

## MEMORANDUM

<b>TO</b>	Peter Weaver, STPA	<b>FILE NO.</b>	S-1977-06
<b>FROM</b>	Jocelyn MacDonald	<b>SHIFT:</b>	0630 to 1830
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<b>DATE</b>	15 January, 2013	<b>STPA NO.</b>	<b>TP6B-P3-0516</b>

**SUBJECT: 14 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 14 January 2013. Brad Kelly of ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH) performed all air monitoring activities.

Weather conditions on the day of sampling:

- Mainly cloudy
- Temperature: approximately 5°C
- Wind Direction: 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 Brad Kelly 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 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	0700	155	13	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
2 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	0720	155	15	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
3 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	0800	155	12	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
4 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	0815	155	14	8.0	0.05	Southwest	Downwind	Excavators 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 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	0900	155	6	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
6 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	0940	155	6	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
7 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1000	155	6	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
8 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1030	155	7	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
9 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1100	155	6	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity

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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 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1145	155	4	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
11 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1200	155	5	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
12 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1235	155	4	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
13 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1300	155	5	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity

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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>
14 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1315	155	4	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
15 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1400	155	3	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
16 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1425	155	5	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
17 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1500	155	6	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity

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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>
18 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1520	155	5	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
19 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1600	155	5	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
20 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1640	155	7	8.0	0.05	Southwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
21 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1700	155	7	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity

22 100m Southeast of Portside Aggregates Ltd Building (N46°09.232' W060°11.542')	1730	155	6	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
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- 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	100m Southeast of Portside Aggregates Ltd Building.	0700 to 0759	14	14	1005	991	296
2	100m Southeast of Portside Aggregates Ltd Building.	0800 to 0859	13	27	1005	978	278
3	100m Southeast of Portside Aggregates Ltd Building.	0900 to 0959	6	33	1005	972	260
4	100m Southeast of Portside Aggregates Ltd Building.	1000 to 1059	7	40	1005	965	233
5	100m Southeast of Portside Aggregates Ltd Building.	1100 to 1159	5	45	1005	960	205
6	100m Southeast of Portside Aggregates Ltd Building.	1200 to 1259	5	50	1005	955	177
7	100m Southeast of Portside Aggregates Ltd Building.	1300 to 1359	5	55	1005	950	149
8	100m Southeast of Portside Aggregates Ltd Building.	1400 to 1459	4	59	1005	838	120

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	100m Southeast of Portside Aggregates Ltd Building.	1500 to 1559	6	65	1005	832	93
10	100m Southeast of Portside Aggregates Ltd Building.	1600 to 1659	6	71	1005	826	99
11	100m Southeast of Portside Aggregates Ltd Building.	1700 to 1759	7	78	1005	819	77

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	100m Southeast of Portside Aggregates Ltd Building.	0700 to 0759	0.1	0.1	8.0	7.90	NO
2	100m Southeast of Portside Aggregates Ltd Building.	0800 to 0859	0.1	0.2	8.0	7.80	NO
3	100m Southeast of Portside Aggregates Ltd Building.	0900 to 0959	0.1	0.3	8.0	7.70	NO
4	100m Southeast of Portside Aggregates Ltd Building.	1000 to 1059	0.1	0.4	8.0	7.60	NO
5	100m Southeast of Portside Aggregates Ltd Building.	1100 to 1159	0.1	0.5	8.0	7.50	NO
6	100m Southeast of Portside Aggregates Ltd Building.	1200 to 1259	0.1	0.6	8.0	7.40	NO
7	100m Southeast of Portside Aggregates Ltd Building.	1300 to 1359	0.1	0.7	8.0	7.30	NO
8	100m Southeast of Portside Aggregates Ltd Building.	1400 to 1459	0.1	0.8	8.0	7.20	NO
9	100m Southeast of Portside Aggregates Ltd Building.	1500 to 1559	0.1	0.9	8.0	7.10	NO
10	100m Southeast of Portside Aggregates Ltd Building.	1600 to 1659	0.1	1.00	8.0	7.00	NO
11	100m Southeast of Portside Aggregates Ltd Building.	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.