

MEMORANDUM

TO	Peter Weaver, STPA	FILE NO.	S-1977-05
FROM	Jocelyn MacDonald	SHIFT:	0630 to 1815
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DATE	14 January, 2013	STPA NO.	TP6B-P3-0515

**SUBJECT: 11 January 2013 Real-time Air Monitoring Results
Sydney Tar Ponds Agency – 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 11 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 -5 °C
- Wind Direction: Northwest

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 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 concentrations (15-minute averages) of dust as PM₁₀ were below the established Site Action Level for this parameter of 155 µg/m³.

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.

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Table 1.0
Real-time Airborne Dust as PM₁₀ and TVOC Concentration Results
Sydney Tar Ponds Agency – 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 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0730	155	19	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
2 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0745	155	20	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	30	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')	0830	155	41	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	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
5 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	0900	155	70	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')	0945	155	24	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	47	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')	1045	155	31	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	38	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 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
10 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1135	155	23	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
11 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1200	155	72	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	Visually high amounts of dust coming from sample location.
12 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1215	155	29	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
13 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1300	155	31	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
14 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1340	155	28	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 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
15 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1400	155	24	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
16 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1425	155	19	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
17 75m Northeast of Rail America maintenance building (N46°08.941' W060°11.718')	1500	155	16	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
18 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1515	155	27	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
19 50m South of Rail America maintenance building. (N46°09.950' W060°11.863')	1600	155	19	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 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
20 75m Northeast of Rail America maintenance building (N46°08.941' W060°11.718')	1645	155	17	8.0	0.05	Northwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
22 75m Northeast of Rail America maintenance building (N46°08.941' W060°11.718')	1700	155	17	8.0	0.05	Northwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
22 75m Northeast of Rail America maintenance building (N46°08.941' W060°11.718')	1715	155	15	8.0	0.05	Northwest	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. All samples reported are downwind 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	50m South of Rail America maintenance building.	0700 to 0759	20	20	1005	985	318
2	50m South of Rail America maintenance building.	0800 to 0859	36	55	1005	950	337
3	50m South of Rail America maintenance building.	0900 to 0959	47	102	1005	903	362
4	50m South of Rail America maintenance building.	1000 to 1059	39	141	1005	864	368
5	50m South of Rail America maintenance building.	1100 to 1159	31	172	1005	833	366
6	50m South of Rail America maintenance building.	1200 to 1259	51	222	1005	783	387
7	50m South of Rail America maintenance building.	1300 to 1359	30	252	1005	753	383
8	50m South of Rail America maintenance building.	1400 to 1459	22	273	1005	732	372

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 ($\mu\text{g}/\text{m}^3$)
9	50m South of Rail America maintenance building.	1500 to 1559	22	295	1005	710	360
10	50m South of Rail America maintenance building.	1600 to 1659	18	313	1005	692	378
11	50m South of Rail America maintenance building.	1700 to 1759	16	329	1005	676	329

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	50m South of Rail America maintenance building.	1200 to 1259	0.1	0.60	8.0	7.40	NO
7	50m South of Rail America maintenance building.	1300 to 1359	0.1	0.70	8.0	7.30	NO
8	50m South of Rail America maintenance building.	1400 to 1459	0.1	0.80	8.0	7.20	NO
9	50m South of Rail America maintenance building.	1500 to 1559	0.1	0.90	8.0	7.10	NO
10	50m South of Rail America maintenance building.	1600 to 1659	0.1	1.0	8.0	7.00	NO
11	50m South of Rail America maintenance 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.