

## MEMORANDUM

<b>TO</b>	Peter Weaver, STPA	<b>FILE NO.</b>	S-1977-08
<b>FROM</b>	Jocelyn MacDonald	<b>SHIFT:</b>	0630 to 1830
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<b>DATE</b>	17 January, 2013	<b>STPA NO.</b>	<b>TP6B-P3-0518</b>

**SUBJECT: 16 January 2013 Real-time Air Monitoring Results  
Sydney Tar Ponds Agency – Solidification and Stabilization  
FINAL REPORT**

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Attached is a summary of Real-time particulate (as PM<sub>10</sub>) and Total Volatile Organic Compound (TVOC) concentrations for air monitoring performed on the 16 January 2013. Kelly Morrison of ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH) performed all air monitoring activities.

Weather conditions on the day of sampling:

- Overcast
- Temperature: approximately -4 °C
- Wind Direction: Northwest to Southwest

**Comments:** *STPA has instructed ALL-TECH to perform air monitoring duties at one location downwind of solidification and stabilization activities. ALL-TECH was on-Site at 0630 hours and sampling began as soon as there was site activity. Air monitoring was performed during site construction activities.*

Real-time monitoring for dust as PM<sub>10</sub> was accomplished using a hand-held electronic TSI DustTrak aerosol monitor. Real-time monitoring for TVOC was accomplished using the hand-held MiniRAE 2000/3000 Photo-ionization Detector (PID).

All downwind concentrations (15-minute averages) of dust as PM<sub>10</sub> were below the established Site Action Level for this parameter of 155 µg/m<sup>3</sup>.

All downwind concentrations of TVOC were below the established action level for this parameter of 0.66 parts per million (volume) (ppm(v)). Each measurement is the average of a 15 minute sample. A minimum of 2 samples were taken downwind of the activity every hour. Levels above detection limit are noted in Table 1.0 of each report.

This report continues the practice of using a more conservative approach to estimating the cumulative Daily TVOCs value and forecasting of the Daily Budget for TVOCs (8 ppm(v)). Up to this point, TVOCs concentrations measured below the Detection Limit (DL) of the PID (0.1 ppm(v)) were shown as <DL or Not-detected (ND). There was no addition to the cumulative limit when a value <DL or ND was recorded. ALL-TECH is adopting a more conservative approach in estimating the cumulative value and forecasting the Daily Budget for TVOCs, by assigning a quantitative value of half the Detection Limit (0.5DL or 0.05 ppm(v)) to each measurement recorded at <DL. This recognizes the fact that the concentration could be any value up to the Detection Limit and assigns a mid-point value within the range. There are a number of factors of safety within the calculation of the Daily Limit. The use of 0.5DL for values below the level of detection adds to the conservatism of the approach to management of site activities. However, the comparison of the daily cumulative results to those from earlier reports will appear to show an increase in TVOCs concentration. It should be recognized that the use of 0.5DL for a 10 h workday will add about 12.5% of the Daily Budget Limit to the cumulative TVOCs concentration because of this change in methodology.

A Single-Sample Level has also been established for TVOC concentration in air at 0.66 ppm(v), or 0.66 ppm. This concentration level is included as *criteria* for the perimeter monitoring program to signal contractors and site managers to the presence of elevated concentrations of TVOCs. It is not linked directly to any health-based standard, but can be thought of as a point of information and communication about the real-time monitoring.

This report has been prepared by Kelly Morrison and reviewed by Dwayne Timmons. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Dwayne Timmons

**ALL-TECH Environmental Services Cape Breton Ltd.**

Copied via e-mail:

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**Table 1.0**  
**Real-time Airborne Dust as PM<sub>10</sub> and TVOC Concentration Results**  
**Sydney Tar Ponds Agency – Solidification and Stabilization**

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM <sub>10</sub> 15 Minute Action Level (µg/m <sup>3</sup> )	Dust asPM <sub>10</sub> 15 Minute Average Concentration (µg/m <sup>3</sup> )	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) <sup>1</sup>	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result <sup>2</sup>
1 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0700	155	5	8.0	0.05	Northwest	Downwind	Dozer and backhoe operating.	No observations seen to affect sampling integrity
2 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0745	155	6	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
3 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0800	155	7	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
4 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0815	155	8	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

<sup>1</sup> See NOTE (1) at end of Table

<sup>2</sup> See NOTE (2) at end of Table

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM <sub>10</sub> 15 Minute Action Level (µg/m <sup>3</sup> )	Dust asPM <sub>10</sub> 15 Minute Average Concentration (µg/m <sup>3</sup> )	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) <sup>1</sup>	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result <sup>2</sup>
5 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0900	155	13	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	Visually high amounts of dust coming from sample location.
6 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0930	155	8	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
7 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1000	155	10	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
8 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1040	155	7	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
9 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1100	155	12	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM <sub>10</sub> 15 Minute Action Level (µg/m <sup>3</sup> )	Dust asPM <sub>10</sub> 15 Minute Average Concentration (µg/m <sup>3</sup> )	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) <sup>1</sup>	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result <sup>2</sup>
10 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1145	155	6	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
11 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1200	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	Visually high amounts of dust coming from sample location.
12 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1245	155	20	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
13 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1300	155	26	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
14 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1345	155	26	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM <sub>10</sub> 15 Minute Action Level (µg/m <sup>3</sup> )	Dust asPM <sub>10</sub> 15 Minute Average Concentration (µg/m <sup>3</sup> )	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) <sup>1</sup>	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result <sup>2</sup>
15 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1400	155	26	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
16 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1445	155	28	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
17 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1500	155	14	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
18 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1545	155	9	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
19 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1600	155	11	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM <sub>10</sub> 15 Minute Action Level (µg/m <sup>3</sup> )	Dust asPM <sub>10</sub> 15 Minute Average Concentration (µg/m <sup>3</sup> )	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) <sup>1</sup>	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result <sup>2</sup>
20 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1640	155	12	8.0	0.05	Southwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
22 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1700	155	13	8.0	0.05	Southwest	Downwind	No activity on site.	No observations seen to affect sampling integrity
22 60m Northeast of Portside Aggregates Ltd. Repair shop (N46°09.311' W060°11.568')	1730	155	13	8.0	0.05	Southwest	Downwind	No activity on site.	No observations seen to affect sampling integrity

**Notes:** (1) The Detection Limit for VOCs using the PID is 0.1 ppm(v). Values less than the Detection Limit (<DL) or Not-detected (ND) are recorded at half the DL (0.05 ppm(v)) to provide a more conservative approach for the daily cumulative value, than assigning 0 ppm(v) for all values measured as <DL or ND. Hence, values in the table of 0.05 ppm(v) will have been recorded as <DL (or ND).

(2) Once the sample is started, it is completed at that location regardless of wind change during the 15 minutes. Significant wind changes, if any, during sampling would be noted in Observations.

\*ND denotes that the result was below the instrument detection limit.

\*\*Air sample duration for each monitoring event was 15 minutes. All samples reported are downwind in relation to the activity.

**Table 2.0**  
**Comparison of Downwind Daily Results for Dust (as PM<sub>10</sub>) Budget**

Item ID for Reference	Location	Duration	Hourly Dust Concentration Average (µg/m <sup>3</sup> )	Actual Cumulative Dust Budget Value (µg/m <sup>3</sup> )	Dust Budget Exceedance Value (µg/m <sup>3</sup> ) <sup>(1)</sup>	Remaining Dust Budget Value (µg/m <sup>3</sup> )	Forecasted Dust Budget (µg/m <sup>3</sup> )
1	50m South of Rail America maintenance building.	0700 to 0759	6	6	1005	999	290
2	50m South of Rail America maintenance building.	0800 to 0859	8	13	1005	992	267
3	50m South of Rail America maintenance building.	0900 to 0959	11	24	1005	981	247
4	50m South of Rail America maintenance building.	1000 to 1059	9	32	1005	973	223
5	50m South of Rail America maintenance building.	1100 to 1159	9	41	1005	964	199
6	60m Northeast of Portside Aggregates Ltd. Repair shop	1200 to 1259	14	55	1005	950	183
7	60m Northeast of Portside Aggregates Ltd. Repair shop	1300 to 1359	26	81	1005	924	188
8	60m Northeast of Portside Aggregates Ltd. Repair shop	1400 to 1459	27	108	1005	897	183



Item ID for Reference	Location	Duration	Hourly Dust Concentration Average ( $\mu\text{g}/\text{m}^3$ )	Actual Cumulative Dust Budget Value ( $\mu\text{g}/\text{m}^3$ )	Dust Budget Exceedance Value ( $\mu\text{g}/\text{m}^3$ ) <sup>(1)</sup>	Remaining Dust Budget Value ( $\mu\text{g}/\text{m}^3$ )	Forecasted Dust Budget ( $\mu\text{g}/\text{m}^3$ )
9	60m Northeast of Portside Aggregates Ltd. Repair shop	1500 to 1559	12	120	1005	885	162
10	60m Northeast of Portside Aggregates Ltd. Repair shop	1600 to 1659	12	131	1005	874	173
11	60m Northeast of Portside Aggregates Ltd. Repair shop	1700 to 1759	13	144	1005	861	144

Notes: (1) Based on projected length of workday.

Budget (Forecast):  $990 \mu\text{g}/\text{m}^3 > (\text{Budget to that point}) + (\text{Highest hourly average to that point} \times 1\text{hr}) + (33 \mu\text{g}/\text{m}^3 \times (\text{remaining work hours} - 1\text{ hour}))$   
 This is based on a 10-h workday, but the formula would be modified to add  $15 \mu\text{g}/\text{m}^3$  as background for each hour beyond 10, up to a total of 15 hours.  
 \*Individual values may not add to totals or accumulated values shown because of statistical rounding.

**Table 3.0**  
**Comparison of Downwind Daily Results for TVOC Budget**

Item ID for Reference	Location	Duration	Hourly Total of TVOC Readings (ppm(v))	Cumulative TVOC Hourly Readings (ppm(v))	TVOC Budget Limit Value (ppm(v))	Remaining TVOC Budget Value (ppm(v))	Sustained Odours Observed (YES/NO)
1	50m South of Rail America maintenance building.	0700 to 0759	0.1	0.10	8.0	7.90	NO
2	50m South of Rail America maintenance building.	0800 to 0859	0.1	0.20	8.0	7.80	NO
3	50m South of Rail America maintenance building.	0900 to 0959	0.1	0.30	8.0	7.70	NO
4	50m South of Rail America maintenance building.	1000 to 1059	0.1	0.40	8.0	7.60	NO
5	50m South of Rail America maintenance building.	1100 to 1159	0.1	0.50	8.0	7.50	NO
6	60m Northeast of Portside Aggregates Ltd. Repair shop	1200 to 1259	0.1	0.60	8.0	7.40	NO
7	60m Northeast of Portside Aggregates Ltd. Repair shop	1300 to 1359	0.1	0.70	8.0	7.30	NO
8	60m Northeast of Portside Aggregates Ltd. Repair shop	1400 to 1459	0.1	0.80	8.0	7.20	NO
9	60m Northeast of Portside Aggregates Ltd. Repair shop	1500 to 1559	0.1	0.90	8.0	7.10	NO
10	60m Northeast of Portside Aggregates Ltd. Repair shop	1600 to 1659	0.1	1.0	8.0	7.00	NO
11	60m Northeast of Portside Aggregates Ltd. Repair shop	1700 to 1759	0.1	1.10	8.0	6.90	NO

### Calculations

- **Hourly Average for Dust as  $PM_{10}$  ( $\mu\text{g}/\text{m}^3$ ) = the average of all downwind 15 minute readings within one hour**
- **Actual  $PM_{10}$  Cumulative Dust Budget ( $\mu\text{g}/\text{m}^3$ ) = the sum of all downwind hourly averages**
- **Forecasted Dust Budget Value ( $\mu\text{g}/\text{m}^3$ ) =  $990 \mu\text{g}/\text{m}^3 > (\text{Budget to that point}) + (\text{Highest hourly average to that point} \times 1\text{hr}) + (33 \mu\text{g}/\text{m}^3 \text{ as background} \times (\text{remaining work hours} - 1 \text{ hour}))$**

This is based on a 10-h workday, but the formula would be modified to add  $15 \mu\text{g}/\text{m}^3$  as background for each hour beyond 10, up to a total of 15 hours.