Chapter 7

Current and Future Air Quality – Desert Nonattainment Areas SIP

- **Coachella Valley has seen a substantial reduction in ozone levels over the past several decades, but does not yet meet federal 8-hour ozone standards.**
- **Coachella Valley is currently classified as a "severe" ozone nonattainment area for the 2015 ozone standard and is required to meet that standard by 2032.**
- **The bulk of the emissions causing high ozone in the Coachella Valley are coming from the South Coast Air Basin.**
- **We project that the Coachella Valley will not attain the 2015 8-hour ozone standard by 2032 without additional control measures.**
- **South Coast AQMD is requesting to reclassify the Coachella Valley as "extreme" non-attainment area with 2037 as the attainment year.**
- **The Coachella Valley is projected to attain the federal 8-hour ozone standards in 2037 with the implementation of the control measures proposed in this AQMP.**

In This Chapter

Introduction

The Coachella Valley Planning Area (Coachella Valley) is defined as the desert portion of Riverside County in the Salton Sea Air Basin (SSAB) and is part of ~~the~~ South Coast Air Quality Management District (South Coast AQMD) jurisdiction. The Coachella Valley is the most populated area in this desert region, which encompasses several communities, including Palm Springs, Desert Hot Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio, Coachella, Thermal, and Mecca. Figure 7-1 provides a map of the area and the surrounding topography.

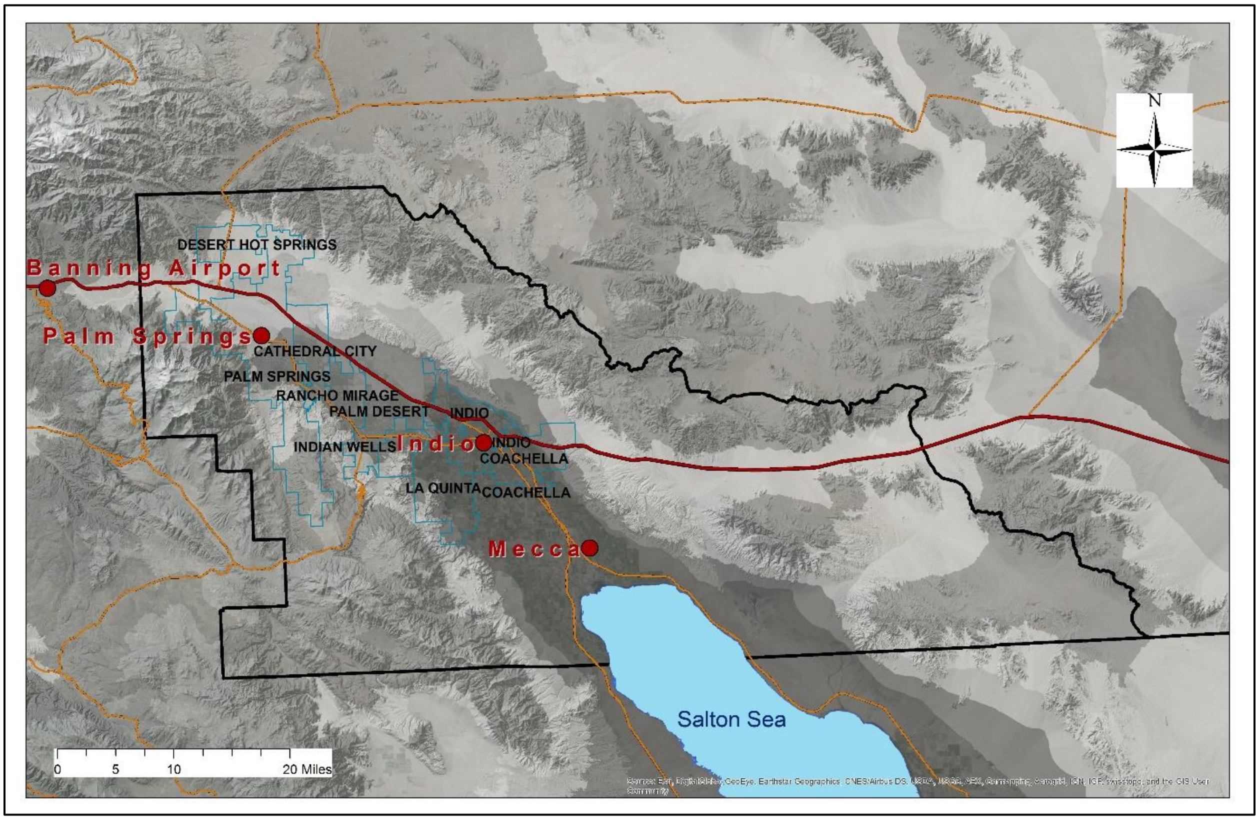


FIGURE 7-1
LOCATION AND TOPOGRAPHY OF THE COACHELLA VALLEY PLANNING AREA
(THE SAN GORGONIO PASS (AKA BANNING PASS) IS THE WEST-EAST PASS BETWEEN THE MOUNTAINS NEAR THE BANNING AIRPORT AIR MONITORING STATION THAT LEADS FROM THE SOUTH COAST AIR BASIN INTO THE COACHELLA VALLEY. THE SOUTH COAST AQMD AIR MONITORING STATIONS AT PALM SPRINGS, INDIO, AND MECCA ARE SHOWN WITHIN THE COACHELLA VALLEY BOUNDARY.)

Similar to the South Coast Air Basin (Basin), the Coachella Valley is a growing area, as shown by the historic and projected populations presented in Table 7-1. By 2045, the population in the Coachella Valley is projected to increase by 48 percent over 2018 levels. On a percentage basis, the Coachella Valley growth is expected to exceed that of the Basin for that time period (48 percent versus 16 percent). This population growth is taken into account in the emission projections for future years, which are used to demonstrate attainment of the air quality standards.

TABLE 7-1

HISTORIC AND PROJECTED POPULATIONS FOR SOUTH COAST AIR BASIN AND COACHELLA VALLEY

Area	Historic Population			Projected Population			
	1990	2000	2010	2018	2030	2035	2045
South Coast Air Basin	13,083,594	14,640,692	15,735,186	16,671,807	17,984,614	18,470,403	19,264,860
Coachella Valley	244,070	325,937	425,404	471,012	568,622	613,096	698,607

Source: Historic populations from Southern California Association of Governments, January 2016 CARB 2013 Almanac of Emissions and Air Quality, 2013 Edition, Appendix C;[1] Population projections from Connect SoCal – The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (Southern California Association of Governments)

The Coachella Valley experiences high levels of ozone and fails to meet 8-hour federal and State ozone standards, but it officially attained the revoked 1-hour ozone National Ambient Air Quality Standard (NAAQS, 120 ppb (parts per billion)) in 2015. Current classifications of ozone nonattainment for the Coachella Valley are in Table 7-2. The Coachella Valley is also still designated as a nonattainment area for PM10 (particles less than 10 microns in diameter), due to windblown dust events that recur in the area, with a classification of "serious." The Coachella Valley meets the current federal standards for nitrogen dioxide (NO_2), carbon monoxide (CO), lead, and sulfur dioxide (SO_2).

Previous Air Quality Management Plans (AQMPs) addressed the planning requirements for the 1997 and 2008 ozone standards. This chapter and associated appendices constitute the ozone State Implementation Plan (SIP) for the 2015 8-hour ozone NAAQS, which addresses the current status of ozone air quality and provides the strategy toward future attainment of the federal 8-hour ozone standard in the Coachella Valley, presenting the projections of future ozone levels based on the base year 2018 emissions inventories, growth projections, and control strategies within and outside the Coachella Valley.

[1] http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm.

TABLE 7-2

OZONE NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ATTAINMENT STATUS IN THE COACHELLA VALLEY

Ozone Standard	Designation[a]	Attainment Date[b]
(1979) **1-Hour** (120 ppb)[c]	Attainment	11/15/2007 (attained 12/31/2013)
(2015) **8-Hour** (70 ppb)[d]	Nonattainment (“severe-15”)	8/3/2033
(2008) **8-Hour** (75 ppb)[d]	Nonattainment (“severe-15”)	7/20/2027
(1997) **8-Hour** (80 ppb)[d]	Nonattainment (“extreme”)	6/15/2024

a) The United State Environmental Protection Agency (U.S. EPA) often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration

c) The 1979 1-hour ozone NAAQS (120 ppb) was revoked, effective 6/15/05; the Southeast Desert Modified Air Quality Management Area, including the Coachella Valley, had not timely attained this standard by the 11/15/07 “severe-17” deadline, based on 2005-2007 data; on 8/25/14, the U.S. EPA proposed a clean data finding based on 2011-2013 data and a determination of attainment for the former 1-hour ozone NAAQS for the Southeast Desert nonattainment area; this rule was finalized by the U.S. EPA on 4/15/15, effective 5/15/15, and included preliminary 2014 data

d) The 2008 8-hour ozone NAAQS (75 ppb) was revised to 70 ppb, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (80 ppb) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the 1997 and 2008 ozone NAAQS until they are attained. The Coachella Valley was reclassified to “extreme” nonattainment effective 7/10/2019.

Air Quality Setting

Air Quality Summary

The South Coast AQMD monitors air quality at four permanent locations in the Coachella Valley - Indio, Palms Springs, Mecca, and the north shore of the Salton Sea. The Palm Springs air monitoring station is located closer to the San Gorgonio Pass (also known as the Banning Pass), predominantly downwind of the densely populated Basin. The Indio station is located further east in the Coachella Valley, on the predominant downwind side of the main population areas of the Coachella Valley. The Mecca station, established in 2013, is closer to the Salton Sea in the southeastern portion of the Coachella Valley. Ozone is routinely measured at the Palm Springs and Indio Stations. PM10 and PM2.5 (particulate matter less than 10 and 2.5 microns in diameter, respectively) are measured at Palm Springs, Indio, and Mecca[2]. Sulfates (from PM10) are measured in Indio and the Palm Springs station measures CO, and NO_2. Hydrogen sulfide (H_2S), a gas emitted naturally from the Salton Sea that can occasionally cause strong odors, is measured in Indio[3], Mecca, and on the north shore of the Salton Sea.

Recent and historic air pollution data collected in the Coachella Valley is summarized in this chapter~~,~~ and is also presented in Chapter 2: Air Quality and Health Effects, along with that of the Basin. Additional details can be found in Appendix II – Current Air Quality. Information on the health effects associated with criteria air pollutants are summarized in Chapter 2 and detailed in Appendix I – Health Effects.

Attainment Status

The Coachella Valley remains a nonattainment area for the 1997 and 2008 8-hour ozone NAAQS, as well as for the 2015 ozone NAAQS. However, the Coachella Valley is in attainment of the former (1979) 1-hour ozone NAAQS. The Coachella Valley is also a nonattainment area for the state 1-hour and 8-hour ozone standards and the federal 24-hour PM10 standard.

The current federal NAAQS attainment designations for the Coachella Valley are presented in Table 7-3. The California Ambient Air Quality Standards (CAAQS) attainment designations are presented in Table 7-4.

---

[2] Continuous PM2.5 measurements began in 2021 at the Mecca station.

[3] H2S measurements in Indio began in 2021.

TABLE 7-3

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) ATTAINMENT STATUS IN THE COACHELLA VALLEY

Criteria Pollutant	Averaging Time	Designation[a]	Attainment Date[b]
Ozone (O_3)	(1979) **1-Hour** (120 ppb)[c]	Attainment	11/15/2007 (attained 12/31/2013)
	(2015) **8-Hour** (70 ppb)[d]	Nonattainment ("severe-15")	8/3/2033
	(2008) **8-Hour** (75 ppb)[d]	Nonattainment ("severe-15")	7/20/2027
	(1997) **8-Hour** (80 ppb)[d]	Nonattainment ("extreme")	6/15/2024
PM2.5[e]	(2006) **24-Hour** (35 μg/m^3)	Unclassifiable/Attainment	N/A (attained)
	(2012) **Annual** (12.0 μg/m^3)	Unclassifiable/Attainment	N/A (attained)
	(1997) **Annual** (15.0 μg/m^3)	Unclassifiable/Attainment	N/A (attained)
PM10[f]	(1987) **24-hour** (150 μg/m^3)	Nonattainment ("serious")	12/31/2006
Lead (Pb)	(2008) **3-Months Rolling** (0.15 μg/m^3)	Unclassifiable/Attainment	Unclassifiable/ Attainment
CO	(1971) **1-Hour** (35 ppm)	Unclassifiable/Attainment	N/A (attained)
	(1971) **8-Hour** (9 ppm)	Unclassifiable/Attainment	N/A (attained)
NO_2[g]	(2010) **1-Hour** (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	(1971) **Annual** (0.053 ppm)	Unclassifiable/Attainment	N/A (attained)
SO_2[h]	(2010) **1-Hour** (75 ppb)	Designations Pending	N/A (attained)
	(1971) **24-Hour** (0.14 ppm) (1971) **Annual** (0.03 ppm)	Unclassifiable/Attainment	Unclassifiable/ Attainment

a) The U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration

c) The 1979 1-hour ozone NAAQS (120 ppb) was revoked, effective 6/15/05; the Southeast Desert Modified Air Quality Management Area, including the Coachella Valley, had not timely attained this standard by the 11/15/07 "severe-17" deadline, based on 2005-2007 data; on 8/25/14, U.S. EPA proposed a clean data finding based on 2011-2013 data and a determination of attainment for the former 1-hour ozone NAAQS for the Southeast Desert nonattainment area; this rule was finalized by the U.S. EPA on 4/15/15, effective 5/15/15, and included preliminary 2014 data

d) The 2008 8-hour ozone NAAQS (75 ppb) was revised to 70 ppb, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (80 ppb) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the 1997 and 2008 ozone NAAQS until they are attained. The Coachella Valley was reclassified to Extreme nonattainment effective 7/10/2019.

e) The annual PM2.5 standard was revised on 1/15/13, effective 3/18/13, from 15 to 12 μg/m^3

f) The annual PM10 standard was revoked, effective 12/18/06; the 24-hour PM10 NAAQS attainment deadline was 12/31/2006; the Coachella Valley Attainment Re-designation Request and PM10 Maintenance Plan was postponed by the U.S. EPA pending additional monitoring and analysis in the southeastern Coachella Valley
g) New 1-hour NO_2 NAAQS became effective 8/2/10; attainment designations 1/20/12; annual NO_2 NAAQS retained
h) The 1971 Annual and 24-hour SO_2 NAAQS were revoked, effective 8/23/10.

TABLE 7-4

CALIFORNIA AMBIENT AIR QUALITY STANDARDS (CAAQS) ATTAINMENT STATUS IN THE COACHELLA VALLEY

Pollutant	Averaging Time and Level[a]	Designation[b]
Ozone (O_3)	**1-Hour** (90 ppb)	Nonattainment
	8-Hour (70 ppb)	Nonattainment
PM2.5	**Annual** (12.0 µg/m^3)	Attainment
PM10	**24-Hour** (50 µg/m^3)	Nonattainment
	Annual (20 µg/m^3)	Nonattainment
Lead (Pb)	**30-Day Average** (1.5 µg/m^3)	Attainment
CO	**1-Hour** (20 ppm)	Attainment
	8-Hour (9.0 ppm)	Attainment
NO_2	**1-Hour** (0.18 ppm)	Attainment
	Annual (0.030 ppm)	Attainment
SO_2	**1-Hour** (0.25 ppm)	Attainment
	24-Hour (0.04 ppm)	Attainment
Sulfates	**24-Hour** (25 µg/m^3)	Attainment
H_2S[c]	**1-Hour** (0.03 ppm)	Unclassified[c]

a) State standards, or CAAQS, for ozone, CO, SO_2, NO_2, PM10 and PM2.5 are values not to be exceeded; lead, sulfates, and H_2S standards are values not to be equaled or exceeded; CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
b) CA State designations shown were updated by CARB in 2019, based on the 2016–2018 3-year period; stated designations are based on a 3-year data period after consideration of outliers and exceptional events.[4]
c) South Coast AQMD began monitoring H_2S in the southeastern Coachella Valley in November 2013 due to odor events related to the Salton Sea; this area has not been classified, but nonattainment is anticipated for the H_2S CAAQS in at least part of the Coachella Valley.

[4] http://www.arb.ca.gov/desig/statedesig.htm#current.

The days exceeding air quality standards at the Coachella Valley air monitoring stations in 2020 are shown in Figure 7-2, separated by air quality index category. Figure 7-3 shows the Coachella Valley 3-year (2018–2020) design values, as percentages of the current and revoked federal standards. A design value is a statistic that describes the air quality status of a given area relative to the level and form of the NAAQS and are generally based on a 3-year average.[5] Note that the modeling design values used for the AQMP attainment demonstration are based on a 5-year period, weighted toward the center year, as specified in the U.S. EPA modeling guidelines.[6]

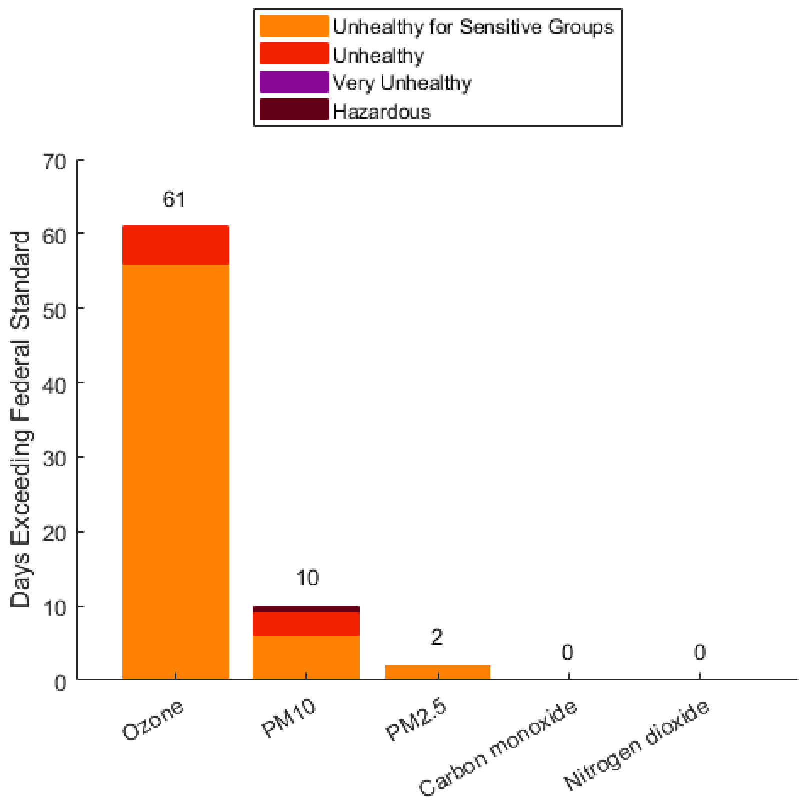


FIGURE 7-2

2020 EXCEEDANCES IN COACHELLA VALLEY BY AIR QUALITY INDEX (AQI) CATEGORY

(DAYS EXCEEDING FEDERAL STANDARD BY MAXIMUM AQI RECORDED IN THE COACHELLA VALLEY. NOTE THAT SULFUR DIOXIDE IS NOT MONITORED AT ANY STATION IN THE COACHELLA VALLEY DUE TO THE ABSENCE OF ANY SIGNIFICANT EMISSION SOURCES.)

---

[5] For most criteria pollutants, the design value is a 3-year average and takes into account the form of the short-term standard (e.g., 98th percentile, fourth highest daily maximum 8-hour ozone, etc.). Design values can also be calculated for standards that are exceedance-based (e.g., 1-hour ozone and 24-hour PM10) so that they can be expressed as a concentration instead of an exceedance count, in order to allow a direct comparison to the level of the standard.

[6] Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze, Office of Air Quality Planning and Standards, USEPA, 2018. Available at: https://www.epa.gov/sites/default/files/2020-10/documents/o3-pm-rh-modeling_guidance-2018.pdf.

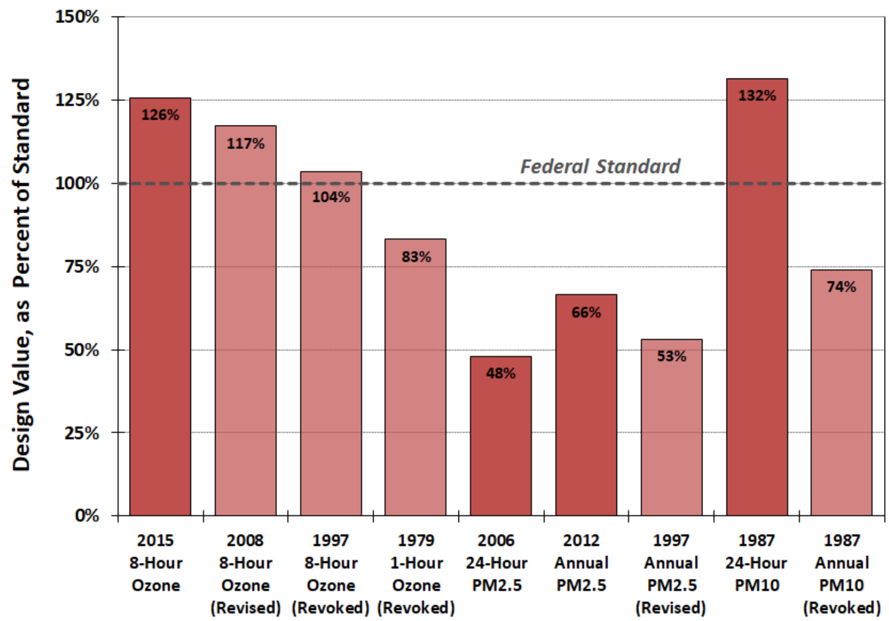


FIGURE 7-3

COACHELLA VALLEY 3-YEAR (2018–2020) DESIGN VALUES AS PERCENT OF FEDERAL STANDARD

(PM10 FLAGGED EXCEPTIONAL EVENTS ARE EXCLUDED BUT SUPPORTING DOCUMENTATION AND U.S. EPA CONCURRENCE ARE STILL NEEDED; NOTE THAT 100 PERCENT OF THE FEDERAL STANDARD IS NOT EXCEEDING THAT STANDARD; DARKER SHADING INDICATES CURRENT, MOST-STRINGENT NAAQS)

Figure 7-4 shows the trend of 3-year design values in the Coachella Valley since 1990, including 1-hour and 8-hour ozone and 24-hour and annual PM2.5, as a percentage of the federal standards (including the former 1979 1-hour ozone NAAQS, the 1997, 2008 and 2015 8-hour ozone NAAQS, the 2006 24-hour PM2.5 NAAQS, and the 2012 annual PM2.5 NAAQS). While recent 8-hour ozone concentrations remain above the NAAQS, the trend shows continued improvement. The PM2.5 design values have remained below the federal standards since the start of these measurements in the Coachella Valley.

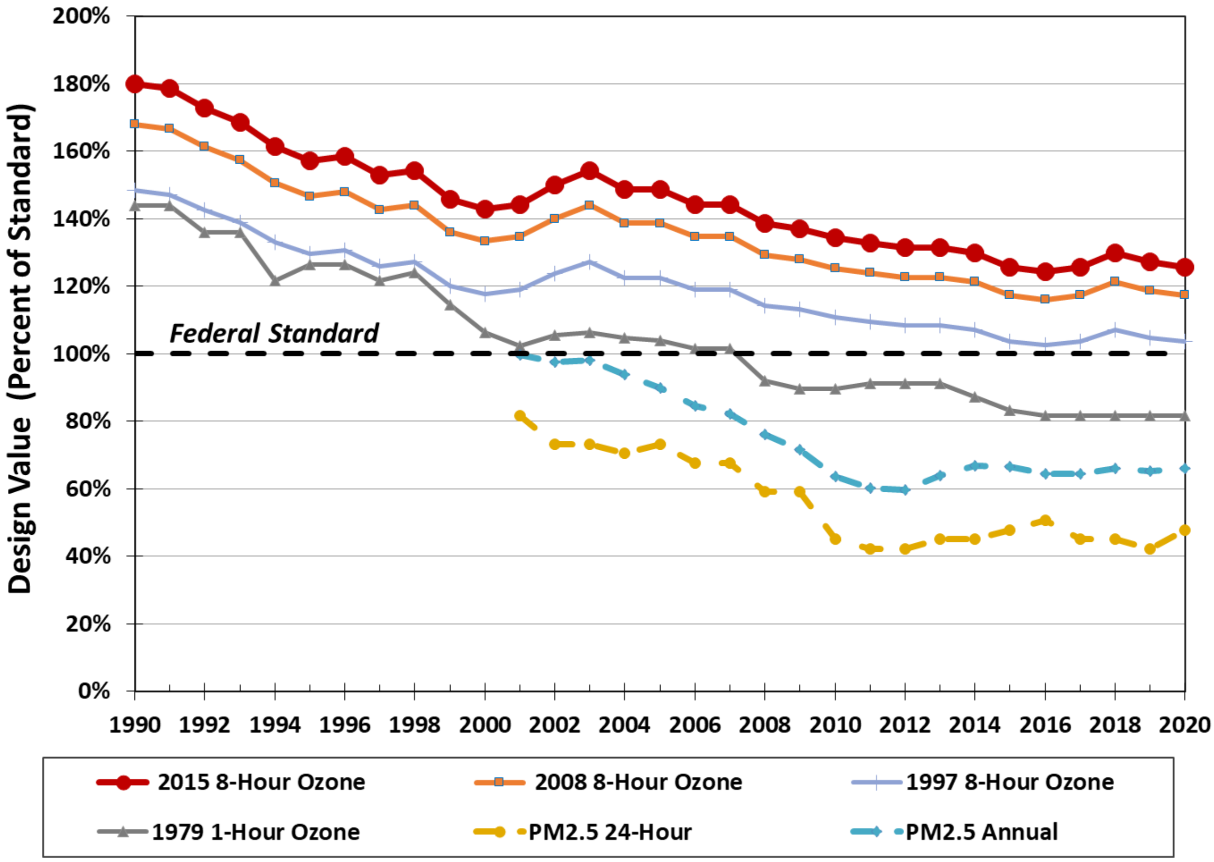


FIGURE 7-4

COACHELLA VALLEY 3-YEAR DESIGN VALUE TRENDS OF OZONE AND PM2.5 AS PERCENT OF THE MOST RECENT FEDERAL STANDARDS, 1990–2015

(PM2.5 MONITORING STARTED IN 1999; THE YEAR PLOTTED IS THE END YEAR OF THE 3-YEAR DESIGN VALUE)

Ozone (O_3)

Most of the emissions forming ozone in the Coachella Valley comes from the South Coast Air Basin. Ozone is formed photochemically from Nitrogen Oxides (NOx) and Volatile Organic Compounds (VOCs) emitted upwind and transported from the Basin to the Coachella Valley. The Basin's prevailing sea breeze causes polluted air to be transported inland. As the air is being transported inland, ozone is formed, with high concentrations occurring in the inland valleys of the Basin, extending from eastern San Fernando Valley through the San Gabriel Valley into the Riverside-San Bernardino area and the adjacent mountains. Ozone levels in the Coachella Valley are therefore mostly due to emissions upwind of the area, and not from sources within. The South Coast AQMD monitors ozone continuously at the Palm Springs and Indio air monitoring stations. Ozone concentrations in the Coachella Valley, and the number of days exceeding the federal ozone standards, are greatest in the late spring and summer months, with no exceedances during the winter.

While the Coachella Valley attains the 1-hour federal standard, the area fails to meet 8-hour NAAQS. The Palm Springs station had higher ozone design values and significantly more days above the standards than the Indio station. Table 7-5 shows the maximum concentrations, design values and the number of days exceeding the federal standards in the Coachella Valley in 2020.

TABLE 7-5

OZONE CONCENTRATIONS, DESIGN VALUES, AND EXCEEDANCE DAYS IN THE COACHELLA VALLEY IN 2020

Ozone Metric	Max Concentration	Design Value
1-hour	119 ppb	106 ppb
8-hour	94 ppb	88 ppb

Ozone Standard	Max Concentration as % of Standard	Design Value as % of Standard	Exceedance days
120 ppb (1979)	99%	88%	0
80 ppb (1997)	112%	104%	5
75 ppb (2008)	125%	117%	37
70 ppb (2015)	134%	126%	61

The 1-hour and 8-hour State ozone standards were exceeded on 9 days and 53 days, respectively, in the Coachella Valley in 2020. The 1-hour ozone health advisory level (≥ 150 ppb) has not been exceeded in the Coachella Valley area since 1998. No 1-hour Stage 1 episode levels (≥ 200 ppb) have been recorded in the Coachella Valley area since 1988.

Figure 7-5 shows the trend of the annual number of days exceeding federal and State ozone standards at Coachella Valley monitoring sites for the years 1990–2020. Figure 7-6 shows the 3-year ozone design value trends from 1990 through 2020 (labeled as the end year of each 3-year design value period). As illustrated, the Coachella Valley has experienced a trend of steady ozone improvements over the years and it is possible to meet the 1997 8-hour ozone standard, 80 ppb by 2023. However, additional gains are needed to achieve the current and previous 8-hour ozone standards.

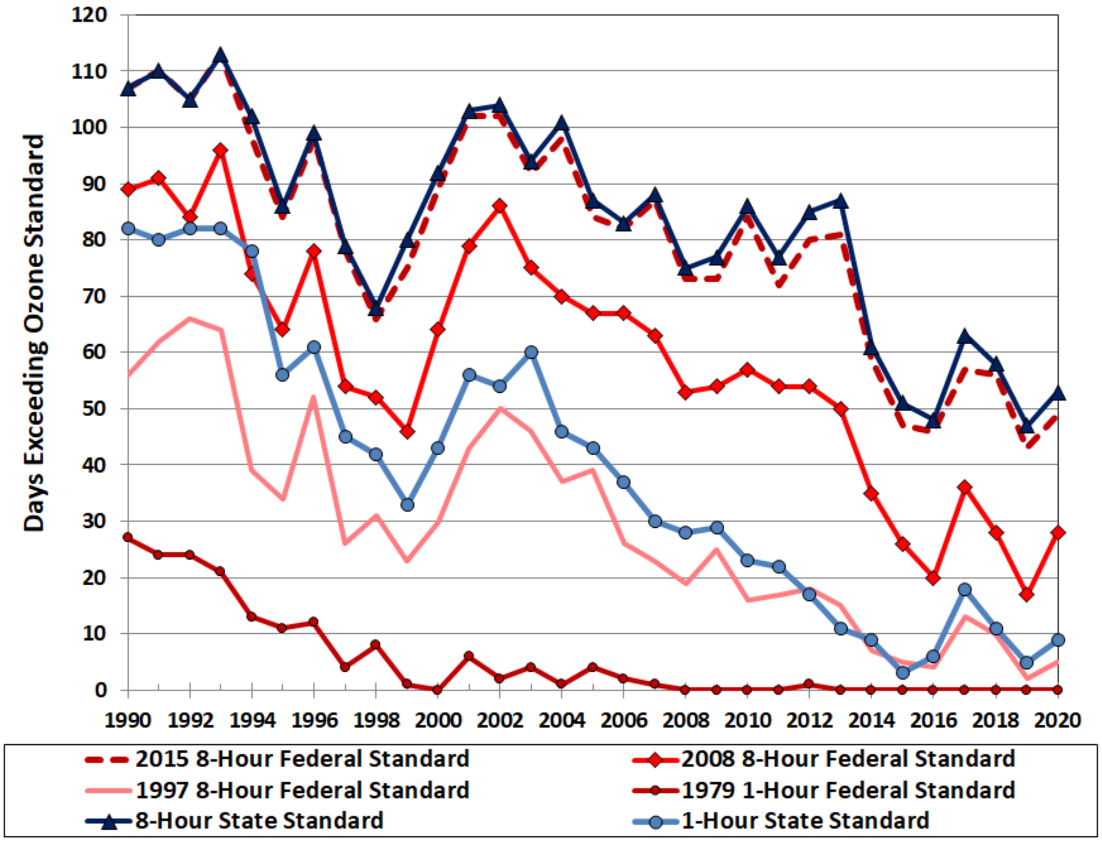


FIGURE 7-5

NUMBER OF DAYS EXCEEDING FEDERAL AND STATE OZONE STANDARDS IN THE COACHELLA VALLEY, 1990–2020

(THE 2015 8-HOUR FEDERAL STANDARD IS THE CURRENT OZONE NAAQS, BUT COMMITMENTS REMAIN TOWARD TIMELY ATTAINMENT OF THE FORMER FEDERAL STANDARDS; THE COACHELLA VALLEY HAS ATTAINED THE FORMER 1979 FEDERAL 1-HOUR OZONE STANDARD)

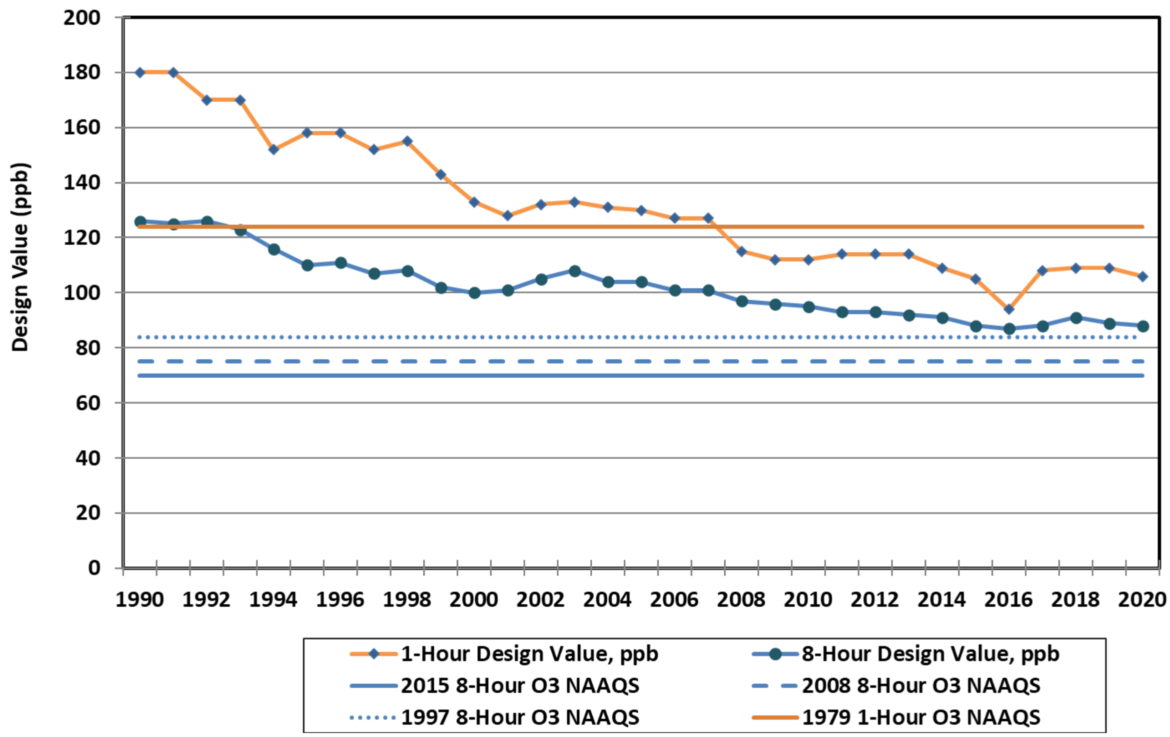


FIGURE 7-6

COACHELLA VALLEY FEDERAL 8-HOUR AND 1-HOUR OZONE 3-YEAR DESIGN VALUE TRENDS, 1990–2020

(DASHED LINES INDICATE THE CURRENT 2015, REVISED 2008, AND REVOKED 1997 8-HOUR NAAQS AND THE REVOKED 1979 1-HOUR OZONE NAAQS (ATTAINED); YEAR PLOTTED IS THE END YEAR OF THE 3-YEAR DESIGN VALUE PERIOD)

Particulate Matter Less than 10 Microns (PM10)

PM10 is measured daily at both Indio and Palm Springs by supplementing the (primary) 1-in-3-day Federal Reference Method (FRM) filter sampling at Indio and the 1-in-6-day FRM sampling at Palm Springs with (secondary) continuous hourly Federal Equivalent Method (FEM) measurements at both stations. In addition, a third station has been operational in the community of Mecca in the southeastern Coachella Valley since 2013, measuring PM10 with a real-time FEM sampler. This monitoring was started at the request of the U.S. EPA Region IX to help evaluate windblown dust in that portion of the Coachella Valley, which is potentially impacted by high-wind natural events, agricultural activities, and fugitive dust from the exposed shoreline of the receding Salton Sea.

Although exceedances of the ozone standard in the Coachella Valley area are primarily due to the transport of ozone and its precursors from the densely populated areas of the upwind Basin to the west, PM10 in the Coachella Valley is largely due to locally generated sources of fugitive dust (e.g., construction activities, re-entrained dust from paved and unpaved road travel, and natural wind-blown sources). The

Coachella Valley is subject to frequent high winds that generate wind-blown sand and dust, leading to high episodic PM10 concentrations, especially from disturbed soil and natural desert blow sand[7] areas. PM10 is the only pollutant which often reaches higher concentrations in the SSAB than in the Basin. All days in recent years that exceeded the 24-hour PM10 NAAQS at the Indio, Palm Springs, or Mecca stations would not have exceeded that standard except for the contribution of windblown dust and sand due to strong winds in the upwind source area. However, not all events would qualify as an exceptional event based on the U.S. EPA guidance.

On some of the Coachella Valley's high PM10 days, long-range transport of wind-generated dust and sand occurs with relatively light winds in the Coachella Valley, when entrained dust from desert thunderstorm outflows is transported to the Coachella Valley from the desert areas of southeastern California, Arizona, Nevada or northern Mexico. These events are typically seen in the summer months with southeasterly flows and thunderstorm activity related to the North American Monsoon.[8, 9] In the more extreme cases seen in the southwestern U.S. deserts, a deep wall of dust entrained by the thunderstorm downdraft and outflow can advance long distances from the origin, creating dust storms that are often referred to as *haboobs*.

On other high PM10 days, local windblown dust and sand is generated from strong winds in the Coachella Valley. Air forced through the San Gorgonio Pass (also referred to as Banning Pass) can create strong northwesterly winds along the centerline of the Coachella Valley. This wind forcing is often related to a marine air mass with a deep marine layer and strong westerly onshore (sea-breeze) flows in the South Coast Air Basin pushing through the San Gorgonio Pass. On other days, storm systems with frontal passages create strong winds through the San Gorgonio Pass and along the Valley. Hourly averaged winds measured near Cathedral City, in the Whitewater River Wash near the centerline of the Coachella Valley, typically exceeded 25 mph for at least one hour on approximately one third of the days in each year.

From 2018 to 2020, 18 24-hour PM10 exceedances at the monitors in Indio, Palm Springs, or Mecca were recorded, all due to high winds. These measurements are summarized in Table 7-6. Concentrations impacted by wind speed in excess of 25 mile per hour is one of the criteria that the U.S. EPA uses to determine if an exceptional event was caused by high winds and thus exceptional event demonstrations for these events would likely be concurred upon by the U.S. EPA with additional supporting information. These "suspected" exceptional events were identified as days when the daily maximum of the five-minute

---

[7] The blowsand process is a natural sand migration caused by the action of winds on the vast areas of sand in the Coachella Valley. The sand is supplied by weather erosion of the surrounding mountains and foothills. Although the sand migration is somewhat disrupted by urban growth in the Valley, the overall region of blowsand activity encompasses approximately 130 square miles, extending from near Cabazon in the San Gorgonio Pass to the Salton Sea.

[8] Adams, D.K., and A.C. Comrie. (1979). The North American Monsoon. *Bull. Amer. Meteor. Soc.,* 78, 2197-2213. Available at: https://journals.ametsoc.org/view/journals/bams/78/10/1520-0477_1997_078_2197_tnam_2_0_co_2.xml.

[9] NOAA/National Weather Service. (2004). The North American Monsoon. Reports to the Nation on our Changing Planet. Available at: https://www.cpc.ncep.noaa.gov/products/outreach/Report-to-the-Nation-Monsoon_aug04.pdf.

average wind speed measured at Palm Springs Regional Airport or Jacqueline Cochran Regional Airport exceeded 25 miles per hour. Only two exceedances of the 24-hour PM10 NAAQS did not meet the wind speed criteria, however, they were also likely caused by high winds.

The 2018 through 2020 events in the Coachella Valley meeting the 25 mile per hour criteria have been flagged in the U.S. EPA Air Quality System (AQS) database as high-wind exceptional events, in accordance with the U.S. EPA Exceptional Events Rule. South Coast AQMD does not plan to submit exceptional event demonstrations to U.S. EPA for these events as they are not regulatory significant as their removal does not result in an attaining design value. After excluding days with wind speeds exceeding 25 miles per hour in the Coachella Valley, the federal 24-hour and former annual PM10 standards were exceeded at the Mecca monitors but not at Indio or Palm Springs monitors in the period from 2018 to 2020. The fourth highest in three-year 24-hour PM10 concentration-based design value at Mecca (204 Microgram per Cubic Meter, $\mu g/m^3$) was 132% of the current 24-hour federal PM10 standard.

TABLE 7-6

HIGH-WIND EXCEPTIONAL EVENT DAYS IN THE COACHELLA VALLEY FROM 2018 THROUGH 2020

Date	Indio (2) (µg/m³)	Indio (3) (µg/m³)	Mecca (1) (µg/m³)	Mecca (3) (µg/m³)	Palm Springs (2) (µg/m³)	Palm Springs (3) (µg/m³)	Event Description
2/11/2018	ND	108	ND	**191**	ND	78	High winds
2/19/2018	51	56	ND	**264**	17	21	Wind speed > 25 mph
4/12/2018	ND	120	ND	**194**	ND	45	High winds
4/16/2018	ND	**259**	ND	**179**	ND	43	Wind speed > 25 mph
4/29/2018	57	58	ND	**170**	ND	31	High winds
7/9/2018	ND	**335**	ND	**274**	ND	**421**	Wind speed > 25 mph
7/10/2018	149	146	ND	109	ND	**173**	High winds
10/30/2019	71	80	**204**	**232**	27	31	High winds
1/29/2020	ND	59	ND	**173**	ND	21	Wind speed > 25 mph
5/12/2020	ND	29	ND	**298**	ND	19	Wind speed > 25 mph
5/13/2020	ND	30	ND	**181**	ND	17	Wind speed > 25 mph
5/19/2020	ND	25	ND	**220**	ND	12	Wind speed > 25 mph
5/22/2020	ND	29	ND	**259**	ND	21	Wind speed > 25 mph
6/5/2020	ND	141	ND	**680**	ND	33	Wind speed > 25 mph
6/6/2020	ND	50	ND	**289**	ND	16	Wind speed > 25 mph
6/7/2020	ND	40	ND	**207**	ND	24	Wind speed > 25 mph
10/26/2020	ND	103	ND	**239**	ND	ND	Wind speed > 25 mph
11/7/2020	ND	102	ND	**218**	ND	ND	Wind speed > 25 mph

ND = No Data.

Numbers in parenthesis indicate the parameter occurrence code (POC), which is used to distinguish between multiple monitors at a single monitoring site.

Bold text indicates concentrations in excess of the PM10 NAAQS.

The POC 3 monitors were measurement with continuous FEM Tapered Element Oscillating Microbalance (TEOM) instruments.

When considering the form of the federal PM10 standards, and after excluding the flagged high-wind exceptional events, the 3-year (2018–2020) concentration-based design values for the Coachella Valley are 204 µg/m^3 for the 24-hour average and 38 µg/m^3 for the annual average (former standard). These are 132 and 76 percent of the 24-hour and former annual PM10 federal standards, respectively. The 24-hour average concentration-based design value is 408 percent of the California State 24-hour (50 µg/m^3) PM10 standard and the 2018–2020 high state PM10 annual designation value (39 µg/m^3) is 195 percent of the state annual average PM10 standard (20 µg/m^3). Figure 7-7 shows the trend of the annual average PM10 concentrations in the Coachella Valley for the station showing the highest PM10 measurements from 1990 through 2020, along with the annual PM2.5 trend.

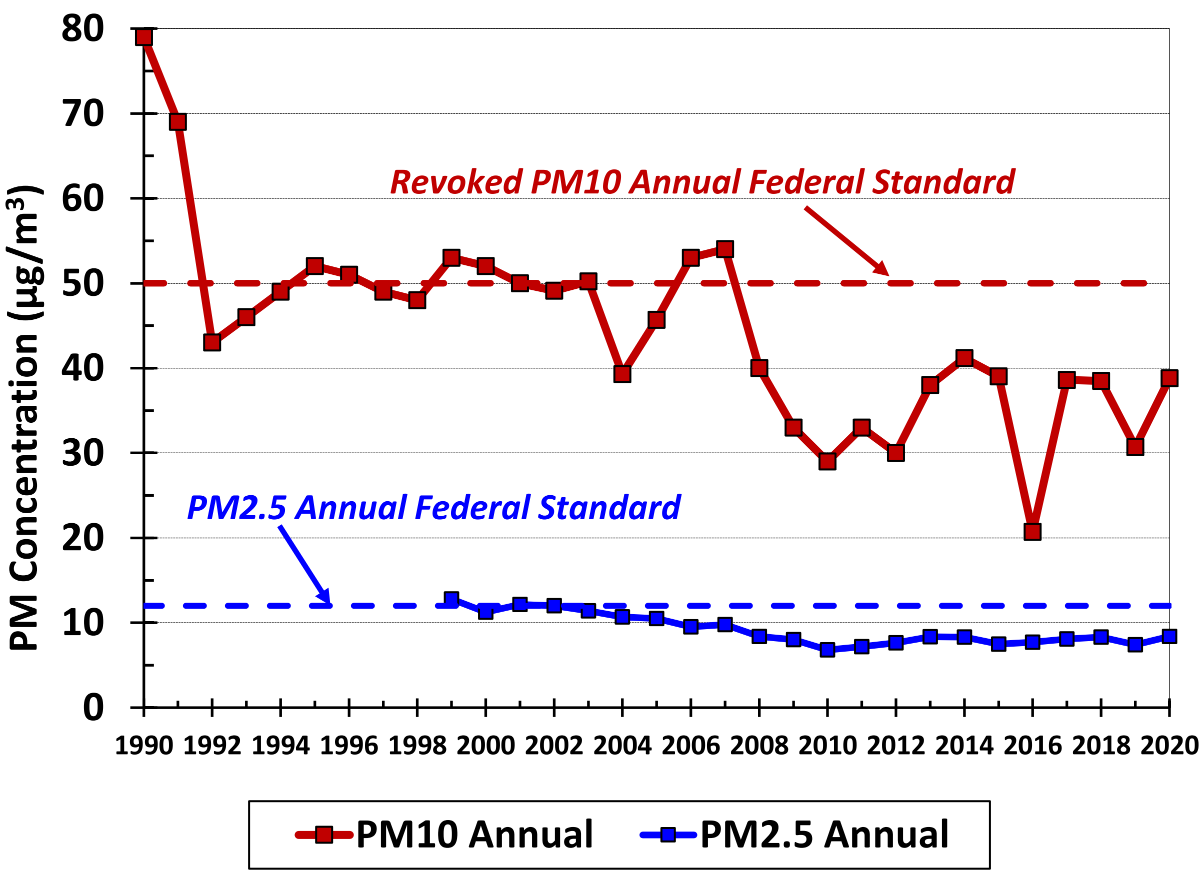


FIGURE 7-7

COACHELLA VALLEY TREND OF ANNUAL AVERAGE PM10 AND PM2.5, 1990–2020

Particulate Matter Less than 2.5 Microns (PM2.5)

The South Coast AQMD began PM2.5 fine particulate monitoring in both the Coachella Valley and the Basin in 1999. Two long-term, routine stations (Palm Springs and Indio) measure PM2.5 with 24-hour filter-based FRM measurements every third day, as required by the U.S. EPA monitoring regulations.[10] Another routine station at the Joshua Tree National Park measures PM2.5 with a continuous BAM (Beta attenuation monitoring) monitor, which is maintained by the National Park Service. PM2.5 has remained relatively low, especially when compared to the South Coast Air Basin, due to fewer combustion-related emissions sources and less secondary aerosol formation in the atmosphere. There is also typically increased vertical mixing and horizontal dispersion in the desert areas. When looking at the 3-year design value for the 2018-2020 period, the Coachella Valley PM2.5 24-hour design value (17 $\mu g/m^3$) is 48 percent of the 24-hour NAAQS (35 $\mu g/m^3$) and the annual average design value (8.0 $\mu g/m^3$) is 66 percent of the current (2012) annual NAAQS (12.0 $\mu g/m^3$).

Figure 7-8 shows the trend of 3-year design values for annual average and 24-hour PM2.5 from 2001 through 2020. The monitoring stations in the Coachella Valley have not violated the 3-year design value form of the current standards since monitoring began. The annual average for the first year of measurements (1999) was just slightly above the level of the standard as can be seen in the trend of the annual average PM2.5 concentrations, as shown in Figure 7-8, along with annual trend of PM10.

There are occasionally some individual days that exceeded the level of the 24-hour PM2.5 standard in the Coachella Valley, due to the PM2.5 fine particulate portion of windblown dust during very high PM10 events caused by high winds. Even though the PM2.5 standard can be exceeded during these exceptional events, the PM2.5 mass is a very small fraction of the total PM10 mass. These events are extreme and can be flagged as exceptional events, but they do not occur frequently enough to violate the 98th percentile form of the 24-hour PM2.5 standard.

The 2020 Coachella Valley maximum 24-hour average and the highest annual average concentrations (20.2 $\mu g/m^3$ and 8.4 $\mu g/m^3$, respectively, both at Indio) were 57 percent and 70 percent of the current federal 24-hour and annual standards. The annual PM2.5 State standard (12.0 $\mu g/m^3$), which is the same level as the federal annual standard, but with different rounding requirements, is also not exceeded in the Coachella Valley.

[10] Additional continuous instruments at Indio and Mecca were installed in 2021.

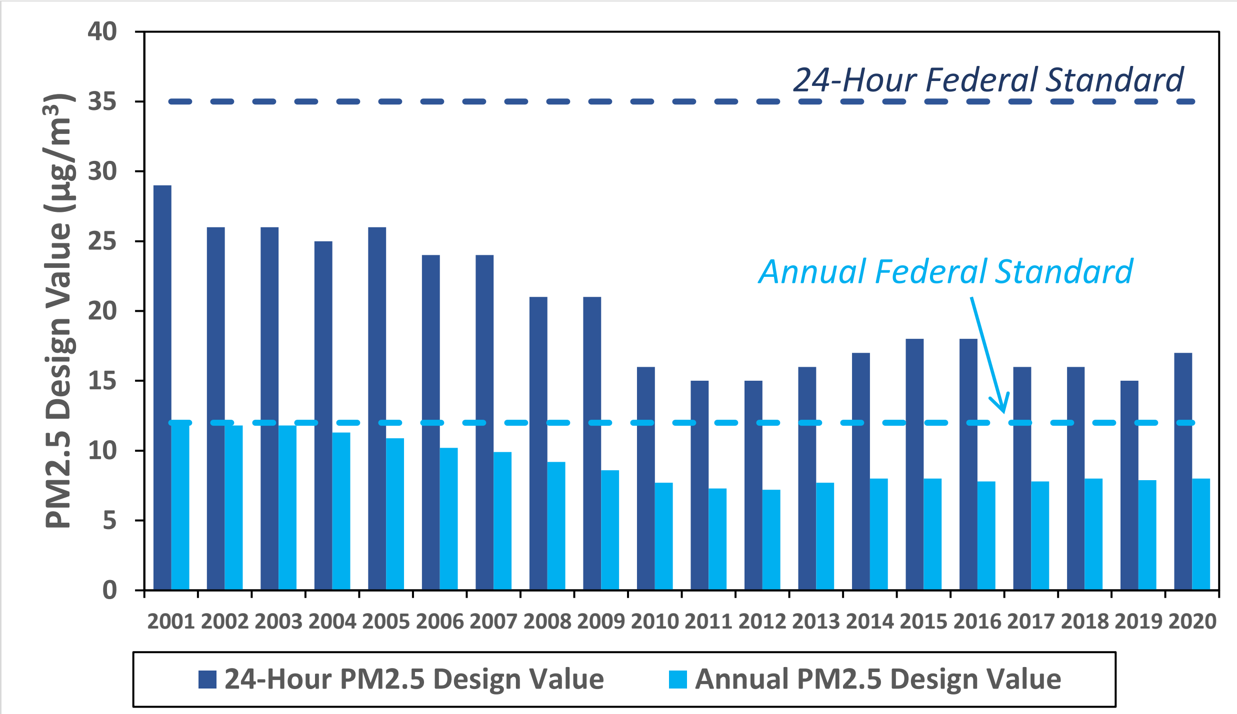


FIGURE 7-8

COACHELLA VALLEY TREND OF 24-HOUR AND ANNUAL AVERAGE PM2.5 DESIGN VALUES, 2001–2020

Carbon Monoxide (CO)

Carbon monoxide was measured at one Coachella Valley air monitoring station (Palm Springs) in 2020. Neither the federal nor State standards were exceeded. The maximum 8-hour average CO concentration recorded in 2015 (0.5 ppm) was less than 6 percent of both the federal (9 ppm) and State (9.0 ppm) 8-hour standards. The maximum 1-hour CO concentration (0.8 ppm) was 2 percent of the federal (35 ppm) and 4 percent of the State (20 ppm) 1-hour CO standards. Historical carbon monoxide air quality data show that the Coachella Valley area has not exceeded the federal CO standards in nearly three decades.

For the 3-year period 2018–2020, the 1-hour and 8-hour design values were 0.8 ppm and 0.5, 2 and 6 percent, respectively, of the federal standards (4 percent of the State 1-hour standard and 6 percent of the State 8-hour standard).

Nitrogen Dioxide (NO_2)

Nitrogen dioxide was measured at one station (Palm Springs) in the Coachella Valley in 2020. The maximum 1-hour average NO_2 concentration (47.4 ppb) was 47 percent of the 2010 federal 1-hour standard (100 ppb) and 26 percent of the State 1-hour standard (180 ppb). The maximum annual average NO_2 concentration (0.0066 ppm) was approximately 12 percent of the federal annual standard (0.0534 ppm) and 22 percent of the State annual standard (0.030 ppm).

For the 3-year period from 2018–2020, the NO_2 design values for the Coachella Valley were 34 ppb for the 1-hour average and 0.007 ppm for the annual average, 34 percent and 13 percent of those NAAQS, respectively.

Sulfur Dioxide (SO_2)

Sulfur dioxide was not measured in the Coachella Valley in 2020. Historic analyses have shown SO_2 concentrations to be well below the State and federal standards and there are no significant emissions sources of SO_2 in the Coachella Valley.

Sulfates (SO_4^{2-})

Sulfate, from FRM PM10 filters, was measured at two stations (Palm Springs and Indio) in the Coachella Valley in 2020. The 2020 maximum 24-hour average sulfate concentration was 2.7 µg/m^3 and the 3-year maximum State designation value was 2.6 µg/m^3 (10 percent of the 25 µg/m^3 State sulfate standard).

Lead (Pb)

Lead concentrations were not measured in the Coachella Valley in 2020. Historic analyses have shown concentrations to be less than the State and federal standards and no major sources of lead emissions are located in the Coachella Valley.

Hydrogen Sulfide (H_2S)

A significant H_2S odor event occurred in September 2012, bringing sulfur or rotten-egg odors and widespread attention to this issue of H_2S odors from the Salton Sea. This event affected people in communities throughout the Coachella Valley, across many areas of the South Coast Air Basin, and into portions of the Mojave Desert Air Basin to the north. Over 235 complaints were registered with South Coast AQMD during this event, from as far west as the San Fernando Valley in Los Angeles County.

South Coast AQMD started measuring H_2S near the Salton Sea at two locations in November 2013, in order to better understand odor events related to the Salton Sea and to better communicate these events to the community. One of the H_2S monitoring stations is located on Torres-Martinez tribal land that is close to the shore, in a sparsely populated area. The second monitor is located at the South Coast AQMD Mecca air monitoring station site (Saul Martinez Elementary School), a more populated community approximately four miles north of the Salton Sea.

The H_2S produced in the Salton Sea is a product of anaerobic organic decay that is particularly active in the summer months, especially at the bottom of the shallow Sea with the abundant desert sunlight and heat. The 2012 event occurred during a period of moist southeasterly "monsoonal" flows in desert areas of southeastern California, along with desert thunderstorms. Strong outflow winds from thunderstorms to the south crossed the Salton Sea, causing mixing in the water layers that released and transported significant amounts of H_2S gas and the associated odors.

While strong events like that of September 2012 are uncommon, less extreme releases of H_2S can frequently cause odors in areas close to the Salton Sea. These events are more prevalent during the hot summer months, especially when the southeasterly "monsoonal" flow events occur, but they sometimes occur at other times of the year. Elevated H_2S concentrations are typically measured near the Salton Sea during wind shifts that bring flows from the south or east directions. These shifts occur most often in the early morning or the late afternoon/early evening hours in this area. The Salton Sea's receding shorelines and shallower waters may affect the number or severity of these odor events in the future.

While there is no federal standard for H_2S, the State of California has set a standard of 30 parts per billion (ppb), averaged over one hour as a level not to be reached or exceeded. The State standard was adopted in 1969, based on the thresholds for annoyance and unpleasant odors, with the purpose of decreasing odor annoyances.[11] Humans can detect H_2S odors at extremely low concentrations, down to a few ppb. Above the State standard, most individuals can smell the offensive odor and many may experience temporary symptoms such as headaches and nausea due to unpleasant odors. The CAAQS for H_2S was reviewed in 1984 and retained without change.

Figure 7-9 shows annual totals of days with at least one hour that exceeded the 1-hour state H_2S standard at near-shore (Torres-Martinez) and Mecca stations from 2014 to 2020. During this period, H_2S concentrations at the Torres-Martinez site near the Salton Sea shoreline exceeded the 1-hour state standard an average of 38.3 days per year, with a range of 22 to 68 days. Of the 268 exceeding days during this period, 121 days (45%) had H_2S exceedances that lasted longer than one hour (2-20 hours). Most exceedances occurred during summer months (June – September), with exceedances peaking in either August or September each year.

Further north from the Salton Sea in Mecca, H_2S concentrations exceeded the state standard an average of 6.6 days per year from 2014-2020, with a range of 2 to 14 exceeding days. Multi-hour (2-7 hours) exceedances were recorded on half of the 46 exceeding days from 2014-2020. Nearly all exceedances recorded at Mecca occurred during summer months and most frequently occurred in August or September.

[11] Collins, J., and D. Lewis. (2000). Hydrogen Sulfide: Evaluation of Current California Air Quality Standards with Respect to Children. California Office of Environmental Health Hazard Assessment document prepared for CARB. Available at: http://www.arb.ca.gov/ch/ceh/001207/h2s_oehha.pdf.

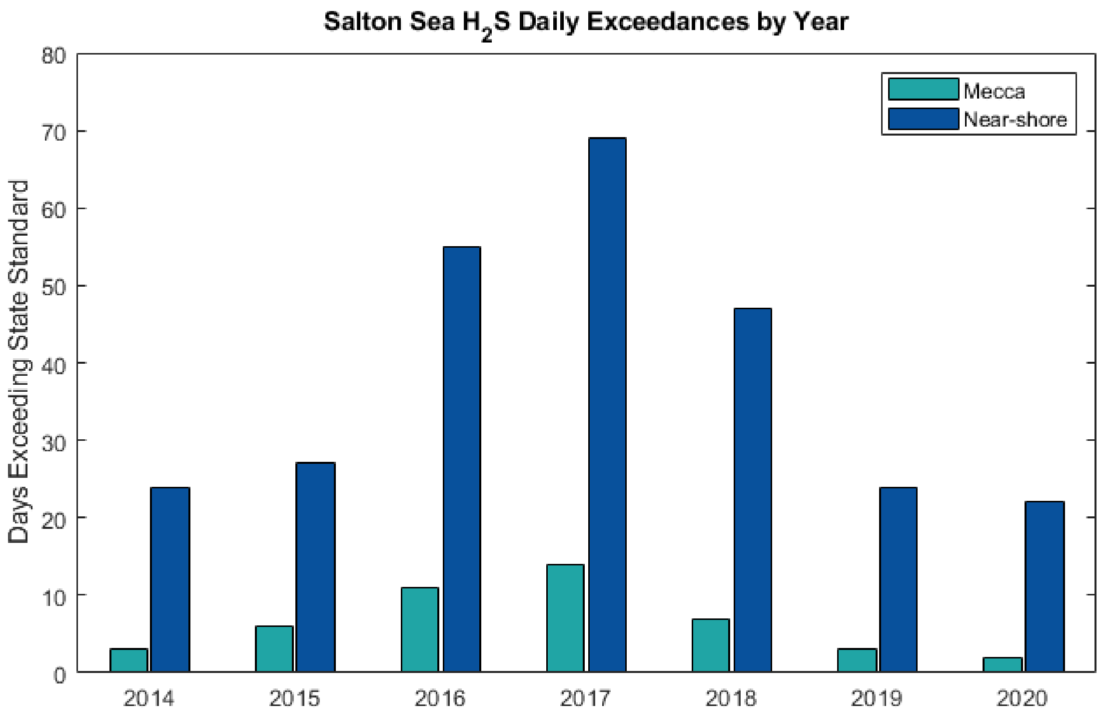


FIGURE 7-9

NUMBER OF DAYS IN EACH YEAR WITH 1-HOUR HYDROGEN SULFIDE (H_2S) OVER THE STATE STANDARD FROM 2014 TO 2020 FOR COACHELLA VALLEY MONITORING STATIONS

Pollutant Transport

Ozone in the Coachella Valley is both directly transported from the Basin and formed photochemically from precursors emitted upwind and within the Coachella Valley. Pollutant transport from the South Coast Air Basin to the SSAB occurs through the San Gorgonio Pass to the Coachella Valley.[12] The transport pathway to the Coachella Valley has been well documented and studied in the past. An experiment in the early 1970s concluded that the South Coast Air Basin was the source of the observed high ozone levels in the Coachella Valley.[13] Transport from Anaheim to Palm Springs was directly identified with an inert sulfur hexafluoride tracer release.[14] A comprehensive study of transport from the South Coast Air Basin to the SSAB also confirmed the ozone transport pathway to the Coachella Valley.[15]

Looking at averaged ozone concentrations by time of day for various stations along the corridor from Los Angeles County into Riverside County and into the Coachella Valley also shows this transportation of pollution. Figure 7-10 shows averaged 1-hour ozone concentrations for the May–October smog season, by hour, for the 2018–2020 period. At stations near where the majority of ozone precursor emissions are emitted (source region), ozone peaks occur just after mid-day on average. This peak corresponds to the peak of incoming solar radiation and therefore the peak of ozone production. Ozone peaks near the emissions source region are not as high as those further downwind, due to the time required for ozone to form. Downwind of the source region, ozone peaks occur later in the day and at generally higher concentrations as ozone and ozone precursors are transported downwind and the reactions forming ozone continue. At Palm Springs, ozone concentration peaks occur in the late afternoon or early evening. If this peak were predominately locally generated, it would be occurring closer to near mid-day, as is seen in the major source areas of the South Coast Air Basin, and not in the late afternoon or early evening, as is seen at Palm Springs.

[12] Keith, R.W. (1980). A Climatological Air Quality Profile: California's South Coast Air Basin. Staff Report, South Coast Air Quality Management District.

[13] Kauper, E.K. (1971). Coachella Valley Air Quality Study. Final Report, Pollution Res. & Control Corp., Riverside County Contract & U.S. Public Health Service Grant No. 69-A-0610 RI.

[14] Drivas, P.J., and F.H. Shair. (1974). A Tracer Study of Pollutant Transport in the Los Angeles Area. *Atmos. Environ*. 8, 1155-1163.

[15] Smith, T.B., et al. (1983). The Impact of Transport from the South Coast Air Basin on Ozone Levels in the Southeast Desert Air Basin. CARB Research Library Report No. ARB-R-83-183. CARB Contract to MRI/Caltech. Available at: http://www.arb.ca.gov/research/single-project.php?row_id=64953.

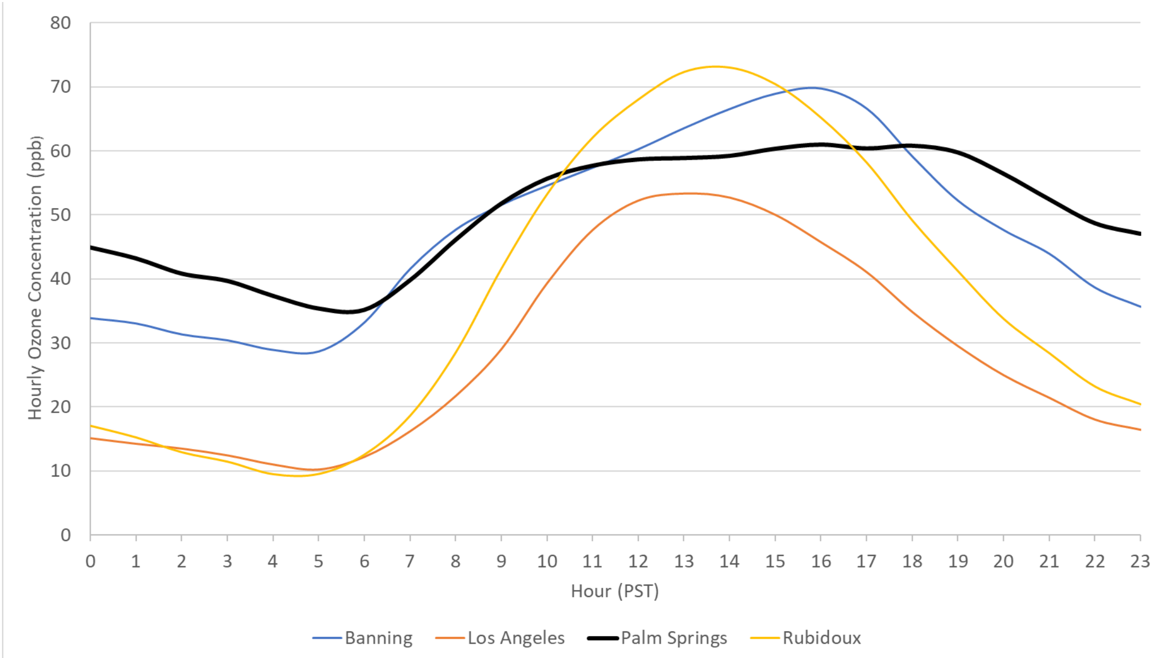


FIGURE 7-10
DIURNAL PROFILE OF 3-YEAR (2018–2020) HOURLY OZONE CONCENTRATIONS ALONG THE TRANSPORT ROUTE INTO THE COACHELLA VALLEY
(HOURS IN PACIFIC STANDARD TIME (PST); AVERAGED FOR THE MAY-OCTOBER OZONE SEASON BY HOUR)

Palm Springs also shows higher morning ozone concentrations, when compared to the concentrations in the morning in the South Coast Air Basin closer to the main emissions source areas (i.e., Los Angeles and Rubidoux). The stations in the South Coast have more local NOx emissions (mostly from mobile sources) that help scavenge[16] ozone during nighttime. The Coachella Valley has limited local NOx emissions to help scavenge the ozone at night. This elevated overnight ozone contributes to an early morning start to the daily ozone increase in Coachella Valley, starting after sunrise (5-6 a.m. Pacific Standard Time during ozone season), with the ample sunlight and strong overnight temperature inversions in the desert. Ozone concentrations observed on high ozone days in the Coachella Valley can reach an initial peak before noon and then drop slightly with increased mixing in the early afternoon, before climbing to the daily peak, typically between 4 and 6 p.m., as the typical onshore flow reaches the Coachella Valley through the San Gorgonio Pass, transporting new ozone from the South Coast Air Basin.

[16] Freshly emitted NOx includes NO, which destroys ozone through a fast reaction colloquially termed 'scavenging'.

Future Air Quality

Emissions Inventories

Table 7-7 shows base year (2018) and future-year emission inventories for the Coachella Valley, based on the draft 2022 AQMP inventory methodology as described in Appendix III – Base and Future Year Emission Inventory. Emissions, in tons per day, of VOC, NOx, CO, SOx, PM10, PM2.5, and Ammonia (NH_3) are shown. The corresponding inventories for the South Coast Air Basin are shown for comparison in Table 7-8. The Basin emissions are far greater than emissions generated in the Coachella Valley. Depending on the pollutant, emissions in the Basin are 5 to 50 times greater than emissions in the Coachella Valley. Future increases in some of the pollutant emissions within the Coachella Valley are largely due to projected increases in population, Vehicle Mile Travel (VMT), and construction activity. Improved air quality in the Coachella Valley depends on reduced emissions in the Basin. This is further illustrated by continued improvement in ozone air quality in the Coachella Valley, as described earlier.

TABLE 7-7

COACHELLA VALLEY SUMMER PLANNING EMISSIONS FOR BASE YEAR (2018) AND FUTURE YEARS, WITHOUT FURTHER CONTROLS

Coachella Valley Emissions (Tons per Day)							
YEAR	**VOC**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**	**NH_3**
2018	13.~~8~~34	~~19.3~~18.92	~~66.1~~59.60	0.~~3~~29	~~56.1~~28.55	4.~~4~~41	2.~~5~~50
~~2024~~2023	~~13.2~~12.58	~~14.7~~13.32	~~62.8~~54.61	0.~~3~~31	~~62.2~~31.04	4.~~7~~56	2.~~8~~77
~~2027~~2026	~~13.4~~12.28	~~14.1~~11.02	~~64.0~~50.45	0.~~3~~30	~~64.4~~32.19	4.~~8~~69	2.~~9~~87
~~2030~~2029	~~13.6~~11.97	~~13.8~~10.50	~~65.3~~45.91	0.~~3~~28	~~66.0~~33.03	4.~~9~~79	~~3.0~~2.97
2032	~~13.7~~11.81	~~13.7~~10.20	~~66.7~~41.15	0.~~3~~27	~~67.1~~33.79	~~5.0~~4.89	3.~~1~~06
~~2033~~2035	~~13.8~~11.67	~~13.6~~9.78	~~67.2~~37.36	0.~~3~~27	~~67.5~~34.36	~~5.0~~4.94	3.~~1~~14
~~2036~~2037	~~14.0~~11.68	~~13.0~~9.23	~~69.3~~36.03	0.~~3~~28	~~68.7~~34.82	5.~~0~~00	3.~~2~~20
~~2037~~	~~14.2~~	~~12.7~~	~~70.4~~	~~0.3~~	~~69.2~~	~~5.1~~	~~3.2~~

TABLE 7-8

SOUTH COAST AIR BASIN SUMMER PLANNING EMISSIONS FOR BASE YEAR (2018) AND FUTURE YEARS BASELINE EMISSIONS

South Coast Air Basin Emissions (Tons per Day)							
Year	**VOC**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**	**NH₃**
2018	~~416.8~~405.9	~~347.1~~350.8	~~1845~~1657.5	14.~~4~~6	~~310.7~~179.8	59.~~3~~1	77.~~3~~0
~~2024~~2023	~~388.3~~378.5	~~252.9~~249.5	~~1688.8~~1485.1	15.0	~~318.1~~181.4	~~58.6~~57.8	79.~~8~~3
~~2027~~	~~386.3~~	~~239.8~~	~~1669.1~~	~~15.2~~	~~321.8~~	~~58.3~~	~~81.3~~
~~2030~~2026	~~385~~365.5	~~232.5~~219.6	~~1663.6~~1353.0	~~15.4~~14.7	~~325.3~~183.5	~~59~~58.0	~~82.4~~80.9
~~2032~~2029	~~385~~352.8	~~230.3~~206.6	~~1671.7~~1213.1	~~15.5~~14.9	~~326.6~~185.2	58.~~6~~1	~~83.3~~82.1
~~2033~~2032	~~386.1~~344.9	~~228.6~~198.9	~~1675.3~~1066.9	15.~~5~~0	~~328.5~~186.2	~~59.3~~58.1	83.~~4~~1
~~2036~~2035	~~388~~340.2	~~221.9~~192.3	~~1692.6~~969.5	15.~~6~~1	~~332.4~~187.9	~~59.6~~58.4	84.~~4~~1
2037	~~389.3~~338.7	~~219.6~~184.4	~~1699.8~~923.2	15.~~7~~2	~~333.8~~189.3	~~59.7~~58.6	84.~~9~~7

Reasonable Further Progress

The federal CAA requires SIPs for most nonattainment areas to demonstrate Reasonable Further Progress (RFP) toward attainment through emission reductions phased in from the time of the SIP submission until the attainment date time frame under CAA section 172(c)(2). The RFP requirements in the CAA are intended to ensure that ozone nonattainment areas reduce emissions over time in order to attain the ozone NAAQS. The U.S. EPA has determined that the plan should rely only on emission reductions achieved from sources within the nonattainment area.

Subpart 2 sections 182(b)(1) and 182(c)(2)(B) contain specific emission reduction targets to ensure that ozone nonattainment areas provide for sufficient precursor emission reductions to attain the ozone national ambient air quality standard. Section 182(b)(1)(A) requires that "moderate" or above areas provide for VOC reductions of at least 15 percent from baseline emissions within six years after November 15, 1990. The U.S. EPA final rule of "*Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area State Implementation Plan Requirements*" (83 FR 62998) states that if an area has already met the 15 percent requirement for VOC under either the 1-hour ozone NAAQS or the 1997 8-hour ozone NAAQS, such requirement under 182(b)(1) would not have to be fulfilled again.

Instead, such areas would need to meet the CAA requirements under Section 182(c)(2)(B), which requires that "serious" and above areas provide VOC and/or NOx reductions (CAA, Section 182(c)(2)(C)) of 18 percent over the first six years after the baseline year for the 2015 8-hour ozone NAAQS, and an additional 3 percent per year averaged over each consecutive three-year period until the attainment date.

For the 182(c)(2)(B) RFP requirement for Serious and higher areas, U.S. EPA guidance allows for NOx emission reductions to substitute for VOC emission reductions to demonstrate the annual 3 percent reductions of ozone precursors if that substitution yields equivalent ozone reductions.[17] Additional U.S. EPA guidance states that certain conditions are needed to use NOx substitution in an RFP demonstration.[18] First, an equivalency demonstration must show that cumulative RFP emission reductions are consistent with the NOx and VOC emission reductions determined in the ozone attainment demonstration. Second, the reductions in NOx and VOC emissions should be consistent with the continuous RFP emission reduction requirement. The guidance states that "Any combination of VOC (ROG) and NOx emission reductions which totals 3 percent per year and meet other SIP consistency requirements described in this document are allowed." Photochemical modeling included in the attainment demonstration in this Chapter shows that NOx reductions are critical for the Coachella Valley to reach attainment.

Tables 7-9 and 7-10 summarize the RFP calculations. The emissions inventory used in the RFP demonstration is the baseline emissions shown in Table 7-7~~ and the benefits of two regulations adopted by CARB in December 2021: (1) Heavy-Duty Inspection and Maintenance Plan (HD I&M)[19] and (2) Small Off-Road Engines (SORE)[20] regulation.~~. The RFP demonstration was extended to 2037, which is the attainment date for Extreme nonattainment areas. The rationale to request the redesignation of the Coachella Valley from Severe to Extreme non-attainment area ("bump-up" request) and the demonstration of attainment as Extreme non-attainment area are provided later of this chapter.

Figure 7-11 depicts the target level and projected baseline RFP demonstration for VOC. For each of the milestone years, the required progress is met on the basis of reductions from the existing control program using a combination of VOC and NOx reductions within the Coachella Valley portion of the SSAB alone. No additional reductions from the proposed control measures in this AQMP are needed for progress purposes. Projected VOC baseline emissions are not sufficient to meet the CAA requirements as the baseline VOC emission levels are above the target levels of each milestone year. Therefore, projected NOx baseline emission reductions are needed to show compliance with the targeted RFP levels. The CAA Section 182(c)(2)(C) provides for NOx reductions to substitute for RFP reductions not achieved for VOC emissions. The demonstration in Tables 7-9 and 7-10 show compliance with RFP requirements. Figure 7-12 illustrates how the cumulative reductions in VOC and NOx combined surpass the required reduction in

[17] Guidance on the Post-1996 Rate-of-Progress Plan and the Attainment Demonstration. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1001E8Z.PDF?Dockey=P1001E8Z.PDF

[18] https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/19931201_oaqps_nox_substitution_guidance.pdf

~~[19]https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2021/hdim2021/isor.pdf.~~

~~[20]https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2021/sore21/isor.pdf.~~

VOC, thus showing compliance with RFP requirements. The contingency measure requirement for the RFP demonstration is summarized in Chapter 4 of the 2022 AQMP.

While the Coachella Valley is expected to meet the RFP requirements for ozone precursor emissions using the emissions originated from the Valley, attainment of the 2015 ozone standard relies on the emission reductions not only within the Coachella Valley but also in upwind areas. As mentioned previously, poor ozone air quality in the Coachella Valley is primarily due to transport of ozone and its precursors from the upwind sources and attainment in Coachella Valley is only possible with substantial emission reductions in the Basin. Accordingly, the proposed control strategy consists of two components: 1) an aggressive control strategy for NOx emission sources in the Basin; and 2) control of locally generated emissions via proposed state-wide or nationally applied control measures implemented by state and federal actions.

TABLE 7-9

SUMMARY OF REASONABLE FURTHER PROGRESS CALCULATIONS – VOC

Row	Calculation Step[a]	2017[b]	2023	2026	2029	2032	2035	2037
1	RFP Baseline VOC ~~Emissions[c]~~Emissions (tons/day)	~~412.59~~13.47	~~377.59~~12.58	~~364.61~~12.28	~~351.94~~11.97	~~344.05~~11.81	~~339.32~~11.67	~~337.87~~11.68
2	Required Percent Change Since Previous Milestone Year (%)	-	18	27	36	45	54	60
3	Target VOC Level (tons/day)	-	~~338.33~~11.05	~~301.19~~9.83	~~264.06~~8.62	~~226.93~~7.41	~~189.79~~6.20	~~165.04~~5.39
4	Cumulative Milestone Year Shortfall (tons/day)	-	~~39.26~~1.53	~~63.42~~2.45	~~87.88~~3.35	~~117.12~~4.40	~~149.53~~5.47	~~172.83~~6.29
5	Cumulative Shortfall in VOC (%)	-	~~9.5~~11.4	~~15.4~~18.2	~~21.3~~24.9	~~28.4~~32.7	~~36.2~~40.6	~~41.9~~46.7
6	Incremental Milestone Year Shortfall (%)	-	~~9.5~~11.4	~~5.9~~6.8	~~5.9~~6.7	7.~~1~~8	7.~~8~~9	~~5.7~~6.0

[a] Units are in tons per day (tons/day), based on the summer planning inventory unless otherwise noted.
[b] Base Year (2017).
~~[c]RFP Baseline VOC Emissions reflect emission reduction benefits from CARB's Heavy-Duty Inspection and Maintenance Plan (HD I&M) and Small Off-Road Engines (SORE) regulations adopted in December 2021; used in RFP demonstration.~~

Row Description:

ROW 1: RFP baseline emissions used for RFP demonstration; Baseline and Future Emission Inventory taking into account existing rules and projected growth~~, and CARBS's HD I&M and SORE regulations~~.

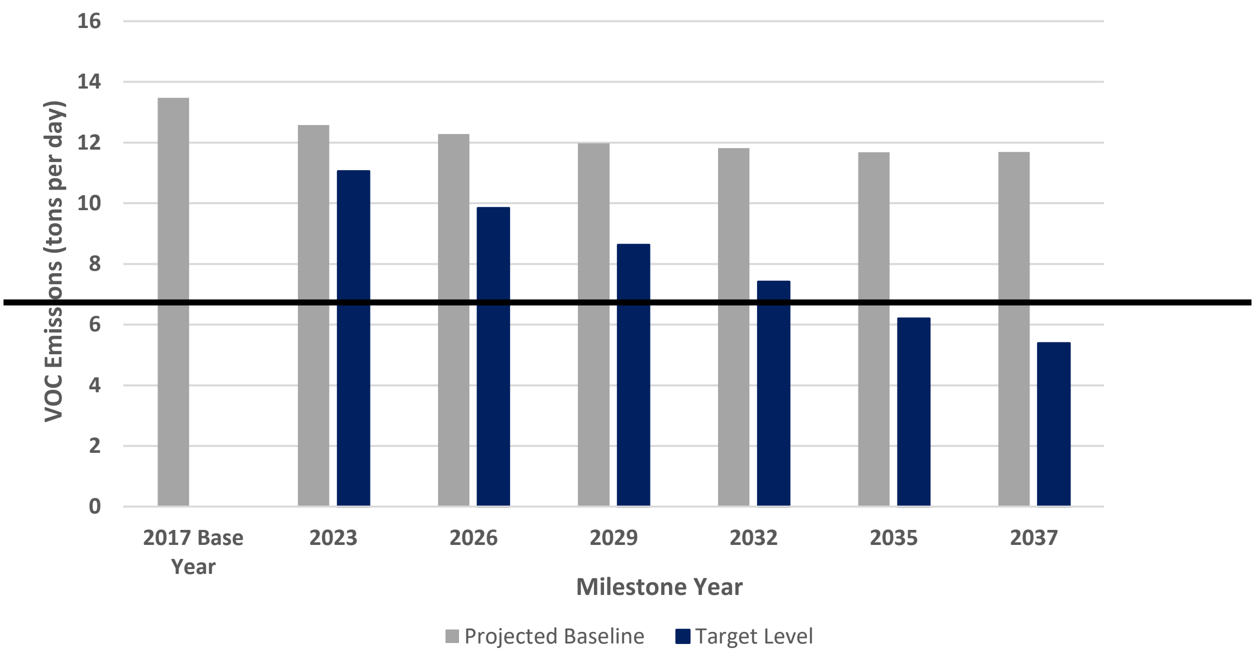
ROW 2: Required 18% reduction 6 years after Base Year; future milestone years are every 3 years until attainment year; and required reductions are 3% per year for each milestone year (e.g., for every 3 years, required 9% reduction).

ROW 3: [(2017 Base Year Row 1) x (1-Row 2)]

ROW 4: [(Row 1) – (Row 3)] or (Baseline – Target) – negative number meets target level and positive number is shortfall of target level.

ROW 5: [(Row 4) / (Row 1 Base Year) x 100] (e.g., for 2029, cumulative shortfall is 3.35/13.~~48~~47 = 24.~~8~~9.

ROW 6: Negative (Row 5) is zero shortfall; positive number is a shortfall. Incremental milestone year shortfall is determined by subtracting the previous year's cumulative shortfall from the current cumulative shortfall (e.g., for 2029, cumulative shortfall of 24.~~8~~9% – previous 2026 shortfall of 18.~~1~~2% = 6.7%).



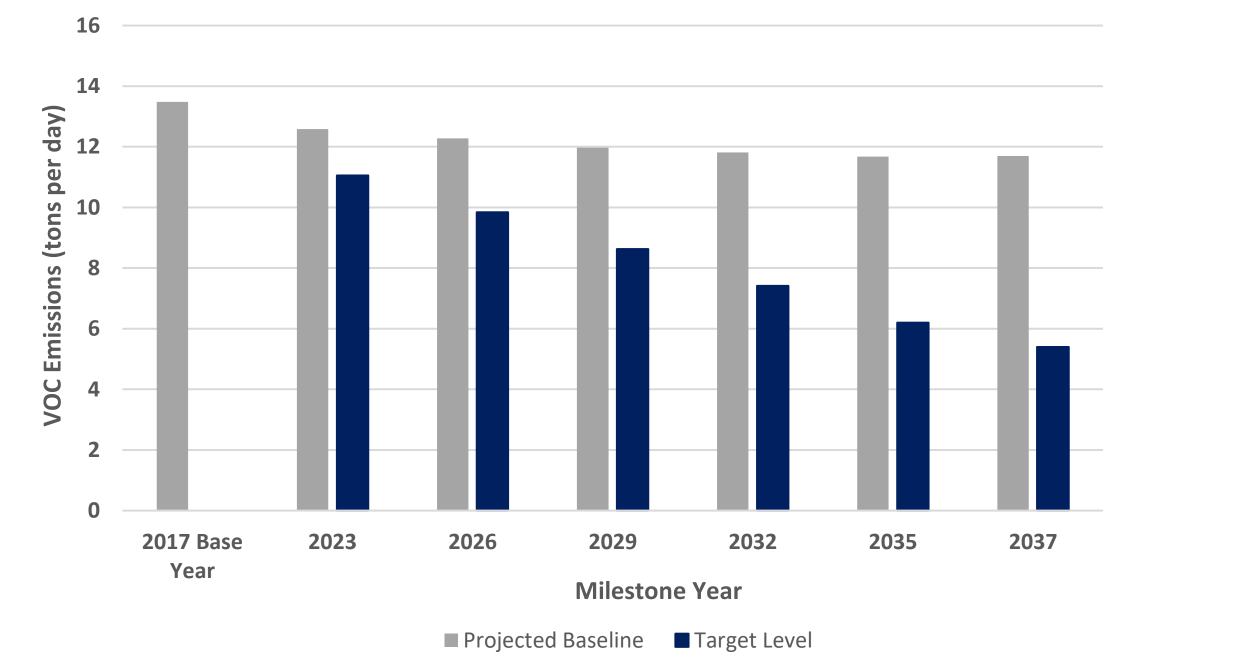


FIGURE 7-11

REASONABLE FURTHER PROGRESS – VOC

~~*[RFP BASELINE EMISSIONS REFLECT EMISSION REDUCTION BENEFITS FROM CARB'S HEAVY-DUTY INSPECTION AND MAINTENANCE PLAN (HD I&M) AND SMALL OFF-ROAD ENGINES (SORE) REGULATIONS ADOPTED IN DECEMBER 2021; USED IN RFP DEMONSTRATION]*~~

TABLE 7-10

SUMMARY OF REASONABLE FURTHER PROGRESS CALCULATIONS – NOx

Row	Calculation Step[a]	2017[b]	2023	2026	2029	2032	2035	2037
1	RFP Baseline NOx Emissions (tons/day)~~[c]~~	19.~~42~~43	13.32	11.02	10.50	10.~~21~~20	9.78	9.~~24~~23
2	Reductions in NOx Emissions since Base Year (tons/day)	-	6.~~10~~11	8.~~40~~41	8.~~92~~93	9.~~22~~23	9.~~64~~65	10.~~19~~20
3	Percent Reductions in NOx Emissions since Base Year (%)	-	31.4	43.3	~~45.9~~46.0	47.5	49.~~6~~7	52.5
4	Cumulative Shortfall in VOC (%)	-	11.~~3~~4	18.~~1~~2	24.~~8~~9	32.~~6~~7	40.~~7~~6	46.~~8~~7
5	Percent Surplus Reduction (%)	-	20.1	25.1	21.1	14.8	9.0	5.~~7~~8
6	RFP Compliance	-	Yes	Yes	Yes	Yes	Yes	Yes

[a] Units are in tons per day (tons/day), based on the summer planning inventory unless otherwise noted.
[b] Base Year (2017).
~~[c] Baseline Emissions reflect emission reduction benefits from CARB's Heavy-Duty Inspection and Maintenance Plan (HD I&M) and Small Off-Road Engines (SORE) regulations adopted in December 2021; used in RFP demonstration.~~

Row Description:

ROW 1: RFP baseline emissions used for RFP demonstration; Baseline and Future Emission Inventory taking into account existing rules and projected growth, and CARBS's HD I&M and SORE regulations.

ROW 2: Reductions achieved in Baseline: [(Row 1 Base Year) – (Row 1 Milestone Year)]; e.g., for 2026: 19.~~42~~43 tons/day – 11.02 tons/day = 8.~~40~~41 tons/day.

ROW 3: % Reductions achieved since Base Year: [(Row 2) / (Row 1 Base Year)] x 100; e.g., for 2026: (8.~~40~~41/19.~~42~~43) x 100 = 43.3%.

ROW 4: Cumulative VOC shortfall from Table 7-~~7~~9.

ROW 5: Surplus reductions achieved [(Row 3) – (Row 4)].

ROW 6: Positive number in Row 5 is percent surplus for each milestone year, thus meeting RFP target levels.

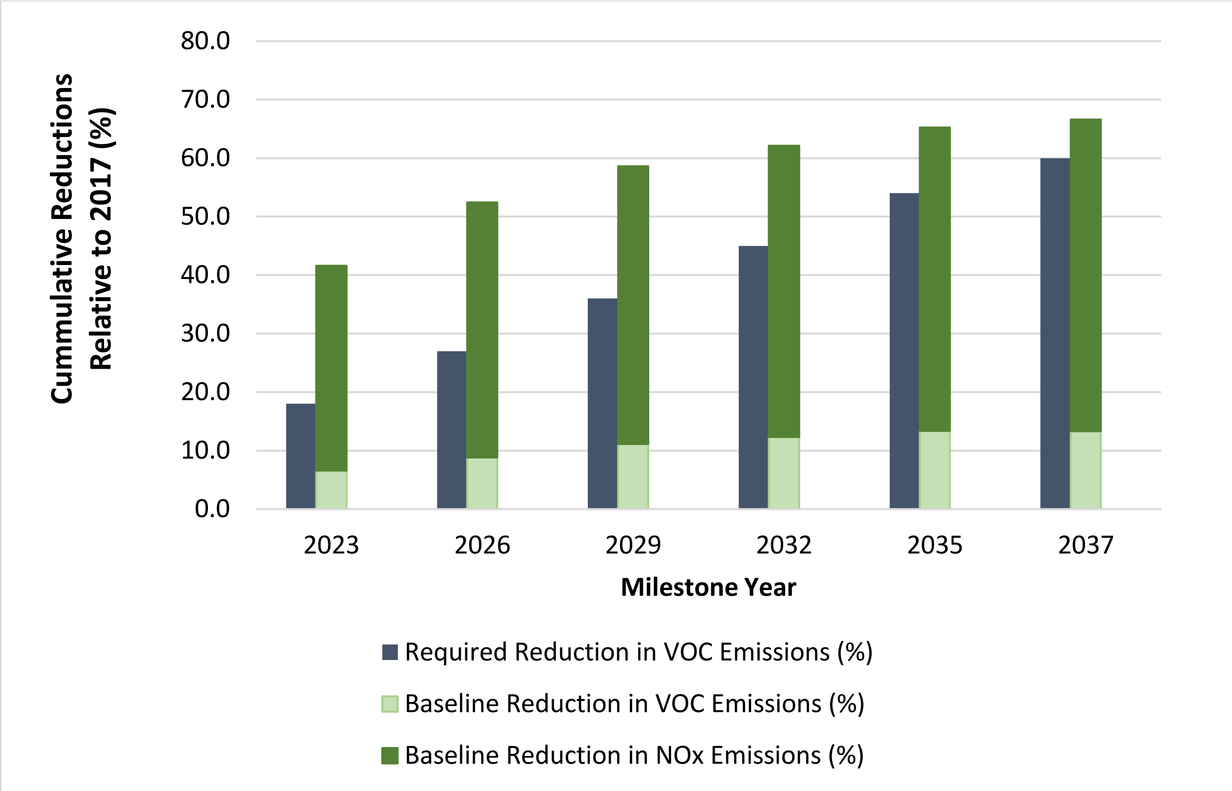


FIGURE 7-12

REASONABLE FURTHER PROGRESS WITH VOC AND NOX REDUCTIONS

Transportation Conformity Budget

The California Air Resources Board (CARB) has prepared the motor vehicle emissions budget (MVEB)[21] for the 70 parts per billion (ppb) 8-hr ozone National Ambient Air Quality Standard (NAAQS). The MVEB is the maximum allowable emissions from motor vehicles within an air basin and is used for determining whether transportation plans and projects conform to the applicable State Implementation Plan (SIP).

Transportation conformity is the federal regulatory procedure for linking and coordinating the transportation and air quality planning processes through the MVEB established in the SIP. Under section 176(c) of the Clean Air Act (Act), federal agencies may not approve or fund transportation plans and projects unless they are consistent with the regional SIP. In addition, conformity with the SIP requires that transportation activities do not (1) cause or contribute to new air quality violations, (2) increase the frequency or severity of any existing violation, or (3) delay timely attainment of NAAQS. Therefore, quantifying on-road motor vehicle emissions and comparing those emissions with a budget

[21] Federal transportation conformity regulations are found in 40 CFR Part 51, subpart T – Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. of the Federal Transit Laws. Part 93, subpart A of this chapter was revised by the EPA in the August 15, 1997 Federal Register.

established in the SIP determine transportation conformity between air quality and transportation planning.

The MVEBs are set for each criteria pollutant or its precursors for each milestone year and the attainment year of the SIP. Subsequent transportation plans and programs produced by transportation planning agencies must demonstrate that the emissions from the proposed plan, program, or project do not exceed the MVEBs established in the applicable SIP. The MVEBs established in this SIP apply as a "ceiling" or limit on transportation emissions for the Southern California Association of Governments for the years in which they are defined and for all subsequent years until another year for which a different budget is specified, or until a SIP revision modifies the budget. For the Coachella Valley 70 ppb 8-hr ozone SIP, the milestone years and the attainment year of the SIP (also referred to as the plan analysis years) are 2023, 2026, 2029, 2032, 2035, and 2037.

Methodology

The MVEB for the 70 ppb ozone SIP is established based on guidance from the U.S. EPA on the motor vehicle emission categories and precursors that must be considered in transportation conformity determinations as found in the transportation conformity regulation and final rules as described below.

The MVEB must be clearly identified and precisely quantified, and consistent with applicable CAA requirements for reasonable further progress and attainment toward meeting NAAQS. Further, it should be consistent with the emission inventory and control measures in the SIP.

The 70 ppb 8-hr ozone SIP establishes budgets for VOC and NOx emissions, which are ozone precursors, using emission rates from California's motor vehicle emission model, EMFAC2017 (V.1.0.3)[22], using activity data (vehicle miles traveled [VMT] and speed distributions) from the Southern California Association of Governments' (SCAG) latest regional transportation plan, which is the 2020 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS).[23]

On August 15, 2019, the U.S. EPA approved EMFAC2017 for use in SIPs and to demonstrate transportation conformity.[24] The EMFAC model estimates emissions from two combustion processes (start and running) and four evaporative processes (hot soak, running loss, diurnal, and resting loss). In addition, the emissions output from the EMFAC2017 model was adjusted to account for the impacts of recently adopted regulations and regulations currently under development that are not reflected in the EMFAC2017 model using off-model adjustments.[25] The regulations incorporated in this way are the Heavy-Duty Warranty Phase 1, Innovative Clean Transit (ICT), Amendments to the Heavy-Duty Vehicle

---

[22] More information on data sources can be found in the EMFAC technical support documentation at: https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation

[23] SCAG Connect SoCal 2020 RTP/SCS https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176

[24] U.S. EPA approval of EMFAC2017 can be found at 84 FR 41717 https://www.federalregister.gov/d/2019-17476

[25] Off-Model Adjustment Factors to Account for Recently Adopted Regulations in EMFAC2017 Model https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory

Inspection Program (HDVIP), Periodic Smoke Inspection Program (PSIP), Advanced Clean Trucks (ACT), Heavy-Duty (HD) Low NOx Omnibus, Heavy-Duty Inspection and Maintenance, Advanced Clean Cars II (ACC II), and Advanced Clean Fleets (ACF).

The MVEB for this SIP was developed to be consistent with the on-road emissions inventory[26] and attainment demonstration, using the following method:

1) Used the EMFAC2017 model to produce an initial/preliminary calculation of the on-road motor vehicle emissions totals (average summer day) for the appropriate pollutants (VOC and NOx) using 2020 RTP/SCS activity data.
2) Applied the off-model adjustments to account for recently adopted regulations. On-Road mobile source emissions accounting for steps 1 and 2 are consistent with the emissions presented in Chapter 3 and Appendix III of this Plan.
3) Subtracted expected emission reductions from ACC II and ACF to be consistent with the on-road control measures in the California's State Implementation Plan Strategy.[27]
4) Rounded the totals for both VOC and NOx to the nearest tenth ton.

Motor Vehicle Emissions Budget

The MVEB in Table 1 was established according to the methodology outlined above and in inter agency consultation[28] - the South Coast Air Quality Management District, California Air Resources Board, the Southern California Association of Governments, U.S. EPA, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA). The MVEB is consistent with the emission inventories and control measures in the 70 ppb 8-hr ozone SIP. These budgets will be effective once U.S. EPA determines it is adequate.

Table 7-11 contains detailed MVEBs for each milestone and attainment year for the Coachella Valley regions. In addition, it provides emissions from the EMFAC 2017 model, recently adopted regulations, and regulations currently under development using off-model adjustments for both VOC and NOx emissions. The final MVEB is rounded upwards to the nearest ton.

---

[26] More information about the on-road motor vehicle emission budgets can be found in Chapter 3 and Appendix III of the plan.

[27] 2022 State Strategy for the State Implementation Plan https://ww2.arb.ca.gov/resources/documents/2022-state-strategy-state-implementation-plan-2022-state-sip-strategy

[28] To satisfy the requirements established in 40 CFR Part 93, Section 118(e)(4)(ii).

TABLE 7-11

MOTOR VEHICLE EMISSIONS BUDGETS FOR THE 70 PPB OZONE STANDARD (SUMMER SEASON)

Coachella Valley Totals (Tons/Day)	2023		2026		2029	
	VOC	NOx	VOC	NOx	VOC	NOx
Vehicular Exhaust	2.65	5.98	2.41	5.79	2.26	5.71
Reductions from recently adopted regulations using off-model adjustments[a]	0.0001	0.2599	0.0013	2.2561	0.0045	2.7522
Reductions from developing regulations using off-model adjustments[b]	-	-	-	-	-	-
Total[c]	2.65	5.72	2.41	3.54	2.26	2.96
Motor Vehicle Emission Budget[d]	2.7	5.8	2.5	3.6	2.3	3

Coachella Valley Totals (Tons/Day)	2032		2035		2037	
	VOC	NOx	VOC	NOx	VOC	NOx
Vehicular Exhaust	2.11	5.71	1.92	5.84	1.88	6.01
Reductions from recently adopted regulations using off-model adjustments[a]	0.0101	3.0465	0.0161	3.3464	0.0204	3.5502
Reductions from developing regulations using off-model adjustments[b]	-	-	-	-	0.23	0.89
Total[c]	2.10	2.66	1.90	2.49	1.63	1.56
Motor Vehicle Emission Budget[d]	2.2	2.7	2	2.5	1.7	1.6

[a] This reflects the adjustment factor for Heavy-Duty Vehicle Warranty Phase 1, ICT, HDVIP/PSIP, ACT, HD I/M, and HD Low NOx Omnibus regulations.

[b] This reflects the on-road commitments for ACCII and ACF from the draft 2022 State SIP Strategy.

[c] Values from EMFAC2017 v1.03 may not add up due to rounding.

[d] Motor vehicle emission budgets calculated are rounded up to the nearest tenth of a ton per day.

Source: EMFAC2017 v1.03

Other Federal Clean Air Act Requirements.

The VMT Offset demonstration required for the 2015 ozone standard was submitted to the U.S. EPA in 2020.[29] The Reasonably Available Control Measures demonstration and the Motor Vehicle Emissions Budgets are included in Appendix VI.

Ozone Attainment Demonstration and Projections

Design Values

For modeling purposes, the U.S. EPA's guidance requires the use of a 5-year weighted average design value to calculate future air quality using Relative Response Factors (RRF). Ozone design values in the Coachella Valley experienced an overall decline with respect to the design values used in the 2016 AQMP. Figure 7-~~12~~13 shows the 5-year weighted design value trends from the period 2010-2014 included in the 2016 AQMP through the period 2015-2019 used in this AQMP. Palm Springs remains the design monitoring site for Coachella Valley, and its design value decreased from 91.7 ppb to 89.3 ppb. Indio's design value decreased initially but it went back up during the last two 5-year period to the exact same design value of 84.3 ppb as in the 2016 AQMP (2010-2014 period).

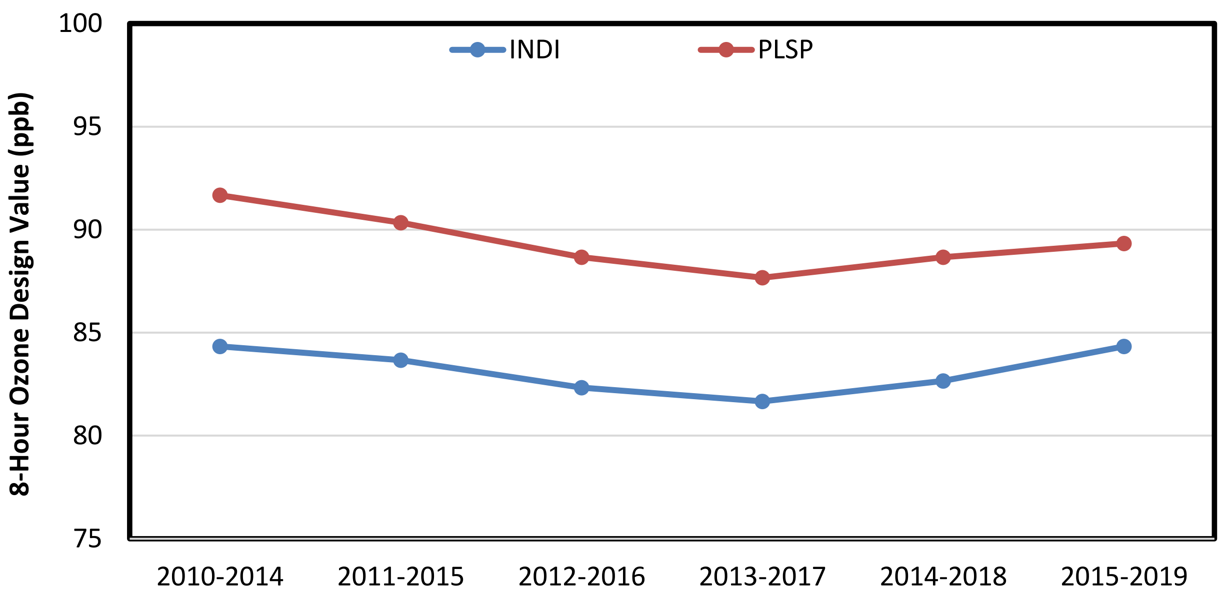


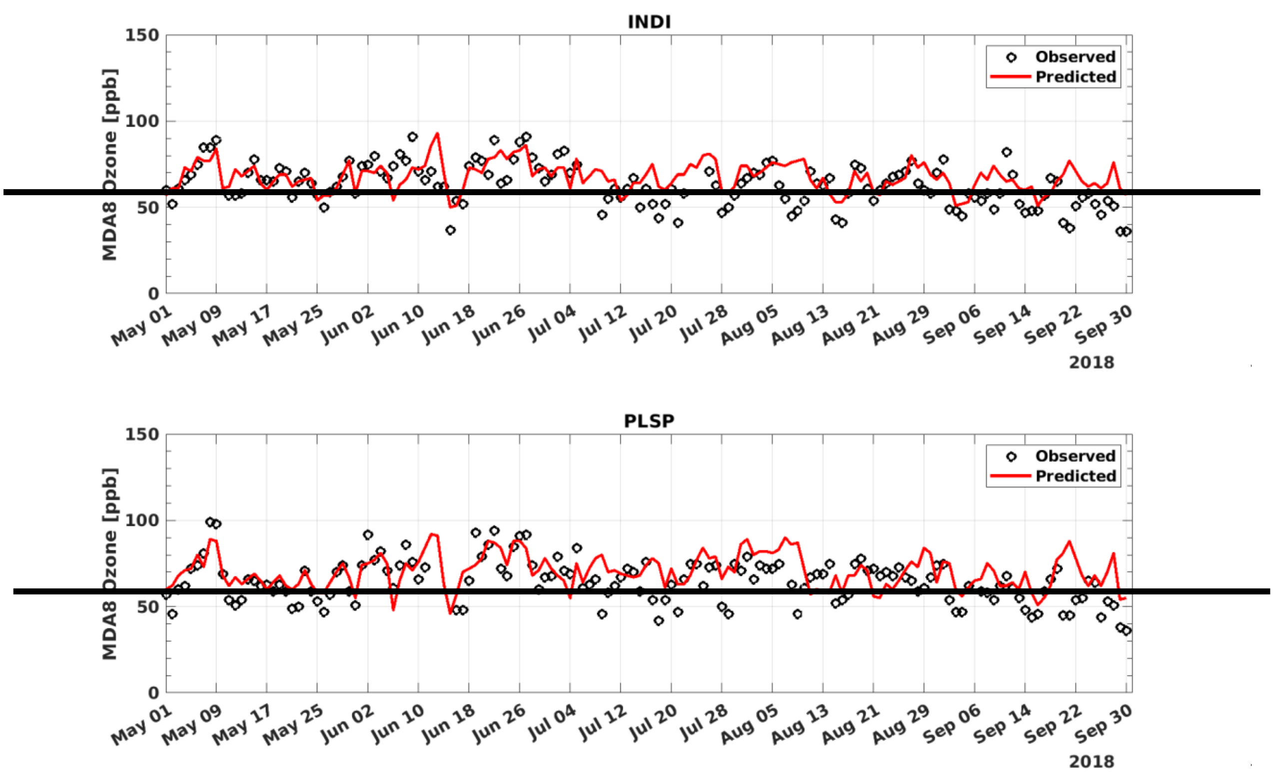
FIGURE 7-~~12~~13

5-YEAR WEIGHTED 8-HOUR OZONE DESIGN VALUES IN THE COACHELLA VALLEY MONITORING STATIONS OF PALM SPRINGS (PLSP) AND INDIO (INDI)

[29] https://ww2.arb.ca.gov/resources/documents/2017-baseline-inventory-and-vehicle-miles-traveled-offset-demonstration-2015-70.

2015 8-Hour Ozone NAAQS Attainment Demonstration

The Coachella Valley is classified as "severe-15" ozone nonattainment area for the 2015 8-hour ozone standard with 2032 as the attainment year. Air quality modeling simulations for the attainment demonstration in the Coachella Valley use the same modeling framework and modeling domain as in the attainment demonstration for the Basin consistent with that presented in Chapter 5 and Appendix V of this AQMP. Briefly, future projected air quality for the Coachella Valley was developed using CMAQ simulations and Relative Response Factors (RRFs), focusing on the 10 highest ozone days for the Coachella Valley stations during the five-month period encompassing the peak of the ozone season (May through September of 2018; 153 days). RRFs were calculated by comparing 2018 and future emission scenario simulations. Figure 7-~~13~~14 depicts the modeled and measured 8-hour ozone concentrations at Indio (INDI) and Palm Springs (PLSP) in the Coachella Valley during the 2018 ozone season. These data demonstrate that the model captures high ozone episodes, which suggests reasonable model performance especially for the top 10 days that are used in the RRF. A comprehensive model performance evaluation is presented in Appendix V.



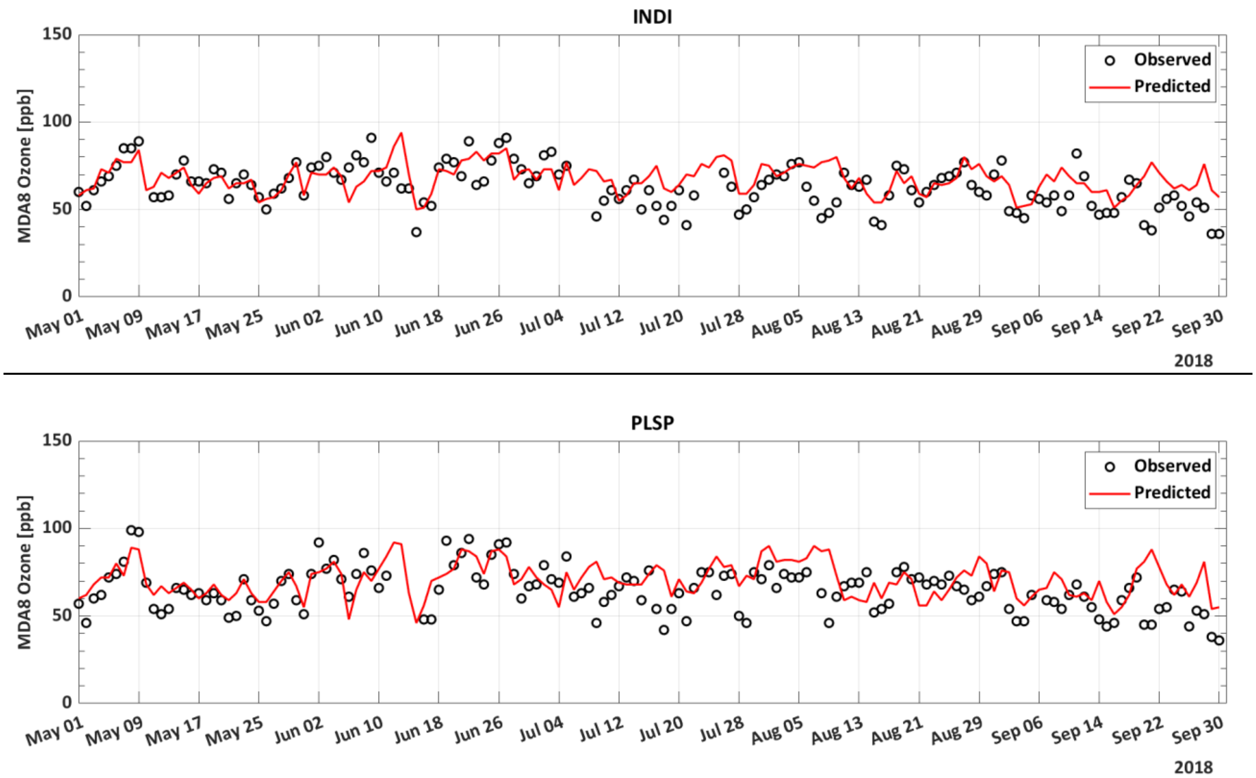


FIGURE 7-~~13~~14

MODELED AND OBSERVED INDIO (TOP) AND PALM SPRINGS (BOTTOM) DAILY MAXIMUM 8-HOUR (MDA8) AVERAGE OZONE CONCENTRATIONS: MAY 1 THROUGH SEPT 30, 2018.

Isopleth plots generated using the AQMP modeling framework are developed to understand the overall level of emission reductions for the South Coast Air Basin required to attain ozone standards in the Coachella Valley. Since the transport of ozone and its precursors from the Basin is the main cause of the ozone pollution in the Coachella Valley, the emission reductions in the Basin is the key to attain federal ozone standards. The ozone isopleths were therefore illustrated as a function of the Basin's total emissions. Figure 7-~~14~~15 shows the isopleth plots for Palm Springs and Indio. The plots suggest that Indio will have higher ozone levels in 2037 than Palm Springs. ~~For the Coachella Valley to attain~~Attainment of the 2015 8-hour ozone standard of 70 ppb[30] in the Coachella Valley requires a carrying capacity of 100 tons per day of NOx in the Basin. This corresponds to a ~~57~~50 percent decrease in NOx in the Basin ~~and Coachella Valley~~ beyond 2032 baseline emissions.

While isopleth plots provide a general understanding on how ozone responds to overall reductions of emissions in the modeling domain, attainment demonstration requires modeling of source specific

---

[30] From the U.S. EPA's Modeling Guidance for Demonstrating Air Quality Goals for Ozone, PM2.5 and Regional Haze, 2018: "Design values for the 0.070 ppm NAAQS are truncated to the 3rd decimal digit. Therefore, 0.0709 ppm (70.9 ppb) is considered attainment and 0.0710 (71.0 ppb) is considered nonattainment. The same rounding/truncation procedures should be applied in the modeled attainment test."

emission reductions based on specific proposed regulations. Figure 7-~~15~~16 shows the remaining NOx emissions in the Coachella Valley and the Basin in the 2018, 2032 and 2037 baselines, and the attainment demonstration scenarios in 2032 and 2037. Figure 7-~~16~~17 shows the future ozone design values in the Coachella Valley monitoring stations resulting from the emission scenarios shown in Figure 7-~~15~~16. The 2032 ~~Draft~~Revised Progress scenario assumed linear progress for South Coast AQMD's stationary source measures from 2022 to 2037. Year specific control factors for mobile sources were provided based on the draft 2022 SIP Strategy by CARB. Detailed emissions reductions for 2032 scenario are provided in Table 7-~~11~~12. Simulation of baseline 2032 and baseline 2037 show progress on ozone based on current regulations but fail to demonstrate attainment. This indicates that for the Coachella Valley to meet the 2015 8-hour ozone standard, additional emission reductions beyond current regulations are needed.

Additional control scenarios are simulated to show potential pathways towards attainment in the Coachella Valley. Baseline and attainment scenarios for the Coachella Valley include parallel emission reductions in the Basin. As measurements and simulations suggest, transport from the Basin contribute substantially to ozone concentrations in the Coachella Valley, and emission controls in the Basin are necessary to be able to attain the federal 8-hour ozone standards. The Draft Progress scenario for 2032 includes partial fulfillment of the proposed control measures by CARB and South Coast AQMD that target the ozone attainment in the Basin by 2037. In particular, the progress of the control measures by 2032 is shown in Table 7-~~11~~12. With this level of emission reductions, results show that the Coachella Valley would fail to attain the ozone standards by 2032, with a design value of 71.~~5 ppb in Indio. In addition, some emission reductions included in the 2032 attainment scenario would be considered as reductions from 182(e)(5) measures ("black box" measures). However, because the Coachella Valley is designated as Severe-15 nonattainment area, "black box" measures are not allowed to be used to demonstrate attainment.~~7 ppb in Indio.

In contrast, the 2037 attainment demonstration scenario for the Basin shows that the monitoring stations in the Coachella Valley would have design values well below the 2015 8-hour ozone federal standard. All monitoring stations in the Coachella Valley are expected to meet the 2015 ozone NAAQS in 2037 with the control strategy to attain the standard in the South Coast Air Basin.

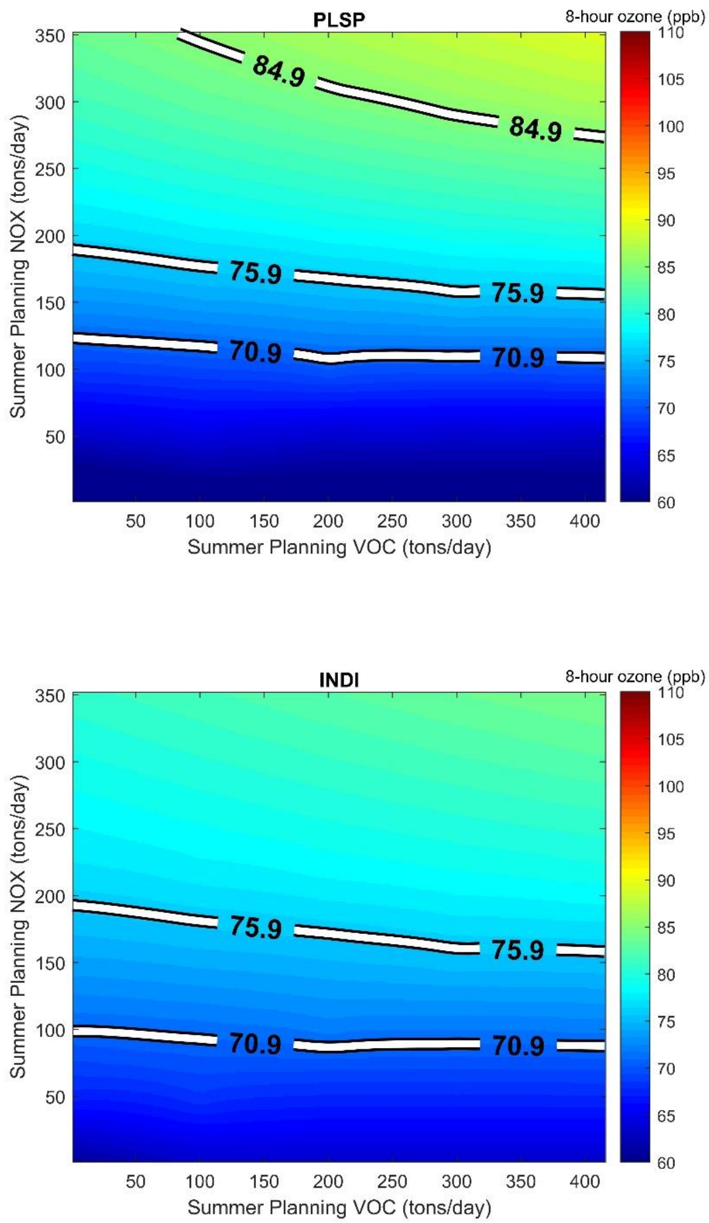


FIGURE 7-~~14~~15

ISOPLETH PLOTS OF THE 8-HOUR OZONE DESIGN VALUES IN THE COACHELLA VALLEY MONITORING STATIONS OF PALM SPRINGS (PLSP, TOP) AND INDIO (INDI, BOTTOM)

TABLE 7-~~11~~12

SUMMARY OF CATEGORY-SPECIFIC NOx EMISSION REDUCTIONS (TONS PER DAY) FROM CARB AND SOUTH COAST CONTROL MEASURES IN 2032

Control Measure	NOx Baseline	NOx Reduction	Category Remaining NOx
South Coast AQMD stationary measures	~~41~~42.1	2.~~7~~6	~~38.4~~39.5
CARB Passenger Vehicles/Motorcycles measures	~~14.8~~17.0	2.~~4~~6	~~12~~14.4
CARB Medium-Duty Vehicles measures	2.~~5~~3	0.~~1~~0	2.~~4~~3
CARB Heavy-Duty Vehicles measures	~~48.6~~23.9	~~32.3~~10.0	~~16.4~~14.0
CARB Locomotive measures	17.~~7~~8	~~11.5~~10.0	~~6.2~~7.8
CARB Off-Road Equipment measures	~~40.0~~27.6	~~16.7~~8.9	~~23.2~~18.7
CARB Commercial Harbor Craft measures	5.6~~.1~~	~~3~~2.6	3.~~1~~0
CARB Recreational Boast measures	3.4	0.~~0~~1	3.~~4~~3
Total CARB and South Coast AQMD Measures	**~~174.3~~139.7**	**~~68.7~~36.8**	**~~105.6~~102.9**
South Coast AQMD MOB-05 incentive program[1]	N/A	0.2	N/A
South Coast AQMD MOB-11 incentive program[2]	N/A	~~10.~~7.1	N/A
Aircraft[3]	25.~~7~~9	0	25.~~7~~9
Ocean-Going Vessels (OGV)[4]	~~30.4~~33.2	0	~~30.4~~33.2
Total (All Measures)[5]	**~~230.2~~198.9**	**~~79.5~~44.1**	**~~150.7~~154.8**

[1]Estimated reductions from Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles.

[2]Estimated reductions from mobile sources with emission reductions from Incentive Programs.

[3]No reduction assumed for aircraft emission in the 2032 control scenario.

[4]No reduction assumed for OGV emission in the 2032 control scenario, area quantified as “server” non-attainment cannot rely on emission reduction from sources from 182(e)(5).

[5]Sum may not add up due to rounding.

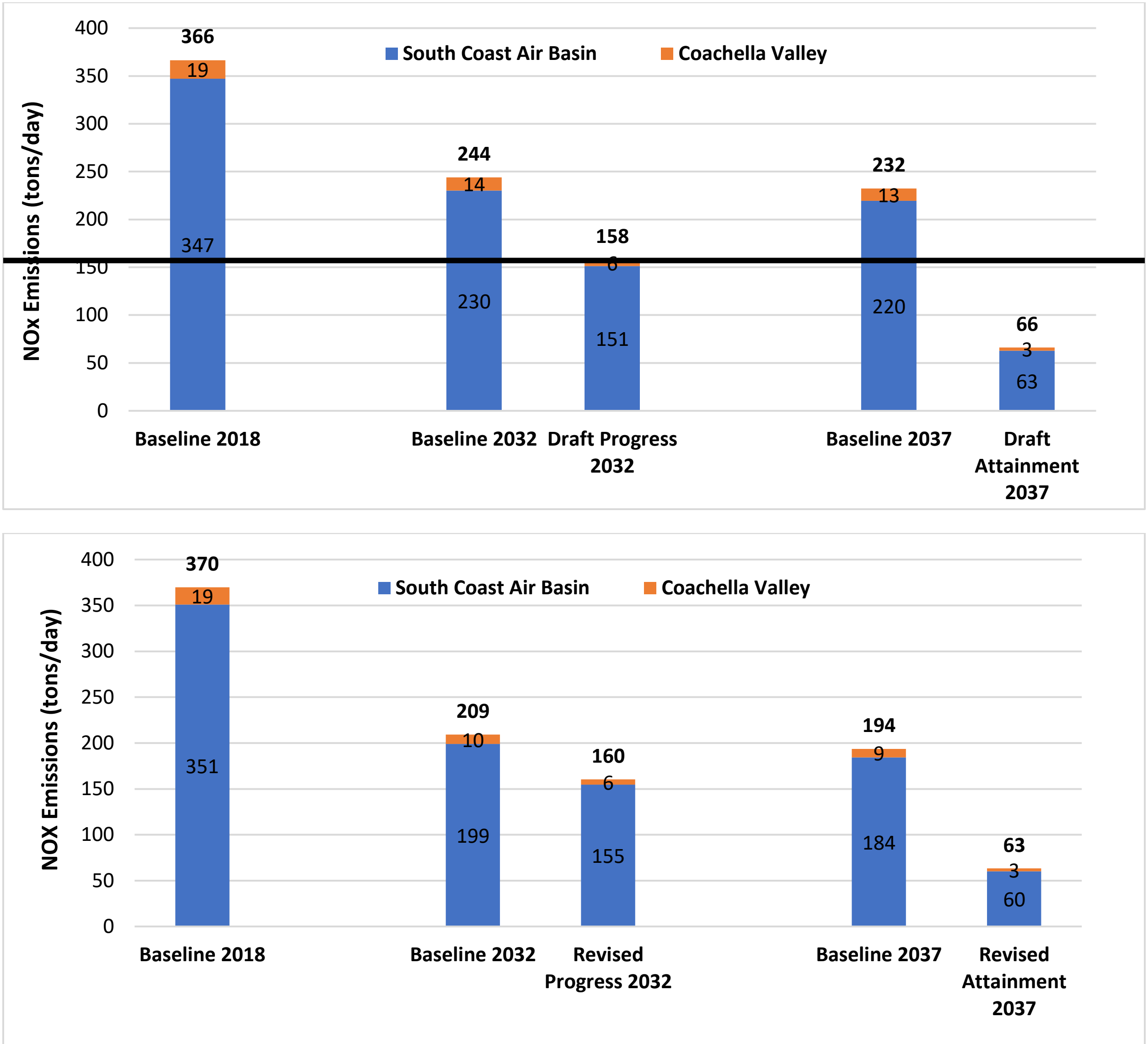


FIGURE 7-~~15~~16

SUMMARY OF NOX EMISSIONS IN THE ATTAINMENT DEMONSTRATION FOR THE COACHELLA VALLEY.
(*EMISSIONS FROM THE BASIN AND COACHELLA VALLEY ARE SHOWN. TOTALS REFLECT THE SUM OF EMISSIONS IN THE BASIN AND THE COACHELLA VALLEY AND ARE SHOWN IN BOLD AT THE TOP OF EACH BAR.*)

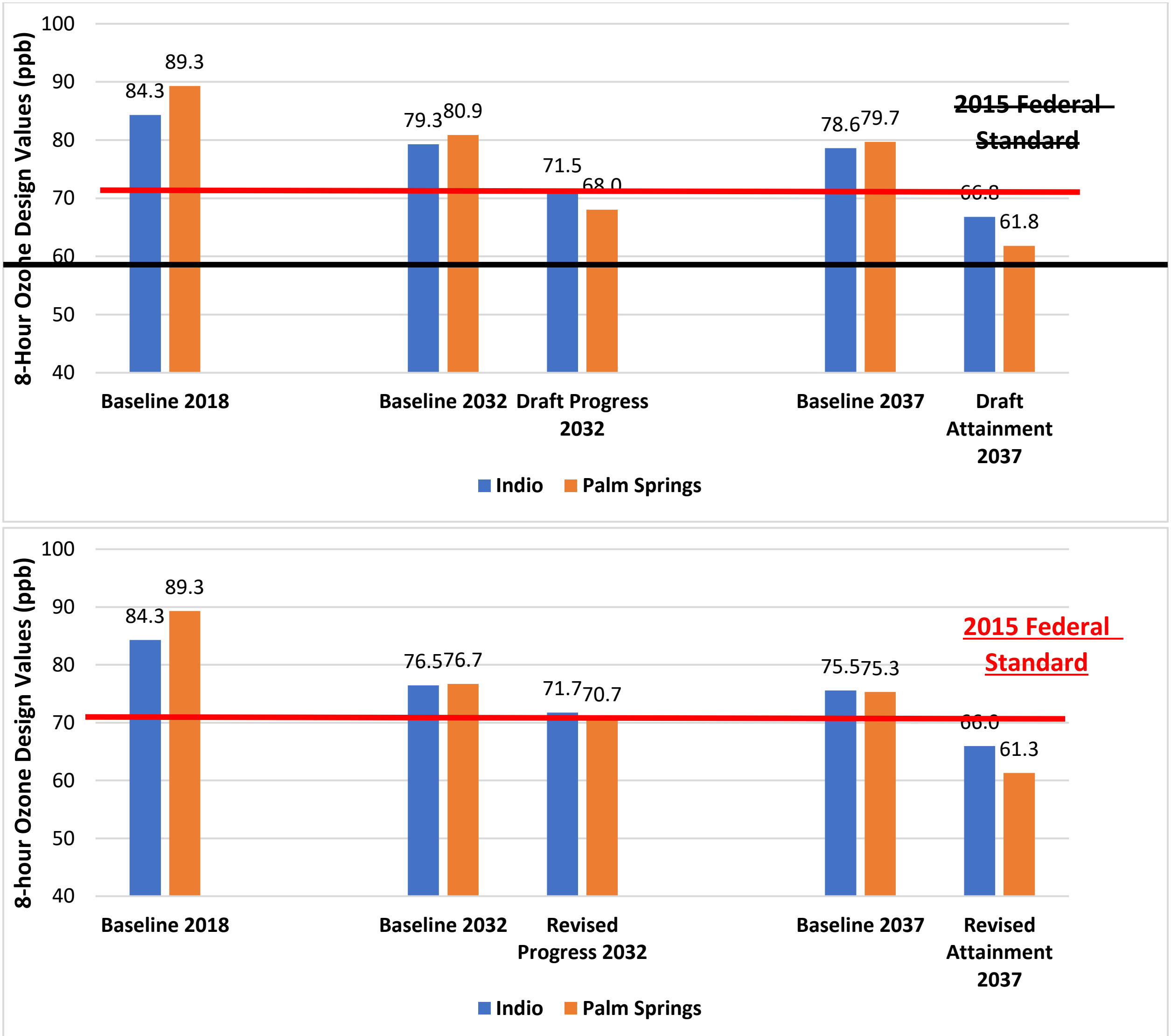


FIGURE 7-~~16~~17
FUTURE OZONE DESIGN VALUES IN THE COACHELLA VALLEY IN COMPARISON WITH FEDERAL STANDARD

Impracticability Demonstration

The high levels of ozone experienced in the Coachella Valley are mostly due to ozone and emissions transported from the South Coast Air Basin. Attainment of the 2015 ozone standard in Coachella Valley without substantial emissions reductions in the Basin is not possible. Namely, the Coachella Valley is unable to attain the ozone standards by 2032 even with undefined "black box" emission reduction measures implanted in the Basin to attain the 2015 8-hour ozone standard by the 2037 deadline. Therefore, ~~the~~ South Coast AQMD seeks a voluntary bump up in classification to Extreme nonattainment for the 2015 8-hour ozone standard for the Coachella Valley Planning Area. To do so, ~~the~~ South Coast AQMD must demonstrate that meeting the standard by the 2032 deadline is impractical. This section provides the impracticability demonstration and a request to reclassify the Coachella Valley as Extreme nonattainment ("bump-up" request) and the attainment demonstration in 2037.

Table 7-~~12~~13 shows that the ongoing emission reductions from already adopted regulations and programs (baseline) did improve the 8-hour ozone in 2032 but fell short of demonstrating attainment. The 2032 baseline design value is projected to be ~~80.9~~76.7 ppb at Palm Springs, the highest ozone level in the Coachella Valley with the 2032 baseline scenario. The 2032 Progress Scenario, which reflects emission reductions specified in Table 7-~~11~~12, is still short of attainment. The 2032 Progress Scenario yielded a design value of 71.~~5~~7 ppb at Indio, above the 2015 ozone standard. Coachella Valley will therefore not attain the standard by the deadline and will require an extension until further emission reductions can be achieved.

TABLE 7-~~12~~13

BASELINE AND FUTURE PROJECTED DESIGN VALUES IN COACHELLA VALLEY

Station	2018 5-Year Weighted Design Value (ppb)	2032 Baseline Design Value (ppb)	2032 Revised Draft Progress Scenario (ppb)
Palm Springs	89.3	~~80.9~~76.7	~~68.0~~70.7
Indio	84.3	~~79.3~~76.5	71.~~5~~7

Request to Redesignate the Coachella Valley as Extreme Nonattainment

Under the CAA, the U.S. EPA shall grant requests to reclassify nonattainment areas to higher ozone nonattainment classifications.[31] The voluntarily request for reclassification to a more severe classification is commonly referred to as a "bump-up."

Through this AQMP and accompanying Resolution of the Governing Board adopting the 2022 AQMP, the South Coast AQMD is formally requesting CARB to submit a request to the U.S. EPA for a voluntary reclassification of the Coachella Valley Portion of the Salton Sea Air Basin from "severe-15" to "extreme"

[31] CAA sect 181(b)(3).

nonattainment for the 2015 8-hour ozone standard and that the EPA Administrator grant such request upon receipt. Through this request, the South Coast AQMD is also seeking an extension of the ozone attainment date from ~~June 15~~August 3, 2033 to ~~June 15~~August 3, 2038.

Reclassification from Severe to Extreme nonattainment area implies that requirements for Extreme nonattainment areas would apply in the Coachella Valley. These requirements include but are not limited to the use of clean fuels or advanced control technology for boilers as described at CAA section 182(e)(3) and the lower threshold for Major Sources (10 tons per year). Because the Coachella Valley was reclassified as Extreme nonattainment area for the 1997 8-hour ozone standard in 2019, the implications of a bump-up were already addressed during the development of the Coachella Valley Extreme Area Plan finalized in December of 2020. Other requirements such as RFP determination and attainment demonstration are addressed in this chapter.

2015 8-Hour Ozone NAAQS Attainment Demonstration

The Basin is currently classified as an Extreme nonattainment area for the 2015 8-hour ozone NAAQS with an attainment year of 2037. Since emission reductions in the Basin are critical for attainment in Coachella Valley, and Coachella Valley cannot attain with baseline reductions, attainment can only be demonstrated by employing the control strategy presented in Chapter 4 of this AQMP. The control strategy includes measures identified as 182(e)(5) "black box" measures which will be permitted once U.S. EPA approves the reclassification of Coachella Valley as an Extreme nonattainment area.

Table 7-~~13~~14 summarizes the results of the ozone simulations, displaying both the 2037 baseline and attainment scenarios. The 2037 baseline emissions inventory does not contain additional reductions beyond already adopted measures. As expected, this scenario does not lead to attainment and the control strategy outlined in Chapter 4 of this AQMP must be implemented to achieve attainment. The reductions from the control strategy will ensure attainment of the 2015 federal 8-hour standard by 2037 at all stations, with a design value of 66.40 ppb in Indio.

TABLE 7-~~13~~14

MODEL-PREDICTED 8-HOUR OZONE DESIGN VALUES (PPB)

Station	2037 Baseline	2037 Controlled
Palm Springs	~~80.2~~75.3	~~62~~61.3
Indio	~~78.8~~75.5	66.40

Conclusions

The Coachella Valley is designated as "severe-15" nonattainment for the 2015 8-hour ozone NAAQS[32], which required the attainment date to be 2032. With the current emission controls in place in the Basin and the Coachella Valley, ozone levels are not expected to meet the 2015 8-hour ozone standard by 2032. As air quality modeling simulation results suggest, the Coachella Valley will not be able to attain the 2015 8-hour ozone standards with non-182(e)(5) controlled measures by the deadline of 2032. Thus, the South Coast AQMD is requesting a voluntary reclassification of the Coachella Valley Portion of the Salton Sea Air Basin from "severe-15" to "extreme" nonattainment for the 2015 8-hour ozone standard, with an extension of the ozone attainment date from ~~June 15~~August 3, 2033 to ~~June 15~~August 3, 2038. The Coachella Valley is anticipated to meet the 2015 8-hour ozone NAAQS in 2037 with the emissions reduction commitment proposed to attain the 2015 ozone NAAQS in the South Coast Air Basin. The detailed emission reduction commitment is provided in Chapter 4 and Appendix IV of this AQMP.

[32] 83 FR 25776