



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

September 1, 2019 – November 30, 2019

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 (Landfill site) and at Van Gogh Elementary School (Community site) in the nearby community of Granada Hills in fall 2007. At these sites, particulate matter less than 10 microns in aerodynamic diameter (PM₁₀), wind speed (WS) and wind direction (WD), and black carbon (BC, as a surrogate for diesel particulate matter [DPM]), are measured. The collected data are validated and evaluated for completeness quarterly. 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

PM₁₀ concentrations are compared with federal and state PM₁₀ standards. When PM₁₀ concentrations are above the standard (i.e., an exceedance), additional comparisons are made with the historical, regional, and annual ambient PM₁₀ concentrations. The PM₁₀ and BC data are analyzed annually to characterize the impact of landfill operations on ambient air quality as observed at the Community site. 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 Forty-Eighth Quarterly Report summarizes the September–November (2019 fall quarter) monitoring results from the thirteenth year of continuous monitoring.

ES-2. Statistics

From October 10 to October 24, 2019, the Landfill Site was without power because of the Saddle Ridge Fire, causing a decline in data capture at that site. For this quarter, the percent data capture for PM₁₀ was 84.75% at the Landfill site and 99.95% at the Community site. For the Landfill site, 2.16% of the captured PM₁₀ data were invalidated, and for the Community site, 1.01% were invalidated. No hourly PM₁₀ values were deemed suspect at either of the monitoring sites in this quarter.

Hourly BC data capture was 84.29% at the Landfill site and 98.72% at the Community site. No hourly BC data were invalidated at either site. For the hourly BC data, 0.60% were deemed suspect at the Landfill site, and 0.56% at the Community site.

During this quarter, the state 24-hr PM₁₀ standard (50 µg/m³) was exceeded on 53% of days (39 days) at the Landfill site and 19% of days (17 days) at the Community site. The federal 24-hr PM₁₀ standard (150 µg/m³) was exceeded on 7% of days (5 days) at the Landfill site and 4% of days (3 days) at the Community site. The majority of the federal and state exceedance days were attributed to fire- and smoke-related activity in the region.

¹ Section C.10.a of Ordinance No. 172,933.

² County Condition 81.

1. Introduction

This report summarizes data completeness, ambient particulate matter less than 10 microns in aerodynamic diameter (PM₁₀) concentrations, average and maximum ambient black carbon (BC, a surrogate for diesel particulate matter [DPM]) concentrations, instrument flow rate verification (quality control) data, and field operations for the quarterly period of September 1 through November 30, 2019. The collected data are validated and evaluated for completeness quarterly. This is the thirteenth consecutive year that data were collected in the fall from continuous monitors at the Sunshine Canyon Landfill site (LS, previously called the Berm site) and the Van Gogh Elementary School Community site (CS). The monitoring site locations are shown in **Figure 1**. PM₁₀ is measured with a beta attenuation monitor (BAM), and BC is measured with an Aethalometer. The Sunshine Canyon Landfill North (LN) monitoring site shown in Figure 1 was installed in December 2015 and decommissioned on May 31, 2017.

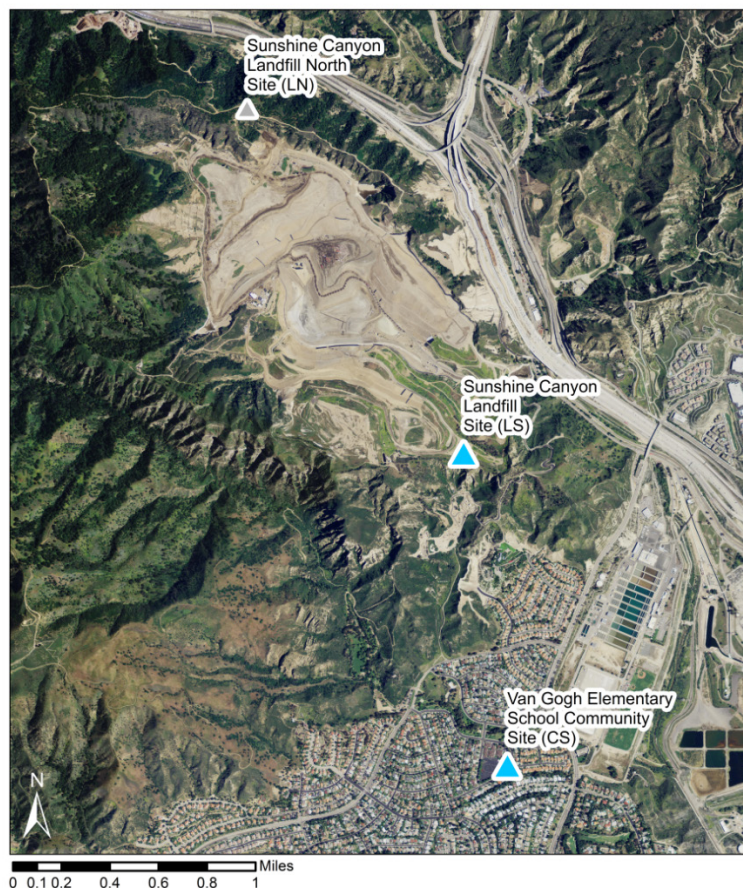


Figure 1. View of Sunshine Canyon Landfill and the surrounding monitoring stations (blue triangles): Sunshine Canyon Landfill (LS) and Community site (CS). The Sunshine Canyon Landfill North site (LN, gray triangle) collected data from December 1, 2015, through May 31, 2017, and has since been decommissioned.

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 2019 fall quarter are shown in **Table 1**. Data deemed as suspect are included in subsequent analyses (e.g., regional comparisons), while invalid data are not. The percent data capture for PM₁₀ was 84.75% at the Landfill site and 99.95% at the Community site. From October 10 to October 24, 2019, the Landfill Site was without power due to the impact from the Saddle Ridge Fire. At the Landfill and Community sites, 2.16% and 1.01% of the captured PM₁₀ data were invalidated, respectively. No hourly PM₁₀ values were deemed suspect at either of the monitoring sites in this quarter.

Table 1. Data completeness statistics for hourly BC, hourly PM₁₀, and 1-min wind speed and wind direction data for the 2019 fall 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
Sunshine Canyon Landfill (LS)	09/01/19-11/30/19	84.75	84.29	84.62	97.84	100	98.71	0	0.60	0.0072
Community Site (CS)	09/01/19-11/30/19	99.95	98.72	95.57	98.99	100	98.85	0	0.56	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.

Hourly BC data capture was 84.29% at the Landfill site and 98.72% at the Community site. At the Landfill site, 0.60% of the BC data were deemed suspect, and at the Community site, 0.56% were deemed suspect. No BC data were invalidated at either site.

The wind data capture percentages were 84.62% at the Landfill site and 95.57% at the Community site. At the Landfill site, 1.29% of the data were invalidated, with 0.0072% of the data deemed suspect. At the Community site, 1.15% of the data were invalidated, while no data were deemed suspect.

3. PM₁₀ Exceedances

The federal and state PM₁₀ exceedances for the fall quarter of the baseline year (2002), the fall quarters of the previous eleven years (2008–2018), and the current fall quarter (2019) are summarized in **Table 2**. In this quarter, the state PM₁₀ standard of 50 µg/m³ was exceeded on 53% of days (39 days) at the Landfill site and 19% of days (17 days) at the Community site. This is the highest number of fall quarter state PM₁₀ exceedances on record for the Community site.

The federal 24-hr PM₁₀ standard (150 µg/m³) was exceeded on 7% of days (5 days) at the Landfill site and 4% of days (3 days) at the Community site. This is the highest number of fall quarter federal PM₁₀ exceedances on record for both sites.

As shown in **Table 2**, state and federal exceedances were uncharacteristically high for this time period. Throughout most of October and into early November, several wildfires and high wind events were active near the monitoring sites. In addition, other fires within and around the Los Angeles Basin produced several smoky days. **Table 3** and **Figure 2** depict the major fire events in the immediate area of the Landfill and Community monitoring sites. **Figures 3 through 6** highlight days when nearby wildfire activity heavily contributed to the PM₁₀ 24-hr federal standard exceedance at the Landfill and/or Community monitoring sites. The NOAA HYSPLIT Trajectory Model was used to model wind flow coming to the monitoring sites at three different heights (10, 100, and 250 meters above ground). Wind flow is an indicator for potential smoke impact on the monitoring sites from nearby wildfires.

High wind events and local impacts account for the remaining days when the PM₁₀ 24-hr federal standard was exceeded at the Landfill Site (November 16, 25, 26). Figure 6 illustrates a high wind advisory with back trajectory HYSPLIT model data. As shown in Figure 6, wind flow came from the north, where air quality monitoring sites in the Mojave Desert showed high levels of PM₁₀.

Table 2. Number of exceedances of federal and state 24-hr PM₁₀ standards during the fall quarters of the baseline year (2002) and each year from 2008 to 2019. In the “Federal 24-hr” column, the values are number of exceedances and the date(s) on which those exceedances occurred. In the “State 24-hr” column, the values are 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 on which valid 24-hr average PM₁₀ concentrations were measured. The most recent fall quarter is shown in **bold**. The LN site only measured PM₁₀ for one fall quarter.

Site	Quarter Period	Quarter Name	Exceedances of PM ₁₀ Standard	
			Federal 24-hr 150 µg/m ³	State 24-hr 50 µg/m ³
Sunshine Canyon Landfill (LS)	09/01/02–11/30/02	Baseline Year	0	51/77 (66%)
	09/01/08–11/30/08	2008 Fall	1 (10/09/08)	12/73 (16%)
	09/01/09–11/30/09	2009 Fall	1 (10/27/09)	78/89 (19%)
	09/01/10–11/30/10	2010 Fall	0	8/86 (9%)
	09/01/11–11/30/11	2011 Fall	1 (11/02/11)	20/89 (22%)
	09/01/12–11/30/12	2012 Fall	1 (10/26/12)	9/85 (11%)
	09/01/13–11/30/13	2013 Fall	1 (10/04/13)	14/89 (16%)
	09/01/14–11/30/14	2014 Fall	0	5/91 (5%)
	09/01/15–11/30/15	2015 Fall	0	10/86 (12%)
	09/01/16–11/30/16	2016 Fall	1 (11/27/16)	12/48 (25%)
	09/01/17–11/30/17	2017 Fall	3 (10/09/17, 10/24/17, 11/21/17)	27/87 (32%)
	09/01/18–11/30/18	2018 Fall	1 (11/8/2018)	14/89 (16%)
	09/01/19–11/30/19	2019 Fall	5 (10/25/19, 10/31/19, 11/16/19, 11/25/19, 11/26/19)	39/74 (53%)
Sunshine Canyon Landfill North (LN)	06/01/16–08/31/16	2016 Fall	0	13/35 (37%)
Community Site (CS)	09/01/02–11/30/02	Baseline Year	0	8/33 (24%)
	09/01/08–11/30/08	2008 Fall	0	12/90 (13%)
	09/01/09–11/30/09	2009 Fall	1 (10/27/2009)	11/78 (14%)
	09/01/10–11/30/10	2010 Fall	0	7/91 (8%)
	09/01/11–11/30/11	2011 Fall	0	11/88 (13%)
	09/01/12–11/30/12	2012 Fall	0	5/90 (6%)
	09/01/13–11/30/13	2013 Fall	0	7/85 (8%)
	09/01/14–11/30/14	2014 Fall	0	0/91 (0%)
	09/01/15–11/30/15	2015 Fall	0	0/90 (0%)
	09/01/16–11/30/16	2016 Fall	0	1/50 (2%)
	09/01/17–11/30/17	2017 Fall	0	4/92 (5%)
	09/01/18–11/30/18	2018 Fall	0	2/88 (3%)
		09/01/19–11/30/19	2019 Fall	3 (10/10/19, 10/11/19, 10/30/19)

Table 3. Active wildfire events in the immediate areas around the Landfill and Community Monitoring Sites during the fall quarter of 2019.

Fire Name	Occurrence Date	Acres Burned
Wendy Fire	Oct 10 – Oct 14	91
Saddle Ridge Fire	Oct 10 – Oct 31	8,799
Olivas Fire	Oct 11 – Oct 12	200
Palisades Fire	Oct 21 – Oct 31	42
Tick Fire	Oct 24 – Nov 5	4,615
Getty Fire	Oct 28 – Nov 5	745
Easy Fire	Oct 30 – Nov 2	1,806
Maria Fire	Oct 31 – Nov 6	9,999



Figure 2. Location of the active wildfire events in the immediate areas around the Landfill and Community Monitoring Sites during the fall quarter of 2019. Note: other wildfires in the Southern California region were active in the fall quarter and contributed to regional smoke impacts.



Figure 3. PM₁₀ concentrations and fire activity for October 10, 2019. Red triangles indicate hazard mapping system satellite detected (HMS) fire hot spots. Black dots represent 24-hr PM₁₀ concentrations ($\mu\text{g}/\text{m}^3$) at monitoring sites within the Los Angeles Basin. The NOAA HYSPLIT trajectory model is used to model wind flow at three different heights: 10 meters (green line), 100 meters (blue line), and 250 meters (red line) above ground. The Community Monitoring Site (CS) exceeded the federal standard on this date. Note that the Landfill Monitoring Site was offline due to power loss.

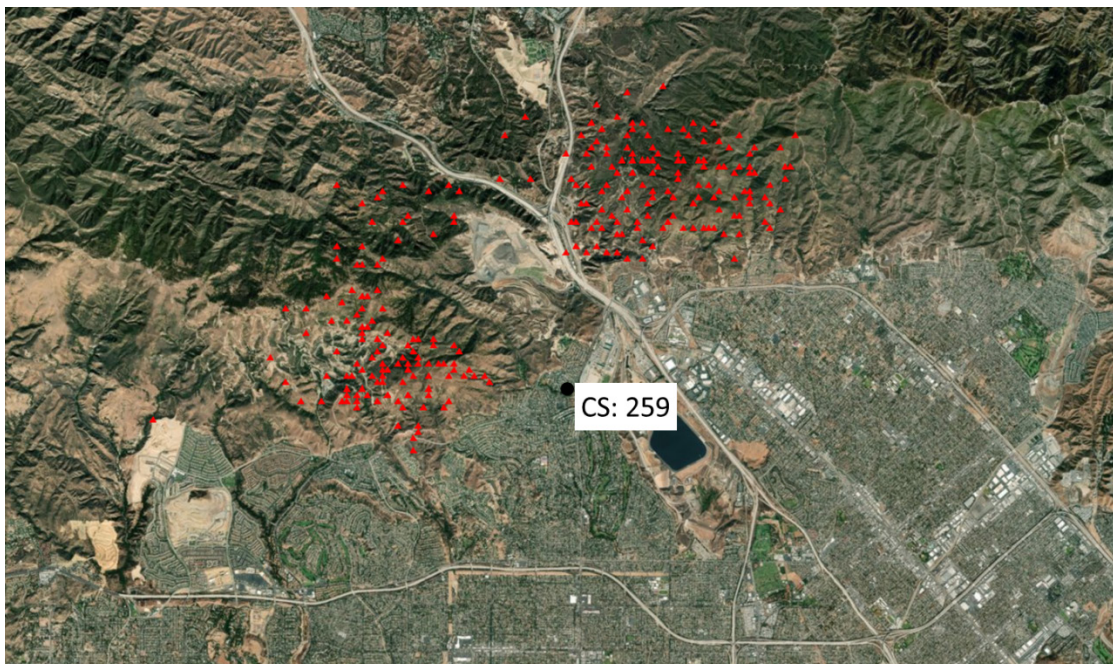


Figure 4. PM₁₀ concentrations and fire activity for October 11, 2019. Red triangles indicate HMS fire hot spots from the Saddle Ridge Fire. The Community Monitoring Site (CS) exceeded the federal standard on this date. Note that the Landfill Monitoring Site was offline due to power loss.

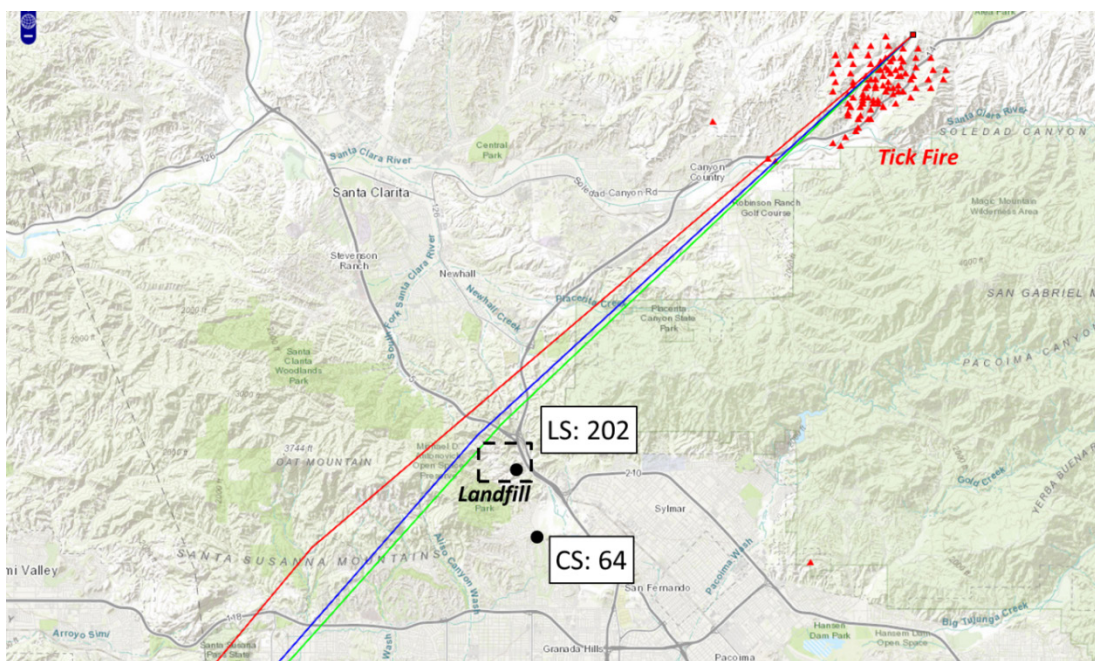


Figure 5. PM₁₀ concentrations and fire activity for October 25, 2019. Red triangles indicate HMS fire hot spots for the Tick Fire. Black dots represent 24-hr PM₁₀ concentrations ($\mu\text{g}/\text{m}^3$) at the Landfill (LS) and Community Monitoring (CS) sites. The NOAA HYSPLIT trajectory model is used to model wind flow at three different heights: 10 meters (green line), 100 meters (blue line), and 250 meters (red line) above ground. The Landfill Site exceeded the federal standard, while the Community Site exceeded the state standard.

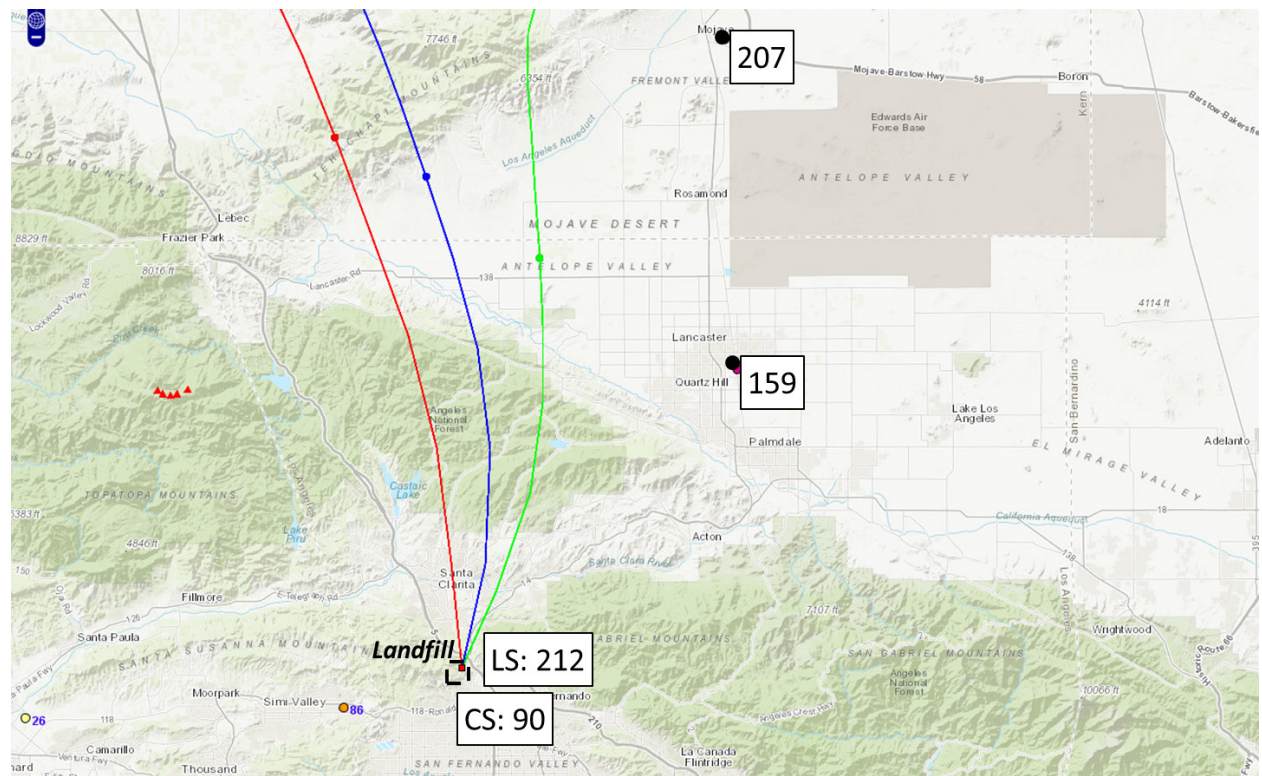


Figure 6. PM₁₀ concentrations and high wind event for November 25, 2019. Black dots represent 24-hr PM₁₀ concentrations ($\mu\text{g}/\text{m}^3$) at the Landfill (LS), Community Monitoring (CS), and other nearby sites. The NOAA HYSPLIT trajectory model is used to model back trajectory wind flow at three different heights: 10 meters (green line), 100 meters (blue line), and 500 meters (red line) above ground. The Landfill Site exceeded the federal standard, while the Community Site exceeded the state standard.

4. Average and Maximum Black Carbon Concentrations and PM₁₀ 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 in an attempt to quantify the relative amounts of DPM in ambient air. Findings from the Multiple Air Toxics Exposure Study IV (MATES IV), conducted by the South Coast Air Quality Management District (SCAQMD), found DPM to be the most important toxic air pollutant contributing to risk in the Los Angeles basin (South Coast Air Quality Management District, 2015).

BC is measured using an Aethalometer, which passes air through a filter tape trapping the suspended particles. A light beam projected through the deposit is attenuated by light-absorbing particles. Aethalometers are subject to a saturation effect, where 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). Instrument response is dampened with heavier loading (i.e., higher concentrations) of BC aerosol. 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 the reported BC values to date from the Landfill, Landfill North, and Community sites have been adjusted to compensate for this tape saturation effect; this compensation had not been 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 BC data shown in this Quarterly Report have been compensated, with the exception of data from the baseline year, because the raw data for the baseline year are unavailable.

The 24-hr average and maximum compensated BC concentrations collected during the 2019 fall quarter, the compensated BC data from the fall quarters of the 10 previous years, and the uncompensated data from the baseline year are provided in **Table 4**. The 2019 fall quarter average at the Landfill and Community sites are similar to the past several fall quarters, though the maximum 24-hr BC concentrations at both sites are slightly higher than in previous years. This is most likely due to the extensive wildfire activity in the region.

Distributions of 24-hour average PM₁₀ and BC data from fall quarters from 2008 through 2019 (presented as notched box-whisker plots⁵), and percentile trends for these metrics, are shown in **Figures 7 through 11**.

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 95% confidence interval of the median is beyond the 25th or 75th percentile, then the notches extend beyond the box, which creates a “folded” appearance. 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.

Table 4. Twenty-four-hour BC concentrations for the fall quarter of the baseline year (2002) and each year from 2008 through 2019. Asterisks (*) denote uncompensated BC values. The most recent fall quarter is shown in **bold**. The LN site only measured BC for one fall quarter.

Site	Quarterly Period	Quarter Name	BC Concentrations ($\mu\text{g}/\text{m}^3$)	
			Average 24-Hr	Maximum 24-Hr
Sunshine Canyon Landfill (LS)	09/01/02–11/30/02	Baseline Year	1.26*	2.83*
	09/01/08–11/30/08	2008 Fall	1.47	2.88
	09/01/09–11/30/09	2009 Fall	1.21	3.45
	09/01/10–11/30/10	2010 Fall	0.87	2.74
	09/01/11–11/30/11	2011 Fall	1.07	2.71
	09/01/12–11/30/12	2012 Fall	0.95	2.63
	09/01/13–11/30/13	2013 Fall	0.92	2.32
	09/01/14–11/30/14	2014 Fall	0.81	2.42
	09/01/15–11/30/15	2015 Fall	0.48	1.17
	09/01/16–11/30/16	2016 Fall	0.59	1.64
	09/01/17–11/30/17	2017 Fall	0.54	1.30
	09/01/18–11/30/18	2018 Fall	0.55	1.43
	09/01/19–11/30/19	2019 Fall	0.51	1.62
Sunshine Canyon Landfill North (LN)	09/01/16–11/30/16	2016 Fall	0.64	1.95
Community Site (CS)	09/01/02–11/30/02	Baseline Year	1.31*	2.92*
	09/01/08–11/30/08	2008 Fall	0.86	6.15
	09/01/09–11/30/09	2009 Fall	1.00	3.23
	09/01/10–11/30/10	2010 Fall	0.80	2.47
	09/01/11–11/30/11	2011 Fall	0.95	2.55
	09/01/12–11/30/12	2012 Fall	0.77	2.07
	09/01/13–11/30/13	2013 Fall	0.57	1.63
	09/01/14–11/30/14	2014 Fall	0.83	1.98
	09/01/15–11/30/15	2015 Fall	0.64	1.68
	09/01/16–11/30/16	2016 Fall	0.64	1.54
	09/01/17–11/30/17	2017 Fall	0.46	1.22
	09/01/18–11/30/18	2018 Fall	0.57	1.55
	09/01/19–11/30/19	2019 Fall	0.48	1.88

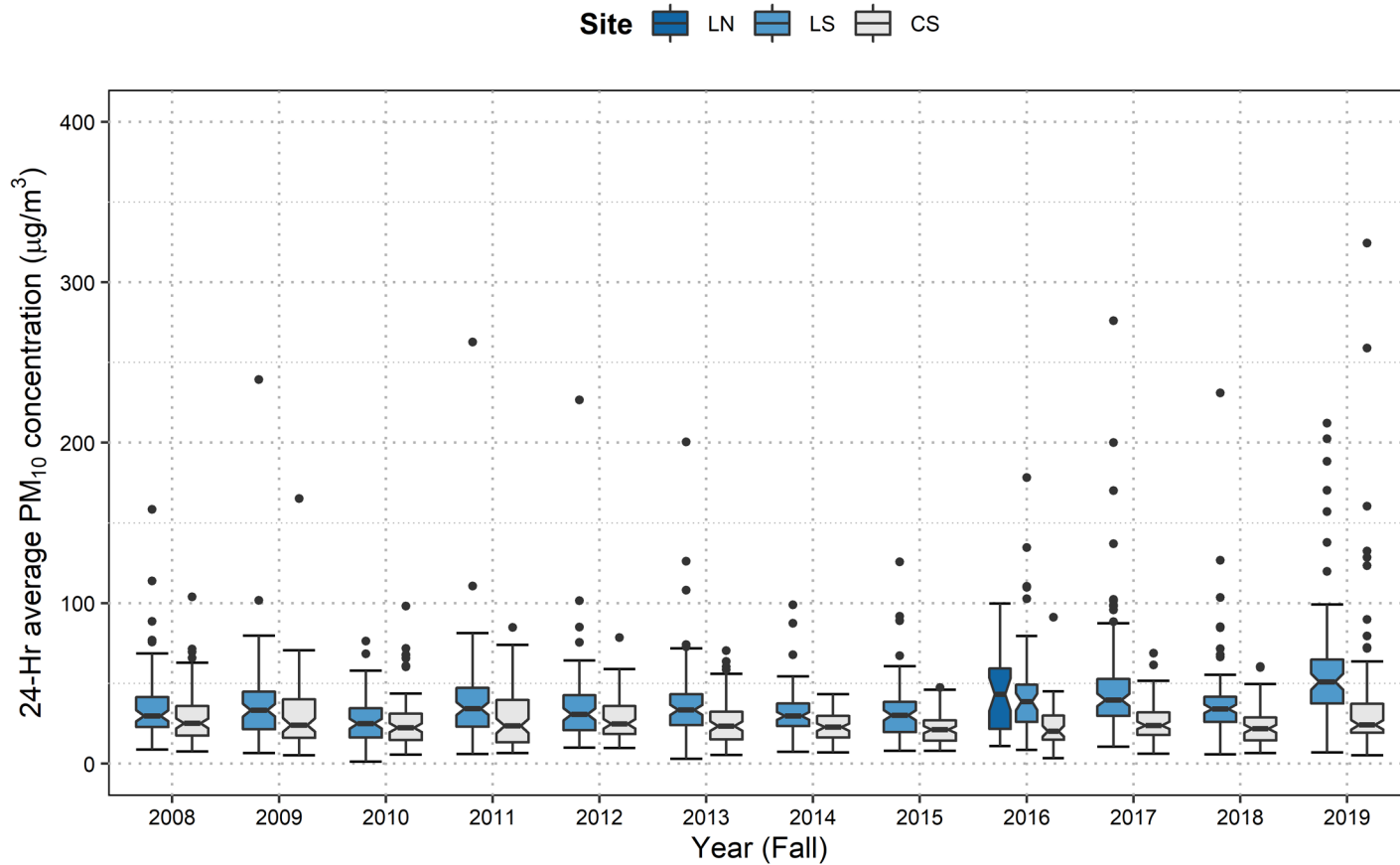


Figure 7. Distribution of 24-hr average PM₁₀ concentrations at the Sunshine Canyon Landfill North site (LN), Landfill site (LS), and Community site (CS) during fall (September–November) quarters from 2008 to 2019.

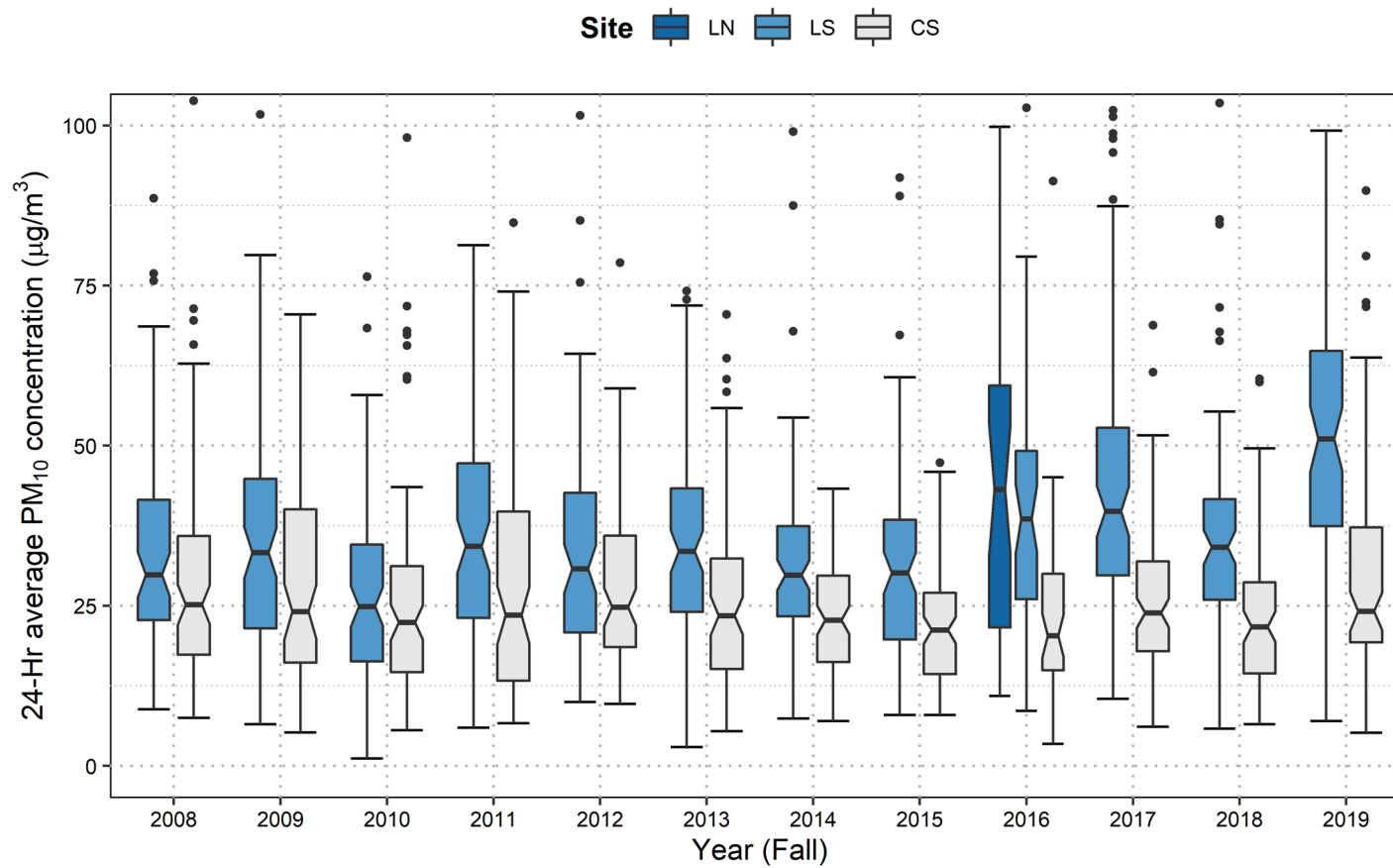


Figure 8. Distribution of 24-hr average PM₁₀ concentrations at the Sunshine Canyon Landfill North site (LN), Landfill site (LS), and Community site (CS) during fall (September–November) quarters from 2008 to 2019. This is the same data shown in Figure 2, but the graph has been zoomed into the lower concentration range

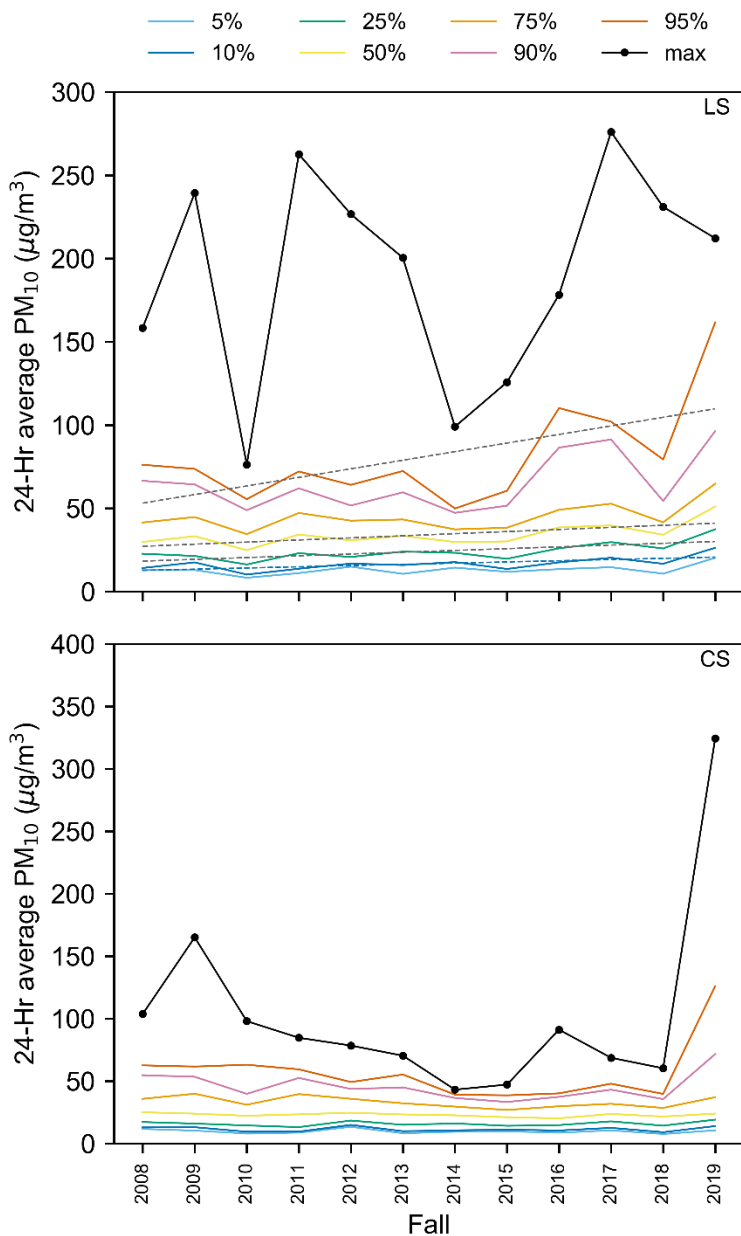


Figure 9. Trends of 24-hr average PM₁₀ maxima and percentiles at the Sunshine Canyon Landfill site (LS, top) and Community site (CS, bottom) during fall (September–November) quarters from 2008 to 2019. A colored dashed line denotes a statistically significant decreasing linear trend, whereas a gray dashed line denotes a statistically significant increasing linear trend. Statistical significance was defined at the 95% confidence level (p -value ≤ 0.05).

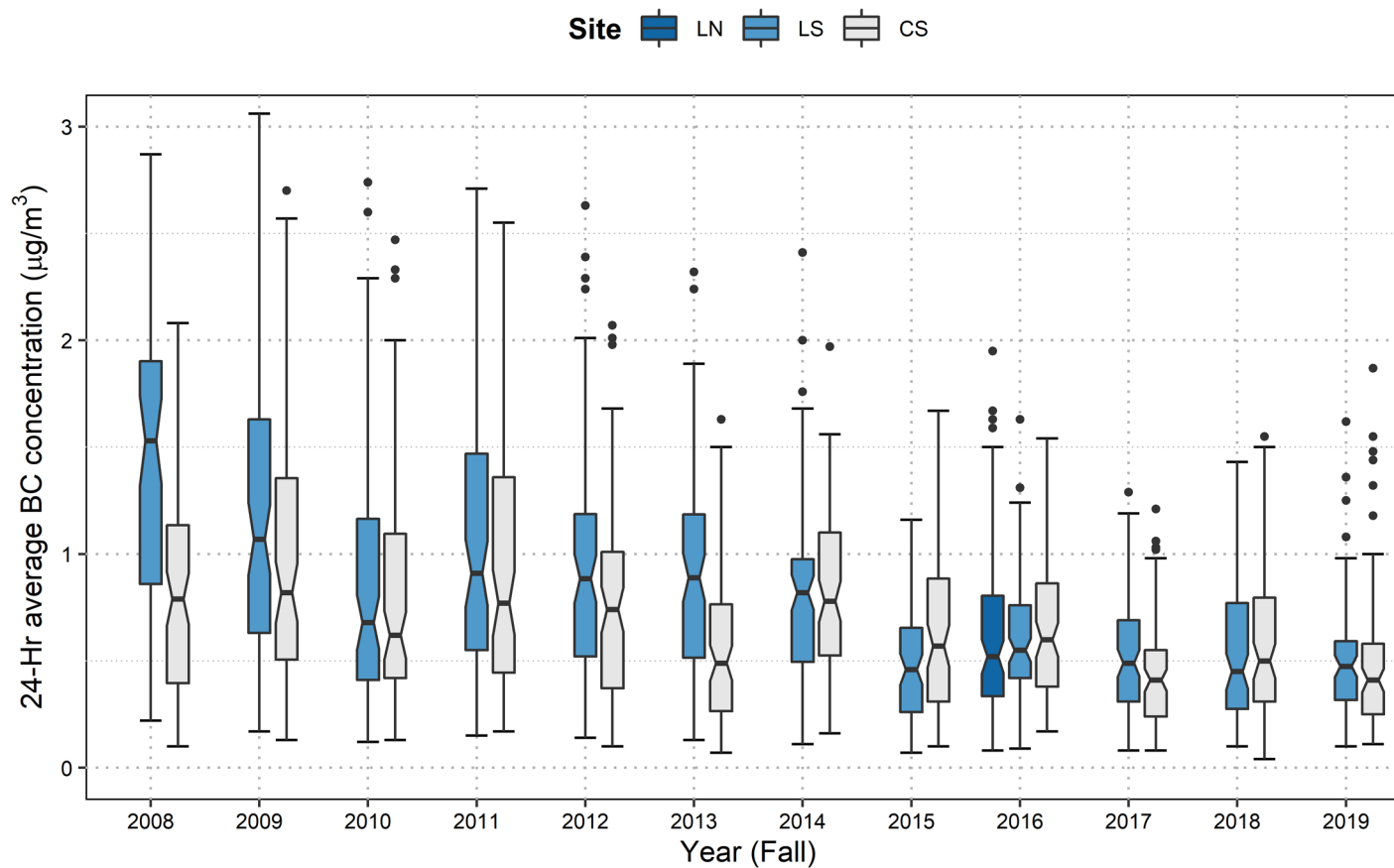


Figure 10. Distribution of daily 24-hr average BC concentrations at the Sunshine Canyon Landfill North site (LN), Landfill site (LS), and Community site (CS) during fall (September–November) quarters from 2008 to 2019.

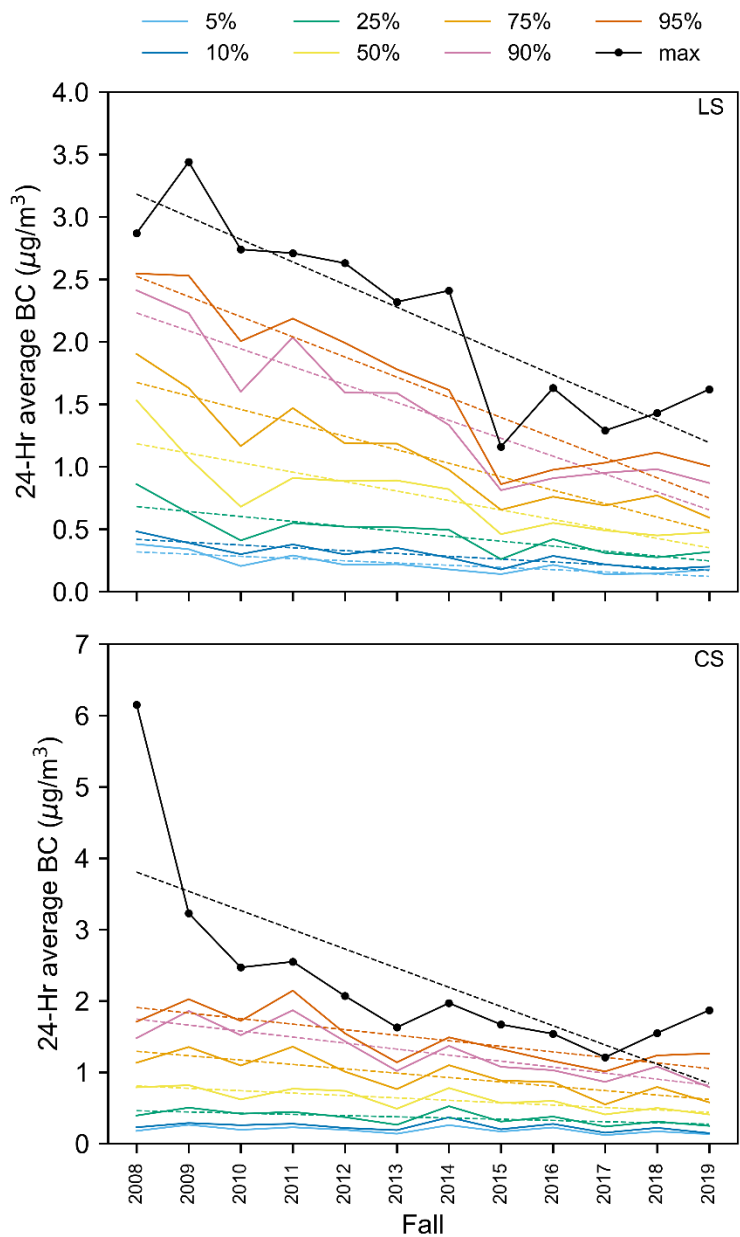


Figure 11. Trends of 24-hr average BC maxima and percentiles at the Sunshine Canyon Landfill site (LS, top) and Community site (CS, bottom) during fall (September–November) quarters from 2008 to 2019. A colored dashed line denotes a statistically significant decreasing linear trend, whereas a gray dashed line denotes a statistically significant increasing linear trend. Statistical significance was defined at the 95% confidence level ($p\text{-value} \leq 0.05$).

At this time of year, the median 24-hr average PM₁₀ concentrations measured at the Community site are lower than those measured at the Landfill site (Figures 7 and 8). As indicated by the non-overlapping notches in the box-whisker plot, in the 2019 fall quarter, the difference between the median 24-hr PM₁₀ concentrations at the Community and the Landfill sites is statistically significantly (similar to previous fall quarters).

At the Landfill site, there are statistically significant increasing trends in the 25th, 50th, and 90th percentiles recorded for the 24-hr average PM₁₀ percentiles (Figure 9).⁶ All of the percentiles recorded in this quarter are greater than the previous fall quarter. This fall quarter the maxima is slightly lower than the previous fall quarter. In contrast, at the Community site, there are no statistically significant trends recorded for the 24-hr average PM₁₀ percentiles, although the 2019 fall quarter shows a significant increase in the maxima, 95th, and 90th percentiles.

During the fall quarters, the median 24-hr average BC concentrations are not usually significantly different among the Landfill and Community sites, as indicated by overlapping notches in the box-whisker plot (Figure 10). There is some year-to-year variability in median 24-hr average BC concentrations over the past 11 years, and the range of 24-hr average BC values generally decreased over time at each monitoring site. The median 24-hr average BC concentration at the Landfill site in the 2019 fall quarter is similar to the median in the 2017 fall quarter.

There is a statistically significant decrease in all the percentiles (5%, 10%, 25%, 50%, 75%, 90%, 95%) and maxima of 24-hr average BC concentrations during fall quarters at the Landfill site (Figure 11). At the Community site, there is a statistically significant decrease in the higher percentiles (25%, 50%, 75%, 90%, 95%) and maxima of 24-hr average BC concentrations. At the Landfill site, there are statistically significant decreases in the lower percentiles as well as the higher percentiles. This may imply that the background BC levels at this site are also decreasing. At the Community site, the rate of decrease of 24-hr average BC concentration maxima is much greater than those of any percentile. There were no statistically significant increasing trends in the maxima or percentiles.

⁶ These results depend on the percentiles chosen in the trend analysis. Other percentiles may exhibit different trends, which may or may not be statistically significant.

5. Field Operations

Tables 5 and 6 list dates and major tasks associated with visits to the Landfill site and the Community site during the 2019 fall quarter.

Table 5. Landfill monitoring site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
09/03/19	Changed BAM tape. Ran self test on BAM after respooling roll and passed.
09/20/19	Collected PM ₁₀ and BC data. Restarted Aethalometer. Checked Aethalometer and BAM tape supplies. Cleaned BAM roller, vane, and nozzle, and performed leak check. Performed flow check on Aethalometer and BAM samplers.
10/24/19	Powered back up after fire recovery. Restarted Aethalometer and BAM. Collected PM ₁₀ and BC data. Unable to check Aethalometer and BAM flow from roof due to high winds. Cleaned BAM roller, vane, and nozzle. Checked BAM tape supply.
10/30/19	BAM temperature input was missing and flow stopped. Possible BAM sensor problem, but unable to reach sensor on roof due to high winds. Checked and retensioned BAM terminal inputs. Restarted BAM.
11/20/19	Changed BAM tape. Ran self test on BAM after respooling roll, tensioned, and passed.

Table 6. Community site visits, field maintenance, and operations.

Date of Site Visit	Description of Work
09/03/19	Changed BAM tape. Ran self test on BAM after respooling roll and passed.
09/20/19	Collected PM ₁₀ and BC data. Restarted Aethalometer. Respoiled new Aethalometer tape roll. Checked BAM tape supply and performed leak check. Performed flow check on Aethalometer and BAM samplers. Cleaned BAM roller, vane, and nozzle.
10/24/19	Collected PM ₁₀ and BC data. Restarted Aethalometer. Cleaned Aethalometer roller and cabinet. Cleaned BAM roller, vane, and nozzle. Checked BAM and Aethalometer tape supply. Performed flow check on Aethalometer and BAM samplers. Performed leak check on BAM. Trailer AC unit is not cooling.
11/08/19	Reset meteorology data logger. Meteorology power cycled and tested. Data gap for meteorology inputs represent data loss due to the logger down.
11/20/19	Changed Aethalometer tape. Spooled new roll, tensioned, and ran self test for Aethalometer.

Aethalometer and BAM flow rates measured with a National Institute of Standards and Technology (NIST)-traceable flow standard are shown in **Table 7**. 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 cut point of the inlet, with an acceptable range of 16.0 lpm to 17.3 lpm. The Aethalometer has no size cut point.

Table 7. Flow rates for the BAM PM₁₀ 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)	09/20/19	16.7	17.18	16.7	17.18	4.0	4.1
Community Site (CS)	09/20/19	16.7	16.98	16.7	16.98	4.1	4.2
	10/24/19	16.7	16.89	16.7	16.89	3.9	4.1

6. References

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