

## MEMORANDUM

<b>TO</b>	Dawn MacNeil, STPA	<b>FILE NO.</b>	S-1573-20
<b>FROM</b>	Sue Lanoë	<b>SHIFT:</b>	0630 to 1830
<b>TEL</b>	(902) 539-3012	<b>CC:</b>	Shawn Bernon, STPA Wilfred Kaiser, STPA Terry Smith, ALL-TECH
<b>FAX</b>	(902) 539-3381		
<b>DATE</b>	8 <sup>th</sup> September, 2010	<b>STPA NO.</b>	<b>TP6B-SP-0468</b>

**SUBJECT: 7<sup>th</sup> September, 2010 Real-time Air Monitoring Results  
Sydney Tar Ponds Agency – South Pond 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 7<sup>th</sup> of September, 2010. Brent Campbell and Dave Reeves of ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH) performed all air monitoring activities.

Weather conditions on the day of sampling:

- Mainly cloudy with afternoon showers
- Temperature: approximately 21°C
- Wind Direction: Southwest

**Comments:** *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 and upwind 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 and upwind 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 and 1 sample upwind every hour. Levels above detection limit are noted in Table 1.0.

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 David Reeves and reviewed by Jennifer Andrews. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,



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Sue Lanoë  
Environmental Engineering Technologist  
**ALL-TECH Environmental Services Cape Breton Ltd.**

Copied via e-mail:

Shawn Bernon	<a href="mailto:shawn@tarpondscleanup.ca">shawn@tarpondscleanup.ca</a>
Wilfred Kaiser	<a href="mailto:wilfred@tarpondscleanup.ca">wilfred@tarpondscleanup.ca</a>
George Hennick	<a href="mailto:george@tarpondscleanup.ca">george@tarpondscleanup.ca</a>
Nancy LeDrew	<a href="mailto:nancy@tarpondscleanup.ca">nancy@tarpondscleanup.ca</a>
Lorraine MacNeil	<a href="mailto:lorraine@tarpondscleanup.ca">lorraine@tarpondscleanup.ca</a>
Jo-Ann MacMaster	<a href="mailto:joann@tarpondscleanup.ca">joann@tarpondscleanup.ca</a>
Darren Gardiner	<a href="mailto:dgardiner@craworld.com">dgardiner@craworld.com</a>
Kevin Mac Pherson	<a href="mailto:kevinmacp@cbcl.ca">kevinmacp@cbcl.ca</a>
Terry Smith	<a href="mailto:tsmith@toalltech.com">tsmith@toalltech.com</a>
Sue Lanoë	<a href="mailto:slanoë@alltechenvironmental.com">slanoë@alltechenvironmental.com</a>
Darren Lawless	<a href="mailto:dlawless@toalltech.com">dlawless@toalltech.com</a>
Kelly Morrison	<a href="mailto:kmorrison@alltechenvironmental.com">kmorrison@alltechenvironmental.com</a>
Jocelyn MacDonald	<a href="mailto:sydney@toalltech.com">sydney@toalltech.com</a>
Kathy Harquail	<a href="mailto:kharquail@toalltech.com">kharquail@toalltech.com</a>

**Table 1.0**  
**Real-time Airborne Dust as PM<sub>10</sub> and TVOC Concentration Results**  
**Sydney Tar Ponds Agency – South Pond 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 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	0700	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
2 300m Northwest of STPA building (N46°08.855' W060°11.141')	0700	155	15	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
3 300m Northwest of STPA building (N46°08.855' W060°11.141')	0740	155	46	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
4 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	0800	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
5 300m Northwest of STPA building (N46°08.855' W060°11.141')	0800	155	17	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	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>
6 300m Northwest of STPA building (N46°08.855' W060°11.141')	0835	155	14	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
7 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	0900	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
8 300m Northwest of STPA building (N46°08.855' W060°11.141')	0900	155	20	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
9 300m Northwest of STPA building (N46°08.855' W060°11.141')	0930	155	13	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
10 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1000	155	5	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
11 300m Northwest of STPA building (N46°08.855' W060°11.141')	1000	155	16	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	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>
12 300m Northwest of STPA building (N46°08.855' W060°11.141')	1030	155	10	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	Dust observed from sample site
13 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1100	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
14 300m Northwest of STPA building (N46°08.855' W060°11.141')	1100	155	11	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
15 300m Northwest of STPA building (N46°08.855' W060°11.141')	1140	155	44	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
16 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1200	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
17 300m Northwest of STPA building (N46°08.855' W060°11.141')	1200	155	19	8.0	0.05	Southwest	Downwind	No activity observed on site	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>
18 300m Northwest of STPA building (N46°08.855' W060°11.141')	1225	155	18	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
19 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1300	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
20 300m Northwest of STPA building (N46°08.855' W060°11.141')	1300	155	28	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
21 300m Northwest of STPA building (N46°08.855' W060°11.141')	1340	155	52	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
22 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1400	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
23 300m Northwest of STPA building (N46°08.855' W060°11.141')	1400	155	15	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	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>
24 300m Northwest of STPA building (N46°08.855' W060°11.141')	1445	155	22	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
25 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1500	155	8	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
26 300m Northwest of STPA building (N46°08.855' W060°11.141')	1500	155	17	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
27 300m Northwest of STPA building (N46°08.855' W060°11.141')	1535	155	21	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
28 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1600	155	10	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
29 300m Northwest of STPA building (N46°08.855' W060°11.141')	1600	155	17	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	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>
30 300m Northwest of STPA building (N46°08.855' W060°11.141')	1630	155	17	8.0	0.05	Southwest	Downwind	Excavators and trucks operating (N46°08.230' W060°11.197')	No observations seen to affect sampling integrity
31 110m Southeast of Ritchie St. and Dodd St. intersection (N46°08.456' W060°11.371')	1700	155	11	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
32 300m Northwest of STPA building (N46°08.855' W060°11.141')	1700	155	17	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
33 300m Northwest of STPA building (N46°08.855' W060°11.141')	1730	155	17	8.0	0.05	Southwest	Downwind	No activity observed 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. Highlighted rows (cream) are downwind samples; rows with no colour fill are upwind samples, 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	300m Northwest of STPA building	0700 to 0759	31	31	1005	974	340
2	300m Northwest of STPA building	0800 to 0859	16	47	1005	958	323
3	300m Northwest of STPA building	0900 to 0959	17	64	1005	941	306
4	300m Northwest of STPA building	1000 to 1059	13	77	1005	928	286
5	300m Northwest of STPA building	1100 to 1159	28	105	1005	900	281
6	300m Northwest of STPA building	1200 to 1259	19	124	1005	881	266
7	300m Northwest of STPA building	1300 to 1359	40	164	1005	841	283
8	300m Northwest of STPA building	1400 to 1459	19	183	1005	822	268
9	300m Northwest of STPA building	1500 to 1559	19	202	1005	803	254
10	300m Northwest of STPA building	1600 to 1659	17	219	1005	786	271

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 ( $\mu\text{g}/\text{m}^3$ )
11	300m Northwest of STPA building	1700 to 1759	17	236	1005	769	233

**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	300m Northwest of STPA building	0700 to 0759	0.1	0.1	8.0	7.9	NO
2	300m Northwest of STPA building	0800 to 0859	0.1	0.2	8.0	7.8	NO
3	300m Northwest of STPA building	0900 to 0959	0.1	0.3	8.0	7.7	NO
4	300m Northwest of STPA building	1000 to 1059	0.1	0.4	8.0	7.6	NO
5	300m Northwest of STPA building	1100 to 1159	0.1	0.5	8.0	7.5	NO
6	300m Northwest of STPA building	1200 to 1259	0.1	0.6	8.0	7.4	NO
7	250m Northwest of STPA building	1300 to 1359	0.1	0.7	8.0	7.3	NO
8	300m Northwest of STPA building	1400 to 1459	0.1	0.8	8.0	7.2	NO
9	300m Northwest of STPA building	1500 to 1559	0.1	0.9	8.0	7.1	NO
10	300m Northwest of STPA building	1600 to 1659	0.1	1.0	8.0	7.0	NO
11	300m Northwest of STPA building	1700 to 1759	0.1	1.1	8.0	6.9	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.