



**Sonoma Technology, Inc.**  
*Air Quality Research and Innovative Solutions*

# **Fifteenth Quarterly Report of Ambient Air Quality Monitoring at Sunshine Canyon Landfill and Van Gogh Elementary School**

(June 1, 2011 – August 31, 2011)

**Quarterly Report**  
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## Executive Summary

### ES-1. Background

Continuous monitoring of meteorological and air quality parameters began at the Sunshine Canyon Landfill (the Landfill) and at Van Gogh Elementary School in the nearby community of Granada Hills in fall 2007. PM<sub>10</sub> (particulate matter less than 10 microns in aerodynamic diameter) is measured hourly. Wind speed and wind direction are measured as 1-minute averages, and black carbon (BC, a surrogate for diesel particulate matter) is averaged over 5-minute intervals. The collected data undergo quarterly validation and are evaluated for completeness.

Following data validation, all data are reported as hourly averages. PM<sub>10</sub> concentrations are then compared with federal and state PM<sub>10</sub> standards. When PM<sub>10</sub> exceedances occur, additional comparisons are made with the historical, regional, and annual ambient PM<sub>10</sub> concentrations. At least annually, the PM<sub>10</sub> and BC data are analyzed to characterize the impact of landfill operations on ambient air quality on a neighborhood scale. The validated hourly data and a summary of the analytical results and field operations are reported to the Planning Department of the City of Los Angeles. This Fifteenth Quarterly Report summarizes the summer quarter monitoring results from the fourth year of continuous monitoring.

### ES-2. Statistics

Data capture for the monitoring period of June 1, 2011, through August 31, 2011, was nearly 100% for all parameters at both sites. A small percentage of wind data were invalidated due to database write errors. There were no exceedances of the 150 µg/m<sup>3</sup> 24-hr federal PM<sub>10</sub> standard at either site during this monitoring quarter. The more stringent 24-hr California state PM<sub>10</sub> standard (50 µg/m<sup>3</sup>) was exceeded during this period on 25% of the days at the Landfill site and on 12% of the days at the Van Gogh School site. Average 24-hr BC concentrations at the Landfill and School sites were similar for this quarterly period, and were the lowest among all summer quarter measurements to date.

### ES-3. Landfill Gas Sampling

No landfill gas (LFG) samples were obtained during the 2011 summer period.



## 1. Introduction

This report provides a summary of data completeness, ambient PM<sub>10</sub> (particulate matter less than 10 microns in aerodynamic diameter) concentrations, average and maximum black carbon (BC) concentrations, instrument flow rate verification (quality control) data, and field operations for the quarterly period of June 1, 2011, through August 31, 2011. Data from this quarterly period represent the fourth consecutive year of summer season data collected from continuous monitoring at the Sunshine Canyon Landfill (the Landfill) and Van Gogh Elementary School monitoring sites.

## 2. Data Completeness

**Table 1** gives completeness statistics for all measured variables for the period June 1, 2011, through August 31, 2011. Data capture rates for all measured variables were near 100% at both sites. A small percentage of wind data were invalidated at both sites. This was due to infrequent connectivity problems between the data acquisition system's analog input module, which records the wind sensor signals, and the onsite SQL database. The small percentage of invalidated PM<sub>10</sub> data was due to downtime during equipment maintenance.

**Table 1.** Data completeness statistics for the recent monitoring quarter, June 1, 2011, through August 31, 2011.

Monitoring Location	Dates	Percent Data Capture (%) <sup>a</sup>			Percent Data Valid or Suspect (%) <sup>b</sup>			Percent Data Suspect (%) <sup>c</sup>		
		PM <sub>10</sub>	BC	WS/WD	PM <sub>10</sub>	BC	WS/WD	PM <sub>10</sub>	BC	WS/WD
Sunshine Canyon Landfill	6/1/11–8/31/11	100.0%	100.0%	99.9%	99.8%	100.0%	99.6%	0.0%	0.0%	0.0%
Van Gogh Elem. School	6/1/11–8/31/11	100.0%	100.0%	100.0%	99.4%	100.0%	98.4%	0.0%	0.0%	0.0%

<sup>a</sup> Percent Data Capture is the percentage of collected data values divided by the total number of expected data intervals in the date range (e.g., for the raw BC 5-minute data, 12 data values are expected per hour and 288 data values are expected per day).

<sup>b</sup> Percent Data Valid or Suspect is the percentage of data values that are either valid or suspect, divided by the number of captured data values.

<sup>c</sup> Percent Data Suspect is the percentage of data values labeled as suspect divided by the number of captured data values.

## 3. PM<sub>10</sub> Exceedances

The federal and state PM<sub>10</sub> exceedances for the current quarter and the corresponding quarters of the previous three years (2008, 2009, and 2010) and the baseline year (November 22, 2001, to November 21, 2002) are summarized in **Table 2**. There were no exceedances of

the federal 24-hr PM<sub>10</sub> standard of 150 µg/m<sup>3</sup> at either monitoring location for these summer months. The percentage of days exceeding the state standard of 50 µg/m<sup>3</sup> for the June through August quarter was 12% for the Van Gogh School site and 25% for the Landfill site. Ambient PM<sub>10</sub> concentrations during summertime monitoring are more heavily influenced by contributions from the South Coast Air Basin than are those measured during the wintertime, due to the dominance of southerly (onshore) wind flows during the warm months.

**Table 2.** Number of exceedances of federal and state 24-hr PM<sub>10</sub> standards during the current quarter and the June through August quarterly periods of the baseline year and of 2008, 2009, and 2010. In the State column, the *percentage of exceedances* is derived from the total number of days on which valid 24-hr average PM<sub>10</sub> concentrations were measured.

Site	Quarterly Period	PM <sub>10</sub> Standard			
		Federal 24-hr 150 µg/m <sup>3</sup>		State 24-hr 50 µg/m <sup>3</sup>	
		Number of Exceedances	Date Occurred	Exceedances/ Total Possible Days	Percentage Exceedances
Van Gogh School	6/1/02–8/31/02	0	NA	5/16	31%
	6/1/08–8/31/08	0	NA	25/89	28%
	6/1/09–8/31/09	0	NA	14/90	16%
	6/1/10–8/31/10	0	NA	27/83	33%
	6/1/11–8/31/11	0	NA	11/92	12%
Sunshine Canyon Landfill	6/1/02–8/31/02	0	NA	44/67	66%
	6/1/08–8/31/08	0	NA	28/92	30%
	6/1/09–8/31/09	0	NA	16/87	18%
	6/1/10–8/31/10	0	NA	10/91	11%
	6/1/11–8/31/11	0	NA	23/92	25%

## 4. Average and Maximum Black Carbon Concentrations

While no federal or state standards exist for BC concentrations in ambient air, BC is a measurable component of ambient air that correlates well with diesel particulate matter (DPM). Because of growing evidence that DPM is associated with several negative health effects, BC is often measured in an attempt to quantify the relative amounts of DPM in ambient air.

**Table 3** provides the 24-hr average and maximum 24-hr BC concentrations for June 1, 2011, through August 31, 2011, and compares these concentrations with data from corresponding quarters of the three most recent years and the baseline year. The average 24-hr BC concentrations at both monitoring sites during the 2011 summer quarter were the lowest of those measured to date for this season of the year. The maximum 24-hr BC



concentration measured at the landfill site was also the lowest of those recorded in previous summer quarters.

**Table 3.** Comparison of 24-hr BC concentrations for the current quarter with those measured in the June 1 through August 31 quarterly periods of the baseline year and of 2008, 2009, and 2010.

Site	Quarterly Period	BC Concentrations ( $\mu\text{g}/\text{m}^3$ )	
		Average 24-hr	Maximum 24-hr
Van Gogh School	6/1/02–8/31/02	1.40	2.33
	6/1/08–8/31/08	0.98	1.71
	6/1/09–8/31/09	1.03	2.23
	6/1/10–8/31/10	1.07	1.75
	6/1/11–8/31/11	0.86	1.43
Sunshine Canyon Landfill	6/1/02–8/31/02	1.09	2.69
	6/1/08–8/31/08	1.41	3.01
	6/1/09–8/31/09	1.26	2.45
	6/1/10–8/31/10	1.06	1.88
	6/1/11–8/31/11	0.99	1.78

## 5. Landfill Gas Sampling

The ambient air quality monitoring work conducted during 2008–2010 at these sites demonstrated that landfill impacts on the neighboring communities have seasonal, as well as diurnal, components. Given the limited number of landfill gas (LFG) sampling periods (four per year) prescribed by the Conditions of Approval (C.10.a), we have chosen to focus on sampling LFG during the fall and winter months, when winds change from an onshore (southerly) flow to an offshore (northerly) flow, and when early morning meteorological conditions favor downslope air flow patterns that may carry pollutants from the landfill to the community. The complaint registry at the South Coast Air Quality Management District (SCAQMD) indicates that odor complaints from the community are most frequent from October to January, suggesting that transport from the landfill may be occurring during those months. No LFG samples were obtained during the 2011 summer period.

## 6. Field Operations

**Tables 4 and 5** list dates and major tasks associated with visits to the Landfill and Van Gogh School sites, respectively, between June 1, 2011, and August 31, 2011. **Table 6** shows the PM<sub>10</sub> and BC monitors' flow rates as reported by the monitors and measured with a NIST-traceable flow standard.

**Table 4.** Sunshine Canyon Landfill monitoring site visits and field maintenance and operations from June 1, 2011, through August 31, 2011.

Date of Site Visit	Description of Work
Wednesday, June 22, 2011	Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Leak check on BAM. Collected PM <sub>10</sub> and BC data. Inspected roller, vane, and nozzle.
Monday, July 11, 2011	Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Leak check on BAM. Collected PM <sub>10</sub> and BC data. Inspected roller, vane, and nozzle.
Wednesday, July 27, 2011	Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Inspected BAM roller, vane, and nozzle. Installed new BAM tape; self test passed. Collected PM <sub>10</sub> and BC data.
Thursday, August 18, 2011	Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Inspected BAM roller, vane, and nozzle. Collected PM <sub>10</sub> and BC data.

**Table 5.** Van Gogh School monitoring site visits and field maintenance and operations from June 1, 2011, through August 31, 2011.

Date of Site Visit	Description of Work
Saturday, June 11, 2011	BAM tape supply out, installed new tape and ran self test; passed.
Wednesday, June 22, 2011	Weed abatement of perimeter fence. Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Leak check on BAM. Collected PM <sub>10</sub> and BC data. Inspected roller, vane, and nozzle.
Monday, July 11, 2011	Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Collected PM <sub>10</sub> and BC data. Inspected roller, vane, and nozzle.
Wednesday, July 27, 2011	Regular preventive maintenance. New BAM tape installed. Self test passed. Flow checks on PM <sub>10</sub> and BC samplers. Collected PM <sub>10</sub> and BC data. Cleaned BAM capstan roller and nozzle.
Thursday, August 18, 2011	Regular preventive maintenance. Flow checks on PM <sub>10</sub> and BC samplers. Collected PM <sub>10</sub> and BC data. Inspected roller, vane, and nozzle.

**Table 6.** Flow rates in liters per minute (lpm) for the BAM PM<sub>10</sub> monitors and Aethalometer BC monitors at the Sunshine Canyon Landfill and Van Gogh School sites from June 1, 2011, through August 31, 2011. BAM flow rates are volumetric (local temperature and pressure), and Aethalometer flow rates are at standard temperature and pressure. Reference flows were measured with a NIST-traceable flow standard. BAM target flow rate is 16.7 lpm volumetric to meet the 10-micron cut point of the inlet, with an acceptable range of 16.0 to 17.3 lpm. The Aethalometer has no size cut point.

Location	Date	Flow Rates (lpm)					
		BAM as Found	Reference	BAM as Left	Reference	Aethalometer as Found	Reference
Sunshine Canyon Landfill	6/22/11	16.5	16.3	16.5	16.3	3.0	3.11
	7/11/11	16.8	16.5	16.8	16.5	3.0	3.19
	7/27/11	16.8	16.4	16.8	16.4	2.9	3.2
	8/18/11	16.9	16.8	16.9	16.8	2.9	2.9
Van Gogh Elementary School	6/22/11	16.7	16.5	16.7	16.5	3.3	3.0
	7/11/11	16.7	16.7	16.7	16.7	3.3	3.1
	7/27/11	16.7	16.5	16.7	16.5	3.3	3.2
	8/18/11	16.7	16.7	16.7	16.7	<sup>a</sup>	3.1

<sup>a</sup> Not recorded.