REPORT

DURHAM YORK ENERGY CENTRE

COURTICE, ONTARIO

2019 Q3 AMBIENT AIR QUALITY MONITORING REPORT

RWDI #1803743

November 14, 2019

SUBMITTED TO:

The Director, Legislative Services-Regional Clerk or Designate,

The Regional Municipality of Durham
605 Rossland Road East, 1st Floor
Corporate Services-Legislative Services Division
Whitby, ON L1N 6A3

CC:

Lyndsay Waller
Lyndsay.Waller@durham.ca

Andrew Evans
Andrew.Evans@durham.ca

SUBMITTED BY:

John DeYoe, B.A.
Air Quality Specialist – Principal
John.DeYoe@rwdi.com

RWDI
Consulting Engineers & Scientists
600 Southgate Drive
Guelph, ON N1G 4P6
T: 519.823.1311
F: 519.823.1316

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1 INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by The Regional Municipality of Durham (Region of Durham) to conduct discrete and continuous air quality ambient monitoring at the Durham York Energy Centre (DYEC) monitoring stations. The facility address is 1835 Energy Drive, Clarington, Ontario. The DYEC is a facility that manages post diversion municipal solid waste from the Regions of Durham and York to create energy from waste combustion. Commercial operation of the DYEC commenced on February 1, 2016. The site location is shown below in Figure 1.

Condition 11 of the Environmental Assessment Notice of Approval and Condition 7(4) of the Environmental Compliance Approval (ECA) requires ambient air monitoring to be undertaken by the DYEC. An Ambient Air Monitoring and Reporting Plan was prepared and approved by the Ministry of Environment, Conservation and Parks (MECP) to satisfy these conditions. Two (2) monitoring stations were established to monitor ambient air quality around the DYEC and quantify the background ambient air quality levels and DYEC contributed emissions to ambient air quality levels.

This monitoring plan was developed based on the Regional Council mandate to provide ambient monitoring in the area of the DYEC. The purposes of the ambient monitoring program are to:

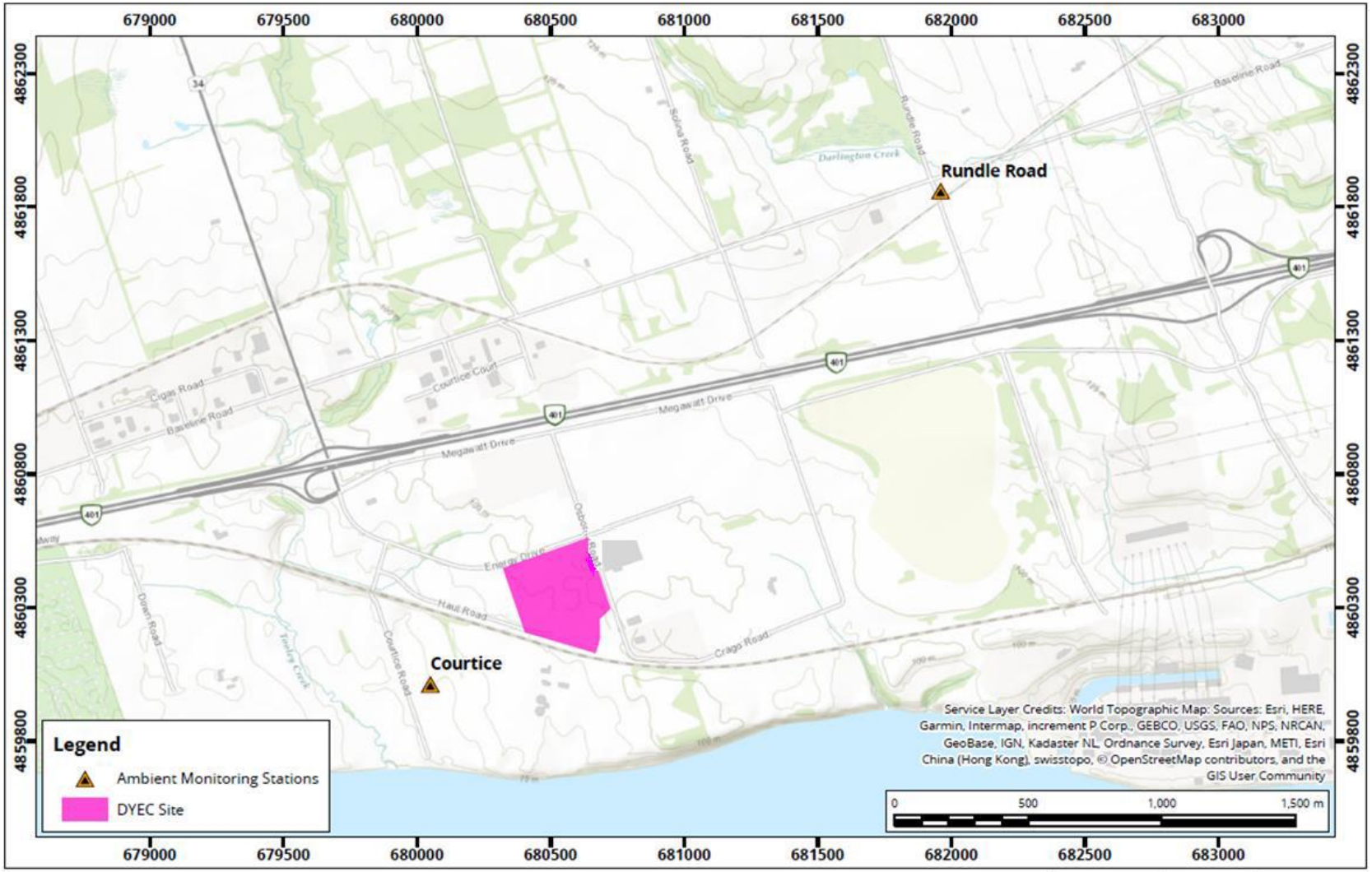
- Quantify any measurable ground level concentrations resulting from emissions from the DYEC cumulative to local air quality, including validating the predicted concentrations from the dispersion modelling conducted in the Environmental Assessment (2009a);
- Monitor concentration levels of EFW-related air contaminants in nearby residential areas; and,
- Quantify background ambient levels of air contaminants in the area.

The facility has two (2) monitoring stations which collect continuous and discrete ambient measurements, known as the Courtice Station and Rundle Road Station. The station locations are shown in Figure 1. The Courtice and Rundle Road Stations were operational in May of 2013 and have been operated on behalf of the Region of Durham by Stantec Consulting Ltd. since that time up until July 31, 2018. RWDI has overseen the operation of the stations on behalf of the Region of Durham since August 1, 2018.

The Courtice and Rundle Road Stations continuously monitor the following air quality parameters: Particulate Matter less than 2.5 microns (PM2.5), Nitrogen Oxides (NO_X) and Sulfur Dioxide (SO_2). In addition, both discretely monitor the following air quality parameters: Total Suspended Particulate (TSP), Metals, Dioxins and Furans (D&F) and Polycyclic Aromatic Hydrocarbons (PAHs).

Continuous meteorological data is collected at the Courtice and Rundle Road Stations. The Rundle Road Station collects the following meteorological parameters: wind speed, wind direction, ambient temperature, precipitation and relative humidity. The meteorological tower there, is approximately 10 meters tall. The Courtice Station collects the following meteorological parameters: ambient temperature, ambient pressure, precipitation and relative humidity. For purposes of this report, wind speed and wind direction data for the Courtice Station have been obtained from the adjacent Courtice Water Pollution Control Plant (WPCP) meteorological tower, which is approximately 20 meters tall.

Data recovery for all parameters measured was greater than 75% during the third quarter. This meets the quarter validity criteria. None of the measurements for any parameter were in excess of the Ambient Air Quality Criteria during the third quarter.



DYEC Site and Ambient Monitoring Station Locations

Map Projection: NAD 1983 UTM Zone 17N
DYEC - Region of Durham, Ontario

True North

Drawn by: DJH | Figure: 1
Approx. Scale: 1:20,000
Date Revised: Oct 25, 2018

Project #: 1803743

1.1 Sampling Locations

The Station sites were selected in consultation with MECP and Region of Durham representatives at the onset of the program and were chosen based on considerations of nearby receptors and agreeability with MECP siting criteria. The Courtice Station is predominantly upwind of the DYEC and is located on the Courtice WPCP property just southwest of the DYEC. The Rundle Road Station is predominantly downwind of the DYEC and is located just southeast of the intersection of Baseline Road and Rundle Road just northeast of the DYEC. Pictures of all two (2) Stations are presented as Figure 2 and 3.

Figure 2. Rundle Road Station

Figure 3. Courtice Station

2 SAMPLING METHODOLOGY

The Rundle Road and Courtice Stations are both equipped with the following continuous monitors: Thermo Scientific Model 5030 SHARP (Synchronized Hybrid Ambient Real-time Particulate) monitor ($PM_{2.5}$ analyzer), Teledyne Nitrogen Oxides Analyzer Model T200 (NO_X analyzer), and a Teledyne Sulfur Dioxide Analyzer Model T100 (SO_2 analyzer). Both Stations also have the following periodic monitors: High Volume (Hi-Vol) Air Sampler outfitted with a TSP inlet head as approved by the United States Environmental Protection Agency (U.S. EPA), and a Hi-Vol Air Sampler outfitted with a polyurethane foam plug and circular quartz filter for measuring PAH's and D&F's as approved by U.S. EPA.

2.1 Nitrogen Oxide Analyzers

The Teledyne T200 Nitrogen Oxide (NO_X) analyzers use chemiluminescence detection, coupled with microprocessor technology to provide sensitivity and stability for ambient air quality applications. The instrument determines real-time concentration of nitric oxide (NO), total nitrogen oxides (NO_X) (the sum of NO and NO_2), and nitrogen dioxide (NO_2). The amount of NO is measured by detecting the chemiluminescence reaction that occurs in the reaction cell when NO molecules are exposed to ozone (O_3). The NO and O_3 molecules collide in the reaction cell and enter a higher energy state. When these excited molecules return to a stable energy state, they emit a photon of light which is proportional to the amount of NO in the sample stream of gas entering the analyzer. To determine the total NO_X ($NO+NO_2$) measurement, sample gas is periodically bypassed through a heated molybdenum converter cartridge that converts any NO_2 molecules in the sample stream into NO (any existing NO molecules in the stream remain as is). The instrument will switch the sample stream through the converter periodically and then through the reaction cell where the same chemiluminescence reaction occurs with ozone. The resultant response produced is now the sum of NO and converted NO_2 producing a NO_X measurement. The resultant NO_2 determination is the NO_X measurement subtracted from the NO measurement.

The NO_X analyzers were zero and span checked daily using the internal zero and span (IZS) system and calibrated once a month using either EPA protocol span gases and a dilution system or an ESA permeation tube calibrator. Automatic IZS checks were performed on a daily basis commencing at approximately 1:45 on one day and ending at 02:10 the same day. The checks consisted of a 10-minute zero check, a 10-minute span check and a 5-minute purge. These checks provide a way to monitor daily performance of the analyzer using an external charcoal and purafil zeroing cartridge for the zero, and an internal permeation oven with a permeation tube for the span. These IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift.

The instrument collects data using its own data acquisition system (DAS) on a 5-minute interval. Data is collected from the instrument directly which is attached to an Envidas computer. The computer can be accessed remotely, and all instrument parameters can be examined as well as the measurement data. This allows the tracking of instrument performance. Data was also collected at 1-minute intervals by an external datalogger using analog output connections as a back-up. The measurement data was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria.

2.2 Sulphur Dioxide Analyzers

The Teledyne T100 Sulphur Dioxide (SO_2) Analyzer is a microprocessor-controlled analyzer that determines the concentration of SO_2 in a sample gas drawn through the instrument. In the sample chamber, sample gas is excited by ultraviolet light causing the SO_2 to absorb energy from the light and move to an active state (SO_2*). These active SO_2* molecules must decay into a stable state back to SO_2, and when this happens a photon of light is released which is recognized by the instrument as fluorescence. The instrument measures the amount of florescence to determine the amount of SO_2 present in the sample gas.

The SO_2 analyzers were zero and span checked daily using the IZS system and calibrated once a month using either EPA protocol span gases and a dilution system or an ESA permeation tube calibrator. Automatic IZS checks were performed on a daily basis commencing at approximately 1:45 on one day and ending at 02:10 the same day. The checks consisted of a 10-minute zero check, a 10-minute span check and a 5-minute purge. These checks provide a way to monitor daily performance of the analyzer using an external charcoal and purafil zeroing cartridge for the zero, and an internal permeation oven with a permeation tube for the span. These IZS checks are not for calibration purposes but are merely a diagnostic tool to identify instrument drift.

The instrument collects data using its own data acquisition system (DAS) on a 5-minute interval. Data is collected from the instrument directly which is attached to an Envidas computer. The computer can be accessed remotely, and all instrument parameters can be examined as well as the measurement data. This allows the tracking of instrument performance. Data was also collected at 1-minute intervals by an external datalogger using analog output connections as a back-up. The measurement data was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria.

2.3 SHARP 5030 $PM_{2.5}$ Analyzers

The SHARP 5030 is a hybrid nephelometric/radiometric particulate mass monitor capable of providing precise, real-time measurements with a superior detection limit. The SHARP incorporates a high sensitivity light scattering photometer whose output signal is continuously referenced to the time-averaged measurement of an integral beta attenuating mass sensor. The SHARP also incorporates a dynamic inlet heating system designed to maintain the relative humidity of the air passing through the filter tape constant.

The SHARP is calibrated once a month to ensure accuracy and validity of its data. The $PM_{2.5}$ inlet head and sharp cut cyclone is cleaned monthly as well to ensure proper performance. The monthly calibration process consists of the following: zeroing the nephelometer if necessary, calibration of ambient temperature, calibration of barometric pressure, and calibration of the flow.

The instrument collects data using its own data acquisition system (DAS) on a 5-minute interval. Data is collected from the instrument directly which is attached to an Envidas computer. The computer can be accessed remotely, and all instrument parameters can be examined as well as the measurement data. This allows the tracking of instrument performance. Data was also collected at 1-minute intervals by an external datalogger using analog output connections as a back-up. The measurement data was averaged using Envista processing software over a 1-hour and 24-hour period to compare to the applicable ambient air quality criteria.

2.4 TSP High Volume Air Samplers

The Tisch TE-5170 TSP (Total Suspended Particulate) high volumetric air samplers (Hi-Vols) were outfitted with a TSP inlet capable of collecting particulate of all aerodynamic diameters. Each Hi-Vol is equipped with a mass flow controller, which ensures a flow rate of 40 cubic feet per minute (CFM). The previous timer and chart recorder system has been replaced with an automated relay system controlled by a data logger to toggle the sampler on and off. The chart recorder system was replaced by a digital pressure transducer that records the blower output pressure (flow) during the sample duration. The Hi-Vols have Teflon coated glass fibre filters that are outfitted at the top of the sampler, and air is drawn through the filter, thereby collecting all TSP. All of the TSP Hi-Vols operate on a six-day cycle, each consisting of 24-hour (midnight to midnight) samples, concurrent with the National Air Pollution Surveillance (NAPS) schedule. Each Hi-Vol is calibrated monthly to ensure accuracy and validity of the volume of air drawn through the filter.

The Teflon coated glass fibre filter media was pre and post weighed by ALS Laboratories in Burlington, Ontario. The filters are then analyzed for total particulate weight, metals analysis and mercury.

2.5 Polyurethane Foam Samplers

The Dioxins, Furans, and PAH samples were collected using Tisch TE-1000 samplers which are listed as reference devices for U.S. EPA Methods TO-9 and TO-13. The samplers use a collection filter that is ‘backed-up’ by a polyurethane foam (PUF) plug. The airborne compounds present in the particulate phase are collected on the Teflon coated glass fibre filter and any compounds present in the vapour phase are absorbed in the PUF plug. At the start of August, the PUF media was changed to include two PUF plugs enclosing XAD material. This was a recommendation from ALS Laboratories to achieve lower detection limits due to the stability of the compounds being absorbed into the XAD material. Each PUF sampler is equipped with a blower which can sustain 8 cubic feet per minute (CFM) of flow over the sampling duration. The previous timer system has been replaced with an automated relay system controlled by a data logger to toggle the sampler on and off. A digital pressure transducer that records the blower output pressure (flow) during the sample duration was also added. All PUF samplers operate on a twelve-day cycle, each consisting of 24-hour (midnight to midnight) samples, concurrent with the NAPS schedule. Every twelve days, the PUF plugs and filters are analyzed for PAH’s, and every twenty-four days they are analyzed for both PAH’s and D&F’s. Each PUF sampler is calibrated monthly to ensure accuracy and validity of the volume of air drawn through the filters.

The filter and PUF media/glassware is proofed and analyzed by ALS Laboratories in Burlington, Ontario. The filters and PUF/XAD plugs are then analyzed for PAH’s and D&F’s.

2.6 Meteorological Towers

Meteorological data was collected from the Rundle and Courtice Stations. This is done so that a vector could be associated with the applicable contaminant concentrations. The Rundle and Courtice Stations are outfitted with a Campbell Scientific HMP60 Temperature / Relative Humidity probe, and a Texas Instruments TE525M rain gauge. Meteorological data was collected at 1-minute intervals and was averaged using Envista processing software over a 1-hour period.

3 AIR QUALITY CRITERIA AND STANDARDS

The monitored contaminant concentrations were compared to air quality criteria and standards set by the MECP and by Environment Canada. The MECP developed Ambient Air Quality Criteria (AAQCs) which are the maximum desirable concentrations in the outdoor air, based on effects to the environment and health (MECP, 2012). Not all contaminants have an applicable regulatory limit; therefore, other criteria were used for comparison. These included human health risk assessment (HHRA) criteria. For $PM_{2.5}$, Environment Canada has established a Canadian Ambient Air Quality Standard (CAAQS) (Environment Canada, 2013). CAAQS are health-based air quality objectives for the outdoor air. The current CAAQS' for $PM_{2.5}$ are 28 µg/m^3 for the 3-year average of annual 98th percentile 24-hour concentration, and 10 µg/m^3 for the 3-year average of annual average concentrations (in effect as of 2015). Since the 24-hour and annual CAAQS are based on the average of three calendar years of data, it should be noted that these standards do not apply to the quarterly data presented in this report.

All applicable criteria and standards are shown in the 'Summary of Ambient Measurements' section of this report.

4 MECP AUDITS

There was no MECP audit during Q3.

5 SUMMARY OF AMBIENT MEASUREMENTS

Ambient air quality monitoring results for all contaminants sampled at the Courtice and Rundle Road Stations are discussed herein. Summary statistics from July 1, 2019 to Sep 30, 2019 are presented in a summary format below and in a more detailed matrix format in **Appendix A** for continuous measurements and **Appendix B** for discrete measurements.

5.1 Meteorological Station Results

5.1.1 Courtice Station Results

The Courtice Station collected the following meteorological parameters: relative humidity, ambient temperature, ambient pressure and precipitation. For purposes of this report, wind speed and wind direction data for the Courtice Station have been obtained from the adjacent Courtice Water Pollution Control Plant (WPCP) meteorological tower, which is approximately 20 meters tall. The Courtice Station maintained a minimum 100% of data collection for all of the parameters measured during Q3. It should be noted that the wind direction data from the Courtice station has been configured as blowing to as opposed to the more common blowing from configuration. The raw Courtice wind direction data is adjusted from a “blowing to” configuration to a “blowing from” configuration. Hourly statistics from the meteorological station are presented in Table 1. A wind rose showing trends in wind speed and wind direction during Q3 is provided in **Figure 4**.

The winds at both stations was dominated by a west south-west flow which is typical for the summer months in this area. The distribution at the Courtice station was somewhat more diversified, likely due to land-lake air flows.

Annual calibration of wind head check was performed on May 24, 2019 along with hi-vols, tipping bucket, temperature, RH and pressure sensor.

Table 1: Hourly Statistics from the Courtice WPCP Meteorological Station

Courtice Station MET Statistics	Maximum 1 hr Mean					Minimum 1 hr Mean					Monthly Mean					Total	% valid hours					
Parameter	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	Rain	WS	WD	Temp	RH	Pres	Rain
Units	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	mm	(%)					
July	29	30	98	30.0	20.0	0	14	32	29.4	0.0	7	21	74	30	0.1	99.1	100.0	100.0	100.0	100.0	100.0	100.0
August	27	25	98	30.0	8.9	0	12	34	29.3	0.0	10	20	72	30	0.1	55.0	100.0	100.0	100.0	100.0	100.0	100.0
September	31	25	97	30.2	6.8	0	8	45	29.0	0.0	10	17	76	30	0.1	46.0	100.0	100.0	99.3	99.3	99.3	99.3
Q3 Arithmetic Mean											9	19	74	30	0.1	200.1	100.0	100.0	99.8	99.8	99.8	99.8

5.1.2 Rundle Road Station Results

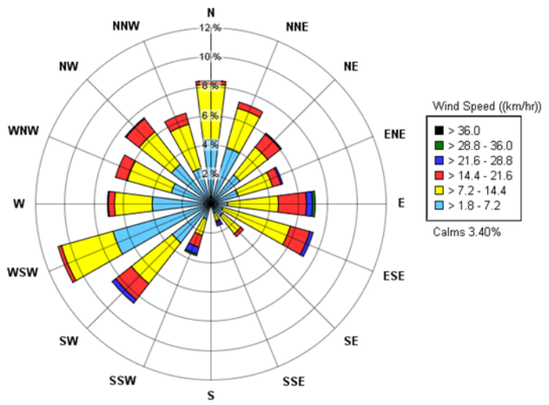
The Rundle Road Station collected the following meteorological parameters: wind speed, wind direction, relative humidity, ambient temperature and precipitation. The meteorological tower at the station is at a height of approximately 10 meters tall. The Rundle Road Station maintained a minimum 95.1% data collection for all of the meteorological parameters measured during Q3. Hourly statistics from the meteorological station is presented in Table 2. A wind rose showing trends in wind speed and wind direction during Q3 is provided in **Figure 4**.

Annual calibration was performed on May 24, 2019 for tipping bucket, temperature, RH and hi-vols.

Table 2: Hourly Statistics from the Rundle Road Meteorological Station

Rundle Station MET Statistics	**Maximum 1 hr Mean**				**Minimum 1 hr Mean**				**Monthly Mean**				**Total**	**% Valid Hours**				
Parameter	WS	Temp	RH	Rain	WS	Temp	RH	Rain	WS	Temp	RH	Rain	Rain	WS	WD	Temp	RH	Rain
Units	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	mm	(%)				
July	21	31	98	11.3	0	12	33	0.0	7	22	74	0.1	43.0	100.0	100.0	100.0	100.0	100.0
August	22	27	98	6.1	0	11	36	0.0	7	20	73	0.0	26.1	99.9	87.8	100.0	100.0	99.9
September	21	26	98	3.0	0	7	44	0.0	7	16	80	0.0	33.5	100.0	82.2	100.0	100.0	100.0
Q3 Arithmetic Mean									7	19	75	0.0	102.7	100.0	90.1	100.0	100.0	100.0

Courtice Station Wind Rose	Rundle Station Wind Rose



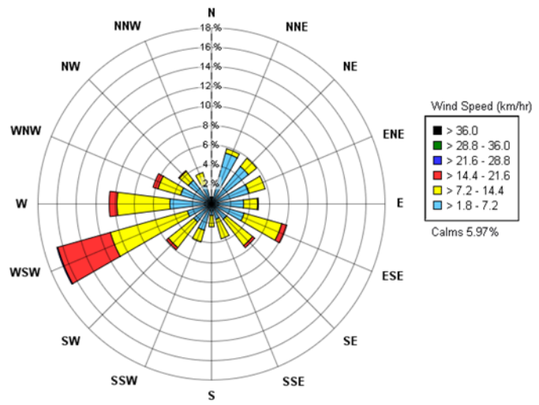


Figure 4. Wind Roses of Hourly Wind Speed and Wind Direction – July to September 2019

5.2 NOX, SO2 and PM2.5 Summary Table Results

Table 3 provides a summary of Maximum 1-hour Means, Maximum 24-hour Means, Monthly Means, Quarterly Means and Percent valid data for Courtice Station. Table 4 provides a summary of Maximum 1-hour Means, Maximum 24-hour Means, Monthly Means, Quarterly Means and Percent valid data for Rundle Station. Table 5 provides a summary of Exceedance Statistics for both Courtice and Rundle Stations. There were no exceedances for any parameters at either station during this quarter.

Table 3: Summary of Percent Valid Data for Courtice Station

Courtice Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Running Average					Monthly Mean					% Valid Hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
July	35	50	36	26	25	17	17	8	10	5	8	5	1	4	2	99.9	99.7	99.7	99.7	99.5
August	25	42	21	26	58	11	13	4	9	8	5	5	1	4	1	99.9	98.8	98.8	98.8	99.7
September	42	59	42	23	38	14	23	13	12	8	5	8	3	5	2	99.7	99.4	99.4	99.4	85.4
Q3 Arithmetic Mean											6	6	2	4	2	99.8	99.3	99.3	99.3	94.9

[A] The 24-hour $PM_{2.5}$ criterion applies to the 98^{th} percentile over 3 consecutive years.

Table 4: Summary of Percent Valid Data for Rundle Road Station

Rundle Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Running Average					Monthly Mean					% Valid Hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
July	28	39	22	17	35	17	10	4	7	6	7	4	1	3	1	99.9	99.7	99.7	99.7	99.7
August	22	26	14	20	31	12	10	2	9	4	5	3	1	2	1	100.0	99.7	99.7	99.7	99.2
September	22	22	12	13	22	13	9	3	8	4	4	3	1	2	0	99.6	99.6	99.6	99.6	99.6
Q3 Arithmetic Mean											5	3	1	3	1	99.8	99.7	99.7	99.7	100

[A] The 24-hour $PM_{2.5}$ criterion applies to the 98th percentile over 3 consecutive years

Table 5: Summary of Exceedance Statistics

Event Statistics	Mean > 1 hr AAQC for Courtice Monitoring Station			Mean > 1 hr AAQC for Rundle Monitoring Station			Rolling Mean > 24 hr AAQC for Courtice Monitoring Station			Rolling Mean > 24 hr AAQC for Rundle Monitoring Station		
Compound	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2
Units	No.			No.			No.			No.		
July		0	0		0	0	N/A	0	0	N/A	0	0
August		0	0		0	0	N/A	0	0	N/A	0	0
September		0	0		0	0	N/A	0	0	N/A	0	0
Q3 Arithmetic Mean		0	0		0	0	N/A	0	0	N/A	0	0

5.3 Oxides of Nitrogen Results

5.3.1 Courtice Station Results

Data recovery levels were high for oxides of nitrogen (99.3% valid data). Monitoring results were compared to the AAQC for NO_2 only, as it is the only parameter that has AAQC values for 1-hour and 24-hour averaging periods (there are no AAQC's for NO or NO_X). There were no exceedances above the AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest NO_2 value seen among the 1-hour averages was 26 ppb, which is 13.0% of the AAQC. The highest NO_2 value seen among the rolling 24-hour averages was 12 ppb, which is 12% of the AAQC. The measurements are summarized in Table 3 above. A pollution rose is presented in **Figure 5** for the Courtice Station during Q3 composed of hourly average NO_2 concentrations. A pollution rose indicates the percentage of time that the wind originates from a given direction coupled with the pollutant measurement for that time in either ppb or micrograms per meter cubed. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution rose from the Courtice Station shows some NO_2 impacts from the west to the east northeast with a heavy predominance from the north vector, which probably is related to roadway traffic. There is a lobe from the east-northeast which may be from the DYEC or more likely from other traffic activity in that direction.

5.3.2 Rundle Road Station Results

Data recovery levels were high for oxides of nitrogen (99.70 valid data). There were no exceedances above the AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest NO_2 value seen among the 1-hour averages was 20 ppb, which is 10 % of the AAQC. The highest NO_2 value seen among the rolling 24-hour averages was 9 ppb, which is 9% of the AAQC. The measurements are summarized in Table 4 above. A pollution rose is presented in **Figure 5** for the Rundle Road Station during Q3 composed of hourly average NO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated NO_2 events at the Rundle Station occurred when winds were from the south-west which is fairly consistent with the general distribution of the winds and is in line with high traffic areas and urban background.

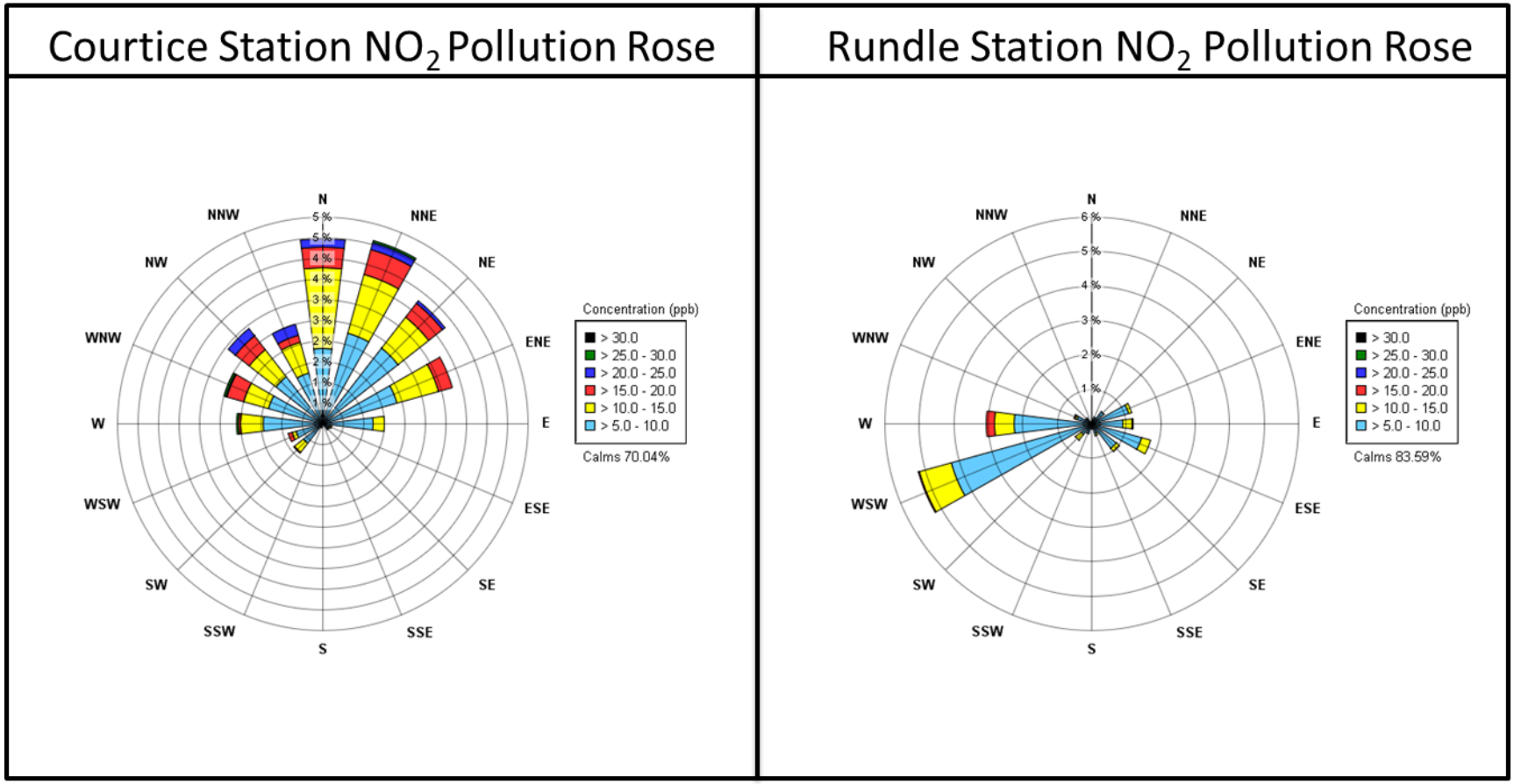


Figure 5. Pollution Roses of Hourly Average NO_2 Concentrations – July to September 2019

5.4 Sulphur Dioxide Results

5.4.1 Courtice Station Results

Data recovery levels were high for sulphur dioxide (94.9% valid data). Monitoring results were compared to the AAQC for 1-hour and 24-hour averaging periods. There were no exceedances above these AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest SO_2 value seen among the 1-hour averages was 58 ppb, which is 23.2% of the AAQC. The highest SO_2 value seen among the 24-hour averages was 8 ppb, which is 8% of the AAQC. The results are summarized in Table 3 above. A pollution rose is presented in **Figure 6** for the Courtice Station during Q3 composed of hourly average SO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

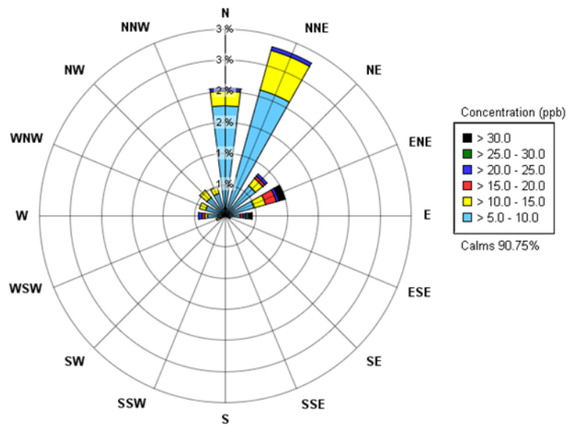
The pollution wind rose below shows that the majority of elevated SO_2 events at Courtice occurred from the north through north-northeast. The results were possibly related to emissions from the waste water treatment plant, roadway emission, the DYEC and other industrial sources in the area. These elevated levels are well below the AAQC criteria.

5.4.2 Rundle Road Station Results

Data recovery levels were high for sulphur dioxide (100% valid data). Monitoring results were compared to the AAQC for 1-hour and 24-hour averaging periods. There were no exceedances above these AAQC values for the entirety of the sampling period for 1-hour and 24-hour averaged data. The highest SO_2 value seen among the 1-hour averages was 35 ppb, which is 14.0% of the AAQC. The highest SO_2 value seen among the 24-hour averages was 6 ppb, which is 6% of the AAQC. The results are summarized in Table 4 above. A pollution rose is presented in **Figure 6** for the Rundle Road Station during Q3 composed of hourly average SO_2 concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 ppb were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated SO_2 events at the Rundle Station occurred when winds were from the east south east and southeast. The pollution wind rose indicates that the DYEC was a not major contributor to SO_2 levels at the station and that the levels may be related to other industrial activity.

Courtice Station SO_2 Pollution Rose



Rundle Station SO_2 Pollution Rose

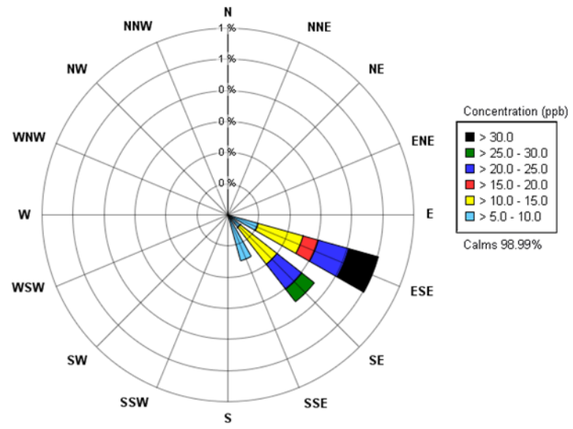


Figure 6. Pollution Roses of Hourly Average SO_2 Concentrations July to September

5.5 Fine Particulate Matter ($PM_{2.5}$) Results

5.5.1 Courtice Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.8% valid data). There is no 1-hour AAQC or standard for $PM_{2.5}$, but there is a 24-hour CAAQS standard of 28 µg/m^3 for the 3-year average of annual 98th percentile 24-hour concentrations, and 10 µg/m^3 for the 3-year average of annual average concentrations (in effect as of 2015). Note that since the reported data has not surpassed the 3-year average, the CAAQS' for $PM_{2.5}$ was not applicable to the data. The highest $PM_{2.5}$ value seen among the 1-hour averages was 42 µg/m^3 and the highest value seen among the rolling 24-hour averages was 17 µg/m^3. The results are summarized in Table 3 above. A pollution rose is presented in **Figure 7** for the Courtice Station during Q3 composed of hourly average $PM_{2.5}$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 µg/m^3 were omitted from the graphic wind rose representation.

The pollution rose below shows that the majority of elevated $PM_{2.5}$ events at Courtice were fairly similar to the general distribution of winds. Elevated $PM_{2.5}$ measurements were related to urban background, roadway emissions, possibly emissions from the DYEC and other nearby industrial sources. All the impacts are well below the criteria values.

5.5.2 Rundle Road Station Results

Data recovery levels were high for particulate matter less than 2.5 microns (99.8% valid data). The highest $PM_{2.5}$ value seen among the 1-hour averages was 28 µg/m^3 and the highest value seen among the rolling 24-hour averages was 17 µg/m^3. The results are summarized in Table 4 above. A pollution rose is presented in **Figure 7** for the Rundle Road Station during Q3 composed of hourly average $PM_{2.5}$ concentrations. In order to show where possible major sources of pollutants are coming from, levels below 5 µg/m^3 were omitted from the graphic wind rose representation.

The pollution wind rose below shows that the majority of elevated $PM_{2.5}$ events at the Rundle Station occurred when winds were from the west south-west direction and followed the general distribution of wind angles. The elevated $PM_{2.5}$ measurements were related to nearby roadway construction, highway activity, urban background and possibly DYEC emissions. All concentrations were well below criteria levels.

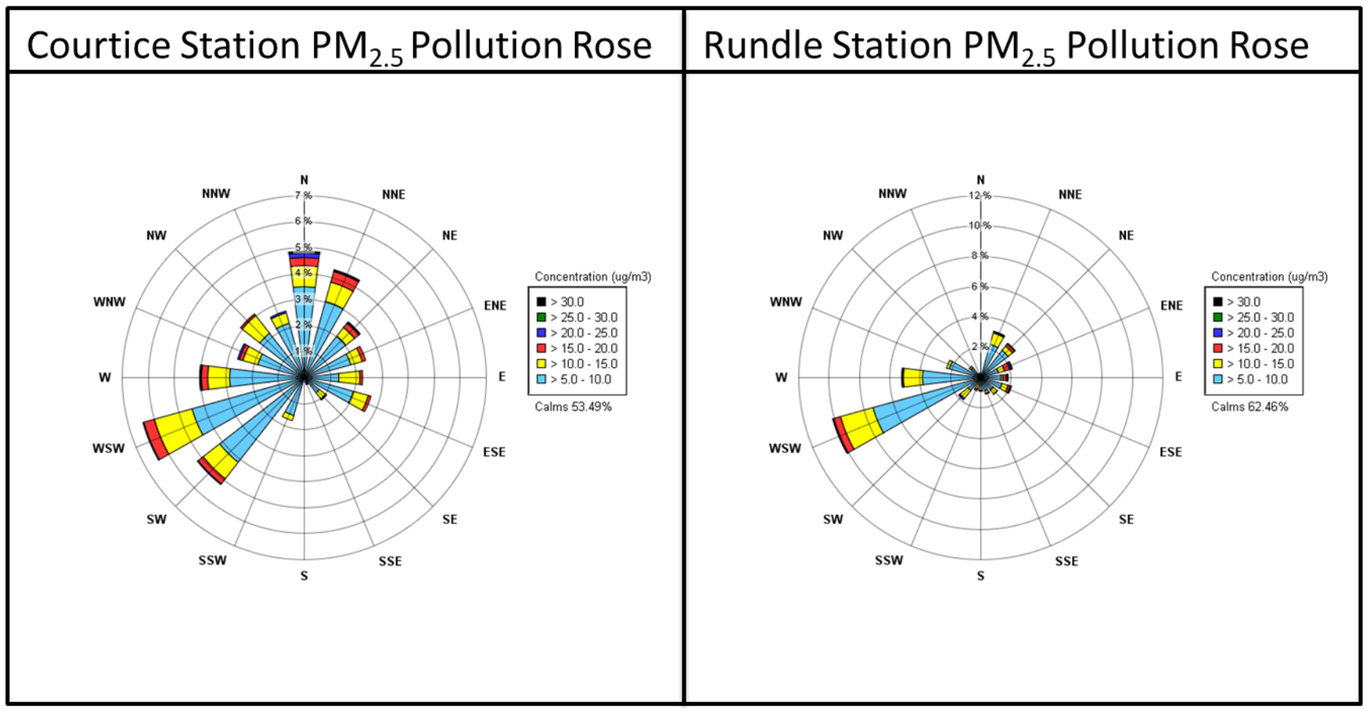


Figure 7. Pollution Roses of Hourly Average $PM_{2.5}$ Concentrations – July to September 2019

5.6 TSP and Metals Hi-Vol Results

All of the TSP Hi-Vols operated on a discrete schedule every 6 days according to the NAPS schedule during Q3 with the sample days being: July 2, 8, 14, 20, 26, August 1, 7, 13, 19, 25, 31, and September 6, 12, 18, 24, 30 2019.

5.6.1 Courtice Station Results

Data recovery levels were high for the TSP sampler at the Courtice Station (94% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q3. Table 6 is a summary of the statistics for this station.

Table 6: Summary of TSP Sampler Courtice Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid Data
Particulate (TSP)	µg/m³	*120*	*120*	0	27.36	30.72	8.77	57.63	46.26	43.16	57.63	15	94
Total Mercury (Hg)	µg/m³	*2*	*2*	0	1.73E-05	2.98E-05	1.46E-08	6.97E-05	4.50E-05	6.97E-05	3.88E-05	15	94
Aluminum (Al)	µg/m³	*4.8*	-	0	1.10E-01	1.23E-01	6.31E-02	2.96E-01	2.20E-01	2.96E-01	1.53E-01	15	94
Antimony (Sb)	µg/m³	*25*	*25*	0	8.88E-04	9.83E-04	4.40E-04	2.55E-03	1.33E-03	1.16E-03	2.55E-03	15	94
Arsenic (As)	µg/m³	*0.3*	*0.3*	0	1.02E-03	1.07E-03	9.20E-04	2.75E-03	9.68E-04	2.75E-03	9.62E-04	15	94
Barium (Ba)	µg/m³	*10*	*10*	0	8.52E-03	9.53E-03	3.89E-03	2.23E-02	2.23E-02	1.39E-02	1.38E-02	15	94
Beryllium (Be)	µg/m³	*0.01*	*0.01*	0	3.17E-05	3.17E-05	3.07E-05	3.23E-05	3.23E-05	3.23E-05	3.21E-05	15	94
Bismuth (Bi)	µg/m³	-	-	-	6.06E-04	6.27E-04	5.52E-04	1.42E-03	1.42E-03	5.81E-04	5.77E-04	15	94
Boron (B)	µg/m³	*120*	-	0	1.27E-02	1.27E-02	1.23E-02	1.29E-02	1.29E-02	1.29E-02	1.28E-02	15	94
Cadmium (Cd)	µg/m³	*0.025*	*0.025*	0	6.35E-04	6.35E-04	6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.41E-04	15	94
Chromium (Cr)	µg/m³	*0.5*	-	0	3.09E-03	3.43E-03	1.57E-03	5.35E-03	5.35E-03	4.85E-03	3.94E-03	15	94
Cobalt (Co)	µg/m³	*0.1*	*0.1*	0	6.35E-04	6.35E-04	6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.41E-04	15	94
Copper (Cu)	µg/m³	*50*	-	0	1.82E-02	2.29E-02	5.92E-03	5.65E-02	5.65E-02	5.52E-02	2.90E-02	15	94
Iron (Fe)	µg/m³	*4*	-	0	3.20E-01	3.53E-01	1.80E-01	6.58E-01	6.58E-01	6.32E-01	4.73E-01	15	94
Lead (Pb)	µg/m³	*0.5*	*0.5*	0	1.76E-03	2.01E-03	9.26E-04	3.74E-03	3.35E-03	3.74E-03	3.06E-03	15	94
Magnesium (Mg)	µg/m³	-	-	-	2.17E-01	2.32E-01	1.20E-01	3.81E-01	3.81E-01	3.56E-01	2.88E-01	15	94
Manganese (Mn)	µg/m³	*0.4*	-	0	8.79E-03	1.00E-02	3.90E-03	2.06E-02	2.06E-02	1.65E-02	1.21E-02	15	94
Molybdenum (Mo)	µg/m³	*120*	-	0	6.33E-04	7.39E-04	3.14E-04	1.35E-03	1.23E-03	1.35E-03	1.13E-03	15	94
Nickel (Ni)	µg/m³	*0.2*	-	0	9.99E-04	1.02E-03	9.20E-04	2.00E-03	2.00E-03	9.68E-04	9.62E-04	15	94
Phosphorus (P)	µg/m³	-	-	-	1.42E+00	1.55E+00	2.39E-01	2.02E+00	2.02E+00	1.99E+00	1.71E+00	15	94
Selenium (Se)	µg/m³	*10*	*10*	0	3.17E-03	3.17E-03	3.07E-03	3.23E-03	3.23E-03	3.23E-03	3.21E-03	15	94
Silver (Ag)	µg/m³	*1*	*1*	0	3.17E-04	3.17E-04	3.07E-04	3.23E-04	3.23E-04	3.23E-04	3.21E-04	15	94
Strontium (Sr)	µg/m³	*120*	-	0	4.77E-03	5.47E-03	2.09E-03	1.20E-02	1.20E-02	8.77E-03	7.56E-03	15	94
Thallium (Tl)	µg/m³	-	-	-	2.86E-05	2.86E-05	2.76E-05	2.90E-05	2.90E-05	2.90E-05	2.88E-05	15	94
Tin (Sn)	µg/m³	*10*	*10*	0	5.58E-04	6.36E-04	3.09E-04	1.61E-03	1.61E-03	7.74E-04	8.33E-04	15	94
Titanium (Ti)	µg/m³	*120*	-	0	5.28E-03	6.51E-03	3.40E-03	1.84E-02	1.42E-02	1.84E-02	1.03E-02	15	94
Uranium (Ur)	µg/m³	*1.5*	-	0	3.17E-05	3.17E-05	3.07E-05	3.23E-05	3.23E-05	3.23E-05	3.21E-05	15	94
Vanadium (V)	µg/m³	*2*	*1*	0	1.59E-03	1.59E-03	1.53E-03	1.61E-03	1.61E-03	1.61E-03	1.60E-03	15	94
Zinc (Zn)	µg/m³	*120*	-	0	2.53E-02	2.68E-02	1.25E-02	4.54E-02	4.54E-02	3.97E-02	2.46E-02	15	94
Zirconium (Zr)	µg/m³	*20*	-	0	6.35E-04	6.35E-04	6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.41E-04	15	94

Note: All non-detectable results were reported as 1/2 of the detection limit

5.6.2 Rundle Road Station Results

Data recovery levels were high for the TSP sampler at the Rundle Road Station (94% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for TSP, mercury or metals during Q3. Table 7 is a summary of the statistics for this station.

Table 7: Summary of TSP Sampler Rundle Road Station

Contaminant	Units	MECP Criteria	HHRA Health Based Criteria	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid Data
Particulate (TSP)	µg/m³	*120*	*120*	0	27.0	29.3	12.2	55.4	55.4	31.9	52.6	15	94
Total Mercury (Hg)	µg/m³	*2*	*2*	0	9.40E-06	2.83E-05	6.22E-09	6.10E-05	3.12E-05	6.10E-05	4.30E-05	15	94
Aluminum (Al)	µg/m³	*4.8*	-	0	1.12E-01	1.21E-01	5.48E-02	2.75E-01	2.75E-01	1.73E-01	1.37E-01	15	94
Antimony (Sb)	µg/m³	*25*	*25*	0	6.22E-04	8.61E-04	2.69E-04	4.81E-03	1.39E-03	7.39E-04	4.81E-03	15	94
Arsenic (As)	µg/m³	*0.3*	*0.3*	0	9.53E-04	9.53E-04	9.32E-04	9.68E-04	9.62E-04	9.68E-04	9.55E-04	15	94
Barium (Ba)	µg/m³	*10*	*10*	0	7.82E-03	8.71E-03	4.33E-03	2.67E-02	2.67E-02	1.15E-02	1.03E-02	15	94
Beryllium (Be)	µg/m³	*0.01*	*0.01*	0	3.18E-05	3.18E-05	3.11E-05	3.23E-05	3.21E-05	3.23E-05	3.18E-05	15	94
Bismuth (Bi)	µg/m³	-	-	-	6.09E-04	6.32E-04	5.59E-04	1.46E-03	1.46E-03	5.81E-04	5.73E-04	15	94
Boron (B)	µg/m³	*120*	-	0	1.27E-02	1.27E-02	1.24E-02	1.29E-02	1.28E-02	1.29E-02	1.27E-02	15	94
Cadmium (Cd)	µg/m³	*0.025*	*0.025*	0	6.36E-04	6.36E-04	6.21E-04	6.45E-04	6.41E-04	6.45E-04	6.37E-04	15	94
Chromium (Cr)	µg/m³	*0.5*	-	0	3.32E-03	3.54E-03	1.55E-03	5.29E-03	5.29E-03	4.42E-03	4.28E-03	15	94
Cobalt (Co)	µg/m³	*0.1*	*0.1*	0	6.36E-04	6.36E-04	6.21E-04	6.45E-04	6.41E-04	6.45E-04	6.37E-04	15	94
Copper (Cu)	µg/m³	*50*	-	0	2.52E-02	2.96E-02	9.62E-03	6.47E-02	5.64E-02	6.47E-02	4.27E-02	15	94
Iron (Fe)	µg/m³	*4*	-	0	2.81E-01	3.02E-01	1.63E-01	7.13E-01	7.13E-01	3.96E-01	3.47E-01	15	94
Lead (Pb)	µg/m³	*0.5*	*0.5*	0	1.22E-03	1.35E-03	9.32E-04	3.44E-03	3.44E-03	1.91E-03	9.55E-04	15	94
Magnesium (Mg)	µg/m³	-	-	-	2.11E-01	2.24E-01	1.40E-01	5.03E-01	5.03E-01	3.57E-01	2.08E-01	15	94
Manganese (Mn)	µg/m³	*0.4*	-	0	7.88E-03	8.71E-03	4.14E-03	2.29E-02	2.29E-02	1.13E-02	8.99E-03	15	94
Molybdenum (Mo)	µg/m³	*120*	-	0	8.48E-04	9.53E-04	3.18E-04	1.60E-03	1.35E-03	1.60E-03	1.24E-03	15	94
Nickel (Ni)	µg/m³	*0.2*	-	0	1.00E-03	1.03E-03	9.32E-04	2.10E-03	2.10E-03	9.68E-04	9.55E-04	15	94
Phosphorus (P)	µg/m³	-	-	-	1.52E+00	1.65E+00	2.33E-01	2.15E+00	2.09E+00	2.15E+00	2.09E+00	15	94
Selenium (Se)	µg/m³	*10*	*10*	0	3.18E-03	3.18E-03	3.11E-03	3.23E-03	3.21E-03	3.23E-03	3.18E-03	15	94
Silver (Ag)	µg/m³	*1*	*1*	0	3.18E-04	3.18E-04	3.11E-04	3.23E-04	3.21E-04	3.23E-04	3.18E-04	15	94
Strontium (Sr)	µg/m³	*120*	-	0	4.54E-03	4.98E-03	2.87E-03	1.32E-02	1.32E-02	8.47E-03	5.53E-03	15	94
Thallium (Tl)	µg/m³	-	-	-	2.86E-05	2.86E-05	2.80E-05	2.90E-05	2.88E-05	2.90E-05	2.87E-05	15	94
Tin (Sn)	µg/m³	*10*	*10*	0	4.44E-04	5.09E-04	3.11E-04	1.34E-03	1.34E-03	8.28E-04	7.55E-04	15	94
Titanium (Ti)	µg/m³	*120*	-	0	5.05E-03	5.92E-03	3.46E-03	1.59E-02	1.59E-02	8.92E-03	1.06E-02	15	94
Uranium (Ur)	µg/m³	*1.5*	-	0	3.18E-05	3.18E-05	3.11E-05	3.23E-05	3.21E-05	3.23E-05	3.18E-05	15	94
Vanadium (V)	µg/m³	*2*	*1*	0	1.59E-03	1.59E-03	1.55E-03	1.61E-03	1.60E-03	1.61E-03	1.59E-03	15	94
Zinc (Zn)	µg/m³	*120*	-	0	1.77E-02	2.01E-02	1.06E-02	5.16E-02	4.87E-02	5.16E-02	2.02E-02	15	94
Zirconium (Zr)	µg/m³	*20*	-	0	6.36E-04	6.36E-04	6.21E-04	6.45E-04	6.41E-04	6.45E-04	6.37E-04	15	94

Note: All non-detectable results were reported as 1/2 of the detection limit

5.7 PAH Results

All of the PUF Hi-Vols operated on a discrete schedule every 12 days for PAH's according to the NAPS schedule during Q3 with the sample days being: July 8, 20, August 1, 13, 25, and September 6, 18, 30 2019.

5.7.1 Courtice Station Results

Data recovery levels were high for the PAH results at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the PAH's during Q3. Table 8 is a summary of the statistics for this station.

Table 8: Statistics Summary of PAH Results for Courtice Station

Contaminant	MECP Criteria (µg/m³)	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	12000	0	6.639	2.464	14.596	9.731	14.596	6.074	8	100
2-Methylnaphthalene	10000	0	10.582	3.839	23.509	14.776	23.509	8.926	8	100
Acenaphthene	-	-	4.768	0.334	10.093	7.403	10.093	3.558	8	100
Acenaphthylene	3500	0	0.197	0.042	0.437	0.316	0.437	0.075	8	100
Anthracene	200	0	0.219	0.057	0.398	0.301	0.398	0.191	8	100
Benzo(a)Anthracene	-	-	0.011	0.006	0.024	0.024	0.014	0.008	8	100
Benzo(a)fluorene	-	-	0.026	0.013	0.042	0.042	0.037	0.027	8	100
Benzo(a)Pyrene (Historically High)	0.05	0	0.012	0.001	0.027	0.027	0.016	0.021	8	100
Benzo(b)Fluoranthene	-	-	0.019	0.000	0.043	0.039	0.043	0.017	8	100
Benzo(b)fluorene	-	-	0.014	0.006	0.034	0.034	0.016	0.012	8	100
Benzo(e)Pyrene	-	-	0.012	0.003	0.026	0.026	0.015	0.010	8	100
Benzo(g,h,i)Perylene	-	-	0.017	0.003	0.040	0.021	0.040	0.012	8	100
Benzo(k)Fluoranthene	-	-	0.020	0.004	0.037	0.028	0.037	0.022	8	100
Biphenyl	-	-	2.292	0.940	5.031	2.684	5.031	2.060	8	100
Chrysene	-	-	0.043	0.026	0.077	0.077	0.048	0.042	8	100
Dibenzo(a,h)Anthracene	-	-	0.006	0.000	0.032	0.004	0.032	0.003	8	100
Fluoranthene	-	-	0.694	0.424	1.230	0.764	1.230	0.580	8	100
Indeno(1,2,3-cd)Pyrene	-	-	0.015	0.002	0.036	0.019	0.036	0.010	8	100
Naphthalene	22500	0	26.010	10.158	48.137	37.910	48.137	21.902	8	100
o-Terphenyl	-	-	0.009	0.006	0.015	0.015	0.010	0.010	8	100
Perylene	-	-	0.001	0.000	0.004	0.004	0.001	0.001	8	100
Phenanthrene	-	-	4.312	1.487	8.665	5.881	8.665	3.589	8	100
Pyrene	-	-	0.329	0.228	0.565	0.343	0.565	0.287	8	100
Tetralin	-	-	3.596	1.474	7.800	6.388	5.155	7.800	8	100
Fluorene[1]			2.886	2.886	2.886	0.000	2.886	0.000	1	13
Total PAH	-	-	60.203	23.956	117.891	86.702	117.891	49.037	8	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] Fluorene reported only once on August 25 sampling event. The fluorene levels below instrument response were not listed on the analytical reports.

5.7.2 **Rundle Road Station Results**

Data recovery levels were high for the PAH results at the Rundle Road Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the PAH's during Q3. Table 9 is a summary of the statistics for this station.

Table 9: Statistics Summary of PAH Results for Rundle Road Station

Contaminant	MECP Criteria (µg/m³)	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	*12000*	0	9.346	2.145	16.060	14.433	16.060	9.734	8	100
2-Methylnaphthalene	*10000*	0	16.722	3.670	29.371	23.067	29.371	15.083	8	100
Acenaphthene	-	-	9.590	0.882	17.980	14.200	17.980	6.877	8	100
Acenaphthylene	*3500*	0	0.221	0.026	0.531	0.531	0.531	0.191	8	100
Anthracene	*200*	0	0.968	0.127	1.851	1.802	1.851	0.215	8	100
Benzo(a)Anthracene	-	-	0.013	0.004	0.031	0.031	0.021	0.007	8	100
Benzo(a)fluorene	-	-	0.067	0.017	0.120	0.111	0.120	0.027	8	100
Benzo(a)Pyrene	*0.05*	0	0.013	0.000	0.033	0.033	0.014	0.029	8	100
Benzo(b)Fluoranthene	-	-	0.021	0.000	0.056	0.056	0.056	0.022	8	100
Benzo(b)fluorene	-	-	0.032	0.009	0.071	0.071	0.050	0.010	8	100
Benzo(e)Pyrene	-	-	0.014	0.000	0.029	0.029	0.024	0.011	8	100
Benzo(g,h,i)Perylene	-	-	0.020	0.000	0.057	0.057	0.057	0.016	8	100
Benzo(k)Fluoranthene	-	-	0.026	0.002	0.059	0.059	0.059	0.009	8	100
Biphenyl	-	-	3.731	0.761	5.530	4.700	5.530	3.136	8	100
Chrysene	-	-	0.079	0.026	0.152	0.152	0.109	0.046	8	100
Dibenzo(a,h)Anthracene	-	-	0.007	0.000	0.035	0.035	0.035	0.002	8	100
Fluoranthene	-	-	2.893	0.502	4.735	4.533	4.735	1.638	8	100
Indeno(1,2,3-cd)Pyrene	-	-	0.019	0.000	0.055	0.055	0.055	0.012	8	100
Naphthalene	*22500*	0	26.989	7.576	53.667	53.667	37.748	21.761	8	100
o-Terphenyl	-	-	0.009	0.005	0.019	0.019	0.011	0.007	8	100
Perylene	-	-	0.001	0.000	0.005	0.005	0.001	0.001	8	100
Phenanthrene	-	-	11.945	1.906	24.007	20.000	24.007	9.269	8	100
Pyrene	-	-	1.239	0.230	2.040	1.873	2.040	0.711	8	100
Tetralin	-	-	6.933	1.461	36.000	36.000	3.576	2.070	8	100
Fluorene[1]			6.867	6.867	6.867	0.000	6.867	0.000	1	13
Total PAH	-	-	90.425	19.426	160.310	160.310	143.466	70.856	8	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] Fluorene reported only once on August 25 sampling event. The fluorene levels below instrument response were not listed on the analytical reports.

5.8 Dioxin and Furan Results

All of the PUF Hi-Vols operated on a discrete schedule every 24 days for D&F's according to the NAPS schedule during Q3 with the sample days being: July 8, August 1, August 25, and September 18, 2019.

5.8.1 Courtice Station Results

Data recovery levels were acceptable for the D&F results at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q3. Table 10 is a summary of the statistics for this station.

Table 10: Courtice Station Q3 Monitoring Results for Dioxins and Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	MECP Criteria (µg/m³)	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid Data
2,3,7,8-TCDD	pg/m³	-	-	-	-	1.37E-03	6.62E-04	2.90E-03	1.03E-03	2.90E-03	8.74E-04	4	100
1,2,3,7,8-PeCDD	pg/m³	-	-	-	-	1.29E-03	2.62E-04	3.10E-03	3.10E-03	1.14E-03	6.44E-04	4	100
1,2,3,4,7,8-HxCDD	pg/m³	-	-	-	-	2.61E-04	8.13E-05	4.15E-04	3.67E-04	4.15E-04	8.13E-05	4	100
1,2,3,6,7,8-HxCDD	pg/m³	-	-	-	-	2.42E-04	7.36E-05	4.33E-04	4.33E-04	3.85E-04	7.36E-05	4	100
1,2,3,7,8,9-HxCDD	pg/m³	-	-	-	-	3.90E-04	7.67E-05	8.31E-04	5.76E-04	8.31E-04	7.67E-05	4	100
1,2,3,4,6,7,8-HpCDD	pg/m³	-	-	-	-	2.75E-04	7.21E-05	5.08E-04	2.50E-04	5.08E-04	7.21E-05	4	100
OCDD	pg/m³	-	-	-	-	2.76E-05	2.07E-05	3.90E-05	2.60E-05	3.90E-05	2.07E-05	4	100
2,3,7,8-TCDF	pg/m³	-	-	-	-	1.27E-04	6.90E-05	2.12E-04	2.12E-04	1.54E-04	6.90E-05	4	100
1,2,3,7,8-PeCDF	pg/m³	-	-	-	-	4.07E-05	2.12E-05	6.27E-05	6.27E-05	5.37E-05	2.12E-05	4	100
2,3,4,7,8-PeCDF	pg/m³	-	-	-	-	4.74E-04	1.93E-04	1.27E-03	1.27E-03	2.26E-04	1.93E-04	4	100
1,2,3,4,7,8-HxCDF	pg/m³	-	-	-	-	2.10E-04	4.48E-05	3.88E-04	3.88E-04	2.31E-04	1.78E-04	4	100
1,2,3,6,7,8-HxCDF	pg/m³	-	-	-	-	1.65E-04	9.26E-05	2.15E-04	1.94E-04	2.15E-04	1.60E-04	4	100
2,3,4,6,7,8-HxCDF	pg/m³	-	-	-	-	2.26E-04	4.01E-05	5.61E-04	5.61E-04	2.31E-04	7.06E-05	4	100
1,2,3,7,8,9-HxCDF	pg/m³	-	-	-	-	1.81E-04	8.59E-05	2.84E-04	2.84E-04	2.62E-04	8.59E-05	4	100
1,2,3,4,6,7,8-HpCDF	pg/m³	-	-	-	-	5.87E-05	2.30E-05	1.43E-04	1.43E-04	3.80E-05	2.30E-05	4	100
1,2,3,4,7,8,9-HpCDF	pg/m³	-	-	-	-	2.42E-05	5.40E-06	4.63E-05	4.63E-05	3.54E-05	9.82E-06	4	100
OCDF	pg/m³	-	-	-	-	3.65E-06	6.94E-07	6.82E-06	6.82E-06	3.86E-06	3.21E-06	4	100
Total Toxic Equivalency	pg TEQ/m³	*0.1 1*[1]	-	0.1	0	5.14E-03	1.78E-03	8.96E-03	8.96E-03	5.31E-03	1.78E-03	4	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

5.8.2 **Rundle Road Station Results**

Data recovery levels were acceptable for the D&F results at the Courtice Station (100% valid data). There were no exceedances of any of the AAQC's or HHRA Criteria for any of the D&F's during Q3. Table 11 is a summary of the statistics for this station.

Table 11: Rundle Road Station Q3 Monitoring Results for Dioxins and Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	MECP Criteria (µg/m³)	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid Data
2,3,7,8-TCDD	pg/m³	-	-	-	-	9.65E-04	5.94E-04	1.83E-03	7.50E-04	1.83E-03	6.81E-04	4	100
1,2,3,7,8-PeCDD	pg/m³	-	-	-	-	5.86E-04	2.33E-04	1.02E-03	1.02E-03	5.61E-04	5.32E-04	4	100
1,2,3,4,7,8-HxCDD	pg/m³	-	-	-	-	1.63E-04	4.49E-05	3.13E-04	3.13E-04	2.15E-04	4.49E-05	4	100
1,2,3,6,7,8-HxCDD	pg/m³	-	-	-	-	1.79E-04	4.15E-05	4.07E-04	4.07E-04	1.98E-04	4.15E-05	4	100
1,2,3,7,8,9-HxCDD	pg/m³	-	-	-	-	2.07E-04	4.65E-05	5.07E-04	5.07E-04	1.98E-04	4.65E-05	4	100
1,2,3,4,6,7,8-HpCDD	pg/m³	-	-	-	-	2.43E-04	7.44E-05	3.66E-04	2.17E-04	3.66E-04	7.44E-05	4	100
OCDD	pg/m³	-	-	-	-	2.27E-05	9.18E-06	3.52E-05	2.26E-05	3.52E-05	9.18E-06	4	100
2,3,7,8-TCDF	pg/m³	-	-	-	-	4.60E-05	6.50E-06	6.83E-05	6.83E-05	5.28E-05	5.65E-05	4	100
1,2,3,7,8-PeCDF	pg/m³	-	-	-	-	2.31E-05	2.50E-06	6.00E-05	6.00E-05	1.44E-05	1.54E-05	4	100
2,3,4,7,8-PeCDF	pg/m³	-	-	-	-	2.32E-04	1.29E-04	3.65E-04	3.65E-04	2.95E-04	1.40E-04	4	100
1,2,3,4,7,8-HxCDF	pg/m³	-	-	-	-	1.79E-04	5.15E-05	3.57E-04	3.57E-04	2.48E-04	5.15E-05	4	100
1,2,3,6,7,8-HxCDF	pg/m³	-	-	-	-	1.73E-04	5.50E-05	3.40E-04	3.40E-04	2.31E-04	6.64E-05	4	100
2,3,4,6,7,8-HxCDF	pg/m³	-	-	-	-	2.35E-04	1.00E-04	4.47E-04	4.47E-04	2.48E-04	1.46E-04	4	100
1,2,3,7,8,9-HxCDF	pg/m³	-	-	-	-	1.99E-04	7.33E-05	3.60E-04	3.60E-04	2.81E-04	8.14E-05	4	100
1,2,3,4,6,7,8-HpCDF	pg/m³	-	-	-	-	4.67E-05	2.48E-05	1.06E-04	1.06E-04	2.83E-05	2.76E-05	4	100
1,2,3,4,7,8,9-HpCDF	pg/m³	-	-	-	-	2.15E-05	5.83E-06	4.40E-05	4.40E-05	2.97E-05	6.48E-06	4	100
OCDF	pg/m³	-	-	-	-	2.69E-06	1.39E-06	5.62E-06	5.62E-06	1.93E-06	1.81E-06	4	100
Total Toxic Equivalency	pg TEQ/m³	*0.1 1*[1]	-	0.1	0	3.52E-03	2.02E-03	5.39E-03	5.39E-03	3.43E-03	2.02E-03	4	100

Note: All non-detectable results were reported as 1/2 of the detection limit
[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

6 DATA REQUESTS

The following sections outline any instrumentation issues encountered that have caused data loss at any of the monitors at each of the stations.

Appendix C contains monthly IZS zero trends for the NO_X and SO_2 analyzers at the Courtice and Rundle Road Stations.

Edit logs identifying missing data, maintenance times, calibrations and any other missing data have been included in **Appendix D**.

6.1 Courtice Road Station

On August 26, 2019 the NOx unit removed due to excessively high calibration slopes and was replaced with another NOx unit.

September 23, 2019 SO2 analyzer was swapped out due to low overnight span and significant jump in UV output.

6.2 Rundle Road Station

There were no issues with Rundle Road Station during Q3.

7 CONCLUSIONS

This Q3 report provides a summary of the ambient air quality data collected at the Courtice and Rundle Road Stations. Throughout this monitoring period, there were no exceedances of the AAQC, and HHRA Health Based Criteria. Data recovery rates were acceptable and valid for all measured Q3 parameters.

8 REFERENCES

1. Canadian Council of Ministers of the Environment, 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

2. Environment Canada, 2013. Canadian Ambient Air Quality Standards. [Online]

3. Ontario Ministry of the Environment and Climate Change, 2012. [Standards Development Branch] Ontario's Ambient Air Quality Criteria (Sorted by Contaminant Name). PIBS #6570e01

APPENDIX A

Table A1: 2019 Summary Statistics for Q3

Courtice Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Running Average					Monthly Mean					% valid hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
July	35	50	36	26	25	17	17	8	10	5	8	5	1	4	2	99.9	99.7	99.7	99.7	99.5
August	25	42	21	26	58	11	13	4	9	8	5	5	1	4	1	99.9	98.8	98.8	98.8	99.7
September	42	59	42	23	38	14	23	13	12	8	5	8	3	5	2	99.7	99.4	99.4	99.4	85.4
Q3 Arithmetic Mean											6	6	2	4	2	99.8	99.3	99.3	99.3	94.9

Rundle Monitoring Station Data Statistics	Maximum 1 hr Mean					Maximum 24 hr Running Average					Monthly Mean					% valid hours				
Compound	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2	$PM_{2.5}$	NO_x	NO	NO_2	SO_2
Units	($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				($\mu g/m^3$)	ppb				(%)				
AAQC				200	250	28[A]			100	100										
July	28	39	22	17	35	17	10	4	7	6	7	4	1	3	1	99.9	99.7	99.7	99.7	99.7
August	22	26	14	20	31	12	10	2	9	4	5	3	1	2	1	100.0	99.7	99.7	99.7	99.2
September	22	22	12	13	22	13	9	3	8	4	4	3	1	2	0	99.6	99.6	99.6	99.6	99.6
Q3 Arithmetic Mean											5	3	1	3	1	99.8	99.7	99.7	99.7	100

Event Statistics	Mean > 1 hr AAQC for			Mean > 1 hr AAQC for			Rolling Mean > 24 hr			Rolling Mean > 24 hr		
Compound	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2	$PM_{2.5}$	NO_2	SO_2
Units	No.			No.			No.			No.		
July		0	0		0	0	N/A	0	0	N/A	0	0
August		0	0		0	0	N/A	0	0	N/A	0	0
September		0	0		0	0	N/A	0	0	N/A	0	0
Q3 Total		0	0		0	0	N/A	0	0	N/A	0	0

Courtice Station MET Statistics	Maximum 1 hr Mean					Minimum 1 hr Mean					Monthly Mean					Total	% valid hours					
Parameter	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	WS	Temp	RH	Pres	Rain	Rain	WS	WD	Temp	RH	Pres	Rain
Units	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	(km/hr)	(°C)	(%)	"Hg	mm	mm	(%)					
July	29	30	98	30.0	20.0	0	14	32	29.4	0.0	7	21	74	30	0.1	99.1	100.0	100.0	100.0	100.0	100.0	100.0
August	27	25	98	30.0	8.9	0	12	34	29.3	0.0	10	20	72	30	0.1	55.0	100.0	100.0	100.0	100.0	100.0	100.0
September	31	25	97	30.2	6.8	0	8	45	29.0	0.0	10	17	76	30	0.1	46.0	100.0	100.0	99.3	99.3	99.3	99.3
Q3 Arithmetic Mean											9	19	74	30	0.1	200.1	100.0	100.0	99.8	99.8	99.8	99.8

Rundle Station MET Statistics	Maximum 1 hr Mean				Minimum 1 hr Mean				Monthly Mean				Total	% valid hours				
Parameter	WS	Temp	RH	Rain	WS	Temp	RH	Rain	WS	Temp	RH	Rain	Rain	WS	WD	Temp	RH	Rain
Units	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	(km/hr)	(°C)	(%)	mm	mm	(%)				
July	21	31	98	11.3	0	12	33	0.0	7	22	74	0.1	43.0	100.0	100.0	100.0	100.0	100.0
August	22	27	98	6.1	0	11	36	0.0	7	20	73	0.0	26.1	99.9	87.8	100.0	100.0	99.9
September	21	26	98	3.0	0	7	44	0.0	7	16	80	0.0	33.5	100.0	82.2	100.0	100.0	100.0
Q3 Arithmetic Mean									7	19	75	0.0	102.7	100.0	90.1	100.0	100.0	100.0

Table A2: 2019 Q3 Station Courtice Monitoring Results for $PM_{2.5}$

Data Statistics	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	(ug/m^3)	(ug/m^3)	(ug/m^3)	No.	%
July	N/A	8	35	17	743	99.9
August	N/A	5	25	11	743	99.9
September	N/A	5	42	14	718	99.7

Table A3: 2019 Q3 Station Rundle Monitoring Results for $PM_{2.5}$

Data Statistics	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$	$PM_{2.5}$
	No.	(ug/m^3)	(ug/m^3)	(ug/m^3)	No.	%
July	N/A	7	28	17	743	99.9
August	N/A	5	22	12	744	100.0
September	N/A	4	22	13	717	99.6

Table A4: 2019 Q3 Station Courtice Monitoring Results for NOx

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	N/A	N/A	5	50	17	742	99.7
August	N/A	N/A	5	42	13	735	98.8
September	N/A	N/A	8	59	23	716	99.4

Table A5: 2019 Q3 Station Rundle Monitoring Results for NOx

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x	NO_x
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	N/A	N/A	4	39	10	742	99.7
August	N/A	N/A	3	26	10	742	99.7
September	N/A	N/A	3	22	9	717	99.6

Table A6: 2019 Q3 Station Courtice Monitoring Results for NO

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO	NO	NO	NO	NO	NO	NO
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	N/A	N/A	1	36	8	742	99.7
August	N/A	N/A	1	21	4	735	98.8
September	N/A	N/A	3	42	13	716	99.4

Table A7: 2018 Q3 Station Rundle Monitoring Results for NO

Data Statistics	Events > 1 hr AAQC	Events > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO	NO	NO	NO	NO	NO	NO
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	N/A	N/A	1	22	4	742	99.7
August	N/A	N/A	1	14	2	742	99.7
September	N/A	N/A	1	12	3	717	99.6

Table A8: 2019 Q3 Station Courtice Monitoring Results for NO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	0	0	4	26	10	742	99.7
August	0	0	4	26	9	735	98.8
September	0	0	5	23	12	716	99.4

Table A9: 2019 Q3 Station Rundle Monitoring Results for NO_2

Data Statistics	Events > 1 hr AAQC	Rolling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2	NO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	0	0	3	17	7	742	99.7
August	0	0	2	20	9	742	99.7
September	0	0	2	13	8	717	99.6

Table A10: 2019 Q3 Station Courtice Monitoring Results for SO_2

Data Statistics	Events > 1 hr AAQC	Rollling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	0	0	2.4	25	5	740	99.5
August	0	0	1.5	58	8	742	99.7
September	0	0	2.3	38	8	615	85.4

Table A11: 2019 Q3 Station Rundle Monitoring Results for SO_2

Data Statistics	Events > 1 hr AAQC	Rollling Mean > 24 hr AAQC	Arithmetic Mean	Maximum 1 hr Mean	Maximum 24 hr Rolling Mean	Number of valid Hours	% valid data
Month	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2	SO_2
	No.	No.	(ppb)	(ppb)	(ppb)	No.	%
July	0	0	1.2	35	6	742	99.7
August	0	0	0.5	31	4	738	99.2
September	0	0	0.3	22	4	717	99.6

Table A12: 2019 Q3 Courtice Meterological Station Windspeed Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Wind Speed	Wind Speed	Wind Speed	Wind Speed
	(km/hr)	(km/hr)	(km/hr)	(%)
July	29	0	7	100.0
August	27	0	10	100.0
September	31	0	10	100.0

Table A13: 2018 Q3 Rundle Meterological Station Windspeed Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Wind Speed	Wind Speed	Wind Speed	Wind Speed
	(km/hr)	(km/hr)	(km/hr)	(%)
July	21	0	7	100.0
August	22	0	7	99.9
September	21	0	7	100.0

Table A14: 2019 Q3 Courtice Meterological Station Wind Direction Data Summary

MET Statistics	% valid hours
Month	Wind Direction
	(%)
July	100.0
August	100.0
September	100.0

Table A15: 2019 Q3 Rundle Meterological Station Wind Direction Data Summary

MET Statistics	% valid hours
Month	Wind Direction
	(%)
July	100.0
August	87.8
September	82.2

Table A16: 2019 Q3 Courtice Meterological Station Temperature Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Temperature	Temperature	Temperature	Temperature
	(°C)	(°C)	(°C)	(%)
July	30	14	21	100.0
August	25	12	20	100.0
September	25	8	17	99.3

Table A17: 2019 Q3 Rundle Meterological Station Temperature Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Temperature	Temperature	Temperature	Temperature
	(°C)	(°C)	(°C)	(%)
July	31	12	22	100.0
August	27	11	20	100.0
September	26	7	16	100.0

Table A18: 2019 Q3 Courtice Meterological Station Relative Humidity Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	% valid hours
Month	Relative Humidity	Relative Humidity	Relative Humidity	Relative Humidity
	(%)	(%)	(%)	(%)
July	98	32	74	100.0
August	98	34	72	100.0
September	97	45	76	99.3

Table A19: 2019 Q3 Rundle Meterological Station Relative Humidity Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	% valid hours
Month	Relative Humidity	Relative Humidity	Relative Humidity	Relative Humidity
	(%)	(%)	(%)	(%)
July	98	33	74	100.0
August	98	36	73	100.0
September	98	44	80	100.0

Table A20: 2019 Q3 Courtice Meterological Station Precipitation Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	Total	% valid hours
Month	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation
	(mm)	(mm)	(mm)	(mm)	(mm)
July	20.0	0.0	0.1	99.1	100.0
August	8.9	0.0	0.1	55.0	100.0
September	6.8	0.0	0.1	46.0	99.3

Table A21: 2019 Q3 Rundle Meterological Station Precipitation Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Monthly Mean	Total	% valid hours
Month	Precipitation	Precipitation	Precipitation	Precipitation	Precipitation
	(mm)	(mm)	(mm)	(mm)	(mm)
July	11.3	0.0	0.1	43.0	100.0
August	6.1	0.0	0.0	26.1	99.9
September	3.0	0.0	0.0	33.5	100.0

Table A22: 2019 Q3 Courtice Meterological Station Pressure Data Summary

MET Statistics	Maximum 1 hr Mean	Minimum 1 hr	Quarterly Mean	% valid hours
Month	Pressure	Pressure	Pressure	Pressure
	(mmHg)	(mmHg)	(mmHg)	(%)
July	30.0	29.4	29.7	100.0
August	30.0	29.3	29.7	100.0
September	30.2	29.0	29.9	99.3

APPENDIX B

Table B1: Summary of Sample Flow Rate and Sample Duration for Dioxins & Furans

Sample Date	Courtice			Rundle		
	Filter ID	Sample Duration	Sample Volume	Filter ID	Sample Duration	Sample Volume
	No.	(min)	(m^3)	No.	(min)	(m^3)
July 8, 2019	L2308172-1	1451	335	L2308172-2	1435	300
August 1, 2019	L2324643-1	1452	325	L2324643-2	1429	303
August 25, 2019	L2338107-2	1449	324	L2338107-1	1428	300
September 18, 2019	L2352677-2	1448	306	L2352677-1	1433	301

Table B2: 2019 Courtice Station Q3 Monitoring Results for Dioxins & Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	8-Jul-19	1-Aug-19	25-Aug-19	18-Sep-19	MECP Criteria (µg/m^3)	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	pg/m^3	-	-	1.03E-03	6.62E-04	2.90E-03	8.74E-04	-	-	1.37E-03	6.62E-04	2.90E-03	1.03E-03	2.90E-03	8.74E-04	4	100
1,2,3,7,8-PeCDD	pg/m^3	-	-	3.10E-03	1.14E-03	2.62E-04	6.44E-04	-	-	1.29E-03	2.62E-04	3.10E-03	3.10E-03	1.14E-03	6.44E-04	4	100
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	3.67E-04	4.15E-04	1.79E-04	8.13E-05	-	-	2.61E-04	8.13E-05	4.15E-04	3.67E-04	4.15E-04	8.13E-05	4	100
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	4.33E-04	3.85E-04	7.72E-05	7.36E-05	-	-	2.42E-04	7.36E-05	4.33E-04	4.33E-04	3.85E-04	7.36E-05	4	100
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	5.76E-04	8.31E-04	7.72E-05	7.67E-05	-	-	3.90E-04	7.67E-05	8.31E-04	5.76E-04	8.31E-04	7.67E-05	4	100
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	2.50E-04	5.08E-04	2.71E-04	7.21E-05	-	-	2.75E-04	7.21E-05	5.08E-04	2.50E-04	5.08E-04	7.21E-05	4	100
OCDD	pg/m^3	-	-	2.60E-05	3.90E-05	2.46E-05	2.07E-05	-	-	2.76E-05	2.07E-05	3.90E-05	2.60E-05	3.90E-05	2.07E-05	4	100
2,3,7,8-TCDF	pg/m^3	-	-	2.12E-04	7.08E-05	1.54E-04	6.90E-05	-	-	1.27E-04	6.90E-05	2.12E-04	2.12E-04	1.54E-04	6.90E-05	4	100
1,2,3,7,8-PeCDF	pg/m^3	-	-	6.27E-05	2.54E-05	5.37E-05	2.12E-05	-	-	4.07E-05	2.12E-05	6.27E-05	6.27E-05	5.37E-05	2.12E-05	4	100
2,3,4,7,8-PeCDF	pg/m^3	-	-	1.27E-03	2.26E-04	2.04E-04	1.93E-04	-	-	4.74E-04	1.93E-04	1.27E-03	1.27E-03	2.26E-04	1.93E-04	4	100
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	3.88E-04	2.31E-04	4.48E-05	1.78E-04	-	-	2.10E-04	4.48E-05	3.88E-04	3.88E-04	2.31E-04	1.78E-04	4	100
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	1.94E-04	2.15E-04	9.26E-05	1.60E-04	-	-	1.65E-04	9.26E-05	2.15E-04	1.94E-04	2.15E-04	1.60E-04	4	100
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	5.61E-04	2.31E-04	4.01E-05	7.06E-05	-	-	2.26E-04	4.01E-05	5.61E-04	5.61E-04	2.31E-04	7.06E-05	4	100
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	2.84E-04	2.62E-04	9.26E-05	8.59E-05	-	-	1.81E-04	8.59E-05	2.84E-04	2.84E-04	2.62E-04	8.59E-05	4	100
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	1.43E-04	3.08E-05	3.80E-05	2.30E-05	-	-	5.87E-05	2.30E-05	1.43E-04	1.43E-04	3.80E-05	2.30E-05	4	100
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	4.63E-05	3.54E-05	5.40E-06	9.82E-06	-	-	2.42E-05	5.40E-06	4.63E-05	4.63E-05	3.54E-05	9.82E-06	4	100
OCDF	pg/m^3	-	-	6.82E-06	3.86E-06	6.94E-07	3.21E-06	-	-	3.65E-06	6.94E-07	6.82E-06	6.82E-06	3.86E-06	3.21E-06	4	100
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1* [1]	-	0.009	5.31E-03	4.52E-03	1.78E-03	0.1	0	5.14E-03	1.78E-03	8.96E-03	8.96E-03	5.31E-03	1.78E-03	4	100

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

Table B3: 2019 Rundle Station Q3 Monitoring Results for Dioxins & Furans

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	8-Jul-19	1-Aug-19	25-Aug-19	18-Sep-19	MECP Criteria (µg/m^3)	No. > Criteria	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
2,3,7,8-TCDD	pg/m^3	-	-	7.50E-04	5.94E-04	1.83E-03	6.81E-04	-	-	9.65E-04	5.94E-04	1.83E-03	7.50E-04	1.83E-03	6.81E-04	4	100
1,2,3,7,8-PeCDD	pg/m^3	-	-	1.02E-03	5.61E-04	2.33E-04	5.32E-04	-	-	5.86E-04	2.33E-04	1.02E-03	1.02E-03	5.61E-04	5.32E-04	4	100
1,2,3,4,7,8-HxCDD	pg/m^3	-	-	3.13E-04	2.15E-04	7.83E-05	4.49E-05	-	-	1.63E-04	4.49E-05	3.13E-04	3.13E-04	2.15E-04	4.49E-05	4	100
1,2,3,6,7,8-HxCDD	pg/m^3	-	-	4.07E-04	1.98E-04	7.00E-05	4.15E-05	-	-	1.79E-04	4.15E-05	4.07E-04	4.07E-04	1.98E-04	4.15E-05	4	100
1,2,3,7,8,9-HxCDD	pg/m^3	-	-	5.07E-04	1.98E-04	7.50E-05	4.65E-05	-	-	2.07E-04	4.65E-05	5.07E-04	5.07E-04	1.98E-04	4.65E-05	4	100
1,2,3,4,6,7,8-HpCDD	pg/m^3	-	-	2.17E-04	3.66E-04	3.13E-04	7.44E-05	-	-	2.43E-04	7.44E-05	3.66E-04	2.17E-04	3.66E-04	7.44E-05	4	100
OCDD	pg/m^3	-	-	2.26E-05	3.52E-05	2.37E-05	9.18E-06	-	-	2.27E-05	9.18E-06	3.52E-05	2.26E-05	3.52E-05	9.18E-06	4	100
2,3,7,8-TCDF	pg/m^3	-	-	6.83E-05	5.28E-05	6.50E-06	5.65E-05	-	-	4.60E-05	6.50E-06	6.83E-05	6.83E-05	5.28E-05	5.65E-05	4	100
1,2,3,7,8-PeCDF	pg/m^3	-	-	6.00E-05	1.44E-05	2.50E-06	1.54E-05	-	-	2.31E-05	2.50E-06	6.00E-05	6.00E-05	1.44E-05	1.54E-05	4	100
2,3,4,7,8-PeCDF	pg/m^3	-	-	3.65E-04	1.29E-04	2.95E-04	1.40E-04	-	-	2.32E-04	1.29E-04	3.65E-04	3.65E-04	2.95E-04	1.40E-04	4	100
1,2,3,4,7,8-HxCDF	pg/m^3	-	-	3.57E-04	2.48E-04	6.00E-05	5.15E-05	-	-	1.79E-04	5.15E-05	3.57E-04	3.57E-04	2.48E-04	5.15E-05	4	100
1,2,3,6,7,8-HxCDF	pg/m^3	-	-	3.40E-04	2.31E-04	5.50E-05	6.64E-05	-	-	1.73E-04	5.50E-05	3.40E-04	3.40E-04	2.31E-04	6.64E-05	4	100
2,3,4,6,7,8-HxCDF	pg/m^3	-	-	4.47E-04	2.48E-04	1.00E-04	1.46E-04	-	-	2.35E-04	1.00E-04	4.47E-04	4.47E-04	2.48E-04	1.46E-04	4	100
1,2,3,7,8,9-HxCDF	pg/m^3	-	-	3.60E-04	2.81E-04	7.33E-05	8.14E-05	-	-	1.99E-04	7.33E-05	3.60E-04	3.60E-04	2.81E-04	8.14E-05	4	100
1,2,3,4,6,7,8-HpCDF	pg/m^3	-	-	1.06E-04	2.48E-05	2.83E-05	2.76E-05	-	-	4.67E-05	2.48E-05	1.06E-04	1.06E-04	2.83E-05	2.76E-05	4	100
1,2,3,4,7,8,9-HpCDF	pg/m^3	-	-	4.40E-05	2.97E-05	5.83E-06	6.48E-06	-	-	2.15E-05	5.83E-06	4.40E-05	4.40E-05	2.97E-05	6.48E-06	4	100
OCDF	pg/m^3	-	-	5.62E-06	1.93E-06	1.39E-06	1.81E-06	-	-	2.69E-06	1.39E-06	5.62E-06	5.62E-06	1.93E-06	1.81E-06	4	100
Total Toxic Equivalency	pg TEQ/m^3	*0.1* *1* [1]	-	0.005	0.00	0.00	0.00	0.1	0	3.52E-03	2.02E-03	5.39E-03	5.39E-03	3.43E-03	2.02E-03	4	100

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] O. Reg. 419/05 Schedule Upper Risk Thresholds

Table B4: Summary of Sample Flow Rate and Sample Duration for PAHs

Sample Date	Courtice			Rundle		
	Filter ID	Sample Duration	Sample Volume	Filter ID	Sample Duration	Sample Volume
	No.	(min)	(m^3)	No.	(min)	(m^3)
July 8, 2019	L2308172-1	1451	335	L2308172-2	1435	300
July 20, 2019	L2314777-1	1446	323	L2314777-2	1426	300
August 1, 2019	L2324643-1	1452	325	L2324643-2	1429	303
August 13, 2019	L2330372-1	1449	322	L2330372-2	1446	302
August 25, 2019	L2338107-2	1449	324	L2338107-1	1428	300
September 6, 2019	L2345933-1	1405	316	L2345933-2	1396	297
September 18, 2019	L2352677-2	1448	326	L2352677-1	1433	301
September 30, 2019	L2359790-1	1441	323	L2359790-2	1431	299

Table B5: 2019 Courtice Station Q3 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	8-Jul-19	20-Jul-19	1-Aug-19	13-Aug-19	25-Aug-19	6-Sep-19	18-Sep-19	30-Sep-19	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	ng/m^3	*12000*	-	9.731	2.464	6.862	14.596	5.340	2.842	6.074	5.200	12000	0	6.639	2.464	14.596	9.731	14.596	6.074	8	100
2-Methylnaphthalene	ng/m^3	*10000*	-	14.776	3.839	13.077	23.509	8.395	4.335	8.926	7.800	10000	0	10.582	3.839	23.509	14.776	23.509	8.926	8	100
Acenaphthene	ng/m^3	-	-	7.403	0.334	8.923	10.093	4.907	1.108	3.558	1.820	-	-	4.768	0.334	10.093	7.403	10.093	3.558	8	100
Acenaphthylene	ng/m^3	*3500*	-	0.316	0.063	0.437	0.385	0.203	0.042	0.075	0.053	3500	0	0.197	0.042	0.437	0.316	0.437	0.075	8	100
Anthracene	ng/m^3	*200*	-	0.301	0.096	0.375	0.398	0.249	0.057	0.191	0.085	200	0	0.219	0.057	0.398	0.301	0.398	0.191	8	100
Benzo(a)Anthracene	ng/m^3	-	-	0.011	0.024	0.014	0.008	0.010	0.006	0.008	0.006	-	-	0.011	0.006	0.024	0.024	0.014	0.008	8	100
Benzo(a)fluorene	ng/m^3	-	-	0.031	0.042	0.013	0.037	0.022	0.019	0.014	0.027	-	-	0.026	0.013	0.042	0.042	0.037	0.027	8	100
Benzo(a)Pyrene (Historically High)	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	0.005	0.027	0.016	0.001	0.011	0.021	0.001	0.012	0.05	0	0.012	0.001	0.027	0.027	0.016	0.021	8	100
Benzo(b)Fluoranthene	ng/m^3	-	-	0.014	0.039	0.043	0.005	0.023	0.010	0.017	0.000	-	-	0.019	0.000	0.043	0.039	0.043	0.017	8	100
Benzo(b)fluorene	ng/m^3	-	-	0.015	1431.000	0.006	0.016	0.011	0.011	0.006	0.012	-	-	178.885	0.006	1431.000	1431.000	0.016	0.012	8	100
Benzo(e)Pyrene	ng/m^3	-	-	0.014	0.026	0.010	0.003	0.015	0.007	0.009	0.010	-	-	0.012	0.003	0.026	0.026	0.015	0.010	8	100
Benzo(g,h,i)Perylene	ng/m^3	-	-	0.021	0.021	0.040	0.003	0.022	0.012	0.011	0.009	-	-	0.017	0.003	0.040	0.021	0.040	0.012	8	100
Benzo(k)Fluoranthene	ng/m^3	-	-	0.021	0.028	0.037	0.004	0.025	0.012	0.008	0.022	-	-	0.020	0.004	0.037	0.028	0.037	0.022	8	100
Biphenyl	ng/m^3	-	-	2.684	1.300	2.498	5.031	1.975	0.940	1.844	2.060	-	-	2.292	0.940	5.031	2.684	5.031	2.060	8	100
Chrysene	ng/m^3	-	-	0.038	0.077	0.048	0.037	0.046	0.026	0.030	0.042	-	-	0.043	0.026	0.077	0.077	0.048	0.042	8	100
Dibenzo(a,h)Anthracene	ng/m^3	-	-	0.002	0.004	0.032	0.000	0.005	0.002	0.001	0.003	-	-	0.006	0.000	0.032	0.004	0.032	0.003	8	100
Fluoranthene	ng/m^3	-	-	0.764	0.498	0.849	1.230	0.694	0.516	0.580	0.424	-	-	0.694	0.424	1.230	0.764	1.230	0.580	8	100
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	0.017	0.019	0.036	0.002	0.021	0.009	0.007	0.010	-	-	0.015	0.002	0.036	0.019	0.036	0.010	8	100
Naphthalene	ng/m^3	*22500*	*22500*	37.910	21.920	25.477	48.137	26.574	10.158	21.902	16.000	22500	0	26.010	10.158	48.137	37.910	48.137	21.902	8	100
o-Terphenyl	ng/m^3	-	-	0.011	0.015	0.006	0.010	0.008	0.006	0.007	0.010	-	-	0.009	0.006	0.015	0.015	0.010	0.010	8	100
Perylene	ng/m^3	-	-	0.003	0.004	0.001	0.001	0.001	0.001	0.000	0.000	-	-	0.001	0.000	0.004	0.004	0.001	0.001	8	100
Phenanthrene	ng/m^3	-	-	5.881	2.034	6.000	8.665	4.599	1.487	3.589	2.240	-	-	4.312	1.487	8.665	5.881	8.665	3.589	8	100
Pyrene	ng/m^3	-	-	0.343	0.248	0.385	0.565	0.330	0.228	0.287	0.248	-	-	0.329	0.228	0.565	0.343	0.565	0.287	8	100
Tetralin	ng/m^3	-	-	6.388	1.474	2.046	5.155	1.914	2.101	1.890	7.800	-	-	3.596	1.474	7.800	6.388	5.155	7.800	8	100
Fluorene	ng/m^3	-	-	N/A	N/A	N/A	N/A	2.886	N/A	N/A	N/A			2.886	2.886	2.886	0.000	2.886	0.000	1	13
Total PAH[4]	ng/m^3	-	-	86.702	1465.597	67.231	117.891	58.288	23.956	49.037	43.893	-	-	239.074	23.956	1465.597	1465.597	117.891	49.037	8	100

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants

Table B6: 2019 Rundle Station Q3 Monitoring Results for PAHs

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	8-Jul-19	20-Jul-19	1-Aug-19	13-Aug-19	25-Aug-19	6-Sep-19	18-Sep-19	30-Sep-19	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Arithmetic Mean	Minimum Q3 Concentration	Maximum Q3 Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
1-Methylnaphthalene	ng/m^3	*12000*	-	14.433	8.600	8.944	16.060	11.533	2.145	9.734	3.320	*12000*	0	9.346	2.145	16.060	14.433	16.060	9.734	8	100
2-Methylnaphthalene	ng/m^3	*10000*	-	23.067	15.433	20.033	29.371	21.267	3.670	15.083	5.850	*10000*	0	16.722	3.670	29.371	23.067	29.371	15.083	8	100
Acenaphthene	ng/m^3	-	-	14.200	9.267	13.399	17.980	10.933	0.882	6.877	3.180	-	-	9.590	0.882	17.980	14.200	17.980	6.877	8	100
Acenaphthylene	ng/m^3	*3500*	-	0.236	0.103	0.531	0.300	0.295	0.026	0.191	0.082	*3500*	0	0.221	0.026	0.531	0.236	0.531	0.191	8	100
Anthracene	ng/m^3	*200*	-	1.290	0.650	1.802	1.851	1.410	0.127	0.215	0.401	*200*	0	0.968	0.127	1.851	1.290	1.851	0.215	8	100
Benzo(a)Anthracene	ng/m^3	-	-	0.013	0.031	0.018	0.007	0.021	0.004	0.007	0.004	-	-	0.013	0.004	0.031	0.031	0.021	0.007	8	100
Benzo(a)fluorene	ng/m^3	-	-	0.111	0.111	0.058	0.120	0.070	0.019	0.027	0.017	-	-	0.067	0.017	0.120	0.111	0.120	0.027	8	100
Benzo(a)Pyrene	ng/m^3	*0.05* [1] *5* [2] *1.1* [3]	*1*	0.003	0.033	0.014	0.000	0.011	0.029	0.001	0.014	*0.05*	0	0.013	0.000	0.033	0.033	0.014	0.029	8	100
Benzo(b)Fluoranthene	ng/m^3	-	-	0.013	0.043	0.056	0.000	0.025	0.011	0.022	0.000	-	-	0.021	0.000	0.056	0.043	0.056	0.022	8	100
Benzo(b)fluorene	ng/m^3	-	-	0.056	1431.000	0.021	0.050	0.030	0.010	0.009	0.009	-	-	178.898	0.009	1431.000	1431.000	0.050	0.010	8	100
Benzo(e)Pyrene	ng/m^3	-	-	0.009	0.029	0.022	0.000	0.024	0.006	0.011	0.009	-	-	0.014	0.000	0.029	0.029	0.024	0.011	8	100
Benzo(g,h,i)Perylene	ng/m^3	-	-	0.016	0.027	0.057	0.000	0.025	0.009	0.016	0.011	-	-	0.020	0.000	0.057	0.027	0.057	0.016	8	100
Benzo(k)Fluoranthene	ng/m^3	-	-	0.030	0.036	0.059	0.002	0.034	0.009	0.009	0.026	-	-	0.026	0.002	0.059	0.036	0.059	0.009	8	100
Biphenyl	ng/m^3	-	-	4.700	3.833	3.993	5.530	4.167	0.761	3.136	1.26	-	-	3.731	0.761	5.530	4.700	5.530	3.136	8	88
Chrysene	ng/m^3	-	-	0.088	0.152	0.109	0.078	0.106	0.026	0.046	0.031	-	-	0.079	0.026	0.152	0.152	0.109	0.046	8	100
Dibenzo(a,h)Anthracene	ng/m^3	-	-	0.003	0.005	0.035	0.000	0.003	0.002	0.002	0.003	-	-	0.007	0.000	0.035	0.005	0.035	0.002	8	100
Fluoranthene	ng/m^3	-	-	3.567	4.533	4.257	4.735	3.077	0.502	1.638	0.836	-	-	2.893	0.502	4.735	4.533	4.735	1.638	8	100
Indeno(1,2,3-cd)Pyrene	ng/m^3	-	-	0.011	0.028	0.055	0.000	0.025	0.009	0.012	0.010	-	-	0.019	0.000	0.055	0.028	0.055	0.012	8	100
Naphthalene	ng/m^3	*22500*	*22500*	53.667	35.000	24.026	37.748	22.733	7.576	21.761	13.400	*22500*	0	26.989	7.576	53.667	53.667	37.748	21.761	8	100
o-Terphenyl	ng/m^3	-	-	0.010	0.019	0.007	0.010	0.011	0.005	0.007	0.005	-	-	0.009	0.005	0.019	0.019	0.011	0.007	8	100
Perylene	ng/m^3	-	-	0.000	0.005	0.001	0.001	0.001	0.001	0.001	0.000	-	-	0.001	0.000	0.005	0.005	0.001	0.001	8	100
Phenanthrene	ng/m^3	-	-	7.233	16.200	20.000	24.007	13.367	1.906	9.269	3.580	-	-	11.945	1.906	24.007	16.200	24.007	9.269	8	100
Pyrene	ng/m^3	-	-	1.553	1.873	1.828	2.040	1.367	0.230	0.711	0.312	-	-	1.239	0.230	2.040	1.873	2.040	0.711	8	100
Tetralin	ng/m^3	-	-	36.000	2.340	1.515	3.576	1.570	1.461	2.070	1.510	-	-	6.255	1.461	36.000	36.000	3.576	2.070	8	100
Fluorene	ng/m^3	-	-	N/A	N/A	N/A	N/A	6.867	N/A	N/A	N/A			6.867	6.867	6.867	0.000	6.867	0.000	1	13
Total PAH [4]	ng/m^3	-	-	160.310	1529.352	100.843	143.466	98.971	19.426	70.856	32.612	-	-	269.480	19.426	1529.352	1529.352	143.466	70.856	8	100

NOTE: All non-detectable results were reported as 1/2 of the detection limit

[1] AAQC

[2] O. Reg. 419/05 Schedule Upper Risk Thresholds

[3] O. Reg. 419/05 24 Hour Guideline

[4] Total PAH sums all PAH contaminants

Table B7: Summary of Sample Flow Rate and Sample Duration for TSP

Sample Date	Courtice			Rundle		
	Filter ID	Sample Duration	Sample Volume	Filter ID	Sample Duration	Sample Volume
	No.	(min)	(m^3)	No.	(min)	(m^3)
July 2, 2019	L2308180-2	1409	1550	L2308180-4	1413	1570
July 8, 2019	L2308180-1	1406	1550	L2308180-3	1415	1560
July 14, 2019	L2314796-2	1405	1620	L2314796-4	1412	1560
July 20, 2019	L2314796-1	1404	1580	L2314796-3	1412	1580
July 26, 2019	INVALID			INVALID		
August 1, 2019	L2324656-2	1400	1630	L2324656-4	1411	1560
August 7, 2019	L2330380-1	1410	1550	L2330380-3	1409	1550
August 13, 2019	L2330380-2	1408	1550	L2330380-4	1414	1560
August 19, 2019	L2338119-3	1411	1550	L2338119-1	1414	1570
August 25, 2019	L2338119-4	1408	1590	L2338119-2	1412	1570
August 31, 2019	L2347771-2	1409	1600	L2347771-4	1411	1580
September 6, 2019	L2347771-1	1431	1600	L2347771-3	1384	1580
September 12, 2019	L2352684-4	1402	1560	L2352684-2	1412	1590
September 18, 2019	L2352684-3	1408	1560	L2352684-1	1417	1610
September 24, 2019	L2359786-2	1411	1580	L2359786-4	1414	1590

Table B8: 2019 Courtice Station Q3 Monitoring Results for TSP and Metals

Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-19	8-Jul-19	14-Jul-19	20-Jul-19	26-Jul-19	1-Aug-19	7-Aug-19	13-Aug-19	19-Aug-19	25-Aug-19	31-Aug-19	6-Sep-19	12-Sep-19	18-Sep-19	24-Sep-19	30-Sep-19	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	$\mu g/m^3$	*120*	*120*	46.26	44.32	19.14	26.71		38.77	27.68	43.16	8.77	14.34	20.38	13.94	36.86	57.63	28.54	34.33	*120*	0	27.36	30.72	8.77	57.63	46.26	43.16	57.63	15	94
Total Mercury (Hg)	$\mu g/m^3$	*2*	*2*	1.46E-08	2.26E-05	2.67E-05	4.50E-05		4.14E-05	3.83E-05	6.97E-05	2.77E-05	2.64E-05	4.06E-05	3.88E-05	9.62E-06	1.47E-05	2.15E-05	2.42E-05	*2*	0	1.73E-05	2.98E-05	1.46E-08	6.97E-05	4.50E-05	6.97E-05	3.88E-05	15	94
Aluminum (Al)	$\mu g/m^3$	*4.8*	-	1.81E-01	2.20E-01	1.07E-01	1.18E-01		2.96E-01	6.32E-02	1.26E-01	6.71E-02	9.06E-02	9.38E-02	6.31E-02	7.50E-02	1.53E-01	6.84E-02	1.27E-01	*4.8*	0	1.10E-01	1.23E-01	6.31E-02	2.96E-01	2.20E-01	2.96E-01	1.53E-01	15	94
Antimony (Sb)	$\mu g/m^3$	*25*	*25*	1.33E-03	1.07E-03	8.70E-04	7.85E-04		1.16E-03	8.39E-04	1.11E-03	5.29E-04	4.40E-04	8.25E-04	9.88E-04	6.28E-04	1.17E-03	2.55E-03	4.52E-04	*25*	0	8.88E-04	9.83E-04	4.40E-04	2.55E-03	1.33E-03	1.16E-03	2.55E-03	15	94
Arsenic (As)	$\mu g/m^3$	*0.3*	*0.3*	9.68E-04	9.68E-04	9.26E-04	9.49E-04		9.20E-04	9.68E-04	9.68E-04	9.68E-04	9.43E-04	2.75E-03	9.38E-04	9.62E-04	9.62E-04	9.49E-04	9.55E-04	*0.3*	0	1.02E-03	1.07E-03	9.20E-04	2.75E-03	9.68E-04	2.75E-03	9.62E-04	15	94
Barium (Ba)	$\mu g/m^3$	*10*	*10*	2.23E-02	1.34E-02	6.11E-03	7.28E-03		1.39E-02	9.10E-03	1.34E-02	5.94E-03	4.34E-03	8.44E-03	7.38E-03	6.35E-03	1.38E-02	7.34E-03	3.89E-03	*10*	0	8.52E-03	9.53E-03	3.89E-03	2.23E-02	2.23E-02	1.39E-02	1.38E-02	15	94
Beryllium (Be)	$\mu g/m^3$	*0.01*	*0.01*	3.23E-05	3.23E-05	3.09E-05	3.16E-05		3.07E-05	3.23E-05	3.23E-05	3.23E-05	3.14E-05	3.13E-05	3.13E-05	3.21E-05	3.21E-05	3.16E-05	3.18E-05	*0.01*	0	3.17E-05	3.17E-05	3.07E-05	3.23E-05	3.23E-05	3.23E-05	3.21E-05	15	94
Bismuth (Bi)	$\mu g/m^3$	-	-	1.42E-03	5.81E-04	5.56E-04	5.70E-04		5.52E-04	5.81E-04	5.81E-04	5.81E-04	5.66E-04	5.63E-04	5.63E-04	5.77E-04	5.77E-04	5.70E-04	5.73E-04	-	-	6.06E-04	6.27E-04	5.52E-04	1.42E-03	1.42E-03	5.81E-04	5.77E-04	15	94
Boron (B)	$\mu g/m^3$	*120*	-	1.29E-02	1.29E-02	1.23E-02	1.27E-02		1.23E-02	1.29E-02	1.29E-02	1.29E-02	1.26E-02	1.25E-02	1.25E-02	1.28E-02	1.28E-02	1.27E-02	1.27E-02	*120*	0	1.27E-02	1.27E-02	1.23E-02	1.29E-02	1.29E-02	1.29E-02	1.28E-02	15	94
Cadmium (Cd)	$\mu g/m^3$	*0.025*	*0.025*	6.45E-04	6.45E-04	6.17E-04	6.33E-04		6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.29E-04	6.25E-04	6.25E-04	6.41E-04	6.41E-04	6.33E-04	6.37E-04	*0.025*	0	6.35E-04	6.35E-04	6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.41E-04	15	94
Chromium (Cr)	$\mu g/m^3$	*0.5*	-	5.35E-03	5.23E-03	4.75E-03	4.18E-03		4.85E-03	1.61E-03	3.68E-03	1.61E-03	1.57E-03	4.25E-03	3.94E-03	3.53E-03	3.78E-03	1.58E-03	1.59E-03	*0.5*	0	3.09E-03	3.43E-03	1.57E-03	5.35E-03	5.35E-03	4.85E-03	3.94E-03	15	94
Cobalt (Co)	$\mu g/m^3$	*0.1*	*0.1*	6.45E-04	6.45E-04	6.17E-04	6.33E-04		6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.29E-04	6.25E-04	6.25E-04	6.41E-04	6.41E-04	6.33E-04	6.37E-04	*0.1*	0	6.35E-04	6.35E-04	6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.41E-04	15	94
Copper (Cu)	$\mu g/m^3$	*50*	-	3.19E-02	5.65E-02	1.78E-02	2.41E-02		5.52E-02	1.41E-02	3.66E-02	6.39E-03	1.47E-02	1.79E-02	2.90E-02	1.37E-02	1.40E-02	6.33E-03	5.92E-03	*50*	0	1.82E-02	2.29E-02	5.92E-03	5.65E-02	5.65E-02	5.52E-02	2.90E-02	15	94
Iron (Fe)	$\mu g/m^3$	*4*	-	5.96E-01	6.58E-01	2.83E-01	2.56E-01		6.32E-01	2.46E-01	4.59E-01	1.80E-01	2.00E-01	3.26E-01	2.21E-01	1.96E-01	4.73E-01	2.56E-01	3.07E-01	*4*	0	3.20E-01	3.53E-01	1.80E-01	6.58E-01	6.58E-01	6.32E-01	4.73E-01	15	94
Lead (Pb)	$\mu g/m^3$	*0.5*	*0.5*	3.35E-03	2.90E-03	9.26E-04	2.15E-03		3.74E-03	9.68E-04	2.52E-03	9.68E-04	9.43E-04	2.19E-03	2.44E-03	9.62E-04	2.05E-03	9.49E-04	3.06E-03	*2*	0	1.76E-03	2.01E-03	9.26E-04	3.74E-03	3.35E-03	3.74E-03	3.06E-03	15	94
Magnesium (Mg)	$\mu g/m^3$	-	-	3.68E-01	3.81E-01	2.16E-01	2.22E-01		3.56E-01	1.74E-01	3.23E-01	2.06E-01	1.82E-01	1.88E-01	1.38E-01	1.54E-01	2.88E-01	1.20E-01	1.66E-01	-	-	2.17E-01	2.32E-01	1.20E-01	3.81E-01	3.81E-01	3.56E-01	2.88E-01	15	94
Manganese (Mn)	$\mu g/m^3$	*0.4*	-	1.77E-02	2.06E-02	8.52E-03	9.94E-03		1.65E-02	6.06E-03	1.50E-02	4.90E-03	3.90E-03	8.44E-03	4.81E-03	4.94E-03	1.21E-02	6.01E-03	1.13E-02	*0.4*	0	8.79E-03	1.00E-02	3.90E-03	2.06E-02	2.06E-02	1.65E-02	1.21E-02	15	94
Molybdenum (Mo)	$\mu g/m^3$	*120*	-	1.23E-03	1.10E-03	8.02E-04	9.49E-04		1.35E-03	3.23E-04	1.03E-03	3.23E-04	3.14E-04	8.13E-04	1.13E-03	3.21E-04	7.69E-04	3.16E-04	3.18E-04	*120*	0	6.33E-04	7.39E-04	3.14E-04	1.35E-03	1.23E-03	1.35E-03	1.13E-03	15	94
Nickel (Ni)	$\mu g/m^3$	*0.2*	-	2.00E-03	9.68E-04	9.26E-04	9.49E-04		9.20E-04	9.68E-04	9.68E-04	9.68E-04	9.43E-04	9.38E-04	9.38E-04	9.62E-04	9.62E-04	9.49E-04	9.55E-04	*0.2*	0	9.99E-04	1.02E-03	9.20E-04	2.00E-03	2.00E-03	9.68E-04	9.62E-04	15	94
Phosphorus (P)	$\mu g/m^3$	-	-	1.93E+00	2.00E+00	2.02E+00	1.95E+00		1.99E+00	1.62E+00	1.71E+00	1.12E+00	1.34E+00	1.66E+00	1.71E+00	1.67E+00	1.36E+00	9.75E-01	2.39E-01	-	-	1.42E+00	1.55E+00	2.39E-01	2.02E+00	2.02E+00	1.99E+00	1.71E+00	15	94
Selenium (Se)	$\mu g/m^3$	*10*	*10*	3.23E-03	3.23E-03	3.09E-03	3.16E-03		3.07E-03	3.23E-03	3.23E-03	3.23E-03	3.14E-03	3.13E-03	3.13E-03	3.21E-03	3.21E-03	3.16E-03	3.18E-03	*10*	0	3.17E-03	3.17E-03	3.07E-03	3.23E-03	3.23E-03	3.23E-03	3.21E-03	15	94
Silver (Ag)	$\mu g/m^3$	*1*	*1*	3.23E-04	3.23E-04	3.09E-04	3.16E-04		3.07E-04	3.23E-04	3.23E-04	3.23E-04	3.14E-04	3.13E-04	3.13E-04	3.21E-04	3.21E-04	3.16E-04	3.18E-04	*1*	0	3.17E-04	3.17E-04	3.07E-04	3.23E-04	3.23E-04	3.23E-04	3.21E-04	15	94
Strontium (Sr)	$\mu g/m^3$	*120*	-	9.55E-03	1.20E-02	4.51E-03	4.62E-03		8.77E-03	2.84E-03	6.65E-03	4.26E-03	5.03E-03	3.25E-03	2.25E-03	2.56E-03	7.56E-03	2.09E-03	6.05E-03	*120*	0	4.77E-03	5.47E-03	2.09E-03	1.20E-02	1.20E-02	8.77E-03	7.56E-03	15	94
Thallium (Tl)	$\mu g/m^3$	-	-	2.90E-05	2.90E-05	2.78E-05	2.85E-05		2.76E-05	2.90E-05	2.90E-05	2.90E-05	2.83E-05	2.81E-05	2.81E-05	2.88E-05	2.88E-05	2.85E-05	2.87E-05	-	-	2.86E-05	2.86E-05	2.76E-05	2.90E-05	2.90E-05	2.90E-05	2.88E-05	15	94
Tin (Sn)	$\mu g/m^3$	*10*	*10*	1.61E-03	9.03E-04	3.09E-04	8.23E-04		7.36E-04	6.45E-04	7.74E-04	3.23E-04	3.14E-04	6.88E-04	6.25E-04	3.21E-04	8.33E-04	3.16E-04	3.18E-04	*10*	0	5.58E-04	6.36E-04	3.09E-04	1.61E-03	1.61E-03	7.74E-04	8.33E-04	15	94
Titanium (Ti)	$\mu g/m^3$	*120*	-	1.03E-02	1.42E-02	3.40E-03	3.48E-03		1.84E-02	3.55E-03	9.68E-03	3.55E-03	3.46E-03	3.44E-03	3.44E-03	3.53E-03	1.03E-02	3.48E-03	3.50E-03	*120*	0	5.28E-03	6.51E-03	3.40E-03	1.84E-02	1.42E-02	1.84E-02	1.03E-02	15	94
Uranium (Ur)	$\mu g/m^3$	*1.5*	-	3.23E-05	3.23E-05	3.09E-05	3.16E-05		3.07E-05	3.23E-05	3.23E-05	3.23E-05	3.14E-05	3.13E-05	3.13E-05	3.21E-05	3.21E-05	3.16E-05	3.18E-05	*1.5*	0	3.17E-05	3.17E-05	3.07E-05	3.23E-05	3.23E-05	3.23E-05	3.21E-05	15	94
Vanadium (V)	$\mu g/m^3$	*2*	*1*	1.61E-03	1.61E-03	1.54E-03	1.58E-03		1.53E-03	1.61E-03	1.61E-03	1.61E-03	1.57E-03	1.56E-03	1.56E-03	1.60E-03	1.60E-03	1.58E-03	1.59E-03	*2*	0	1.59E-03	1.59E-03	1.53E-03	1.61E-03	1.61E-03	1.61E-03	1.60E-03	15	94
Zinc (Zn)	$\mu g/m^3$	*120*	-	4.54E-02	3.06E-02	2.56E-02	3.91E-02		3.48E-02	2.64E-02	2.55E-02	2.38E-02	1.58E-02	3.97E-02	2.46E-02	1.90E-02	2.15E-02	1.25E-02	1.80E-02	*120*	0	2.53E-02	2.68E-02	1.25E-02	4.54E-02	4.54E-02	3.97E-02	2.46E-02	15	94
Zirconium (Zr)	$\mu g/m^3$	*20*	-	6.45E-04	6.45E-04	6.17E-04	6.33E-04		6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.29E-04	6.25E-04	6.25E-04	6.41E-04	6.41E-04	6.33E-04	6.37E-04	*20*	0	6.35E-04	6.35E-04	6.13E-04	6.45E-04	6.45E-04	6.45E-04	6.41E-04	15	94

INVALID

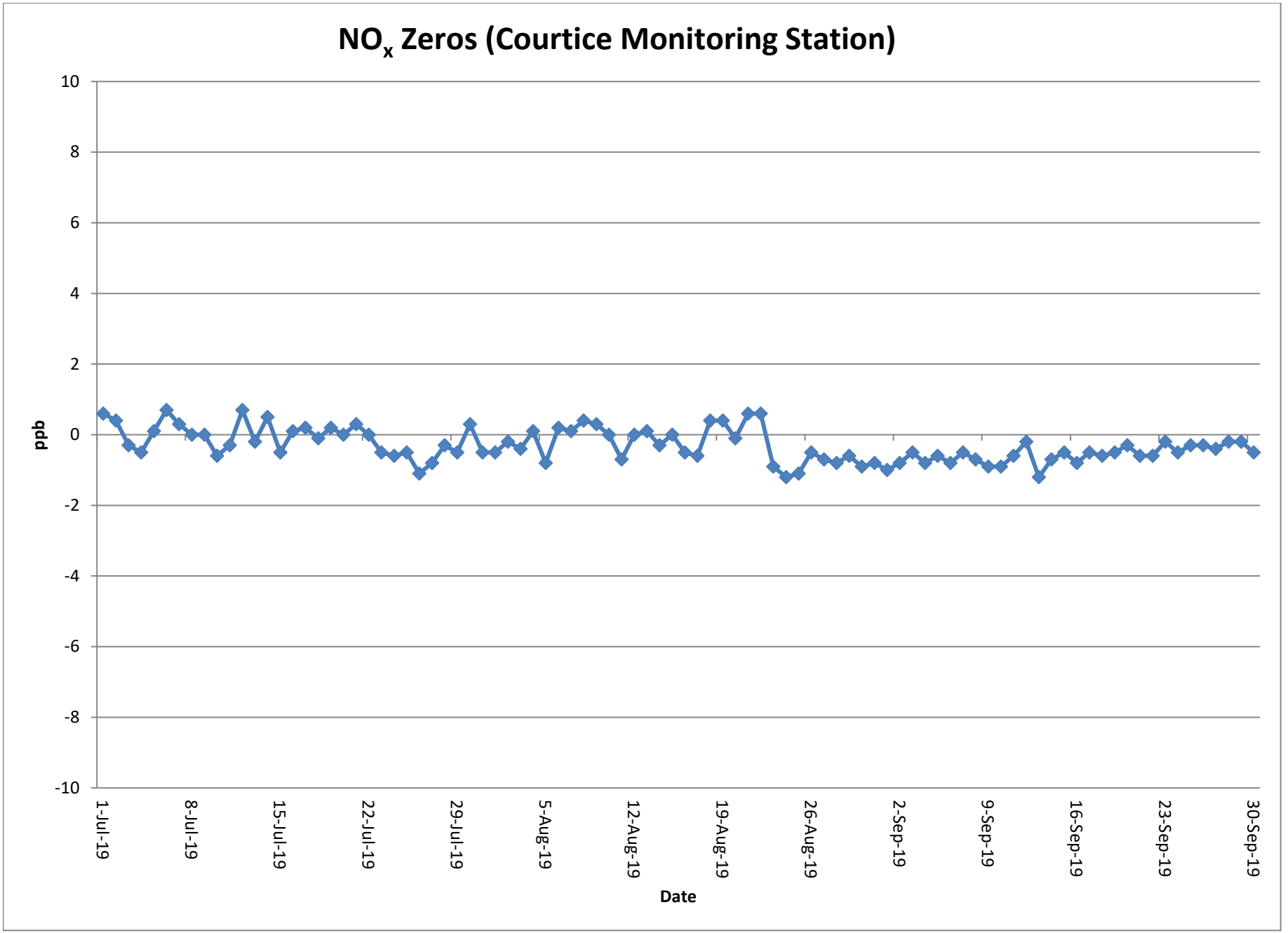
NOTE: All non-detectable results were reported as 1/2 of the detection limit

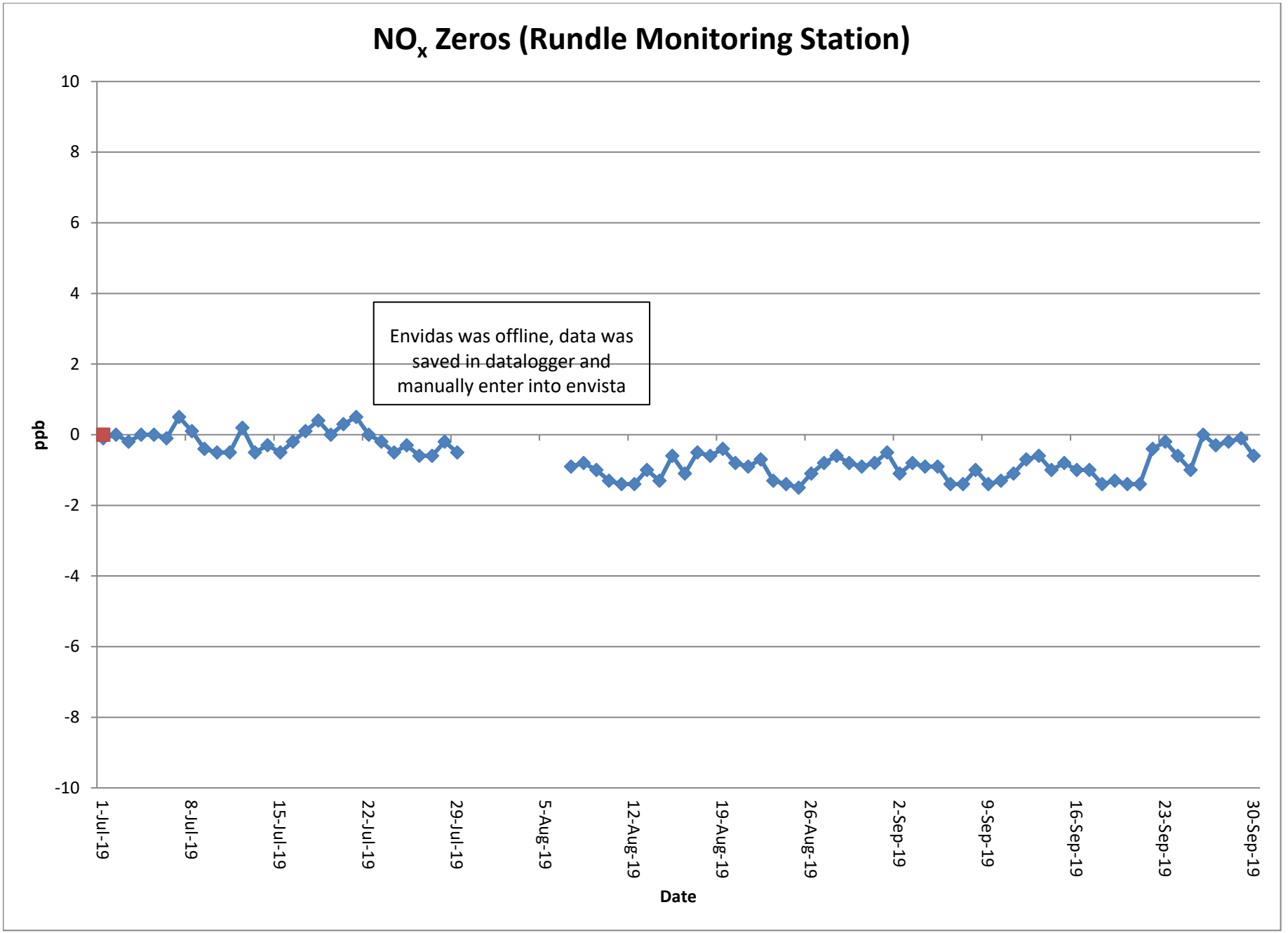
Table B9: 2019 Rundle Station Q3 Monitoring Results for TSP and Metals

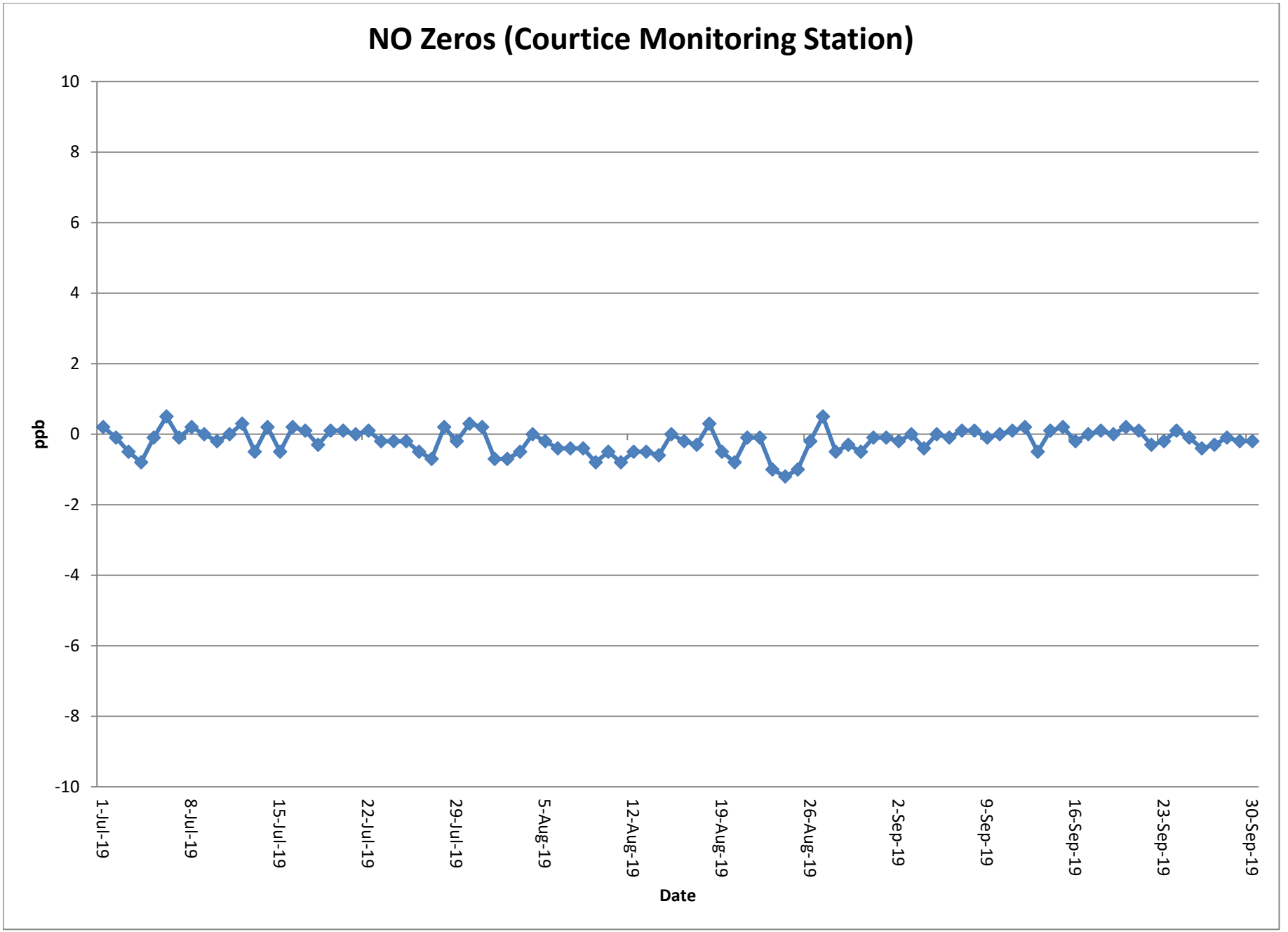
Contaminant	Units	*MECP Criteria*	*HHRA Health Based Criteria*	2-Jul-19	8-Jul-19	14-Jul-19	20-Jul-19	26-Jul-19	1-Aug-19	7-Aug-19	13-Aug-19	19-Aug-19	25-Aug-19	31-Aug-19	6-Sep-19	12-Sep-19	18-Sep-19	24-Sep-19	30-Sep-19	MECP Criteria ($\mu g/m^3$)	No. > Criteria	Geometric Mean	Arithmetic Mean	Q3 Minimum Concentration	Q3 Maximum Concentration	July Maximum Concentration	August Maximum Concentration	September Maximum Concentration	Number of Valid Samples	% Valid data
Particulate (TSP)	$\mu g/m^3$	*120*	*120*	55.35	27.37	12.18	36.65		21.15	26.58	31.92	16.94	14.90	30.19	23.10	37.23	28.20	52.58	25.48	*120*	0	27.0	29.3	12.2	55.4	55.4	31.9	52.6	15	94
Total Mercury (Hg)	$\mu g/m^3$	*2*	*2*	6.22E-09	6.99E-09	3.12E-05	3.02E-05		1.67E-05	6.10E-05	5.42E-05	4.84E-05	3.25E-05	1.14E-05	4.30E-05	1.57E-05	1.24E-05	3.14E-05	3.69E-05	*2*	0	9.40E-06	2.83E-05	6.22E-09	6.10E-05	3.12E-05	6.10E-05	4.30E-05	15	94
Aluminum (Al)	$\mu g/m^3$	*4.8*	-	2.75E-01	1.58E-01	1.09E-01	1.49E-01		9.94E-02	5.48E-02	7.69E-02	1.73E-01	1.02E-01	9.68E-02	8.54E-02	9.43E-02	1.37E-01	1.13E-01	8.98E-02	*4.8*	0	1.12E-01	1.21E-01	5.48E-02	2.75E-01	2.75E-01	1.73E-01	1.37E-01	15	94
Antimony (Sb)	$\mu g/m^3$	*25*	*25*	1.39E-03	6.35E-04	2.69E-04	7.09E-04		4.36E-04	5.55E-04	5.96E-04	7.39E-04	3.50E-04	4.43E-04	4.62E-04	4.72E-04	5.40E-04	4.81E-03	5.10E-04	*25*	0	6.22E-04	8.61E-04	2.69E-04	4.81E-03	1.39E-03	7.39E-04	4.81E-03	15	94
Arsenic (As)	$\mu g/m^3$	*0.3*	*0.3*	9.55E-04	9.62E-04	9.62E-04	9.49E-04		9.62E-04	9.68E-04	9.62E-04	9.55E-04	9.55E-04	9.49E-04	9.49E-04	9.43E-04	9.32E-04	9.43E-04	9.55E-04	*0.3*	0	9.53E-04	9.53E-04	9.32E-04	9.68E-04	9.62E-04	9.68E-04	9.55E-04	15	94
Barium (Ba)	$\mu g/m^3$	*10*	*10*	2.67E-02	8.78E-03	5.45E-03	7.85E-03		6.41E-03	7.81E-03	8.78E-03	1.15E-02	4.33E-03	5.63E-03	5.76E-03	7.36E-03	1.03E-02	8.93E-03	5.16E-03	*10*	0	7.82E-03	8.71E-03	4.33E-03	2.67E-02	2.67E-02	1.15E-02	1.03E-02	15	94
Beryllium (Be)	$\mu g/m^3$	*0.01*	*0.01*	3.18E-05	3.21E-05	3.21E-05	3.16E-05		3.21E-05	3.23E-05	3.21E-05	3.18E-05	3.18E-05	3.16E-05	3.16E-05	3.14E-05	3.11E-05	3.14E-05	3.18E-05	*0.01*	0	3.18E-05	3.18E-05	3.11E-05	3.23E-05	3.21E-05	3.23E-05	3.18E-05	15	94
Bismuth (Bi)	$\mu g/m^3$	-	-	1.46E-03	5.77E-04	5.77E-04	5.70E-04		5.77E-04	5.81E-04	5.77E-04	5.73E-04	5.73E-04	5.70E-04	5.70E-04	5.66E-04	5.59E-04	5.66E-04	5.73E-04	-	-	6.09E-04	6.32E-04	5.59E-04	1.46E-03	1.46E-03	5.81E-04	5.73E-04	15	94
Boron (B)	$\mu g/m^3$	*120*	-	1.27E-02	1.28E-02	1.28E-02	1.27E-02		1.28E-02	1.29E-02	1.28E-02	1.27E-02	1.27E-02	1.27E-02	1.27E-02	1.26E-02	1.24E-02	1.26E-02	1.27E-02	*120*	0	1.27E-02	1.27E-02	1.24E-02	1.29E-02	1.28E-02	1.29E-02	1.27E-02	15	94
Cadmium (Cd)	$\mu g/m^3$	*0.025*	*0.025*	6.37E-04	6.41E-04	6.41E-04	6.33E-04		6.41E-04	6.45E-04	6.41E-04	6.37E-04	6.37E-04	6.33E-04	6.33E-04	6.29E-04	6.21E-04	6.29E-04	6.37E-04	*0.025*	0	6.36E-04	6.36E-04	6.21E-04	6.45E-04	6.41E-04	6.45E-04	6.37E-04	15	94
Chromium (Cr)	$\mu g/m^3$	*0.5*	-	5.29E-03	4.42E-03	4.55E-03	3.73E-03		4.42E-03	3.42E-03	3.40E-03	4.39E-03	1.59E-03	3.61E-03	3.67E-03	4.28E-03	1.55E-03	3.21E-03	1.59E-03	*0.5*	0	3.32E-03	3.54E-03	1.55E-03	5.29E-03	5.29E-03	4.42E-03	4.28E-03	15	94
Cobalt (Co)	$\mu g/m^3$	*0.1*	*0.1*	6.37E-04	6.41E-04	6.41E-04	6.33E-04		6.41E-04	6.45E-04	6.41E-04	6.37E-04	6.37E-04	6.33E-04	6.33E-04	6.29E-04	6.21E-04	6.29E-04	6.37E-04	*0.1*	0	6.36E-04	6.36E-04	6.21E-04	6.45E-04	6.41E-04	6.45E-04	6.37E-04	15	94
Copper (Cu)	$\mu g/m^3$	*50*	-	3.49E-02	4.12E-02	1.16E-02	5.64E-02		2.62E-02	2.44E-02	6.47E-02	1.99E-02	9.62E-03	1.63E-02	4.27E-02	1.43E-02	3.47E-02	3.45E-02	1.21E-02	*50*	0	2.52E-02	2.96E-02	9.62E-03	6.47E-02	5.64E-02	6.47E-02	4.27E-02	15	94
Iron (Fe)	$\mu g/m^3$	*4*	-	7.13E-01	4.26E-01	1.88E-01	3.11E-01		2.17E-01	1.91E-01	3.03E-01	3.96E-01	2.92E-01	2.27E-01	1.63E-01	2.62E-01	3.47E-01	2.74E-01	2.27E-01	*4*	0	2.81E-01	3.02E-01	1.63E-01	7.13E-01	7.13E-01	3.96E-01	3.47E-01	15	94
Lead (Pb)	$\mu g/m^3$	*0.5*	*0.5*	3.44E-03	2.37E-03	9.62E-04	2.09E-03		9.62E-04	9.68E-04	9.62E-04	1.91E-03	9.55E-04	9.49E-04	9.49E-04	9.43E-04	9.32E-04	9.43E-04	9.55E-04	*2*	0	1.22E-03	1.35E-03	9.32E-04	3.44E-03	3.44E-03	1.91E-03	9.55E-04	15	94
Magnesium (Mg)	$\mu g/m^3$	-	-	5.03E-01	2.50E-01	2.12E-01	2.59E-01	INVALID	1.73E-01	1.81E-01	2.18E-01	3.57E-01	1.66E-01	1.96E-01	1.46E-01	1.89E-01	1.68E-01	2.08E-01	1.40E-01	-	-	2.11E-01	2.24E-01	1.40E-01	5.03E-01	5.03E-01	3.57E-01	2.08E-01	15	94
Manganese (Mn)	$\mu g/m^3$	*0.4*	-	2.29E-02	1.31E-02	7.18E-03	9.49E-03		6.03E-03	5.74E-03	9.55E-03	1.13E-02	4.14E-03	8.23E-03	4.75E-03	5.85E-03	8.26E-03	8.99E-03	5.22E-03	*0.4*	0	7.88E-03	8.71E-03	4.14E-03	2.29E-02	2.29E-02	1.13E-02	8.99E-03	15	94
Molybdenum (Mo)	$\mu g/m^3$	*120*	-	1.15E-03	1.35E-03	3.21E-04	1.33E-03		8.33E-04	9.68E-04	1.60E-03	9.55E-04	3.18E-04	6.96E-04	1.20E-03	8.18E-04	1.24E-03	1.19E-03	3.18E-04	*120*	0	8.48E-04	9.53E-04	3.18E-04	1.60E-03	1.35E-03	1.60E-03	1.24E-03	15	94
Nickel (Ni)	$\mu g/m^3$	*0.2*	-	2.10E-03	9.62E-04	9.62E-04	9.49E-04		9.62E-04	9.68E-04	9.62E-04	9.55E-04	9.55E-04	9.49E-04	9.49E-04	9.43E-04	9.32E-04	9.43E-04	9.55E-04	*0.2*	0	1.00E-03	1.03E-03	9.32E-04	2.10E-03	2.10E-03	9.68E-04	9.55E-04	15	94
Phosphorus (P)	$\mu g/m^3$	-	-	1.87E+00	1.88E+00	2.09E+00	1.65E+00		2.15E+00	1.82E+00	1.71E+00	1.64E+00	1.27E+00	1.57E+00	1.74E+00	2.09E+00	2.33E-01	1.50E+00	1.51E+00	-	-	1.52E+00	1.65E+00	2.33E-01	2.15E+00	2.09E+00	2.15E+00	2.09E+00	15	94
Selenium (Se)	$\mu g/m^3$	*10*	*10*	3.18E-03	3.21E-03	3.21E-03	3.16E-03		3.21E-03	3.23E-03	3.21E-03	3.18E-03	3.18E-03	3.16E-03	3.16E-03	3.14E-03	3.11E-03	3.14E-03	3.18E-03	*10*	0	3.18E-03	3.18E-03	3.11E-03	3.23E-03	3.21E-03	3.23E-03	3.18E-03	15	94
Silver (Ag)	$\mu g/m^3$	*1*	*1*	3.18E-04	3.21E-04	3.21E-04	3.16E-04		3.21E-04	3.23E-04	3.21E-04	3.18E-04	3.18E-04	3.16E-04	3.16E-04	3.14E-04	3.11E-04	3.14E-04	3.18E-04	*1*	0	3.18E-04	3.18E-04	3.11E-04	3.23E-04	3.21E-04	3.23E-04	3.18E-04	15	94
Strontium (Sr)	$\mu g/m^3$	*120*	-	1.32E-02	4.94E-03	3.14E-03	4.11E-03		3.01E-03	3.10E-03	4.23E-03	8.47E-03	4.46E-03	4.75E-03	3.42E-03	4.34E-03	5.53E-03	5.09E-03	2.87E-03	*120*	0	4.54E-03	4.98E-03	2.87E-03	1.32E-02	1.32E-02	8.47E-03	5.53E-03	15	94
Thallium (Tl)	$\mu g/m^3$	-	-	2.87E-05	2.88E-05	2.88E-05	2.85E-05		2.88E-05	2.90E-05	2.88E-05	2.87E-05	2.87E-05	2.85E-05	2.85E-05	2.83E-05	2.80E-05	2.83E-05	2.87E-05	-	-	2.86E-05	2.86E-05	2.80E-05	2.90E-05	2.88E-05	2.90E-05	2.87E-05	15	94
Tin (Sn)	$\mu g/m^3$	*10*	*10*	1.34E-03	7.69E-04	3.21E-04	7.59E-04		3.21E-04	3.23E-04	3.21E-04	8.28E-04	3.18E-04	3.16E-04	3.16E-04	7.55E-04	3.11E-04	3.14E-04	3.18E-04	*10*	0	4.44E-04	5.09E-04	3.11E-04	1.34E-03	1.34E-03	8.28E-04	7.55E-04	15	94
Titanium (Ti)	$\mu g/m^3$	*120*	-	1.59E-02	1.03E-02	3.53E-03	3.48E-03		3.53E-03	3.55E-03	3.53E-03	8.92E-03	3.50E-03	3.48E-03	3.48E-03	3.46E-03	1.06E-02	8.18E-03	3.50E-03	*120*	0	5.05E-03	5.92E-03	3.46E-03	1.59E-02	1.59E-02	8.92E-03	1.06E-02	15	94
Uranium (Ur)	$\mu g/m^3$	*1.5*	-	3.18E-05	3.21E-05	3.21E-05	3.16E-05		3.21E-05	3.23E-05	3.21E-05	3.18E-05	3.18E-05	3.16E-05	3.16E-05	3.14E-05	3.11E-05	3.14E-05	3.18E-05	*1.5*	0	3.18E-05	3.18E-05	3.11E-05	3.23E-05	3.21E-05	3.23E-05	3.18E-05	15	94
Vanadium (V)	$\mu g/m^3$	*2*	*1*	1.59E-03	1.60E-03	1.60E-03	1.58E-03		1.60E-03	1.61E-03	1.60E-03	1.59E-03	1.59E-03	1.58E-03	1.58E-03	1.57E-03	1.55E-03	1.57E-03	1.59E-03	*2*	0	1.59E-03	1.59E-03	1.55E-03	1.61E-03	1.60E-03	1.61E-03	1.59E-03	15	94
Zinc (Zn)	$\mu g/m^3$	*120*	-	4.87E-02	2.05E-02	1.74E-02	2.38E-02		1.37E-02	1.63E-02	1.50E-02	5.16E-02	1.09E-02	2.02E-02	1.30E-02	1.19E-02	1.39E-02	1.42E-02	1.06E-02	*120*	0	1.77E-02	2.01E-02	1.06E-02	5.16E-02	4.87E-02	5.16E-02	2.02E-02	15	94
Zirconium (Zr)	$\mu g/m^3$	*20*	-	6.37E-04	6.41E-04	6.41E-04	6.33E-04		6.41E-04	6.45E-04	6.41E-04	6.37E-04	6.37E-04	6.33E-04	6.33E-04	6.29E-04	6.21E-04	6.29E-04	6.37E-04	*20*	0	6.36E-04	6.36E-04	6.21E-04	6.45E-04	6.41E-04	6.45E-04	6.37E-04	15	94

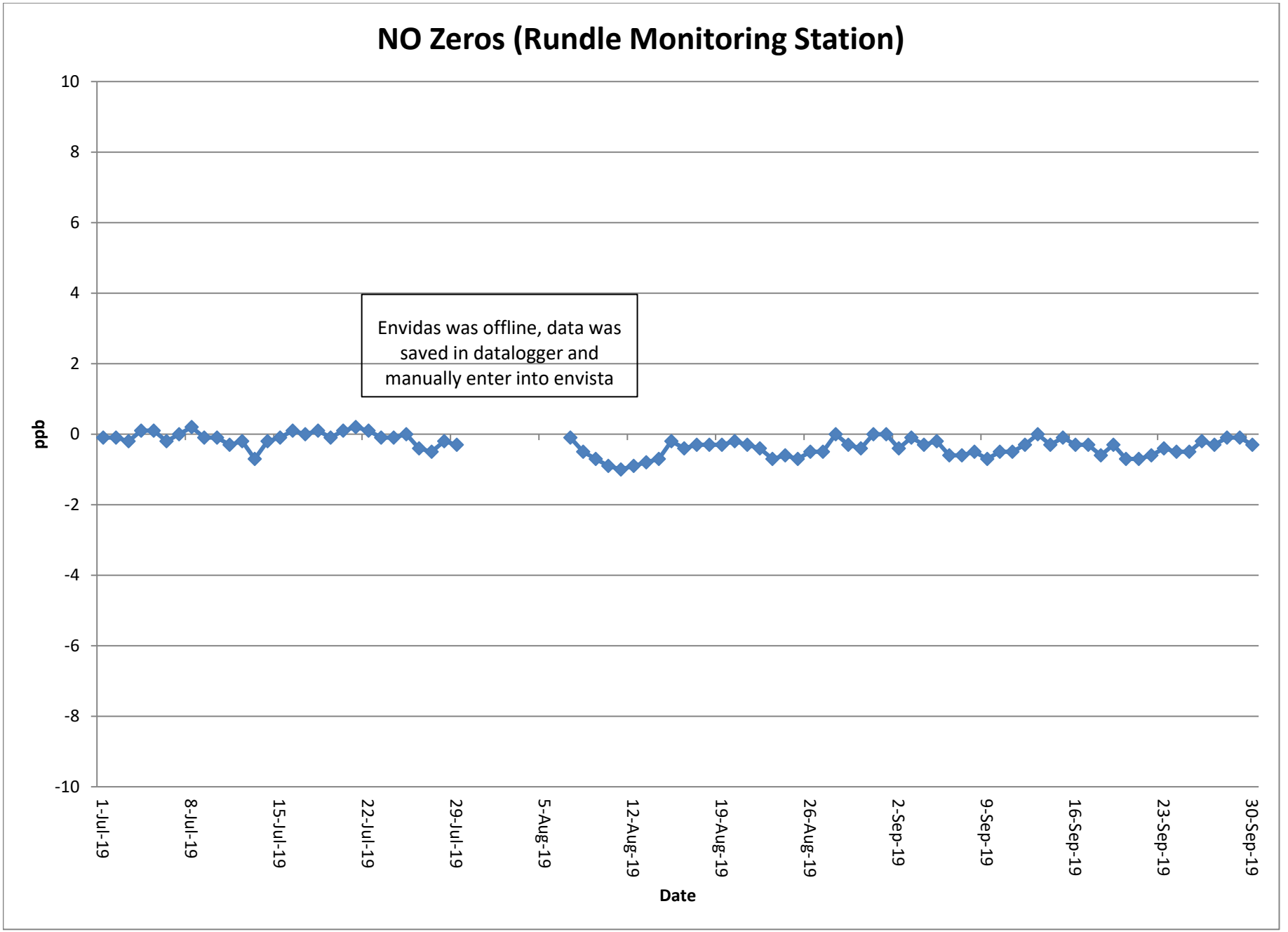
NOTE: All non-detectable results were reported as 1/2 of the detection limit

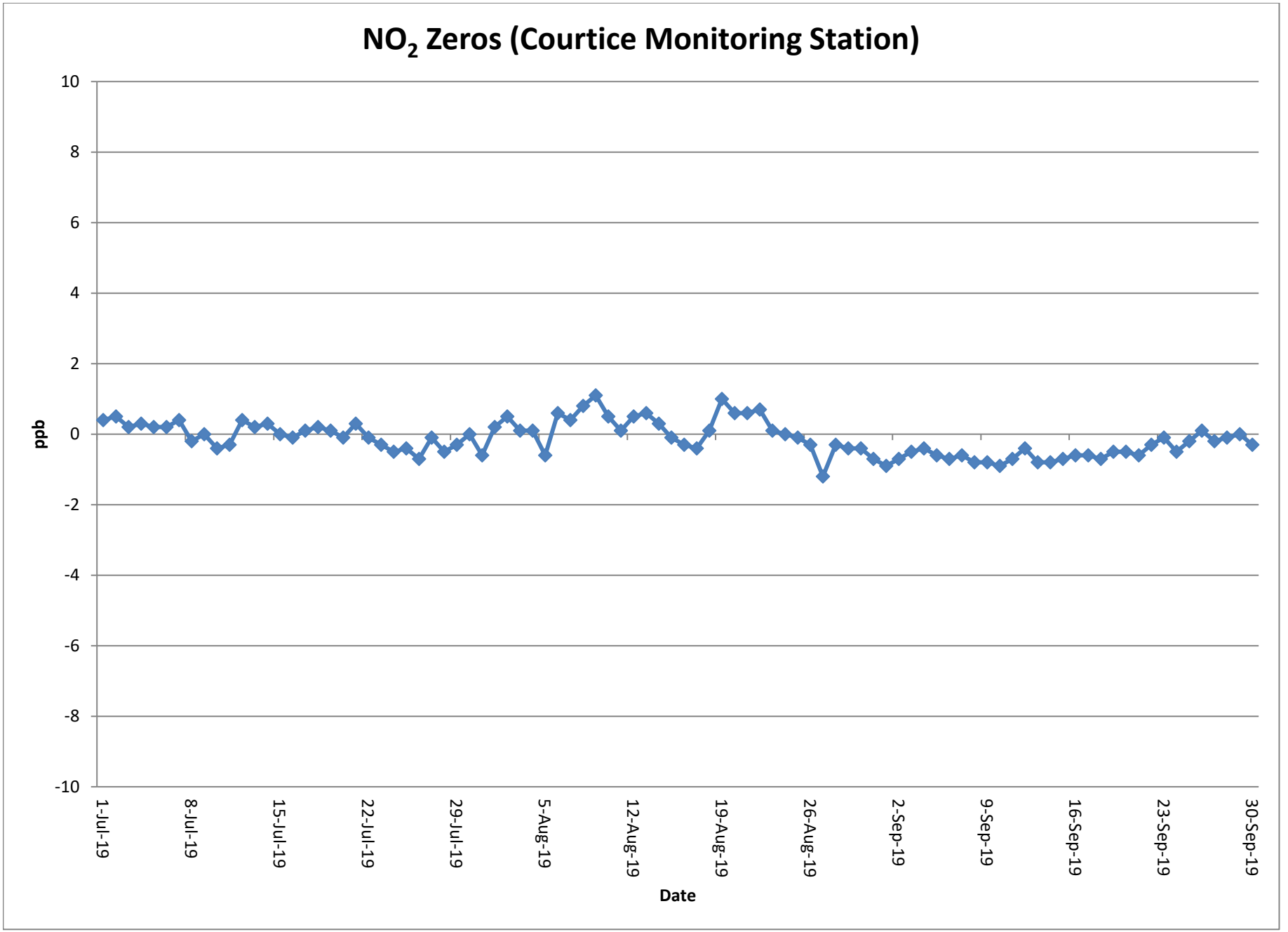
APPENDIX C

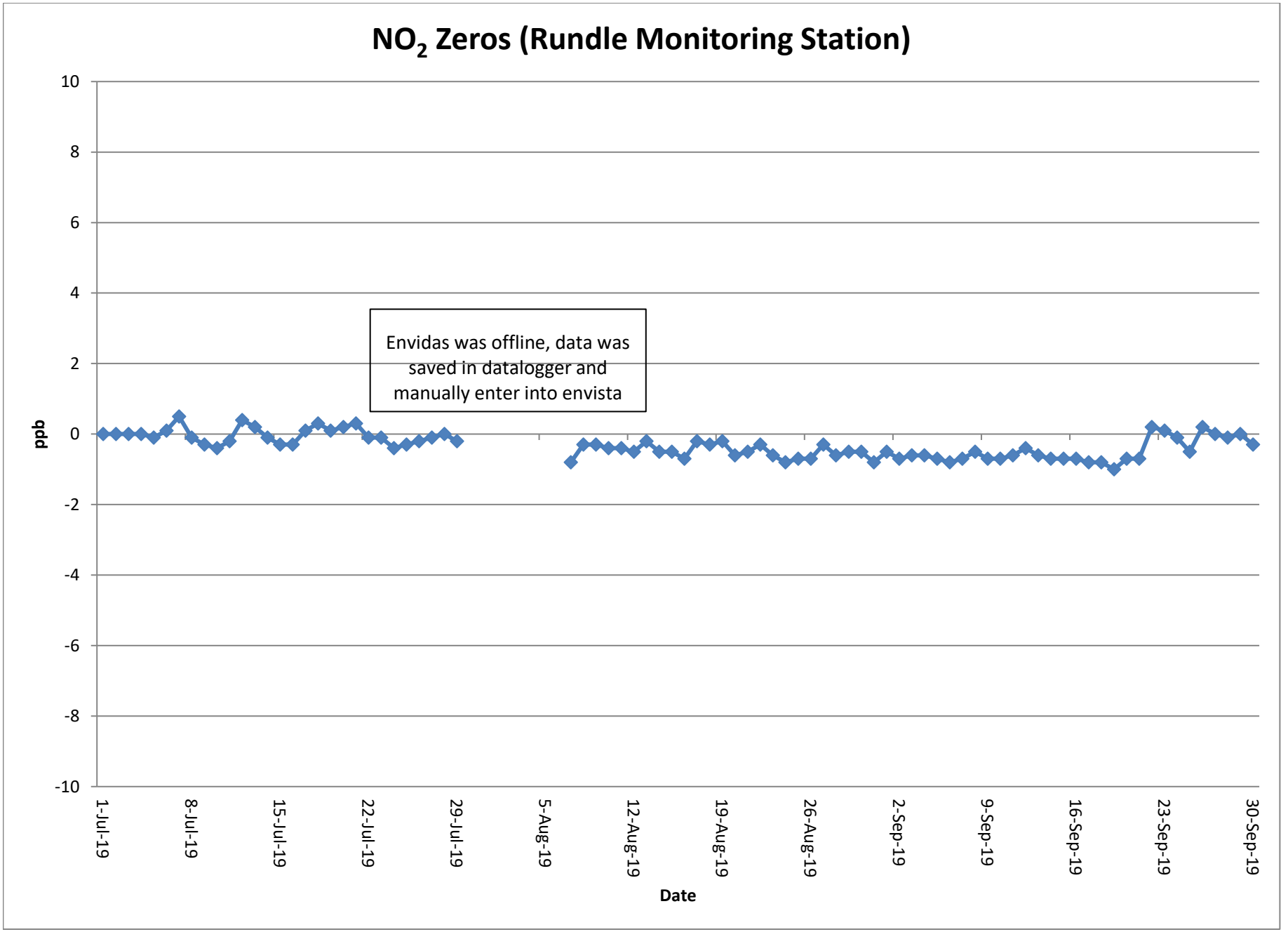

NOx Zeros (Courtice Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date

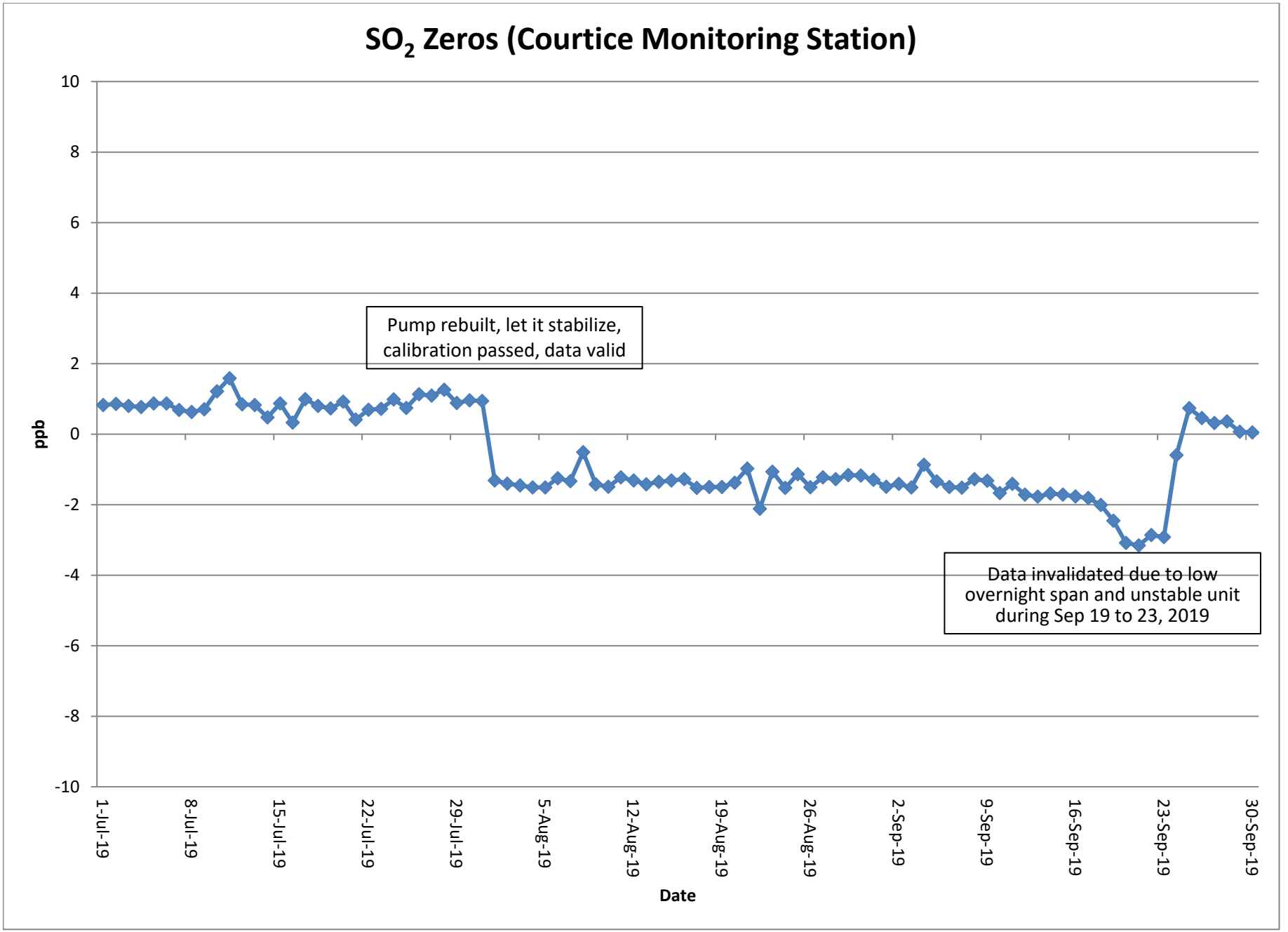

NOx Zeros (Rundle Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
Envidas was offline, data was saved in datalogger and manually enter into envista
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date

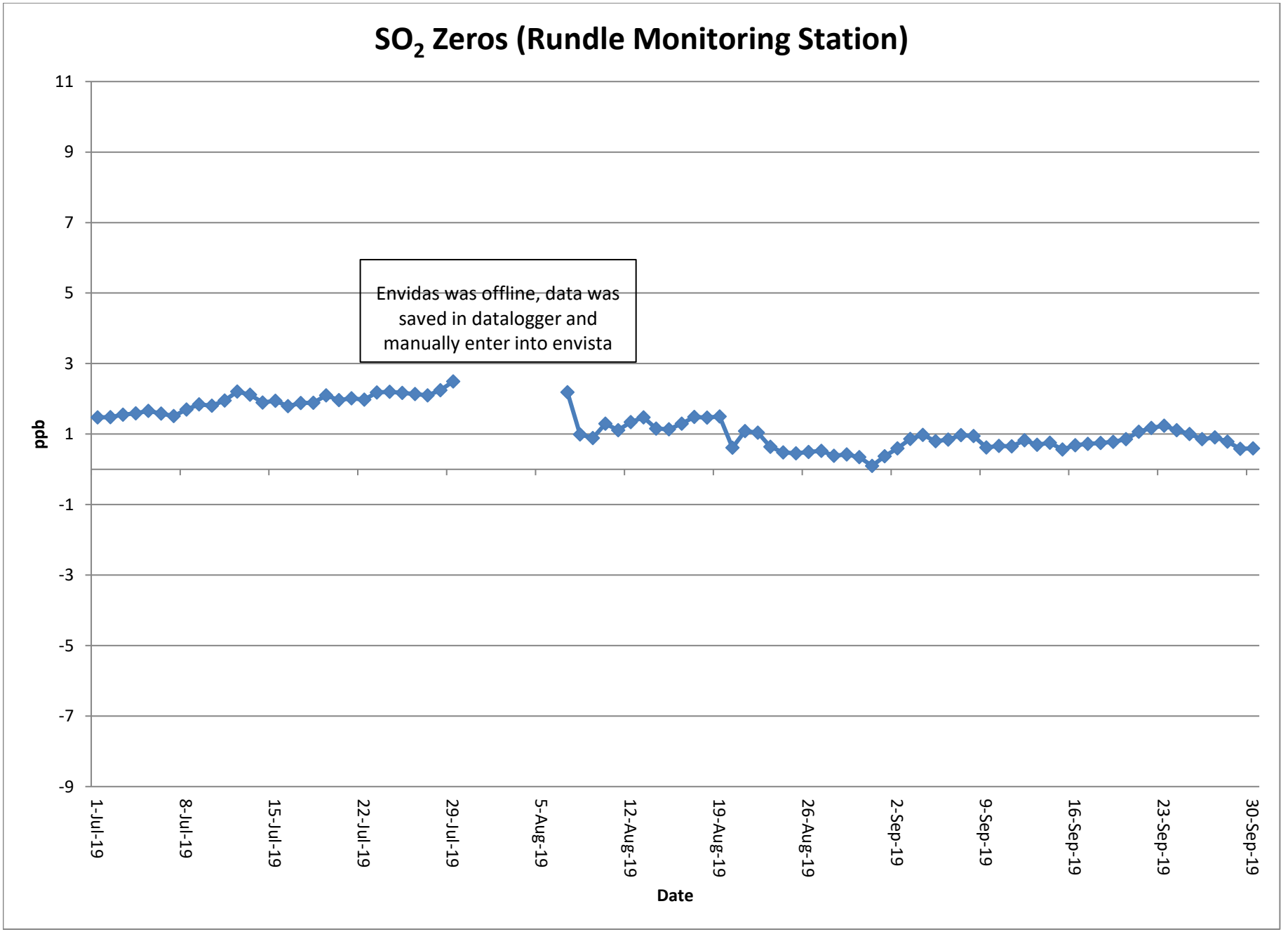

NO Zeros (Courtice Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date


NO Zeros (Rundle Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
Envidas was offline, data was saved in datalogger and manually enter into envista
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date


NO_2 Zeros (Courtice Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date


NO2 Zeros (Rundle Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
Envidas was offline, data was saved in datalogger and manually enter into envista
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date


SO2 Zeros (Courtice Monitoring Station)
10
8
6
4
2
0
-2
-4
-6
-8
-10
ppb
Pump rebuilt, let it stabilize, calibration passed, data valid
Data invalidated due to low overnight span and unstable unit during Sep 19 to 23, 2019
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date


SO2 Zeros (Rundle Monitoring Station)
11
9
7
5
3
1
-1
-3
-5
-7
-9
ppb
Envidas was offline, data was saved in datalogger and manually enter into envista
1-Jul-19
8-Jul-19
15-Jul-19
22-Jul-19
29-Jul-19
5-Aug-19
12-Aug-19
19-Aug-19
26-Aug-19
2-Sep-19
9-Sep-19
16-Sep-19
23-Sep-19
30-Sep-19
Date

APPENDIX D

Table D1: 3rd Quarter Edit Log for $PM_{2.5}$ at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: $PM_{2.5}$		**Instrument Make & Model:** Thermo Scientific Model 5030 SHARP Monitor					**s/n:** E-1563	
Data Edit Period	Start Date: July 1, 2019			End Date: September 30, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	31/07/2019	SS	Deleted Hours	31/07/2019	15:00	31/07/2019	16:00	Monthly Calibration
2	16/08/2019	QMI	Zero correction	01/07/2019	00:00	31/07/2019	00:00	Correcting values <0 to 0
3	22/08/2019	SS	Deleted Hours	22/08/2019	11:00	22/08/2019	12:00	Monthly Calibration
4	10/09/2019	QMI	Zero correction	01/08/2019	00:00	31/08/2019	00:00	Correcting values <0 to 0
5	24/09/2019	SS	Deleted Hours	24/09/2019	17:00	24/09/2019	18:00	Monthly Calibration
6	10/10/2019	QMI	Zero correction	01/09/2019	00:00	30/09/2019	00:00	Correcting values <0 to 0

Table D2: 3rd Quarter Edit Log for $PM_{2.5}$ at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45200				**Station Name:** Rundle Road Station				
Station Address: Rundle Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: $PM_{2.5}$		**Instrument Make & Model:** Thermo Scientific Model 5030 SHARP Monitor					**s/n:** E-1569	
Data Edit Period	Start Date: July 1, 2019			End Date: September 30, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	31/07/2019	SS	Deleted Hours	31/07/2019	19:00	31/07/2019	20:00	Monthly Calibration
2	19/08/2019	QMI	Zero correction	01/07/2019	00:00	31/07/2019	00:00	Correcting values <0 to 0
3	03/09/2019	QMI	Zero correction	01/08/2019	00:00	30/08/2019	00:00	Correcting values <0 to 0
4	06/09/2019	SS	Deleted Hours	06/09/2019	16:00	06/09/2019	17:00	Make up Calibration for Month of August
5	25/09/2019	SS	Deleted Hours	25/09/2019	17:00	25/09/2019	17:00	Monthly Calibration
6	07/10/2019	QMI	Zero correction	01/09/2019	00:00	30/09/2019	00:00	Correcting values <0 to 0

Table D3: 3rd Quarter Edit Log for NO_x at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: NOx		**Instrument Make & Model:** Teledyne Nitrogen Oxide Analyzer Model T200				**s/n:** 675		
Data Edit Period	Start Date: July 1, 2019			End Date: September 30, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	31/07/2019	SS	Deleted Hours	31/07/2019	14:00	31/07/2019	16:00	Monthly Calibration
2	16/08/2019	QMI	Zero correction	01/07/2019	00:00	31/07/2019	00:00	Correcting values <0 to 0
3	22/08/2019	SS	Deleted Hours	22/08/2019	12:00	22/08/2019	14:00	Monthly Calibration
4	26/08/2019	SS	Deleted Hours	26/08/2019	15:00	26/08/2019	19:00	Replace unit (S/N 675) for maintenance, install Unit (S/N 1424)
5	27/08/2019	SS	Deleted Hours	27/08/2019	11:00	27/08/2019	14:00	Fine tune Calibration
6	11/09/2019	QMI	Zero correction	01/08/2019	00:00	30/08/2019	00:00	Correcting values <0 to 0
7	24/09/2019	SS	Deleted Hours	24/09/2019	13:00	24/09/2019	15:00	Monthly Calibration
8	10/10/2019	QMI	Zero correction	01/09/2019	00:00	30/09/2019	00:00	Correcting values <0 to 0

Table D4: 3rd Quarter Edit Log for NO_x at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45200				**Station Name:** Rundle Road Station				
Station Address: Rundle Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: NOx		**Instrument Make & Model:** Teledyne Nitrogen Oxide Analyzer Model T200				**s/n:** 676		
Data Edit Period	Start Date: July 1, 2019			End Date: September 30, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	31/07/2019	SS	Deleted Hours	31/07/2019	19:00	31/07/2019	21:00	Monthly Calibration
2	19/08/2019	QMI	Zero correction	01/07/2019	00:00	31/07/2019	00:00	Correcting values <0 to 0
3	07/08/2019	SS	Deleted Hours	07/08/2019	13:00	07/08/2019	15:00	Monthly Calibration
4	03/09/2019	QMI	Zero correction	01/08/2019	00:00	30/08/2019	00:00	Correcting values <0 to 0
5	25/09/2019	SS	Deleted Hours	25/09/2019	15:00	25/09/2019	17:00	Monthly Calibration
6	07/10/2019	QMI	Zero correction	01/09/2019	00:00	30/09/2019	00:00	Correcting values <0 to 0

Table D5: 3rd Quarter Edit Log for SO_2 at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: SO_2		**Instrument Make & Model:** Teledyne Sulfur Dioxide Analyzer Model T100				**s/n:** 565		
Data Edit Period	Start Date: July 1, 2019			End Date: September 30, 2019		All testing done in EST		

Edit #	Edit Date (dd/mm/yyyy)	Editor's Name	Edit Action	Starting		Ending		Reason
				Date (dd/mm/yyyy)	Hour (xx:xx)	Date (dd/mm/yyyy)	Hour (xx:xx)	
1	31/07/2019	SS	Deleted Hours	31/07/2019	14:00	31/07/2019	16:00	Monthly Calibration
2	16/08/2019	QMI	Zero correction	01/07/2019	00:00	31/07/2019	00:00	Correcting values <0 to 0
3	22/08/2019	SS	Deleted Hours	22/08/2019	11:00	22/08/2019	13:00	Monthly Calibration
4	03/09/2019	QMI	Zero offset adjustment	21/08/2019	02:15	22/08/2019	01:45	Correcting zero drift
5	11/09/2019	QMI	Zero correction	01/08/2019	00:00	31/08/2019	00:00	Correcting values <0 to 0
6	23/09/2019	SS	Deleted Hours	23/09/2019	14:00	23/09/2019	19:00	Replaced analyzer due to low overnight span & calibrate
7	10/10/2019	QMI	Deleted Hours	19/09/2019	02:00	23/09/2019	02:00	Due to low overnight span, data are not valid during 20-23 September
8	24/09/2019	SS	Deleted Hours	24/09/2019	11:00	24/09/2019	13:00	Monthly Calibration
9	10/10/2019	QMI	Zero offset adjustment	17/09/2019	02:15	19/09/2019	01:45	Correcting zero drift
10	10/10/2019	QMI	Zero correction	01/09/2019	00:00	30/09/2019	00:00	Correcting values <0 to 0

Table D6: 3rd Quarter Edit Log for SO_2 at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Road Station				
Station Address: Rundle Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: SO_2			**Instrument Make & Model:** Teledyne Sulfur Dioxide Analyzer Model T100				**s/n:** 566	
Data Edit Period		Start Date: July 1, 2019		End Date: September 30, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	31/07/2019	SS	Deleted Hours	31/07/2019	19:00	31/07/2019	21:00	Monthly Calibration
2	19/08/2019	QMI	Zero offset adjustment	12/07/2019	02:15	29/07/2019	01:45	Correcting zero drift
3	19/08/2019	QMI	Zero correction	01/07/2019	00:00	31/07/2019	00:00	Correcting values <0 to 0
4	07/08/2019	SS	Deleted Hours	07/08/2019	11:00	07/08/2019	13:00	Monthly Calibration
5	21/08/2019	SS	Deleted Hours	21/08/2019	17:00	21/08/2019	20:00	Maintenance
6	22/08/2019	SS	Deleted Hours	22/08/2019	9:00	22/08/2019	10:00	Maintenance / calibration
7	03/09/2019	QMI	Zero correction	01/08/2019	00:00	30/08/2019	00:00	Correcting values <0 to 0
8	25/09/2019	SS	Deleted Hours	25/09/2019	16:00	25/09/2019	17:00	Monthly Calibration
9	07/10/2019	QMI	Zero correction	01/09/2019	00:00	30/09/2019	00:00	Correcting values <0 to 0

Table D7 3rd Quarter Edit Log for Meteorological Parameters at Courtice Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: WS, WD, Ambient T, P, RH and Rain			**Instrument Make & Model:** Miscellaneous Meterological Instrumentation			**s/n:** N/A		
Data Edit Period		Start Date: July 1, 2019		End Date: September 30, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1								
2								
3								
4								

Table D8: 3rd Quarter Edit Log for Meteorological Parameters at Rundle Road Station

Emitter's Name: Durham York Energy Centre								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Station				
Station Address: Rundle Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: WS, WD, Ambient T, P, RH and Rain			**Instrument Make & Model:** Miscellaneous Meterological Instrumentation			**s/n:** N/A		
Data Edit Period		Start Date: July 1, 2019		End Date: September 30, 2019		All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1								
2								
3								
4								

Table D9: 3rd Quarter Edit Log for Non-Continuous at Courtice Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period		Start Date: July 1, 2019		End Date: September 30, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	09/07/2019	MT	Maintenance and Repair	09/07/2019	10:30	09/07/2019	11:00	TSP/PAH Pickup
2	11/07/2019	MT	Maintenance and Repair	11/07/2019	10:40	11/07/2019	11:10	TSP Setup
3	18/07/2019	KE	Maintenance and Repair	18/07/2019	10:00	18/07/2019	10:30	TSP/PAH Setup
4	22/07/2019	KE	Maintenance and Repair	22/07/2019	10:00	22/07/2019	10:30	TSP/PAH Pickup and TSP setup
5	31/07/2019	MT and SRS	Maintenance and Repair	31/07/2019	10:00	31/07/2019	12:30	SO2 Pump re-build
7	02/08/2019	MT	Maintenance and Repair	02/08/2019	10:00	02/08/2019	10:30	TSP/PAH Pickup
8	06/08/2019	MT	Maintenance and Repair	06/08/2019	14:00	06/08/2019	14:30	TSP Setup
9	12/08/2019	MT	Maintenance and Repair	12/08/2019	12:15	12/08/2019	12:45	TSP/PAH Setup
10	14/08/2019	MT	Maintenance and Repair	14/08/2019	15:40	14/08/2019	16:00	TSP/PAH Pickup
11	22/08/2019	SRS	Maintenance and Repair	22/08/2019	10:30	22/08/2019	14:00	Switched out SHARP unit for repair (S/N 1424)
12	23/08/2019	MT	Maintenance and Repair	23/08/2019	15:00	23/08/2019	15:30	TSP/PAH Setup
13	26/08/2019	MT	Maintenance and Repair	26/08/2019	12:20	26/08/2019	12:40	TSP/PAH Setup
14	26/08/2019	SRS	Maintenance and Repair	26/08/2019	16:00	26/08/2019	18:00	Ran takeout cal on Nox(S/N 645) - passed. Switched out Nox (S/N 1424)
15	27/08/2019	SRS	Maintenance and Repair	27/08/2019	11:00	27/08/2019	15:00	Checked New Nox bottle - contaminated with ~50 ppb NO2
16	03/09/2019	SRS	Maintenance and Repair	03/09/2019	11:00	03/09/2019	16:00	Annual maint. on decommissioned Nox unit S/N 645. Replaced Ozone DFU filter and cleanser, cleaned RxCell, replaced gasket and o-rings. Replaced all orifice components on RxCell and vacuum manifold
17	05/09/2019	MT	Maintenance and Repair	05/09/2019	13:55	05/09/2019	14:20	TSP/PAH Setup
18	09/09/2019	MT	Maintenance and Repair	09/09/2019	14:05	09/09/2019	14:30	TSP/PAH Pickup
19	11/09/2019	MT	Maintenance and Repair	11/09/2019	16:00	11/09/2019	16:20	TSP Setup
20	17/09/2019	MT	Maintenance and Repair	17/09/2019	15:05	17/09/2019	15:25	TSP/PAH Setup

Table D9 (cont.): 3rd Quarter Edit Log for Non-Continuous at Courtice Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45201				**Station Name:** Courtice Station				
Station Address: 100 Osbourne Road				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period		Start Date: July 1, 2019		End Date: September 30, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
21	20/09/2019	MT	Maintenance and Repair	20/09/2019	11:00	20/09/2019	11:25	TSP/PAH Pickup
22	22/09/2019	MT	Maintenance and Repair	22/09/2019	10:30	22/09/2019	11:00	TSP Setup
23	23/09/2019	SRS	Maintenance and Repair	23/09/2019	16:00	23/09/2019	18:20	SO2 diagnostics after low overnight spans. Diagnostics show higher UV output. Removed unit for repair and installed Unit S/N 565. Peaked lamp + ran lamp and PMT hardware cal. Instrument Calibrated and operational
24	24/09/2019	SRS	Maintenance and Repair	24/09/2019	11:00	24/09/2019	14:00	Installed relays for Hi-vol and PUF control. Intalled pressure transducers. Re-programmed datalogger to accommodate
25	25/09/2019	SRS	Maintenance and Repair	25/09/2019	11:00	25/09/2019	13:00	Configured Envidas to accommodate new CR1000 program. Station fully operational.
26	29/09/2019	MT	Maintenance and Repair	29/09/2019	12:20	29/09/2019	12:20	TSP/PAH Pickup

Table D10: 3rd Quarter Edit Log for Non-Continuous at Rundle Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller		**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca			
Station Number: 45200				**Station Name:** Rundle Station				
Station Address: Rundle Rd				**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON				
Pollutants or Parameter: N/A			**Instrument Make & Model:** N/A				**s/n:**	
Data Edit Period		Start Date: July 1, 2019		End Date: September 30, 2019			All testing done in EST	
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
1	06/07/2019	MT	Maintenance and Repair	06/07/2019	10:00	06/07/2019	10:30	TSP/PAH Pickup and NOx and SO2 System Reset
2	09/07/2019	MT	Maintenance and Repair	09/07/2019	11:00	09/07/2019	11:30	TSP/PAH Pickup
3	11/07/2019	MT	Maintenance and Repair	11/07/2019	10:15	11/07/2019	10:45	TSP Setup
4	18/07/2019	MT and KE	Maintenance and Repair	18/07/2019	09:15	18/07/2019	09:45	TSP/PAH Changeover, and NOx and SO2 system reset fault cleared
5	22/07/2019	MT and KE	Maintenance and Repair	22/07/2019	10:00	22/07/2019	12:30	System reset faults cleared, TSP/PAH pickup, TSP Setup
6	31/07/2019	MT	Maintenance and Repair	31/07/2019	15:20	31/07/2019	17:00	TSP/PAH Changeover
7	31/07/2019	SRS	Maintenance and Repair	31/07/2019	17:00	31/07/2019	19:00	Envidas computer Boot disk error, downloaded data from CR1000
8	01/08/2019	SRS	Maintenance and Repair	01/08/2019	09:30	01/08/2019	12:00	Pulled Envidas Computor out for repair, installed Aux modem on CR1000 for data retrieval
9	02/08/2019	MT	Maintenance and Repair	02/08/2019	11:00	02/08/2019	11:30	TSP/PAH Pickup
10	06/08/2019	MT	Maintenance and Repair	06/08/2019	14:30	06/08/2019	15:00	TSP Setup
11	06/08/2019	SRS	Maintenance and Repair	06/08/2019	15:00	06/08/2019	15:30	Install and configure new envidas computer, unable to establish remote connection
12	07/08/2019	SRS	Maintenance and Repair	07/08/2019	12:00	07/08/2019	12:30	Re-establish remote connection, station fully functional
13	12/08/2019	MT	Maintenance and Repair	12/08/2019	12:10	12/08/2019	12:40	SO2 and NOx system reset, TSP/PAH Setup
14	14/08/2019	MT	Maintenance and Repair	14/08/2019	16:10	14/08/2019	16:40	SO2 and NOx system reset, TSP/PAH Setup
15	16/08/2019	MT	Maintenance and Repair	16/08/2019	11:50	16/08/2019	12:30	TSP Setup
16	21/08/2019	SRS	Maintenance and Repair	21/08/2019	16:00	21/08/2019	18:00	Replaced torn diaphram on SO2
17	22/08/2019	SRS	Maintenance and Repair	22/08/2019	08:30	22/08/2019	09:30	Fine-tuning after repair

Table D10 (cont.): 3rd Quarter Edit Log for Non-Continuous at Rundle Station

Emitter's Name: Durham York Energy Center								
Contact	**Name:** Ms. Lyndsay Waller	**Phone:** (905) 404-0888 ext 4107		**Email:** Lyndsay.Waller@Durham.ca				
Station Number: 45200			**Station Name:** Rundle Station					
Station Address: Rundle Rd			**Emitter Address:** The Region of Durham, 605 Rossland Road, Whitby, ON					
Pollutants or Parameter: N/A		**Instrument Make & Model:** N/A				**s/n:**		
Data Edit Period	Start Date: July 1, 2019		End Date: September 30, 2019			All testing done in EST		
Edit #	**Edit date (dd/mm/yyyy)**	**Editor's Name**	**Edit Action**	**Starting**		**Ending**		**Reason**
				Date (dd/mm/yyyy)	**Hour (xx:xx)**	**Date (dd/mm/yyyy)**	**Hour (xx:xx)**	
18	23/08/2019	MT	Maintenance and Repair	23/08/2019	14:00	23/08/2019	14:20	TSP/PAH Setup
19	26/08/2019	MT	Maintenance and Repair	26/08/2019	13:10	26/08/2019	14:30	Nox, SO2 system reset. TSP/PAH Pickup
20	05/09/2019	MT	Maintenance and Repair	05/09/2019	14:00	05/09/2019	14:20	TSP/PAH Pickup
21	06/09/2019	SRS	Maintenance and Repair	06/09/2019	16:00	06/09/2019	17:00	Intalled new UPS
22	09/09/2019	MT	Maintenance and Repair	09/09/2019	13:30	09/09/2019	13:50	TSP/PAH Pickup
23	11/09/2019	MT	Maintenance and Repair	11/09/2019	17:00	11/09/2019	17:20	TSP Setup
24	20/09/2019	MT	Maintenance and Repair	20/09/2019	10:35	20/09/2019	11:00	TSP/PAH Setup
25	22/09/2019	MT	Maintenance and Repair	22/09/2019	11:00	22/09/2019	11:30	TSP Setup
26	29/09/2019	MT	Maintenance and Repair	29/09/2019	11:30	29/09/2019	12:00	TSP/PAH Pickup