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Ambient Air Quality Monitoring at Sunshine Canyon Landfill and Van Gogh Elementary School

Continuous monitoring of particulate matter, black carbon, wind speed, and wind direction began at the Sunshine Canyon Landfill (Landfill Site) and at Van Gogh Elementary School (Community Site) in Granada Hills in fall 2007.

These data are used to characterize ambient air pollution concentrations on a neighborhood scale in the context of the Los Angeles basin and to evaluate the impact of landfill operations on air quality in the community.

Particulate Matter (PM_{10})

PM_{10} is particulate matter less than 10 microns in diameter. A human hair is about 100 micrometers in diameter. Its width could hold roughly 10 PM_{10} particles. PM_{10} is present in dust, smoke, soot, and dirt. It can be inhaled and drawn into the lungs, causing health problems for some people.

Wind-Blown Dust

Landfill Operations

Dirt Roads

Black Carbon (BC)

Black carbon is a sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuel. Many BC particles are too small to be visible. BC emissions can cause adverse health and climate effects.

Vehicular Traffic

Diesel Engines

Industrial Activities

Wind

Wind Speed and Wind Direction are measured because they can significantly affect when and how far airborne pollutants travel from their sources.

Statistical Summary for the Summer 2023 Quarter

PM_{10} Exceedances

Total PM_{10} Summer Quarter Exceedances over 15 Years	2	**Landfill Site** Federal Exceedances	0	**Community Site** Federal Exceedances	515	**Landfill Site** State Exceedances	132	**Community Site** State Exceedances
Total Exceedances in the 63rd Quarter	0	**Landfill Site** Federal Exceedances	0	**Community Site** Federal Exceedances	53	**Landfill Site** State Exceedances	1	**Community Site** State Exceedances

PM_{10}

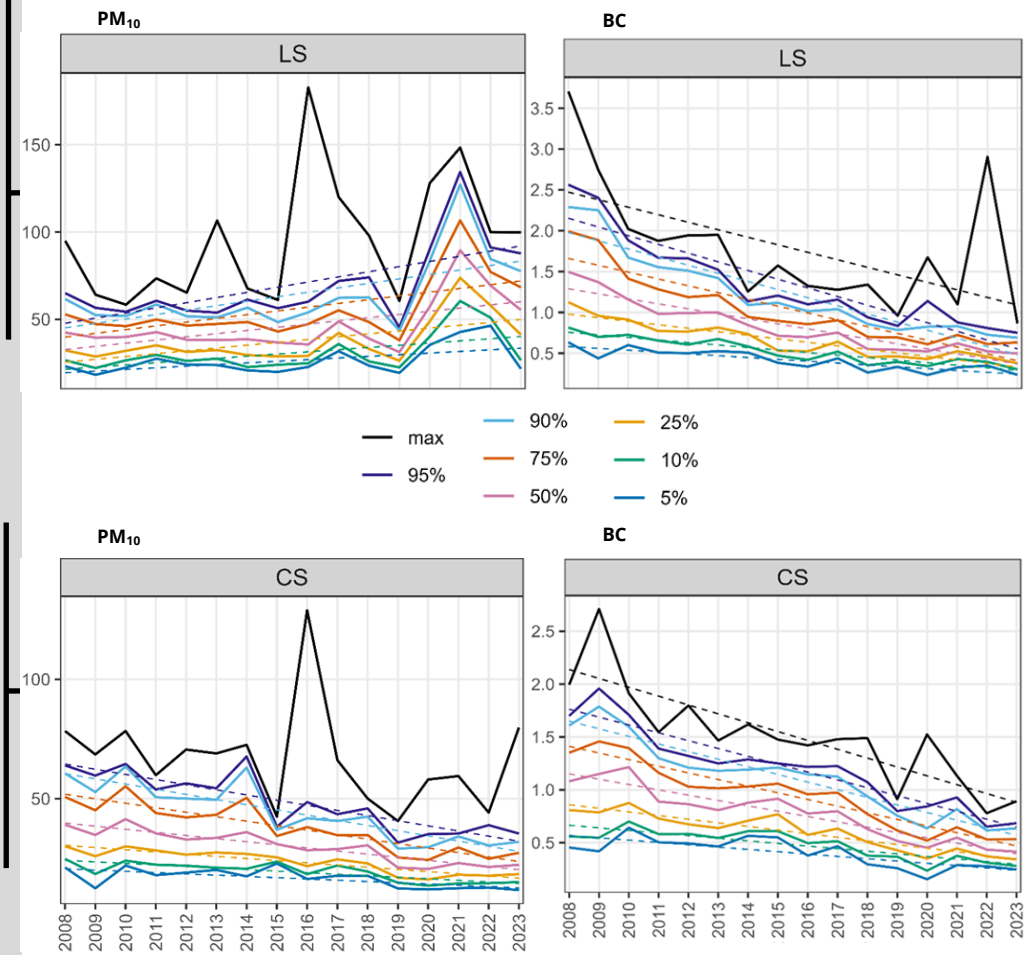
Landfill Site

There is a statistically significant trend all percentiles, with the exception of the maximum PM_{10} concentrations. However, all percentiles concentration decreased from the previous summer quarter.

Community Site

There is a statistically significant decreasing trend for all percentiles with the exception of the maximum.

Average and Maximum Black Carbon and PM_{10} Concentrations



Black Carbon

Landfill Site

There is a statistically significant decreasing trend in all percentiles at the Landfill site during summer quarters over the observational record.

Community Site

There is a statistically significant declining trend in summer quarter 24-hr BC concentrations at all percentiles and the maximum concentration.

Data Completeness

	Data Capture			*Valid Data Used for Analysis*		
	PM_{10}	**BC**	**Wind Speed & Direction**	**PM_{10}**	**BC**	**Wind Speed & Direction**
Landfill Site	97.51%	96.88%	97.92%	99.86%	99.95%	99.62%
Community Site	97.46%	96.74%	95.79%	99.91%	100%	100%

December 2023

Sixty-Third Quarterly Report of Ambient Air Quality Monitoring at Sunshine Canyon Landfill and Van Gogh Elementary School

June 1, 2023 – August 31, 2023

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Executive Summary

Background

Continuous monitoring of meteorological and air quality parameters began at the Sunshine Canyon Landfill (Landfill site) and at Van Gogh Elementary School (Community site) in the nearby community of Granada Hills in fall 2007. The following parameters are measured at these sites: particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), wind speed (WS), wind direction (WD), and black carbon (BC) as a surrogate for diesel particulate matter (DPM). The collected data are validated and evaluated quarterly for completeness. Monitoring is conducted to fulfill stipulations in the City of Los Angeles' Conditions of Approval for the expansion of the landfill.[1] Similar conditions cover the County of Los Angeles' portion of the landfill.[2]

PM_{10} concentrations are compared with federal and state PM_{10} standards. When PM_{10} concentrations are above the standard (i.e., an exceedance), additional comparisons are made with the historical, regional, and annual ambient PM_{10} concentrations. PM_{10} and BC data are analyzed in an in-depth annual report that characterizes landfill operation impacts on ambient air quality as observed at the Community site. This is done by quantifying PM_{10} and BC concentrations and exceedances and comparing concentrations between the Landfill and Community sites.

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 and to the Los Angeles County Department of Regional Planning. This Sixty-Third Quarterly Report summarizes the June 1, 2023 – August 31, 2023 (2023 summer quarter) monitoring results from the sixteenth year of continuous data collection.

Statistics

For this quarter, the percentage of hourly PM_{10} data captured was 97.51% at the Landfill site and 97.46% at the Community site. Of the captured PM_{10} data, 0.14% were invalidated at the Landfill site and 0.33% were invalidated at the Community site. The beta attenuation monitor (BAM) instrument at the Landfill site experienced persistent inlet moisture issues throughout the 2023 winter, spring, and summer quarters, which contributed to 48.86% of PM_{10} data being flagged as suspect. Operational issues caused by moisture should decrease as the Landfill site was relocated away from the odor misters during the last days of the summer quarter (see Section 5). At the Community site, 25.60% of data were deemed suspect.

[1] Section C.10.a of Ordinance No. 172,933
[2] County Condition 81

Hourly BC data capture was 96.88% at the Landfill site and 96.74% at the Community site. Of the captured hourly BC data, 0.05% of data were deemed invalid at the Landfill site and no data were deemed invalid at the Community site. Of the captured hourly BC data, 2.24% were deemed suspect at the Landfill site, and 4.73% were deemed suspect at the Community site.

One-min WS and WD data capture was 97.92% at the Landfill site and 95.79% at the Community site. Of the captured 1-min WS and WD data, less than 1.0% were deemed invalid at the Landfill site (0.38%), and none were deemed invalid at the Community sites. No data were deemed suspect at either the Landfill site or Community site.

During this quarter, the state 24-hr PM_{10} standard (50 µg/m^3) was exceeded on 60% of days (53 days out of the valid 89 days of the quarter) at the Landfill site, and on 2% of days at the Community site (1 day out of 89 days of the quarter). There were no federal exceedances of the 24-hr PM_{10} 150 µg/m^3 standard at either the Landfill site or the Community site. The 24-hr average BC concentration was 0.50 µg/m^3 at the Landfill site and 0.44 µg/m^3 at the Community site. Both sites exhibited the lowest 24-hr average BC concentrations of all monitored summer quarters (2008–2023).

1. Introduction

This report summarizes data completeness, ambient PM_{10} concentrations, average and maximum ambient BC as a surrogate for DPM concentrations, instrument flow rate verification (quality control) data, and field operations for the quarterly period of June 1 – August 31, 2023. Collected data are validated and evaluated quarterly for completeness. This is the sixteenth year that continuous monitors collected data in the summer at the Sunshine Canyon Landfill site (previously called the Berm site) and the Van Gogh Elementary School Community site. Monitoring site locations are shown in **Figure 1**. PM_{10} is measured with a BAM, and BC is measured with an Aethalometer. The Sunshine Canyon Landfill North monitoring site shown in Figure 1 was installed in December 2015 and decommissioned on May 31, 2017. In this quarter, the equipment shelter at the Community site was replaced during July 21-23. The Landfill site was relocated approximately 720 feet to the northwest on the last days of the quarter (August 29-31) to eliminate the negative impacts of the nearby odor misters on data quality. New aethalometers (Magee Scientific aethalometer model AE33) and communication hardware were installed at both sites during shelter upgrades. Magee Scientific Aethalometer AE33 came on the market six years ago and now is the dominant instrument in the field of Black Carbon monitoring.

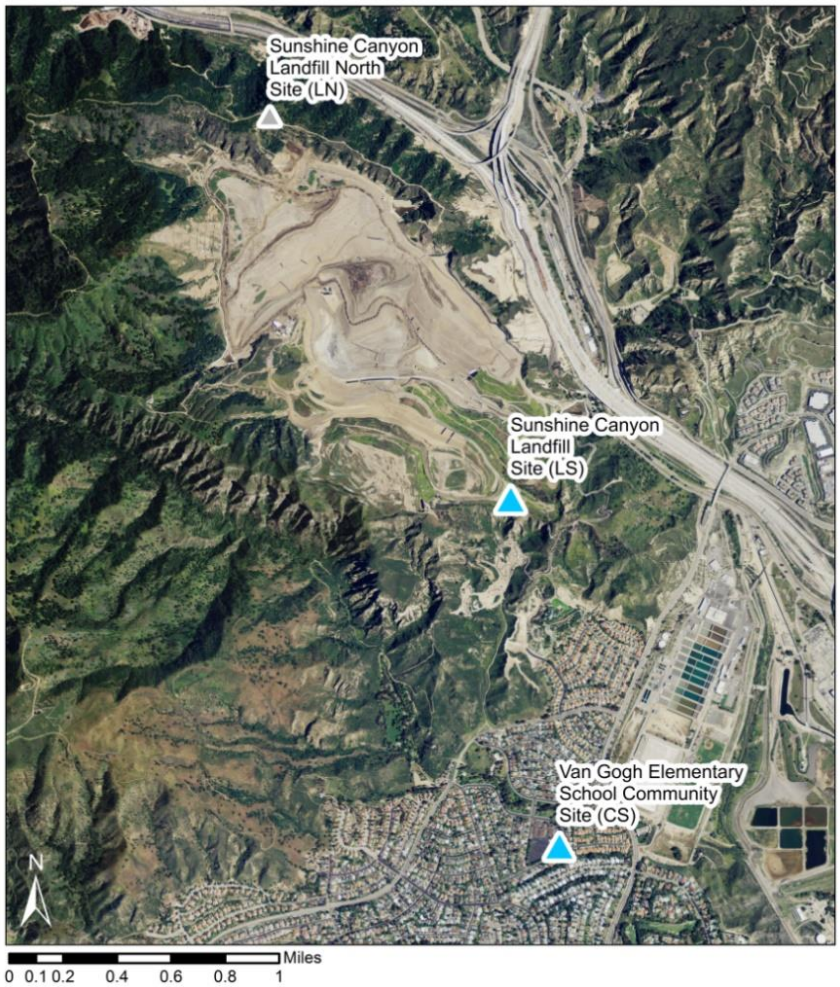

Figure 1. Sunshine Canyon Landfill, including the Landfill and Community monitoring sites (blue triangles). The Sunshine Canyon Landfill North site (gray triangle) collected data from Dec. 1, 2015, through May 31, 2017, and has been decommissioned.

Monitoring is conducted to fulfill stipulations in the City of Los Angeles' Conditions of Approval for the expansion of the landfill.[3] Similar conditions cover the County of Los Angeles' portion of the landfill.[4]

[3] Section C.10.a of Ordinance No. 172,933
[4] County Condition 81

2. Data Completeness

Completeness statistics for all measured variables during the 2023 summer quarter are shown in Table 1. Data deemed suspect are included in subsequent analyses (e.g., regional comparisons if applicable), while invalid data are not. The percent data capture for PM_{10} was 97.51% at the Landfill site and 97.46% at the Community site. The percent of captured PM_{10} data invalidated was 0.14% at the Landfill site and 0.33% at the Community site. The percent of hourly PM_{10} values deemed suspect was 48.86% at the Landfill site and 25.60% at the Community site. Moisture from odor misters impacted the Landfill shelter and likely contributed to the high abundance of suspect PM_{10} data at the Landfill site. The relocation of the Landfill site to a higher elevation away from the odor misters will likely improve data quality. Newly installed HVAC systems at both the Landfill site and Community site shelters will also improve data quality. Additionally, as part of the shelter replacement and relocation tasks, upgraded MetOne BAM 1020 PM_{10} monitors were installed that will improve data collection and quality.

Table 1. Data completeness statistics for hourly PM_{10}, hourly BC, and 1-min WS and WD data for the 2023 summer quarter monitoring period.

Monitoring Location	Dates	Data Capture (%)[a]			Data Valid or Suspect (%)[b]			Data Suspect (%)[c]		
		PM_{10}	BC	WS/ WD	PM_{10}	BC	WS/ WD	PM_{10}	BC	WS/ WD
Landfill Site	06/01/23-08/31/23	97.51	96.88	97.92	99.86	99.95	99.62	48.86	2.24	0
Community Site	06/01/23-08/31/23	97.46	96.74	95.79	99.67	100.0	100.0	25.60	4.73	0

[a] Data Capture is the number of collected data values divided by the total number of expected data intervals during the date range indicated in the "Dates" column (e.g., for the raw BC 1-hr data, 24 data values per day are expected), multiplied by 100.
[b] Data Valid or Suspect is the number of data values that are either valid or suspect divided by the number of captured data values, multiplied by 100.
[c] Data Suspect is the number of data values labeled as suspect divided by the number of captured data values, multiplied by 100.

BC data at the Landfill site was measured by the AE21 aethalometer throughout the quarter until the last day of the quarter (August 31), when the AE33 aethalometer was installed and began recording BC data. There was insufficient data on the last day of the quarter at the Landfill site to calculate a 24-hr average BC concentration. BC concentrations at the Community site were measured by the AE21 aethalometer from June 1 until July 21. On July 24, the newly installed AE33 Aethalometer began recording BC data at the Community site; data from July 24 until the end of the quarter were measured by the AE33 aethalometer. Hourly BC data capture was 96.88% at the Landfill site and

96.74% at the Community site. 0.05% of BC data were deemed invalid at the Landfill site, and no BC data were deemed invalid at the Community site. The percent of hourly BC data deemed suspect was 2.24% at the Landfill site and 4.73% at the Community site.

At the Landfill site, the wind data capture percentage was 97.92%, 0.38% of data were invalidated, and no data were deemed suspect. At the Community site, the wind data capture percentage was 95.79%, and no data were invalidated or deemed suspect.

3. PM_{10} Exceedances

Federal and state PM_{10} exceedances for the baseline summer quarter (2002), previous 15 summer quarters (2008–2022), and current summer quarter (2023) are summarized in Table 2 for the Landfill site and Table 3 for the Community site. In this quarter, the state PM_{10} standard of 50 µg/m^3 was exceeded on 60% of days (53 of 89 days) at the Landfill site, and 2% of days (1 of 89 days) at the Community site. The federal 24-hr PM_{10} standard (150 µg/m^3) was not exceeded at either the Landfill site or the Community site.

Table 2. Number of federal and state 24-hr PM_{10} standard exceedances during the summer quarters for the baseline year (2002) and 2008 to 2023 at the Landfill site. In the "Federal 24-hr" column, values represent the number of exceedances and the date(s) when exceedances occurred. In the "State 24-hr" column, values represent the number of exceedances/total days on which valid 24-hr averages were measured, and the percentage of exceedances out of the total number of days with valid concentrations. The most recent summer quarter is bold.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m³	State 24-hr 50 µg/m³
06/01/02–08/31/02	Baseline Year	0	44/67 (66%)
06/01/08–08/31/08	2008 Summer	0	28/92 (30%)
06/01/09–08/31/09	2009 Summer	0	16/87 (18%)
06/01/10–08/31/10	2010 Summer	0	11/91 (12%)
06/01/11–08/31/11	2011 Summer	0	23/92 (25%)
06/01/12–08/31/12	2012 Summer	0	10/76 (13%)
06/01/13–08/31/13	2013 Summer	0	14/91 (15%)
06/01/14–08/31/14	2014 Summer	0	19/91 (21%)
06/01/15–08/31/15	2015 Summer	0	8/92 (9%)
06/01/16–08/31/16	2016 Summer	2 (07/22/2016 & 07/30/2016)	16/92 (17%)
06/01/17–08/31/17	2017 Summer	0	41/91 (46%)
06/01/18–08/31/18	2018 Summer	0	19/91 (21%)
06/01/19–08/31/19	2019 Summer	0	2/91 (3%)
06/01/20–08/31/20	2020 Summer	0	63/91 (70%)
06/01/21–08/31/21	2021 Summer	0	73/78 (94%)
06/01/22-08/31/22	2022 Summer	0	75/82 (92%)
06/01/23-08/31/23	**2023 Summer**	**0**	**53/89 (60%)**

Table 3. Number of federal and state 24-hr PM_{10} standard exceedances during the summer quarters for the baseline year (2002) and 2008 to 2023 at the Community site. In the "Federal 24-hr" column, values represent the number of exceedances and the date(s) when exceedances occurred. In the "State 24-hr" column, values represent the number of exceedances/total days on which valid 24-hr averages were measured, and the percentage of exceedances out of the total number of days with valid concentrations. The most recent summer quarter is **bold**.

Quarter Period	Quarter Name	Exceedances of PM_{10} Standard	
		Federal 24-hr 150 µg/m³	State 24-hr 50 µg/m³
06/01/02–08/31/02	Baseline Year	0	5/16 (31%)
06/01/08–08/31/08	2008 Summer	0	25/89 (28%)
06/01/09–08/31/09	2009 Summer	0	13/90 (14%)
06/01/10–08/31/10	2010 Summer	0	27/83 (33%)
06/01/11–08/31/11	2011 Summer	0	11/92 (12%)
06/01/12–08/31/12	2012 Summer	0	10/92 (11%)
06/01/13–08/31/13	2013 Summer	0	9/90 (10%)
06/01/14–08/31/14	2014 Summer	0	22/86 (26%)
06/01/15–08/31/15	2015 Summer	0	0/30 (0%)
06/01/16–08/31/16	2016 Summer	0	4/92 (4%)
06/01/17–08/31/17	2017 Summer	0	2/92 (3%)
06/01/18–08/31/18	2018 Summer	0	1/92 (2%)
06/01/19–08/31/19	2019 Summer	0	0/91 (0%)
06/01/20–08/31/20	2020 Summer	0	1/90 (2%)
06/01/21–08/31/21	2021 Summer	0	1/84 (2%)
06/01/22-08/31/22	2022 Summer	0	0/90 (0%)
06/01/23-08/31/23	**2023 Summer**	**0**	**1/89 (2%)**

4. Average and Maximum BC and PM_{10} Concentrations

Although no federal or state standards exist for BC concentrations in ambient air, BC is a measurable component of ambient air that correlates well with DPM. Because of growing evidence that DPM is associated with several negative health effects, BC is often measured to quantify the relative amounts of DPM in ambient air. Findings from the Multiple Air Toxics Exposure Study V (MATES V) conducted by the South Coast Air Quality Management District (South Coast AQMD) found DPM to be the most important toxic air pollutant contributing to negative health impacts in the Los Angeles basin (South Coast Air Quality Management District, 2015).

BC is measured by an aethalometer, which passes air through a filter tape to trap suspended particles. Light-absorbing particles attenuate a light beam projected through the deposit. The buildup of BC on the air sampling tape causes an artifact that affects the accuracy of the measured concentration (Drinovec et al., 2015; Allen, 2014), subjecting aethalometers to a saturation effect. Instrument response is dampened with heavier loading (i.e., higher concentrations) of BC aerosols. This artifact can cause BC concentration readings to be lower than the true concentration. However, mathematical methods to correct the BC concentration values are available and widely used. All reported BC values to date from the Landfill, Landfill North, and Community sites have been adjusted in this report to compensate for this tape saturation effect. This compensation was not performed in quarterly reports prior to the 29th Quarterly Report (winter 2015). Because the compensation process changes the reported concentration, and because uncompensated values were used in previous reports, prior-year BC concentrations shown in this report do not match concentrations reported prior to the 29th Quarterly Report. All available BC data shown in this Quarterly Report have been compensated (data was unavailable from the baseline year). BC data at the Landfill site were measured by the AE21 Aethalometer until the last day of the quarter (August 31), when the AE33 Aethalometer was installed and began recording BC data. There were insufficient data on the last day of the quarter at the Landfill site to calculate a 24-hr average BC concentration. BC data at the Community site were measured by the AE21 Aethalometer from June 1 until July 21. On July 24, the newly installed AE33 Aethalometer began recording BC data at the Community site; data from July 24 until the end of the quarter were measured by the AE33 Aethalometer.

The 24-hr average and maximum compensated BC concentrations collected during the 2023 summer quarter, the compensated BC data from the 15 previous summer quarters, and the uncompensated data from the baseline year are provided in Table 4 for the Landfill site and Table 5 for the Community site. The 2023 summer quarter 24-hr average and maximum BC concentration at the Landfill site is the lowest on record. The 24-hr average BC concentration at the Community site is the lowest on record, and the maximum BC concentration is the second lowest on record.

Table 4. 24-hr BC concentrations for summer quarters from the baseline year (2002) and each year from 2008 to 2023 at the Landfill site. Uncompensated BC values are reported for the 2002 summer quarter. The most recent summer quarter is shown in **bold**.

Quarterly Period	Quarter Name	BC Concentrations (µg/m^3)	
		Average 24-Hr	Maximum 24-Hr
06/01/02–08/31/02	Baseline Year	1.09*	2.69*
06/01/08–08/31/08	2008 Summer	1.41	3.01
06/01/09–08/31/09	2009 Summer	1.26	2.45
06/01/10–08/31/10	2010 Summer	1.06	1.88
06/01/11–08/31/11	2011 Summer	0.99	1.78
06/01/12–08/31/12	2012 Summer	0.93	1.79
06/01/13–08/31/13	2013 Summer	0.98	1.98
06/01/14–08/31/14	2014 Summer	0.79	1.34
06/01/15–08/31/15	2015 Summer	0.76	1.58
06/01/16–08/31/16	2016 Summer	0.70	1.33
06/01/17–08/31/17	2017 Summer	0.77	1.28
06/01/18–08/31/18	2018 Summer	0.59	1.34
06/01/19–08/31/19	2019 Summer	0.57	0.97
06/01/20–08/31/20	2020 Summer	0.58	1.68
06/01/21–08/31/21	2021 Summer	0.62	1.10
06/01/22–08/31/22	2022 Summer	0.58	2.90
06/01/23–08/31/23	**2023 Summer**	**0.50**	**0.86**

[a] Uncompensated BC values.

Table 5. 24-hr BC concentrations for summer quarters from the baseline year (2002) and each year from 2008 to 2023 at the Community site. Uncompensated BC values are reported for the 2002 summer quarter. The most recent summer quarter is shown in bold.

Quarterly Period	Quarter Name	BC Concentrations (µg/m³)	
		Average 24-Hr	Maximum 24-Hr
06/01/02–08/31/02	Baseline Year	1.40*	2.33*
06/01/08–08/31/08	2008 Summer	0.98	1.71
06/01/09–08/31/09	2009 Summer	1.03	2.23
06/01/10–08/31/10	2010 Summer	1.08	1.75
06/01/11–08/31/11	2011 Summer	0.86	1.43
06/01/12–08/31/12	2012 Summer	0.81	1.63
06/01/13–08/31/13	2013 Summer	0.76	1.31
06/01/14–08/31/14	2014 Summer	0.86	1.50
06/01/15–08/31/15	2015 Summer	0.92	1.48
06/01/16–08/31/16	2016 Summer	0.79	1.42
06/01/17–08/31/17	2017 Summer	0.81	1.48
06/01/18–08/31/18	2018 Summer	0.66	1.49
06/01/19–08/31/19	2019 Summer	0.54	0.92
06/01/20–08/31/20	2020 Summer	0.47	1.53
06/01/21–08/31/21	2021 Summer	0.57	1.13
06/01/22–08/31/22	2022 Summer	0.45	0.78
06/01/23–08/31/23	**2023 Summer**	**0.44**	**0.89**

[a] Uncompensated BC values.

Distributions of 24-hr average PM_{10} and BC data from the summer quarters in 2008 through 2023 (presented as notched box-whisker plots[5]), and percentile trends for these metrics, are shown in Figures 3 through 6.

[5] A notched box-whisker plot shows the entire distribution of concentrations for each year. Each box illustrates the 25th (lower box extent), 50th (median, midline), and 75th (upper box extent) percentiles. The extent of the box indicates the interquartile range (IQR), where 50% of the data lie. The whiskers indicate values that are up to 1.5 times the IQR from the 25th or 75th percentile. Data outside of the IQR are referred to as "outliers" and are plotted individually. The boxes are notched (narrowed) at the median and return to full width at the 95% lower- and upper-confidence interval values (i.e., the extents of the notches indicate the range in which the median falls with 95% confidence). If the notches of any two boxes do not overlap, there is strong evidence that the medians are statistically different at the 95% confidence level.

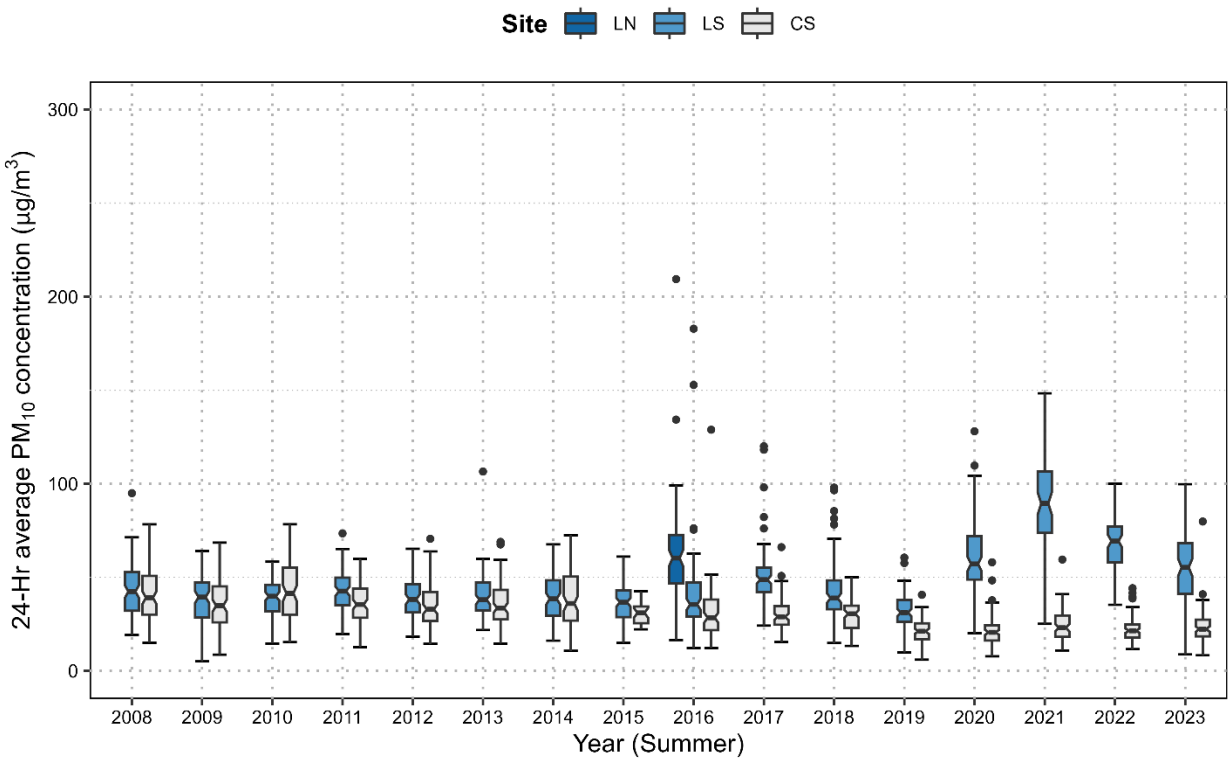

Figure 2. Distribution of 24-hr average PM_{10} concentrations at the Sunshine Canyon Landfill North, Landfill, and Community sites during summer (June-August) quarters from 2008 to 2023.

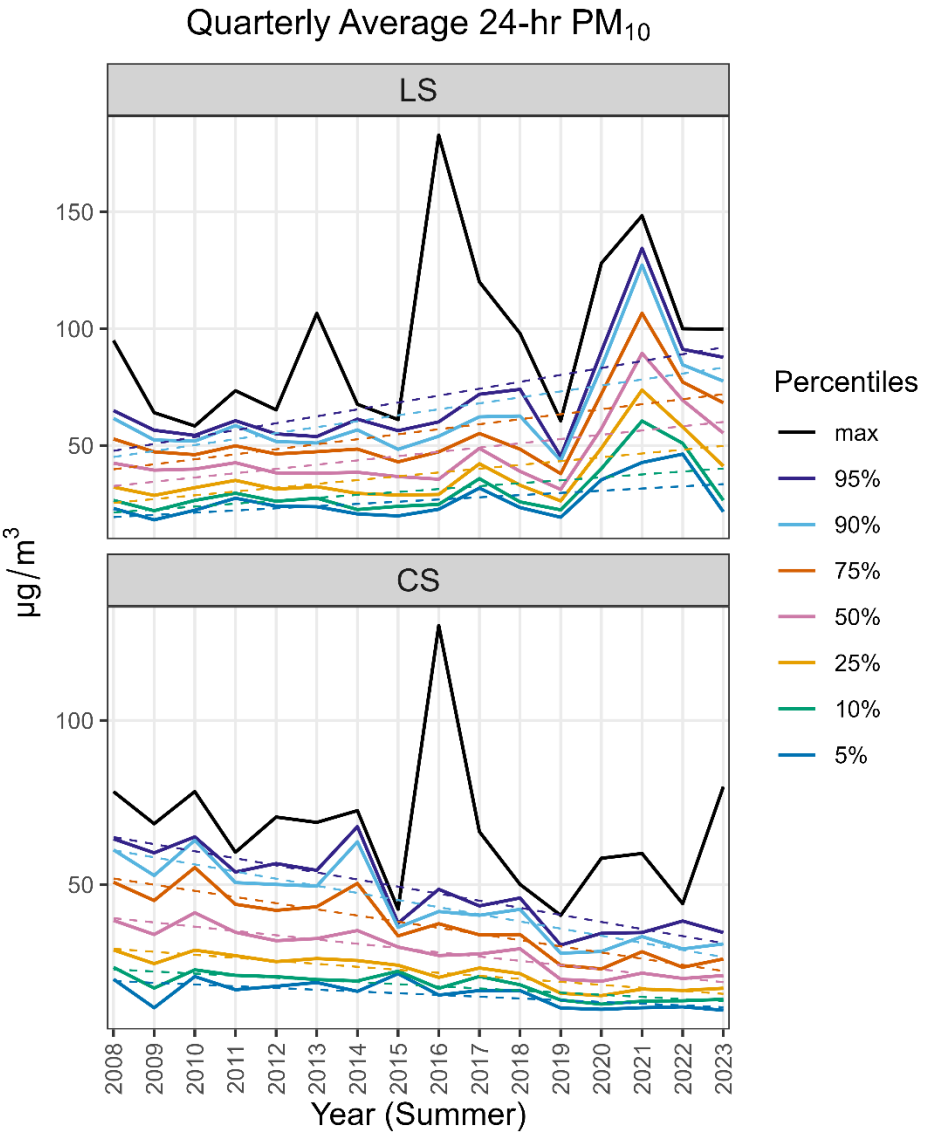

Figure 3. Trends of 24-hr average PM_{10} maxima and percentiles at the Sunshine Canyon Landfill site (top) and Community site (bottom) during summer (June-August) quarters from 2008 to 2023. The dashed lines denote statistically significant linear trends. Statistical significance was defined at the 95% confidence level (*p-value* ≤0.05). Note: the y-axis scale is larger at the Landfill site than the Community site.

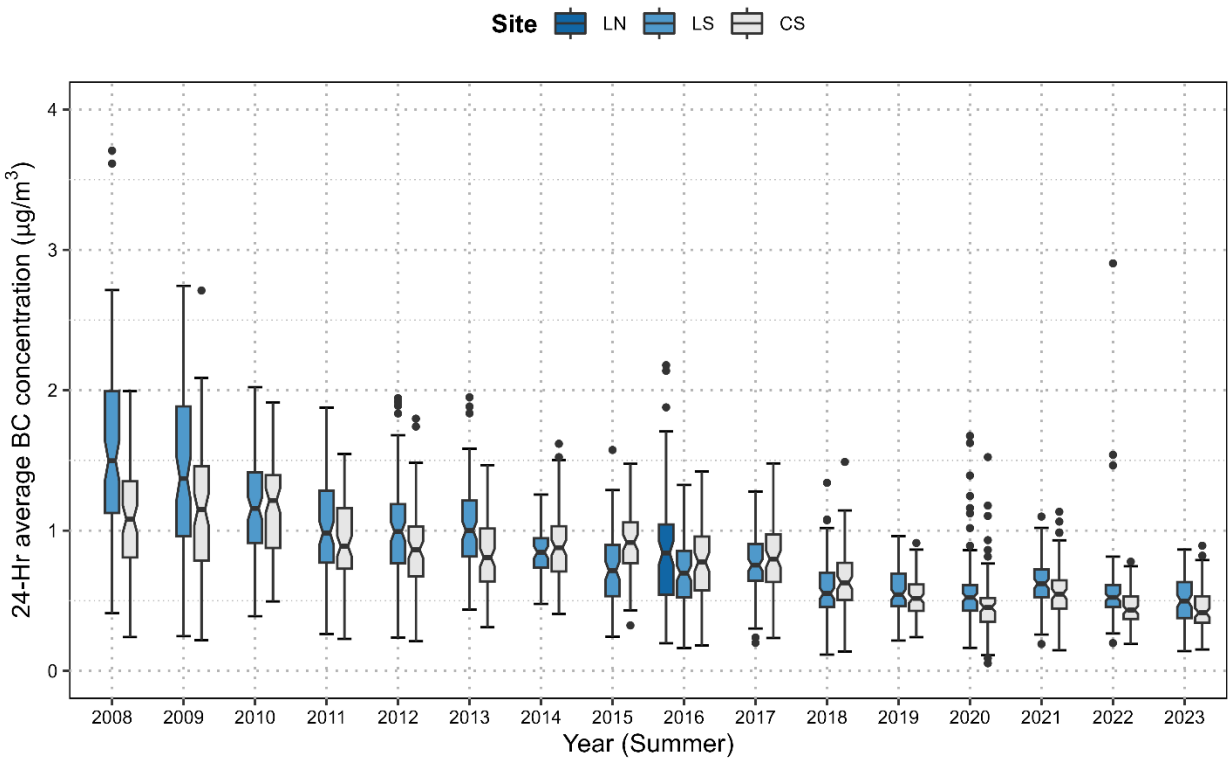

Figure 4. Distribution of 24-hr average BC concentrations at the Sunshine Canyon Landfill North, Landfill, and Community sites during summer (June-August) quarters from 2008 to 2023.

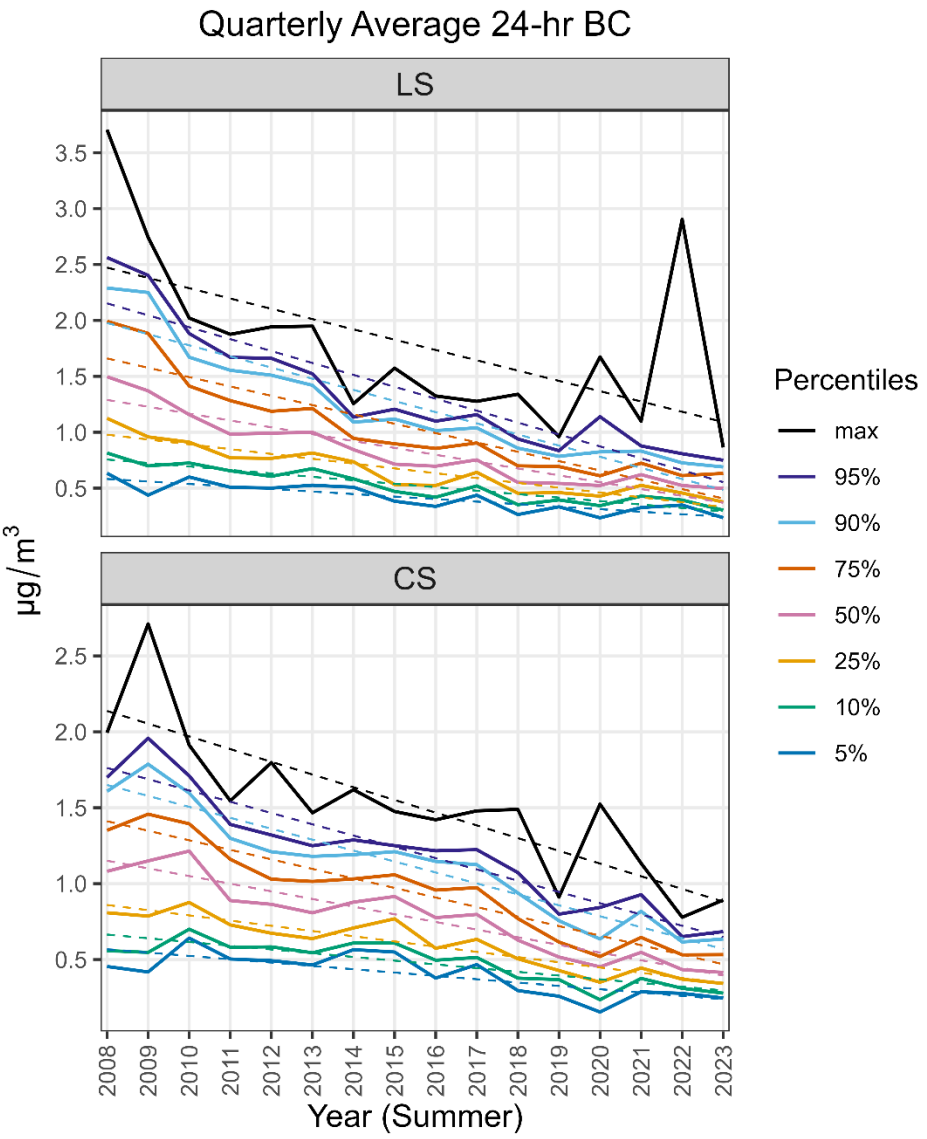

Figure 5. Trends of 24-hr average BC maxima and percentiles at the Sunshine Canyon Landfill site (top) and Community site (bottom) during summer (June-August) quarters from 2008 to 2023. The dashed lines denote statistically significant decreasing linear trends. Statistical significance was defined at the 95% confidence level (*p-value* ≤0.05). Note: the y-axis scale is larger at the Landfill site than the Community site.

At this time of year, the median 24-hr average PM_{10} concentrations measured at the Community site are usually lower than the Landfill site (Figure 3). This remained true in the 2023 summer quarter. As indicated by the non-overlapping notches (and the entire interquartile range) in the box-whisker plot, the difference between the median 24-hr PM_{10} concentrations at the Community and Landfill sites is statistically significant. At the Landfill site, there is a statistically significant increasing trend in all percentiles, but not the maximum (Figure 4). At the Community site, there is a statistically significant decreasing trend for all percentiles, but not the maximum.

During summer quarters, the median 24-hr average BC concentrations are not usually significantly different between the Landfill and the Community sites, as indicated by overlapping notches in the box-whisker plot (Figure 5). In the summer 2023 quarter, the median 24-hr average BC concentration at the Landfill site was not statistically higher than at the Community site. There is some year-to-year variability in median 24-hr average BC concentrations over the 16 recorded consecutive years, but the range of 24-hr average BC values has generally decreased over time at both monitoring sites. Compared to the previous summer quarter, the Landfill site and Community site saw lower median 24-hr average BC concentrations in summer 2023.

There is a statistically significant decreasing trend in all percentiles and the maximum concentration at the Landfill site during summer quarters over the observational record. With the exception of the 75th percentile, the maximum and all percentiles decreased at the Landfill site from the summer quarter of 2022 to the summer quarter of 2023. At the Community site, there is a statistically significant declining trend in summer quarter 24-hr BC concentrations at all percentiles and the maximum concentration. However, the 75th through the 95th and the maximum 24-hr BC concentrations increased slightly from the previous summer quarter.

5. Field Operations

Tables 6 and 7 list dates and major tasks associated with visits to the Landfill and Community sites during the 2023 summer quarter. The equipment shelter at the Community site was replaced during July 21-23. Data collection at the Community site ceased on July 21 at 7:00 a.m. PDT and fully resumed with all instruments operational on July 21 at 16:00 p.m. PDT. The Landfill site was relocated approximately 720 feet to the northwest to eliminate negative impacts on data quality from nearby odor misters. The Landfill shelter was shut down and moved beginning on August 29 at 8:00 a.m. PDT and was established with all instruments operational on August 31 at 14:00 p.m. PDT. New Aethalometers (Magee Scientific Aethalometer model AE33) and communication hardware and software were installed at both sites during shelter upgrades.

Table 6. Landfill monitoring site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
7/12/2023	Collected PM_{10} and BC data Serviced the HVAC system
8/2/2023	Replaced capacitor in the HVAC unit
8/14/2023	HVAC evaluation Site relocation inspection
8/29/2023	Site relocation
9/19/2023[a]	Collected PM_{10} and BC data Restarted Aethalometer Performed flow checks on Aethalometer and BAM

[a] The next site visit that occurred after the current quarter is included in this report. The information from this site visit is used to assess the quality of the last portion of data from the current quarter.

Table 7. Community site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
7/12/2023	Collected PM_{10} and BC data Restarted BAM
7/21/2023	Shut down entire site for shelter and equipment upgrades
7/23/2023	Completed shelter and equipment upgrades
7/26/2023	Found and solved communication issue with BAM
8/28/2023	Collected PM_{10} and BC data
9/5/2023[a]	Replaced HVAC on shelter
9/19/2023[a]	Collected PM_{10} and BC data Cleaned roller, vane, and nozzle on BAM Performed flow checks on Aethalometer and BAM

[a] The next site visit that occurred after the current quarter is included in this report. The information from this site visit is used to assess the quality of the last portion of data from the current quarter.

Aethalometer and BAM flow rates measured with a National Institute of Standards and Technology (NIST)-traceable flow standard are shown in Table 8. BAM flow rates are volumetric (i.e., they depend on local temperature and pressure), and Aethalometer flow rates are at standard temperature and pressure. The target flow rate of the BAM is 16.7 liters per minute (lpm) volumetric to meet the 10-micron particle cut point of the inlet, with an acceptable range of 16.0 lpm to 17.3 lpm. The Aethalometer has no particle size cut point.

Table 8. Flow rates for the BAM PM_{10} and Aethalometer BC monitors at the Landfill and Community sites. "Ref." is the Reference and "Aeth." is the Aethalometer.

Location	Date	Flow Rate (lpm)					
		As Found		As Left		As Found	
		BAM	Ref.	BAM	Ref.	Aeth.	Ref.
Sunshine Canyon Landfill (LS)	9/19/2023	16.7	16.7	16.67	16.7	4.94	4.94
Sunshine Canyon Community (CS)	9/19/2023	16.7	16.7	16.64	16.7	4.9	5.17

6. References

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