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June 11, 2019

**Southwestern Public Health
Elgin Oxford St. Thomas
410 Buller Street
Woodstock ON N4S 6G9**

Subject: 2018 Ministry Air Quality Sampling Results

Attn: Peter Heywood, Director

Dear Peter,

As part of the ministry's ongoing commitment to share our air monitoring data in Beachville, I am providing the outcomes of the ministry's particulate and air quality sampling for 2018. This includes information from the ministry's stationary monitors and results from a four-day survey conducted by the ministry's Environmental Monitoring and Reporting Branch near the Carmeuse Lime Beachville operation.

The following is a summary of the results from each data collection.

2018 Hi-Volume Air Monitoring Data

In 2018, the ministry collected 24-hour samples of total suspended particulate (TSP) using a Hi-Volume air monitor once every six days at four monitoring stations in the Beachville area (Stations 17017, 17026, 17027, and 17006). Particulate matter less than 10 μm in aerodynamic diameter (PM_{10}) and its constituent metals were measured once every six days at Station 17506, which is co-located with 17006. Wind speed and wind direction are measured at this station as well.

The analytical results of the ministry's sampling can be found in the attached Excel spreadsheet. The particulate results are summarized in the appendices below.

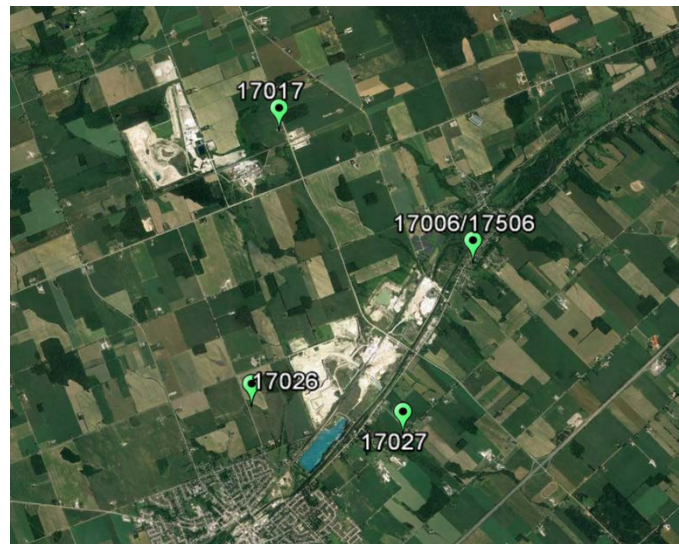


Figure 1: Ministry particulate monitoring stations in the Beachville area.

The following summarizes the ministry's interpretation of the sampling results:

- Particulate concentrations were generally below the applicable Ambient Air Quality Criteria (AAQC).
- Total suspended particulate (TSP) concentrations were below the ministry's annual AAQC ($60 \mu\text{g}/\text{m}^3$, based on a geometric mean).
- Exceedances of the 24-hour AAQC for total suspended particulate ($120 \mu\text{g}/\text{m}^3$) were observed in 1 of the 49 samples collected at Station 17017 and 2 of the 55 samples collected at Station 17027. TSP exceedances were not observed at the other two monitoring stations.
- An exceedance of the 24-hour AAQC for PM_{10} ($50 \mu\text{g}/\text{m}^3$) was observed in one of the 47 samples collected at Station 17506.
- Analytical results of metals sampling showed very low concentrations with no exceedances of applicable AAQC.
- Based on the results from Station 17006 (the ministry's longest running station, now located at the Bell building), suspended particulate concentrations in the Beachville area in the last six years (2013-2018) have decreased from historical levels (Figure 2). Concentrations over the last six years (2013-2018) are stable; that is, neither an increasing nor decreasing trend in concentrations is present.
- PM_{10} has been measured at Station 17506 since November 2014. Between 2015 and 2018, PM_{10} concentrations at Station 17506 show evidence of a decreasing trend. Due to the variability that can occur in year-to-year particulate concentrations, the ministry will continue to review PM_{10} monitoring data for a longer time period to confirm this apparent trend.
- Suspended particulate concentrations measured at Stations 17006, 17017, 17026 and 17027 over the last four to six years (2013-2018) do not show any evidence of an increasing or decreasing trend in concentrations.

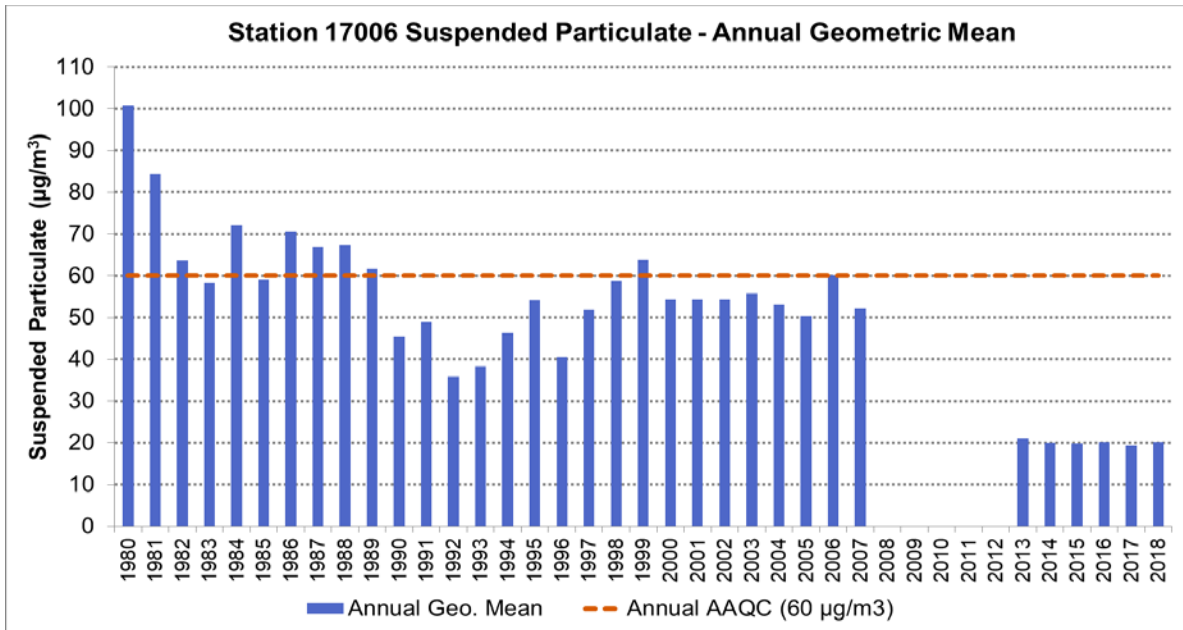


Figure 2: Annual geometric mean TSP concentrations at Station 17006 between 1980 and 2018, in comparison to the ministry’s annual AAQC of 60 µg/m³. This station moved from 12 Vine Street to the Bell building on Canfield Lane in September 2017. Between 2008 and 2012, TSP was measured using a different instrument (a Lo-Volume air monitor). Results during this time are not shown as they are not directly comparable to TSP measurements collected with Hi-Vol air monitors.

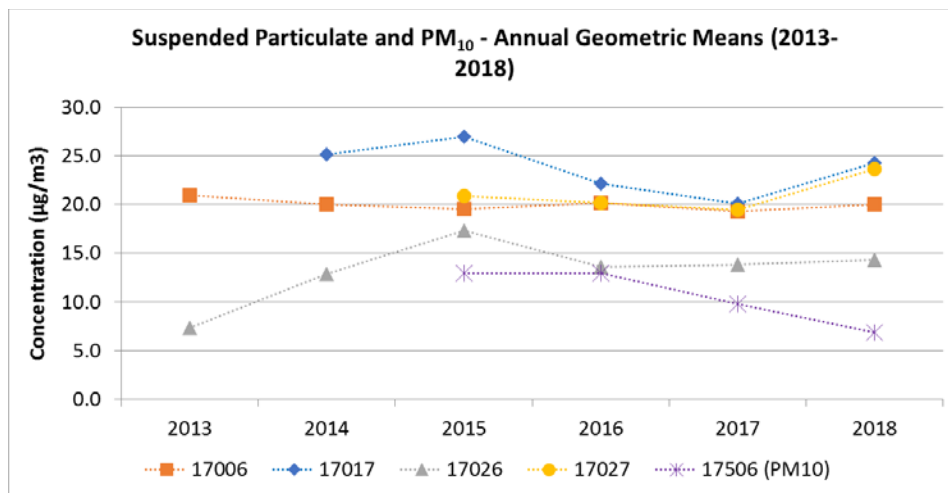


Figure 3: Annual geometric mean particulate concentrations measured in Beachville between 2013 and 2018. PM₁₀ is measured at Station 17506; TSP is measured at all other stations. Station 17506 was installed in November 2014. Station 17027 was installed in February 2015. Station 17006/17506 moved from Vine Street to Canfield Lane in September 2017.

The *Operations Manual for Air Quality Monitoring in Ontario* outlines the ministry's targets for data completeness for non-continuous data. On an annual basis, all stations met the data completeness criteria (75% valid samples). On a seasonal basis, Station 17017 and 17506 did not meet the data completeness criteria for one or more season. In these seasons, the percentages of available results from these stations were marginally below the data completeness criteria, so the respective annual averages are not anticipated to be strongly impacted by the seasons with less than 75% data availability. Data completeness by station is summarized in Table 3 in the Appendix.

Summary of 2018 Carmeuse survey results

The ministry's Environmental Monitoring and Reporting Branch conducted mobile and stationary air monitoring for volatile organic compounds (VOC) and particulate matter near Carmeuse Lime Beachville Operation, Ingersoll over four days from August to October 2018.

Half-hour average benzene, toluene, styrene, and 1,3-butadiene concentrations up to 0.45, 0.79, 0.04, and 0.28 $\mu\text{g}/\text{m}^3$, respectively, were observed during stationary measurements downwind of the facility using thermal desorption (TD) tube sampling with active pumping. None of the target compounds exceeded their respective half-hour converted assessment values derived from Ontario Regulation 419/05 – Local Air Quality standards and guidelines.

On average, downwind concentrations for PM_{10} , $\text{PM}_{2.5}$, PM_{10} , and TSP were 1.7, 1.9, 3.0, and 3.3 times higher respectively than upwind concentrations.

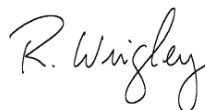
A copy of this report is attached for your reference.

Beta Attenuation Monitor (BAM) Pilot

Further to correspondence from April 19, 2018, the ministry installed two continuous Beta Attenuation Monitors (BAMs) in May 2018 at Station 17017 and 17006/17506, which measure PM_{10} on an hourly basis. We will share the results of the pilot in a separate letter.

The ministry will continue to meet its responsibility by ensuring ongoing compliance with our regulatory requirements. We look forward to working with Southwestern Public Health to ensure the protection of the health of the residents and the natural environment. The ministry would be pleased to discuss this matter further should you have any questions. Please do not hesitate to contact me to arrange a call.

Sincerely,



Rob Wrigley
District Manager
London District Office, Southwest Region
Ministry of the Environment, Conservation and Parks

Attach. Excel- Analytical results
PDF-EMRB TAGA Survey Carmeuse

Appendix

Summary of MECP Beachville Particulate Sampling Results (2018)

Table 1: Summary of 2018 Particulate Results					
Parameter:	TSP				PM ₁₀
Station:	17006	17017	17026	17027	17506
n	53	49	57	55	47
Median (µg/m ³)	21	23	16	20	8
Arithmetic average (µg/m ³)	25.8	34.4	18.7	31.5	10.0
Maximum (µg/m ³)	114	140	87	142	56
Geometric Mean (µg/m ³)	20.0	24.3	14.3	23.7	6.9
n > 24-hour AAQC	0	1	0	2	1

Table 2: Summary of Ambient Air Quality Criteria (AAQC) Exceedances						
TSP 24-hour AAQC: 120 µg/m ³						
PM ₁₀ 24-hour AAQC: 50 µg/m ³						
Parameter:	TSP				PM ₁₀	Wind Direction
Station:	17006	17017	17026	17027	17506	
May 2, 2018	114	80	87	139	56	SW
June 25, 2018	18	16	20	142	12	NNE
October 11, 2018	30	140	18	40	4	NW

24-hour AAQC exceedances are shown in red font. Particulate concentrations measured at all sites on these days are given for comparison purposes. The prevailing wind direction measured over the 24-hour period at Station 17006/17506 for the day of the exceedance is provided as well.

Table 3: Data Availability by Station (%)						
	Potential Sampling Days	TSP				PM ₁₀
		17006	17017	17026	17027	17506
Total 2018	61	87%	80%	93%	90%	77%
2018 - Q1	15	93%	67%	100%	93%	93%
2018 - Q2	15	87%	80%	80%	80%	67%
2018 - Q3	16	88%	88%	100%	100%	75%
2018 - Q4	15	80%	87%	93%	87%	73%

Table 4: 2018 Particulate Monitoring Results										
All results in $\mu\text{g}/\text{m}^3$	TSP									PM10
	Date	17006		17017		17026		17027		17506
2018-01-02	100		NA		9		26		27	
2018-01-08	21		NA		16	PPL	15		7	
2018-01-14	20		NA		10		NA	NDIF	NA	NDIF
2018-01-20	38		NA		15		20		11	TF
2018-01-26	11	TF	NA		19		58		3	<T; TF
2018-02-01	35		28		21		32		12	
2018-02-07	22		45		17		14		10	
2018-02-13	35		38		30		52		13	
2018-02-19	7	PPL	12	PPL	12	PPL	16	PPL	4	<T
2018-02-25	NA	NDIF	13		5		4	<T	7	
2018-03-03	5	TF	9		16	PPL; TF	54		4	<T
2018-03-09	11		16		5		16		5	
2018-03-15	23		13		15		40		11	
2018-03-21	22		13		30		40		9	
2018-03-27	6		7	TF	7		9		1	<=W
2018-04-02	22		16		17		NA	NDIF	8	
2018-04-08	2	<T	7		7		30		NA	NDIF
2018-04-14	3	<T	10	PPL	NA	NDTW	10	PPL	NA	NDIF
2018-04-20	4	<T	15		26		31		4	<T
2018-04-26	21		18	PFC	11		18		10	
2018-05-02	114		80		87		139		56	
2018-05-08	44		77	PPL	60		61		22	
2018-05-14	46		38		26		58	PPL	NA	NDIF
2018-05-20	NA	NDIF	NA	NDIF	NA	NDIF	NA	NDIF	NA	NDIF
2018-05-26	NA	NDIF	NA	NDIF	NA	NDIF	NA	NDIF	NA	NDIF
2018-06-01	35	TF	56		34		65		21	
2018-06-07	40		NA	NDIF	27		38		9	
2018-06-13	70		69		42		49	TF; PPL	26	
2018-06-19	11	TF; PFC	22	TF	25		22		6	
2018-06-25	18		16		20		142		12	
2018-07-01	25		21		10		12		17	
2018-07-07	20		7		6		16		9	
2018-07-13	35		47		60		35		NA	NDIF
2018-07-19	32		47		28		20		NA	NDIF
2018-07-25	28		109		13		38		16	
2018-07-31	28		57		23		23		14	
2018-08-06	37		49		21		4	<T	19	
2018-08-12	21		23		17		25		7	
2018-08-18	19		18		16		20		9	

2018-08-24	34		58		19		37		13	
Table 4: 2018 Particulate Monitoring Results										
All results in $\mu\text{g}/\text{m}^3$	TSP								PM10	
Date	17006		17017		17026		17027		17506	
2018-08-30	NA	NDIF	2	<T	12		10		NA	NDIF
2018-09-05	37		NA	NDIF	32		30		NA	NDIF
2018-09-11	9		12		15		16		1	<=W
2018-09-17	19		37		12		18		6	
2018-09-23	22		NA	NDIF	28		20		7	
2018-09-29	NA	NDIF	24		10		16		4	<T; TF
2018-10-05	13		NA	NDIF	16		15		2	<T
2018-10-11	30	TF	140	TF	18		40		4	<T
2018-10-17	18		25		3	<T	10		5	
2018-10-23	NA		NA		NA		NA		NA	
2018-10-29	NA	NDIF	47		8		19		NA	NDIF
2018-11-04	15		3	<T	7		2	<T	NA	NDIF
2018-11-10	11		91		8		11		3	<T
2018-11-16	15		105		1	<=W	13		2	<T
2018-11-22	37		34		51		48		13	
2018-11-28	14		32		3	<T	NA	NDIF	4	<T
2018-12-04	15		12		4	<T	80		1	<=W
2018-12-10	29		42		13		74		12	
2018-12-16	15		8		3	<T	12		2	<T
2018-12-22	4	<T	5		1	<=W	6		1	<=W
2018-12-28	NA	NDIF	15		1	<=W	1	<=W	NA	NDIF

Data Flag Explanation	
<=W	NO MEASURABLE RESPONSE (ZERO): <REPORTED
<T	A MEASURABLE TRACE AMOUNT:INTERPRET WITH
NA	RESULT NOT AVAILABLE
NDIF	NO DATA: INVALID FILTER (NO AIR VOLUME)
NDBL	NO DATA: UNRELIABLE BLANK
NDTW	NO DATA: TARE WEIGHT > FILTER WEIGHT
PFC	POSSIBLE FILTER CONTAMINATION
PPL	POSSIBLE PARTICULATE LOSS
SIFUS	SUSPECT INCORRECT FILTER USED FOR SAMPLING (<i>samples with this flag are excluded from summary</i>)
TF	TORN FILTER
UCR	UNRELIABLE: COULD NOT CONFIRM BY
UTF	UNRELIABLE: TORN FILTER
Red font indicates an exceedance of the respective 24-hour Ambient Air	