

MEMORANDUM

TO	Dawn MacNeil, STPA	FILE NO.	S-1573-17
FROM	Sue Lanoë	SHIFT:	0630 to 1745
TEL	(902) 539-3012	CC:	Shawn Bernon, STPA Wilfred Kaiser, STPA Terry Smith, ALL-TECH
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DATE	8 th September, 2010	STPA NO.	TP6B-SP-0465

**SUBJECT: 7th September, 2010 Real-time Air Monitoring Results
Sydney Tar Ponds Agency – South Pond Solidification and Stabilization
FINAL REPORT**

Attached is a summary of Real-time particulate (as PM₁₀) and Total Volatile Organic Compound (TVOC) concentrations for air monitoring performed on the 7th of September, 2010. Kevin Whiting and Reg Peters 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 PM₁₀ 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 PM₁₀ were below the established Site Action Level for this parameter of 155 µg/m³.

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

Sincerely,



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

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Table 1.0
Real-time Airborne Dust as PM₁₀ and TVOC Concentration Results
Sydney Tar Ponds Agency – South Pond Solidification and Stabilization

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
1 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	0700	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
2 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	0700	155	14	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
3 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	0725	155	59	8.0	0.05	Southwest	Downwind	No activity observed on site	Dust from street activity
4 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	0800	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
5 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	0800	155	9	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity

¹ See NOTE (1) at end of Table

² See NOTE (2) at end of Table

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
6 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	0820	155	9	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
7 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	0900	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
8 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	0900	155	15	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
9 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	0945	155	9	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
10 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1000	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
11 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1000	155	16	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
12 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1015	155	10	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
13 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1100	155	8	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
14 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1100	155	14	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
15 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1130	155	16	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
16 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1200	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
17 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1200	155	11	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 ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
18 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1215	155	10	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
19 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1300	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
20 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1300	155	10	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
21 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1335	155	36	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
22 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1400	155	8	8.0	0.1	Southwest	Upwind	Background	No observations seen to affect sampling integrity
23 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1400	155	15	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
24 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1425	155	23	8.0	0.1	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity
25 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1500	155	9	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
26 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1500	155	10	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
27 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1520	155	11	8.0	0.1	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
28 40m East of Intercolonial St. fixed station (N46°08.599' W060°11.386')	1600	155	10	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
29 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1600	155	10	8.0	0.05	Southwest	Downwind	Excavator operating (N46°08.437' W060°11.293')	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
30 35m East of Ferry St. and Stable Dr. intersection (N46°08.870' W060°11.158')	1645	155	13	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 PM₁₀) Budget

Item ID for Reference	Location	Duration	Hourly Dust Concentration Average (µg/m ³)	Actual Cumulative Dust Budget Value (µg/m ³)	Dust Budget Exceedance Value (µg/m ³) ⁽¹⁾	Remaining Dust Budget Value (µg/m ³)	Forecasted Dust Budget (µg/m ³)
1	35m East of Ferry St. and Stable Dr. intersection	0700 to 0759	37	37	990	953	337
2	35m East of Ferry St. and Stable Dr. intersection	0800 to 0859	9	46	990	944	313
3	35m East of Ferry St. and Stable Dr. intersection	0900 to 0959	12	58	990	932	292
4	35m East of Ferry St. and Stable Dr. intersection	1000 to 1059	13	71	990	919	272
5	35m East of Ferry St. and Stable Dr. intersection	1100 to 1159	15	86	990	904	254
6	35m East of Ferry St. and Stable Dr. intersection	1200 to 1259	11	97	990	893	232
7	35m East of Ferry St. and Stable Dr. intersection	1300 to 1359	23	120	990	870	222
8	35m East of Ferry St. and Stable Dr. intersection	1400 to 1459	19	139	990	851	208
9	35m East of Ferry St. and Stable Dr. intersection	1500 to 1559	11	150	990	840	185

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 ($\mu\text{g}/\text{m}^3$) ⁽¹⁾	Remaining Dust Budget Value ($\mu\text{g}/\text{m}^3$)	Forecasted Dust Budget ($\mu\text{g}/\text{m}^3$)
10	35m East of Ferry St. and Stable Dr. intersection	1600 to 1659	12	162	990	828	160

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	35m East of Ferry St. and Stable Dr. intersection	0700 to 0759	0.1	0.1	8.0	7.9	NO
2	35m East of Ferry St. and Stable Dr. intersection	0800 to 0859	0.1	0.2	8.0	7.8	NO
3	35m East of Ferry St. and Stable Dr. intersection	0900 to 0959	0.1	0.3	8.0	7.7	NO
4	35m East of Ferry St. and Stable Dr. intersection	1000 to 1059	0.1	0.4	8.0	7.6	NO
5	35m East of Ferry St. and Stable Dr. intersection	1100 to 1159	0.1	0.5	8.0	7.5	NO
6	35m East of Ferry St. and Stable Dr. intersection	1200 to 1259	0.1	0.6	8.0	7.4	NO
7	35m East of Ferry St. and Stable Dr. intersection	1300 to 1359	0.1	0.7	8.0	7.3	NO
8	35m East of Ferry St. and Stable Dr. intersection	1400 to 1459	0.15	0.85	8.0	7.15	NO
9	35m East of Ferry St. and Stable Dr. intersection	1500 to 1559	0.15	1.00	8.0	7.00	NO

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)
10	35m East of Ferry St. and Stable Dr. intersection	1600 to 1659	0.1	1.15	8.0	6.85	NO

Calculations

- Hourly Average for Dust as PM_{10} ($\mu g/m^3$) = the average of all downwind 15 minute readings within one hour

- Actual PM_{10} Cumulative Dust Budget ($\mu g/m^3$) = the sum of all downwind hourly averages

- Forecasted Dust Budget Value ($\mu g/m^3$) = $990 \mu g/m^3 > (\text{Budget to that point}) + (\text{Highest hourly average to that point} \times 1\text{hr}) + (33 \mu g/m^3 \text{ as background} \times (\text{remaining work hours} - 1 \text{ hour}))$

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