Stantec Consulting Ltd.
401 Wellington Street West, Suite 100, Toronto ON M5V 1E7

December 16, 2014
File: 160950528

Attention: Mr. Dan Orr, Manager, Technical Support Section
Ministry of the Environment and Climate Change
Central Region, Technical Support Section
5775 Yonge Street, 8th Floor
Toronto, ON M2M 4J1

Dear Mr. Orr,

Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

The Ministry of the Environment and Climate Change (MOECC) conducted a data validation review and issued a comment letter (dated July 8, 2014) for the Annual Ambient Air Monitoring Report for the Durham York Energy Centre (May to December 2013), and the Quarterly Ambient Air Quality Monitoring Reports for Quarters 2, 3 and 4 of 2013. As requested by the MOECC, this letter is an addendum to the Annual Report and provides Stantec's responses to the MOECC's comments. The sections below correspond to the items listed in the MOECC's letter.

1.0 CONTINUOUS PARAMETERS (MAY TO DECEMBER 2013)

All continuous measurement data underwent a data validation process by Stantec following guidelines provided by MOECC. Monitoring data was invalidated based on information available at the time of the data review and only if sufficient justification was available to provide a high degree of confidence that the data was not representative of actual conditions.

1.1 VALIDITY OF NO_2 MEASUREMENTS AT THE COURTICE STATION ON MAY 6 AND 7, 2013

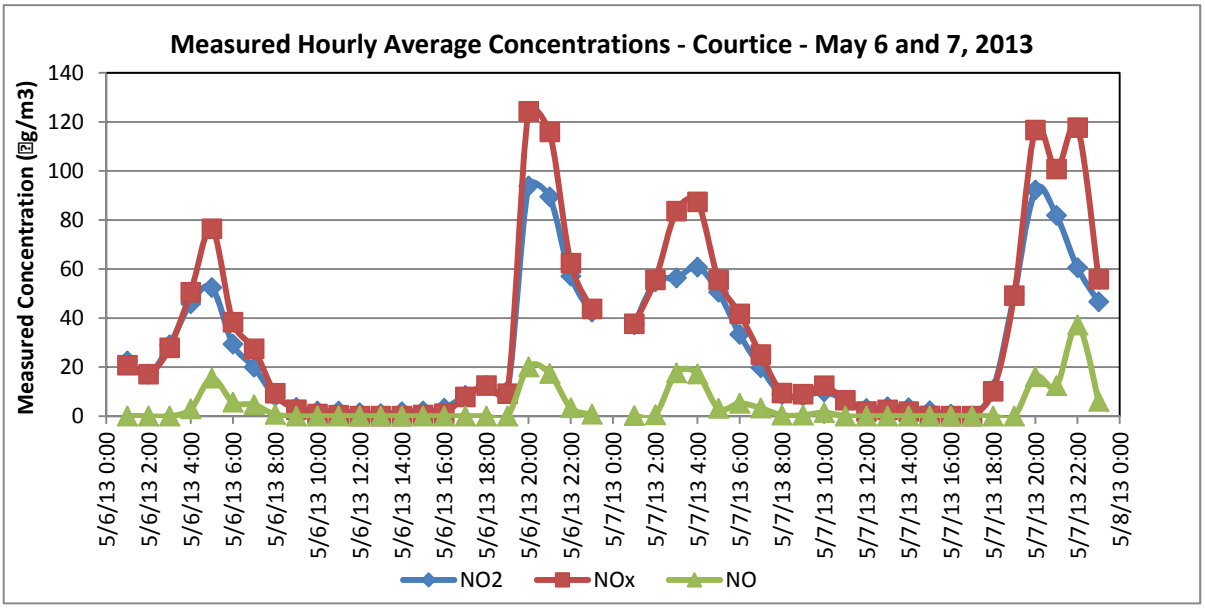
MOECC has requested a clarification of the validity of the NO / NO_2 / NOx measurements recorded at the Courtice WPCP Station on May 6 and May 7 commencing at 21:00 and 20:00, due to the relatively sudden increases in concentrations seen at these times without corresponding increases at the Rundle Station. Plots of the measured NOx / NO / NO_2 concentrations along with wind direction/wind speed are presented in Figure 1 below. Hour 0 was routinely invalidated as a calibration hour during this period (the NOx analyzer was set to auto-calibrate at this hour every day).

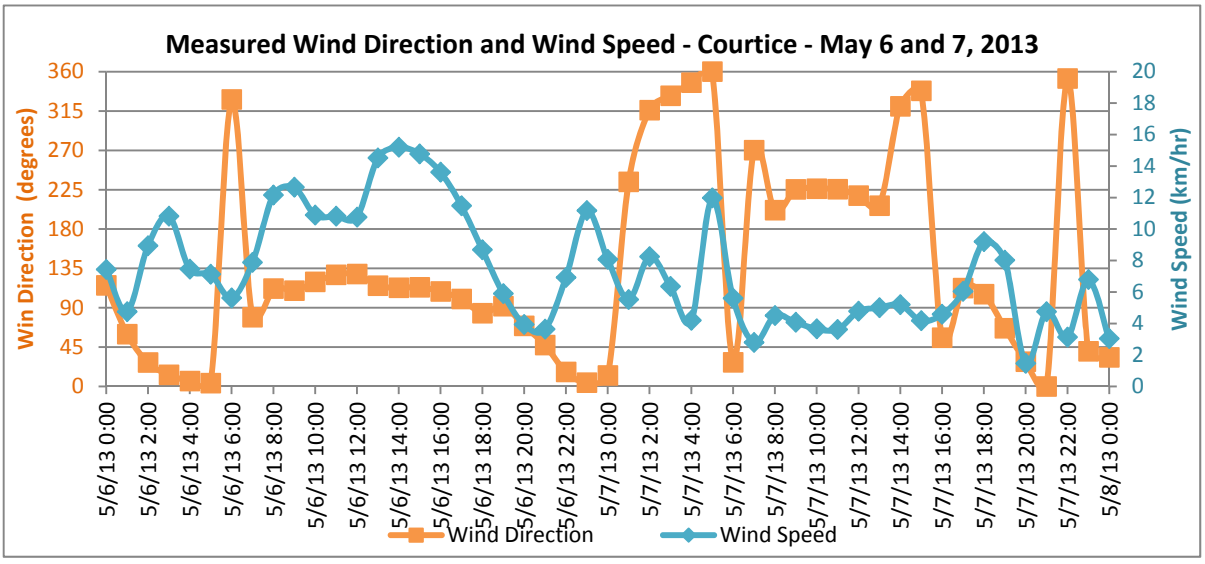
The elevated concentrations correspond to periods of time when winds were blowing from northerly to north-easterly directions. The elevated levels may have been due to local sources of NO/NO_2 in the area such as train traffic on the CN rail line to the north of the Courtice Water Pollution Control Plant (WPCP), vehicle emissions from trucks which on occasion idle to the north/north-east of the monitoring station while delivering supplies to the Chemical building in the

Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

WPCP, or construction emissions from the DYEC site (e.g. portable gensets for temporary lighting, etc). As the changes in ambient concentrations showed gradual declines in concentration (as the wind direction shifted) and the values were well within the measurement range of the instrument, Stantec saw no justification for invalidating the data during this period based on MOECC data editing protocols for rate of change or magnitude of measured levels.

Figure 1 – Measured Hourly Average NO/NO_2/NOx Concentrations and Wind Speed/Wind Direction at the Courtice WPCP Station on May 6 – May 7, 2013





Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

1.2 $PM_{2.5}$ ON JUNE 30 TO JULY 3, 2013 AT THE COURTICE STATION

MOECC has requested clarification of the $PM_{2.5}$ measurements at the Courtice station between June 30th to July 3, 2013, as the data showed blocks of what the MOECC has termed "repeated hourly values".

During Stantec's validation process (following MOECC standard protocols), this data was reviewed and it was noted that while the $PM_{2.5}$ levels during this period stayed relatively constant, the values did in fact vary between 18.6 and 19.3 $\mu g/m^3$. Stantec's experience with the Thermo-Sharpe $PM_{2.5}$ monitor has been that during an instrument malfunction, the measured values repeat exactly, which was not seen during this period. While the $PM_{2.5}$ trend during this period was unusual, Stantec did not judge there to be sufficient justification for invalidating the data at that time. However, in light of the additional information provided by the MOECC in their July 2014 letter on measured $PM_{2.5}$ levels in Oshawa and on Quebec forest fires occurring during this period, Stantec concurs that there is now sufficient justification for invalidating these measurements.

An updated data recovery rate table and ambient CAC summary table for the Courtice monitoring station (Tables 3-4 and 4-2 in the 2013 Annual Report) are provided in Attachment A of this letter. The following updated monthly data summary tables are provided in Attachment B to this letter:

- Appendix D Data Summary Table $PM_{2.5}$ – Courtice – June 2013 (Q2 2013 report), and
- Appendix D Data Summary Table $PM_{2.5}$ – Courtice – July 2013 (Q3 2013 report).

Relative to the previously reported values, the $PM_{2.5}$ data recovery rate for the Courtice Station between May and December 2013 has changed from 75% to 74%, and the mean $PM_{2.5}$ level decreases from 8.6 to 8.5 $\mu g/m^3$. The 98th percentile $PM_{2.5}$ level remains unchanged with this revision to the $PM_{2.5}$ data set. These minor data edits did not affect the results or conclusions of the 2013 Annual Report with regard to ambient $PM_{2.5}$ levels.

As indicated in the MOECC's letter, elevated $PM_{2.5}$ levels (measured hourly averages in the 40 to 50 $\mu g/m^3$ range) were recorded at the Rundle Road station and the MOECC Oshawa station between June 30 to July 3, 2013. The MOECC attributes these elevated $PM_{2.5}$ levels due to forest fires in Quebec during that period and has recommended that this be noted in the report. This addendum to the 2013 reports duly notes this contribution to ambient $PM_{2.5}$ levels.

Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

2.0 NON-CONTINUOUS PARAMETERS (MAY TO DECEMBER 2013)

PAH and Dioxins/Furans (D&F) samples are collected with mass-flow controlled high-volume air samplers. PAH /dioxin and furan samplers at the Courtice WPCP and Rundle Road stations have been maintained at the maximum flow rate that the flow controller is capable of, as agreed upon with the MOECC. However, as MOECC has noted, there were four instances in 2013 where meteorological conditions and/or filter loading resulted in the average flow rate over the course of a sample being below the MOECC recommended flow rate. As requested by the MOECC, these samples have been noted as having flow rates below the range of 8 cfm ±10% in the following updated report tables (included in Attachment C to this letter):

- Q3 2013 Quarterly Report, Appendices G and H (for Courtice PAH and D&F samples on July 3 and 27, and the Courtice PAH sample taken on July 15)

- Q4 2013 Quarterly Report, Appendices G and H (Rundle PAH and D&F sample on Oct 7).

3.0 GENERAL COMMENTS – 2013 ANNUAL AMBIENT AIR QUALITY MONITORING REPORT

The following revisions are made to the 2013 Annual Ambient Air Quality Monitoring Report and presented in this addendum.

The first paragraph on page vi of the **Executive Summary** is revised as follows:

"The 2013 monitoring collected background air quality levels (i.e. air quality without the DYEC operating). The DYEC was under construction in 2013, with commissioning of the facility currently anticipated to start in July 2014. Based on this schedule, 14-months of background air quality data will be collected prior to the start of the facility operations. Due to various instrumentation issues during the initial shake-down period, data recovery rates were low for certain parameters during the initial two months (May and June 2013) of monitoring. However, from July 2013 onwards, there has been few instrumentation issues and data recovery rates have been acceptable. For all parameters, a minimum of 12-months of data with acceptable data recovery rates will be collected. As the MOE requires quarterly and annual reports to be submitted based on calendar quarters/years, a separate report will be issued summarizing the data collected over the 14-months of background data collection. At this time, sufficient data will have been collected to compare annual average levels to applicable annual criteria."

Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

The notes under **Table 2-3 Summary of Air Quality Criteria for Metals** are revised as follows:

Notes:

A. Carcinogenic Annual Average. Units in $(ng/m^3)^{-1}$.
B. Ontario Ambient Air Quality Criteria - The standard for benzo(a)pyrene (B(a)P) is for B(a)P as a surrogate for PAHs.
C. O. Reg. 419 Schedule 6 Upper Risk Thresholds
D. Future O. Reg. 419 Standard that will be in effect in 2016
E. Application of the air standard for dioxins, furans, and dioxin-like PCBs requires the calculation of the total toxicity equivalent (TEQ) concentration contributed by all dioxin-like compounds in the mixture. TEQ is calculated using the methodology as per the O. Reg.419 Summary of Standards and Guidelines, and the corresponding WHO_{2005} toxic equivalency factors (TEFs).
F. Ontario Ambient Air Quality Criteria
G. Toxic Equivalency Factors (TEFs) are shown as benzo(a)pyrene equivalents.

Regards,

STANTEC CONSULTING LTD.

Original Signature on File

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Attachment: Attachment A – Updated Summary Tables– Courtice WPCP Station
Attachment B – Updated Monthly PM2.5 Data Summary Tables
Attachment C – Updated PAH and D&F Summary Tables

c. Greg Borchuk, Region of Durham
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Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

ATTACHMENT A – UPDATED SUMMARY TABLES – COURTICE WPCP STATION

Table 3-4 Summary of Data Recovery Rates for the Courtice WPCP Station (Upwind) –2013 Monitoring Period

Parameter	Valid Measurement Hours	Data Recovery Rate (%)
SO_2	5698	97%
NO_X	5779	98%
$PM_{2.5}$	4335	74%
Temperature	5854	99.6%
Rainfall	5854	99.6%
Relative Humidity	5854	99.6%
Pressure	5729	97%
Wind Speed/Direction	5880	100%
TSP/Metals	40 [A]	98%
PAHs	21 [A]	100%
Dioxins and Furans	10 [A]	100%

Note:

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

Table 4-2 Summary of Ambient CAC Monitoring Data - 2013 Monitoring Period

Pollutant	Averaging Period	AAQC / HHRA Health-Based Standards			Courtice WPCP (Upwind)		Rundle Road (Downwind)	
		µg/m³	ppb		Concentration (µg/m³)	Concentration (ppbv)	Concentration (µg/m³)	Concentration (ppbv)
SO_2	1	690	250	Maximum	157.2	56.3	65.3	24.8
				Minimum	0.0	0.0	0.0	0.0
				Mean	4.4	1.6	1.2	0.4
				Standard Deviation	8.3	3.0	2.7	1.0
				# of Exceedances	0	0	0	0
	24	275	100	Maximum	36.8	13.8	10.4	3.9
				Minimum	0.0	0.0	0.0	0.0
				Mean	4.4	1.6	1.2	0.4
				Standard Deviation	5.6	2.0	1.2	0.4
				# of Exceedances	0	0	0	0
	Annual	55 / 29 [B]	20 / 11 [B]	Mean (Period)	4.4	1.6	1.2	0.4
				# of Exceedances	N/A [A]	N/A [A]	N/A [A]	N/A [A]
$PM_{2.5}$	24	30 [C]	NA	Maximum	27.0	-	50.6	-
				Minimum	1.8	-	0.6	-
				Mean	8.5	-	8.4	-
				98th Percentile [D]	21.5	-	21.7	-
				Standard Deviation	4.6	-	6.2	-
				# of Exceedances	N/A [G]	-	N/A [G]	-
NO_2	1	400 [E]	200 [E]	Maximum	93.8	48.0	78.3	39.3
				Minimum	0.0	0.0	0.0	0.0
				Mean	12.6	6.4	12.8	6.5
				Standard Deviation	14.0	7.1	10.0	5.1
				# of Exceedances	0	0	0	0
	24	200 [E]	100 [E]	Maximum	54.5	26.8	50.4	24.7
				Minimum	0.5	0.3	0.4	0.2
				Mean	12.6	6.4	12.9	6.6
				Standard Deviation	8.0	4.1	6.9	3.5
				# of Exceedances	0	0	0	0
NO [F]	1	NA	NA	Maximum	148.1	111.1	53.5	40.7

Table 4-2 Summary of Ambient CAC Monitoring Data - 2013 Monitoring Period

Pollutant	Averaging Period	AAQC / HHRA Health-Based Standards			Courtice WPCP (Upwind)		Rundle Road (Downwind)	
		µg/m³	ppb		Concentration (µg/m³)	Concentration (ppbv)	Concentration (µg/m³)	Concentration (ppbv)
				Minimum	0.0	0.0	0.0	0.0
				Mean	4.1	3.2	3.9	3.0
				Standard Deviation	8.2	6.4	3.8	2.9
				# of Exceedances	N/A	N/A	N/A	N/A
	24	NA	NA	Maximum	30.4	22.9	14.1	10.6
				Minimum	0.0	0.0	0.6	0.5
				Mean	4.1	3.2	3.9	3.0
				Standard Deviation	3.8	3.0	1.8	1.4
				# of Exceedances	N/A	N/A	N/A	N/A
NO_X	1	400 [E]	200 [E]	Maximum	309.0	151.3	138.1	68.5
				Minimum	0.0	0.0	0.0	0.0
				Mean	18.7	9.6	15.8	8.0
				Standard Deviation	24.0	12.2	13.8	7.0
				# of Exceedances	0	0	0	0
	24	200 [E]	100 [E]	Maximum	100.8	49.6	71.2	34.9
				Minimum	0.3	0.1	0.7	0.3
				Mean	18.7	9.5	15.9	8.1
				Standard Deviation	12.9	6.6	8.5	4.3
				# of Exceedances	0	0	0	0

Notes:

A. As the length of the measurement period in 2013 was less than 9-months, the period (i.e. 8-months) averages presented in this report were not compared to available MOE annual criteria.

B. Annual AAQC / Annual HHRA.

C. Canada-Wide Standards for Respirable Particulate Matter. The Respirable Particulate Matter Objective is referenced to the average of the 98th percentile of the daily average over 3 consecutive years.

D. The 98th percentile of the daily average $PM_{2.5}$ measurements in the period.

E. As per current version (April 2012) of Reg 419 Summary of Standards and Guidelines, the air standard for NO_X is compared to a monitored NO_X concentration, although the Reg419 Schedule 3 standard for NO_X is based on health effects of NO_2.

F. NO has no regulatory criteria.

G. Daily $PM_{2.5}$ concentrations were not compared to the Canada Wide Standard shown in this table, which requires averaging the 98th percentile concentrations over three consecutive years, as compared to the 8-month period covered by this report.

Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

ATTACHMENT B – UPDATED MONTHLY DATA SUMMARY TABLES FOR $PM_{2.5}$, JUNE AND JULY 2013 – COURTICE WPCP STATION

PM$_{2.5}$ - COURTICE
June 2013
(ug/m3)

Day	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
25	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
26	M	M	M	M	M	M	M	M	M	C	C	C	C	14.7	11.7	9.6	9.5	9.4	8.8	9.2	9.9	10.0	9.4	10.3	11	14.7	8.8	
27	10.0	10.4	10.4	10.1	9.9	9.9	10.1	10.1	10.1	10.2	10.4	10.7	10.6	9.9	10.8	10.5	11.0	11.2	10.8	11.0	11.2	11.2	11.4	11.5	24	11.5	9.9	10.6
28	11.5	11.3	10.9	10.3	9.7	10.0	10.4	10.7	11.2	10.1	10.9	10.9	11.1	8.5	9.1	7.8	6.6	5.6	4.8	4.5	4.0	3.6	3.7	4.2	24	11.5	3.6	8.4
29	3.4	3.1	3.0	3.2	3.3	3.2	3.3	3.3	3.5	3.2	3.0	3.4	3.3	3.3	3.5	3.8	5.4	4.3	3.9	4.2	4.5	4.5	5.5	6.4	24	6.4	3.0	3.8
30	5.7	5.2	5.0	5.2	5.0	4.3	3.8	3.5	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	4.1	5.3	M	M	M	21	5.7	2.9	3.8
31																									0	0.0	0.0	
Count	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	4	4	4	104	5	4	4
Maximum	11.5	11.3	10.9	10.3	9.9	10.0	10.4	10.7	11.2	10.2	10.9	10.9	11.1	14.7	11.7	10.5	11.0	11.2	10.8	11.0	11.2	11.2	11.4	11.5	24	14.7	9.9	11.1
Minimum	3.4	3.1	3.0	3.2	3.3	3.2	3.3	3.3	3.0	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9	4.1	4.0	3.6	3.7	4.2	0	0	2.9	
Average	7.6	7.5	7.3	7.2	7.0	6.8	6.9	6.9	6.9	6.6	6.8	7.0	7.0	7.9	7.6	6.9	7.1	6.7	6.2	6.6	7.0	7.3	7.5	8.1	3	2	1	6.6

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100
Data	3.0	3.3	3.9	4.8	6.5	9.7	10.1	10.5	11.1	11.3	11.7	14.7

Maximum
14.7
10.6
6.6

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

$PM_{2.5}$ - July (ug/m3) COURTICE 2013

Day	Hour 0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Count	Maximum	Minimum	Average
1	M	M	M	M	M	M	M	M	M	15.5	13.4	14.4	14.2	12.7	11.2	11.3	10.0	8.5	8.4	8.7	8.2	9.8	7.1	7.7	15	15.5	7.1	
2	8.1	7.5	9.2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	3	9.2	7.5	
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0	0.0	0.0	
4	17.5	8.7	7.0	7.3	8.4	7.4	7.3	7.4	7.4	7.9	8.3	8.5	8.8	8.8	9.4	10.0	9.5	9.7	10.2	11.2	12.2	12.8	11.3	10.9	24	17.5	7.0	9.5
5	11.8	10.8	10.7	11.4	11.6	11.6	10.1	10.3	10.7	10.3	10.2	10.4	10.0	10.4	7.2	8.1	9.7	7.8	8.9	8.1	9.2	14.0	14.8	14.4	24	14.8	7.2	10.5
6	17.0	15.3	13.8	12.4	11.1	13.6	13.4	14.6	13.7	16.1	21.8	16.9	14.4	11.9	10.7	10.1	9.6	10.3	10.1	10.8	12.5	13.6	13.2	13.6	24	21.8	9.6	13.4
7	14.3	13.5	9.2	8.9	8.5	7.6	8.2	8.6	8.9	8.2	7.9	7.8	7.9	10.0	12.7	10.5	8.5	6.2	6.5	8.0	7.6	7.5	8.1	9.7	24	14.3	6.2	9.0
8	8.2	7.7	8.3	8.7	8.6	8.7	8.4	9.1	10.6	11.6	14.3	14.6	15.0	13.2	12.4	13.8	13.7	15.3	14.2	10.0	10.8	9.2	9.4	11.8	24	15.3	7.7	11.2
9	10.9	10.4	12.5	14.9	16.3	13.6	9.8	10.2	10.4	10.0	9.7	8.6	7.5	7.4	7.5	7.7	8.3	8.7	9.3	10.9	14.1	17.2	15.7	15.3	24	17.2	7.4	11.1
10	15.1	17.6	23.2	20.7	16.3	13.7	11.0	11.0	9.1	8.0	6.7	8.3	10.6	12.8	13.0	11.8	10.8	7.8	8.3	7.4	7.8	10.0	11.5	12.6	24	23.2	6.7	11.9
11	14.2	13.8	13.0	12.0	10.9	9.8	9.2	8.4	7.9	8.3	8.9	8.3	8.7	9.2	9.1	8.6	7.9	8.3	8.4	5.7	5.5	5.4	5.2	5.0	24	14.2	5.0	8.8
12	5.3	5.9	5.7	5.4	5.4	5.8	5.7	5.3	4.8	4.6	4.6	4.1	3.7	3.8	3.8	4.3	3.9	3.8	4.0	3.7	4.9	6.1	6.5	9.2	24	9.2	3.7	5.0
13	9.5	9.1	8.4	8.4	8.1	7.9	6.9	6.9	5.2	5.8	6.2	7.1	7.0	6.8	6.3	6.2	5.3	5.1	4.9	5.5	6.5	6.9	9.6	8.7	24	9.6	4.9	7.0
14	8.8	7.7	8.4	8.0	8.2	8.5	7.9	7.2	6.6	7.0	7.8	7.7	7.3	6.5	6.3	6.4	6.8	6.8	6.7	7.5	9.8	10.6	11.6	12.3	24	12.3	6.3	8.0
15	13.1	12.9	13.8	14.7	16.4	15.8	13.8	12.5	12.1	13.8	13.1	12.2	12.2	11.5	11.8	12.9	13.1	11.1	10.8	11.2	13.5	15.7	16.5	17.0	24	17.0	10.8	13.4
16	15.8	15.0	15.6	15.8	16.1	16.2	15.7	14.7	15.3	16.1	16.8	16.5	16.3	16.9	16.5	15.6	14.4	13.8	15.1	17.0	20.6	23.2	25.8	24.8	24	25.8	13.8	17.1
17	25.7	26.4	26.7	25.1	25.5	27.4	25.7	24.4	23.6	22.7	24.0	28.0	25.3	23.1	22.0	17.8	15.0	14.3	13.7	14.4	15.4	15.1	16.7	17.9	24	28.0	13.7	21.5
18	17.4	17.2	16.9	17.3	16.8	18.4	17.3	15.2	14.8	16.9	17.3	17.7	17.5	19.0	16.4	14.8	15.6	15.6	14.8	14.3	16.6	19.5	18.1	14.2	24	19.5	14.2	16.7
19	14.5	15.4	16.6	16.6	16.8	16.6	16.3	16.0	16.8	17.7	18.2	18.2	17.2	15.6	15.5	13.2	10.1	12.2	10.3	8.9	9.8	9.6	9.4	10.0	24	18.2	8.9	14.2
20	9.7	9.7	8.6	8.3	8.7	7.3	6.9	6.9	7.2	7.6	7.7	7.4	8.6	9.4	9.0	8.2	7.7	7.3	7.7	8.5	8.9	9.6	9.7	9.9	24	9.9	6.9	8.3
21	9.8	9.8	9.9	9.1	8.5	8.2	7.3	6.1	5.6	5.6	5.4	5.2	4.8	4.4	4.2	3.9	3.3	3.2	3.3	3.6	4.5	6.5	6.1	6.4	24	9.9	3.2	6.0
22	7.3	7.4	7.2	7.0	7.1	7.2	7.1	7.0	6.3	5.1	5.3	5.0	5.1	5.1	5.2	5.1	5.5	5.4	6.0	5.8	6.3	6.3	6.4	6.4	24	7.4	5.0	6.2
23	5.6	5.1	5.4	5.9	5.6	5.9	5.0	3.3	3.3	3.5	4.1	4.6	6.7	9.4	11.2	11.1	9.9	6.4	6.1	6.0	6.2	6.4	6.4	6.2	24	11.2	3.3	6.2
24	5.6	5.6	6.0	5.9	6.2	6.6	6.0	5.4	5.5	5.4	5.2	5.1	4.8	4.4	4.1	3.9	3.4	3.4	3.4	3.6	3.9	4.0	4.4	4.6	24	6.6	3.4	4.9
25	3.9	3.8	3.8	3.8	3.8	3.6	3.7	3.9	3.7	3.5	3.5	3.4	3.3	3.2	3.1	2.9	2.9	2.9	2.9	3.6	5.8	6.1	6.5	7.0	24	7.0	2.9	3.9
26	7.7	7.4	6.9	7.0	7.5	7.4	6.7	4.9	4.3	4.3	4.6	4.3	4.3	4.3	3.9	4.3	4.4	4.4	5.3	5.4	6.8	8.0	7.8	7.4	24	8.0	3.9	5.8
27	8.3	8.1	7.4	6.6	6.1	5.5	5.0	4.1	3.8	3.7	4.0	4.1	4.8	6.2	6.7	8.9	10.8	9.7	9.4	10.8	13.2	13.6	13.8	13.5	24	13.8	3.7	7.8
28	12.4	12.4	12.9	13.4	14.3	10.8	9.6	8.8	7.7	7.3	7.3	7.3	6.9	7.1	6.9	6.7	6.9	6.9	6.8	6.6	6.7	6.2	6.2	6.2	24	14.3	6.2	8.5
29	5.7	5.6	5.2	5.5	5.7	6.9	6.6	5.3	5.4	5.8	5.6	5.6	5.8	5.0	3.7	3.4	3.5	3.6	5.3	5.3	5.3	4.8	4.7	5.5	24	6.9	3.4	5.2
30	4.5	3.6	3.7	3.6	4.1	4.8	3.9	3.4	3.4	3.5	3.8	3.9	3.6	3.5	3.4	3.4	3.7	3.6	3.7	4.5	6.9	6.9	7.8	7.5	24	7.8	3.4	4.4
31	8.36	8.57	8.1	7.9	7.5	7.6	7.6	5.8	5.0	4.9	5.0	5.0	A	5.1	5.1	4.7	5.3	7.1	6.3	6.7	7.0	10.3	9.0	8.6	23	10.3	4.7	6.8
Count	29	29	29	28	28	28	28	28	28	29	29	29	28	29	29	29	29	29	29	29	29	29	29	29	689	29	28	29
Maximum	25.7	26.4	26.7	25.1	25.5	27.4	25.7	24.4	23.6	22.7	24.0	28.0	25.3	23.1	22.0	17.8	15.6	15.6	15.1	17.0	20.6	23.2	25.8	24.8	24	28.0	15.1	23.0
Minimum	3.9	3.6	3.7	3.6	3.8	3.6	3.7	3.3	3.3	3.5	3.5	3.4	3.3	3.2	3.1	2.9	2.9	2.9	2.9	3.6	3.9	4.0	4.4	4.6	0	0.0	2.9	
Average	10.9	10.4	10.5	10.4	10.4	10.2	9.4	8.8	8.5	9.0	9.3	9.3	9.4	9.2	8.9	8.6	8.3	7.9	8.0	8.1	9.2	10.2	10.3	10.5	22	13	6	9.4

Percentiles	10	20	30	40	50	60	70	80	90	95	99	100	Maximum
													28.0
													21.5
Data	4.1	5.4	6.4	7.3	8.2	9.3	10.8	13.6	16.1	17.5	25.6	28.0	9.4

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

Reference: Durham York Energy Centre Project, MOECC Data Validation Review for Q2-Q4 2013 Quarterly and 2013 Annual Ambient Air Monitoring Reports (May to December 2013)

ATTACHMENT C – UPDATED SUMMARY TABLES FOR PAH AND DF - Q3 2013-COURTICE WPCP STATION AND Q4 2013-RUNDLE ROAD STATION

Polycyclic Aromatic Hydrocarbons	Courtice WPCP Station	July - Sept 2013															
Location		Courtice		Courtice		Courtice		Courtice		Courtice		Courtice		Courtice		Courtice	
Date	dd/mm/yyyy	3/7/2013		15/07/2013		27/07//2013		8/8/2013		20/8/2013		1/9/2013		13/9/2013		25/09/13	
Start Time	hh:mm	0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00	
Sample Duration	minutes	21.86		23.35		24.1		23.93		23.51		22.92		23.53		24.12	
Technician		TH		TZ		TH		TZ		TZ		TH		TZ		TH	
Filter Number		RU4052-01		SA4626-01		SA4849-01		SB5662-01		SB5730-01		SB5735-01		SB5744-01		TC6182-01	
Maxaam ID		SD6727		SH3354		SL8782		SQ0307		ST6709		SY5325		TC6617		TH0378	
Analytical Report #		B3A7931		B3B5407		B3C4356		B3D3196		B3E0054		B3E9599		B3F7409		B3G5782	
Total Volumetric Flow	Am^3/sample	271.98		289.25		261.34		336.92		339.60		329.45		331.03		340.09	
Analytical Results	**Units**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**	**Value**	**RDL**
Benzo(a)pyrene	µg	0.003	0.00042	0.005	0.00055	0.004	0.00099	0.005	0.00068	0.022	0.00021	0.003	0.0012	0.003	0.0013	0.006	0.00099
1-Methylnaphthalene	µg	2.49	0.15	7.86	0.15	1.65	0.15	2.22	0.15	5.36	0.2	1.56	0.15	0.32	0.2	2.51	0.15
2-Methylnaphthalene	µg	4.83	0.15	15.7	0.15	3.09	0.15	3.99	0.15	10.4	0.2	2.65	0.15	0.58	0.2	4.65	0.15
Acenaphthene	µg	3	0.075	11.2	0.075	2.88	0.075	2.52	0.075	4.8	0.1	2.12	0.075	<0.10	0.1	2.2	0.075
Acenaphthylene	µg	<0.075	0.075	0.18	0.075	<0.075	0.075	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	0.132	0.075
Anthracene	µg	3.57	0.075	0.33	0.075	0.12	0.075	0.15	0.075	0.12	0.1	0.09	0.075	<0.10	0.1	0.078	0.075
Benzo(a)anthracene	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Benzo(a)fluorene	µg	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Benzo(b)fluoranthene	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Benzo(b)fluorene	µg	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Benzo(e)pyrene	µg	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Benzo(g,h,i)perylene	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	0.12	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Benzo(k)fluoranthene	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Biphenyl	µg	1.44	0.15	4.32	0.15	1.02	0.15	1.08	0.15	2.48	0.2	0.81	0.15	<0.20	0.2	0.85	0.15
Chrysene	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Dibenz(a,h)anthracene [1]	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	0.09	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Dibenzo(a,c) anthracene + Picene [2]	µg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.15	0.15
Fluoranthene	µg	0.6	0.075	1.29	0.075	0.6	0.075	0.81	0.075	0.68	0.1	0.45	0.075	<0.10	0.1	0.222	0.075
Indeno(1,2,3-cd)pyrene	µg	<0.075	0.075	<0.075	0.075	<0.075	0.075	0.12	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Naphthalene	µg	9.72	0.11	41.4	1.1	7.11	0.11	10.5	0.11	28.7	0.14	7.55	0.11	1.67	0.14	11.9	0.11
o-Terphenyl	µg	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Perylene	µg	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Phenanthrene	µg	3.63	0.075	9.81	0.075	3.48	0.075	3.42	0.075	4.68	0.1	2.19	0.075	0.22	0.1	1.54	0.075
Pyrene	µg	0.21	0.075	0.48	0.075	0.21	0.075	0.33	0.075	0.28	0.1	0.189	0.075	<0.10	0.1	0.117	0.075
Tetralin	µg	0.48	0.15	1.41	0.15	0.39	0.15	0.75	0.15	1.48	0.2	0.45	0.15	0.23	0.2	1.25	0.15

Calculated Concentrations	Quarter 3 2013			Courtice	Courtice	Courtice	Courtice	Courtice	Courtice	Courtice	Courtice
	Units	Maximum	Minimum	3/7/2013	15/07/2013	27/07//2013	8/8/2013	20/8/2013	1/9/2013	13/9/2013	25/09/13
Benzo(a)pyrene	ng/m^3	6.48E-02	9.06E-03	1.10E-02	1.73E-02	1.53E-02	1.48E-02	6.48E-02	9.11E-03	9.06E-03	1.76E-02
1-Methylnaphthalene	ng/m^3	2.72E+01	9.67E-01	9.15E+00	2.72E+01	6.31E+00	6.59E+00	1.58E+01	4.74E+00	9.67E-01	7.38E+00
2-Methylnaphthalene	ng/m^3	5.43E+01	1.75E+00	1.78E+01	5.43E+01	1.18E+01	1.18E+01	3.06E+01	8.04E+00	1.75E+00	1.37E+01
Acenaphthene	ng/m^3	3.87E+01	1.51E-01	1.10E+01	3.87E+01	1.10E+01	7.48E+00	1.41E+01	6.43E+00	1.51E-01	6.47E+00
Acenaphthylene	ng/m^3	6.22E-01	1.11E-01	1.38E-01	6.22E-01	1.43E-01	1.11E-01	1.47E-01	1.14E-01	1.51E-01	3.88E-01
Anthracene	ng/m^3	1.31E+01	1.51E-01	1.31E+01	1.14E+00	4.59E-01	4.45E-01	3.53E-01	2.73E-01	1.51E-01	2.29E-01
Benzo(a)anthracene	ng/m^3	1.51E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	1.11E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Benzo(a)fluorene	ng/m^3	3.02E-01	2.21E-01	2.76E-01	2.59E-01	2.87E-01	2.23E-01	2.94E-01	2.28E-01	3.02E-01	2.21E-01
Benzo(b)fluoranthene	ng/m^3	1.51E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	1.11E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Benzo(b)fluorene	ng/m^3	3.02E-01	2.21E-01	2.76E-01	2.59E-01	2.87E-01	2.23E-01	2.94E-01	2.28E-01	3.02E-01	2.21E-01
Benzo(e)pyrene	ng/m^3	3.02E-01	2.21E-01	2.76E-01	2.59E-01	2.87E-01	2.23E-01	2.94E-01	2.28E-01	3.02E-01	2.21E-01
Benzo(g,h,i)perylene	ng/m^3	3.56E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	3.56E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Benzo(k)fluoranthene	ng/m^3	1.51E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	1.11E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Biphenyl	ng/m^3	1.49E+01	3.02E-01	5.29E+00	1.49E+01	3.90E+00	3.21E+00	7.30E+00	2.46E+00	3.02E-01	2.50E+00
Chrysene	ng/m^3	1.51E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	1.11E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Dibenz(a,h)anthracene [1]	ng/m^3	2.67E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	2.67E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Dibenzo(a,c) anthracene + Picene [2]	ng/m^3	2.21E-01	2.21E-01	-	-	-	-	-	-	-	2.21E-01
Fluoranthene	ng/m^3	4.46E+00	1.51E-01	2.21E+00	4.46E+00	2.30E+00	2.40E+00	2.00E+00	1.37E+00	1.51E-01	6.53E-01
Indeno(1,2,3-cd)pyrene	ng/m^3	3.56E-01	1.10E-01	1.38E-01	1.30E-01	1.43E-01	3.56E-01	1.47E-01	1.14E-01	1.51E-01	1.10E-01
Naphthalene	ng/m^3	1.43E+02	5.04E+00	3.57E+01	1.43E+02	2.72E+01	3.12E+01	8.45E+01	2.29E+01	5.04E+00	3.50E+01
o-Terphenyl	ng/m^3	3.02E-01	2.21E-01	2.76E-01	2.59E-01	2.87E-01	2.23E-01	2.94E-01	2.28E-01	3.02E-01	2.21E-01
Perylene	ng/m^3	3.02E-01	2.21E-01	2.76E-01	2.59E-01	2.87E-01	2.23E-01	2.94E-01	2.28E-01	3.02E-01	2.21E-01
Phenanthrene	ng/m^3	3.39E+01	6.65E-01	1.33E+01	3.39E+01	1.33E+01	1.02E+01	1.38E+01	6.65E+00	6.65E-01	4.53E+00
Pyrene	ng/m^3	1.66E+00	1.51E-01	7.72E-01	1.66E+00	8.04E-01	9.79E-01	8.25E-01	5.74E-01	1.51E-01	3.44E-01
Tetralin	ng/m^3	4.87E+00	6.95E-01	1.76E+00	4.87E+00	1.49E+00	2.23E+00	4.36E+00	1.37E+00	6.95E-01	3.68E+00
Total PAH	ng/m^3	3.27E+02	1.28E+01	1.13E+02	3.27E+02	8.12E+01	7.92E+01	1.76E+02	5.69E+01	1.28E+01	7.69E+01

Note:
RDL = Reportable Detection Limit
The PAH samples taken on July 3, July 15, and July 27, 2013 have flow rates below the MOECC recommended range of 8 cfm ±10%.
1. Dibenzo(a,c)anthracene was not reported for July, August, September 1, and September 13, 2013 samples. Based on laboratory analyses, dibenzo(a,c)anthracene co-elutes with dibenz(a,h)anthracene and a value is below estimated minimum detection limit.
2. Dibenzo(a,c) anthracene + Picene was reported for the September 25, 2013 sample. Based on the laboratory analyses report, picene elutes after dibenz(a,h)anthracene. Ions specific to this compound in the appropriate retention time range were searched with no possible positives detected.

Dioxins and Furans	Courtice WPCP Station	July to September 2013											
Location		Courtice			Courtice			Courtice			Courtice		
Date	dd/mm/yyyy	3/7/2013			27/07//2013			20/8/2013			13/9/2013		
Start Time	hh:mm	0:00			0:00			0:00			0:00		
Sample Duration	minutes	21.86			24.1			23.51			23.53		
Technician		TH			TH			TZ			TZ		
Filter Number		RU4052-01			SA4849-01			SB5730-01			SB5774-01		
Maxaam ID		SD6727			SL8782			ST6709			TC6617		
Analytical Report #		B3A7931			B3C4356			B3E0054			B3F7409		
Total Volumetric Flow	Am^3/sample	271.98			261.34			339.60			331.03		
Analytical Results	Units	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF	Value	EDL	WHO_{2005} TEF
2,3,7,8-Tetra CDD *	pg	<2.9	2.9	1	<2.6	2.6	1	<4.2	4.2	1	<4.4	4.4	1
1,2,3,7,8-Penta CDD	pg	<3.2	3.2	1	<3.4	3.4	1	<4.3	4.3	1	<4.1	4.1	1
1,2,3,4,7,8-Hexa CDD	pg	<3.0	3	0.1	<3.2	3.2	0.1	<4.9	4.9	0.1	<4.2	4.2	0.1
1,2,3,6,7,8-Hexa CDD	pg	3	2.5	0.1	<2.7	2.7	0.1	<4.1	4.1	0.1	8	4.5	0.1
1,2,3,7,8,9-Hexa CDD	pg	<3.4 (1)	3.4	0.1	<2.8	2.8	0.1	<4.3	4.3	0.1	9	4	0.1
1,2,3,4,6,7,8-Hepta CDD	pg	26	2.7	0.01	10	3.3	0.01	12	4.1	0.01	53	4.2	0.01
Octa CDD	pg	84	4.5	0.0003	60	4.5	0.0003	86	4.2	0.0003	211	4.2	0.0003
Total Tetra CDD	pg	<3.8 (1)	3.8		<2.6	2.6		<4.2	4.2		<4.4	4.4	
Total Penta CDD	pg	<7.9 (1)	7.9		<5.0 (1)	5		<4.3	4.3		17	4.1	
Total Hexa CDD	pg	10	2.7		4	2.9		<4.4	4.4		68	4.2	
Total Hepta CDD	pg	45	2.7		25	3.3		12	4.1		116	4.2	
2,3,7,8-Tetra CDF **	pg	<2.7	2.7	0.1	<5.0	5	0.1	<4.2	4.2	0.1	8	4.3	0.1
1,2,3,7,8-Penta CDF	pg	<3.0	3	0.03	<3.0	3	0.03	<4.1	4.1	0.03	<4.3	4.3	0.03
2,3,4,7,8-Penta CDF	pg	<2.9	2.9	0.3	<2.9	2.9	0.3	<4.0	4	0.3	5	4.4	0.3
1,2,3,4,7,8-Hexa CDF	pg	<3.1	3.1	0.1	<3.1	3.1	0.1	<4.0	4	0.1	13 (1)	4.2	0.1
1,2,3,6,7,8-Hexa CDF	pg	<2.7	2.7	0.1	<2.7	2.7	0.1	<3.5	3.5	0.1	5	4	0.1
2,3,4,6,7,8-Hexa CDF	pg	<3.2	3.2	0.1	<3.2	3.2	0.1	<5.6 (1)	5.6	0.1	12	4.6	0.1
1,2,3,7,8,9-Hexa CDF	pg	<3.4	3.4	0.1	<3.4	3.4	0.1	<4.5	4.5	0.1	<4.8	4.8	0.1
1,2,3,4,6,7,8-Hepta CDF	pg	<4.0 (1)	4	0.01	5	2.3	0.01	<6.9 (1)	6.9	0.01	17	3.8	0.01
1,2,3,4,7,8,9-Hepta CDF	pg	<2.7	2.7	0.01	<3.0	3	0.01	<4.6	4.6	0.01	<4.7	4.7	0.01
Octa CDF	pg	7	3.2	0.0003	6	3.6	0.0003	8	4.1	0.0003	8	4.4	0.0003
Total Tetra CDF	pg	<2.7	2.7		5	3.1		<4.2	4.2		8	4.3	
Total Penta CDF	pg	<3.0	3		<2.9	2.9		<4.0	4		26	4.3	
Total Hexa CDF	pg	<3.1	3.1		<3.1	3.1		<5.5 (1)	5.5		37	4.4	
Total Hepta CDF	pg	<4.5 (1)	4.5		5	2.6		<7.8 (1)	7.8		23	4.2	
Toxic Equivalency	pg	<2.7	2.7		<5.0	5		<4.2	4.2		8.8	4.3	

Calculated Concentrations	Units	Quarter 3 2013 Maximum	Quarter 3 2013 Minimum	Courtice 3/7/2013	Courtice 27/07//2013	Courtice 20/8/2013	Courtice 13/9/2013
2,3,7,8-Tetra CDD *	pg/m^3	6.65E-03	4.97E-03	5.33E-03	4.97E-03	6.18E-03	6.65E-03
1,2,3,7,8-Penta CDD	pg/m^3	6.51E-03	5.88E-03	5.88E-03	6.51E-03	6.33E-03	6.19E-03
1,2,3,4,7,8-Hexa CDD	pg/m^3	7.21E-03	5.52E-03	5.52E-03	6.12E-03	7.21E-03	6.34E-03
1,2,3,6,7,8-Hexa CDD	pg/m^3	2.42E-02	5.17E-03	1.10E-02	5.17E-03	6.04E-03	2.42E-02
1,2,3,7,8,9-Hexa CDD	pg/m^3	2.72E-02	5.36E-03	6.25E-03	5.36E-03	6.33E-03	2.72E-02
1,2,3,4,6,7,8-Hepta CDD	pg/m^3	1.60E-01	3.53E-02	9.56E-02	3.83E-02	3.53E-02	1.60E-01
Octa CDD	pg/m^3	6.37E-01	2.30E-01	3.09E-01	2.30E-01	2.53E-01	6.37E-01
Total Tetra CDD	pg/m^3	6.99E-03	4.97E-03	6.99E-03	4.97E-03	6.18E-03	6.65E-03
Total Penta CDD	pg/m^3	5.14E-02	6.33E-03	1.45E-02	9.57E-03	6.33E-03	5.14E-02
Total Hexa CDD	pg/m^3	2.05E-01	6.48E-03	3.68E-02	1.53E-02	6.48E-03	2.05E-01
Total Hepta CDD	pg/m^3	3.50E-01	3.53E-02	1.65E-01	9.57E-02	3.53E-02	3.50E-01
2,3,7,8-Tetra CDF **	pg/m^3	2.42E-02	4.96E-03	4.96E-03	9.57E-03	6.18E-03	2.42E-02
1,2,3,7,8-Penta CDF	pg/m^3	6.49E-03	5.52E-03	5.52E-03	5.74E-03	6.04E-03	6.49E-03
2,3,4,7,8-Penta CDF	pg/m^3	1.51E-02	5.33E-03	5.33E-03	5.55E-03	5.89E-03	1.51E-02
1,2,3,4,7,8-Hexa CDF	pg/m^3	6.34E-03	5.70E-03	5.70E-03	5.93E-03	5.89E-03	6.34E-03
1,2,3,6,7,8-Hexa CDF	pg/m^3	1.51E-02	4.96E-03	4.96E-03	5.17E-03	5.15E-03	1.51E-02
2,3,4,6,7,8-Hexa CDF	pg/m^3	3.63E-02	5.88E-03	5.88E-03	6.12E-03	8.25E-03	3.63E-02
1,2,3,7,8,9-Hexa CDF	pg/m^3	7.25E-03	6.25E-03	6.25E-03	6.51E-03	6.63E-03	7.25E-03
1,2,3,4,6,7,8-Hepta CDF	pg/m^3	5.14E-02	7.35E-03	7.35E-03	1.91E-02	1.02E-02	5.14E-02
1,2,3,4,7,8,9-Hepta CDF	pg/m^3	7.10E-03	4.96E-03	4.96E-03	5.74E-03	6.77E-03	7.10E-03
Octa CDF	pg/m^3	2.57E-02	2.30E-02	2.57E-02	2.30E-02	2.36E-02	2.42E-02
Total Tetra CDF	pg/m^3	2.42E-02	4.96E-03	4.96E-03	1.91E-02	6.18E-03	2.42E-02
Total Penta CDF	pg/m^3	7.85E-02	5.52E-03	5.52E-03	5.55E-03	5.89E-03	7.85E-02
Total Hexa CDF	pg/m^3	1.12E-01	5.70E-03	5.70E-03	5.93E-03	8.10E-03	1.12E-01
Total Hepta CDF	pg/m^3	6.95E-02	8.27E-03	8.27E-03	1.91E-02	1.15E-02	6.95E-02
Toxic Equivalency	pg/m^3			4.96E-03	9.57E-03	6.18E-03	2.66E-02
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	3.46E-02	1.90E-02	1.92E-02	1.90E-02	2.02E-02	3.46E-02

Calculated TEQ Concentrations	Units	Courtice 3/7/2013	Courtice 27/07//2013	Courtice 20/8/2013	Courtice 13/9/2013
2,3,7,8-Tetra CDD *	pg TEQ/m^3	5.33E-03	4.97E-03	6.18E-03	6.65E-03
1,2,3,7,8-Penta CDD	pg TEQ/m^3	5.88E-03	6.51E-03	6.33E-03	6.19E-03
1,2,3,4,7,8-Hexa CDD	pg TEQ/m^3	5.52E-04	6.12E-04	7.21E-04	6.34E-04
1,2,3,6,7,8-Hexa CDD	pg TEQ/m^3	1.10E-03	5.17E-04	6.04E-04	2.42E-03
1,2,3,7,8,9-Hexa CDD	pg TEQ/m^3	6.25E-04	5.36E-04	6.33E-04	2.72E-03
1,2,3,4,6,7,8-Hepta CDD	pg TEQ/m^3	9.56E-04	3.83E-04	3.53E-04	1.60E-03
Octa CDD	pg TEQ/m^3	9.27E-05	6.89E-05	7.60E-05	1.91E-04
Total Tetra CDD	pg TEQ/m^3				
Total Penta CDD	pg TEQ/m^3				
Total Hexa CDD	pg TEQ/m^3				
Total Hepta CDD	pg TEQ/m^3				
2,3,7,8-Tetra CDF **	pg TEQ/m^3	4.96E-04	9.57E-04	6.18E-04	2.42E-03
1,2,3,7,8-Penta CDF	pg TEQ/m^3	1.65E-04	1.72E-04	1.81E-04	1.95E-04
2,3,4,7,8-Penta CDF	pg TEQ/m^3	1.60E-03	1.66E-03	1.77E-03	4.53E-03
1,2,3,4,7,8-Hexa CDF	pg TEQ/m^3	5.70E-04	5.93E-04	5.89E-04	6.34E-04
1,2,3,6,7,8-Hexa CDF	pg TEQ/m^3	4.96E-04	5.17E-04	5.15E-04	1.51E-03
2,3,4,6,7,8-Hexa CDF	pg TEQ/m^3	5.88E-04	6.12E-04	8.25E-04	3.63E-03
1,2,3,7,8,9-Hexa CDF	pg TEQ/m^3	6.25E-04	6.51E-04	6.63E-04	7.25E-04
1,2,3,4,6,7,8-Hepta CDF	pg TEQ/m^3	7.35E-05	1.91E-04	1.02E-04	5.14E-04
1,2,3,4,7,8,9-Hepta CDF	pg TEQ/m^3	4.96E-05	5.74E-05	6.77E-05	7.10E-05
Octa CDF	pg TEQ/m^3	7.72E-06	6.89E-06	7.07E-06	7.25E-06
Total Tetra CDF	pg TEQ/m^3				
Total Penta CDF	pg TEQ/m^3				
Total Hexa CDF	pg TEQ/m^3				
Total Hepta CDF	pg TEQ/m^3				
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	1.92E-02	1.90E-02	2.02E-02	3.46E-02

Notes:
EDL = Estimated Detection Limit
* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
The DF samples taken on July 3 and July 27, 2013 have flow rates below the MOECC recommended range of 8 cfm ±10%.

Polycyclic Aromatic Hydrocarbons	Rundle Road Station		Oct - Dec 2013													
Location			Rundle		Rundle		Rundle		Rundle		Rundle		Rundle		Rundle	
Date	dd/mm/yyyy		07/10/2013		19/10/2013		31/10/2013		12/11/2013		24/11/2013		06/12/2013		18/12/2013		30/12/2013	
Start Time	hh:mm		0:00		0:00		0:00		0:00		0:00		0:00		0:00		0:00	
Sample Duration	minutes		23.36		24.23		24.17		23.84		23.12		23.43		23.4		23.65	
Technician			TH		TH		TH		TH		TH		TH		TH		TH	
Filter Number			ST9557-01		TF3525-01		TF3779-01		TF4121-01		TR5431-01		TR5580-01		UB9208-01		UB9220-01	
Maxaam ID			TK9802		TQ1888		TT5803		TX5840		UD0996		UG3587		UJ9904		UL6665	
Analytical Report #			B3H3495		B3I3581		B3J0032		B3J8000		B3K8022		B3L4460		B3M1686		B401530	
Total Volumetric Flow	Am^3/sample		275.08		317.75		360.39		337.39		321.62		339.61		336.94		334.44	
Analytical Results	Units		Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL	Value	RDL
Benzo(a)pyrene	µg		<0.0033	0.0033	0.011	0.00068	0.007	0.0011	0.009	0.0043	<0.0053	0.0053	<0.023	0.023	0.139	0.012	<0.022	0.022
1-Methylnaphthalene	µg		1.13	0.2	2.59	0.15	1.43	0.2	0.46	0.15	0.98	0.2	0.82	0.15	3.94	0.2	0.81	0.15
2-Methylnaphthalene	µg		2.02	0.2	4.42	0.15	2.45	0.2	0.74	0.15	1.48	0.2	1.32	0.15	6.48	0.2	1.31	0.15
Acenaphthene	µg		0.61	0.1	0.699	0.075	0.62	0.1	<0.075	0.075	0.12	0.1	0.093	0.075	0.46	0.1	0.093	0.075
Acenaphthylene	µg		<0.10	0.1	0.135	0.075	<0.10	0.1	0.123	0.075	0.32	0.1	0.093	0.075	0.55	0.1	0.168	0.075
Anthracene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.41	0.1	<0.075	0.075
Benzo(a)anthracene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.18	0.1	<0.075	0.075
Benzo(a)fluorene	µg		<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	0.2	0.2	<0.15	0.15
Benzo(b)fluoranthene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.32	0.1	0.084	0.075
Benzo(b)fluorene	µg		<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Benzo(e)pyrene	µg		<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Benzo(g,h,i)perylene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.19	0.1	<0.075	0.075
Benzo(k)fluoranthene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.11	0.1	<0.075	0.075
Biphenyl	µg		0.4	0.2	0.73	0.15	0.68	0.2	0.31	0.15	0.63	0.2	0.53	0.15	2.07	0.2	0.5	0.15
Chrysene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.31	0.1	<0.075	0.075
Dibenz(a,h)anthracene [1]	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075
Dibenzo(a,c) anthracene + Picene [2]	µg		<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.20	0.2	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Fluoranthene	µg		0.27	0.1	0.249	0.075	0.36	0.1	0.123	0.075	0.21	0.1	0.174	0.075	1.4	0.1	0.198	0.075
Indeno(1,2,3-cd)pyrene	µg		<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	<0.10	0.1	<0.075	0.075	0.16	0.1	<0.075	0.075
Naphthalene	µg		6.58	0.14	15.1	0.11	8.89	0.14	3.3	0.11	7.62	0.14	6.43	0.11	31.7	0.14	7.75	0.11
o-Terphenyl	µg		<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Perylene	µg		<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15	<0.20	0.2	<0.15	0.15
Phenanthrene	µg		1.06	0.1	1.13	0.075	1.27	0.1	0.417	0.075	0.86	0.1	0.555	0.075	3.79	0.1	0.543	0.075
Pyrene	µg		0.13	0.1	0.153	0.075	0.18	0.1	0.087	0.075	0.14	0.1	0.108	0.075	1.05	0.1	0.123	0.075
Tetralin	µg		0.59	0.2	1.49	0.15	0.75	0.2	0.22	0.15	0.31	0.2	0.4	0.15	1.7	0.2	0.42	0.15

Calculated Concentrations	Quarter 4 2013			Rundle	Rundle	Rundle	Rundle	Rundle	Rundle	Rundle	Rundle
	Units	Maximum	Minimum	07/10/2013	19/10/2013	31/10/2013	12/11/2013	24/11/2013	06/12/2013	18/12/2013	30/12/2013
Benzo(a)pyrene	ng/m^3	4.13E-01	6.00E-03	6.00E-03	3.46E-02	1.94E-02	2.67E-02	8.24E-03	3.39E-02	4.13E-01	3.29E-02
1-Methylnaphthalene	ng/m^3	1.17E+01	1.36E+00	4.11E+00	8.15E+00	3.97E+00	1.36E+00	3.05E+00	2.41E+00	1.17E+01	2.42E+00
2-Methylnaphthalene	ng/m^3	1.92E+01	2.19E+00	7.34E+00	1.39E+01	6.80E+00	2.19E+00	4.60E+00	3.89E+00	1.92E+01	3.92E+00
Acenaphthene	ng/m^3	2.22E+00	1.11E-01	2.22E+00	2.20E+00	1.72E+00	1.11E-01	3.73E-01	2.74E-01	1.37E+00	2.78E-01
Acenaphthylene	ng/m^3	1.63E+00	1.39E-01	1.82E-01	4.25E-01	1.39E-01	3.65E-01	9.95E-01	2.74E-01	1.63E+00	5.02E-01
Anthracene	ng/m^3	1.22E+00	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	1.22E+00	1.12E-01
Benzo(a)anthracene	ng/m^3	5.34E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	5.34E-01	1.12E-01
Benzo(a)fluorene	ng/m^3	5.94E-01	2.21E-01	3.64E-01	2.36E-01	2.77E-01	2.22E-01	3.11E-01	2.21E-01	5.94E-01	2.24E-01
Benzo(b)fluoranthene	ng/m^3	9.50E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	9.50E-01	2.51E-01
Benzo(b)fluorene	ng/m^3	3.64E-01	2.21E-01	3.64E-01	2.36E-01	2.77E-01	2.22E-01	3.11E-01	2.21E-01	2.97E-01	2.24E-01
Benzo(e)pyrene	ng/m^3	3.64E-01	2.21E-01	3.64E-01	2.36E-01	2.77E-01	2.22E-01	3.11E-01	2.21E-01	2.97E-01	2.24E-01
Benzo(g,h,i)perylene	ng/m^3	5.64E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	5.64E-01	1.12E-01
Benzo(k)fluoranthene	ng/m^3	3.26E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	3.26E-01	1.12E-01
Biphenyl	ng/m^3	6.14E+00	9.19E-01	1.45E+00	2.30E+00	1.89E+00	9.19E-01	1.96E+00	1.56E+00	6.14E+00	1.50E+00
Chrysene	ng/m^3	9.20E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	9.20E-01	1.12E-01
Dibenz(a,h)anthracene [1]	ng/m^3	1.82E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	1.48E-01	1.12E-01
Dibenzo(a,c) anthracene + Picene [1]	ng/m^4	3.64E-01	2.21E-01	3.64E-01	2.36E-01	2.77E-01	2.96E-01	3.11E-01	2.21E-01	2.97E-01	2.24E-01
Fluoranthene	ng/m^3	4.16E+00	3.65E-01	9.82E-01	7.84E-01	9.99E-01	3.65E-01	6.53E-01	5.12E-01	4.16E+00	5.92E-01
Indeno(1,2,3-cd)pyrene	ng/m^3	4.75E-01	1.10E-01	1.82E-01	1.18E-01	1.39E-01	1.11E-01	1.55E-01	1.10E-01	4.75E-01	1.12E-01
Naphthalene	ng/m^3	9.41E+01	9.78E+00	2.39E+01	4.75E+01	2.47E+01	9.78E+00	2.37E+01	1.89E+01	9.41E+01	2.32E+01
o-Terphenyl	ng/m^3	3.64E-01	2.21E-01	3.64E-01	2.36E-01	2.77E-01	2.22E-01	3.11E-01	2.21E-01	2.97E-01	2.24E-01
Perylene	ng/m^3	3.64E-01	2.21E-01	3.64E-01	2.36E-01	2.77E-01	2.22E-01	3.11E-01	2.21E-01	2.97E-01	2.24E-01
Phenanthrene	ng/m^3	1.12E+01	1.24E+00	3.85E+00	3.56E+00	3.52E+00	1.24E+00	2.67E+00	1.63E+00	1.12E+01	1.62E+00
Pyrene	ng/m^3	3.12E+00	2.58E-01	4.73E-01	4.82E-01	4.99E-01	2.58E-01	4.35E-01	3.18E-01	3.12E+00	3.68E-01
Tetralin	ng/m^3	5.05E+00	6.52E-01	2.14E+00	4.69E+00	2.08E+00	6.52E-01	9.64E-01	1.18E+00	5.05E+00	1.26E+00
Total PAH	ng/m^3	1.65E+02	1.96E+01	5.03E+01	8.64E+01	4.91E+01	1.96E+01	4.25E+01	3.32E+01	1.65E+02	3.80E+01

Note:
RDL = Reportable Detection Limit
The PAH sample taken on October 7, 2013 has a flow rate below the MOECC recommended range of 8 cfm ±10%.
1. Based on laboratory analyses, dibenzo(a,c)anthracene co-elutes with dibenz(a,h)anthracene.
Picene elutes after dibenz(a,h)anthracene.

Dioxins and Furans	Rundle Road Station	October - December 2013											
Location		Rundle			Rundle			Rundle			Rundle		
Date	dd/mm/yyyy	10/7/2013			10/31/2013			11/24/2013			12/18/2013		
Start Time	hh:mm	0:00			0:00			0:00			0:00		
Sample Duration	minutes	23.36			24.17			23.12			23.4		
Technician		TH			TH			TH			TH		
Filter Number		ST9557-01			TF3779-01			TR5431-01			UB9208-01		
Maxaam ID		TK9802			TT5803			UD0996			UJ9904		
Analytical Report #		B3H3495			B3J0032			B3K8022			B3M1686		
Total Volumetric Flow	Am^3/sample	275.08			360.39			321.62			336.94		
Analytical Results	Units	Value	RDL	WHO_{2005} TEF	Value	RDL	WHO_{2005} TEF	Value	RDL	WHO_{2005} TEF	Value	RDL	WHO_{2005} TEF
2,3,7,8-Tetra CDD *	pg	<4.8	4.8	1	<4.3	4.3	1	<6.8	6.8	1	<3.0	3	1
1,2,3,7,8-Penta CDD	pg	<4.4	4.4	1	<4.1	4.1	1	<5.8	5.8	1	<3.8	3.8	1
1,2,3,4,7,8-Hexa CDD	pg	<4.3	4.3	0.1	<4.4	4.4	0.1	<4.1	4.1	0.1	<4.0	4	0.1
1,2,3,6,7,8-Hexa CDD	pg	<4.6	4.6	0.1	<4.4	4.4	0.1	<4.4	4.4	0.1	<4.2	4.2	0.1
1,2,3,7,8,9-Hexa CDD	pg	<4.0	4	0.1	<4.1	4.1	0.1	6	3.9	0.1	6.4	3.8	0.1
1,2,3,4,6,7,8-Hepta CDD	pg	30	4.1	0.01	28	4.4	0.01	24	3.2	0.01	41.7	3.5	0.01
Octa CDD	pg	194	4.8	0.0003	140	4	0.0003	79	5.9	0.0003	<110 (1)	110	0.0003
Total Tetra CDD	pg	<4.8	4.8		<4.3	4.3		<6.8	6.8		<3.0	3	
Total Penta CDD	pg	<4.4	4.4		<4.1	4.1		<5.8	5.8		<3.8	3.8	
Total Hexa CDD	pg	<5.6	5.6		7	4.3		22	4.1		29.6	4	
Total Hepta CDD	pg	51	4.1		61	4.4		49	3.2		88.6	3.5	
2,3,7,8-Tetra CDF **	pg	<4.2	4.2	0.1	<4.5	4.5	0.1	<5.3	5.3	0.1	<5.9 (2)	5.9	0.1
1,2,3,7,8-Penta CDF	pg	<4.3	4.3	0.03	<4.0	4	0.03	<3.5	3.5	0.03	<4.4	4.4	0.03
2,3,4,7,8-Penta CDF	pg	<4.4	4.4	0.3	<4.0	4	0.3	<3.6	3.6	0.3	<4.4	4.4	0.3
1,2,3,4,7,8-Hexa CDF	pg	6	4.1	0.1	<4.2	4.2	0.1	<3.2	3.2	0.1	<3.6	3.6	0.1
1,2,3,6,7,8-Hexa CDF	pg	<3.8	3.8	0.1	<3.9	3.9	0.1	<3.0	3	0.1	<3.4	3.4	0.1
2,3,4,6,7,8-Hexa CDF	pg	<4.4	4.4	0.1	<4.7	4.7	0.1	<3.4	3.4	0.1	<3.9	3.9	0.1
1,2,3,7,8,9-Hexa CDF	pg	<4.4	4.4	0.1	<4.8	4.8	0.1	<3.5	3.5	0.1	<4.2	4.2	0.1
1,2,3,4,6,7,8-Hepta CDF	pg	<19	19	0.01	<5.4	5.4	0.01	<3.1	3.1	0.01	<7.5 (1)	7.5	0.01
1,2,3,4,7,8,9-Hepta CDF	pg	5	4.9	0.01	<4.5	4.5	0.01	<3.8	3.8	0.01	<3.7	3.7	0.01
Octa CDF	pg	29	4.2	0.0003	12	4.1	0.0003	6	4.2	0.0003	8.3	4.9	0.0003
Total Tetra CDF	pg	<4.2	4.2		<4.5	4.5		<5.3	5.3		5.9	4	
Total Penta CDF	pg	<4.4	4.4		<4.0	4		<3.6	3.6		5.4	4.4	
Total Hexa CDF	pg	13	4.2		<4.4	4.4		<3.3	3.3		<3.7	3.7	
Total Hepta CDF	pg	15	4.3		<6.0	6		<3.5	3.5		<8.4 (1)	8.4	
Toxic Equivalency	pg	<4.2	4.2		<4.5	4.5							

Calculated Concentrations	Quarter 4 2013			Rundle	Rundle	Rundle	Rundle
	Units	Maximum	Minimum	10/7/2013	10/31/2013	11/24/2013	12/18/2013
2,3,7,8-Tetra CDD *	pg/m3	1.06E-02	4.45E-03	8.72E-03	5.97E-03	1.06E-02	4.45E-03
1,2,3,7,8-Penta CDD	pg/m3	9.02E-03	5.64E-03	8.00E-03	5.69E-03	9.02E-03	5.64E-03
1,2,3,4,7,8-Hexa CDD	pg/m3	7.82E-03	5.94E-03	7.82E-03	6.10E-03	6.37E-03	5.94E-03
1,2,3,6,7,8-Hexa CDD	pg/m3	8.36E-03	6.10E-03	8.36E-03	6.10E-03	6.84E-03	6.23E-03
1,2,3,7,8,9-Hexa CDD	pg/m3	1.90E-02	5.69E-03	7.27E-03	5.69E-03	1.87E-02	1.90E-02
1,2,3,4,6,7,8-Hepta CDD	pg/m3	1.24E-01	7.46E-02	1.09E-01	7.77E-02	7.46E-02	1.24E-01
Octa CDD	pg/m3	7.05E-01	1.63E-01	7.05E-01	3.88E-01	2.46E-01	1.63E-01
Total Tetra CDD	pg/m3	1.06E-02	4.45E-03	8.72E-03	5.97E-03	1.06E-02	4.45E-03
Total Penta CDD	pg/m3	9.02E-03	5.64E-03	8.00E-03	5.69E-03	9.02E-03	5.64E-03
Total Hexa CDD	pg/m3	8.79E-02	1.02E-02	1.02E-02	1.94E-02	6.84E-02	8.79E-02
Total Hepta CDD	pg/m3	2.63E-01	1.52E-01	1.85E-01	1.69E-01	1.52E-01	2.63E-01
2,3,7,8-Tetra CDF **	pg/m3	8.76E-03	6.24E-03	7.63E-03	6.24E-03	8.24E-03	8.76E-03
1,2,3,7,8-Penta CDF	pg/m3	7.82E-03	5.44E-03	7.82E-03	5.55E-03	5.44E-03	6.53E-03
2,3,4,7,8-Penta CDF	pg/m3	8.00E-03	5.55E-03	8.00E-03	5.55E-03	5.60E-03	6.53E-03
1,2,3,4,7,8-Hexa CDF	pg/m3	2.18E-02	4.97E-03	2.18E-02	5.83E-03	4.97E-03	5.34E-03
1,2,3,6,7,8-Hexa CDF	pg/m3	6.91E-03	4.66E-03	6.91E-03	5.41E-03	4.66E-03	5.05E-03
2,3,4,6,7,8-Hexa CDF	pg/m3	8.00E-03	5.29E-03	8.00E-03	6.52E-03	5.29E-03	5.79E-03
1,2,3,7,8,9-Hexa CDF	pg/m3	8.00E-03	5.44E-03	8.00E-03	6.66E-03	5.44E-03	6.23E-03
1,2,3,4,6,7,8-Hepta CDF	pg/m3	3.45E-02	4.82E-03	3.45E-02	7.49E-03	4.82E-03	1.11E-02
1,2,3,4,7,8,9-Hepta CDF	pg/m3	1.82E-02	5.49E-03	1.82E-02	6.24E-03	5.91E-03	5.49E-03
Octa CDF	pg/m3	1.05E-01	1.87E-02	1.05E-01	3.33E-02	1.87E-02	2.46E-02
Total Tetra CDF	pg/m3	1.75E-02	6.24E-03	7.63E-03	6.24E-03	8.24E-03	1.75E-02
Total Penta CDF	pg/m3	1.60E-02	5.55E-03	8.00E-03	5.55E-03	5.60E-03	1.60E-02
Total Hexa CDF	pg/m3	4.73E-02	5.13E-03	4.73E-02	6.10E-03	5.13E-03	5.49E-03
Total Hepta CDF	pg/m3	5.45E-02	5.44E-03	5.45E-02	8.32E-03	5.44E-03	1.25E-02
Toxic Equivalency	pg/m3			7.63E-03	6.24E-03	0.00E+00	0.00E+00
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3	2.88E-02	1.94E-02	2.88E-02	1.94E-02	2.84E-02	1.99E-02
Calculated TEQ Concentrations	**Units**			**Rundle**	**Rundle**	**Rundle**	**Rundle**
				41554	**41578**	**41602**	**41626**
2,3,7,8-Tetra CDD *	pg TEQ/m^3			8.72E-03	5.97E-03	1.06E-02	4.45E-03
1,2,3,7,8-Penta CDD	pg TEQ/m^3			8.00E-03	5.69E-03	9.02E-03	5.64E-03
1,2,3,4,7,8-Hexa CDD	pg TEQ/m^3			7.82E-04	6.10E-04	6.37E-04	5.94E-04
1,2,3,6,7,8-Hexa CDD	pg TEQ/m^3			8.36E-04	6.10E-04	6.84E-04	6.23E-04
1,2,3,7,8,9-Hexa CDD	pg TEQ/m^3			7.27E-04	5.69E-04	1.87E-03	1.90E-03
1,2,3,4,6,7,8-Hepta CDD	pg TEQ/m^3			1.09E-03	7.77E-04	7.46E-04	1.24E-03
Octa CDD	pg TEQ/m^3			2.12E-04	1.17E-04	7.37E-05	4.90E-05
Total Tetra CDD	pg TEQ/m^3						
Total Penta CDD	pg TEQ/m^3						
Total Hexa CDD	pg TEQ/m^3						
Total Hepta CDD	pg TEQ/m^3						
2,3,7,8-Tetra CDF **	pg TEQ/m^3			7.63E-04	6.24E-04	8.24E-04	8.76E-04
1,2,3,7,8-Penta CDF	pg TEQ/m^3			2.34E-04	1.66E-04	1.63E-04	1.96E-04
2,3,4,7,8-Penta CDF	pg TEQ/m^3			2.40E-03	1.66E-03	1.68E-03	1.96E-03
1,2,3,4,7,8-Hexa CDF	pg TEQ/m^3			2.18E-03	5.83E-04	4.97E-04	5.34E-04
1,2,3,6,7,8-Hexa CDF	pg TEQ/m^3			6.91E-04	5.41E-04	4.66E-04	5.05E-04
2,3,4,6,7,8-Hexa CDF	pg TEQ/m^3			8.00E-04	6.52E-04	5.29E-04	5.79E-04
1,2,3,7,8,9-Hexa CDF	pg TEQ/m^3			8.00E-04	6.66E-04	5.44E-04	6.23E-04
1,2,3,4,6,7,8-Hepta CDF	pg TEQ/m^3			3.45E-04	7.49E-05	4.82E-05	1.11E-04
1,2,3,4,7,8,9-Hepta CDF	pg TEQ/m^3			1.82E-04	6.24E-05	5.91E-05	5.49E-05
Octa CDF	pg TEQ/m^3			3.16E-05	9.99E-06	5.60E-06	7.39E-06
Total Tetra CDF	pg TEQ/m^3						
Total Penta CDF	pg TEQ/m^3						
Total Hexa CDF	pg TEQ/m^3						
Total Hepta CDF	pg TEQ/m^3						
TOTAL TOXIC EQUIVALENCY	pg TEQ/m^3			2.88E-02	1.94E-02	2.84E-02	1.99E-02

Notes:
RDL = Reportable Detection Limit
* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds
The DF sample taken on October 7, 2013 has a flow rate below the MOECC recommended range of 8 cfm ±10%.