

MEMORANDUM

TO	Dawn MacNeil, STPA	FILE NO.	S-1577-08
FROM	Sue Lanoë	SHIFT:	0630 to 1815
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DATE	8 th September, 2010	STPA NO.	CO7-CO8-0302

**SUBJECT: 7th September, 2010 Real-time Air Monitoring Results
Sydney Tar Ponds Agency – Collections Systems
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. Nigel MacLean and Howie Collins of ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH) performed all air monitoring activities.

Weather conditions on the day of sampling:

- Mix of sun and cloud with 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 Nigel MacLean 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 – Collections Systems

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 120m East of railway building (N46°08.912' W060°11.689')	0700	155	11	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
2 220m South of truck scale (N46°09.211' W060°11.599')	0700	155	10	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
3 220m South of truck scale (N46°09.211' W060°11.599')	0730	155	16	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
4 120m East of railway building (N46°08.912' W060°11.689')	0800	155	4	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
5 220m South of truck scale (N46°09.211' W060°11.599')	0800	155	7	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation	Dust from offsite activity transfer of cement powder from rail cars

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 220m South of truck scale (N46°09.211' W060°11.599')	0825	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
7 120m East of railway building (N46°08.912' W060°11.689')	0900	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
8 220m South of truck scale (N46°09.211' W060°11.599')	0900	155	10	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
9 220m South of truck scale (N46°09.211' W060°11.599')	0935	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
10 120m East of railway building (N46°08.912' W060°11.689')	1000	155	8	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
11 220m South of truck scale (N46°09.211' W060°11.599')	1000	155	9	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
12 220m South of truck scale (N46°09.211' W060°11.599')	1015	155	12	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	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
13 120m East of railway building (N46°08.912' W060°11.689')	1100	155	4	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
14 220m South of truck scale (N46°09.211' W060°11.599')	1100	155	6	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
15 220m South of truck scale (N46°09.211' W060°11.599')	1120	155	10	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
16 120m East of railway building (N46°08.912' W060°11.689')	1200	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
17 220m South of truck scale (N46°09.211' W060°11.599')	1200	155	8	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
18 220m South of truck scale (N46°09.211' W060°11.599')	1215	155	10	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
19 120m East of railway building (N46°08.912' W060°11.689')	1300	155	6	8.0	0.05	Southwest	Upwind	Background	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 220m South of truck scale (N46°09.211' W060°11.599')	1300	155	6	8.0	0.05	Southwest	Downwind	Trucks dumping (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
21 220m South of truck scale (N46°09.211' W060°11.599')	1330	155	9	8.0	0.05	Southwest	Downwind	Trucks dumping (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
22 120m East of railway building (N46°08.912' W060°11.689')	1400	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
23 220m South of truck scale (N46°09.211' W060°11.599')	1400	155	7	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
24 220m South of truck scale (N46°09.211' W060°11.599')	1440	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
25 120m East of railway building (N46°08.912' W060°11.689')	1500	155	8	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
26 220m South of truck scale (N46°09.211' W060°11.599')	1500	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity

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 Real-time Air Monitoring Daily Report - DRAFT

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
27 220m South of truck scale (N46°09.211' W060°11.599')	1520	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
28 120m East of railway building (N46°08.912' W060°11.689')	1600	155	13	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
29 220m South of truck scale (N46°09.211' W060°11.599')	1600	155	9	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
30 220m South of truck scale (N46°09.211' W060°11.599')	1625	155	10	8.0	0.05	Southwest	Downwind	Excavator and trucks in operation (N46°08.498' W060°11.325')	No observations seen to affect sampling integrity
31 120m East of railway building (N46°08.912' W060°11.689')	1700	155	9	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
32 220m South of truck scale (N46°09.211' W060°11.599')	1700	155	17	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
33 220m South of truck scale (N46°09.211' W060°11.599')	1715	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	220m South of truck scale	0700 to 0759	13	13	1005	992	305
2	220m South of truck scale	0800 to 0859	8	21	1005	984	280
3	220m South of truck scale	0900 to 0959	9	30	1005	975	256
4	220m South of truck scale	1000 to 1059	11	41	1005	964	233
5	220m South of truck scale	1100 to 1159	8	49	1005	956	208
6	220m South of truck scale	1200 to 1259	9	58	1005	947	184
7	220m South of truck scale	1300 to 1359	8	64	1005	939	159
8	220m South of truck scale	1400 to 1459	8	72	1005	931	133
9	220m South of truck scale	1500 to 1559	8	80	1005	923	108
10	220m South of truck scale	1600 to 1659	10	90	1005	913	103
11	220m South of truck scale	1700 to 1759	15	105	1005	908	105

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	220m South of truck scale	0700 to 0759	0.1	0.1	8.0	7.9	NO
2	220m South of truck scale	0800 to 0859	0.1	0.2	8.0	7.8	NO
3	220m South of truck scale	0900 to 0959	0.1	0.3	8.0	7.7	NO
4	220m South of truck scale	1000 to 1059	0.1	0.4	8.0	7.6	NO
5	220m South of truck scale	1100 to 1159	0.1	0.5	8.0	7.5	NO
6	220m South of truck scale	1200 to 1259	0.1	0.6	8.0	7.4	NO
7	220m South of truck scale	1300 to 1359	0.1	0.7	8.0	7.3	NO
8	220m South of truck scale	1400 to 1459	0.1	0.8	8.0	7.2	NO
9	220m South of truck scale	1500 to 1559	0.1	0.9	8.0	7.1	NO
10	220m South of truck scale	1600 to 1659	0.1	1.0	8.0	7.0	NO
11	220m South of truck scale	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.