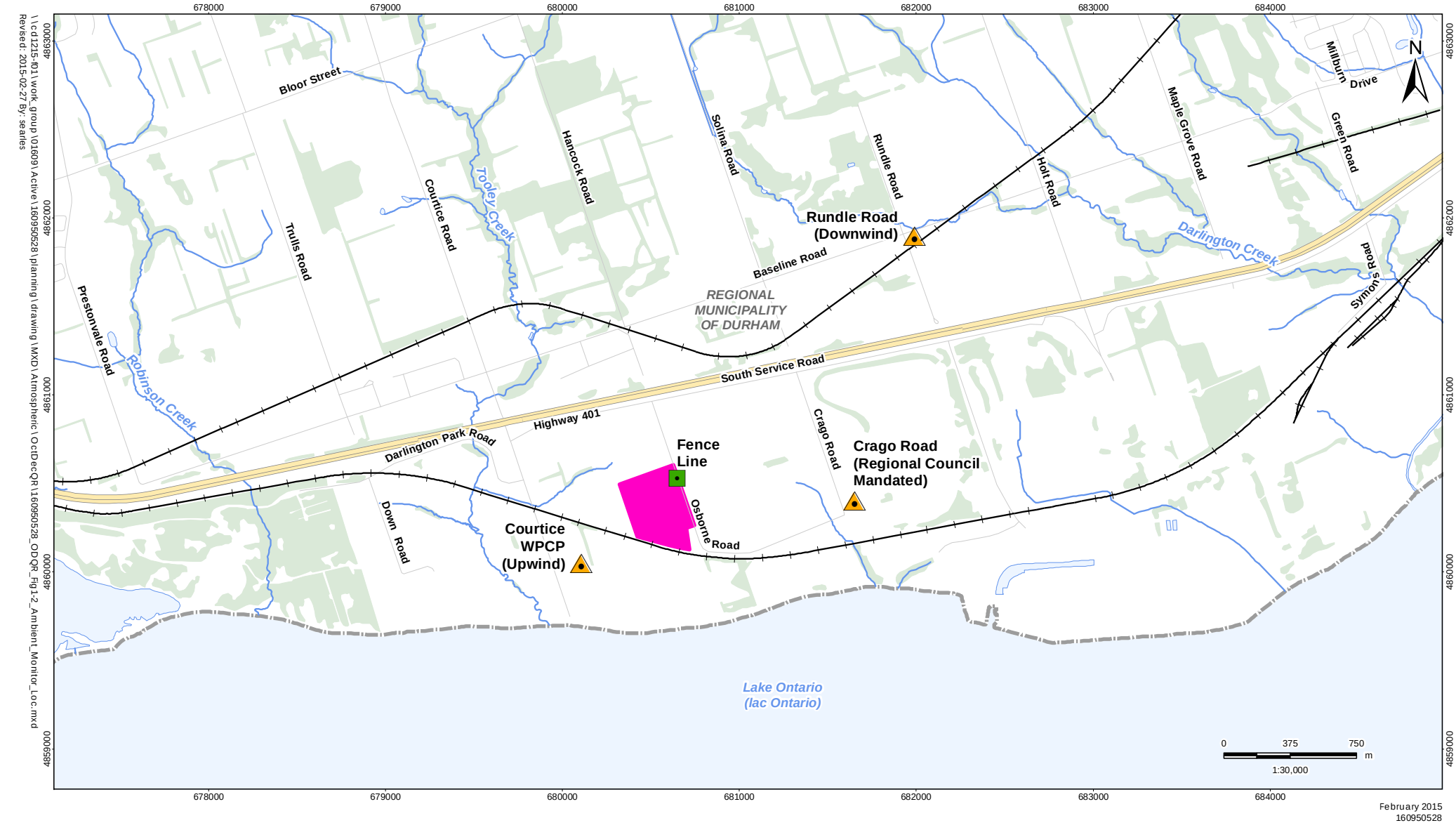
The Region of Durham
Durham York Energy Centre

Figure No.

1-1

Title

Site Location Plan



February 2015
160950528

\\cd1215-001\work_group\01609\Active\160950528\planning\drawing\MXD\Atmospheric\OctDecQR\160950528_ODQR_Fig1-2_Ambient_Monitor_Loc.mxd
Revised: 2015-02-27 By: searles

Stantec

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

Notes

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

Client/Project

The Region of Durham
Durham York Energy Centre

Figure No.

1-2

Title

Locations of Ambient Monitoring Stations

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

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 7.5 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 ($PM_{2.5}$).
- 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)
- Antimony (Sb)
- Arsenic (As)
- Barium (Ba)
- Beryllium (Be)
- Bismuth (Bi)
- Boron (B)
- Cadmium (Cd)
- Cobalt (Co)
- Copper (Cu)
- Chromium (Cr) (Total)
- Iron (Fe)
- Lead (Pb)
- Magnesium (Mg)
- Manganese (Mn)
- Mercury (Hg)
- Molybdenum (Mo)
- Nickel (Ni)
- Phosphorus (Ph)
- Selenium (Se)
- Silver (Ag)
- Strontium (Sr)
- Thallium (Tl)
- Tin (Sn)
- Titanium (Ti)
- Uranium (U)
- Vanadium (V)
- Zinc (Zn)
- Zirconium (Zr)

Polycyclic Aromatic Hydrocarbons:

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

Dioxins and Furans:

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

2.3 AIR QUALITY CRITERIA

Several evaluation criteria were used for comparison to the air quality data as specified in the Ambient Monitoring Plan (Stantec, 2012). The first set was the Ontario Ambient Air Quality Criteria (AAQC) developed by the MOECC (MOECC, 2012). The second 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 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” (ACB List) (MOECC, 2018).

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 another set of evaluation criteria.

The previously applicable 24-hour average Canada-Wide Standard (CWS) for $PM_{2.5}$ of 30 µg/m^3 (98th percentile averaged over 3 consecutive years), has been superseded by a new Canadian Ambient Air Quality Standard (CAAQS) of 28 µg/m^3 (98th percentile averaged over three consecutive years) and an annual objective of 10 µg/m^3 as noted in **Table 2-1**. The proposed CAAQS 24-hour objective for 2020 is 27 µg/m^3.

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	MOECC Criteria			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 dioxide	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 [A]	10 [B]	-	30 [C]	-

Notes:

A. 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.
B. 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.
C. HHRA Health-Based criterion for $PM_{2.5}$ was selected referencing CCME (2006).

Table 2-2: Summary of Air Quality Criteria for Metals

Contaminant	CAS	MOECC Criteria			HHRA Health-Based Criteria		
		1-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Other Time Period ($\mu g/m^3$)	1-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Annual ($\mu g/m^3$)
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	-	-	-	-

Table 2-2: Summary of Air Quality Criteria for Metals

Contaminant	CAS	MOECC Criteria			HHRA Health-Based Criteria		
		1-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Other Time Period ($\mu g/m^3$)	1-Hour ($\mu g/m^3$)	24-Hour ($\mu g/m^3$)	Annual ($\mu g/m^3$)
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	MOECC Criteria			HHRA Health-Based Criteria			
		1-Hour (ng/m^3)	24-Hour (ng/m^3)	Other Time Period (ng/m^3)	1-Hour (ng/m^3)	24-Hour (ng/m^3)	Annual (ng/m^3)	Toxic Equivalency Factor Annual [A, F] $(ng/m^3)^{-1}$
1-Methylnaphthalene	90-12-0	-	12,000	-	-	-	3,000	-
2-Methylnaphthalene	91-57-6	-	10,000	-	-	-	3,000	-
Acenaphthene	83-32-9	-	-	-	1,000	-	-	1
Acenaphthylene	208-96-8	-	3,500	-	1,000	-	-	10
Anthracene	120-12-7	-	200	-	500	-	50	-
Benzo(a)anthracene	56-55-3	-	-	-	500	-	-	100
Benzo(b)fluoranthene	205-99-2	-	-	-	500	-	-	100
Benzo(k)fluoranthene	207 -08-9	-	-	-	500	-	-	100
Benzo(a)fluorene	238-84-6	-	-	-	500	-	50	-
Benzo(b)fluorene	243-17-4	-	-	-	500	-	50	-
Benzo (g,h,i) perylene	191-24-2	-	-	-	500	-	-	100
Benzo(a)pyrene	50-32-8	-	0.05 [B] 5 [C] 1.1 [D]	0.01; annual	-	1	87 [A]	-
Benzo(e)pyrene	192-97-2	-	-	-	500	-	-	10
Biphenyl	92-52-4	-	-	-	-	-	224,000	-
Chrysene	218-01-9	-						-
Dibenzo(a,c)anthracene	215-58-7	-	-	-	-	-	-	100

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

Contaminant	CAS	MOECC Criteria			HHRA Health-Based Criteria			
		1-Hour (ng/m^3)	24-Hour (ng/m^3)	Other Time Period (ng/m^3)	1-Hour (ng/m^3)	24-Hour (ng/m^3)	Annual (ng/m^3)	Toxic Equivalency Factor Annual [A, F] $(ng/m^3)^{-1}$
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 $(ng/m^3)^{-1}$.
B. Ontario Ambient Air Quality Criteria - The standard for benzo(a)pyrene (B(a)P) is for B(a)P as a surrogate for PAHs.
C. O. Reg. 419/05 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 WHO_{2005} toxic equivalency factors (i-TEFs).
F. Toxic Equivalency Factors (TEFs) are shown as benzo(a)pyrene equivalents.

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 (SO_2) are conducted on a continuous basis. A summary of the continuous monitors and a brief description of their principle of operation are provided in **Table 3-1** below.

Table 3-1: Summary of Continuous Ambient Air Quality Monitors

Contaminant	Monitor	Principle of Operation	Range	Time Interval
$PM_{2.5}$	Thermo Sharp 5030 Synchronized Hybrid Ambient Real-time Particulate Monitor	Light Scattering Photometry / Beta Attenuation - Consists of a carbon14 source, detector, and light scattering Nephelometer in a rack-mountable enclosure. The Thermo Sharp utilizes a continuous (non-step wise) hybrid mass measurement and a combination of beta attenuation and light scattering technology. The unit's filter tape is automatically advanced based upon a user defined frequency or particulate loading.	0 - 10 mg/m^3	1 minute
NO, NO_2, NO_X	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 Florescence - SO_2 levels are measured based on the principle that SO_2 has a strong ultraviolet (UV) absorption at a wavelength between 200 and 240 nanometres (nm). The absorption of photons at these wavelengths results in the emission of fluorescence photons at a higher wavelength. The amount of fluorescence measured is directly proportional to the concentration of SO_2.	0 – 1000 ppb	1 second

Two manually operated, high-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 7.5 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

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

3.2 INSTRUMENTATION ISSUES

A 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	None	-	-
NOx	None	-	-
$PM_{2.5}$	Elevated $PM_{2.5}$ concentrations observed following a zero check of the Crago SHARP unit.	February 5, 2018 17:00 to February 6, 2018 6:00	Elevated $PM_{2.5}$ concentrations during this period were invalidated.
	Elevated $PM_{2.5}$ concentrations observed following a zero check of the Crago SHARP unit.	March 23, 2018 8:00 – 13:00	Elevated $PM_{2.5}$ concentrations during this period were invalidated.
TSP/Metals Hi-Vol.	Power outage at Station during sample run for TSP/metals.	January 8, 2018	The TSP/metals sample was determined to be invalid as the sample did not run for 24-hours +/- 10% and therefore, was not sent to the laboratory for analysis.
PAH/ D/F Hi-Vol	None	-	-
Other	None	-	-

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 – January to March 2018

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
SO_2	2154	99.7%
NO_X	2152	99.6%
$PM_{2.5}$	2129	98.6%
Temperature	2160	100%
Rainfall	2160	100%
Relative Humidity	2160	100%
Wind Speed/Direction	2017	93.4%
TSP/Metals	14 [A]	93.3%
PAHs	8 [A]	100%

Table 3-5: Summary of Data Recovery Rates for the Crago Road Station – January to March 2018

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
Dioxins and Furans	4 [A]	100%

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

3.4 FIELD CONDITION OBSERVATIONS

During Q1 2018, 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 during field visits by Stantec personnel.

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 Megawatt Drive and Highway 401. Major work observed included earthworks and Highway 401 overpass construction for on/off ramps connecting to Highway 418. A photograph of soil berms/ramps and overpass construction activities are provided in **Figure 3-1**.

During Q1, there was one period for Boiler 1 and two periods for Boiler 2 where waste feed to each boiler was halted. The times when these feed stops occurred are summarized in **Table 3-6.**

Table 3-6: Summary of Boiler Operational Status in Q1 2018

Boiler	Date	Time	Status
Boiler 1	January 15	15:31 – 22:46	Feed Stop
	March 11 – March 29	00:01 – 00:01	Scheduled Outage
Boiler 2	February 11 – March 1	12:00 – 14:04	Scheduled Outage
	March 2	16:28 – 17:02	Feed Stop
	March 2	20:03 – 22:35	Feed Stop

Figure 3-1: Looking North from Megawatt Drive at the Highway 401 and Highway 418 Construction (January 29, 2018)

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 January to March 2018 period are presented in **Table 4-1**.

Table 4-1: Summary of Hourly Meteorological Measurements – January to March 2018

Parameter		Crago Road Station (Predominately Downwind)	Units
Temperature	Maximum	9.5	C
	Minimum	-26.5	C
	Mean (January)	-6.4	C
	Mean (February)	-2.6	C
	Mean (March)	-0.9	C
	Mean (Period)	-3.3	C
	Standard Deviation	6.3	C
Rainfall	Maximum	5	mm
	Minimum	0.0	mm
	Mean (January)	0.05	mm
	Mean (February)	0.08	mm
	Mean (March)	0.03	mm
	Mean (Period)	0.05	mm
	Standard Deviation	0.29	mm
Relative Humidity	Maximum	98.8	%
	Minimum	21.9	%
	Mean (January)	73.3	%
	Mean (February)	75.3	%
	Mean (March)	62.9	%
	Mean (Period)	70.3	%
	Standard Deviation	15.7	%

Table 4-1: Summary of Hourly Meteorological Measurements – January to March 2018

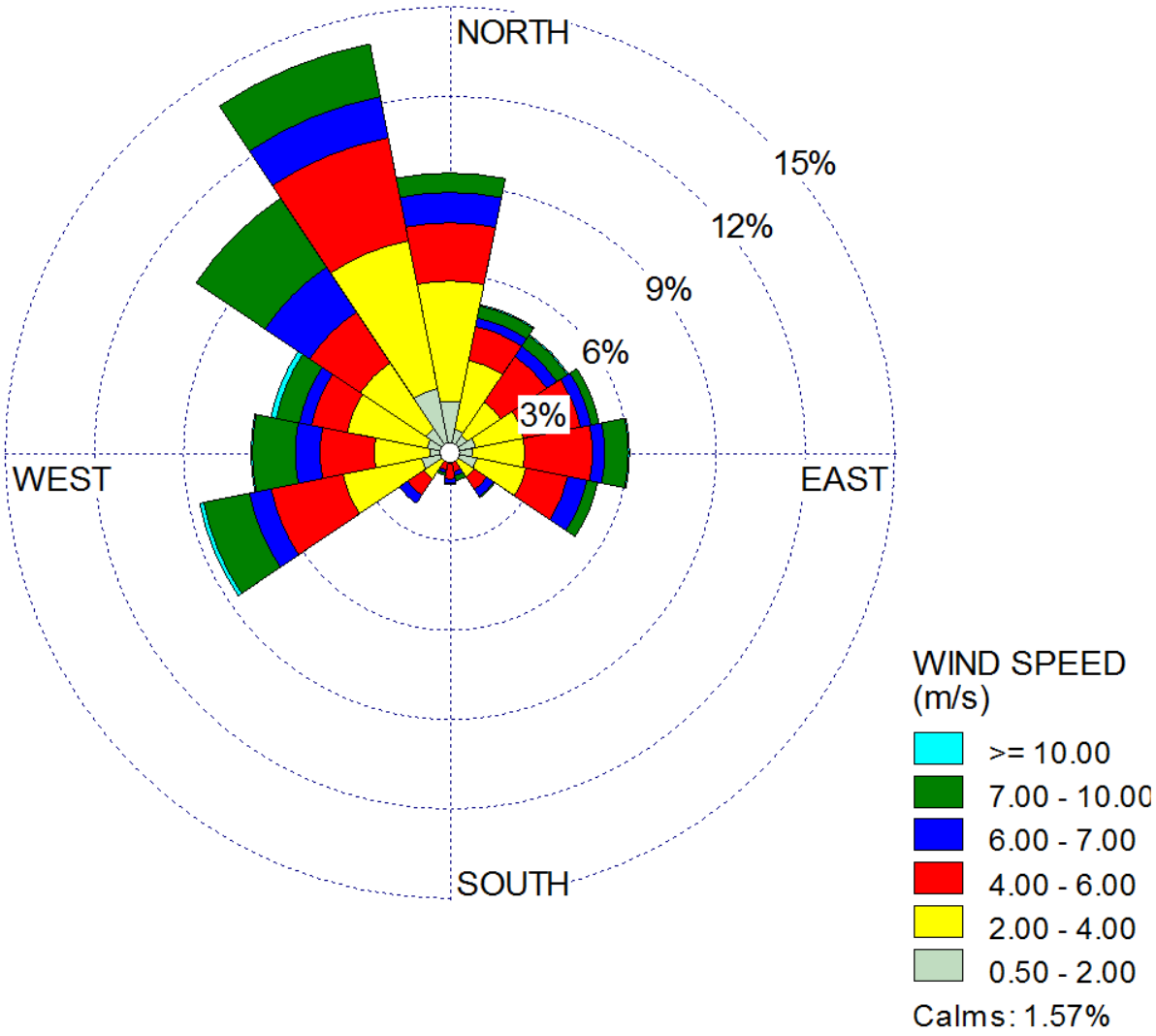
Parameter		Crago Road Station (Predominately Downwind)	Units
Wind Speed [A]	Maximum	45.4	km/hr
	Minimum	0.0	km/hr
	Mean (January)	16.1	km/hr
	Mean (February)	14.1	km/hr
	Mean (March)	15.0	km/hr
	Mean (Period)	15.2	km/hr
	Standard Deviation	8.0	km/hr

Note:
A. Wind speed is measured at 7.5 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 northwesterly to northerly directions. Wind contribution from the southeast to southwest was low. Higher wind speeds occurred from west-southwesterly to west-northwesterly directions.

Figure 4-1: Wind Rose for January to March 2018



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 January to March 2018.

Nitric oxide (NO) has no regulatory criteria as discussed in Section 4.2.2 below. There are both hourly and daily AAQCs for NO_2 which are based on health effects of NO_2; therefore, the AAQC were compared to measured NO_2 concentrations in this report.

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, 2018).

Table 4-2: Summary of Ambient CAC Monitoring Data – January to March 2018

Pollutant	Averaging Period	MOECC and HHRA Health-Based Criteria		Description	Crago Road Station (Predominately Downwind)	
		ppb	µg/m^3		Concentration (ppbv)	Concentration (µg/m^3) [C]
SO_2	1	250	690	Maximum	29.4	82.9
				Minimum	0.0	0.0
				Mean (January)	1.2	3.4
				Mean (February)	1.2	3.6
				Mean (March)	0.9	2.6
				Mean (Period)	1.1	3.2
				Standard Deviation	1.3	3.8
				# of Exceedances	0	0
	24	100	275	Maximum	8.0	22.5
				Minimum	0.0	0.0
				Mean (January)	1.2	3.4
				Mean (February)	1.2	3.6
				Mean (March)	0.9	2.6
				Mean (Period)	1.1	3.2
				Standard Deviation	0.8	2.2
				# of Exceedances	0	0

Table 4-2: Summary of Ambient CAC Monitoring Data – January to March 2018

Pollutant	Averaging Period	MOECC and HHRA Health-Based Criteria		Description	Crago Road Station (Predominately Downwind)	
		ppb	µg/m^3		Concentration (ppbv)	Concentration (µg/m^3) [C]
$PM_{2.5}$	24	N/A	28 [A]	Maximum	-	21.4
				Minimum	-	0.8
				Mean (January)	-	6.2
				Mean (February)	-	6.8
				Mean (March)	-	3.9
				Mean (Period)	-	5.6
				Standard Deviation	-	3.7
				# of Exceedances	-	N/A
NO_2	1	200	400	Maximum	44.4	98.1
				Minimum	0.0	0.0
				Mean (January)	7.9	16.6
				Mean (February)	8.7	18.1
				Mean (March)	3.5	7.3
				Mean (Period)	6.6	13.9
				Standard Deviation	7.5	15.8
				# of Exceedances	0	0
	24	100	200	Maximum	21.2	45.2
				Minimum	0.1	0.1
				Mean (January)	7.9	16.6
				Mean (February)	8.7	18.1
				Mean (March)	3.6	7.4

Table 4-2: Summary of Ambient CAC Monitoring Data – January to March 2018

Pollutant	Averaging Period	MOECC and HHRA Health-Based Criteria		Description	Crago Road Station (Predominately Downwind)	
		ppb	µg/m^3		Concentration (ppbv)	Concentration (µg/m^3) [C]
				Mean (Period)	6.7	13.9
				Standard Deviation	4.7	10.0
				# of Exceedances	0	0
NO [B]	1	N/A	N/A	Maximum	62.6	82.1
				Minimum	0.0	0.0
				Mean (January)	2.3	3.1
				Mean (February)	2.4	3.2
				Mean (March)	1.2	1.6
				Mean (Period)	2.0	2.6
				Standard Deviation	3.8	5.2
				# of Exceedances	N/A	N/A
	24	N/A	N/A	Maximum	16.2	21.3
				Minimum	0.0	0.0
				Mean (January)	2.3	3.1
				Mean (February)	2.4	3.2
				Mean (March)	1.2	1.6
				Mean (Period)	1.9	2.6
				Standard Deviation	2.0	2.7
				# of Exceedances	N/A	N/A

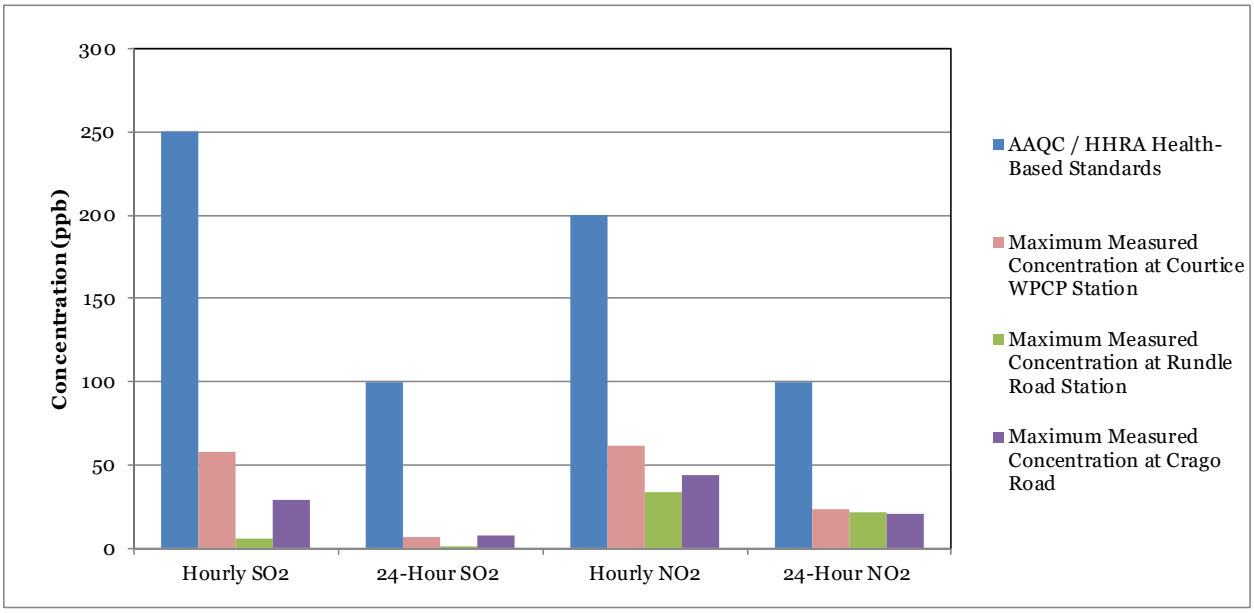
Table 4-2: Summary of Ambient CAC Monitoring Data – January to March 2018

Pollutant	Averaging Period	MOECC and HHRA Health-Based Criteria		Description	Crago Road Station (Predominately Downwind)	
		ppb	µg/m^3		Concentration (ppbv)	Concentration (µg/m^3) [C]
NO_X [B]	1	N/A	N/A	Maximum	92.9	187.0
				Minimum	0.0	0.0
				Mean (January)	9.9	20.7
				Mean (February)	10.7	22.4
				Mean (March)	4.4	9.1
				Mean (Period)	8.3	17.2
				Standard Deviation	10.1	21.0
				# of Exceedances	N/A	N/A
	24	N/A	N/A	Maximum	33.9	69.2
				Minimum	0.2	0.4
				Mean (January)	9.9	20.7
				Mean (February)	10.7	22.4
				Mean (March)	4.5	9.2
				Mean (Period)	8.3	17.3
				Standard Deviation	6.3	13.1
				# of Exceedances	N/A	N/A

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. NO and NOx have no Ambient Air Quality Criteria.
C. The conversions from ppb to µg/m^3 are based on actual temperature and pressure. Therefore, the maximum concentration in ppb may not correspond to the same hour as the maximum concentration in µg/m^3.

Figure 4-2: Comparison of NO_2 and SO_2 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 (SO_2)

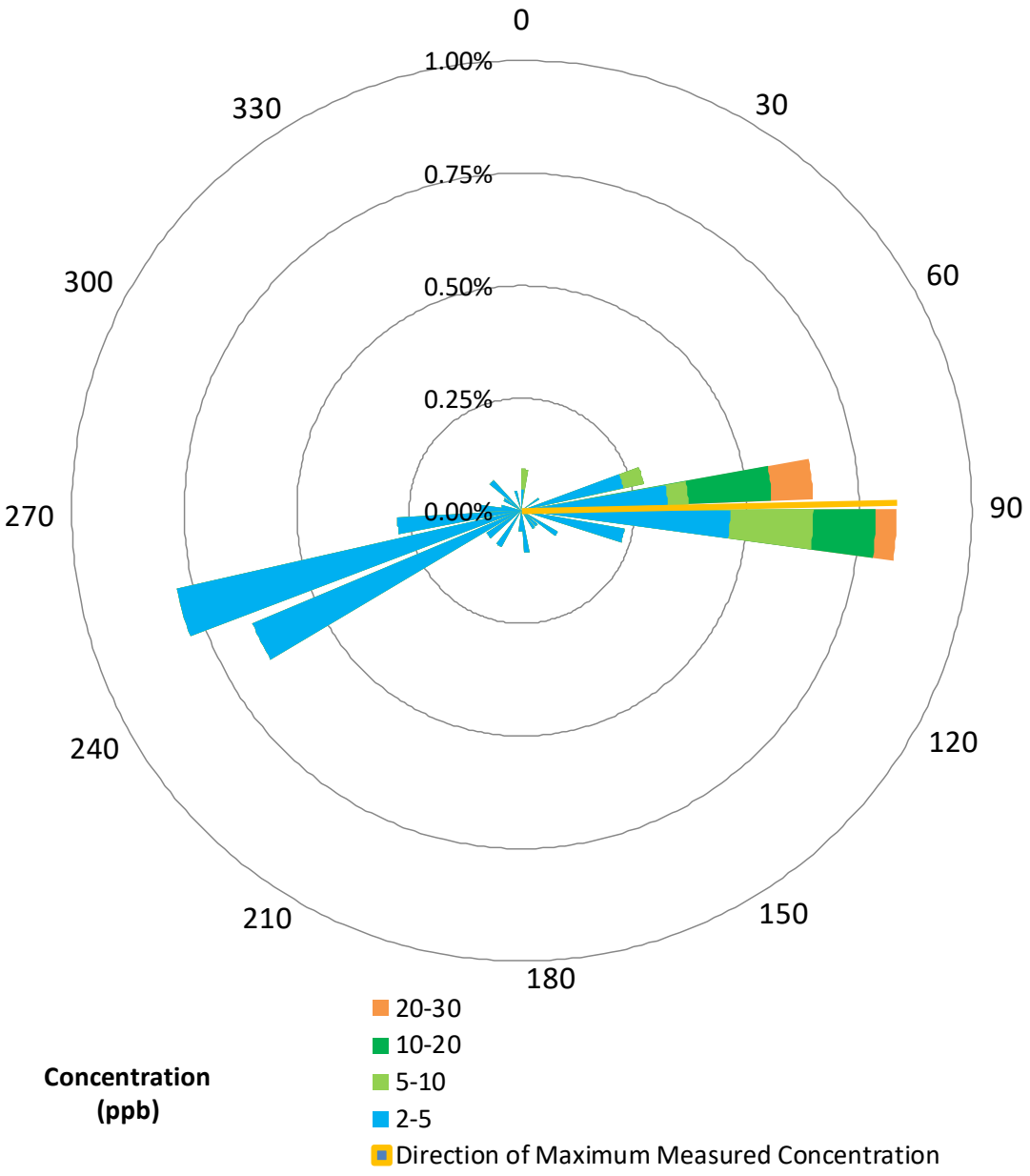
Data summaries are presented in **Appendix A** for sulphur dioxide for each month as well as time history plots of hourly and 24-hour average SO_2 concentrations. For hourly and 24-hour averages, the Ontario AAQCs of 250 ppb and 100 ppb (690 µg/m^3 and 275 µg/m^3) are shown with blue lines on the respective plot. As shown in these figures, measured ambient SO_2 concentrations at the station were well below the Ontario AAQCs.

The maximum hourly and 24-hour average SO_2 concentrations measured at the Crago Road Station during January to March 2018 were 29.4 and 8.0 ppb (82.9 and 22.5 µg/m^3) respectively, which are 12% and 8% of the applicable 1-hour and 24-hour Ontario AAQCs.

A pollution rose of hourly average SO_2 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 2 ppb, 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. In this period, the Crago Road Station generally measured higher hourly concentrations for winds blowing from easterly directions.

The maximum hourly average concentration of SO_2 occurred on January 22, 2018 at 22:00, with winds blowing from the east for which St. Mary's Cement and a CN railway was upwind. The maximum 24-hour average SO_2 concentration also occurred for winds blowing from east (the direction of St. Mary's Cement and a CN railway) on January 23, 2018.

Figure 4-3: Pollution Rose of Measured Hourly Average SO_2 Concentrations – January to March 2018



4.2.2 Nitrogen Dioxide (NO_2)

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

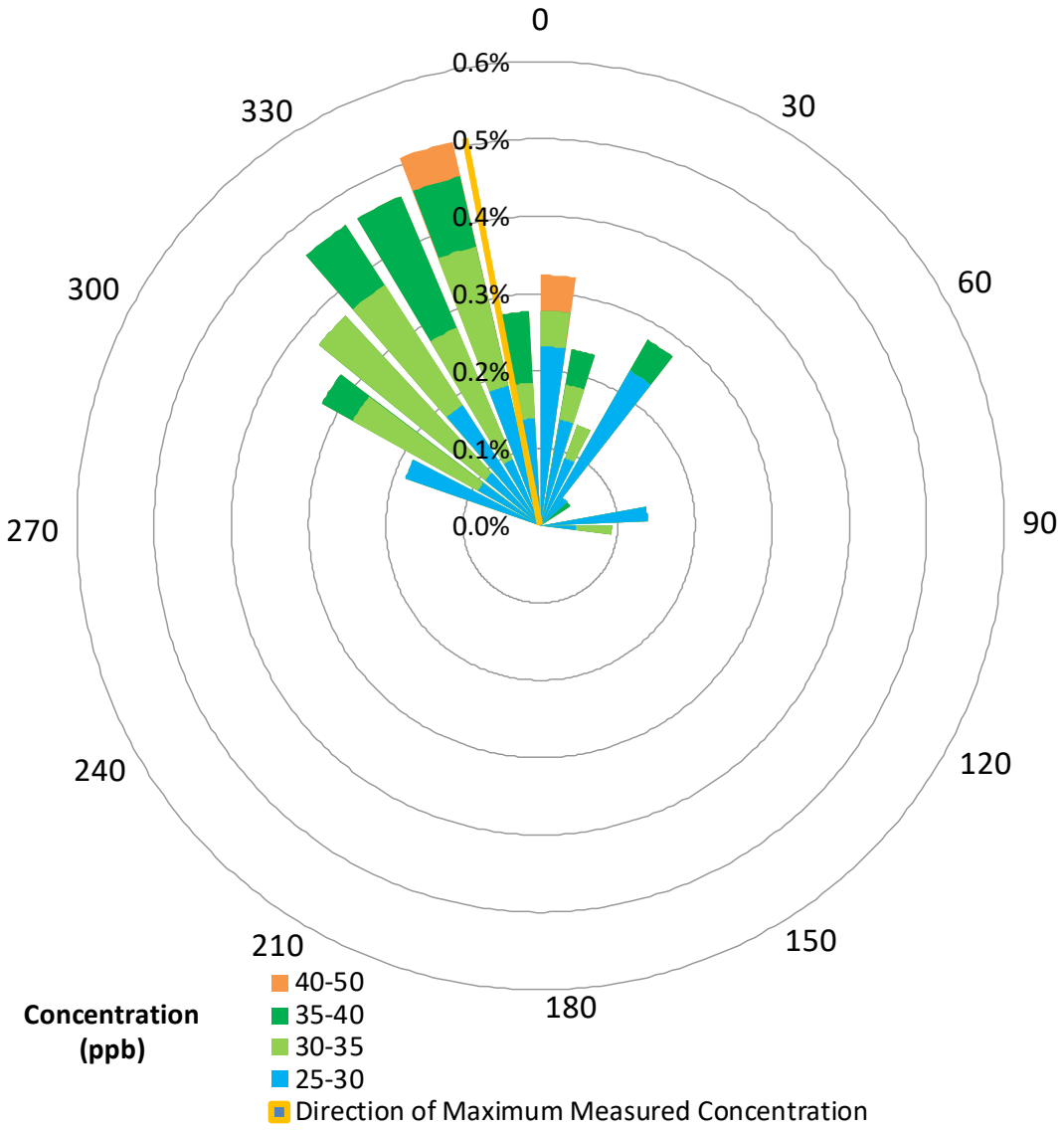
Data summaries for nitrogen dioxide are presented in **Appendix B** for each month as well as time history plots of the hourly and 24-hour average NO_2 concentrations. For the hourly and 24-hour averages, the Ontario AAQCs of 200 ppb and 100 ppb (400 µg/m^3 and 200 µg/m^3) are shown with blue lines on the respective plot. As shown in these figures, measured ambient NO_2 concentrations were well below the Ontario AAQCs.

The maximum measured hourly and 24-hour average concentrations were 44.4 and 21.2 ppb (98.1 and 45.2 µg/m^3), which are 22% and 21% respectively, of the applicable 1-hour and 24-hour Ontario AAQCs.

A pollution rose of measured hourly average NO_2 concentrations is presented in **Figure 4-4**. Concentrations less than 25 ppb, 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 for winds blowing from northerly directions.

The highest measured hourly average NO_2 concentration occurred on February 12, 2018 at 23:00. During this hour, winds were blowing from a north-northwesterly direction for which Highway 401 and Highway 418 construction activities were upwind. The highest 24-hour average NO_2 concentration occurred when winds were blowing from the northwest on January 17, 2018 for which agricultural fields, Highway 401 and Highway 418 construction activities were upwind.

Figure 4-4: Pollution Rose of Measured Hourly Average NO_2 – January to March 2018



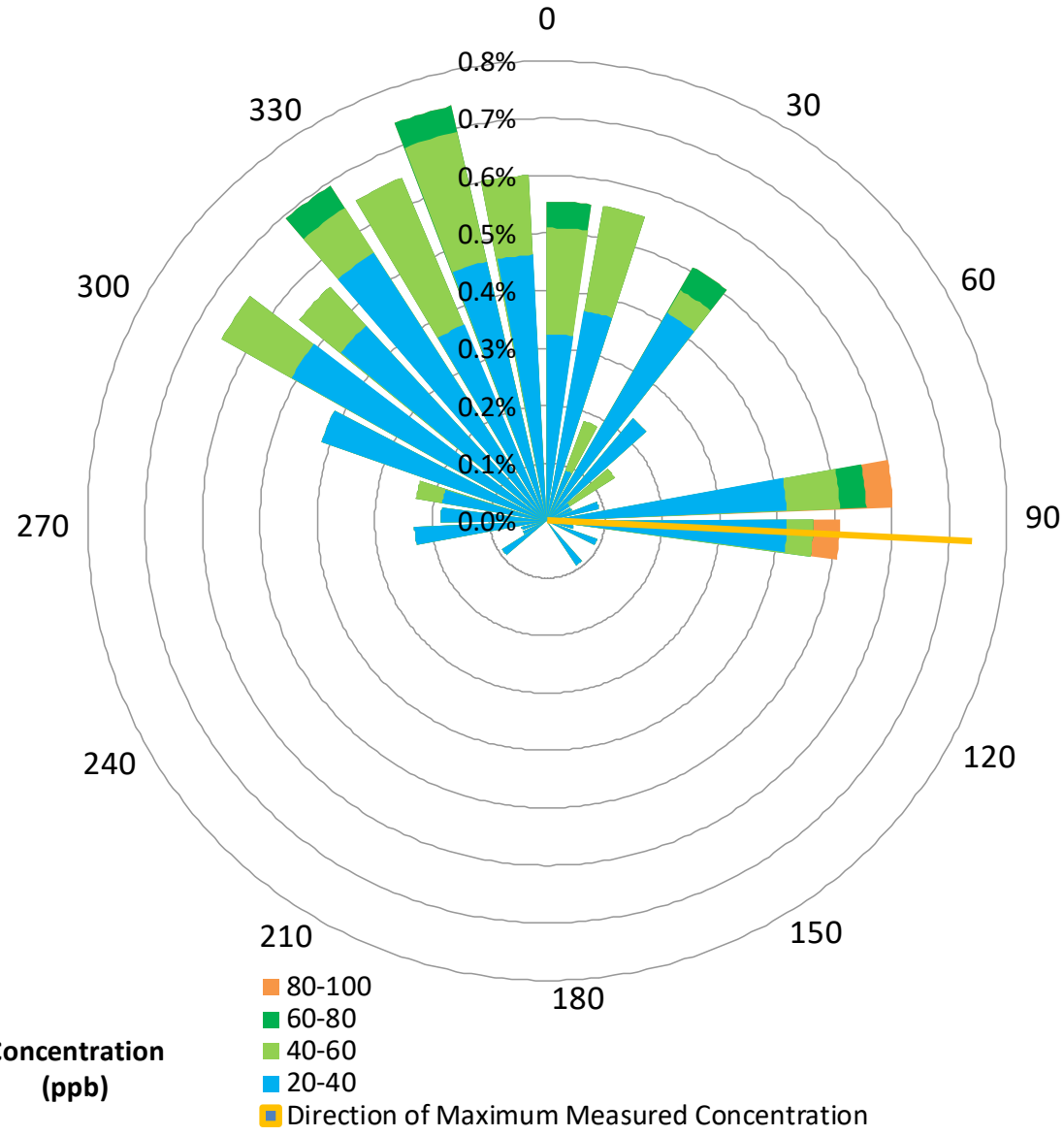
4.2.3 Nitrogen Oxides (NO_X)

Data summaries for each month are presented in **Appendix C** for nitrogen oxides as well as time history plots of the hourly and 24-hour average NO_X concentrations. The maximum hourly NO_X concentration measured at the Crago Road Station was 92.9 ppb (187.0 µg/m^3), and the maximum measured 24-hour average NO_X concentration was 33.9 ppb (69.2 µg/m^3). 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 20 ppb, which account for 84% 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 NOx concentrations typically occurred for winds blowing from easterly directions.

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 a CN railway) on January 23, 2018 at 00:00, the maximum 24-hour average NO_x concentration was also measured on January 23, 2018 when winds were blowing from the east.

Figure 4-5: Pollution Rose of Measured Hourly Average NO_X Concentrations – January to March 2018



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

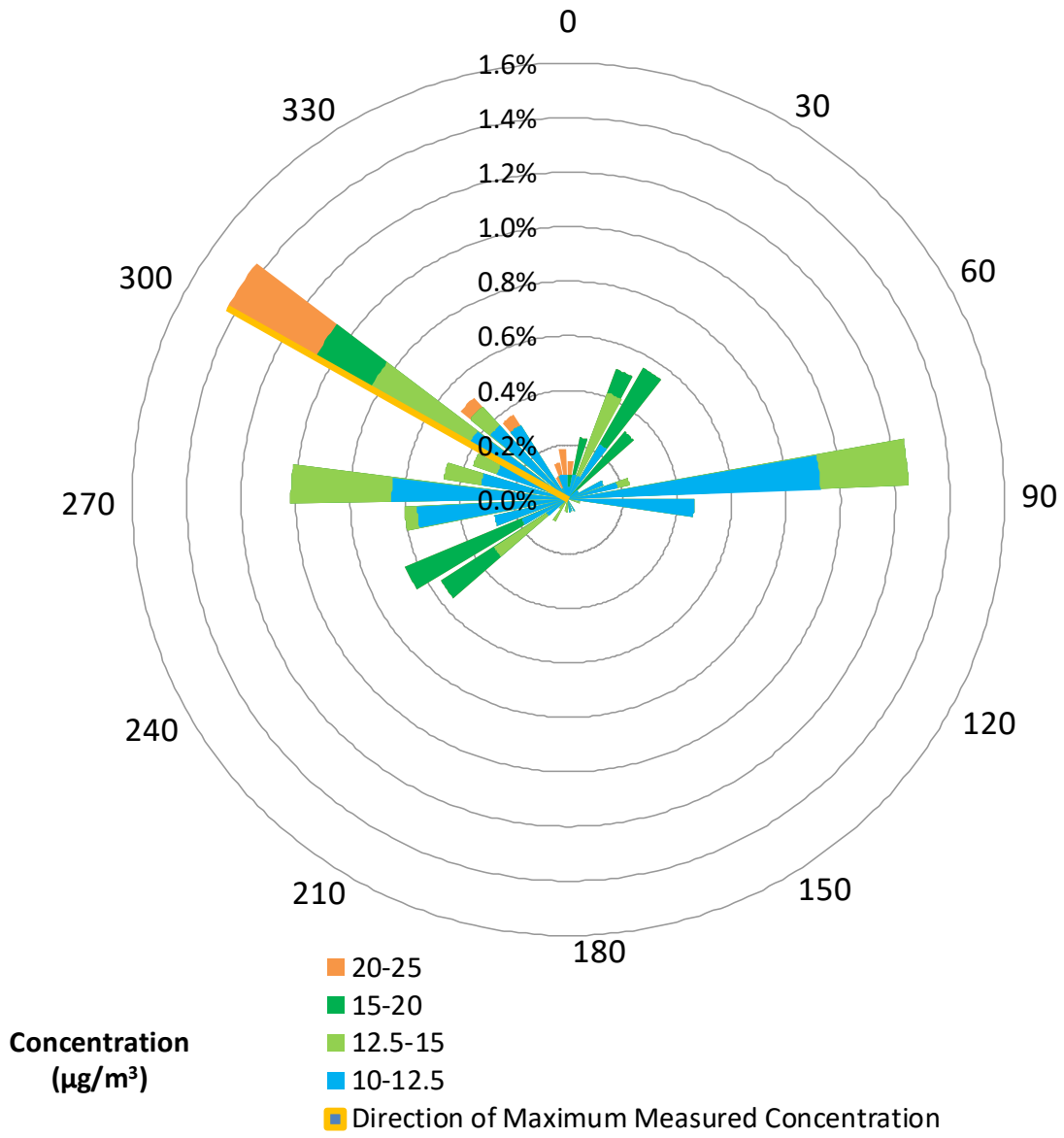
Data summaries and time history plots of measured 24-hour average concentrations are presented in **Appendix D** for $PM_{2.5}$.

The maximum measured 24-hour average $PM_{2.5}$ concentration was 21.4 µg/m^3 during this quarter. It should be noted that an exceedance of the 24-hour CAAQS for $PM_{2.5}$ requires the average of the 98th percentile levels in each of three consecutive calendar years to be greater than 28 µg/m^3. The $PM_{2.5}$ measurements in this report consist of 3 months of data; therefore, there is insufficient data to determine with any certainty if exceedances of the CAAQS would occur.

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/m^3, which account for 80% 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 northwesterly to northerly directions.

The highest measured 24-hour average $PM_{2.5}$ concentration occurred on February 9, 2018 with winds originating from the northwest. For this wind direction, agricultural fields, Highway 401, and Highway 418 construction activities were upwind of the Crago Road Station.

Figure 4-6: Pollution Rose of Measured 24-Hour Average $PM_{2.5}$ Concentrations – January to March 2018



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 Criteria	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Particulate	µg/m^3	120	120	31	10	0
Total Mercury (Hg)	µg/m^3	2	2	4.78E-05	6.28E-06 [A]	0
Aluminum (Al)	µg/m^3	4.8	-	1.40E-01	1.74E-02 [A]	0
Antimony (Sb)	µg/m^3	25	25	3.92E-03 [A]	3.14E-03 [A]	0
Arsenic (As)	µg/m^3	0.3	0.3	2.35E-03 [A]	1.88E-03 [A]	0
Barium (Ba)	µg/m^3	10	10	6.51E-03	2.76E-03	0
Beryllium (Be)	µg/m^3	0.01	0.01	3.92E-04 [A]	3.14E-04 [A]	0
Bismuth (Bi)	µg/m^3	-	-	2.35E-03 [A]	1.88E-03 [A]	-
Boron (B)	µg/m^3	120	-	2.35E-03 [A]	1.88E-03 [A]	0
Cadmium (Cd)	µg/m^3	0.025	0.025	7.84E-04 [A]	6.28E-04 [A]	0
Chromium (Cr)	µg/m^3	0.5	-	1.96E-03 [A]	1.57E-03 [A]	0
Cobalt (Co)	µg/m^3	0.1	0.1	7.84E-04 [A]	6.28E-04 [A]	0
Copper (Cu)	µg/m^3	50	-	1.79E-02	1.64E-03 [A]	0
Iron (Fe)	µg/m^3	4	-	3.12E-01	1.04E-01	0
Lead (Pb)	µg/m^3	0.5	0.5	5.37E-03	9.42E-04 [A]	0
Magnesium (Mg)	µg/m^3	-	-	1.83E-01	3.96E-02	-
Manganese (Mn)	µg/m^3	0.4	-	9.80E-03	2.76E-03	0
Molybdenum (Mo)	µg/m^3	120	-	1.18E-03 [A]	9.42E-04 [A]	0
Nickel (Ni)	µg/m^3	0.2	-	1.18E-03 [A]	9.42E-04 [A]	0
Phosphorus (P)	µg/m^3	-	-	1.84E-02	7.85E-03 [A]	-
Selenium (Se)	µg/m^3	10	10	3.92E-03 [A]	3.14E-03 [A]	0
Silver (Ag)	µg/m^3	1	1	1.96E-03 [A]	1.57E-03 [A]	0
Strontium (Sr)	µg/m^3	120	-	6.21E-03	1.32E-03	0
Thallium (Tl)	µg/m^3	-	-	3.92E-03 [A]	3.14E-03 [A]	-
Tin (Sn)	µg/m^3	10	10	3.92E-03 [A]	3.14E-03 [A]	0
Titanium (Ti)	µg/m^3	120	-	9.28E-03	3.14E-03 [A]	0

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

Contaminant	Units	MOECC Criteria	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Vanadium (V)	µg/m^3	2	1	1.96E-03 A	1.57E-03 A	0
Zinc (Zn)	µg/m^3	120	-	4.76E-02	7.03E-03	0
Zirconium (Zr)	µg/m^3	20	-	1.96E-03 A	1.57E-03 A	0
Total Uranium (U)	µg/m^3	1.5	-	1.76E-04 A	1.41E-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 PAHs with MOECC AAQCs were below their applicable 24-hour criteria, with the exception of four (4) benzo(a)pyrene (B(a)P) measurements which were collected on January 2, 14, 26 and February 7, 2018. The Ontario B(a)P AAQC level was exceeded in these four samples by a range of 18% to 108%. However, all four samples were well below the MOECC Schedule 6 Upper Risk Threshold, the MOECC O. Reg. 419/05 24-hour average guideline, and the HHRA health-based criteria. On these four sample days (January 2, 14, 26 and February 7), winds were blowing from the west, east, east, and south-southeast respectively. For winds blowing from the west, agricultural fields, the DYEC and the CN rail line are upwind, for easterly winds St. Mary's Cement and the CN railway are upwind. For south-southeasterly winds agricultural fields and the CN rail line are upwind.

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

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

The current Ontario 24-hour B(a)P AAQC was introduced in 2011 and levels above this AAQC are commonly measured throughout Ontario. B(a)P measurement data available from the National Air Pollutant Surveillance (NAPS) network for Ontario in 2013 (for Simcoe, Toronto, and Hamilton), all had maximum levels above the AAQC (varying between 136% - 6,220% of the criteria). Available NAPS data for Ontario in 2012 (for Windsor, Toronto, and Hamilton) showed maximum B(a)P levels at these stations

that varied between 716% - 2,920% of the criteria. In 2011, NAPS data available for seven Ontario stations (Windsor, Toronto, Etobicoke, Hamilton, Simcoe, Pt. Petrie, and Burnt Island) showed exceedances at six of the seven stations, with only the remote Burnt Island Ontario station reporting a maximum level below the MOECC AAQC. In 2010, all of these stations, including the Burnt Island station, measured B(a)P levels above the AAQC.

Table 4-4: Summary of Measured Ambient PAH Concentrations

Contaminant	Units	MOECC Criteria	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Benzo(a)pyrene	ng/m^3	0.05 [A]	1	1.04E-01	1.44E-02	4
		5 [B]				0
		1.1 [C]				0
1-Methylnaphthalene	ng/m^3	12,000	-	4.56E+00	8.64E-01	0
2-Methylnaphthalene	ng/m^3	10,000	-	7.13E+00	1.37E+00	0
Acenaphthene	ng/m^3	-	-	1.19E+00	9.00E-02 [A]	-
Acenaphthylene	ng/m^3	3500	-	5.02E-01	7.61E-02 [A]	0
Anthracene	ng/m^3	200	-	1.32E-01 [A]	7.22E-02 [A]	0
Benzo(a)anthracene	ng/m^3	-	-	1.32E-01 [A]	7.22E-02 [A]	-
Benzo(a)fluorene	ng/m^3	-	-	2.64E-01 [A]	1.44E-01 [A]	-
Benzo(b)fluoranthene	ng/m^3	-	-	3.06E-01	7.61E-02 [A]	-
Benzo(b)fluorene	ng/m^3	-	-	2.64E-01 [A]	1.44E-01 [A]	-
Benzo(e)pyrene	ng/m^3	-	-	2.64E-01 [A]	1.44E-01 [A]	-
Benzo(g,h,i)perylene	ng/m^3	-	-	1.32E-01 [A]	7.22E-02 [A]	-
Benzo(k)fluoranthene	ng/m^3	-	-	1.32E-01 [A]	7.22E-02 [A]	-
Biphenyl	ng/m^3	-	-	2.72E+00	6.48E-01	-
Chrysene	ng/m^3	-	-	3.12E-01	7.61E-02 [A]	-
Dibenz(a,h)anthracene [D]	ng/m^3	-	-	1.32E-01 [A]	7.22E-02 [A]	-
Dibenzo(a,c)anthracene + Picene	ng/m^3	-	-	2.64E-01 [A]	8.51E-02 [A]	-
Fluoranthene	ng/m^3	-	-	9.01E-01	9.00E-02 [A]	-
Indeno (1,2,3-cd)pyrene	ng/m^3	-	-	1.32E-01 [A]	7.22E-02 [A]	-
Naphthalene	ng/m^3	22,500	22,500	3.17E+01	5.26E+00	0
o-Terphenyl	ng/m^3	-	-	2.64E-01 [A]	1.44E-01 [A]	-
Perylene	ng/m^3	-	-	2.64E-01 [A]	1.44E-01 [A]	-
Phenanthrene	ng/m^3	-	-	2.59E+00	7.13E-01	-

Table 4-4: Summary of Measured Ambient PAH Concentrations

Contaminant	Units	MOECC Criteria	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
Pyrene	ng/m^3	-	-	6.18E-01	8.68E-02 [A]	-
Tetralin	ng/m^3	-	-	2.04E+00	7.56E-01	-
Total PAH [E]	ng/m^3	-	-	5.34E+01	1.18E+01	-

Notes:

A. Ontario Ambient Air Quality Criteria (AAQC). The AAQC for benzo(a)pyrene (B(a)P) is 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/m^3) as well as the total toxic equivalency concentration (TEQ) are reported. A detailed summary of the concentrations measured for each sample is presented in **Appendix H.**

The maximum measured toxic equivalent dioxin and furan concentration was below the applicable 24-hour Ontario AAQC of 0.1 pg TEQ/m^3 (as shown in **Table 4-5**).

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

Contaminant	Units	MOECC Criteria	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
2,3,7,8-Tetra CDD *	pg/m^3	-	-	6.24E-03 [A]	5.06E-03 [A]	-
1,2,3,7,8-Penta CDD	pg/m^3			1.36E-02	5.28E-03 [A]	
1,2,3,4,7,8-Hexa CDD	pg/m^3			1.62E-02	5.46E-03 [A]	
1,2,3,6,7,8-Hexa CDD	pg/m^3			2.89E-02	5.79E-03 [A]	
1,2,3,7,8,9-Hexa CDD	pg/m^3			5.03E-02	7.94E-03 [A]	
1,2,3,4,6,7,8-Hepta CDD	pg/m^3			3.50E-01	7.45E-02	
Octa CDD	pg/m^3			6.39E-01	1.09E-01 [A]	
Total Tetra CDD	pg/m^3			6.24E-03 [A]	5.28E-03 [A]	
Total Penta CDD	pg/m^3			4.25E-02	5.28E-03 [A]	
Total Hexa CDD	pg/m^3			2.25E-01	3.12E-02	
Total Hepta CDD	pg/m^3			6.27E-01	1.75E-01	

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

Contaminant	Units	MOECC Criteria	HHRA Health Based Criteria	Results		
				Maximum	Minimum	No. of Exceedances
2,3,7,8-Tetra CDF **	pg/m^3			2.05E-02	4.41E-03 [A]	
1,2,3,7,8-Penta CDF	pg/m^3			6.80E-03 [A]	4.33E-03 [A]	
2,3,4,7,8-Penta CDF	pg/m^3			6.80E-03 [A]	4.48E-03 [A]	
1,2,3,4,7,8-Hexa CDF	pg/m^3			6.09E-03 [A]	5.28E-03 [A]	
1,2,3,6,7,8-Hexa CDF	pg/m^3			5.95E-03 [A]	4.33E-03 [A]	
2,3,4,6,7,8-Hexa CDF	pg/m^3			6.66E-03 [A]	5.06E-03 [A]	
1,2,3,7,8,9-Hexa CDF	pg/m^3			7.37E-03 [A]	5.92E-03 [A]	
1,2,3,4,6,7,8-Hepta CDF	pg/m^3			3.12E-02	4.76E-03 [A]	
1,2,3,4,7,8,9-Hepta CDF	pg/m^3			9.07E-03 [A]	5.46E-03 [A]	
Octa CDF	pg/m^3			1.60E-02	5.46E-03 [A]	
Total Tetra CDF	pg/m^3			4.57E-02	4.41E-03 [A]	
Total Penta CDF	pg/m^3			9.54E-03 [A]	5.28E-03 [A]	
Total Hexa CDF	pg/m^3			1.82E-02	5.45E-03 [A]	
Total Hepta CDF	pg/m^3			3.12E-02	5.11E-03 [A]	
TOTAL TOXIC EQUIVALENCY [B]	pg TEQ/m^3	0.1	-	3.78E-02	2.04E-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 WHO_{2005} 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

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 January to March 2018.

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

1. Measured levels of NO_2, SO_2 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 98^{th} 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**, with the exception of the 24-hour benzo(a)pyrene (B(a)P) concentration in four (4) samples which exceeded the applicable Ontario Ambient Air Quality Criteria (AAQC) by a range of 18% to 108%. The current Ontario 24-hour B(a)P AAQC was introduced in 2011 and levels above this AAQC are commonly measured throughout Ontario. The measurements were however, well below the MOECC Schedule 6 Upper Risk Threshold, the MOECC O. Reg. 419/05 24-hour average guideline, and the HHRA health-based criterion.
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 criteria during the monitoring period between January and March 2018, with the exception of four (4) benzo(a)pyrene samples. All measured levels of the monitored contaminants were below their applicable HHRA health-based criteria.

6.0 REFERENCES

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

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

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

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

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

Ontario Ministry of the Environment and Climate Change (MOECC), (2018). Air Contaminants Benchmarks List: Standards, Guidelines and Screening Levels for Assessing Point of Impingement Concentrations of Air Contaminants (ACB List), April 27, 2018.

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

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

Stantec Consulting Limited, (2018). Quarterly Ambient Air Quality Monitoring Report for the Durham York Energy Centre – January to March 2018, May 10, 2018.

APPENDIX A

SO_2 Data Summaries and Time History Plots

SO_2 - Crago Road
January 2018
ppb

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>250	Days>100
1	0.4	0.4	0.4	0.4	0.5	0.3	0.3	0.4	0.5	1.0	1.1	0.8	0.6	0.5	0.5	0.5	0.5	0.5	1.0	1.5	1.7	1.3	0.8	0.8	24	1.7	0.3	0.7	0	0
2	0.9	0.8	0.7	0.7	0.6	0.6	0.9	0.8	0.6	0.7	0.9	0.9	1.1	1.0	0.8	0.9	1.0	0.9	0.8	1.0	1.2	1.1	0.9	0.9	24	1.2	0.6	0.9	0	0
3	0.9	0.8	0.9	0.8	0.8	1.2	1.0	1.2	1.1	1.4	1.1	1.1	1.4	1.5	1.5	1.6	1.5	1.6	1.5	1.4	1.2	1.1	1.2	1.1	24	1.6	0.8	1.2	0	0
4	1.2	1.3	1.4	1.5	1.4	1.1	1.0	0.8	0.8	0.8	0.8	0.7	0.6	0.8	0.8	0.8	0.8	0.7	0.7	0.6	0.7	0.6	0.5	0.5	24	1.5	0.5	0.9	0	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	0.6	0.2	1.2	0.8	0.8	1.0	0.8	0.7	0.8	1.2	24	1.2	0.2	0.6	0	0
6	1.8	1.4	0.8	0.6	0.6	0.6	0.6	0.8	1.0	1.1	1.1	1.0	0.8	0.6	0.6	0.5	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	24	1.8	0.4	0.7	0	0
7	0.5	0.5	0.5	0.5	0.5	0.7	0.8	1.2	1.9	1.3	0.8	1.2	1.0	0.7	0.8	0.8	1.0	1.1	1.2	1.5	1.9	2.0	1.9	2.6	24	2.6	0.5	1.1	0	0
8	2.8	3.0	1.5	1.4	1.3	1.3	1.1	1.0	1.0	0.9	1.0	1.2	1.2	1.3	1.1	0.9	0.8	0.8	0.9	0.8	0.9	0.7	0.9	0.8	24	3.0	0.7	1.2	0	0
9	0.8	0.7	1.0	0.8	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.5	0.5	24	1.0	0.5	0.6	0	0
10	0.5	0.6	0.6	0.7	0.6	0.5	0.7	0.7	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.7	1.9	1.7	0.9	0.7	0.6	0.7	24	1.9	0.5	0.8	0	0
11	0.8	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.1	0.9	1.3	1.1	1.1	1.3	1.5	0.9	0.8	0.8	0.8	0.9	0.8	0.9	24	1.5	0.6	0.9	0	0
12	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	1.0	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	1.0	0.6	0.8	0	0
13	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	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	24	0.6	0.5	0.6	0	0
14	0.5	0.5	0.5	0.5	0.4	0.3	0.4	0.4	0.4	0.7	1.4	2.4	2.3	1.1	0.4	1.0	0.8	0.5	0.5	0.6	0.8	0.7	0.8	0.7	24	2.4	0.3	0.8	0	0
15	0.6	0.6	0.6	0.6	0.5	0.5	1.2	0.8	0.5	0.5	0.5	0.5	1.6	2.7	1.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	24	2.7	0.5	0.8	0	0
16	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.9	1.4	2.4	2.4	2.5	2.6	2.0	1.4	1.2	1.4	1.1	0.8	0.9	0.8	24	2.6	0.6	1.2	0	0
17	0.8	0.9	0.9	1.5	1.8	1.7	1.3	1.1	1.3	1.3	1.1	1.4	0.9	1.0	0.8	0.8	1.1	1.3	2.1	1.6	1.2	1.2	1.3	1.3	24	2.1	0.8	1.2	0	0
18	1.1	1.0	1.2	1.3	1.3	1.4	1.4	1.3	1.4	1.3	1.3	1.3	1.3	1.4	1.2	1.1	1.1	1.1	1.2	1.1	1.3	1.2	1.5	1.4	24	1.5	1.0	1.3	0	0
19	1.3	1.3	1.3	1.4	1.5	1.6	1.6	1.6	1.6	1.6	2.2	2.5	2.5	2.4	2.1	1.6	1.4	1.5	1.8	3.0	2.2	2.1	1.6	1.6	24	3.0	1.3	1.8	0	0
20	1.4	1.3	1.7	2.1	1.8	1.6	1.5	1.6	1.6	1.8	1.7	1.9	2.0	1.9	1.8	1.9	1.4	1.1	1.1	1.1	1.1	1.2	1.6	1.6	24	2.1	1.1	1.6	0	0
21	1.5	1.9	1.9	1.5	1.2	1.3	1.5	1.1	1.1	1.4	2.4	4.4	3.0	2.8	3.0	2.3	2.0	1.5	1.3	1.2	1.0	1.1	1.1	1.0	24	4.4	1.0	1.8	0	0
22	0.9	0.9	0.9	1.3	0.9	0.8	2.0	1.7	2.1	1.7	3.6	3.3	2.5	2.2	0.9	0.9	0.9	4.9	7.8	12.0	8.9	16.0	29.4	10.7	24	29.4	0.8	4.9	0	0
23	24.8	15.2	17.3	20.2	2.6	1.4	1.3	1.1	1.3	1.2	1.1	1.4	1.5	1.2	1.2	1.1	1.4	1.2	1.0	1.1	1.7	1.8	1.1	1.1	24	24.8	1.0	4.3	0	0
24	0.9	1.0	1.0	1.0	1.2	0.8	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.6	24	1.2	0.5	0.7	0	0
25	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	1.1	1.2	1.1	1.4	1.2	0.8	0.6	0.6	0.8	0.7	0.7	0.5	0.5	0.6	24	1.4	0.5	0.7	0	0
26	0.6	0.5	0.6	0.7	0.6	0.7	0.8	0.6	0.6	0.6	0.9	0.5	0.9	1.1	1.0	1.0	0.8	0.7	1.3	4.4	2.1	1.1	0.9	0.9	24	4.4	0.5	1.0	0	0
27	1.1	1.0	0.9	0.9	1.1	1.1	1.1	1.1	0.9	0.9	0.9	0.9	1.0	1.2	1.1	1.0	0.7	0.8	0.9	0.9	0.8	0.8	0.8	0.8	24	1.2	0.7	0.9	0	0
28	0.9	0.7	0.7	1.0	1.0	0.6	0.6	0.7	0.8	0.8	0.8	0.9	0.9	1.7	1.0	0.7	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.7	24	1.7	0.5	0.8	0	0
29	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.4	0.5	0.6	0.6	0.6	24	0.7	0.4	0.6	0	0
30	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.6	0.9	24	0.9	0.5	0.6	0	0
31	0.8	0.7	0.6	0.6	0.7	0.6	0.8	0.9	0.8	0.8	C	C	1.0	0.9	1.0	1.1	1.1	1.1	1.4	1.5	1.3	1.1	1.2	1.4	22	1.5	0.6	1.0	0	0
Count	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	742					
Maximum	24.8	15.2	17.3	20.2	2.6	1.7	2.0	1.7	2.1	1.8	3.6	4.4	3.0	2.8	3.0	2.6	2.0	4.9	7.8	12.0	8.9	16.0	29.4	10.7	24					
Minimum	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.2	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	22					
Averaage	1.7	1.4	1.4	1.5	0.9	0.8	0.9	0.9	0.9	0.9	1.1	1.2	1.2	1.2	1.1	1.0	1.0	1.0	1.2	1.5	1.3	1.4	1.8	1.3						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.3	1.7	2.2	10.0	29.4

Maximum Hourly	29.4
Maximum Daily	4.9
Monthly Average	1.2

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

SO_2 - Crago Road
February 2018
ppb

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>250	Days>100
1	1.3	1.6	1.8	1.8	1.6	2.1	2.1	2.1	2.6	2.5	2.7	2.4	1.6	1.5	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	24	2.7	0.8	1.5	0	0
2	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.7	0.6	0.6	1.0	0.9	1.1	1.2	1.1	1.1	0.8	0.8	0.8	0.8	1.0	1.0	0.9	24	1.2	0.6	0.9	0	0
3	0.8	0.8	0.8	0.7	0.8	0.8	0.6	0.8	1.1	1.3	1.2	1.2	1.3	1.3	1.1	1.2	0.9	0.9	1.1	1.1	1.1	1.1	1.1	1.2	24	1.3	0.6	1.0	0	0
4	1.3	1.3	1.7	2.6	2.0	1.3	1.1	1.1	1.5	1.4	1.4	1.5	1.0	1.0	1.2	1.3	1.2	1.1	1.1	0.9	0.9	0.9	0.9	0.8	24	2.6	0.8	1.3	0	0
5	0.8	0.8	1.6	1.9	7.0	4.0	4.2	3.1	2.3	1.7	1.3	1.3	0.9	0.9	0.8	0.8	0.8	1.3	1.4	1.4	1.3	1.5	1.5	1.7	24	7.0	0.8	1.8	0	0
6	1.4	1.5	1.5	1.2	1.2	1.8	1.7	2.4	2.5	2.4	1.5	1.5	1.5	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.8	24	2.5	0.6	1.3	0	0
7	0.7	0.7	0.7	0.7	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.9	1.0	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	1.0	24	1.0	0.7	0.8	0	0
8	0.8	0.7	0.7	0.7	0.6	0.8	0.7	0.7	0.8	0.7	0.8	1.2	1.0	1.5	1.7	1.4	0.8	0.7	0.9	1.7	1.3	1.1	1.2	1.2	24	1.7	0.6	1.0	0	0
9	0.9	0.9	0.8	0.9	0.9	0.9	1.0	1.0	0.1	2.0	1.8	1.2	1.1	0.9	1.0	1.1	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.8	24	2.0	0.1	1.0	0	0
10	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	24	0.9	0.8	0.8	0	0
11	0.8	0.7	0.8	0.8	0.8	0.8	0.9	2.5	1.1	1.9	18.0	7.3	2.2	8.2	5.9	5.4	2.6	1.1	1.1	1.0	1.0	0.9	0.9	0.9	24	18.0	0.7	2.8	0	0
12	0.8	0.8	0.9	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.8	1.1	24	1.1	0.6	0.8	0	0
13	0.8	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.6	0.6	0.6	0.8	0.9	0.8	0.7	0.8	0.9	0.8	0.9	1.2	24	1.2	0.5	0.7	0	0
14	1.2	0.8	0.7	0.8	1.2	3.1	1.6	1.5	2.3	2.6	2.7	2.4	2.4	3.1	C	C	1.5	1.4	1.4	1.8	1.3	1.2	1.5	2.0	22	3.1	0.7	1.8	0	0
15	1.6	1.5	1.0	1.0	1.1	1.1	1.0	1.1	1.2	1.2	1.3	1.3	1.5	1.5	1.4	1.3	1.3	1.3	1.4	1.2	1.3	1.3	1.3	1.2	24	1.6	1.0	1.3	0	0
16	1.1	0.7	0.9	1.0	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.8	1.4	0.9	0.8	0.8	0.8	0.8	0.8	0.9	1.0	24	1.8	0.7	1.0	0	0
17	0.8	1.0	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.0	1.0	0.9	0.9	1.0	0.7	1.0	1.1	1.1	1.2	1.1	1.1	1.2	1.3	2.2	24	2.2	0.7	1.1	0	0
18	1.6	1.7	1.4	1.4	1.7	1.0	0.9	1.0	0.9	0.9	0.9	0.8	0.9	0.8	0.9	1.3	1.3	1.0	1.0	1.1	1.2	1.2	1.1	0.9	24	1.7	0.8	1.1	0	0
19	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	1.0	1.0	1.0	0.9	24	1.0	0.8	0.9	0	0
20	1.0	1.8	1.8	1.3	1.1	1.7	1.1	1.0	0.9	0.9	1.0	0.9	1.0	0.9	1.0	0.9	1.1	1.0	0.9	1.1	1.1	1.1	1.0	1.2	24	1.8	0.9	1.1	0	0
21	1.0	1.2	1.0	1.2	1.1	1.0	1.3	0.8	0.8	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	24	1.3	0.6	0.8	0	0
22	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	1.4	2.2	0.7	0.7	2.0	2.0	2.5	0.8	0.7	0.6	0.8	0.6	1.1	5.0	24	5.0	0.5	1.1	0	0
23	0.9	3.8	1.8	2.9	12.5	6.1	4.9	1.2	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.9	0.9	1.2	1.3	1.3	1.1	24	12.5	0.8	2.1	0	0
24	1.1	1.1	0.9	0.9	0.9	1.0	0.8	0.8	0.8	0.8	0.9	0.9	1.1	1.2	1.0	1.0	1.6	1.0	0.9	1.1	0.9	0.8	1.0	0.8	24	1.6	0.8	1.0	0	0
25	0.9	2.9	4.9	1.6	0.6	3.5	2.6	1.6	1.1	1.1	1.1	1.1	1.3	1.2	1.1	1.1	1.1	0.9	0.9	1.0	1.1	1.1	1.1	1.3	24	4.9	0.6	1.5	0	0
26	1.1	1.2	1.6	1.5	1.6	1.4	1.4	1.4	1.4	1.2	1.2	1.0	0.8	1.0	1.1	1.1	0.9	0.9	0.8	0.9	1.0	0.9	0.9	0.9	24	1.6	0.8	1.1	0	0
27	1.0	1.1	0.9	1.0	0.9	0.9	1.0	1.4	1.5	2.0	1.8	3.0	2.7	3.4	1.6	1.3	1.4	1.3	1.1	1.1	1.2	1.3	1.5	1.1	24	3.4	0.9	1.5	0	0
28	1.1	1.2	1.6	1.9	2.7	3.2	2.4	1.3	1.5	1.7	1.9	1.7	1.6	1.5	1.4	1.5	1.5	1.3	1.3	1.1	1.1	0.9	0.9	0.9	24	3.2	0.9	1.5	0	0
29																									0					
30																									0					
31																									0					
Count	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	28	28	28	28	28	28	28	28	670					
Maximum	1.6	3.8	4.9	2.9	12.5	6.1	4.9	3.1	2.6	2.6	18.0	7.3	2.7	8.2	5.9	5.4	2.6	1.4	1.4	1.8	1.3	1.5	1.5	5.0	24					
Minimum	0.6	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.1	0.6	0.6	0.8	0.6	0.6	0.6	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0					
Averaage	1.0	1.2	1.2	1.2	1.7	1.6	1.4	1.2	1.2	1.3	1.8	1.5	1.2	1.5	1.3	1.3	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.2						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.8	2.5	5.5	18.0

Maximum Hourly	18.0
Maximum Daily	2.8
Monthly Average	1.2

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

SO_2 - Crago Road
March 2018
ppb

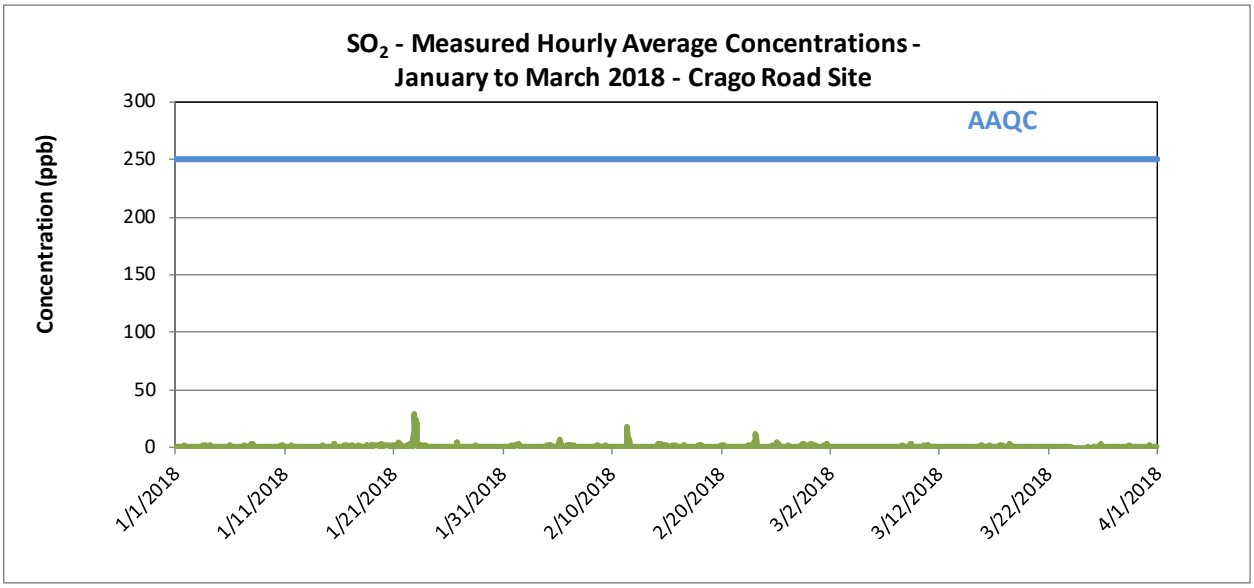
Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>250	Days>100
1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.5	0.9	0.9	0.9	0.9	0.9	0.9	3.6	2.1	1.1	1.1	1.0	0.9	0.9	0.9	24	3.6	0.9	1.1	0	0
2	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.9	24	0.9	0.8	0.9	0	0
3	0.9	0.9	0.8	0.8	0.7	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.6	0.7	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.7	24	0.9	0.6	0.8	0	0
4	0.7	0.9	0.8	0.7	0.7	0.8	1.0	0.9	0.7	0.7	0.8	0.6	0.6	0.8	0.8	0.8	0.9	0.9	0.7	0.6	0.7	0.7	0.8	0.9	24	1.0	0.6	0.8	0	0
5	0.8	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.7	0.7	0.9	0.9	0.9	0.8	1.1	1.0	0.9	0.7	24	1.1	0.7	0.8	0	0
6	0.8	0.6	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	24	0.9	0.6	0.9	0	0
7	0.9	0.9	1.0	1.0	0.9	0.9	0.9	1.0	1.2	1.2	1.3	1.3	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.1	1.1	1.2	24	1.3	0.9	1.0	0	0
8	1.0	1.0	0.9	1.0	1.1	1.0	1.0	1.1	1.1	0.9	0.9	0.9	1.0	1.6	1.6	1.5	1.4	1.3	1.1	1.1	1.0	1.0	0.9	0.9	24	1.6	0.9	1.1	0	0
9	1.1	1.0	0.9	0.9	0.9	0.9	0.9	1.5	1.2	2.7	1.6	1.3	1.4	1.2	1.1	1.1	1.1	1.1	0.9	0.9	0.9	0.9	0.9	0.9	24	2.7	0.9	1.1	0	0
10	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.9	1.0	1.1	1.2	1.0	1.5	0.9	0.9	0.8	0.9	1.8	1.6	1.3	1.5	24	1.8	0.8	1.0	0	0
11	1.2	1.2	1.1	0.9	0.9	0.9	0.9	0.8	0.8	1.1	1.2	1.0	1.1	1.1	0.9	1.1	1.0	0.9	1.0	1.2	1.2	1.1	0.9	0.9	24	1.2	0.8	1.0	0	0
12	0.9	1.0	1.1	1.1	1.1	1.2	1.3	1.2	1.1	1.0	1.0	0.9	0.9	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.9	24	1.3	0.8	1.0	0	0
13	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.9	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	24	1.1	0.8	0.9	0	0
14	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	1.0	1.0	0.9	0.9	1.0	1.1	1.2	1.1	1.1	0.9	0.9	0.9	0.9	1.0	0.9	24	1.2	0.9	1.0	0	0
15	0.6	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.0	1.3	1.3	1.1	1.1	1.1	1.1	1.0	1.0	1.1	1.8	1.2	1.4	1.4	1.2	1.1	24	1.8	0.6	1.1	0	0
16	1.1	1.1	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.9	1.1	1.3	1.3	1.6	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.9	24	1.6	0.8	1.0	0	0
17	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	1.0	1.0	1.7	1.4	1.4	1.9	1.9	1.5	1.3	1.3	1.2	1.0	0.9	0.9	24	1.9	0.8	1.1	0	0
18	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	1.0	3.8	2.0	1.8	2.1	1.8	1.4	1.3	1.3	1.1	1.1	1.1	1.0	0.9	1.0	24	3.8	0.8	1.3	0	0
19	1.0	0.9	0.9	0.9	1.0	1.1	1.1	1.0	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.9	0.9	1.0	0.9	0.9	24	1.1	0.8	0.9	0	0
20	0.9	0.8	0.8	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	C	C	1.1	0.9	1.0	0.9	0.9	1.0	1.0	0.9	0.9	0.9	22	1.1	0.8	0.9	0	0
21	0.6	0.8	0.9	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	24	0.9	0.6	0.8	0	0
22	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.8	0.9	0.9	0.9	1.1	1.3	1.3	1.3	24	1.3	0.8	0.9	0	0
23	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	24	0.9	0.1	0.6	0	0
24	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24	0.3	0.0	0.0	0	0
25	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	24	0.2	0.0	0.0	0	0
26	0.1	0.1	0.1	0.3	0.0	0.0	0.2	0.2	0.6	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.8	1.4	3.2	1.2	0.8	0.8	0.8	0.8	24	3.2	0.0	0.7	0	0
27	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	24	0.9	0.8	0.9	0	0
28	0.9	0.8	0.8	0.9	0.8	0.8	1.0	1.2	1.2	1.1	1.1	1.3	1.3	1.0	1.1	1.0	1.0	1.1	1.1	1.1	0.9	1.0	1.4	1.0	24	1.4	0.8	1.0	0	0
29	1.1	1.0	0.9	1.0	1.0	1.1	1.0	1.1	1.1	1.5	1.3	1.4	1.0	0.9	0.7	0.9	0.9	1.1	1.0	0.9	0.9	0.8	0.9	1.0	24	1.5	0.7	1.0	0	0
30	0.7	0.8	0.9	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.8	0.9	0.9	0.9	0.8	0.9	0.8	1.0	1.1	0.8	0.9	0.9	0.9	0.9	24	1.1	0.7	0.9	0	0
31	0.9	0.9	0.9	1.0	1.0	1.6	1.3	2.0	1.3	1.3	1.2	1.3	1.1	1.2	1.1	1.1	1.1	1.1	0.9	1.0	1.0	1.0	1.1	0.9	24	2.0	0.9	1.1	0	0
Count	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	742					
Maximum	1.2	1.2	1.1	1.1	1.1	1.6	1.3	2.0	1.3	2.7	3.8	2.0	1.8	2.1	1.8	1.9	3.6	2.1	3.2	1.3	1.8	1.6	1.4	1.5	24					
Minimum	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22					
Averaage	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0	0.9	1.0	1.0	0.9	0.9	1.0	0.9	1.0	0.9	0.9	0.9	0.9	0.9						

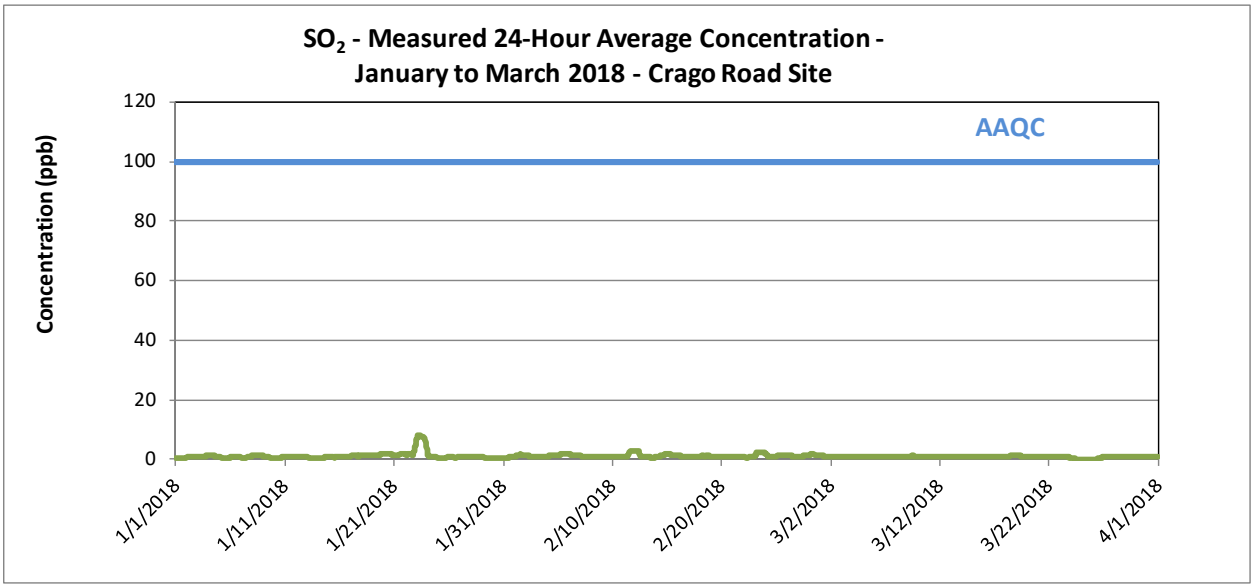
Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	0.7	0.8	0.9	0.9	0.9	0.9	1.0	1.1	1.2	1.4	2.0	3.8

Maximum Hourly	3.8
Maximum Daily	1.3
Monthly Average	0.9

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

Figure A-1 Time History Plots of Measured Hourly Average and 24-Hour Average SO_2 Concentrations– Crago Road Station





APPENDIX B

NO_2 Data Summaries and Time History Plots

NO_2 - Crago Road
January 2018
ppb

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>200	Days>100
1	1.7	2.0	3.0	3.9	4.7	6.9	4.1	6.9	8.7	7.2	8.2	13.1	9.3	5.2	4.5	2.0	1.8	2.3	1.9	2.4	2.3	1.9	4.6	7.6	24	13.1	1.7	4.9	0	0
2	3.7	2.7	3.5	8.8	7.3	14.9	27.1	29.2	14.0	7.8	8.4	7.0	8.3	9.0	9.0	8.4	9.6	10.4	11.0	12.4	22.1	29.1	17.7	8.8	24	29.2	2.7	12.1	0	0
3	12.3	23.3	20.5	19.5	18.8	11.4	7.6	3.7	3.9	4.8	3.2	4.7	4.4	5.2	6.3	6.1	6.1	6.2	6.3	12.9	16.4	22.8	23.8	27.3	24	27.3	3.2	11.6	0	0
4	33.9	31.2	30.4	25.4	34.1	25.4	18.5	6.9	4.9	3.2	3.5	2.6	2.7	2.6	2.7	2.8	2.8	2.6	2.3	2.1	2.0	1.9	1.7	1.9	24	34.1	1.7	10.3	0	0
5	1.9	1.6	1.6	2.2	3.0	3.3	3.2	2.8	2.4	1.9	1.7	1.8	0.0	0.0	0.0	0.0	1.3	3.6	4.6	4.5	4.6	4.3	3.2	2.7	24	4.6	0.0	2.4	0	0
6	3.1	2.3	2.3	2.0	2.9	5.0	5.3	3.7	3.2	2.1	1.6	1.4	1.2	1.3	1.2	1.6	3.1	4.0	6.1	13.4	10.1	6.3	7.2	8.0	24	13.4	1.2	4.1	0	0
7	5.9	15.4	19.7	8.5	8.8	14.2	23.5	29.4	21.5	2.3	2.3	2.6	1.9	1.5	1.6	1.9	3.2	3.5	3.5	4.4	4.3	5.2	4.6	5.9	24	29.4	1.5	8.2	0	0
8	6.3	7.5	4.1	4.0	3.2	2.9	2.5	2.6	2.6	2.7	3.6	4.6	5.0	5.2	8.1	11.8	12.2	11.9	10.9	9.2	12.6	7.3	7.2	6.7	24	12.6	2.5	6.4	0	0
9	6.9	7.8	7.6	9.2	7.5	4.6	4.7	8.2	10.5	10.1	10.0	6.5	5.0	3.9	3.7	5.0	5.6	6.1	7.2	15.2	13.3	7.3	7.0	8.9	24	15.2	3.7	7.6	0	0
10	11.4	5.5	3.0	1.6	2.2	1.4	1.4	2.6	4.0	2.5	3.5	2.2	4.3	3.9	4.6	4.1	6.2	5.6	9.8	15.7	12.7	14.8	11.3	21.2	24	21.2	1.4	6.5	0	0
11	19.0	13.5	11.0	13.7	8.6	15.2	20.3	14.3	22.5	24.2	22.5	19.2	25.9	22.9	26.7	16.6	C	C	18.6	3.7	6.6	7.9	16.6	18.5	22	26.7	3.7	16.7	0	0
12	12.3	4.2	1.9	2.4	3.9	12.6	20.0	18.5	24.1	7.0	2.6	1.9	1.4	1.5	1.8	1.3	1.0	1.1	0.8	0.8	0.5	0.6	0.4	0.3	24	24.1	0.3	5.1	0	0
13	0.3	0.2	0.3	0.1	0.1	0.1	0.2	0.5	0.4	0.7	0.4	0.5	0.4	0.5	0.5	0.6	0.9	1.7	1.7	1.2	1.1	1.0	2.9	4.3	24	4.3	0.1	0.9	0	0
14	3.9	5.5	5.2	4.7	5.3	2.2	2.0	4.0	4.1	4.5	6.0	6.7	7.6	4.6	0.7	3.7	4.9	5.2	5.1	8.0	2.3	1.9	1.9	1.1	24	8.0	0.7	4.2	0	0
15	0.6	1.9	0.9	4.0	6.0	5.1	7.3	8.5	5.4	3.4	3.4	2.5	6.2	7.0	5.7	7.0	6.1	6.6	7.1	7.5	7.9	8.0	8.1	8.0	24	8.5	0.6	5.6	0	0
16	7.6	7.4	9.0	10.4	6.5	9.0	9.1	9.3	12.6	9.7	10.0	10.3	12.5	11.1	12.8	20.8	27.0	34.2	35.5	37.0	32.8	23.7	25.5	20.5	24	37.0	6.5	16.9	0	0
17	5.2	4.7	5.1	13.2	21.0	19.7	23.4	30.3	29.4	24.8	19.2	17.9	12.7	12.0	8.6	6.6	7.6	8.1	7.8	6.4	7.1	5.6	6.1	6.1	24	30.3	4.7	12.9	0	0
18	6.5	6.6	8.1	8.8	9.0	8.9	9.0	10.2	12.6	13.9	11.7	11.9	10.4	8.8	8.2	10.7	12.1	11.4	9.7	9.6	6.9	7.4	9.0	8.5	24	13.9	6.5	9.6	0	0
19	8.3	8.0	9.1	8.9	9.1	10.6	11.2	13.7	13.3	10.9	9.7	8.4	8.9	6.7	6.2	5.5	6.7	7.2	7.8	8.8	7.5	8.6	7.9	6.8	24	13.7	5.5	8.7	0	0
20	5.8	4.7	5.2	5.7	5.0	4.6	4.6	5.4	5.2	5.5	5.7	6.4	6.5	6.3	5.5	6.3	6.5	8.8	9.9	8.9	8.7	7.1	8.4	10.6	24	10.6	4.6	6.5	0	0
21	21.6	32.2	35.4	34.2	31.1	28.1	21.8	18.4	17.5	15.3	15.8	10.6	6.8	7.6	7.9	10.1	10.0	7.4	9.1	6.8	6.8	14.1	11.2	12.9	24	35.4	6.8	16.4	0	0
22	9.5	7.4	7.2	11.7	6.5	7.5	12.2	25.2	19.4	15.9	22.5	14.7	18.7	14.6	4.3	5.6	5.1	17.5	22.0	20.9	23.6	23.1	27.8	24.1	24	27.8	4.3	15.3	0	0
23	30.3	20.4	21.6	27.0	6.0	5.1	5.0	3.1	8.0	5.9	5.7	5.9	4.3	4.1	4.3	4.4	4.8	4.5	5.8	2.9	2.6	2.5	2.2	1.4	24	30.3	1.4	7.8	0	0
24	1.3	1.1	0.9	1.0	1.0	1.7	1.4	1.6	1.6	1.5	1.1	1.2	0.8	1.0	1.2	1.6	2.1	2.7	3.5	4.0	2.2	2.6	2.6	3.1	24	4.0	0.8	1.8	0	0
25	3.1	3.8	2.8	2.4	2.6	3.4	4.2	4.0	4.6	10.5	10.0	4.7	2.1	2.3	2.0	2.2	3.6	8.6	14.4	14.2	15.8	16.4	16.4	18.9	24	18.9	2.0	7.2	0	0
26	15.5	16.6	14.4	16.1	15.3	11.3	3.1	3.1	2.3	1.5	2.2	2.0	3.5	4.7	3.9	3.5	6.6	4.1	6.2	16.3	12.2	9.3	8.2	14.4	24	16.6	1.5	8.2	0	0
27	14.5	9.2	14.5	10.4	8.1	5.0	2.0	3.0	2.2	1.9	2.8	2.1	2.2	3.3	2.9	2.7	2.3	2.6	3.0	3.6	2.9	3.4	10.6	9.9	24	14.5	1.9	5.2	0	0
28	7.4	7.0	10.3	23.0	23.2	9.6	5.5	5.2	6.5	4.8	3.1	4.1	5.2	7.1	4.1	2.4	2.8	2.3	2.3	2.1	2.4	1.9	2.1	2.7	24	23.2	1.9	6.1	0	0
29	4.9	5.1	7.4	2.8	1.3	3.0	3.9	3.6	4.1	3.5	1.9	1.9	2.3	1.7	1.6	3.0	3.4	3.1	3.4	3.3	3.5	3.2	2.4	1.9	24	7.4	1.3	3.2	0	0
30	2.4	1.7	1.1	1.3	1.0	1.0	2.2	2.0	2.1	1.5	1.3	1.7	1.0	1.0	1.2	2.2	2.4	2.7	5.3	6.6	6.4	15.7	24.4	36.1	24	36.1	1.0	5.2	0	0
31	32.8	29.8	22.2	15.0	18.8	13.4	16.0	9.2	3.2	2.6	C	C	3.1	2.3	2.6	2.5	4.3	4.1	4.1	5.3	5.5	3.7	4.0	3.5	22	32.8	2.3	9.5	0	0
Count	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	30	30	31	31	31	31	31	31	740					
Maximum	33.9	32.2	35.4	34.2	34.1	28.1	27.1	30.3	29.4	24.8	22.5	19.2	25.9	22.9	26.7	20.8	27.0	34.2	35.5	37.0	32.8	29.1	27.8	36.1	24					
Minimum	0.3	0.2	0.3	0.1	0.1	0.1	0.2	0.5	0.4	0.7	0.4	0.5	0.0	0.0	0.0	0.0	0.9	1.1	0.8	0.8	0.5	0.6	0.4	0.3	22					
Averaage	9.7	9.4	9.3	9.7	9.1	8.6	9.1	9.3	8.9	6.9	6.8	6.0	6.0	5.5	5.0	5.3	5.7	6.7	8.0	8.7	8.6	8.7	9.3	10.1						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	1.6	2.3	3.1	4.3	5.5	7.1	8.9	12.2	19.0	24.1	33.5	37.0

Maximum Hourly	37.0
Maximum Daily	16.9
Monthly Average	8.0

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

NO_2 - Crago Road
February 2018
ppb

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>200	Days>100
1	6.4	5.3	4.8	5.5	5.4	5.8	6.4	6.6	6.6	7.1	5.9	4.8	4.3	5.7	5.7	2.5	2.3	2.0	2.6	3.0	3.3	3.5	5.7	5.7	24	7.1	2.0	4.9	0	0
2	6.4	10.4	7.0	11.6	8.3	1.8	2.6	2.8	2.5	1.8	1.5	1.5	1.5	2.1	1.9	1.6	2.2	4.2	13.6	20.7	17.9	14.4	4.4	2.8	24	20.7	1.5	6.1	0	0
3	3.2	2.8	2.3	2.6	2.9	2.7	2.8	3.4	4.6	9.8	7.7	4.4	4.4	5.4	4.7	3.8	4.3	4.1	4.8	3.8	3.2	3.7	3.3	3.2	24	9.8	2.3	4.1	0	0
4	3.3	3.8	3.1	6.5	4.9	5.0	5.2	6.9	9.0	12.7	16.4	15.4	2.7	2.3	2.9	2.8	3.2	3.0	3.0	4.8	1.4	1.5	1.5	1.2	24	16.4	1.2	5.1	0	0
5	1.0	1.1	1.2	1.2	1.5	4.9	14.5	15.5	12.3	17.1	12.9	11.5	8.7	5.7	6.1	5.7	6.0	6.5	13.4	17.0	23.0	10.6	10.3	11.2	24	23.0	1.0	9.1	0	0
6	20.2	23.8	20.8	19.6	22.8	17.8	20.4	21.5	22.0	21.4	15.3	13.1	11.2	9.9	7.4	6.2	5.3	7.3	14.0	28.1	29.4	24.4	29.1	37.7	24	37.7	5.3	18.7	0	0
7	32.9	16.2	19.3	15.7	8.0	10.4	10.5	15.3	13.9	9.3	11.4	8.8	6.1	6.1	5.3	4.1	4.1	5.6	6.4	11.2	17.2	28.0	29.7	38.6	24	38.6	4.1	13.9	0	0
8	37.1	32.8	31.9	30.4	29.4	33.2	23.5	17.6	18.8	12.6	8.1	15.2	12.5	4.0	4.0	10.1	6.9	10.2	15.1	16.0	10.8	8.4	10.6	30.9	24	37.1	4.0	17.9	0	0
9	33.6	32.8	34.1	32.9	38.9	36.9	38.9	35.9	10.3	25.2	23.5	22.8	6.5	7.0	6.1	4.9	4.5	9.7	12.1	10.2	11.1	10.8	10.0	9.1	24	38.9	4.5	19.5	0	0
10	5.5	6.1	6.9	5.7	5.3	6.1	5.4	9.0	8.2	9.0	7.6	5.7	4.4	4.3	5.1	4.4	3.4	4.2	5.5	6.4	6.0	5.9	5.0	3.7	24	9.0	3.4	5.8	0	0
11	2.9	4.0	4.6	4.1	2.9	2.8	3.5	8.9	4.5	4.6	17.3	6.2	3.7	10.8	9.1	12.5	7.9	7.2	6.8	7.7	9.7	8.2	5.8	3.3	24	17.3	2.8	6.6	0	0
12	5.1	7.2	5.9	4.0	5.7	6.8	6.0	11.4	24.2	15.6	8.0	2.7	2.7	2.3	2.4	2.5	2.8	5.9	12.2	16.7	18.3	36.6	40.8	44.4	24	44.4	2.3	12.1	0	0
13	38.1	27.4	16.6	20.2	20.7	18.0	15.7	13.4	14.7	18.9	10.7	2.2	1.8	2.3	3.1	2.8	4.7	4.1	3.5	3.0	5.5	2.0	2.6	3.7	24	38.1	1.8	10.7	0	0
14	9.8	18.7	25.9	24.7	4.9	11.8	7.6	8.9	8.1	8.1	7.5	7.3	7.1	7.0	C	C	4.1	4.5	4.4	4.9	4.8	5.8	6.2	6.1	22	25.9	4.1	9.0	0	0
15	4.9	8.2	5.6	4.4	3.9	7.8	4.5	5.5	4.4	4.1	3.4	3.7	3.7	3.6	4.1	6.3	9.3	12.3	16.9	19.5	26.5	30.3	31.2	28.4	24	31.2	3.4	10.5	0	0
16	25.7	10.8	10.3	28.5	12.4	7.0	6.7	5.8	4.4	3.2	3.3	2.0	1.2	0.8	0.8	0.5	0.4	1.2	2.9	2.8	3.3	5.0	10.1	10.0	24	28.5	0.4	6.6	0	0
17	4.2	29.1	22.4	23.4	23.6	26.6	27.3	16.2	1.3	1.5	1.5	1.4	1.0	1.3	0.7	2.5	1.2	1.2	1.6	1.0	1.1	2.8	1.5	3.6	24	29.1	0.7	8.2	0	0
18	7.0	14.7	9.2	13.5	11.4	5.4	5.3	7.1	6.9	3.5	3.5	2.7	2.7	2.1	1.4	2.0	2.6	2.3	1.9	1.3	2.1	1.1	1.3	2.1	24	14.7	1.1	4.7	0	0
19	2.1	4.7	4.2	2.4	3.1	3.4	1.6	4.7	9.0	4.8	1.6	2.3	3.1	7.0	6.7	4.8	6.3	10.5	14.7	13.4	14.4	16.3	10.3	8.0	24	16.3	1.6	6.6	0	0
20	7.7	7.7	12.3	10.0	8.5	12.9	8.7	12.0	11.4	12.9	15.2	11.0	11.7	8.5	13.1	8.7	6.9	2.3	3.9	2.7	6.6	23.1	19.5	22.8	24	23.1	2.3	10.8	0	0
21	19.6	20.8	15.8	23.7	18.5	20.6	20.9	2.1	1.2	1.3	1.6	1.5	1.2	0.9	0.7	0.7	1.1	2.3	3.1	6.8	6.6	3.4	1.9	0.7	24	23.7	0.7	7.4	0	0
22	1.0	13.2	0.0	0.3	1.3	5.2	6.9	7.5	3.0	4.1	4.6	5.7	3.1	1.4	3.0	2.0	4.4	2.4	2.1	5.7	11.1	6.2	8.7	13.4	24	13.4	0.0	4.8	0	0
23	3.6	8.7	5.9	7.1	17.1	13.0	7.3	3.3	2.3	2.5	2.4	2.1	2.0	3.1	3.2	3.8	2.6	17.5	22.5	5.1	10.1	17.5	24.4	14.2	24	24.4	2.0	8.4	0	0
24	7.8	5.9	1.8	3.1	3.4	6.6	8.0	1.3	1.3	0.6	0.5	0.0	0.0	0.0	1.1	0.0	1.8	0.0	11.9	1.4	5.5	1.7	0.6	1.3	24	11.9	0.0	2.7	0	0
25	0.5	5.3	9.5	1.7	0.0	4.6	3.2	2.0	1.0	1.3	0.8	0.1	0.4	0.0	0.7	0.4	0.5	0.8	0.3	0.5	0.9	1.0	1.6	1.5	24	9.5	0.0	1.6	0	0
26	2.4	3.8	2.5	2.1	2.4	3.1	3.3	4.3	5.0	7.6	5.6	2.0	1.8	1.7	1.2	2.1	1.5	4.5	8.1	14.3	33.1	25.3	30.2	35.5	24	35.5	1.2	8.5	0	0
27	34.3	38.1	32.6	28.7	21.8	17.0	25.3	22.5	16.4	13.5	12.5	6.2	6.2	6.1	2.4	1.7	2.8	2.4	2.9	3.1	4.8	2.7	3.4	2.3	24	38.1	1.7	12.9	0	0
28	2.8	1.4	2.5	1.8	4.2	3.2	4.0	9.8	20.7	12.8	4.1	3.7	4.1	6.8	4.2	2.9	3.9	4.3	15.4	5.3	5.2	3.4	3.1	4.6	24	20.7	1.4	5.6	0	0
29																									0					
30																									0					
31																									0					
Count	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	28	28	28	28	28	28	28	28	670					
Maximum	38.1	38.1	34.1	32.9	38.9	36.9	38.9	35.9	24.2	25.2	23.5	22.8	12.5	10.8	13.1	12.5	9.3	17.5	22.5	28.1	33.1	36.6	40.8	44.4	24					
Minimum	0.5	1.1	0.0	0.3	0.0	1.8	1.6	1.3	1.0	0.6	0.5	0.0	0.0	0.0	0.7	0.0	0.4	0.0	0.3	0.5	0.9	1.0	0.6	0.7	0					
Averaage	11.8	13.0	11.4	12.0	10.5	10.7	10.6	10.0	8.9	8.8	7.7	5.9	4.3	4.2	4.0	3.8	3.8	5.1	8.1	8.4	10.5	10.8	11.2	12.5						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	1.4	2.4	3.2	4.3	5.5	6.9	9.8	13.6	21.8	28.9	37.8	44.4

Maximum Hourly	44.4
Maximum Daily	19.5
Monthly Average	8.7

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

NO_2 - Crago Road
March 2018
ppb

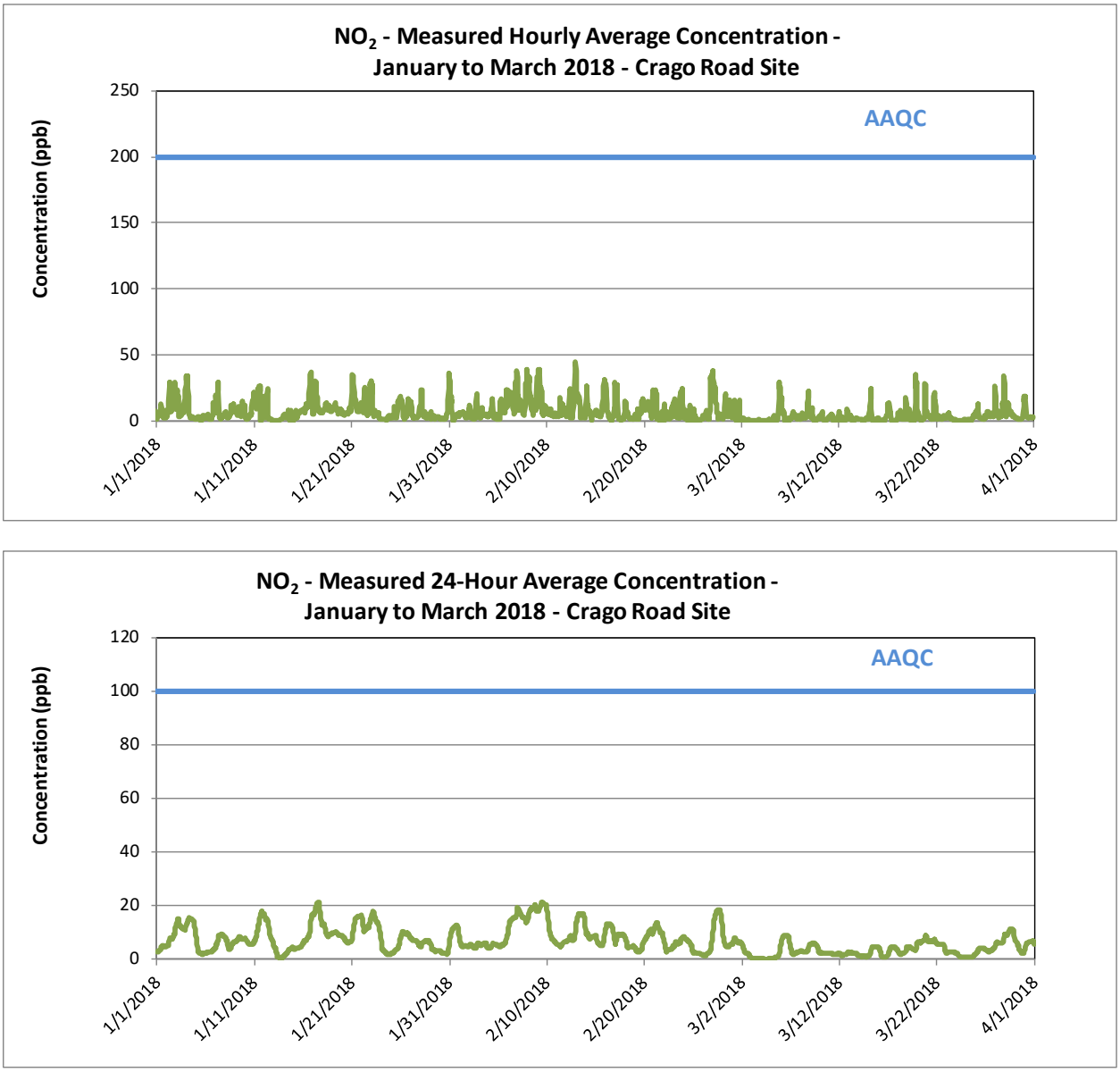
Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>200	Days>100
1	6.6	2.2	10.3	15.0	14.6	8.4	15.6	13.6	8.5	1.8	1.2	0.7	0.3	0.3	0.3	0.8	5.9	9.2	15.4	5.8	1.9	2.1	1.1	0.8	24	15.6	0.3	5.9	0	0
2	0.5	0.4	0.0	0.2	0.1	0.5	2.3	1.1	1.7	0.2	0.3	0.1	0.0	0.2	0.3	0.7	0.8	0.4	0.5	0.6	0.7	0.3	0.6	0.7	24	2.3	0.0	0.6	0	0
3	0.3	0.3	0.0	0.0	0.1	0.0	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.2	0.0	0.1	0.0	24	0.8	0.0	0.1	0	0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.5	1.3	0.6	0.1	0.3	24	1.5	0.0	0.2	0	0
5	0.0	0.0	0.0	0.0	0.0	1.8	2.6	3.9	0.6	0.4	0.6	2.3	0.0	0.0	0.9	0.8	0.9	2.4	3.6	3.3	16.4	28.9	24.0	25.8	24	28.9	0.0	5.0	0	0
6	16.0	17.1	15.2	17.5	9.2	7.4	5.3	7.7	6.4	1.4	0.1	0.8	1.5	0.0	0.0	0.8	1.0	0.1	0.1	0.4	1.9	0.4	1.5	1.1	24	17.5	0.0	4.7	0	0
7	0.9	1.8	1.4	2.6	3.8	4.0	6.6	5.1	3.4	3.7	5.4	3.6	1.9	1.9	2.2	3.2	2.2	2.1	1.1	3.9	2.2	3.6	1.9	2.1	24	6.6	0.9	2.9	0	0
8	1.2	1.7	2.4	3.2	2.4	1.9	6.5	4.7	2.3	2.2	2.3	4.0	4.0	2.4	2.2	3.1	3.9	5.3	8.3	13.7	17.6	22.8	6.9	4.1	24	22.8	1.2	5.4	0	0
9	5.7	3.6	2.0	2.8	5.6	9.9	8.0	4.7	1.9	1.3	0.6	0.2	0.4	0.6	0.1	0.6	0.5	1.0	1.2	1.0	1.5	1.7	1.9	2.8	24	9.9	0.1	2.5	0	0
10	4.4	3.2	3.5	4.6	3.5	5.4	6.7	6.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.4	2.3	3.1	3.3	24	6.7	0.0	2.1	0	0
11	3.0	3.8	4.2	4.6	4.6	5.0	4.0	3.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.2	1.7	1.9	1.5	3.5	4.3	24	5.0	0.0	2.0	0	0
12	7.3	2.3	0.7	0.8	1.5	2.4	2.2	3.4	1.5	0.7	2.6	0.0	0.0	0.0	0.0	0.4	1.3	1.3	4.2	4.5	9.0	6.6	3.2	4.4	24	9.0	0.0	2.5	0	0
13	1.8	1.3	0.9	1.4	3.7	4.0	3.7	2.6	1.3	0.4	0.3	0.2	0.0	0.0	0.8	0.3	0.8	1.4	2.1	2.0	1.7	1.1	1.0	1.5	24	4.0	0.0	1.4	0	0
14	1.2	1.4	1.0	0.9	0.9	1.3	1.5	1.1	1.1	1.0	0.5	0.2	0.2	0.4	0.2	0.4	0.6	0.9	1.0	2.0	2.3	1.7	1.4	1.7	24	2.3	0.2	1.0	0	0
15	3.9	4.1	7.9	7.6	8.4	10.9	16.4	24.7	9.4	0.8	0.6	0.4	0.4	0.2	0.4	0.9	0.9	0.6	1.0	1.6	1.1	1.5	2.0	2.5	24	24.7	0.2	4.5	0	0
16	2.0	1.1	0.5	0.1	0.6	0.2	0.5	0.5	0.3	0.2	0.0	0.0	0.2	0.8	0.2	0.0	0.4	0.9	1.3	3.0	4.3	4.1	4.4	5.7	24	5.7	0.0	1.3	0	0
17	12.7	11.5	9.6	12.8	13.3	8.3	6.5	7.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6	0.0	0.0	0.0	1.4	24	13.3	0.0	3.5	0	0
18	1.5	2.3	5.7	5.7	5.6	3.3	5.7	5.7	8.4	2.1	2.2	1.1	1.3	1.5	0.9	1.3	1.6	1.5	1.6	2.4	17.5	17.7	13.2	1.6	24	17.7	0.9	4.7	0	0
19	2.6	2.8	1.2	1.8	4.3	5.8	8.7	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	2.5	0.3	14.0	35.1	25.4	29.4	24	35.1	0.0	5.8	0	0
20	9.0	8.8	6.3	4.5	6.2	3.1	2.4	1.5	0.6	0.7	0.0	0.0	C	C	2.2	1.6	1.5	2.0	2.3	26.9	28.1	26.8	15.7	4.3	22	28.1	0.0	7.0	0	0
21	7.5	3.7	3.3	2.8	4.0	3.1	4.2	3.6	2.9	2.3	2.0	1.6	1.7	1.7	1.9	1.6	1.8	3.3	18.9	22.0	14.8	16.1	10.7	4.1	24	22.0	1.6	5.8	0	0
22	3.2	2.9	1.7	2.6	2.6	3.2	4.1	2.8	2.3	2.5	1.8	1.5	1.3	1.7	1.5	1.6	1.9	2.3	2.8	3.8	2.4	2.3	2.5	2.7	24	4.1	1.3	2.4	0	0
23	2.3	2.3	2.4	5.1	5.0	4.7	5.6	4.4	2.7	1.9	2.0	1.5	1.4	2.0	1.0	1.0	0.9	0.8	0.8	1.2	1.4	1.1	1.1	0.9	24	5.6	0.8	2.2	0	0
24	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.7	0.9	1.1	1.1	24	1.1	0.5	0.7	0	0
25	1.2	0.5	0.5	0.5	0.4	1.1	1.2	1.1	1.5	0.8	1.1	1.0	0.8	0.9	0.8	1.3	1.3	2.3	4.0	4.0	3.7	5.1	5.6	3.7	24	5.6	0.4	1.9	0	0
26	3.1	7.0	3.2	8.2	5.0	4.0	12.8	5.7	7.4	2.3	1.9	2.1	2.2	2.1	2.1	2.2	2.2	1.7	2.3	1.8	1.5	1.3	1.2	4.4	24	12.8	1.2	3.7	0	0
27	2.1	2.6	2.4	3.2	3.4	3.4	6.9	7.3	6.0	5.6	4.1	3.4	3.4	2.7	3.4	3.7	4.3	5.0	5.8	3.4	4.3	3.3	7.3	7.1	24	7.3	2.1	4.3	0	0
28	26.2	18.3	7.6	3.7	3.9	4.2	4.8	7.7	6.8	4.6	2.5	3.0	3.8	3.7	5.1	3.5	3.7	4.3	4.7	13.9	4.9	26.1	33.8	28.5	24	33.8	2.5	9.6	0	0
29	14.9	11.1	7.5	3.4	5.6	11.4	12.3	13.9	9.5	13.2	11.2	9.9	7.3	5.4	6.0	6.7	5.0	6.0	5.1	3.6	3.7	4.1	3.8	3.0	24	14.9	3.0	7.7	0	0
30	2.6	2.7	2.5	3.2	2.6	2.6	2.7	2.1	1.7	1.3	1.3	1.2	1.2	1.3	1.1	1.1	1.2	1.3	1.7	2.0	2.7	4.6	10.5	19.1	24	19.1	1.1	3.1	0	0
31	14.9	16.4	17.6	18.8	15.3	4.5	2.9	2.9	2.6	2.9	2.7	1.9	2.3	2.4	2.8	3.1	3.6	2.5	1.9	2.6	2.3	1.8	2.9	3.3	24	18.8	1.8	5.6	0	0
Count	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	742					
Maximum	26.2	18.3	17.6	18.8	15.3	11.4	16.4	24.7	9.5	13.2	11.2	9.9	7.3	5.4	6.0	6.7	5.9	9.2	18.9	26.9	28.1	35.1	33.8	29.4	24					
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	22					
Averaage	5.1	4.4	3.9	4.5	4.4	4.1	5.3	4.9	3.0	1.8	1.5	1.3	1.2	1.1	1.2	1.3	1.6	2.0	3.1	4.4	5.4	7.3	6.2	5.7						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	0.0	0.4	0.8	1.3	1.9	2.5	3.5	4.7	8.4	14.9	26.6	35.1

Maximum Hourly	35.1
Maximum Daily	9.6
Monthly Average	3.5

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

Figure B-1 **Time History Plots of Measured Hourly Average and 24-Hour Average NO_2 Concentrations – Crago Road Station**



APPENDIX C

NO_X Data Summaries and Time History Plots

NOx Crago Road
January 2018
ppb

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>200	Days>100
1	1.7	2.0	2.7	3.8	4.7	6.7	4.0	6.8	9.3	8.2	10.9	23.1	14.8	7.6	5.7	2.2	1.9	2.1	2.0	2.3	2.3	2.0	4.7	7.5	24	23.1	1.7	5.8	0	0
2	3.6	2.8	3.5	8.7	7.3	14.9	29.3	32.4	15.2	8.7	11.3	9.1	10.5	12.0	11.0	9.9	10.3	10.7	11.1	12.8	22.7	30.1	18.0	8.8	24	32.4	2.8	13.1	0	0
3	12.2	23.7	21.0	19.4	18.7	12.2	8.2	3.9	4.0	5.7	3.5	6.3	5.1	5.8	6.7	6.4	6.1	6.2	6.1	13.4	17.1	23.3	24.4	28.2	24	28.2	3.5	12.0	0	0
4	39.8	34.2	32.9	25.9	40.1	26.9	19.5	7.0	5.6	4.1	5.3	3.8	3.8	4.1	4.1	3.7	3.3	3.1	2.4	2.4	2.3	2.2	2.0	2.4	24	40.1	2.0	11.7	0	0
5	2.2	2.0	1.8	2.4	3.4	3.9	3.9	3.2	3.2	2.8	3.1	3.0	0.0	0.0	1.0	0.0	1.6	3.3	4.3	4.3	4.5	4.2	3.1	2.7	24	4.5	0.0	2.7	0	0
6	3.3	2.3	2.2	1.9	2.9	4.7	5.3	3.7	3.6	2.7	2.3	2.2	1.5	1.5	1.5	1.8	3.1	3.9	5.9	13.4	10.0	6.2	7.0	7.9	24	13.4	1.5	4.2	0	0
7	5.6	15.7	20.0	8.3	8.4	13.9	23.1	29.7	22.7	2.1	2.9	3.4	2.0	1.3	1.5	1.6	3.7	3.4	3.6	4.4	4.3	5.0	4.3	5.7	24	29.7	1.3	8.2	0	0
8	6.2	7.3	3.7	3.8	2.7	2.5	2.2	2.4	2.2	3.0	3.8	5.2	6.4	6.1	9.4	13.1	13.1	12.2	11.2	9.2	12.7	7.4	7.3	7.5	24	13.1	2.2	6.7	0	0
9	7.4	7.8	7.7	9.6	7.3	4.3	4.6	8.2	11.1	11.8	12.5	7.7	6.2	4.5	4.6	5.8	5.6	6.4	7.0	15.4	13.8	7.5	7.0	8.7	24	15.4	4.3	8.0	0	0
10	11.3	5.1	3.8	1.1	2.0	1.3	1.3	3.1	7.3	2.9	5.1	2.8	6.0	5.8	5.0	4.1	6.2	5.4	9.5	15.9	12.6	14.3	11.1	24.3	24	24.3	1.1	7.0	0	0
11	20.9	13.2	10.7	14.1	8.4	19.9	22.0	14.0	42.3	44.9	39.1	27.8	54.9	41.3	44.1	30.8	C	C	32.9	3.7	8.8	8.2	19.2	26.1	22	54.9	3.7	24.9	0	0
12	13.2	4.4	2.0	2.5	3.9	13.8	20.5	20.2	29.5	8.7	4.0	3.0	2.1	2.1	2.2	1.8	1.2	1.5	1.2	1.2	0.7	0.7	0.7	0.4	24	29.5	0.4	5.9	0	0
13	0.5	0.4	0.4	0.2	0.3	0.5	0.4	0.9	0.8	1.2	1.0	1.0	1.0	1.2	1.2	1.0	1.2	2.0	1.9	1.5	1.2	1.2	3.0	4.6	24	4.6	0.2	1.2	0	0
14	3.9	5.7	5.4	5.1	5.4	2.4	2.3	4.2	4.5	6.2	9.4	10.7	12.1	5.9	1.3	4.8	5.4	5.5	5.5	8.5	2.9	2.8	2.8	1.2	24	12.1	1.2	5.2	0	0
15	0.8	3.6	1.2	4.5	6.2	5.8	8.9	9.5	5.7	4.1	4.3	3.3	9.1	10.2	7.8	8.2	6.7	6.8	7.3	7.8	8.3	8.4	8.4	8.4	24	10.2	0.8	6.5	0	0
16	7.8	7.5	9.3	10.6	6.6	9.3	9.4	9.7	13.7	12.2	15.5	18.5	27.1	22.1	23.5	35.1	36.1	42.1	48.5	65.4	43.2	27.2	32.1	23.2	24	65.4	6.6	23.2	0	0
17	5.9	4.8	6.8	13.7	22.2	21.2	26.3	48.9	64.8	57.9	42.8	39.4	22.7	21.9	12.1	8.4	9.2	9.0	9.5	7.4	8.4	6.2	6.7	6.2	24	64.8	4.8	20.1	0	0
18	7.2	7.0	8.9	8.8	9.2	9.7	9.4	11.0	14.4	17.6	15.8	17.0	14.5	11.4	11.0	12.8	13.5	12.1	10.6	12.6	7.7	7.8	10.0	8.8	24	17.6	7.0	11.2	0	0
19	8.8	8.5	9.7	9.1	9.5	10.9	11.7	14.6	14.5	13.2	13.7	13.2	12.5	8.7	8.0	6.5	7.9	7.6	9.0	9.0	7.7	9.0	8.4	7.6	24	14.6	6.5	10.0	0	0
20	6.6	4.8	5.7	6.5	5.4	4.8	4.6	6.0	5.5	6.3	7.3	8.8	8.5	8.4	7.8	7.2	7.0	10.2	11.2	9.2	9.0	7.3	8.7	10.8	24	11.2	4.6	7.4	0	0
21	21.9	37.9	49.8	42.0	35.6	30.3	22.5	19.1	25.0	21.8	25.8	13.9	8.2	9.3	9.2	11.1	11.0	7.6	9.4	7.0	7.2	14.3	11.6	13.1	24	49.8	7.0	19.4	0	0
22	9.8	7.6	7.4	12.2	6.9	7.9	14.4	38.9	29.6	21.3	38.7	21.5	31.0	26.0	4.7	6.4	6.1	25.4	35.7	33.6	39.4	37.9	64.9	51.6	24	64.9	4.7	24.1	0	0
23	92.9	40.5	53.8	83.3	6.4	5.3	6.3	3.6	9.0	6.6	6.9	8.3	5.6	5.1	6.2	4.8	5.4	4.9	6.7	3.1	3.0	2.9	2.7	1.8	24	92.9	1.8	15.6	0	0
24	1.6	1.3	1.2	1.2	1.2	2.2	1.8	2.0	2.1	2.2	1.8	2.1	1.6	1.9	2.1	2.2	2.6	3.1	3.9	4.5	2.6	3.2	3.1	3.8	24	4.5	1.2	2.3	0	0
25	3.5	4.3	2.9	2.5	2.8	3.6	4.6	4.1	5.1	13.8	13.1	7.3	3.5	3.4	2.8	2.6	4.4	9.0	14.5	14.3	16.3	17.0	17.2	20.2	24	20.2	2.5	8.0	0	0
26	16.3	17.4	15.0	17.1	15.9	11.5	4.4	4.6	3.1	1.9	3.5	3.3	6.0	7.2	5.7	4.6	8.8	4.4	6.6	16.8	12.4	9.7	8.4	19.1	24	19.1	1.9	9.3	0	0
27	18.0	9.3	16.9	10.8	8.7	5.0	2.1	3.6	2.8	2.6	4.5	2.9	3.1	4.3	3.8	3.2	2.7	3.5	3.6	5.1	3.0	3.6	10.8	10.6	24	18.0	2.1	6.0	0	0
28	7.8	7.4	10.4	23.8	27.6	10.4	5.6	5.5	7.6	6.6	4.4	6.6	7.7	7.9	4.9	2.6	3.7	2.6	2.8	2.6	2.7	2.0	2.6	3.2	24	27.6	2.0	7.0	0	0
29	5.4	5.6	8.2	3.1	1.6	3.2	4.4	4.0	4.7	4.2	2.6	3.0	3.3	2.6	1.9	3.6	4.0	3.6	4.0	3.7	4.0	3.9	3.0	2.3	24	8.2	1.6	3.7	0	0
30	2.8	2.1	1.5	1.8	1.3	1.3	2.9	2.9	3.1	2.8	3.2	4.1	3.0	2.4	2.6	3.5	3.5	3.2	5.9	7.1	6.5	16.3	28.9	53.9	24	53.9	1.3	6.9	0	0
31	45.4	40.6	26.3	16.9	21.9	14.4	17.0	10.7	3.6	3.4	C	C	4.9	3.4	3.7	3.9	5.5	4.7	4.4	5.7	5.8	3.8	4.2	3.8	22	45.4	3.4	11.6	0	0
Count	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	30	30	31	31	31	31	31	31	740					
Maximum	92.9	40.6	53.8	83.3	40.1	30.3	29.3	48.9	64.8	57.9	42.8	39.4	54.9	41.3	44.1	35.1	36.1	42.1	48.5	65.4	43.2	37.9	64.9	53.9	24					
Minimum	0.5	0.4	0.4	0.2	0.3	0.5	0.4	0.9	0.8	1.2	1.0	1.0	0.0	0.0	1.0	0.0	1.2	1.5	1.2	1.2	0.7	0.7	0.7	0.4	22					
Averaage	12.7	10.9	11.4	12.1	9.8	9.2	9.8	10.9	12.1	10.0	10.6	9.4	9.6	8.2	7.0	6.9	6.7	7.5	9.6	10.4	9.8	9.5	11.2	12.4						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	2.0	2.9	3.7	4.7	6.2	7.8	9.5	13.7	23.1	34.2	53.9	92.9

Maximum Hourly	92.9
Maximum Daily	24.9
Monthly Average	10.0

Notes C - Calibration / Span Cycle; NA - No Data Available; T - Test; A- MOE Audit; M - Equipment Malfunction / Down; R - Rate of Change

NOx Crago Road
February 2018
ppb

Day	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	6.8	5.7	5.0	5.6	6.4	6.1	7.3	7.9	8.0	11.2	10.4	8.2	6.8	8.3	7.3	3.3	2.9	2.5	3.0	3.3	3.7	3.9	6.0	6.3	24	11.2	2.5	6.1	0	0
2	6.7	10.9	7.2	11.9	9.1	2.4	3.3	3.4	3.6	3.7	2.8	3.1	2.8	3.8	3.4	2.4	2.9	4.6	14.0	21.0	18.7	15.0	5.0	3.0	24	21.0	2.4	6.9	0	0
3	3.9	3.2	2.6	3.1	3.4	3.2	3.3	3.8	5.3	12.7	11.3	6.3	6.2	7.8	6.0	4.9	4.9	5.2	6.8	4.2	3.6	4.3	3.6	3.5	24	12.7	2.6	5.1	0	0
4	3.5	4.5	3.3	8.4	5.3	5.3	5.7	7.5	10.6	15.7	23.4	22.9	3.6	3.6	4.4	4.5	4.2	3.7	3.2	5.7	1.7	1.9	2.2	1.5	24	23.4	1.5	6.5	0	0
5	1.3	1.5	1.5	1.7	1.9	5.3	14.8	16.2	14.9	27.4	21.2	18.7	12.6	8.5	9.2	8.0	7.0	7.4	14.1	17.7	23.7	11.3	11.1	11.9	24	27.4	1.3	11.2	0	0
6	20.6	24.1	21.0	19.8	23.1	18.2	21.0	22.5	26.8	35.7	26.2	21.8	20.3	16.3	11.2	8.3	6.4	8.0	14.5	28.9	31.7	25.4	30.9	46.6	24	46.6	6.4	22.1	0	0
7	40.0	17.2	20.4	16.5	8.4	11.1	10.8	16.1	14.8	10.7	13.4	11.2	8.3	8.8	7.9	5.6	5.2	6.3	7.0	11.6	17.9	29.4	31.8	54.4	24	54.4	5.2	16.0	0	0
8	49.3	37.6	35.2	34.2	32.5	38.6	25.1	18.6	22.4	17.1	12.7	26.8	19.9	6.0	4.8	13.5	8.7	11.4	15.6	16.7	11.1	9.0	11.3	32.0	24	49.3	4.8	21.3	0	0
9	36.2	34.3	35.7	34.1	47.3	42.0	43.1	41.4	14.9	39.7	34.1	28.7	8.2	8.8	7.2	5.5	5.1	10.2	12.5	10.5	11.3	10.9	10.4	9.5	24	47.3	5.1	22.6	0	0
10	5.9	6.5	7.1	6.1	5.3	6.2	5.7	9.4	9.1	10.4	9.2	6.9	5.2	5.0	5.8	4.9	3.9	4.4	5.7	6.8	6.4	6.3	5.4	4.0	24	10.4	3.9	6.3	0	0
11	3.3	4.2	4.9	4.5	3.1	3.2	3.8	10.0	5.2	5.7	27.1	8.5	5.2	16.7	14.1	16.6	9.1	7.5	7.1	8.1	10.1	8.5	6.0	3.6	24	27.1	3.1	8.2	0	0
12	5.2	7.6	6.5	4.4	6.0	7.0	6.3	12.6	33.1	25.2	11.6	4.3	4.3	3.6	3.8	4.0	3.6	6.4	12.7	17.0	18.8	41.7	57.0	79.6	24	79.6	3.6	15.9	0	0
13	49.8	30.0	17.1	20.9	23.0	18.8	16.8	14.8	20.0	33.6	18.1	3.3	2.6	3.6	5.1	4.0	5.6	5.2	4.5	3.7	7.3	2.2	2.8	4.0	24	49.8	2.2	13.2	0	0
14	10.7	19.4	26.6	25.8	5.8	12.1	7.7	9.7	10.2	12.0	11.3	11.7	10.6	10.2	C	C	5.0	6.4	4.9	5.6	5.8	7.2	6.5	6.4	22	26.6	4.9	10.5	0	0
15	5.1	11.1	6.0	4.7	4.2	8.4	5.1	7.2	5.4	6.1	5.8	6.7	6.7	5.6	6.4	9.3	12.2	15.2	41.7	28.4	43.3	39.5	48.8	37.5	24	48.8	4.2	15.4	0	0
16	30.7	11.5	10.8	32.8	12.9	7.7	6.9	6.2	5.3	4.3	4.6	3.4	2.6	1.9	1.9	1.4	1.2	1.8	3.4	3.1	3.8	5.4	10.6	10.6	24	32.8	1.2	7.7	0	0
17	4.7	31.6	23.2	24.2	24.4	29.4	29.4	17.9	2.0	2.5	3.1	3.1	2.2	2.4	1.3	5.4	1.7	1.8	3.7	1.5	1.3	4.5	2.0	4.2	24	31.6	1.3	9.5	0	0
18	7.4	15.3	10.0	14.1	11.6	5.9	5.7	7.7	8.8	5.0	5.4	4.2	3.8	3.4	2.4	3.1	4.0	3.5	3.2	1.7	3.6	1.5	1.7	3.0	24	15.3	1.5	5.7	0	0
19	3.1	5.0	4.6	2.9	3.5	4.7	2.0	5.3	11.3	6.6	2.6	3.4	3.8	8.5	7.8	5.6	7.3	11.2	15.3	14.4	16.2	17.8	11.5	8.9	24	17.8	2.0	7.6	0	0
20	8.2	9.6	13.5	10.6	9.0	15.7	10.2	14.5	13.3	16.2	21.8	16.5	17.4	11.7	23.5	10.9	9.1	2.7	4.5	3.2	7.2	26.6	24.1	46.3	24	46.3	2.7	14.4	0	0
21	28.3	41.5	16.6	28.1	22.5	25.0	40.6	3.3	1.9	2.1	2.6	2.4	2.1	1.7	1.6	1.7	1.7	2.9	3.4	7.3	7.3	3.9	2.3	1.1	24	41.5	1.1	10.5	0	0
22	1.6	14.1	0.4	0.5	1.7	5.5	7.6	8.1	3.7	5.0	6.5	8.0	4.5	2.2	4.6	3.3	7.0	3.4	2.7	6.5	11.5	6.5	9.3	15.7	24	15.7	0.4	5.8	0	0
23	4.1	10.2	6.7	8.4	21.7	16.2	9.4	3.9	3.0	4.9	3.6	2.7	2.7	3.7	4.0	4.5	3.2	23.1	28.9	5.7	10.8	19.4	38.7	16.7	24	38.7	2.7	10.7	0	0
24	9.5	6.5	2.1	3.4	3.9	7.1	8.3	1.7	1.9	1.3	1.2	0.3	0.2	0.1	2.4	0.8	3.5	0.3	14.0	1.9	6.0	1.9	1.0	2.2	24	14.0	0.1	3.4	0	0
25	0.9	7.5	13.0	2.3	0.1	7.2	5.1	3.0	1.5	2.1	1.9	0.9	1.5	1.1	2.3	1.6	1.5	1.9	0.7	0.9	1.5	1.7	2.6	2.1	24	13.0	0.1	2.7	0	0
26	3.0	5.8	2.7	2.6	2.7	3.5	4.0	5.7	6.8	12.8	8.6	3.4	3.4	3.3	2.0	4.1	2.4	5.5	8.6	14.6	36.3	26.9	31.5	43.7	24	43.7	2.0	10.2	0	0
27	38.7	44.9	34.2	31.3	22.0	20.6	35.6	55.1	36.0	22.5	22.3	10.2	9.9	9.6	4.1	2.9	4.2	2.9	3.3	3.5	5.1	3.2	3.8	2.6	24	55.1	2.6	17.9	0	0
28	2.8	1.7	3.0	2.2	5.0	3.5	4.3	11.7	32.4	17.3	5.7	5.3	5.8	12.7	6.2	4.5	5.0	5.0	18.1	5.8	5.8	3.9	3.6	5.4	24	32.4	1.7	7.4	0	0
29																									0					
30																									0					
31																									0					
Count	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	27	28	28	28	28	28	28	28	28	670					
Maximum	49.8	44.9	35.7	34.2	47.3	42.0	43.1	55.1	36.0	39.7	34.1	28.7	20.3	16.7	23.5	16.6	12.2	23.1	41.7	28.9	43.3	41.7	57.0	79.6	24					
Minimum	0.9	1.5	0.4	0.5	0.1	2.4	2.0	1.7	1.5	1.3	1.2	0.3	0.2	0.1	1.3	0.8	1.2	0.3	0.7	0.9	1.3	1.5	1.0	1.1	0					
Averaage	14.0	15.1	12.2	13.0	11.6	12.1	12.5	12.3	11.9	13.2	11.7	9.0	6.5	6.4	6.0	5.4	4.9	6.1	9.9	9.3	11.8	12.1	13.6	16.7						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	2.2	3.3	4.0	5.2	6.4	8.4	11.3	16.6	26.8	35.4	47.7	79.6

Maximum Hourly	79.6
Maximum Daily	22.6
Monthly Average	10.7

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

NOx Crago Road
March 2018
ppb

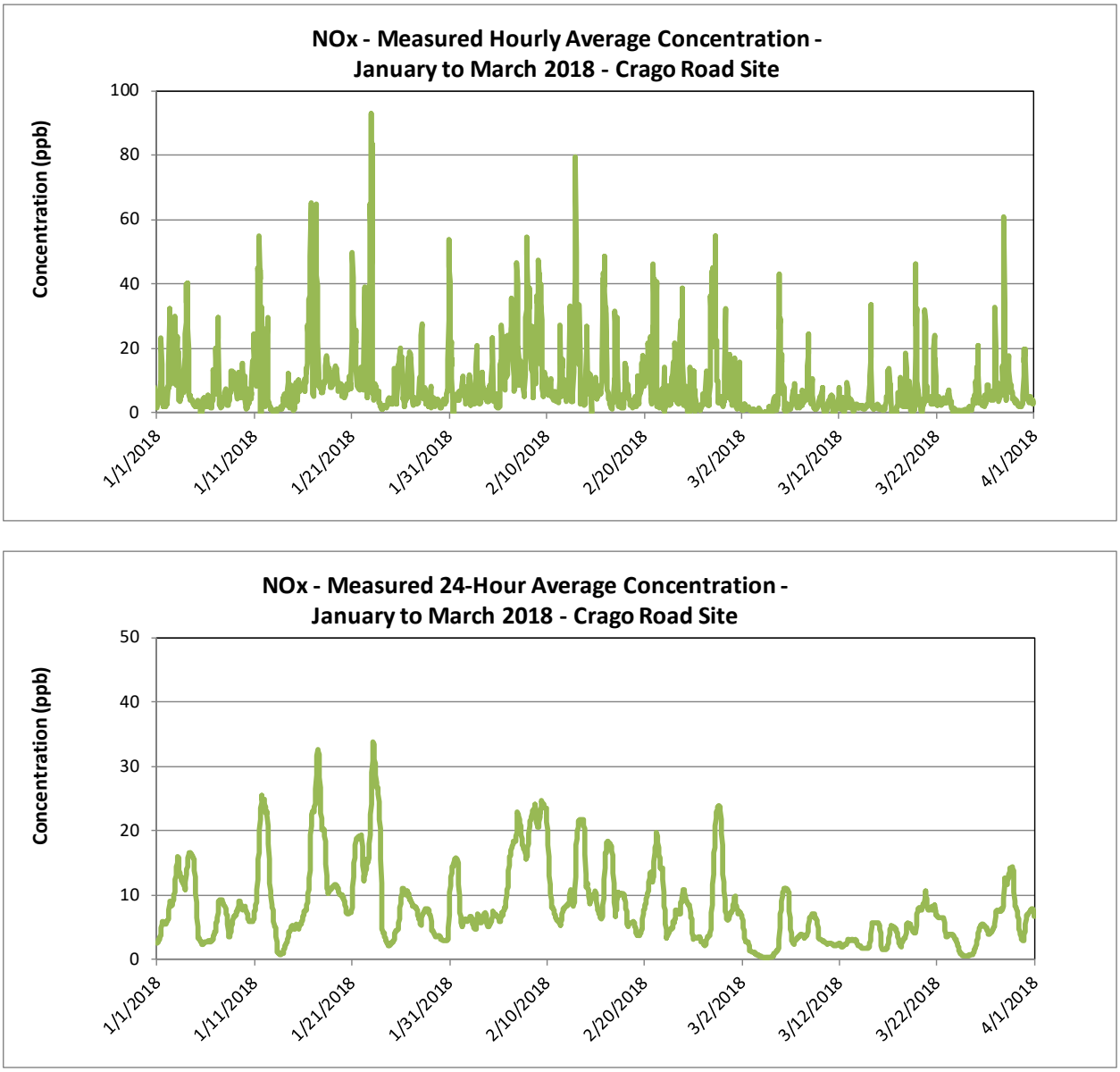
Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average	Hrs>400	Days>200
1	7.2	2.4	10.8	15.5	16.7	8.8	16.4	17.1	11.4	3.0	3.0	1.8	1.0	1.2	1.0	1.4	7.1	9.8	15.9	6.2	2.2	2.3	1.5	1.2	24	17.1	1.0	6.9	0	0
2	1.1	0.9	0.6	0.6	0.5	1.0	2.8	1.8	2.8	1.2	1.4	1.1	0.9	1.2	1.2	1.4	1.9	1.0	1.1	1.1	1.2	0.5	1.0	1.2	24	2.8	0.5	1.2	0	0
3	0.6	0.7	0.1	0.4	0.5	0.6	1.0	0.6	0.0	0.5	0.1	0.6	0.0	0.2	0.0	0.0	0.0	0.1	0.8	1.3	0.6	0.2	0.8	0.3	24	1.3	0.0	0.4	0	0
4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.3	0.0	0.0	0.4	0.4	0.1	1.0	2.0	1.9	1.1	0.6	0.7	24	2.0	0.0	0.4	0	0
5	0.5	0.0	0.1	0.3	0.4	2.3	2.8	4.7	1.3	1.2	1.8	4.8	0.6	0.6	1.9	1.5	2.1	4.0	5.3	3.7	30.6	43.2	26.1	29.1	24	43.2	0.0	7.0	0	0
6	16.9	17.6	15.7	18.1	9.5	7.9	5.8	8.6	7.7	2.4	0.8	1.8	3.0	0.3	0.5	1.4	1.6	0.7	0.5	0.7	2.5	1.0	1.7	1.5	24	18.1	0.3	5.3	0	0
7	1.2	2.4	1.6	3.0	4.2	4.6	7.1	5.6	4.1	5.8	9.1	5.7	2.6	2.5	2.7	3.9	2.7	3.0	1.5	4.8	2.6	4.6	2.7	3.2	24	9.1	1.2	3.8	0	0
8	1.5	2.1	3.1	4.0	3.0	2.2	6.9	5.5	3.2	3.8	3.7	6.5	6.2	3.8	3.7	4.8	5.3	6.0	9.4	14.3	18.4	24.6	7.3	4.3	24	24.6	1.5	6.4	0	0
9	6.1	4.2	2.6	3.1	5.9	10.4	8.5	5.4	2.8	2.2	1.5	1.2	1.1	1.5	1.1	1.4	1.0	1.6	1.6	1.3	1.8	2.0	2.3	3.3	24	10.4	1.0	3.1	0	0
10	4.9	3.6	3.8	5.1	3.8	5.9	7.2	7.6	2.4	0.8	0.4	0.1	0.2	0.4	0.0	0.2	0.1	0.4	0.1	1.3	1.9	2.8	3.6	3.7	24	7.6	0.0	2.5	0	0
11	3.3	4.0	4.6	5.1	4.8	5.4	4.5	5.1	1.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.0	1.8	2.2	2.4	1.9	4.0	4.7	24	5.4	0.0	2.4	0	0
12	7.8	2.8	1.1	1.3	1.9	3.1	2.9	4.2	2.2	1.5	4.8	0.8	0.4	0.0	0.4	1.5	2.1	1.8	4.8	5.0	9.4	7.2	3.7	4.9	24	9.4	0.0	3.1	0	0
13	2.2	1.8	1.6	1.7	4.2	4.4	4.3	3.3	2.5	1.3	1.2	1.2	0.4	0.5	1.6	1.3	1.3	2.0	2.6	2.4	2.1	1.7	1.6	2.2	24	4.4	0.4	2.1	0	0
14	1.4	1.9	1.6	1.4	1.4	2.3	2.2	2.1	1.9	2.2	1.6	1.2	1.0	1.2	1.1	1.2	1.5	1.5	1.6	2.4	2.7	2.2	1.8	2.1	24	2.7	1.0	1.7	0	0
15	4.4	4.5	8.4	7.9	8.7	11.5	17.4	33.6	13.7	1.9	1.9	1.4	1.4	1.1	1.4	1.5	1.9	1.4	1.5	2.1	1.7	2.2	2.4	2.8	24	33.6	1.1	5.7	0	0
16	2.3	1.7	1.1	1.0	1.2	0.9	1.4	1.3	1.1	1.4	0.8	0.9	1.2	1.8	1.0	0.8	1.2	1.6	1.8	3.4	4.8	4.9	5.2	6.4	24	6.4	0.8	2.0	0	0
17	13.1	12.0	10.0	13.2	13.7	8.6	6.9	9.1	1.0	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.9	1.2	0.1	0.1	0.0	1.8	24	13.7	0.0	3.9	0	0
18	2.0	2.7	6.0	6.2	6.2	3.9	6.3	6.9	10.9	3.3	4.0	2.3	2.8	2.7	1.9	2.4	2.6	2.2	2.0	2.9	18.1	18.4	13.7	2.2	24	18.4	1.9	5.5	0	0
19	3.0	3.2	1.7	2.0	4.9	6.3	9.6	4.8	0.7	0.8	0.8	1.2	0.2	0.6	0.1	0.3	1.0	1.9	3.3	0.7	17.7	46.3	27.3	32.5	24	46.3	0.1	7.1	0	0
20	9.7	9.7	6.9	5.0	6.8	3.6	3.0	2.3	1.6	1.8	0.8	1.5	C	C	4.1	3.0	2.4	3.0	2.9	29.8	32.1	28.5	16.6	5.3	22	32.1	0.8	8.2	0	0
21	8.3	4.5	4.1	3.7	4.7	3.7	4.9	4.7	4.1	3.5	3.4	2.8	2.8	2.9	2.9	2.6	2.9	4.3	19.9	24.0	15.5	16.9	11.5	4.9	24	24.0	2.6	6.8	0	0
22	3.7	3.6	2.3	3.4	3.5	4.3	5.1	4.2	3.8	4.2	3.3	2.6	2.3	2.9	2.6	2.8	3.1	3.2	3.8	4.7	3.3	3.2	3.4	3.7	24	5.1	2.3	3.5	0	0
23	3.1	3.2	3.2	5.8	6.0	5.9	7.1	6.3	4.3	3.4	3.5	2.4	2.6	3.4	1.4	0.9	0.8	0.4	0.5	1.0	1.3	0.9	0.9	0.8	24	7.1	0.4	2.9	0	0
24	0.6	0.4	0.7	0.4	0.4	0.5	0.5	0.3	0.5	0.5	0.5	0.8	0.7	0.5	0.3	0.4	0.5	0.4	0.5	0.4	0.4	0.7	0.9	0.9	24	0.9	0.3	0.5	0	0
25	1.2	0.5	0.5	0.3	0.2	1.0	1.1	1.1	1.7	0.9	1.3	1.1	0.9	1.0	0.6	1.3	1.4	2.2	3.9	4.1	3.9	5.0	5.4	3.6	24	5.4	0.2	1.8	0	0
26	3.2	9.6	3.0	14.0	5.8	3.9	20.8	7.3	11.4	3.5	3.0	3.5	3.4	3.0	3.0	3.2	2.9	2.4	3.1	2.4	2.1	1.8	2.0	5.4	24	20.8	1.8	5.2	0	0
27	2.7	3.2	3.2	4.1	4.5	4.0	8.5	8.7	7.7	7.4	5.2	4.5	4.5	3.7	4.5	5.0	5.2	5.9	6.6	4.3	5.3	3.8	8.2	8.4	24	8.7	2.7	5.4	0	0
28	32.7	19.9	8.5	4.5	4.6	4.8	5.6	9.2	8.7	6.1	3.6	4.5	5.8	6.0	8.5	5.4	5.7	5.5	5.6	14.5	5.5	33.8	60.8	34.0	24	60.8	3.6	12.7	0	0
29	15.8	12.0	8.1	3.9	6.1	12.3	13.1	15.7	11.4	17.5	14.6	13.1	9.5	7.3	7.6	8.5	6.2	7.0	6.0	4.4	4.5	4.8	4.7	3.9	24	17.5	3.9	9.1	0	0
30	3.5	3.3	3.1	4.1	3.2	3.3	3.7	2.9	2.7	2.3	2.1	1.8	2.0	2.2	1.8	1.8	1.9	1.8	2.5	2.7	3.4	5.4	11.3	19.8	24	19.8	1.8	3.9	0	0
31	15.6	17.0	18.4	19.6	16.0	5.2	4.4	4.6	4.4	5.2	4.6	3.0	3.5	3.5	3.7	4.1	5.0	3.6	3.1	4.2	3.4	2.5	3.7	3.9	24	19.6	2.5	6.8	0	0
Count	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	742					
Maximum	32.7	19.9	18.4	19.6	16.7	12.3	20.8	33.6	13.7	17.5	14.6	13.1	9.5	7.3	8.5	8.5	7.1	9.8	19.9	29.8	32.1	46.3	60.8	34.0	24					
Minimum	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	0.1	0.1	0.0	0.3	22					
Averaage	5.8	5.0	4.4	5.1	4.9	4.6	6.2	6.3	4.3	2.9	2.7	2.4	2.0	1.9	2.0	2.1	2.3	2.6	3.7	5.0	6.6	8.9	7.6	6.5						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	0.4	0.9	1.4	1.9	2.7	3.4	4.4	5.8	9.6	16.4	32.3	60.8

Maximum Hourly	60.8
Maximum Daily	12.7
Monthly Average	4.4

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

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



APPENDIX D

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

$PM_{2.5}$ - Crago Road, January 2018 (µg/m³)

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	2.4	2.4	4.5	4.3	2.9	2.2	1.5	2.1	1.3	3.4	3.8	3.4	2.6	2.6	3.7	1.2	1.7	2.1	2.0	1.9	1.9	2.1	3.4	3.8	24	4.5	1.2	2.6
2	4.4	4.4	4.3	4.7	5.5	6.6	6.9	5.3	4.2	4.5	7.9	9.4	10.4	10.3	9.6	8.7	8.2	9.0	12.0	13.4	16.2	16.1	13.3	8.1	24	16.2	4.2	8.5
3	9.9	15.2	11.8	10.3	9.2	5.6	4.2	3.1	5.3	7.5	7.5	8.5	9.3	10.2	10.6	10.0	9.3	9.1	10.1	17.1	21.2	19.5	20.3	22.1	24	22.1	3.1	11.1
4	24.1	23.7	23.7	24.0	25.3	23.1	13.9	2.9	2.1	1.9	2.2	2.0	2.5	3.3	3.4	3.5	3.0	2.3	2.2	2.1	1.8	1.5	1.5	1.6	24	25.3	1.5	8.2
5	1.4	1.5	1.5	1.4	1.4	1.1	1.1	1.2	1.6	2.0	2.2	3.5	4.0	2.6	1.8	1.4	1.4	2.2	3.3	3.5	3.0	3.1	2.8	3.6	24	4.0	1.1	2.2
6	4.9	3.9	4.3	5.0	4.8	5.1	5.3	6.0	6.4	5.0	4.3	4.1	3.7	3.3	2.7	2.2	3.8	4.1	5.3	9.0	6.0	5.9	5.6	5.2	24	9.0	2.2	4.8
7	3.0	5.8	4.8	3.1	4.4	6.1	5.9	4.3	3.6	1.8	2.7	3.3	3.8	4.0	3.3	3.8	5.3	5.9	7.0	8.6	9.0	10.8	11.1	12.5	24	12.5	1.8	5.6
8	11.5	11.9	12.3	9.9	8.3	7.5	6.9	5.0	3.6	2.3	2.2	2.6	2.6	3.1	6.2	12.9	12.3	13.6	14.6	17.1	19.7	16.6	12.6	12.6	24	19.7	2.2	9.5
9	12.9	10.9	8.6	8.5	8.6	3.0	2.2	2.3	2.4	2.4	2.6	2.5	2.6	2.8	3.1	3.4	3.9	4.4	4.9	5.7	5.6	4.7	4.1	4.9	24	12.9	2.2	4.9
10	5.4	4.4	3.6	4.8	5.4	5.0	8.7	9.1	6.6	8.8	9.0	9.1	9.5	9.3	9.3	9.2	8.9	8.2	12.9	12.3	10.3	11.0	9.7	10.3	24	12.9	3.6	8.4
11	8.8	7.6	7.4	8.2	8.3	8.7	9.3	8.2	8.3	6.9	6.6	6.1	7.3	5.2	5.5	7.0	7.6	5.4	4.1	1.5	3.0	3.2	2.8	3.0	24	9.3	1.5	6.3
12	2.6	3.3	2.8	2.7	3.1	3.3	3.3	3.5	11.4	1.6	1.3	1.2	1.5	1.4	1.6	2.3	2.4	2.1	1.9	1.5	1.4	1.2	1.1	1.2	24	11.4	1.1	2.5
13	0.9	0.9	0.9	0.8	0.9	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.4	1.8	1.7	1.6	1.5	1.5	1.4	1.4	1.7	1.8	24	1.8	0.8	1.4
14	1.9	1.9	1.8	2.2	2.4	2.4	2.6	2.2	2.0	2.2	3.2	3.5	4.1	2.4	1.6	2.4	2.2	3.3	2.0	2.1	1.4	1.4	1.5	1.7	24	4.1	1.4	2.3
15	1.6	1.6	1.7	2.6	2.6	2.6	5.2	3.6	2.6	2.1	2.7	2.8	5.1	5.2	4.1	4.4	4.5	5.0	5.5	5.4	6.5	6.6	6.5	6.0	24	6.6	1.6	4.0
16	5.6	6.2	6.3	6.5	6.0	6.3	6.6	6.7	7.8	8.6	9.3	8.9	9.6	10.5	12.3	14.4	16.0	17.8	17.0	17.3	18.4	16.0	13.4	11.2	24	18.4	5.6	10.8
17	7.2	6.7	6.7	7.8	9.1	9.5	11.8	14.9	17.9	19.9	17.2	14.5	6.6	4.9	2.8	3.0	3.0	4.1	3.6	3.8	4.9	4.7	6.4	7.0	24	19.9	2.8	8.2
18	7.0	7.2	7.2	6.8	6.8	6.6	6.6	6.7	7.8	8.8	9.1	9.3	8.8	8.1	8.2	9.4	9.5	9.9	9.9	7.7	7.0	7.6	8.3	8.5	24	9.9	6.6	8.0
19	8.1	8.1	8.6	8.6	9.0	9.3	9.2	9.4	8.8	8.3	8.0	7.1	7.0	6.3	5.6	5.4	6.4	7.1	7.7	8.4	8.1	8.3	7.3	6.4	24	9.4	5.4	7.8
20	6.0	6.1	6.6	7.1	7.5	8.1	8.2	8.2	8.0	7.6	7.7	7.6	8.0	8.0	7.6	7.8	7.7	8.7	9.1	9.3	9.4	8.9	9.5	10.7	24	10.7	6.0	8.1
21	12.6	13.9	14.5	15.7	15.8	15.1	14.4	14.1	15.0	16.1	15.2	13.6	12.1	11.7	11.4	11.5	11.9	12.4	11.7	11.6	11.7	13.7	13.1	12.1	24	16.1	11.4	13.4
22	10.2	9.3	9.6	11.7	10.8	11.3	14.6	16.9	14.7	12.5	15.0	14.3	12.9	10.9	5.1	4.0	3.1	10.2	12.9	11.6	14.0	11.9	23.5	11.4	24	23.5	3.1	11.8
23	19.3	8.6	9.9	13.3	8.3	8.0	4.7	2.4	2.2	2.0	1.9	1.7	1.9	2.3	2.3	2.5	1.9	1.7	1.8	0.9	1.0	1.0	0.8	0.8	24	19.3	0.8	4.2
24	0.9	1.1	1.0	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.1	1.1	1.2	1.7	1.9	T	4.5	4.0	4.0	3.4	3.7	4.2	4.4	23	4.5	0.8	2.0
25	3.8	3.0	2.7	2.6	2.2	2.3	2.8	3.1	3.7	5.3	7.0	8.0	7.2	10.1	6.8	3.8	2.7	2.8	4.8	4.7	5.1	4.4	4.7	5.6	24	10.1	2.2	4.5
26	5.0	4.1	4.7	6.0	6.8	9.7	4.3	2.6	2.5	2.0	3.0	3.0	4.7	6.1	5.8	6.0	8.7	11.7	11.9	12.9	9.5	7.5	7.5	8.3	24	12.9	2.0	6.4
27	6.8	5.2	5.4	4.5	4.6	3.9	2.5	3.3	4.6	5.2	5.8	6.3	7.1	8.6	8.8	10.2	9.5	8.6	7.0	9.2	15.7	20.0	18.5	12.7	24	20.0	2.5	8.1
28	16.3	13.0	14.0	14.5	13.2	10.5	9.5	9.3	8.9	8.5	8.4	8.1	8.6	9.1	6.0	4.1	3.0	2.4	1.7	1.4	1.3	1.7	1.1	1.3	24	16.3	1.1	7.3
29	1.7	1.6	1.7	1.4	1.3	1.4	1.4	1.3	1.6	3.2	4.2	4.5	4.6	4.2	3.5	4.8	4.4	4.0	4.1	4.6	4.5	4.6	4.5	3.5	24	4.8	1.3	3.2
30	2.7	2.1	1.9	1.8	1.6	1.5	1.7	1.4	1.3	1.6	1.9	2.0	2.0	2.1	1.9	2.2	1.7	2.1	1.9	1.9	1.8	2.2	3.5	4.7	24	4.7	1.3	2.1
31	6.4	8.8	5.7	4.1	3.7	2.2	2.8	2.8	1.9	2.3	C	C	2.4	2.5	2.5	2.5	2.5	2.6	2.7	3.6	3.8	4.3	5.0	5.5	22	8.8	1.9	3.7
Count	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	30	31	31	31	31	31	31	31	741			
Maximum	24.1	23.7	23.7	24.0	25.3	23.1	14.6	16.9	17.9	19.9	17.2	14.5	12.9	11.7	12.3	14.4	16.0	17.8	17.0	17.3	21.2	20.0	23.5	22.1	24			
Minimum	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.1	1.1	1.2	1.4	1.2	1.4	1.6	1.5	0.9	1.0	1.0	0.8	0.8	22			
Averaage	6.9	6.6	6.5	6.6	6.5	6.1	5.8	5.3	5.5	5.4	5.8	5.8	5.6	5.6	5.2	5.4	5.6	6.1	6.5	6.9	7.4	7.3	7.4	6.8				

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	1.5	2.1	2.8	3.8	4.9	6.5	8.1	9.3	12.6	15.1	21.7	25.3

Maximum Hourly	25.3
Maximum Daily	13.4
Monthly Average	6.2

Notes C - Calibration / Span Cycle; NA - No Data Available; T - Test; A- MOE Audit; M - Equipment Malfunction / Down; R - Rate of Change

$PM_{2.5}$ - Crago Road February 2018 (µg/m³)

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	6.9	7.1	6.8	4.3	5.7	7.5	9.0	10.2	11.4	12.5	12.6	12.5	12.4	10.5	4.4	2.6	2.0	0.8	0.6	1.0	1.2	1.0	1.2	1.2	24	12.6	0.6	6.1
2	1.0	0.9	0.6	0.7	0.5	0.4	0.6	0.7	0.6	1.0	0.8	0.8	0.9	0.9	0.8	0.5	0.6	1.0	2.3	2.5	2.9	2.6	1.3	1.1	24	2.9	0.4	1.1
3	1.2	1.1	1.0	1.1	1.2	1.4	1.9	2.3	3.0	5.7	5.5	5.0	5.4	6.3	6.7	7.9	8.7	8.3	8.9	9.0	8.0	8.0	6.3	4.1	24	9.0	1.0	4.9
4	4.0	4.4	4.0	4.6	4.4	4.7	5.5	7.2	9.5	12.0	14.8	11.5	2.3	1.6	2.0	3.1	2.3	1.6	1.9	4.5	3.3	2.8	2.4	2.2	24	14.8	1.6	4.9
5	2.0	1.5	1.0	1.0	1.2	1.3	1.8	1.9	2.6	4.1	3.0	2.9	3.1	3.4	4.3	5.2	T	M	M	M	M	M	M	M	16	5.2	1.0	2.5
6	M	M	M	M	M	M	M	18.5	19.5	19.3	16.9	17.0	15.1	14.1	10.5	8.6	6.9	7.3	8.5	9.7	9.6	8.0	8.6	7.4	17	19.5	6.9	12.1
7	8.1	8.0	6.3	4.3	4.3	6.5	10.4	20.2	8.4	6.3	6.2	5.1	4.6	5.3	5.5	5.0	5.5	6.9	7.4	7.7	7.6	9.9	9.9	12.2	24	20.2	4.3	7.5
8	16.5	17.7	14.1	9.3	9.9	8.9	7.3	6.3	6.2	5.9	4.7	8.2	9.1	5.9	7.6	11.3	7.9	9.5	10.5	12.6	12.3	12.9	17.0	24.1	24	24.1	4.7	10.6
9	26.2	29.9	32.3	34.0	33.9	34.3	30.0	30.4	T	40.3	20.3	18.1	15.6	16.8	13.5	7.4	4.7	12.3	12.1	11.8	12.1	13.4	13.3	13.8	23	40.3	4.7	20.7
10	15.0	19.2	20.8	23.2	23.8	23.7	23.6	23.0	17.7	16.6	14.5	12.7	10.9	10.3	9.1	9.2	8.7	8.7	8.8	8.2	8.4	7.5	8.0	8.2	24	23.8	7.5	14.2
11	7.0	7.3	9.0	6.3	6.1	6.4	6.9	9.9	6.3	6.2	13.8	7.8	6.9	10.9	9.3	9.8	6.0	4.7	5.9	7.4	8.1	7.3	5.0	3.1	24	13.8	3.1	7.4
12	4.1	5.8	3.9	3.9	5.0	5.8	6.4	8.7	11.2	11.4	7.9	4.5	4.6	4.6	4.7	4.5	4.4	5.1	7.1	7.9	8.9	11.2	12.8	14.3	24	14.3	3.9	7.0
13	14.7	10.9	6.9	6.1	5.0	5.1	5.9	5.7	4.3	8.5	5.4	2.5	2.9	3.3	3.1	3.4	4.3	4.7	4.0	6.6	7.1	6.6	7.5	7.0	24	14.7	2.5	5.9
14	8.9	8.8	9.5	10.8	11.9	15.7	22.2	26.8	23.5	21.4	22.9	23.8	22.1	20.4	C	C	21.8	20.5	19.3	18.8	17.9	17.4	15.9	14.8	22	26.8	8.8	18.0
15	14.9	14.2	12.1	6.9	8.9	6.7	5.6	1.2	5.3	9.5	8.3	5.0	T	8.3	9.1	11.0	12.1	11.6	13.2	14.8	15.8	15.7	16.5	16.2	23	16.5	1.2	10.6
16	16.3	16.7	16.1	15.6	13.5	10.0	6.8	6.9	7.4	2.1	2.3	2.9	2.2	1.8	1.6	1.6	1.4	1.1	1.3	1.3	1.5	1.5	2.1	1.8	24	16.7	1.1	5.7
17	0.9	2.0	2.4	2.9	4.7	6.0	7.2	4.8	2.1	2.6	3.3	3.6	3.7	3.8	4.2	5.1	4.6	4.6	4.7	5.0	5.5	6.3	6.6	8.7	24	8.7	0.9	4.4
18	13.7	19.1	19.3	18.8	15.7	11.4	9.7	9.1	6.3	5.2	5.1	4.5	5.4	4.9	6.1	7.5	9.0	10.2	9.9	9.4	10.3	9.7	10.3	9.7	24	19.3	4.5	10.0
19	9.5	9.4	7.9	8.0	7.1	6.6	6.0	6.1	5.8	4.7	4.3	4.4	5.3	5.6	6.7	6.8	5.5	6.9	9.8	6.2	3.7	2.2	1.6	1.5	24	9.8	1.5	5.9
20	1.3	1.8	2.6	2.3	3.1	3.6	2.6	2.7	3.6	3.8	2.4	2.3	3.1	3.7	3.9	6.0	4.6	4.3	6.7	5.3	7.0	9.6	5.8	5.2	24	9.6	1.3	4.1
21	6.6	8.5	11.8	12.4	10.5	9.5	14.1	1.9	2.0	2.1	2.1	1.8	1.9	2.0	2.1	2.2	2.2	2.3	2.3	2.6	2.5	2.2	2.1	2.1	24	14.1	1.8	4.6
22	1.9	1.7	1.7	1.7	1.9	2.0	2.1	2.2	2.0	2.5	2.5	2.2	T	2.4	2.7	2.7	4.7	2.8	2.5	2.0	2.4	2.3	2.2	2.4	23	4.7	1.7	2.3
23	1.7	2.1	1.9	1.8	3.0	5.0	5.8	3.4	3.8	3.4	3.6	3.1	2.1	1.3	1.3	1.0	0.4	1.9	1.5	1.7	2.9	5.2	5.2	3.1	24	5.8	0.4	2.8
24	2.3	2.1	1.7	1.8	2.2	2.3	2.4	1.7	1.5	1.3	1.3	1.2	1.4	1.6	1.3	1.4	1.9	1.8	2.8	2.8	2.9	2.0	1.8	1.5	24	2.9	1.2	1.9
25	1.5	2.6	3.6	1.8	1.9	4.8	3.8	2.8	1.8	1.5	1.6	1.1	1.6	1.7	2.6	4.3	4.9	6.6	7.8	9.1	9.2	8.7	8.5	8.7	24	9.2	1.1	4.3
26	8.5	7.7	7.6	6.7	7.1	7.0	6.8	7.2	7.1	5.9	4.9	2.0	1.7	2.4	2.5	2.5	2.2	2.2	2.9	3.9	4.0	4.2	4.3	5.2	24	8.5	1.7	4.9
27	5.4	6.4	7.1	7.8	7.7	8.2	8.5	8.3	4.4	3.3	3.8	2.8	3.1	3.4	2.9	2.2	1.7	1.5	1.9	2.1	2.3	2.3	3.2	2.5	24	8.5	1.5	4.3
28	3.0	3.6	5.3	6.8	5.4	6.0	5.9	7.1	8.1	4.6	3.3	3.1	3.3	3.9	3.7	3.9	4.6	5.4	7.2	9.3	10.2	11.3	10.9	9.9	24	11.3	3.0	6.1
29																									0			
30																									0			
31																									0			
Count	27	27	27	27	27	27	27	28	27	28	28	28	26	28	27	27	27	27	27	27	27	27	27	27	652			
Maximum	26.2	29.9	32.3	34.0	33.9	34.3	30.0	30.4	23.5	40.3	22.9	23.8	22.1	20.4	13.5	11.3	21.8	20.5	19.3	18.8	17.9	17.4	17.0	24.1	24			
Minimum	0.9	0.9	0.6	0.7	0.5	0.4	0.6	0.7	0.6	1.0	0.8	0.8	0.9	0.9	0.8	0.5	0.4	0.8	0.6	1.0	1.2	1.0	1.2	1.1	0			
Averaage	7.5	8.2	8.0	7.6	7.6	7.8	8.1	8.5	6.9	8.0	7.1	6.2	5.8	5.8	4.9	5.1	5.3	5.7	6.4	6.8	6.9	7.1	7.0	7.1				

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	1.6	2.2	2.9	4.3	5.4	6.8	8.1	9.9	14.7	19.1	29.9	40.3

Maximum Hourly	40.3
Maximum Daily	20.7
Monthly Average	6.9

Notes C - Calibration / Span Cycle NA - No Data Available T - Test A- MOE Audit M - Equipment Malfunction / Down R - Rate of Change

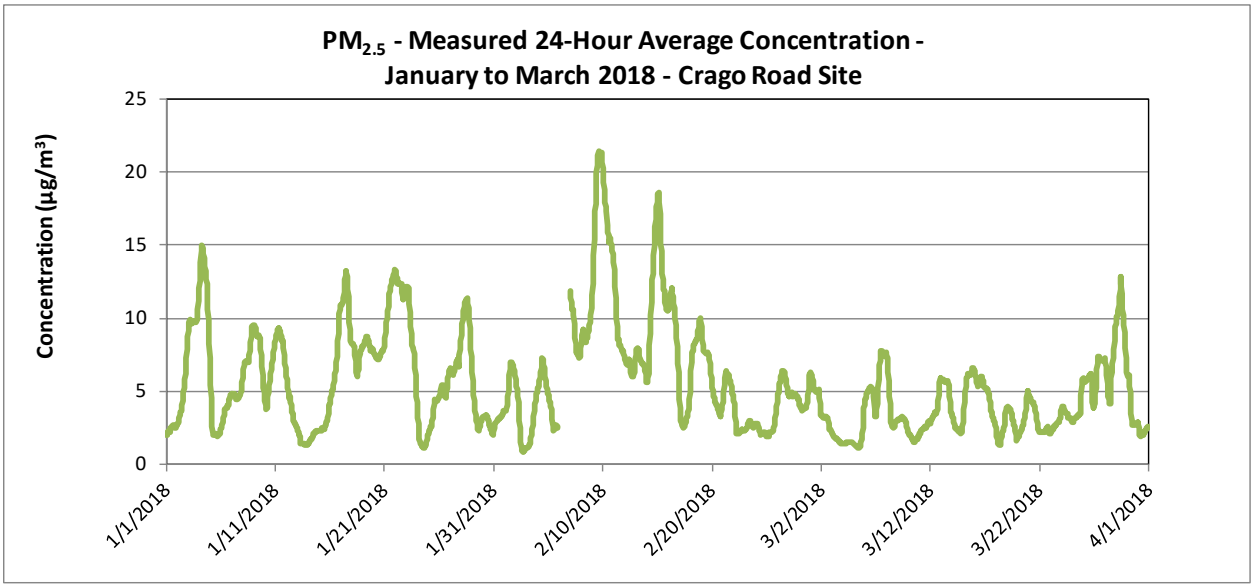
$PM_{2.5}$ - March ($\mu g/m^3$)	Crago Road 2018																												
Day / Hour	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average		
1	7.8	4.6	3.4	4.0	3.5	2.0	2.1	2.3	1.7	1.4	1.1	2.5	2.7	2.9	3.1	3.8	8.3	5.1	8.3	3.4	2.4	2.7	2.5	3.3	24	8.3	1.1	3.5		
2	3.6	3.4	2.9	2.6	2.3	2.2	2.0	2.0	2.1	2.0	1.8	1.7	1.8	1.9	2.1	2.8	2.5	1.9	1.9	2.0	1.9	1.8	1.9	1.8	24	3.6	1.7	2.2		
3	1.7	1.5	1.2	1.2	1.2	1.2	1.6	1.5	1.3	1.3	1.4	1.6	1.4	1.2	1.2	1.1	1.0	0.9	1.3	1.4	1.5	1.7	1.8	1.8	24	1.8	0.9	1.4		
4	1.6	1.5	1.5	1.5	1.6	1.6	1.7	1.8	1.7	1.5	2.0	1.6	1.2	1.3	1.4	1.5	1.3	0.9	0.9	1.2	1.1	0.9	0.8	1.1	24	2.0	0.8	1.4		
5	1.0	0.9	0.8	0.8	0.8	1.1	1.2	1.3	1.2	1.4	1.4	2.2	2.1	2.0	3.1	3.5	3.8	5.9	6.0	5.8	10.3	24.0	9.5	7.4	24	24.0	0.8	4.1		
6	5.5	4.9	4.3	5.1	3.7	2.4	2.2	2.3	2.4	2.5	2.9	4.1	3.2	1.9	2.5	2.6	3.3	3.7	3.7	3.2	3.3	2.9	2.3	3.5	24	5.5	1.9	3.3		
7	6.0	9.0	12.2	14.0	15.9	15.4	17.0	14.7	13.5	9.8	11.1	7.7	6.1	2.3	2.1	2.2	2.1	1.8	1.4	1.5	2.3	6.5	4.6	4.6	24	17.0	1.4	7.7		
8	2.3	2.2	2.3	2.3	2.0	2.3	2.4	2.8	2.1	1.7	2.1	2.7	2.2	2.0	2.0	2.1	2.2	2.8	3.8	5.4	5.9	6.1	4.1	4.1	24	6.1	1.7	2.9		
9	4.7	4.0	2.3	2.1	2.3	2.9	2.3	2.6	2.7	3.3	2.8	2.3	2.2	2.0	0.9	0.8	0.7	1.1	1.3	1.7	1.8	2.0	2.0	2.1	24	4.7	0.7	2.2		
10	1.9	1.7	1.7	1.6	1.4	1.5	1.8	1.7	1.5	1.0	0.7	1.3	1.7	2.5	2.3	2.8	1.6	1.1	1.4	1.9	2.8	4.1	4.3	4.4	24	4.4	0.7	2.0		
11	3.4	2.7	3.4	2.7	3.1	2.7	2.2	2.0	1.5	1.5	1.8	2.0	2.5	2.2	2.2	2.0	3.0	4.1	4.3	4.1	4.4	3.4	2.8	3.0	24	4.4	1.5	2.8		
12	4.5	5.0	4.7	4.1	4.1	3.6	4.2	4.0	3.3	3.0	3.5	1.9	2.2	2.3	4.2	6.3	9.0	12.1	14.2	15.1	14.9	7.4	3.5	3.4	24	15.1	1.9	5.8		
13	4.0	3.5	3.8	4.4	4.3	4.2	3.4	3.0	2.4	2.0	2.2	2.5	2.2	5.3	3.7	3.6	3.5	3.9	4.8	5.5	4.3	2.8	2.0	1.6	24	5.5	1.6	3.5		
14	1.1	1.1	1.0	0.7	0.8	0.7	0.8	1.1	1.3	1.5	1.9	2.1	2.1	2.2	2.9	5.1	5.0	3.2	2.0	2.4	4.2	5.9	5.1	6.8	24	6.8	0.7	2.5		
15	9.9	11.5	11.6	11.4	9.9	9.5	9.4	9.6	6.4	4.0	4.4	3.8	2.4	2.5	2.9	3.3	3.9	3.5	5.1	6.4	6.8	7.0	6.9	6.4	24	11.6	2.4	6.6		
16	7.1	8.3	8.7	7.2	7.1	5.7	4.7	4.4	4.7	4.9	7.0	6.0	6.6	5.9	4.3	4.3	4.2	4.8	3.4	3.2	3.1	2.9	3.1	3.4	24	8.7	2.9	5.2		
17	6.8	9.8	6.5	7.3	6.6	4.8	3.2	2.4	1.3	1.3	1.2	1.1	1.0	1.0	1.3	1.4	1.3	1.2	1.2	1.1	0.7	0.6	0.8	0.9	24	9.8	0.6	2.7		
18	1.1	1.1	1.9	1.5	2.3	1.8	1.9	1.6	2.0	1.9	3.3	4.2	5.1	5.4	4.8	4.8	4.1	3.6	3.7	4.5	10.7	10.5	6.7	2.8	24	10.7	1.1	3.8		
19	2.2	2.2	1.9	1.1	1.1	1.0	1.2	1.0	1.2	1.1	1.1	0.9	0.8	0.8	0.9	1.0	1.2	1.3	1.4	1.2	2.4	3.6	5.3	6.0	24	6.0	0.8	1.8		
20	4.1	2.7	3.0	3.0	3.3	2.9	3.0	2.2	2.2	3.2	2.5	3.6	C	C	5.8	4.7	5.0	5.6	6.3	10.0	11.7	11.9	6.5	2.1	22	11.9	2.1	4.8		
21	2.0	1.6	1.6	1.6	1.4	1.3	1.5	1.8	2.0	2.1	2.3	2.6	1.4	1.8	1.5	1.3	0.9	0.8	1.5	3.4	7.4	6.3	3.5	1.6	24	7.4	0.8	2.2		
22	1.4	1.3	1.1	1.2	1.1	1.7	2.5	2.2	2.0	2.0	1.9	1.9	1.9	3.4	3.6	2.7	2.2	2.5	2.7	2.6	2.1	2.1	2.2	2.2	24	3.6	1.1	2.1		
23	2.2	2.1	2.1	2.2	2.4	2.6	3.8	5.5	M	M	M	M	M	M	6.6	3.0	3.0	2.3	2.6	4.1	4.4	4.0	4.7	6.6	18	6.6	2.1	3.6		
24	4.3	4.7	3.9	2.4	2.4	2.4	2.9	2.2	2.3	2.4	2.5	2.5	3.0	2.7	2.3	2.1	2.2	2.9	2.5	2.5	4.2	3.2	3.4	4.0	24	4.7	2.1	2.9		
25	3.9	4.0	4.0	3.4	6.7	4.7	3.0	2.2	2.7	3.4	3.2	2.6	3.1	3.4	3.0	3.3	3.1	3.3	5.6	12.7	21.5	19.9	11.6	5.3	24	21.5	2.2	5.8		
26	4.9	3.8	3.4	3.5	3.5	3.4	4.3	3.6	3.2	2.8	3.5	4.8	6.7	5.2	3.4	3.3	3.7	4.6	3.6	3.2	3.1	3.2	3.4	3.9	24	6.7	2.8	3.8		
27	8.2	8.6	11.3	11.6	13.0	18.3	18.7	12.9	9.9	7.5	5.4	4.6	3.5	3.1	3.8	3.7	3.3	2.6	2.4	3.4	4.7	4.3	3.3	5.3	24	18.7	2.4	7.2		
28	6.2	5.2	4.6	4.6	5.0	4.6	4.7	5.8	4.4	3.6	3.5	4.4	16.8	18.6	15.7	14.0	9.9	9.5	11.1	12.0	11.7	16.8	17.5	14.9	24	18.6	3.5	9.4		
29	12.3	11.2	9.9	7.0	6.3	11.2	14.0	11.9	12.3	15.1	14.8	12.4	7.3	2.0	1.4	1.2	1.2	1.4	1.4	1.2	1.3	1.5	1.8	2.0	24	15.1	1.2	6.8		
30	1.8	3.2	10.0	8.5	6.5	5.0	2.6	3.0	2.5	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.1	1.5	1.7	1.7	1.4	1.6	1.9	3.0	24	10.0	1.1	2.8		
31	2.3	2.2	2.3	2.3	2.2	2.2	2.1	2.8	3.9	2.5	2.1	1.9	2.2	2.6	2.6	2.8	3.1	2.1	2.0	2.6	2.8	2.7	3.3	2.9	24	3.9	1.9	2.5		
Count	31	31	31	31	31	31	31	31	30	30	30	30	29	29	31	31	31	31	31	31	31	31	31	31	736					
Maximum	12.3	11.5	12.2	14.0	15.9	18.3	18.7	14.7	13.5	15.1	14.8	12.4	16.8	18.6	15.7	14.0	9.9	12.1	14.2	15.1	21.5	24.0	17.5	14.9	24					
Minimum	1.0	0.9	0.8	0.7	0.8	0.7	0.8	1.0	1.2	1.0	0.7	0.9	0.8	0.8	0.9	0.8	0.7	0.8	0.9	1.1	0.7	0.6	0.8	0.9	18					
Averaage	4.2	4.2	4.3	4.1	4.1	4.1	4.2	3.8	3.4	3.1	3.2	3.2	3.3	3.2	3.2	3.2	3.3	3.3	3.7	4.2	5.2	5.6	4.3	3.9						

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	1.2	1.6	2.0	2.3	2.7	3.3	4.0	5.0	7.8	11.7	16.9	24.0

Maximum Hourly	24.0
Maximum Daily	9.4
Monthly Average	3.8

Notes C - Calibration / Span Cycle; NA - No Data Available; T - Test; A- MOE Audit; M - Equipment Malfunction / Down; R - Rate of Change

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



APPENDIX E
Continuous Parameter Edit Log

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**						
Contact	**Greg Crooks / Connie Lim / Toni Zbie**	**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@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-18**	**End date:**	**31-Mar-18**	**Time Zone : EST**		

Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	16-Feb-18	TZ	Invalidate	31-Jan-18	10:00	31-Jan-18	11:00	Monthly calibration.
2	17-Apr-18	TZ	Invalidate	14-Feb-18	14:00	14-Feb-18	15:00	Monthly calibration.
3	17-Apr-18	TZ	Invalidate	20-Mar-18	12:00	20-Mar-18	13:00	Monthly calibration.
4	19-Apr-18	TZ	Data Review	22-Jan-18	19:00	23-Jan-18	03:00	Elevated SO2 concentrations ranging from 12 to 29 ppb were noted. Elevated concentrations were also measured at the Courtice WPCP during this time at about the same levels. Winds were blowing from the east. Possible emission sources include St. Mary's Cement. Data determined to be valid.
5	19-Apr-18	TZ	Data Review	11-Feb-18	10:00	11-Feb-18	15:00	Elevated SO2 concentrations ranging from 2 to 18 ppb were noted. Elevated concentrations were also measured at the Courtice WPCP during this time at about the same levels. Winds were blowing from the east. Possible emission sources include St. Mary's Cement. Data determined to be valid.
6	19-Apr-18	TZ	Data Review	18-Mar-18	10:00	18-Mar-18	10:00	A slightly elevated SO2 concentration of 4 ppb was noted, similar concentrations were observed at Rundle and Courtice stations indicating a source which was influencing all stations.
7	19-Apr-18	TZ	Data Review	4-Jan-18	23:00	5-Jan-18	13:00	Repeating values were investigated. Measurements fluctuated, but appear as repeating due to round off.
8	19-Apr-18	TZ	Data Review	6-Jan-18	21:00	7-Jan-18	04:00	
9	19-Apr-18	TZ	Data Review	12-Jan-18	17:00	13-Jan-18	15:00	
10	19-Apr-18	TZ	Data Review	15-Jan-18	16:00	16-Jan-18	08:00	
11	19-Apr-18	TZ	Data Review	29-Jan-18	01:00	29-Jan-18	08:00	
12	19-Apr-18	TZ	Data Review	29-Jan-18	22:00	30-Jan-18	09:00	
13	19-Apr-18	TZ	Data Review	1-Feb-18	19:00	2-Feb-18	04:00	
14	19-Apr-18	TZ	Data Review	10-Feb-18	13:00	11-Feb-18	00:00	
15	19-Apr-18	TZ	Data Review	28-Feb-18	22:00	1-Mar-18	06:00	
16	19-Apr-18	TZ	Data Review	6-Mar-18	11:00	6-Mar-18	18:00	
17	19-Apr-18	TZ	Data Review	9-Mar-18	19:00	10-Mar-18	04:00	
18	19-Apr-18	TZ	Data Review	13-Mar-18	17:00	14-Mar-18	02:00	
19	19-Apr-18	TZ	Data Review	21-Mar-18	13:00	22-Mar-18	00:00	
20	19-Apr-18	TZ	Data Review	27-Mar-18	16:00	28-Mar-18	00:00	
21	19-Apr-18	TZ	Data Review	24-Mar-18	08:00	24-Mar-18	14:00	Instances of repeating zero values in this timeframe were due to negative instrument zero drift less than -5 ppb and rounded to 0 ppb. As per the MOECC Ambient Monitoring Guideline, no drift correction was applied.
22	19-Apr-18	TZ	Data Review	24-Mar-18	17:00	24-Mar-18	17:00	
23	19-Apr-18	TZ	Data Review	24-Mar-18	20:00	24-Mar-18	22:00	
24	19-Apr-18	TZ	Data Review	25-Mar-18	01:00	25-Mar-18	14:00	
25	19-Apr-18	TZ	Data Review	25-Mar-18	18:00	25-Mar-18	22:00	

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

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**						
Contact	**Greg Crooks / Connie Lim / Toni Zbie**		**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@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-18**	**End date:**	**31-Mar-18**		**Time Zone : EST**	

Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	16-Feb-18	TZ	Invalidate	31-Jan-18	10:00	31-Jan-18	11:00	Monthly calibration.
2	17-Apr-18	TZ	Invalidate	14-Feb-18	14:00	14-Feb-18	15:00	Monthly calibration.
3	17-Apr-18	TZ	Invalidate	20-Mar-18	12:00	20-Mar-18	13:00	Monthly calibration.
4	19-Apr-18	TZ	Invalidate	11-Jan-18	16:00	11-Jan-18	17:00	Rotek on-site to service NO_x analyzer.
5	19-Apr-18	TZ	Data Review	22-Jan-18	21:00	23-Jan-18	03:00	Elevated NOx concentrations of 38 to 93 ppb was noted during this time period. Elevated NOx was also measured at the Courtice WPCP during this time. Winds were blowing from the east. Concentrations of NO were higher than concentrations of NO2, indicating a nearby combustion source. NO2 concentrations measured at Oshawa during this time were lower, similar to lower levels measured at Rundle. Possible near-by emission source is St. Mary's Cement. Data determined to be valid.
6	19-Apr-18	TZ	Data Review	12-Feb-18	21:00	13-Feb-18	02:00	Elevated NOx concentrations of 17 to 80 ppb was noted during this time period. Elevated NOx was also measured at the Courtice WPCP during this time. Winds were blowing from the northwest. During this time, NO2 concentration was slightly higher than NO indicating a more distant emission source. NO2 concentrations measured at Oshawa during this time were lower than those measured at Crago and the Courtice WPCP but higher than those measured at Rundle. Possible sources include Highway 401, the CP rail line, or the DYEC. Data determined to be valid.
7	19-Apr-18	TZ	Data Review	28-Mar-18	21:00	28-Mar-18	23:00	Elevated NOx concentrations of 34 to 61 ppb was noted during this time period. Elevated NOx was also measured at the Courtice WPCP during this time. Winds were blowing from the north. During this time, NO2 concentration was slightly higher than NO indicating a more distant emission source. Possible sources include Highway 401 and the CP rail line. Data determined to be valid.

Examples of Acceptable Edit Actions:

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

EDIT LOG TABLE

Project Name	**Durham York Energy Centre Ambient Air Monitoring Program**						
Contact	**Greg Crooks / Connie Lim / Toni Zbie**	**Phone:**	**905-944-7777**	**E-mail:**	**greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@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**		**Serial Number:**	**CM 0269**	
Data edit period	**Start date:**	**1-Jan-18**	**End date:**	**31-Mar-18**	**Time Zone : EST**		

Edit #	**Edit date**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	16-Feb-18	TZ	Invalidate	31-Jan-18	10:00	31-Jan-18	11:00	Monthly calibration.
2	21-Mar-18	AE	Invalidate	24-Jan-18	16:00	24-Jan-18	16:00	Hourly data invalidated during SHARP zero concentration check done at Site.
3	21-Mar-18	AE	Invalidate	5-Feb-18	16:00	5-Feb-18	16:00	Hourly data invalidated during SHARP zero concentration check done at Site.
4	21-Mar-18	AE	Invalidate	9-Feb-18	08:00	9-Feb-18	08:00	Hourly data invalidated during SHARP zero concentration check done at Site.
5	21-Mar-18	AE	Invalidate	15-Feb-18	12:00	15-Feb-18	12:00	Hourly data invalidated during SHARP zero concentration check done at Site.
6	21-Mar-18	AE	Invalidate	22-Feb-18	12:00	22-Feb-18	12:00	Hourly data invalidated during SHARP zero concentration check done at Site.
7	17-Apr-18	TZ	Invalidate	14-Feb-18	14:00	14-Feb-18	15:00	Monthly calibration.
8	17-Apr-18	TZ	Invalidate	20-Mar-18	12:00	20-Mar-18	13:00	Monthly calibration.
9	19-Apr-18	TZ	Data Review	3-Jan-18	19:00	4-Jan-18	06:00	Elevated PM2.5 concentrations were observed during this time, ranging from 14 to 25 µg/m^3. Elevated concentrations were also observed at the Courtice WPCP and Rundle stations as well as Oshawa. Winds were from the West to Northwest, with overall higher ambient levels in the area. Data is determined to be valid.
10	19-Apr-18	TZ	Invalidate	5-Feb-18	17:00	6-Feb-18	06:00	Elevated PM2.5 concentrations were observed during this time, starting at around 36 µg/m^3 and slowly decreasing to about 17 µg/m^3. These elevated concentrations were observed to occur following a zero check of the Crago SHARP unit and was not observed at the other stations. PM2.5 concentrations at the Courtice WPCP and Rundle Road stations as well as Oshawa were all similar to each other during this time period ranging from about 6 µg/m^3 to 17 µg/m^3. The PM2.5 concentrations measured during this period were invalidated, as the elevated concentrations were likely due to ambient air (not filtered for PM2.5) entering the unit and depositing on the inlet tube when the PM2.5 impactor head was removed.
11	19-Apr-18	TZ	Invalidate	23-Mar-18	08:00	23-Mar-18	13:00	Elevated PM2.5 concentrations were observed during this time, starting high at around 33 µg/m^3 and slowly decreasing to about 18 µg/m^3. These elevated concentrations were observed to occur following a zero check of the Crago SHARP unit and was not observed at the other stations. PM2.5 concentrations at the Courtice WPCP and Rundle stations were low and similar to each other during this time period ranging from about 3 µg/m^3 to 7 µg/m^3 (no data was available from Oshawa). The PM2.5 concentrations measured during this period were invalidated, as the elevated concentrations were likely due to ambient air (not filtered for PM2.5) entering the unit and depositing on the inlet tube when the PM2.5 impactor head was removed.

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
Test

EDIT LOG TABLE

Project Name	Durham York Energy Centre Ambient Air Monitoring Program							
Contact	Greg Crooks / Connie Lim / Toni Zbie		Phone:	905-944-7777	E-mail:	greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@stantec.com		
Station number:	N/A		Station Name:	Crago Road				
Station address:	Crago Road		Emitter Address:	The Region of Durham, 605 Rossland Rd, Whitby, ON				
Pollutant or parameter:	Temperature	Instrument make & model:		Campbell Scientific Model HMP60				
Data edit period	Start date:	1-Jan-18	End date:	31-Mar-18	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 / Toni Zbie		Phone:	905-944-7777	E-mail:	greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@stantec.com		
Station number:	N/A		Station Name:	Crago Road				
Station address:	Crago Road		Emitter Address:	The Region of Durham, 605 Rossland Rd, Whitby, ON				
Pollutant or parameter:	Rainfall	Instrument make & model:		Texas Electronic TE525M				
Data edit period	Start date:	1-Jan-18	End date:	31-Mar-18	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
Invalidating data due to equipment malfunctions and power failures.
Invalidating data when instrumentation off-line

EDIT LOG TABLE

Project Name	Durham York Energy Centre Ambient Air Monitoring Program							
Contact	Greg Crooks / Connie Lim / Toni Zbier		Phone:	905-944-7777	E-mail:	greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@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-18	End date:	31-Mar-18	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 / Toni Zbier		Phone:	905-944-7777	E-mail:	greg.crooks@stantec.com, connie.lim@stantec.com, toni.zbieranowski@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-18	End date:	31-Mar-18	Time Zone : EST			
Edit #	Edit date	Editor's Name	Edit Action	Starting		Ending		Reason
				Date (dd/mm/yyyy)	Hour (xx:xx)	Date (dd/mm/yyyy)	Hour (xx:xx)	
1	16-Feb-18	TZ	Invalidate	12-Jan-18	15:00	14-Jan-18	10:00	Sampler malfunction, WS and WD reading all 0 km/hr and 360° respectively during this time period.
2	16-Feb-18	TZ	Invalidate	14-Jan-18	12:00	14-Jan-18	13:00	Sampler malfunction, WS and WD reading all 0 km/hr and 360° respectively during this time period.
3	27-Mar-18	AE	Invalidate	4-Feb-18	20:00	7-Feb-18	16:00	Sampler malfunction, WS and WD reading all 0 km/hr and 360° respectively during this time period.
4	27-Mar-18	AE	Invalidate	11-Feb-18	15:00	12-Feb-18	09:00	Sampler malfunction, WS and WD reading all 0 km/hr and 360° respectively during this time period.
5	17-Apr-18	TZ	Invalidate	27-Feb-18	01:00	27-Feb-18	07:00	Sampler malfunction, WS and WD reading all 0 km/hr and 360° respectively during this time period.
6	17-Apr-18	TZ	Invalidate	28-Mar-18	19:00	28-Mar-18	20:00	Sampler malfunction, WS and WD reading all 0 km/hr and 360° respectively during this time period.

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

APPENDIX F
Metals Data Summary

Metals and Total Particulates	Crago Road Station	Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago	
Location		02/01/2018		08/01/2018		14/01/2018		20/01/2018		26/01/2018		01/02/2018		07/02/2018		13/02/2018		19/02/2018		25/02/2018		03/03/2018		09/03/2018		15/03/2018		21/03/2018		27/03/2018	
Date	dd/mm/yyyy																												
Start Time	hh:mm	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	Hours	23.39		8.45		23.28		23.4		24.38		23.77		23.84		23.76		23.74		23.72		23.77		23.88		23.81		23.81	
Technician		TZ		TZ		TZ		TZ		AE,TZ		AE,TZ		AE		AE		AE		AE		AE		AE		AE		AE	
Filter Number		17121279				17121287		17121288		17121294		17121299		17121999		18011979		B841720		B847906		B851218		B857743		B861029		B866964		B870985	
Analytical Report #		B801282				B809849		B819762		B821483		B834540		B832196		B838591		18011985		16121539		18020133		16121541		18021537		18022755		18020137	
Total Volumetric Flow	Am^3/sample	1278.50		482.99		1342.20		1416.52		1450.15		1456.87		1440.10		1274.97		1591.61		1544.30		1550.75		1574.98		1519.95		1509.31		1464.47	
Analytical Results	**Units**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**
Particulate	mg	37.5	5.0			29.8	5	44.3	5	42.8	5	32	5	17.4	5	27.6	5	25.4	5	15.3	5.0	16.9	5	15.1	5.0	32.2	5.0	25.8	5.0	21.9	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	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	0.07	0.02
Aluminum (Al)	µg	110	50			118	50	120	50	203	50	106	50	<50	50	53	50	55	50	81	50	82	50	127	50	155	50	175	50	123	50
Antimony (Sb)	µg	<10	10			<10	10	<10	10	<10	10	<10	10	<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	6.0	<6	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
Barium (Ba)	µg	8.0	1.0			4.6	1.0	8.3	1.0	8.2	1.0	7.0	1.0	5.3	1.0	3.6	1.0	4.4	1.0	6.9	1.0	4.8	1.0	8.8	1.0	9.9	1.0	8.7	1.0	6.8	1.0
Beryllium (Be)	µg	<1.0	1.0			<1.0	1.0	<1	1.0	<1	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	1.0	<1.0	1.0
Bismuth (Bi)	µg	<6.0	6.0			<6.0	6.0	<6	6.0	<6	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
Boron (B)	µg	<6.0	6.0			<6.0	6.0	<6	6.0	<6	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
Cadmium (Cd)	µg	<2.0	2.0			<2.0	2.0	<2	2.0	<2	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	2.0	<2.0	2.0
Chromium (Cr)	µg	<5.0	5.0			<5.0	5.0	<5	5.0	<5	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	5.0	<5.0	5.0
Cobalt (Co)	µg	<2.0	2.0			<2.0	2.0	<2	2.0	<2	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	2.0	<2.0	2.0
Copper (Cu)	µg	22.9	5.0			9.3	5.0	19.2	5.0	9.4	5.0	24.3	5.0	6.2	5.0	<5.0	5.0	6.3	5.0	5.3	5.0	6.4	5.0	5.9	5.0	<5.0	5.0	9.3	5.0	7.6	5.0
Iron (Fe)	µg	274	50			236	50	327	50	452	50	323	50	166	50	140	50	165	50	239	50	190	50	225	50	462	50	402	50	362	50
Lead (Pb)	µg	<3.0	3.0			<3.0	3.0	7.6	3.0	3.2	3.0	3.4	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	3.0
Magnesium (Mg)	µg	168	50			145	50	182	50	266	50	146	50	57	50	100	50	71	50	183	50	118	50	114	50	201	50	242	50	185	50
Manganese (Mn)	µg	12.1	1.0			5.3	1.0	10.1	1.0	11.1	1.0	12.3	1.0	5.0	1.0	3.8	1.0	4.4	1.0	8.2	1.0	5.8	1.0	6.6	1.0	14.9	1.0	12.1	1.0	7.8	1.0
Molybdenum (Mo)	µg	<3.0	3.0			<3.0	3.0	<3	3.0	<3	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	3.0	<3.0	3.0
Nickel (Ni)	µg	<3.0	3.0			<3.0	3.0	<3	3.0	<3	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	3.0	<3.0	3.0
Phosphorus (P)	µg	<25	25			<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	<25	25	27	25
Selenium (Se)	µg	<10	10			<10	10	<10	10	<10	10	<10	10	<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	5.0	<5	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	5.0	<5.0	5.0
Strontium (Sr)	µg	3.2	1.0			5.3	1.0	4.6	1.0	9	1.0	3.7	1.0	1.9	1.0	2.6	1.0	2.6	1.0	4.1	1.0	3.6	1.0	3.5	1.0	7.0	1.0	6.7	1.0	3.4	1.0
Thallium (Tl)	µg	<10	10			<10	10	<10	10	<10	10	<10	10	<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	<10	10	<10	10	<10	10	<10	10	<10	10
Titanium (Ti)	µg	<10	10			<10	10	<10	10	12	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	<10	10	14	10	<10	10
Vanadium (V)	µg	<5.0	5.0			<5.0	5.0	<5	5.0	<5	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	5.0	<5.0	5.0
Zinc (Zn)	µg	29.1	5.0			18.6	5.0	41.5	5.0	21.5	5.0	69.3	5.0	19.4	5.0	15.9	5.0	24.8	5.0	17.3	5.0	10.9	5.0	14.2	5.0	24.8	5.0	18.1	5.0	18.5	5.0
Zirconium (Zr)	µg	<5.0	5.0			<5.0	5.0	<5	5.0	<5	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	5.0	<5.0	5.0
Total Uranium (U)	µg	<0.45	0.45			<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45	<0.45	0.45

Calculated Concentrations	Quarter 1			Crago 1	Crago 2	Crago 3	Crago 4	Crago 5	Crago 6	Crago 7	Crago 8	Crago 9	Crago 10	Crago 11	Crago 12	Crago 13	Crago 14	Crago 15
	Units	Maximum	Minimum	1/2/2018	1/8/2018	1/14/2018	1/20/2018	1/26/2018	2/1/2018	2/7/2018	2/13/2018	2/19/2018	2/25/2018	3/3/2018	3/9/2018	3/15/2018	3/21/2018	3/27/2018
Particulate	µg/m^3	31.27	9.59	29.33		22.20	31.27	29.51	21.96	12.08	21.65	15.96	9.91	10.90	9.59	21.18	17.09	14.95
Total Mercury (Hg)	µg/m^3	4.78E-05	6.28E-06	7.82E-06		7.45E-06	7.06E-06	6.90E-06	6.86E-06	6.94E-06	7.84E-06	6.28E-06	6.48E-06	6.45E-06	6.35E-06	6.58E-06	6.63E-06	4.78E-05
Aluminum (Al)	µg/m^3	1.40E-01	1.74E-02	8.60E-02		8.79E-02	8.47E-02	1.40E-01	7.28E-02	1.74E-02	4.16E-02	3.46E-02	5.25E-02	5.29E-02	8.06E-02	1.02E-01	1.16E-01	8.40E-02
Antimony (Sb)	µg/m^3	3.92E-03	3.14E-03	3.91E-03		3.73E-03	3.53E-03	3.45E-03	3.43E-03	3.47E-03	3.92E-03	3.14E-03	3.24E-03	3.22E-03	3.17E-03	3.29E-03	3.31E-03	3.41E-03
Arsenic (As)	µg/m^3	2.35E-03	1.88E-03	2.35E-03		2.24E-03	2.12E-03	2.07E-03	2.06E-03	2.08E-03	2.35E-03	1.88E-03	1.94E-03	1.93E-03	1.90E-03	1.97E-03	1.99E-03	2.05E-03
Barium (Ba)	µg/m^3	6.51E-03	2.76E-03	6.26E-03		3.43E-03	5.86E-03	5.65E-03	4.80E-03	3.68E-03	2.82E-03	2.76E-03	4.47E-03	3.10E-03	5.59E-03	6.51E-03	5.76E-03	4.64E-03
Beryllium (Be)	µg/m^3	3.92E-04	3.14E-04	3.91E-04		3.73E-04	3.53E-04	3.45E-04	3.43E-04	3.47E-04	3.92E-04	3.14E-04	3.24E-04	3.22E-04	3.17E-04	3.29E-04	3.31E-04	3.41E-04
Bismuth (Bi)	µg/m^3	2.35E-03	1.88E-03	2.35E-03		2.24E-03	2.12E-03	2.07E-03	2.06E-03	2.08E-03	2.35E-03	1.88E-03	1.94E-03	1.93E-03	1.90E-03	1.97E-03	1.99E-03	2.05E-03
Boron (B)	µg/m^3	2.35E-03	1.88E-03	2.35E-03		2.24E-03	2.12E-03	2.07E-03	2.06E-03	2.08E-03	2.35E-03	1.88E-03	1.94E-03	1.93E-03	1.90E-03	1.97E-03	1.99E-03	2.05E-03
Cadmium (Cd)	µg/m^3	7.84E-04	6.28E-04	7.82E-04		7.45E-04	7.06E-04	6.90E-04	6.86E-04	6.94E-04	7.84E-04	6.28E-04	6.48E-04	6.45E-04	6.35E-04	6.58E-04	6.63E-04	6.83E-04
Chromium (Cr)	µg/m^3	1.96E-03	1.57E-03	1.96E-03		1.86E-03	1.76E-03	1.72E-03	1.72E-03	1.74E-03	1.96E-03	1.57E-03	1.62E-03	1.61E-03	1.59E-03	1.64E-03	1.66E-03	1.71E-03
Cobalt (Co)	µg/m^3	7.84E-04	6.28E-04	7.82E-04		7.45E-04	7.06E-04	6.90E-04	6.86E-04	6.94E-04	7.84E-04	6.28E-04	6.48E-04	6.45E-04	6.35E-04	6.58E-04	6.63E-04	6.83E-04
Copper (Cu)	µg/m^3	1.79E-02	1.64E-03	1.79E-02		6.93E-03	1.36E-02	6.48E-03	1.67E-02	4.31E-03	1.96E-03	3.96E-03	3.43E-03	4.13E-03	3.75E-03	1.64E-03	6.16E-03	5.19E-03
Iron (Fe)	µg/m^3	3.12E-01	1.04E-01	2.14E-01		1.76E-01	2.31E-01	3.12E-01	2.22E-01	1.15E-01	1.10E-01	1.04E-01	1.55E-01	1.23E-01	1.43E-01	3.04E-01	2.66E-01	2.47E-01
Lead (Pb)	µg/m^3	5.37E-03	9.42E-04	1.17E-03	Sample was invalid	1.12E-03	5.37E-03	2.21E-03	2.33E-03	1.04E-03	1.18E-03	9.42E-04	9.71E-04	9.67E-04	9.52E-04	9.87E-04	9.94E-04	1.02E-03
Magnesium (Mg)	µg/m^3	1.83E-01	3.96E-02	1.31E-01		1.08E-01	1.28E-01	1.83E-01	1.00E-01	3.96E-02	7.84E-02	4.46E-02	1.19E-01	7.61E-02	7.24E-02	1.32E-01	1.60E-01	1.26E-01
Manganese (Mn)	µg/m^3	9.80E-03	2.76E-03	9.46E-03		3.95E-03	7.13E-03	7.65E-03	8.44E-03	3.47E-03	2.98E-03	2.76E-03	5.31E-03	3.74E-03	4.19E-03	9.80E-03	8.02E-03	5.33E-03
Molybdenum (Mo)	µg/m^3	1.18E-03	9.42E-04	1.17E-03		1.12E-03	1.06E-03	1.03E-03	1.03E-03	1.04E-03	1.18E-03	9.42E-04	9.71E-04	9.67E-04	9.52E-04	9.87E-04	9.94E-04	1.02E-03
Nickel (Ni)	µg/m^3	1.18E-03	9.42E-04	1.17E-03		1.12E-03	1.06E-03	1.03E-03	1.03E-03	1.04E-03	1.18E-03	9.42E-04	9.71E-04	9.67E-04	9.52E-04	9.87E-04	9.94E-04	1.02E-03
Phosphorus (P)	µg/m^3	1.84E-02	7.85E-03	9.78E-03		9.31E-03	8.82E-03	8.62E-03	8.58E-03	8.68E-03	9.80E-03	7.85E-03	8.09E-03	8.06E-03	7.94E-03	8.22E-03	8.28E-03	1.84E-02
Selenium (Se)	µg/m^3	3.92E-03	3.14E-03	3.91E-03		3.73E-03	3.53E-03	3.45E-03	3.43E-03	3.47E-03	3.92E-03	3.14E-03	3.24E-03	3.22E-03	3.17E-03	3.29E-03	3.31E-03	3.41E-03
Silver (Ag)	µg/m^3	1.96E-03	1.57E-03	1.96E-03		1.86E-03	1.76E-03	1.72E-03	1.72E-03	1.74E-03	1.96E-03	1.57E-03	1.62E-03	1.61E-03	1.59E-03	1.64E-03	1.66E-03	1.71E-03
Strontium (Sr)	µg/m^3	6.21E-03	1.32E-03	2.50E-03		3.95E-03	3.25E-03	6.21E-03	2.54E-03	1.32E-03	2.04E-03	1.63E-03	2.65E-03	2.32E-03	2.22E-03	4.61E-03	4.44E-03	2.32E-03
Thallium (Tl)	µg/m^3	3.92E-03	3.14E-03	3.91E-03		3.73E-03	3.53E-03	3.45E-03	3.43E-03	3.47E-03	3.92E-03	3.14E-03	3.24E-03	3.22E-03	3.17E-03	3.29E-03	3.31E-03	3.41E-03
Tin (Sn)	µg/m^3	3.92E-03	3.14E-03	3.91E-03		3.73E-03	3.53E-03	3.45E-03	3.43E-03	3.47E-03	3.92E-03	3.14E-03	3.24E-03	3.22E-03	3.17E-03	3.29E-03	3.31E-03	3.41E-03
Titanium (Ti)	µg/m^3	9.28E-03	3.14E-03	3.91E-03		3.73E-03	3.53E-03	8.27E-03	3.43E-03	3.47E-03	3.92E-03	3.14E-03	3.24E-03	3.22E-03	3.17E-03	3.29E-03	9.28E-03	3.41E-03
Vanadium (V)	µg/m^3	1.96E-03	1.57E-03	1.96E-03		1.86E-03	1.76E-03	1.72E-03	1.72E-03	1.74E-03	1.96E-03	1.57E-03	1.62E-03	1.61E-03	1.59E-03	1.64E-03	1.66E-03	1.71E-03
Zinc (Zn)	µg/m^3	4.76E-02	7.03E-03	2.28E-02		1.39E-02	2.93E-02	1.48E-02	4.76E-02	1.35E-02	1.25E-02	1.56E-02	1.12E-02	7.03E-03	9.02E-03	1.63E-02	1.20E-02	1.26E-02
Zirconium (Zr)	µg/m^3	1.96E-03	1.57E-03	1.96E-03		1.86E-03	1.76E-03	1.72E-03	1.72E-03	1.74E-03	1.96E-03	1.57E-03	1.62E-03	1.61E-03	1.59E-03	1.64E-03	1.66E-03	1.71E-03
Total Uranium (U)	µg/m^3	1.76E-04	1.41E-04	1.76E-04		1.68E-04	1.59E-04	1.55E-04	1.54E-04	1.56E-04	1.76E-04	1.41E-04	1.46E-04	1.45E-04	1.43E-04	1.48E-04	1.49E-04	1.54E-04

APPENDIX G
PAHS Data Summary

Polycyclic Aromatic Hydrocarbons	Crago Station															
Location		Crago		Crago		Crago		Crago		Crago		Crago		Crago		Crago	
Date	dd/mm/yyyy	2/01/2018		14/01/2018		26/01/2018		7/02/2018		19/02/2018		3/03/2018		15/03/2018		27/03/2018	
Start Time	hh:mm	0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00	
Sample Duration	hours	23.69		23.68		23.95		24.17		23.84		23.67		23.09		24.5	
Technician		TZ		TZ		AE, TZ		AE		AE		AE		AE		AE	
Filter Number		FSB015-01		FTC970-01		FTJ433-01		FTJ599-01		FXQ365-01		FXQ396-01		GCK081-01		GCQ629-01	
Maxaam ID		FVT589		FXK115		FZR825		GBQ750		GDD210		GFF828		GHG805		GJA694	
Maxxam Job #		B801260		B809851		B821697		B832191		B840443		B851251		B862183		B871177	
Total Volumetric Flow	Am^3/sample	352.82		328.56		346.07		346.31		293.73		277.64		283.74		288.08	
Analytical Results	Units	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL
Benzo(a)pyrene	µg	0.0209	0.0047	0.0228	0.0016	0.0284	0.00082	0.0361	0.00060	0.0055	0.0017	0.0041	0.0016	0.0052	0.0015	0.00416	0.00070
1-Methylnaphthalene	µg	1.54	0.15	0.78	0.10	1.17	0.15	1.58	0.10	1.20	0.15	0.24	0.10	0.70	0.15	0.46	0.10
2-Methylnaphthalene	µg	2.38	0.15	1.18	0.10	1.77	0.15	2.47	0.10	1.85	0.15	0.38	0.10	1.20	0.15	0.68	0.10
Acenaphthene	µg	0.183	0.075	0.112	0.050	0.210	0.075	0.160	0.050	0.351	0.075	<0.050	0.050	0.138	0.075	0.280	0.050
Acenaphthylene	µg	<0.075	0.075	<0.050	0.050	<0.075	0.075	0.174	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050
Anthracene	µg	<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	<0.050	0.050
Benzo(a)anthracene	µg	<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	<0.050	0.050
Benzo(a)fluorene	µg	<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	<0.10	0.10
Benzo(b)fluoranthene	µg	<0.075	0.075	<0.050	0.050	<0.075	0.075	0.106	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050
Benzo(b)fluorene	µg	<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	<0.10	0.10
Benzo(e)pyrene	µg	<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	<0.10	0.10
Benzo(g,h,i)perylene	µg	<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	<0.050	0.050
Benzo(k)fluoranthene	µg	<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	<0.050	0.050
Biphenyl	µg	0.85	0.15	0.43	0.10	0.76	0.15	0.86	0.10	0.80	0.15	0.18	0.10	0.23	0.15	0.28	0.10
Chrysene	µg	<0.075	0.075	<0.050	0.050	<0.075	0.075	0.108	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050
Dibenz(a,h)anthracene	µg	<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	<0.050	0.050
Dibenzo(a,c) anthracene + Picene [1]	µg	<0.15	0.15	<0.10	0.10	<0.15	0.15	<0.10	0.10	<0.050	0.050	<0.10	0.10	<0.15	0.15	<0.10	0.10
Fluoranthene	µg	0.243	0.075	0.262	0.050	0.270	0.075	0.312	0.050	0.189	0.075	<0.050	0.050	<0.075	0.075	0.100	0.050
Indeno(1,2,3-cd)pyrene	µg	<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	<0.050	0.050
Naphthalene	µg	11.2	0.11	5.67	0.072	8.94	0.11	10.5	0.072	8.05	0.11	1.46	0.072	3.80	0.11	2.88	0.072
o-Terphenyl	µg	<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	<0.10	0.10
Perylene	µg	<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	<0.10	0.10
Phenanthrene	µg	0.894	0.075	0.636	0.050	0.663	0.075	0.898	0.050	0.687	0.075	0.198	0.050	0.228	0.075	0.360	0.050
Pyrene	µg	0.153	0.075	0.192	0.050	0.144	0.075	0.214	0.050	<0.075	0.075	<0.050	0.050	<0.075	0.075	<0.050	0.050
Tetralin	µg	0.56	0.15	0.33	0.10	0.63	0.15	0.61	0.10	0.60	0.15	0.21	0.10	0.54	0.15	0.28	0.10

Calculated Concentrations	Quarter 1			Crago 1	Crago 2	Crago 3	Crago 4	Crago 5	Crago 6	Crago 7	Crago 8
	Units	Maximum	Minimum	1/2/2018	1/14/2018	1/26/2018	7/02/2018	19/02/2018	3/03/2018	15/03/2018	27/03/2018
Benzo(a)pyrene	ng/m^3	1.04E-01	1.44E-02	5.92E-02	6.94E-02	8.21E-02	1.04E-01	1.87E-02	1.48E-02	1.83E-02	1.44E-02
1-Methylnaphthalene	ng/m^3	4.56	0.86	4.36E+00	2.37E+00	3.38E+00	4.56E+00	4.09E+00	8.64E-01	2.47E+00	1.60E+00
2-Methylnaphthalene	ng/m^3	7.13	1.37	6.75E+00	3.59E+00	5.11E+00	7.13E+00	6.30E+00	1.37E+00	4.23E+00	2.36E+00
Acenaphthene	ng/m^3	1.19E+00	9.00E-02	5.19E-01	3.41E-01	6.07E-01	4.62E-01	1.19E+00	9.00E-02	4.86E-01	9.72E-01
Acenaphthylene	ng/m^3	0.50	0.08	1.06E-01	7.61E-02	1.08E-01	5.02E-01	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Anthracene	ng/m^3	0.13	0.07	1.06E-01	7.61E-02	1.08E-01	7.22E-02	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Benzo(a)anthracene	ng/m^3	1.32E-01	7.22E-02	1.06E-01	7.61E-02	1.08E-01	7.22E-02	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Benzo(a)fluorene	ng/m^3	2.64E-01	1.44E-01	2.13E-01	1.52E-01	2.17E-01	1.44E-01	2.55E-01	1.80E-01	2.64E-01	1.74E-01
Benzo(b)fluoranthene	ng/m^3	3.06E-01	7.61E-02	1.06E-01	7.61E-02	1.08E-01	3.06E-01	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Benzo(b)fluorene	ng/m^3	2.64E-01	1.44E-01	2.13E-01	1.52E-01	2.17E-01	1.44E-01	2.55E-01	1.80E-01	2.64E-01	1.74E-01
Benzo(e)pyrene	ng/m^3	2.64E-01	1.44E-01	2.13E-01	1.52E-01	2.17E-01	1.44E-01	2.55E-01	1.80E-01	2.64E-01	1.74E-01
Benzo(g,h,i)perylene	ng/m^3	1.32E-01	7.22E-02	1.06E-01	7.61E-02	1.08E-01	7.22E-02	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Benzo(k)fluoranthene	ng/m^3	1.32E-01	7.22E-02	1.06E-01	7.61E-02	1.08E-01	7.22E-02	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Biphenyl	ng/m^3	2.72E+00	6.48E-01	2.41E+00	1.31E+00	2.20E+00	2.48E+00	2.72E+00	6.48E-01	8.11E-01	9.72E-01
Chrysene	ng/m^3	3.12E-01	7.61E-02	1.06E-01	7.61E-02	1.08E-01	3.12E-01	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Dibenz(a,h)anthracene	ng/m^3	1.32E-01	7.22E-02	1.06E-01	7.61E-02	1.08E-01	7.22E-02	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Dibenzo(a,c) anthracene + Picene	ng/m^3	2.64E-01	8.51E-02	2.13E-01	1.52E-01	2.17E-01	1.44E-01	8.51E-02	1.80E-01	2.64E-01	1.74E-01
Fluoranthene	ng/m^3	9.01E-01	9.00E-02	6.89E-01	7.97E-01	7.80E-01	9.01E-01	6.43E-01	9.00E-02	1.32E-01	3.47E-01
Indeno(1,2,3-cd)pyrene	ng/m^3	1.32E-01	7.22E-02	1.06E-01	7.61E-02	1.08E-01	7.22E-02	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Naphthalene	ng/m^3	31.7	5.26	3.17E+01	1.73E+01	2.58E+01	3.03E+01	2.74E+01	5.26E+00	1.34E+01	1.00E+01
o-Terphenyl	ng/m^3	2.64E-01	1.44E-01	2.13E-01	1.52E-01	2.17E-01	1.44E-01	2.55E-01	1.80E-01	2.64E-01	1.74E-01
Perylene	ng/m^3	2.64E-01	1.44E-01	2.13E-01	1.52E-01	2.17E-01	1.44E-01	2.55E-01	1.80E-01	2.64E-01	1.74E-01
Phenanthrene	ng/m^3	2.59E+00	7.13E-01	2.53E+00	1.94E+00	1.92E+00	2.59E+00	2.34E+00	7.13E-01	8.04E-01	1.25E+00
Pyrene	ng/m^3	6.18E-01	8.68E-02	4.34E-01	5.84E-01	4.16E-01	6.18E-01	1.28E-01	9.00E-02	1.32E-01	8.68E-02
Tetralin	ng/m^3	2.04E+00	7.56E-01	1.59E+00	1.00E+00	1.82E+00	1.76E+00	2.04E+00	7.56E-01	1.90E+00	9.72E-01
Total PAH	ng/m^3	5.34E+01	1.18E+01	5.33E+01	3.09E+01	4.44E+01	5.34E+01	4.94E+01	1.18E+01	2.72E+01	2.04E+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.

APPENDIX H
Dioxins and Furans Data Summary

Dioxins and Furans	Crago Station											
Location		Crago			Crago			Crago			Crago		
Date	dd/mm/yyyy	2/01/2018			26/01/2018			19/02/2018			15/03/2018		
Start Time	hh:mm	0:00			0:00			0:00			0:00		
Sample Duration	hours	23.69			23.95			23.84			23.09		
Technician		TZ			AE, TZ			AE			AE		
Filter Number		FSB015-01			FTJ433-01			FXQ365-01			GCK081-01		
Maxaam ID		FVT589			FZR825			GDD210			GHG805		
Maxxam Job #		B801260			B821697			B840443			B82183		
Total Volumetric Flow	Am^3/sample	352.82			346.07			293.73			283.74		
Analytical Results	Units	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF
2,3,7,8-Tetra CDD *	pg	<4.4	4.4	1	<3.5	3.5	1	<3.1	3.1	1	<3.0	3.0	1
1,2,3,7,8-Penta CDD *	pg	<4.6	4.6	1	4.7	3.4	1	<3.1	3.1	1	<3.2	3.2	1
1,2,3,4,7,8-Hexa CDD *	pg	<6.2	6.2	0.1	5.6	4.0	0.1	<3.4	3.4	0.1	<3.1	3.1	0.1
1,2,3,6,7,8-Hexa CDD *	pg	<6.3	6.3	0.1	10.0	3.1	0.1	<3.4	3.4	0.1	3.7	3.1	0.1
1,2,3,7,8,9-Hexa CDD *	pg	<5.6	5.6	0.1	17.4	3.4	0.1	6.4 (1)	3.2	0.1	6.6	2.9	0.1
1,2,3,4,6,7,8-Hepta CDD *	pg	26.3	4.0	0.01	121	3.4	0.01	24.6	3.1	0.01	35.9	3.3	0.01
Octa CDD *	pg	<77 (1)	77	0.0003	221	3.2	0.0003	76.3	3.1	0.0003	62.8	3.2	0.0003
Total Tetra CDD *	pg	<4.4	4.4		<4.2 (1)	4.2		<3.1	3.1		<3.4 (1)	3.4	
Total Penta CDD *	pg	<4.6	4.6		14.7	3.4		<3.1	3.1		<3.8 (1)	3.8	
Total Hexa CDD *	pg	11.0	6.0		77.7	3.5		20.2	3.4		48.3	3.0	
Total Hepta CDD *	pg	61.7	4.0		217	3.4		53.5	3.1		101	3.3	
2,3,7,8-Tetra CDF **	pg	<4.6	4.6	0.1	7.1	3.3	0.1	4.1	3.3	0.1	<2.5	2.5	0.1
1,2,3,7,8-Penta CDF **	pg	<4.8	4.8	0.03	<3.0	3.0	0.03	<3.2	3.2	0.03	<3.0	3.0	0.03
2,3,4,7,8-Penta CDF **	pg	<4.8	4.8	0.3	<3.1	3.1	0.3	<3.1	3.1	0.3	<3.0	3.0	0.3
1,2,3,4,7,8-Hexa CDF **	pg	<4.3	4.3	0.1	<3.8	3.8	0.1	<3.1	3.1	0.1	<3.3	3.3	0.1
1,2,3,6,7,8-Hexa CDF **	pg	<4.2	4.2	0.1	<3.0	3.0	0.1	<2.9	2.9	0.1	<3.1	3.1	0.1
2,3,4,6,7,8-Hexa CDF **	pg	<4.7	4.7	0.1	<3.5	3.5	0.1	<3.3	3.3	0.1	<3.5	3.5	0.1
1,2,3,7,8,9-Hexa CDF **	pg	<5.2	5.2	0.1	<4.1	4.1	0.1	<3.5	3.5	0.1	<3.7	3.7	0.1
1,2,3,4,6,7,8-Hepta CDF **	pg	<4.8	4.8	0.01	10.8	3.0	0.01	5.3	3.1	0.01	<2.7	2.7	0.01
1,2,3,4,7,8,9-Hepta CDF **	pg	<6.4	6.4	0.01	<3.8	3.8	0.01	<3.6	3.6	0.01	<3.1	3.1	0.01
Octa CDF **	pg	<6.0	6.0	0.0003	<11 (1)	11	0.0003	4.7	3.4	0.0003	<3.1	3.1	0.0003
Total Tetra CDF **	pg	<4.6	4.6		15.8	3.3		4.1	3.3		<2.5	2.5	
Total Penta CDF **	pg	<4.8	4.8		<6.6 (1)	6.6		<3.1	3.1		<3.0	3.0	
Total Hexa CDF **	pg	<4.6	4.6		6.3	3.5		<3.2	3.2		<3.4	3.4	
Total Hepta CDF **	pg	<5.5	5.5		10.8	3.4		5.3	3.3		<2.9	2.9	
Toxic Equivalency	pg												

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

Calculated Concentrations	Quarter 1			Crago 1	Crago 2	Crago 3	Crago 4
	Units	Maximum	Minimum	2/01/2018	26/01/2018	19/02/2018	15/03/2018
2,3,7,8-Tetra CDD *	pg/m^3	6.24E-03	5.06E-03	0.006	0.005	0.005	0.005
1,2,3,7,8-Penta CDD *	pg/m^3	1.36E-02	5.28E-03	0.007	0.014	0.005	0.006
1,2,3,4,7,8-Hexa CDD *	pg/m^3	1.62E-02	5.46E-03	0.009	0.016	0.006	0.005
1,2,3,6,7,8-Hexa CDD *	pg/m^3	2.89E-02	5.79E-03	0.009	0.029	0.006	0.013
1,2,3,7,8,9-Hexa CDD *	pg/m^3	5.03E-02	7.94E-03	0.008	0.050	0.022	0.023
1,2,3,4,6,7,8-Hepta CDD *	pg/m^3	3.50E-01	7.45E-02	0.075	0.350	0.084	0.127
Octa CDD *	pg/m^3	6.39E-01	1.09E-01	0.109	0.639	0.260	0.221
Total Tetra CDD *	pg/m^3	6.24E-03	5.28E-03	0.006	0.006	0.005	0.006
Total Penta CDD *	pg/m^3	4.25E-02	5.28E-03	0.007	0.042	0.005	0.007
Total Hexa CDD *	pg/m^3	2.25E-01	3.12E-02	0.031	0.225	0.069	0.170
Total Hepta CDD *	pg/m^3	6.27E-01	1.75E-01	0.175	0.627	0.182	0.356
2,3,7,8-Tetra CDF **	pg/m^3	2.05E-02	4.41E-03	0.007	0.021	0.014	0.004
1,2,3,7,8-Penta CDF **	pg/m^3	6.80E-03	4.33E-03	0.007	0.004	0.005	0.005
2,3,4,7,8-Penta CDF **	pg/m^3	6.80E-03	4.48E-03	0.007	0.004	0.005	0.005
1,2,3,4,7,8-Hexa CDF **	pg/m^3	6.09E-03	5.28E-03	0.006	0.005	0.005	0.006
1,2,3,6,7,8-Hexa CDF **	pg/m^3	5.95E-03	4.33E-03	0.006	0.004	0.005	0.005
2,3,4,6,7,8-Hexa CDF **	pg/m^3	6.66E-03	5.06E-03	0.007	0.005	0.006	0.006
1,2,3,7,8,9-Hexa CDF **	pg/m^3	7.37E-03	5.92E-03	0.007	0.006	0.006	0.007
1,2,3,4,6,7,8-Hepta CDF **	pg/m^3	3.12E-02	4.76E-03	0.007	0.031	0.018	0.005
1,2,3,4,7,8,9-Hepta CDF **	pg/m^3	9.07E-03	5.46E-03	0.009	0.005	0.006	0.005
Octa CDF **	pg/m^3	1.60E-02	5.46E-03	0.009	0.016	0.016	0.005
Total Tetra CDF **	pg/m^3	4.57E-02	4.41E-03	0.007	0.046	0.014	0.004
Total Penta CDF **	pg/m^3	9.54E-03	5.28E-03	0.007	0.010	0.005	0.005
Total Hexa CDF **	pg/m^3	1.82E-02	5.45E-03	0.007	0.018	0.005	0.006
Total Hepta CDF **	pg/m^3	3.12E-02	5.11E-03	0.008	0.031	0.018	0.005
Toxic Equivalency	pg/m^3						
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	3.78E-02	2.04E-02	0.022	0.038	0.020	0.021
Calculated TEQ Concentrations	**Units**			**Crago 1/2/2018**	**Crago 1/26/2018**	**Crago 2/19/2018**	**Crago 3/15/2018**
2,3,7,8-Tetra CDD *	pg TEQ/m^3			0.006	0.005	0.005	0.005
1,2,3,7,8-Penta CDD	pg TEQ/m^3			0.007	0.014	0.005	0.006
1,2,3,4,7,8-Hexa CDD	pg TEQ/m^3			0.0009	0.0016	0.0006	0.0005
1,2,3,6,7,8-Hexa CDD	pg TEQ/m^3			0.0009	0.0029	0.0006	0.0013
1,2,3,7,8,9-Hexa CDD	pg TEQ/m^3			0.0008	0.0050	0.0022	0.0023
1,2,3,4,6,7,8-Hepta CDD	pg TEQ/m^3			0.0007	0.0035	0.0008	0.0013
Octa CDD	pg TEQ/m^3			0.00003	0.00019	0.00008	0.00007
Total Tetra CDD	pg TEQ/m^3						
Total Penta CDD	pg TEQ/m^3						
Total Hexa CDD	pg TEQ/m^3						
Total Hepta CDD	pg TEQ/m^3						
2,3,7,8-Tetra CDF **	pg TEQ/m^3			0.0007	0.0021	0.0014	0.0004
1,2,3,7,8-Penta CDF	pg TEQ/m^3			0.0002	0.0001	0.0002	0.0002
2,3,4,7,8-Penta CDF	pg TEQ/m^3			0.002	0.001	0.002	0.002
1,2,3,4,7,8-Hexa CDF	pg TEQ/m^3			0.0006	0.0005	0.0005	0.0006
1,2,3,6,7,8-Hexa CDF	pg TEQ/m^3			0.0006	0.0004	0.0005	0.0005
2,3,4,6,7,8-Hexa CDF	pg TEQ/m^3			0.0007	0.0005	0.0006	0.0006
1,2,3,7,8,9-Hexa CDF	pg TEQ/m^3			0.0007	0.0006	0.0006	0.0007
1,2,3,4,6,7,8-Hepta CDF	pg TEQ/m^3			0.00007	0.00031	0.00018	0.00005
1,2,3,4,7,8,9-Hepta CDF	pg TEQ/m^3			0.00009	0.00005	0.00006	0.00005
Octa CDF	pg TEQ/m^3			0.000003	0.000005	0.000005	0.000002
Total Tetra CDF	pg TEQ/m^3						
Total Penta CDF	pg TEQ/m^3						
Total Hexa CDF	pg TEQ/m^3						
Total Hepta CDF	pg TEQ/m^3						
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3			0.022	0.038	0.020	0.021

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