SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Staff Report

Request to Reclassify Coachella Valley for the 2008 8-Hour Ozone Standard and the Updated Motor Vehicle Emissions Budgets

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Executive Summary

The Coachella Valley Planning Area (Coachella Valley) is defined as the desert portion of Riverside County in the Salton Sea Air Basin (SSAB) under the jurisdiction of South Coast Air Quality Management District (South Coast AQMD). The Coachella Valley is classified as a "severe-15" nonattainment area for the 2008 8-hour ozone national ambient air quality standard (NAAQS) of 0.075 parts per million (ppm), with an attainment date of July 20, 2027. Over the past 15 years, the air quality in the Coachella Valley has steadily improved because of the implementation of emission control measures by South Coast AQMD and California Air Resources Board (CARB).

Transportation conformity is required by the federal Clean Air Act (CAA) to ensure that regional transportation plans, programs, and projects are consistent with or conform to a State Implementation Plan (SIP) for meeting the NAAQS. Under the United States Environmental Protection Agency's (U.S. EPA's) transportation conformity regulation, Southern California Association of Governments (SCAG) transportation plans such as the Regional Transportation Plan (RTP) and Federal Transportation Improvement Program (FTIP) are required to demonstrate that the emissions from the proposed plan/program do not exceed the Motor Vehicle Emissions Budget (MVEB). The Coachella Valley MVEB for the 2008 8-hour ozone standard was established in the 2016 Air Quality Management Plan (AQMP) and revised in the 2018 SIP update,[1] which was approved by U.S. EPA with an effective date of October 16, 2020.[2]

When conducting conformity determinations for transportation plan amendments or new projects, SCAG is required to calculate emissions associated with the plan/projects using the latest U.S. EPA approved on-road mobile source emissions model. The MVEB contained in the approved 2008 8-hour ozone SIP was developed using EMFAC2014. However, EMFAC2017, which is the latest model approved by U.S. EPA for the determination of transportation conformity, estimates higher emissions for the same vehicle classes and traffic activities. This is due to updated emissions factors reflecting new and improved laboratory and in-use testing data, not from increases in vehicle miles traveled or activity. Consequently, the new modeled vehicular emissions exceed those in the approved MVEB in the Coachella Valley and are no longer consistent with the SIP. Therefore, no new transportation conformity determinations can be made, resulting in a conformity lockdown for the Coachella Valley. Under a conformity lockdown, only projects in the current conforming RTP/FTIP and exempt projects can move forward; no new transportation projects can proceed.

Conformity lockdowns have serious implications and carry economic penalties. According to SCAG, there are currently $26 billion in transportation projects within SCAG's jurisdiction that are currently being impacted by the conformity lockdown. A new MVEB is necessary to resolve this issue. Under the CAA, states and local agencies can voluntarily request that U.S. EPA reclassify a nonattainment area to a next classification of nonattainment. A voluntary reclassification from "severe-15" to "extreme" nonattainment triggers a SIP revision to address "extreme" nonattainment area planning requirements

[1] https://www.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf.

[2] 85 FR 57714.

including establishing a new MVEB. This would also extend the attainment date for Coachella Valley from July 20, 2027 to as expeditiously as practicable, but no later than July 20, 2032.

Once U.S. EPA grants a reclassification, the revised SIP is not due until U.S. EPA establishes a new submittal deadline. However, due to the urgency of resolving the conformity lockdown, staff proposes to concurrently submit SIP elements required to establish the new MVEB, including a baseline emissions inventory, a Reasonable Further Progress (RFP) demonstration and the revised MVEB. This will expedite the process to update the MVEB and allow SCAG to move forward with their subsequent FTIP and RTP amendments. South Coast AQMD will continue developing a SIP to address the remaining "extreme" ozone nonattainment area requirements under CAA section 182(e). The Coachella Valley is already in "extreme" nonattainment for the 1997 8-hour ozone standard, and the South Coast AQMD is also planning to request reclassification to "extreme" for the 2015 8-hour ozone standard. Therefore, no additional adverse impacts are expected from the change in classification for the 2008 8-hour ozone standard.

Chapter 1 – Introduction

Background

Attainment Status of Coachella Valley for Ozone National Ambient Air Quality Standards

Transportation Conformity and Motor Vehicle Emissions Budgets

Format of this Document

Background

The Coachella Valley Planning Area (Coachella Valley) is defined as the desert portion of Riverside County in the Salton Sea Air Basin (SSAB) under the jurisdiction of South Coast Air Quality Management District (South Coast AQMD). The Coachella Valley Planning Area excludes the tribal lands which are under the jurisdiction of the U.S. EPA. 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 1-1 provides a map of the area and the surrounding topography.

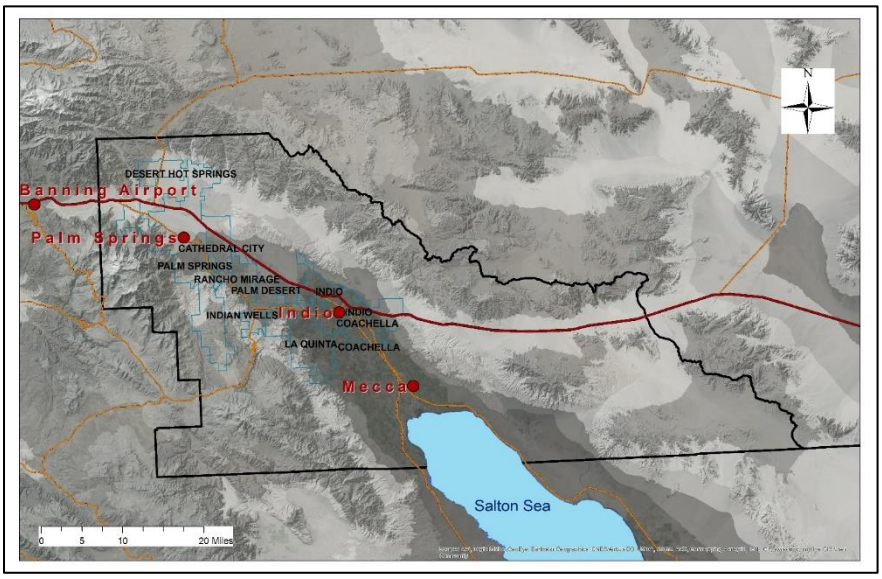

FIGURE 1-1

LOCATION AND TOPOGRAPHY OF THE COACHELLA VALLEY PLANNING AREA

The Coachella Valley is located downwind of the South Coast Air Basin, which is also under the jurisdiction of South Coast AQMD. The combination of topography and climate of Southern California makes the South Coast Air Basin an area of high air pollution potential. Ozone levels in the Coachella Valley are impacted by pollutants directly transported from the South Coast Air Basin as well as pollutants formed secondarily through photochemical reactions from precursors emitted upwind. Local pollutants emitted within the Coachella Valley have limited impact on the ozone levels in the Coachella Valley. While local emission controls benefit Coachella Valley air quality, the area must rely on emission controls being implemented upwind to improve air quality and attain the federal ozone standards.

Attainment Status of Coachella Valley for Ozone National Ambient Air Quality Standards

The U.S. EPA classifies areas of ozone nonattainment (i.e., Extreme, Severe, Serious, Moderate, or Marginal) based on the extent to which an area exceeds the standard. Air districts are permitted to "bump-up" to a higher classification by submitting a voluntary reclassification request, which is subject to U.S. EPA approval. The higher the classification, the more time is allowed to demonstrate attainment in

recognition of the greater challenge to improve ozone air quality. Nonattainment areas with higher classifications are also subject to more stringent requirements.

The Coachella Valley is designated by U.S. EPA as a nonattainment area for the 2015 8-hour ozone standard of 0.070 ppm, the 2008 8-hour ozone standard of 0.075 ppm, and for the 1997 8-hour ozone standard of 0.08 ppm. The ozone nonattainment classifications and attainment deadlines are listed in Table 1-1.

TABLE 1-1
ATTAINMENT STATUS OF THE FEDERAL OZONE AIR QUALITY STANDARDS OF THE COACHELLA VALLEY PLANNING AREA

Criteria Pollutant	Averaging Time	Designation (Classification)	Attainment Date
Ozone (O_3)	(1979) 1-Hour (0.12 ppm)	Attainment	11/15/2007 (attained 12/31/2013)
	(1997) 8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
	(2008) 8-Hour (0.075 ppm)	Nonattainment (Severe)	7/20/2027
	(2015) 8-Hour (0.070 ppm)	Nonattainment (Severe)	8/3/2033

Transportation Conformity and Motor Vehicle Emissions Budgets

Transportation conformity is required by the Federal Clean Air Act (CAA) to ensure that regional transportation plans, programs, and projects are consistent with or conform to a State Implementation Plan (SIP) for meeting the National Ambient Air Quality Standard (NAAQS). Conformity with the SIP means that regional transportation plans, programs, and projects do not cause new violations of the standards, worsen existing violations, or delay timely attainment of the standards. Under U.S. EPA's transportation conformity regulation, Metropolitan Planning Organizations' (MPO) transportation plans such as Southern California Association of Government's (SCAG) Regional Transportation Plan (RTP) and Federal Transportation Improvement Program (FTIP) are required to demonstrate that the emissions from the proposed plan/program do not exceed the Motor Vehicle Emissions Budget (MVEB) established in the SIP. The MVEB is the portion of the total allowable emissions allocated to highway and transit vehicles and is defined in the SIP for the purpose of demonstrating Reasonable Further Progress (RFP) for interim milestone years and attainment of the NAAQS.[3]

[3] Title 40, Code of Federal Regulations (CFR) Part 93 (40 CFR Part 93), Section 93.101.

The MVEB for the 2008 8-hour ozone standard was established in the 2016 AQMP and revised in the 2018 SIP update,[4] which was approved by U.S. EPA with an effective date of October 16, 2020.[5] Since then, the on-road motor vehicle emissions model was updated and the new model generates higher emissions for the same vehicle classes and activities; thus, new estimates are higher than the approved MVEB even though there has not been an increase in vehicle miles traveled or activity. Consequently, the Coachella Valley is no longer able to demonstrate transportation conformity, and is under conformity lockdown.

Conformity lockdowns have serious mobility and economic implications. Only projects in the current conforming RTP/FTIP can move forward and no new projects are allowed, except for exempt projects.[6] According to SCAG, $26 billion of new transportation projects are impacted, with more transportation projects expected to be impacted over time.

To rectify the conformity lockdown, the MVEB for the 2008 8-hour ozone standard needs to be revised. A bump-up of the nonattainment classification from "severe" to "extreme" requires a SIP revision, which provides an opportunity to adjust the MVEB. For this reason, South Coast AQMD is seeking a voluntary reclassification to "extreme" ozone nonattainment for the 2008 ozone NAAQS for Coachella Valley. The reclassification would extend the attainment deadline from July 20, 2027 up to July 20, 2032. Because the Coachella Valley is already classified as "extreme" for the 1997 8-hour ozone standard, there would be no additional adverse impacts for the region as a result of this reclassification.

Recognizing the urgency of resolving the conformity lockdown, staff proposes to perform a two-step submission of the required SIP revision. The first submittal will include the "bump-up" request and the enclosed selected SIP elements necessary to update MVEB, which are a baseline emissions inventory, a RFP demonstration and updated MVEB. The remaining SIP elements will be submitted late 2023 or early 2024 as part of the 2008 8-hour Ozone Extreme Area Plan for the Coachella Valley.

Format of this Document

This document is organized into ten chapters, each addressing a specific topic. Each of the chapters is summarized below.

Chapter 1, "Introduction," includes background, Coachella Valley's ozone air quality settings, transportation conformity and motor vehicle emissions budgets.

Chapter 2, "Motor Vehicle Emissions Budgets and Transportation Conformity," discusses Transportation conformity, the current conformity lockdown and associated consequences in greater detail.

[4] https://www.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf.

[5] 85 FR 57714.

[6] Safety and rehabilitation projects, as well as certain projects with neutral or beneficial effects on air quality, are exempt from conformity.

Chapter 3, “Ozone Air Quality,” discusses ozone air quality characteristics and improvements in the Coachella Valley.

Chapter 4, “Request for Reclassification to Extreme for the 2008 8-Hour Ozone NAAQS,” includes the formal reclassification request from “severe-15” to “extreme” nonattainment for the 2008 8-hour ozone NAAQS for the Coachella Valley.

Chapter 5, “Emissions Inventory for Base and Future Milestone Years” describes the emission inventory used in the subsequent RFP demonstration and Motor Vehicle Emissions Budget

Chapter 6, “Reasonable Further Progress Demonstration for the Extreme Area Plan,” demonstrates that the RFP requirements are satisfied for the extreme area plan for the 2008 8-hour ozone NAAQS for Coachella Valley.

Chapter 7, “Motor Vehicle Emissions Budgets,” presents the revised MVEB for the 2008 8-hour ozone NAAQS extreme area plan.

Chapter 8 “California Environmental Quality Act Analysis,” discusses legal requirements related to CEQA.

Chapter 9, “Public Process,” discusses the role of public participation in developing the voluntary reclassification request and the revised MVEBs.

Chapter 10, “Staff Recommendation,” recommends approval of the reclassification request and RFP demonstration with the revised MVEB to resolve the conformity lockdown.

Chapter 2 – Motor Vehicle Emissions Budgets and Transportation Conformity

Motor Vehicle Emissions Budgets for the 2008 8-Hour Ozone NAAQS

Updating Motor Vehicle Emissions Budgets

Transportation Conformity Regulations and Lockdown

Motor Vehicle Emissions Budgets for the 2008 8-Hour Ozone NAAQS

The MVEB is the portion of the total allowable emissions allocated to highway and transit vehicles. It is defined in the SIP for the purpose of demonstrating Reasonable Further Progress (RFP) for interim milestone years and attainment of the NAAQS.[7] The budget represents the maximum allowable emissions from on-road motor vehicles within a nonattainment area.

On-road motor vehicle emissions are estimated by applying the emission rates calculated by the EMFAC (short for EMission FACtor) model to the transportation activity data, including vehicle miles traveled (VMT) and speed distribution. This data is provided by SCAG in its adopted Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). SCAG develops the RTP/SCS every four years, the FTIP every two years, and occasionally amends them. The RTP/SCS, FTIP, and their amendments are required to demonstrate transportation conformity (i.e., the emissions from the proposed plan or program cannot exceed the MVEB established in the SIP). As part of the conformity determination, SCAG is required to use the most recent EMFAC model approved by the U.S. EPA.

The most recent MVEB for NOx and VOCs for the 2008 8-hour ozone standard was established in the 2016 AQMP and subsequently updated in the 2018 SIP Update.[8] The on-road mobile source emissions in those Plans were estimated using EMFAC2014, the latest U.S. EPA-approved model at the time of the Plan development[9] and the transportation activity data from the SCAG's 2016 RTP/SCS.

Updating Motor Vehicle Emissions Budgets

EMFAC2017 underwent extensive revision from EMFAC2014. EMFAC2017 includes new data and significant changes to the methodologies regarding the calculation of motor vehicle emissions factors based on data from studies on car and truck emissions, and emissions reductions associated with regulations. On August 15, 2019, the U.S. EPA approved EMFAC2017 for use in SIPs and to demonstrate transportation conformity, effective August 16, 2019.[10] The U.S. EPA also allowed a two-year grace period until August 16, 2021, during which both EMFAC2014 and EMFAC2017 could be used for regional emissions analyses. SCAG's subsequent transportation plan, the 2020 RTP/SCS employed EMFAC2014.

The 2020 RTP/SCS estimates generally lower VMTs in the region than those from the 2016 RTP/SCS. SCAG's RTP provides vehicular activities for four categories: light and medium duty vehicles, light-heavy vehicles, medium-heavy vehicles and heavy-heavy vehicles. The activity of light- and medium-duty

[7] 40 CFR Part 93, Section 93.101.

[8] 2018 Updates to the California State Implementation Plan, October 25, 2018, available at: https://www.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.125205769.225247069.1661834629-935999839.1593032779.

[9] U.S. EPA approval of EMFAC2014 can be found at 80 FR 77337, available at: https://www.govinfo.gov/content/pkg/FR-2015-12-14/pdf/2015-31307.pdf.

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

vehicles, including passenger cars and light- and medium-duty trucks, are similar to the 2016 RTP traffic activity. However, vehicle miles traveled by heavy-duty vehicles (including light, medium, and heavy heavy-duty gas and diesel trucks categories) were projected to be lower than the 2016 RTP estimates. The reduced VMTs are more prominent in the heavy heavy-duty category. Since the 2020 RTP used the same emission rates as those in the previous RTP (i.e., EMFAC2014 was used both in the 2016 and 2020 RTPs), reduced vehicular activities, especially in heavy-duty vehicles resulted in significantly lower NOx emissions in the 2020 RTP. Therefore, the emissions from the amended RTP were lower than the MVEB and conformed to the latest approved SIP.

Upon the expiration of the EMFAC2014 grace period, RTP/FTIP amendments and new projects are required to use EMFAC2017. While EMFAC2017 reflects new and improved laboratory and in-use testing data, it has higher emission rates especially for heavy-duty trucks with 2010 and newer model year engines. This is largely driven by new data showing higher NOx emissions under low engine load. VOC emissions from EMFAC2017 are marginally lower than those from EMFAC2014. NOx and VOC emissions estimated by EMFAC2017 are compared to the estimates by EMFAC2014 using the 2020 RTP vehicle activity data. Figure 2-1 shows NOx and VOC emissions years 2023, 2026, 2029 and 2031, by major vehicle categories. Figure 2-2 shows the aggregated total on-road emissions estimated by EMFAC2014 and EMFAC2017. While VOC emissions estimated by EMFAC2017 are lower than the estimates by EMFAC2014, future NOx emissions estimated with EMFAC2017 are significantly higher than those estimated with EMFAC2014. The difference in NOx emissions increases gradually towards later years due to the increasing presence of heavy-duty trucks for 2010 and newer model years. While light-duty vehicles have lower running exhaust emissions in EMFAC2017, they have higher start emissions compared to EMFAC2014. Collectively, the changes result in substantially higher NOx emissions that exceed the emissions in the approved MVEB even when identical travel activity data are used.

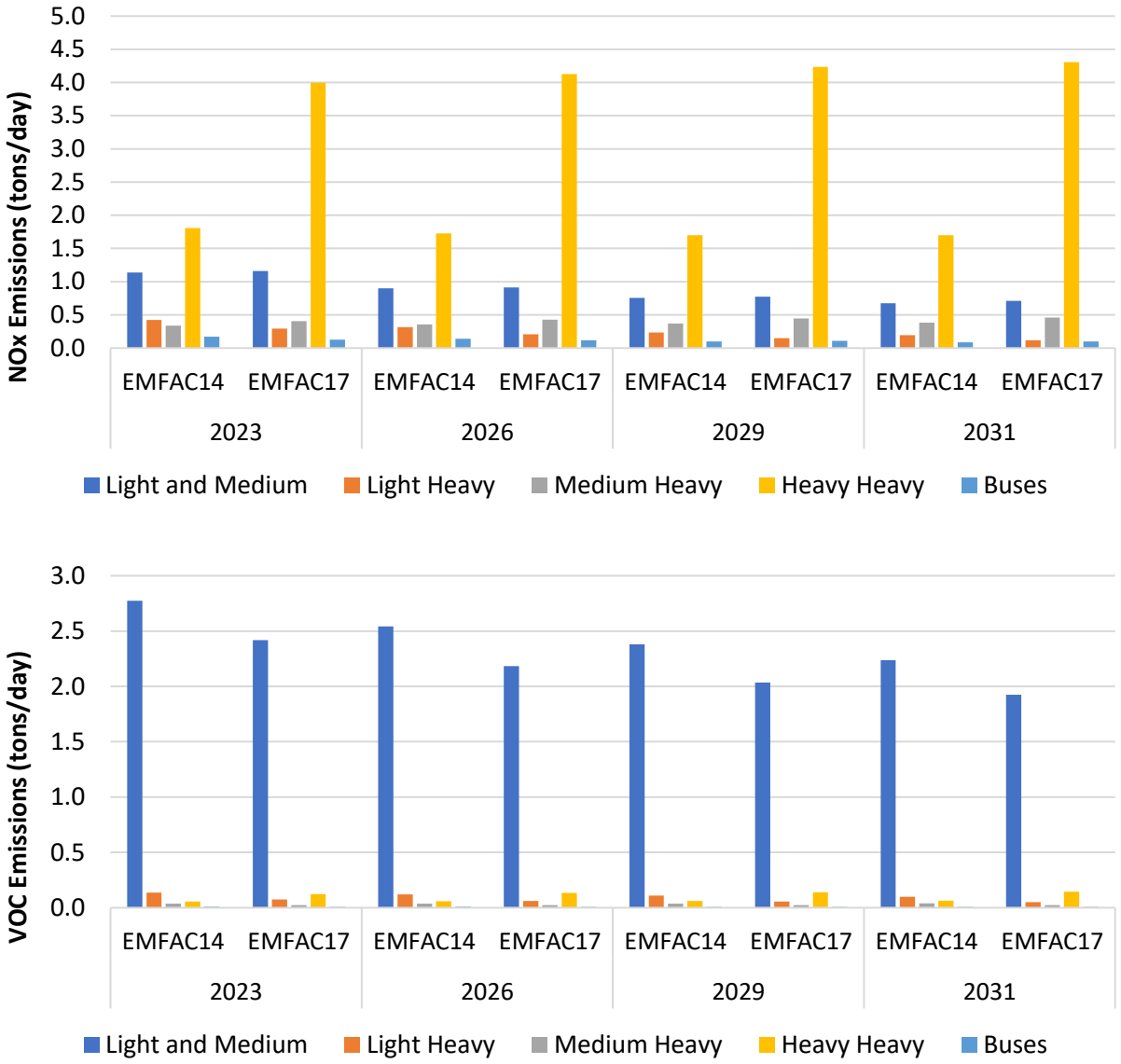

FIGURE 2-1

COMPARISON OF NOX AND VOC SUMMER PLANNING EMISSIONS FROM MAJOR VEHICLE CLASSES ESTIMATED BY EMFAC2014 AND EMFAC2017 USING THE 2020 RTP TRAVEL ACTIVITY DATA. 'EMFAC14' AND 'EMFAC17' REPRESENT EMFAC2014 AND EMFAC2017, RESPECTIVELY

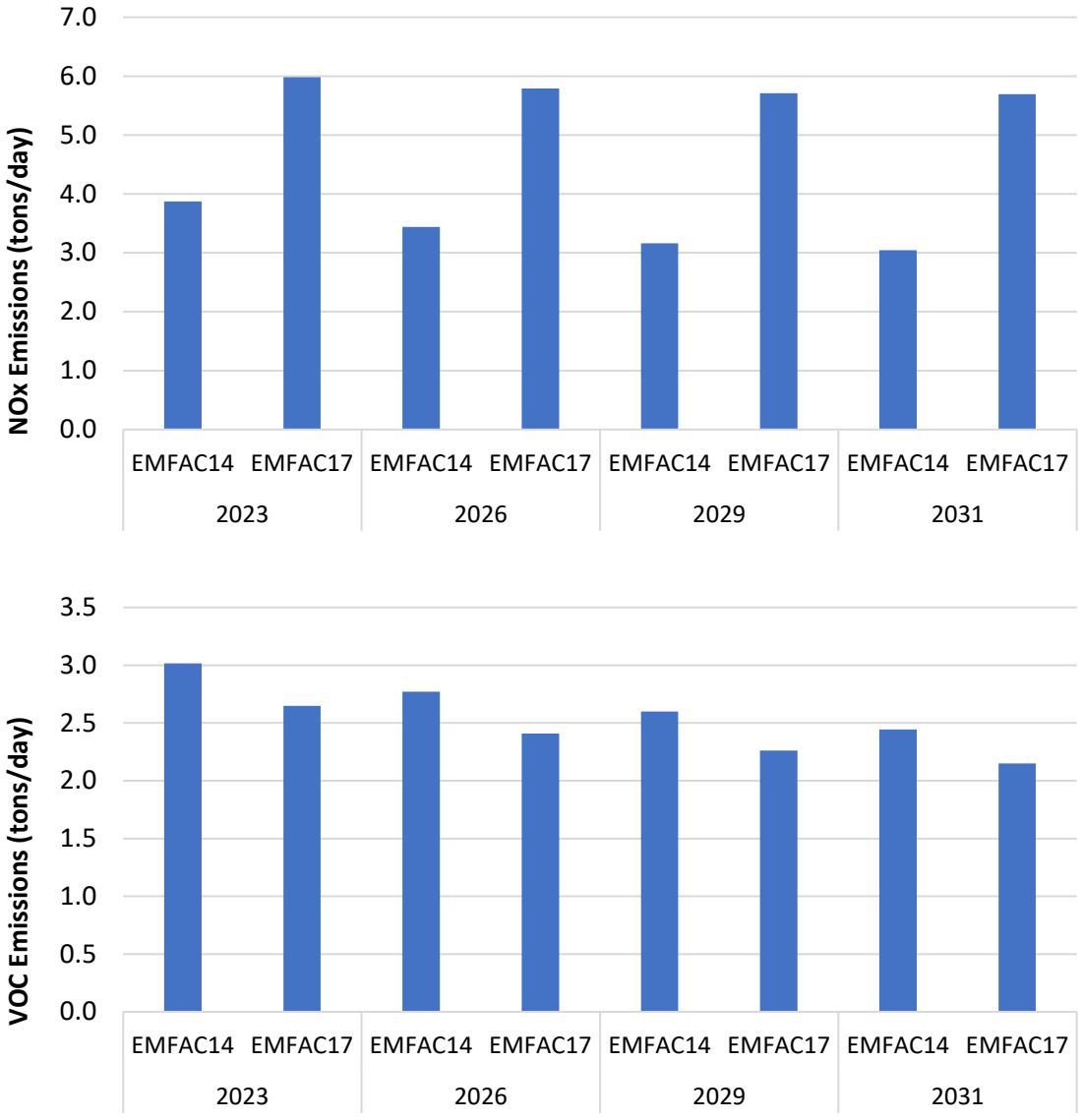

FIGURE 2-2

COMPARISON OF OVERALL NOX AND VOC SUMMER PLANNING EMISSIONS FROM ON-ROAD SOURCES ESTIMATED BY EMFAC2014 AND EMFAC2017 USING THE 2020 RTP TRAVEL ACTIVITY DATA. 'EMFAC14' AND 'EMFAC17' REPRESENT EMFAC2014 AND EMFAC2017, RESPECTIVELY

Transportation Conformity Regulations and Lockdown

Transportation conformity is required by the Federal CAA to ensure that regional transportation plans, programs, and projects are consistent with or "conform" to SIP/Air Quality Management Plan (AQMP) requirement. Specifically, transportation conformity means that the regional transportation plans, programs, and projects will not cause new violations of the national air quality standards, worsen the

existing violations, or delay the timely attainment of the standards. Under the U.S. EPA's Transportation Conformity Regulations, the RTP and FTIP are required to pass the following conformity tests:

- Consistency with the adopted RTP: The FTIP project listing must be consistent with the policies, programs, and projects of the adopted RTP.
- Regional emission analysis: The RTP and FTIP regional emissions must not exceed the MVEB in the applicable SIPs. Where there are no applicable budgets, the build scenario's emission must not exceed the no-build scenario's emissions and/or the build scenario's emission must not exceed the base year emissions.
- Timely implementation of transportation control measures (TCMs): The RTP and FTIP must demonstrate that the TCM project categories listed in the applicable SIPs have been given funding priority, implemented on schedule, and, in the case of any delays, any obstacles to implementation have been overcome.
- Financial constraint: The RTP and FTIP must be financially constrained, in other words, the RTP and FTIP must be based on reasonable estimates about future revenues. In addition, in the first two years of the FTIP, projects must be limited to those for which funds are known to be available and committed.
- Interagency consultation and public involvement: RTP/FTIP must go through interagency consultation and public processes.

A regional transportation conformity failure can cause serious consequences. A transportation "conformity lockdown" occurs when the transportation conformity determinations of the current RTP/SCS and FTIP are still valid, but no new transportation conformity determination may be made. Under a conformity lockdown, only projects in the current conforming RTP/FTIP can move forward. No new RTP/FTIP amendment is allowed, meaning no new transportation projects except for exempt projects can move forward.

Coachella Valley is currently in transportation conformity lockdown. The current lockdown is due to the methodology update in EMFAC2017, which estimates higher NOx emissions for certain vehicular classes based on new and improved testing data, not because of increased vehicular activities. In fact, the traffic activity in the 2020 RTP is lower than that in the 2016 RTP.

SCAG develops the RTP/SCS every four years, the FTIP every two years, and their amendments from time to time. SCAG is due to develop the 2022 FTIP; however, while under the conformity lockdown, no new RTP/FTIP amendment is allowed except for exempt projects. According to SCAG, over $26 billion worth of transportation projects are being impacted because SCAG cannot add new projects or amend current projects due to the conformity lockdown. More transportation projects are expected to be impacted over time.

Chapter 3 – Ozone Air Quality

Air Quality Monitoring in the Coachella Valley

Factors that Influence Ozone Concentrations in the Coachella Valley

Ozone Monitoring Data

Ozone Attainment Status

Air Quality Monitoring in the Coachella Valley

South Coast AQMD has historically monitored Coachella Valley ozone concentrations at Indio and Palm Springs. 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 South Coast Air Basin. Indio is further east in the Coachella Valley, on the downwind side of the main population areas of the Coachella Valley. Both sites have routinely measured ozone (O_3), particulate matter with a diameter less than 10 micron (PM10), particulate matter with a diameter less than 2.5 micron (PM2.5), sulfates (from PM10), and several meteorological parameters. The Palm Springs station also measures carbon monoxide (CO), and nitrogen dioxide (NO2). The Indio station was temporary closed in the spring of 2022 due to issues securing the lease, but it is expected to reopen in a similar location before the end of 2022. This chapter provides an overview of how O_3 is formed and transported to the Coachella Valley, and summarizes historic O_3 data from the area.

Factors that Influence Ozone Concentrations in the Coachella Valley

Ozone is not emitted directly into the atmosphere; near-surface ozone, in contrast to stratospheric ozone, is formed by the reaction of volatile organic compounds (VOCs) with oxides of nitrogen (NOx) in the presence of sunlight. In this context, VOCs and NOx are known as O_3 precursors. Figure 3-1 illustrates the processes influencing ozone concentrations in the Coachella Valley. NOx is generated from combustion of fossil fuels, whereas VOCs are emitted from a wide variety of sources such as consumer products, mobile sources, vegetation, and combustion. Wildfires generate both NOx and VOCs. The chemical reactions that form ozone are highly complex and depend not only on NOx and VOC levels, but also on the ratio of VOC to NOx concentrations. Meteorological conditions such as temperature (T), relative humidity (RH), the amount of sunlight also influence the chemical formation of ozone. NOx emissions can even reduce ozone concentrations in the immediate vicinity of an emission source, but will contribute to ozone formation downwind.

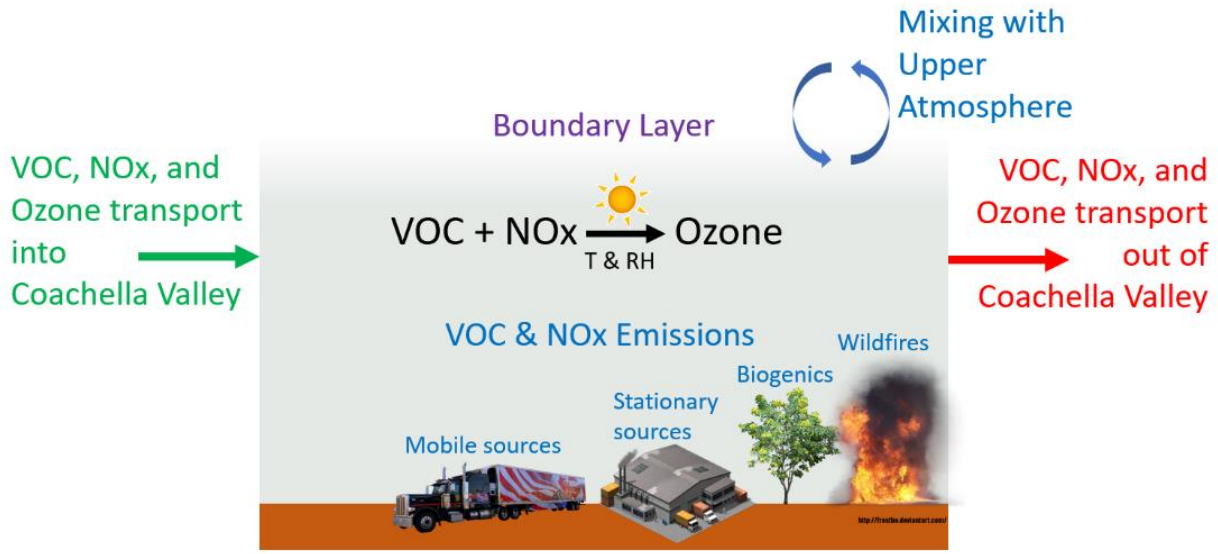

FIGURE 3-1
SCHEMATIC OF PROCESSES INFLUENCING OZONE CONCENTRATIONS IN THE COACHELLA VALLEY

Transport from upwind areas and ozone formation

Ozone in the Coachella Valley is both directly transported from the Basin and formed photochemically from precursors emitted upwind and within the Coachella Valley. The precursors are emitted in the greatest quantity in the coastal and central Los Angeles County areas of the South Coast Air Basin (Basin). The Basin's prevailing sea breeze causes polluted air to be transported inland. As the air is being transported inland, ozone is formed, with peak 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 and its precursors from these upwind areas mostly enter the Coachella Valley through the San Gorgonio Pass. Ozone levels in the Coachella Valley are therefore mostly due to emissions upwind of the area, with a smaller influence from sources within. As the air is transported further inland into the Coachella Valley through the San Gorgonio Pass, ozone concentrations typically decrease due to dilution, but can remain high enough to exceed ozone standards.

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 pollution transport. Figure 3-2 shows averaged 1-hour ozone concentrations for the May–October smog season, by hour, for the 2019–2021 period. At stations near where most ozone precursors 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 via chemical reactions. Ozone peaks near the emissions source region are not as high as those further downwind, due to the time required for ozone to form. From Los Angeles to Banning, ozone peaks occur later in the day as ozone and ozone precursors are transported downwind and ozone-forming reactions continue. At Palm Springs and Indio, ozone concentrations mostly plateau below the levels measured in Banning, between late morning and early

evening. This suggests there is little additional ozone buildup downwind of Banning in the Coachella Valley itself. Any new ozone formed within the Coachella valley is approximately counter-balanced by enhanced atmospheric dispersion caused by intense daytime heating.

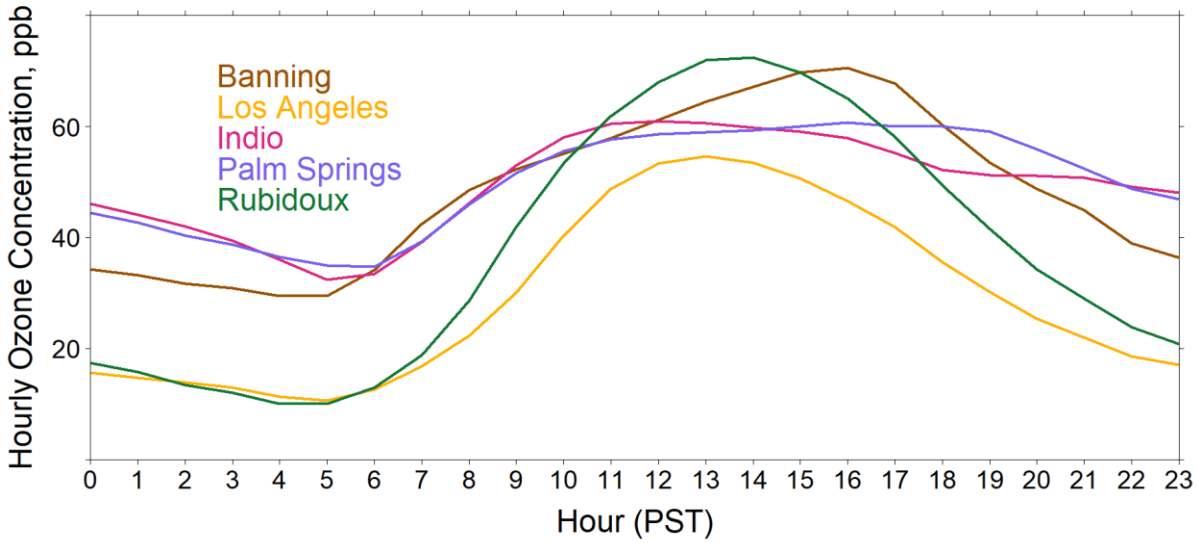

FIGURE 3-2

DIURNAL PROFILE OF 3-YEAR (2019–2021) 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 Basin have more local NOx emissions (mostly from mobile sources) that titrate ozone during nighttime whereas the Coachella Valley has limited local NOx emissions to titrate the ozone at night.

Meteorology and emissions

Ozone concentrations are heavily dependent on meteorological conditions. High ozone concentrations 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 in the Coachella Valley. Ozone concentrations are a strong function of season for several reasons. First, the rate of the reactions that produce ozone in the atmosphere proceeds faster at higher temperatures. Second, elevated temperatures lead to increased precursor concentrations – the chemicals that react together to form ozone - by hastening the evaporation of VOCs into the air. Third, ozone concentrations are also dependent on sunlight intensity and duration, which are stronger during the summer months. Finally, the stability of the atmosphere also

influences ozone concentrations as strong inversions limit mixing with the upper atmosphere, leading to elevated concentrations at the surface.

Year-to-year changes in meteorology can alter transport patterns, leading to changes in precursors and upwind ozone entering the Coachella Valley. Elevated temperatures and reduced atmospheric mixing can also contribute to additional ozone formation. In addition, the North American Monsoon, which can increase humidity and afternoon thunderstorms in the Coachella Valley between July and September can also affect ozone concentrations.

Biogenic VOC emissions (those emitting from vegetation) may also exhibit large year-to-year variations. Vegetation is a large source of VOCs, especially during summer months. Vegetative growth is highly dependent on rainfall during the growing season, which exhibits significant year-to-year variations throughout California.

While it is difficult to measure anthropogenic emissions (emissions from human activity) of NOx and VOCs directly, South Coast AQMD's emissions inventory included in the recent Air Quality Management Plans indicates that emissions from anthropogenic sources in the South Coast Air Basin have declined and will continue to decline.

Ozone Monitoring Data

Figure 3-3 shows that Palm Springs exceeds the 1997, 2008, and 2015 8-hr ozone standards more frequently than Indio. This is consistent with the former site being closer to source areas.

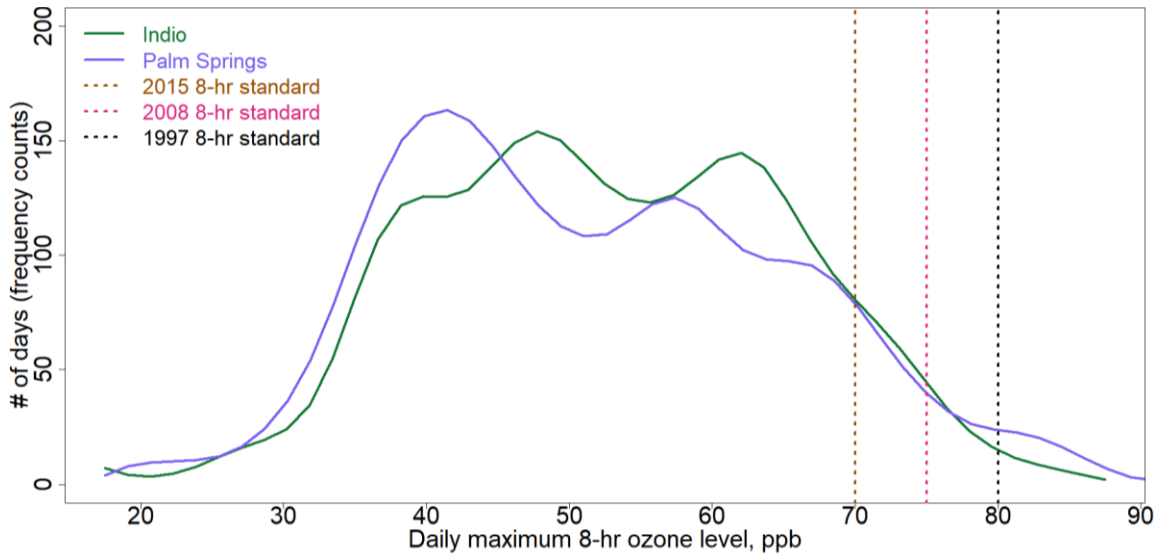

FIGURE 3-3

OZONE HISTOGRAMS FOR THE COACHELLA VALLEY, 2019–2021

South Coast AQMD's Real-time AQI map[11] helps visualize how pollutant levels vary spatially using regulatory measurements at South Coast AQMD monitoring sites, low-cost sensor data (PM2.5 only) and predictions from a chemical transport model (O3 and PM2.5). Hourly AQI map archives from May – October 2021 were analyzed to determine the number of exceedances. Figure 3-4 confirms the decreasing northwest-to-south/southeast gradient across the valley, as one moves further from the main source region.

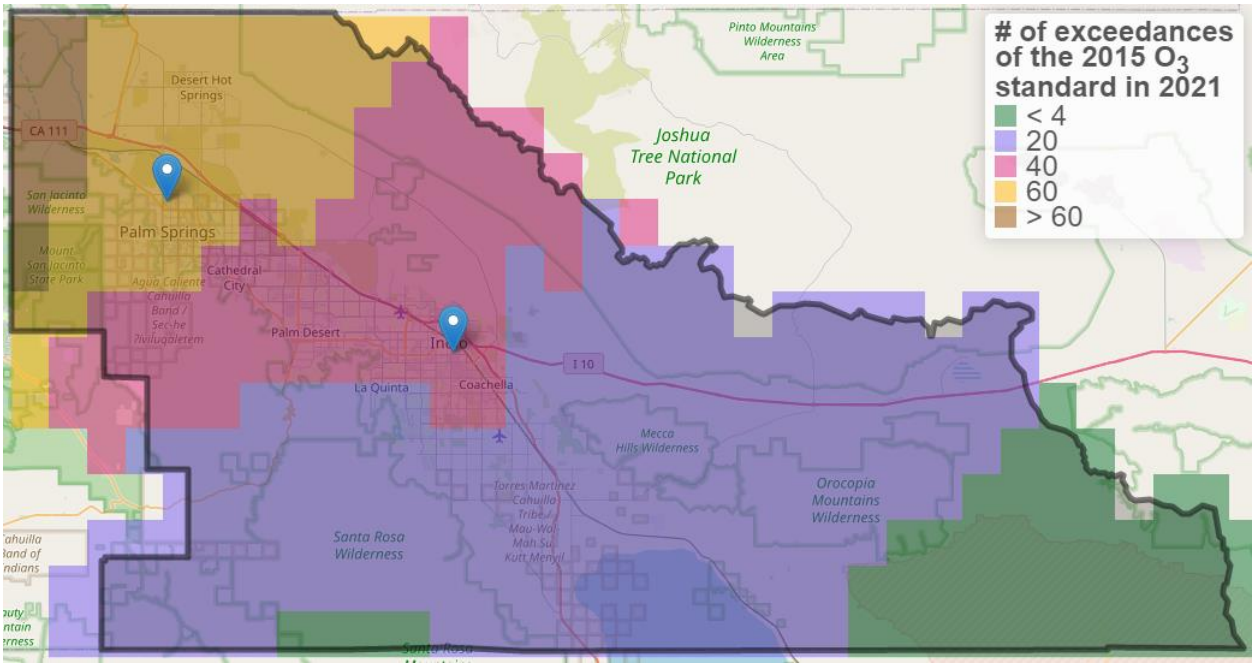

FIGURE 3-4

NUMBER OF TIMES THE MAXIMUM DAILY 8-HR AVERAGE (MDA8) OZONE IN 2021 WITHIN THE COACHELLA VALLEY EXCEEDED 0.07 PPM (2015 8-HR STANDARD). THE LOCATIONS OF THE PALM SPRINGS AND INDIO MONITORS ARE SHOWN, ALONG WITH THE BOUNDARY OF SRA #30

(DATA ARE FROM ARCHIVES OF AQMD'S INTERPOLATED REAL-TIME AQI MAP)

Ozone Attainment Status

Design values are statistical metrics that are used to compare pollutant concentrations with the NAAQS. Trends in the 8-hour ozone design value and the 1-hour ozone design value are plotted in Figure 3-5.

[11] Schulte, N., Li, X., Ghosh, J. K., Fine, P. M., & Epstein, S. A. (2020). Responsive high-resolution air quality index mapping using model, regulatory monitor, and sensor data in real-time. *Environmental Research Letters*, *15*(10), 1040a7.

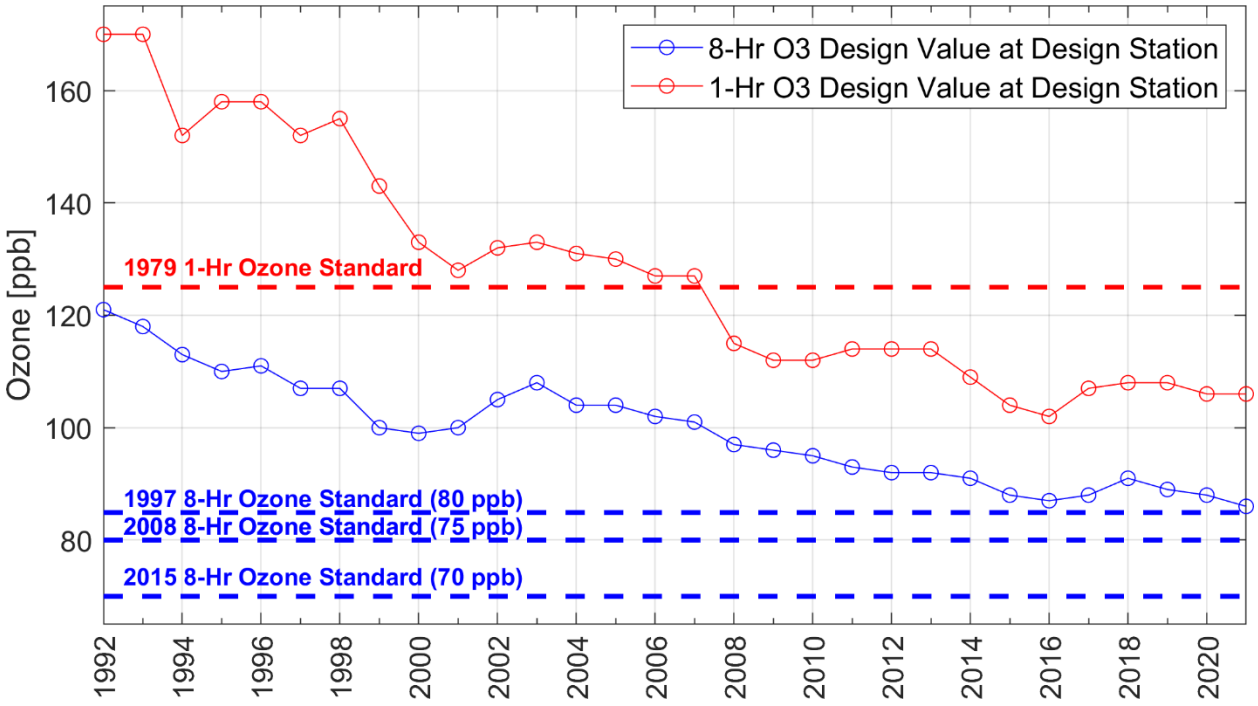

FIGURE 3-5

COACHELLA VALLEY 3-YEAR DESIGN VALUE TRENDS OF OZONE, 1992–2021

(THE YEAR PLOTTED IS THE END YEAR OF THE 3-YEAR DESIGN VALUE)

While the Coachella Valley attains the former 1-hour federal ozone standard, the area exceeds the 8-hour NAAQS. In each year, the Palm Springs monitoring station had the highest design value, and therefore the Palm Springs measurement data reflects the design location for the Coachella Valley. The least-stringent 1997 8-hour standard is met if the design value is less than or equal to 0.084 ppm (84 ppb), due to rounding conventions associated with the 2008 standard of 0.08 ppm. The most recent design value is just 0.002 ppm (2 ppb) over this and is the lowest that has ever been recorded. Ozone design values in the Coachella Valley are expected to continue to decrease because of emission reductions in the South Coast Air Basin and Coachella Valley.[12]

In summary, the Coachella Valley has experienced a multi-decadal trend of steady ozone improvements over the years, however, additional improvements are needed to achieve the 8-hour ozone standard. Due to ozone transport patterns and chemistry, this goal is inextricably linked to ozone reductions in the South Coast Air Basin.

[12] 2022 Draft South Coast AQMD Air Quality Management Plan. Available at http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan#.

Chapter 4 – Request for Reclassification to Extreme for the 2008 8-Hour Ozone NAAQS

Introduction

The Coachella Valley is currently classified as a "severe-15" ozone nonattainment area for the 2008 8-hour standard, with an attainment deadline of July 20, 2027. CAA 181(b)(3) allows for a voluntary reclassification request by any State to reclassify to a higher classification for a nonattainment area. Once U.S. EPA grants the reclassification, the State is required to submit a SIP revision to demonstrate attainment and to address the applicable federal Clean Air Act requirements, including MVEB. The reclassification of Coachella Valley to extreme nonattainment for the 2008 8-hour ozone standard provides an opportunity to revise the MVEB which, upon U.S. EPA's adequacy finding, will resolve the conformity lockdown and alleviate billions of dollars of economic penalties associated with restrictions under the conformity lockdown. The reclassification provides more time to reach attainment as well. Since Coachella Valley is already in extreme nonattainment for the 1997 8-hour ozone standard, extreme nonattainment area requirements are already in place, therefore no regulatory or additional adverse impact is expected from this reclassification.

1997 8-Hour Ozone NAAQS Reclassification to an Extreme Nonattainment Area

On June 7, 2019, the South Coast AQMD Governing Board approved a voluntary request that the U.S. EPA reclassify the Coachella Valley from Severe-15 to Extreme nonattainment for the 1998 8-hour ozone NAAQS, with a new attainment date of June 15, 2024.[13] The voluntary request for reclassification was submitted through CARB to the U.S. EPA, which granted the reclassification request effective July 10, 2019.[14] The U.S. EPA subsequently required that California submit a State Implementation Plan (SIP) revision to address the requirements of CAA section 182(e) as well as revisions to the New Source Review (NSR) and Title V rules. Additionally, the SIP revision had to include the development of contingency measures, an attainment demonstration, a reasonably available control technology analysis, and increased offset ratios for new sources. These requirements were fulfilled as stated in the Extreme Area Plan for 1997 8-hour ozone NAAQS, which was adopted by the South Coast AQMD Board on December 4, 2020[15] and submitted the Plan to the U.S. EPA on December 28, 2020[16] via CARB. The Plan remains under U.S. EPA's review as of September 1, 2022.

[13] http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2019/2019-jun7-027.pdf?sfvrsn=2.

[14] 84 FR 32841.

[15] http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2020/2020-dec4-031.pdf?sfvrsn=2.

[16] https://ww2.arb.ca.gov/resources/documents/2020-coachella-valley-extreme-8-hour-ozone-plan.

2008 8-Hour Ozone NAAQS SIP Status

The Coachella Valley SIP for the 2008 8-hour ozone standard was established in the 2016 AQMP.[17] The 2016 AQMP contained air quality analyses, an emissions inventory for ozone precursors – oxides of nitrogen and volatile organic compounds – a modeled attainment demonstration, reasonably available control measures (RACM) demonstration, RFP demonstrations, a vehicle miles travelled (VMT) offset demonstration, and MVEB.

The 2016 AQMP used 2012 as the base year to project baseline emissions for future RFP milestone years and the attainment year, 2026. The U.S. EPA's Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements [18] (hereafter referred to as "SIP Requirements Rule for the 2008 ozone NAAQS") requires the base year to be the most recent calendar year for which a complete triennial inventory is required to be submitted to U.S. EPA under the provisions of Subpart A of 40 CFR Part 51, Air Emissions Reporting Requirements, 40 CFR Part 51, Section 51.1–51.50. While the latest triennial year for U.S. EPA's National Emissions Inventory was 2011 at the time of nonattainment designation, the SIP Requirements Rule allowed a State to choose the year of nonattainment designation as an alternative base year, which was 2012.

In response to the court decision in *South Coast Air Quality Management District v. U.S. EPA,* 882 F.3d 1138 (D.C. Cir. 2018), which vacated U.S. EPA's SIP Requirements Rule for the 2008 ozone NAAQS with respect to the use of an alternative base year, CARB developed the 2018 Updates to the California State Implementation Plan[19] (referred as "2018 SIP Update'') and replaced the RFP demonstration using the required base year, 2011. The 2018 SIP Update continued to demonstrate RFP with a new base year and surplus NOx reductions as ranging from approximately 10.1 tpd to 12.8 tpd depending upon the RFP milestone year.

Complying with CAA sections 172(c)(9) and 182(c)(9), the 2016 AQMP included contingency measure elements for RFP, which relied upon surplus emissions reductions from already implemented control measures in the milestone years. Attainment contingency measures were included in a CARB staff report submitted on May 5, 2017.[20]

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[17] http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

[18] 80 FR 12264, 12285 (March 6, 2015).

[19] Available at: https://www.arb.ca.gov/planning/sip/2018sipupdate/2018update.pdf?_ga=2.41245602.1692993247.1654823216-816060816.1597333165.

[20] CARB Staff Report - Coachella Valley 8-Hour Ozone Attainment Contingency available at https://ww3.arb.ca.gov/planning/sip/planarea/scabsip/cvcont2017.pdf;

CARB Resolution 17-13 https://ww3.arb.ca.gov/planning/sip/planarea/scabsip/res17-13.pdf;

Submittal letter to U.S.E PA https://ww3.arb.ca.gov/planning/sip/planarea/scabsip/cvcont2017_arbltr.pdf.

However, the U.S. Court of Appeals for the Ninth Circuit decision in *Bahr v. U.S. Environmental Protection Agency*, 836 F.3d 1218 (9th Cir. 2016) ruled that emissions reductions from control measures that have already been implemented may not be counted as contingency measures. To comply with the new requirements, the 2018 SIP Update included a contingency measure for the Coachella Valley, which was later withdrawn on January 8, 2021, and accompanying demonstrations related to the contingency measure requirements.

U.S. EPA approved the Coachella Valley portion of the 2016 AQMP and the 2018 SIP update as meeting all applicable statutory and regulatory requirements, with the exception of the contingency measure elements, for which U.S. EPA deferred action.[21] U.S. EPA indicated that it faced a deadline of September 30, 2022 to take final action on these two measures.

As of September 1, 2022, U.S. EPA has not provided updated guidance for states to develop contingency measures. One of the outstanding questions needed to develop a contingency measure is the specific level of emission reductions that implementation of contingency measures must achieve. U.S. EPA's past interpretation is that such measures should provide for emission reductions approximately equivalent to one year's worth progress, amounting to reductions of 3 percent of the baseline emissions inventory for the nonattainment area. Such a relatively large emission reduction is virtually impossible to achieve in areas that have already taken all feasible measures to reduce emissions, or whose emissions are largely transported from other regions. U.S. EPA's approval of a contingency measure that achieved far less emissions reduction was recently challenged. The 9th Circuit held that U.S. EPA's approval of the measure was arbitrary and capricious absent a rationale for deviating from past guidance.[22] Due to the lack of U.S. EPA's guidance and scarcity of opportunities to achieve one year's worth of reductions, South Coast AQMD requested to withdraw the contingency measure elements for the RFP and attainment contingency measures for the 2008 ozone NAAQS on June 24, 2022, which was submitted to U.S. EPA on August 8, 2022 via CARB.

2015 8-Hour Ozone NAAQS SIP Status

The Coachella Valley is currently classified as "severe-15" nonattainment for the 2015 8-hour ozone standard with an attainment deadline of August 3, 2033. As discussed in the Chapter 5, the ozone levels in Coachella Valley are primarily driven by the transport of ozone and its precursors from the South Coast Air Basin. Accordingly, Coachella Valley's attainment of the standard depends on emission reductions in the South Coast Air Basin. Most emissions reductions needed for attainment in the South Coast Air Basin are expected to occur close to 2037, the attainment year for the 2015 standard. Coachella Valley's attainment by the original severe-15 deadline would be impracticable. Therefore, the 2022 AQMP includes a request to U.S. EPA to reclassify the Coachella Valley to "extreme" nonattainment with a new attainment deadline of August 3, 2038, which is the same attainment deadline for the South Coast Air Basin.

[21] 85 FR 57714.

[22] *Association of Irritated Residents v. U.S. Environmental Protection Agency*, 10 F 4th 937 (9th Cir. 2021).

Requirements Upon Reclassification to an Extreme Nonattainment Area

Upon U.S. EPA's granting the voluntary bump-up request, a revision to the State Implementation Plan (SIP) is required to address extreme nonattainment area requirements and to demonstrate attainment by the new attainment deadline. While detailed plan requirements and the submittal deadline will be established by U.S. EPA's rulemaking, the SIP revision would need to address the following ozone extreme nonattainment area requirements in addition to severe nonattainment area requirements:

(1) An attainment demonstration with a pathway to attain the 2008 8-hour ozone NAAQS as expeditiously as practicable, but no later than July 20, 2032, 20 years from the original designation date;
(2) Base and future milestone year emissions inventories;
(3) A control strategy for attainment;
(4) Additional reasonably available control technology (RACT) rules to address sources subject to the lower extreme area major source threshold;
(5) A reasonably available control measures (RACM) demonstration pursuant to CAA 172(c)(1);
(6) A VMT offset demonstration for the 2031 attainment year;
(7) A revised major stationary source definition;
(8) A modified offset ratio unless federal best available control technology (BACT) is required for all new or modified existing major sources;
(9) Modifications at major station sources pursuant to CAA 182(e)(2);
(10) Revised NOx requirements pursuant to CAA 182(f) and 182(e)(1);
(11) Use of clean fuels or advanced control technology for boilers as described at CAA 182(e)(3); and
(12) Contingency measures.

Impacts on Major Stationary Sources

As discussed earlier in this chapter, the Coachella Valley is already in extreme nonattainment for the 1997 8-hour ozone NAAQS, and South Coast AQMD's Coachella Valley Extreme Area Plan for the 1997 8-Hour Ozone Standard already addressed applicable federal CAA 182 requirements for extreme nonattainment areas. For example, the major stationary source threshold for Coachella Valley has already been lowered to 10 tons per year of VOC and NOx as required under CAA 182(e). As extreme area requirements have already been addressed, South Coast AQMD would not need to amend the Title V Program or NSR Program and anticipates no impacts to any major stationary sources. Therefore, no adverse impact is expected from this reclassification.

Chapter 5 – Emissions Inventory for Base and Future Milestone Years

Introduction

Inventory Base Year

Forecasted Inventories

On-Road Mobile Source Emissions

Other Emission Sources

Introduction

Emissions inventories are required by the CAA and the Ozone SIP Requirements Rule for the 2008 ozone NAAQS[23] for those areas that exceed the health-based NAAQS. These nonattainment areas must develop an emissions inventory as the basis of a State Implementation Plan (SIP) that demonstrates how they will attain the NAAQS by specified dates.

Emissions inventories are estimates of the amount and type of pollutants emitted into the atmosphere by facilities, mobile sources, and areawide sources. They are fundamental components of an air quality plan and serve critical functions such as:

1. The primary input to air quality modeling used in attainment demonstrations;
2. The emissions data used for developing control strategies; and
3. A means to track progress in meeting the emission reduction commitments.

South Coast AQMD and CARB have developed a comprehensive current emissions inventory consistent with the requirements set forth in Section 182(a)–(f) of the federal Clean Air Act.[24] South Coast AQMD and CARB staff conducted a thorough review of the inventory to ensure that the emission estimates reflect accurate emissions reports for point sources and that estimates for mobile and areawide sources are based on the most recent approved models and methodologies. Detailed methodology and emissions by major source category are provided in Attachment A.

Inventory Base Year

40 CFR Part 51, Section 51.1115(a) requires that the inventory year be selected consistent with the baseline year for the reasonable further progress (RFP) plan as required by 40 CFR Part 51, Section 51.1110(b), which states that the baseline year emissions inventory shall be the emissions inventory for the most recent calendar year of which a complete triennial inventory is required to be submitted to U.S. EPA under the provisions of Subpart A of 40 CFR Part 51, Air Emissions Reporting Requirements, 40 CFR Part 51, Section 51.1–51.50. For the Coachella Valley Extreme RFP Plan, an RFP baseline year of 2011 was selected since that was the most recent calendar year of which a complete triennial inventory was required at the time of the final designations of Coachella Valley as nonattainment for the 75 ppb 8-hour ozone NAAQS.[25] California Emission Projection Analysis Model (CEPAM) 2022 v1.01, the most updated emissions inventory developed for the inclusion of the 2015 8-hour ozone SIP, uses a 2018 base year; the inventory was calibrated to 2018 emissions and activity levels, and inventories for other years were

[23] Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements (40 CFR Part 51 Subpart AA; see also https://www.epa.gov/ground-level-ozone-pollution/implementation-2008-national-ambient-air-quality-standards-naaqs-ozone).

[24] Section 182(a)-(f) of the Act. https://www.govinfo.gov/content/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapI-partD-subpart2-sec7511a.htm

[25] https://www.epa.gov/green-book/green-book-8-hour-ozone-2008-area-information.

backcasted or forecasted from that base inventory. This extreme area RFP plan uses the emissions inventory developed based on the CEPAM 2022 v1.01.

Forecasted Inventories

Forecasted inventories are a projection of the base year inventory that reflect expected growth trends for each source category and emissions reductions due to adopted control measures. Forecasted inventories were developed for 2020, 2023, 2026, 2029, and 2031. Detailed emissions by major source category are provided in Attachment A.

On-Road Mobile Source Emissions

Emissions from on-road mobile sources, which include passenger vehicles, buses, and trucks, were estimated using outputs from CARB's EMFAC2017 model. The on-road emissions were calculated by applying EMFAC2017 emission factors to the transportation activity data from SCAG's 2020 RTP/SCS.

EMFAC2017 includes data on California's car and truck fleets and travel activity. Light-duty motor vehicle fleet age, vehicle type, and vehicle population were updated based on 2016 DMV data. The model also reflects the emissions benefits of CARB's recent rulemakings such as the Pavley Standards and Advanced Clean Cars Program and includes the emissions benefits of CARB's Truck and Bus Rule and previously adopted rules for other on-road diesel fleets.

The emissions reflected in this on-road inventory for Coachella Valley are the EMFAC2017 "baseline" emissions without the impact of Advanced Clean Trucks (ACT), Omnibus, and Heavy-Duty I/M. Additional information and documentation on the EMFAC2017 model is available at: *https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation*

Other Emission Sources

The methodology to develop the emissions inventories for stationary and off-road sources is consistent with the Revised Draft 2022 AQMP, except the benefit of additional emission reductions from CARB's Small Off-road Engines regulation is not reflected in the baseline emissions.

Figure 5-1 displays the NOx summer planning emission by major source category for Coachella Valley in 2011, 2023 and 2031. Mobile sources are the major contributor to total NOx emissions in the base year and future year inventories. NOx emissions are projected to decrease almost 50 percent between 2018 (27.5 tons per day) and 2031 (13.9 tons per day). On-road emissions drive the overall downward trend with most of the anticipated reductions occurring in near future years. CARB's Truck and Bus regulation, which will be fully implemented by the end of 2022, contributes to the near-term reductions significantly (from 19.0 tons per day in 2018 to 6.0 tons per day in 2023). The NOx emissions from heavy-duty diesel trucks in 2011 is estimated as 12.7 tons per day (46 percent of total NOx emission in 2011) and is expected to drop to 4.0 tons per day in 2023 (27 percent of total NOx emission in 2023). NOx emissions from off-road mobile categories are dominated by locomotive and off-road equipment in Coachella Valley. The reductions for mobile sources largely reflect the vehicle fleet's turnover to newer vehicles meeting more stringent emissions standards. Stationary and area sources increase slightly in future years in Coachella Valley.

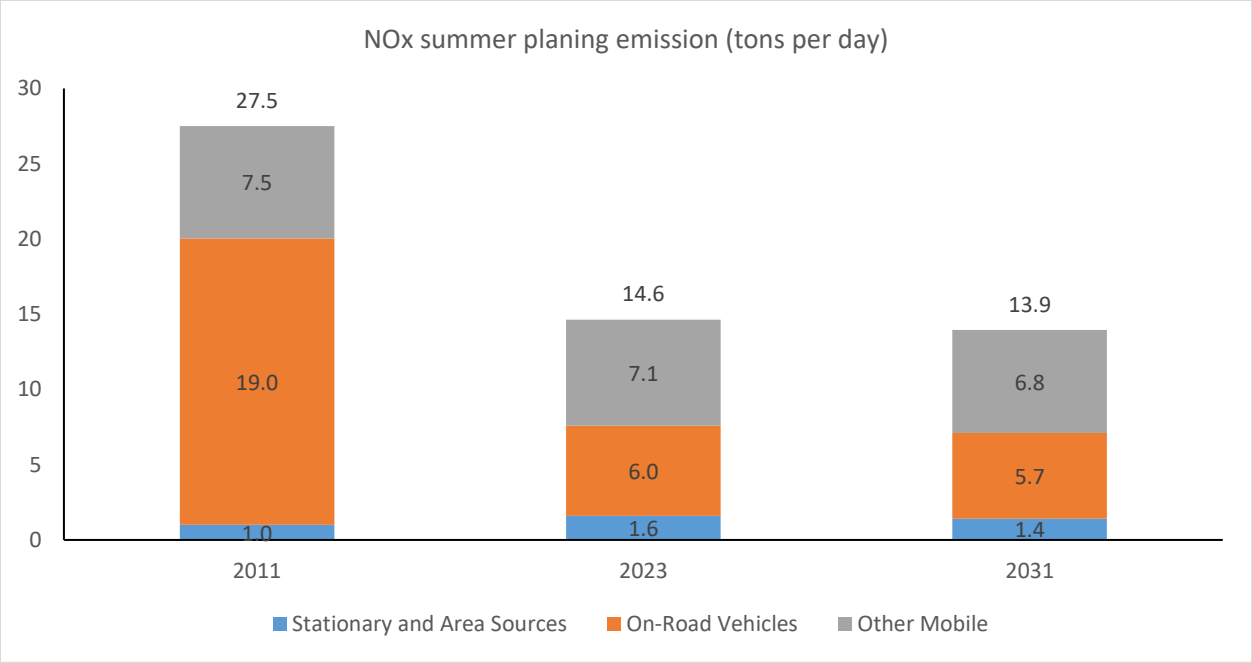

FIGURE 5-1
COACHELLA VALLEY NOX EMISSION BY SOURCE CATEGORY IN 2011, 2023 AND 2031

The summer planning VOC emissions by major source category for Coachella Valley in 2011, 2023 and 2031 are shown in Figure 5-2. VOC emissions from stationary and area sources increase over time from 5.9 to 7.6 tons per day between 2018 and 2031. The main portion of stationary and area source category VOC emissions comes from consumer products which increase over time due to projected population growth in the region. Coatings and related processes are the second largest contributor to VOC emissions among area sources. Emissions from on-road mobile sources are expected to decrease by 61 percent over time, from 5.6 tons per day in 2018 to 2.2 tons per day in 2031 due to on-going implementation of adopted regulations and programs. Off-road mobile sources VOC emissions also decrease in future, although less significantly compared to on-road mobile emissions (35 percent versus 61 percent). The downward trend of the VOC emissions from off-road mobile is mainly driven by CARB's regulation on off-road equipment.

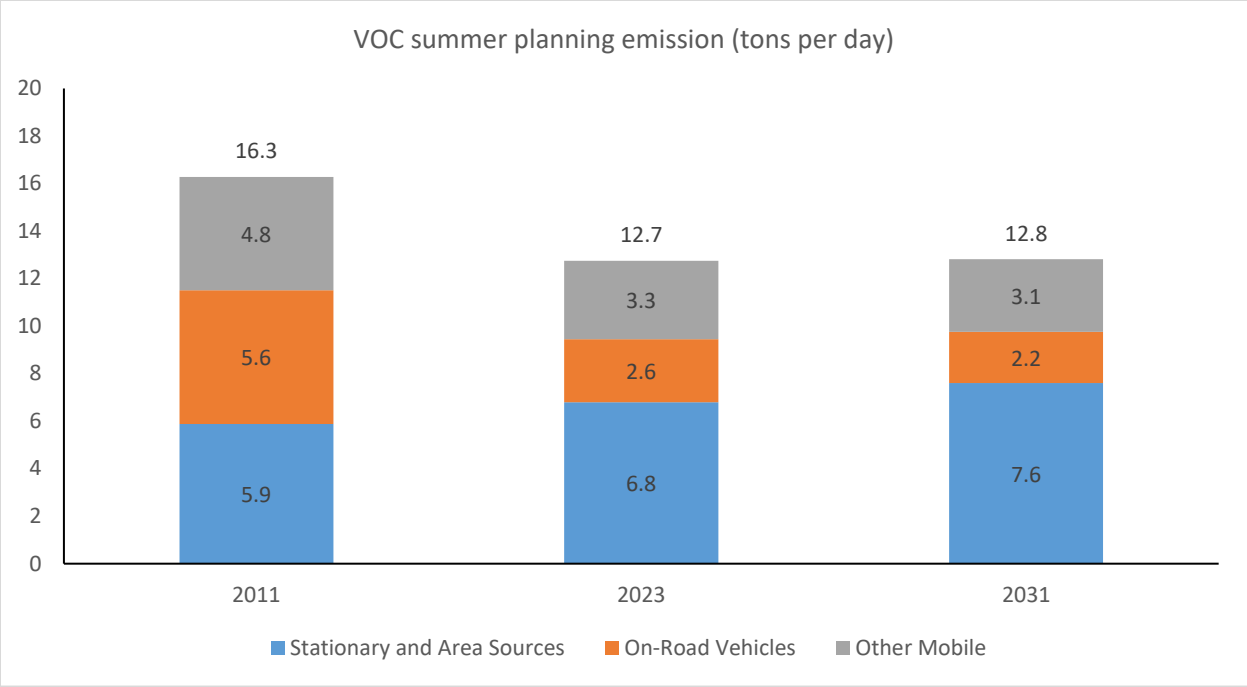

FIGURE 5-2

COACHELLA VALLEY VOC EMISSION BY SOURCE CATEGORY IN 2011, 2023 AND 2031

Chapter 6 – Reasonable Further Progress Demonstration for the Extreme Area Plan

Introduction

Reasonable Further Progress Demonstration

Introduction

Sections 172(c)(2) and 182(b)(1) of the Clean Air Act (Act) require ozone attainment plans to provide for Reasonable Further Progress (RFP). RFP is defined in section 171(1) of the Act as "…such annual incremental reductions in emissions of the relevant air pollutant as are required…for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." This requirement to demonstrate steady progress in emission reductions between the base year and attainment date ensures that areas will begin lowering air pollution in a timely manner and not delay implementation of control programs until immediately before the attainment deadline.

There are two separate RFP requirements for ozone nonattainment areas depending upon their classification. For ozone nonattainment areas classified as Moderate or above, there is a one-time requirement for a 15 percent reduction in Volatile Organic Compound (VOC) emissions over the first six years of the planning period (section 182(b)(1)). For ozone nonattainment areas classified as Serious or higher, section 182(c)(2)(B) of the Act has an additional requirement to demonstrate 3 percent per year cumulative reduction of ozone precursors, VOC and oxides of nitrogen (NOx), averaged over each consecutive three-year period until attainment.

In 2017, U.S. EPA approved a 15 percent VOC-only rate of progress demonstration for the Coachella Valley for the 80 ppb 8-hour ozone standard covering the entire nonattainment area for the 75 ppb 8-hour ozone standard.[26] As such, the requirement to demonstrate a reduction in VOC in the first 6 years of the attainment planning period has been met for the Coachella Valley 8-hour ozone nonattainment area.

For the 182(c)(2)(B) RFP requirement for Serious and higher areas, U.S. EPA guidance allows for NOx substitution to demonstrate the annual 3 percent reductions of ozone precursors if it can be demonstrated that substitution of NOx emission reductions (for VOC reductions) yields equivalent ozone reductions.[27] Additional U.S. EPA guidance states that certain conditions are needed to use NOx substitution in an RFP demonstration.[28] 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 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 2016 AQMP and the Revised Draft 2022 AQMP shows that NOx reductions are critical for the Coachella Valley to reach attainment of the 2008 8-hour ozone standard.[29]

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[26] 62 FR 1150 https://www.gpo.gov/fdsys/pkg/FR-1997-01-08/pdf/97-144.pdf.

[27] P1001E8Z.PDF (epa.gov).

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

[29] http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

http://www.aqmd.gov/2022aqmp.

On December 5, 2018, CARB submitted to U.S. EPA the 2018 Updates to the California State Implementation Plan (referred as "2018 SIP Update"), which included, among other things, an RFP demonstration for the Coachella Valley through the attainment year of 2026 as required for a severe nonattainment area. On October 16, 2020, the U.S. EPA approved the severe RFP demonstration and other elements as applicable for the 75 ppb ozone standard in the Coachella Valley.

The RFP demonstration in the 2018 SIP Update was developed using an inventory that relied upon the CARB motor vehicle emissions model EMFAC2014. On August 15, 2019, U.S. EPA approved California's latest motor vehicle emissions model, EMFAC2017, which includes updated activity levels and emission rates for on-road heavy-duty vehicles and other mobile sources now available at the time of development. Due to the update with this new information, estimated future year, on-road, mobile source emissions in many areas of the State, including the Coachella Valley, are higher than in the previous version of the model, EMFAC2014.

Reasonable Further Progress Demonstration

The RFP demonstration for the Extreme Area Plan is provided in Table 6-1, which shows that the cumulative VOC and NOx emission reductions in the Coachella Valley meet the RFP targets in the milestone years of 2023, 2026, 2029, and the attainment year, 2031. In accordance with U.S. EPA guidance, SIP Requirements Rule for the 2008 ozone NAAQS[30] and the court decision in *South Coast Air Quality Management District v. U.S. EPA,* 882 F.3d 1138 (D.C. Cir. 2018),[31] the emissions reductions in the RFP demonstration occur inside the nonattainment area, are achieved through existing control regulations, and start from a baseline year of 2011.

The Coachella Valley 75 ppb 8-hour ozone RFP demonstration was developed using CARB's California Emissions Projection Analysis Model (CEPAM), 2022, Version 1.01 baseline unadjusted inventory (see Chapter 5 and Attachment A for more information on the planning emissions inventory). In order to demonstrate consistency between the RFP demonstration and MVEB, a line-item adjustment is made in the RFP demonstration to account for the differences in the on-road mobile source emissions projections in the CEPAM inventory and the total of the MVEBs which are individually rounded up to the nearest tenth of a ton per day (see Chapter 7 for more information on the MVEBs). Figure 6-1 illustrates how the cumulative reductions in VOC and NOx combined surpass the required reductions in VOC, thus showing compliance with RFP requirements.

[30] 80 FR 12264 https://www.govinfo.gov/content/pkg/FR-2015-03-06/pdf/2015-04012.pdf#page=1

[31] No. 15-1115, SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT v. ENVIRONMENTAL PROTECTION AGENCY, ET AL.

TABLE 6-1:

RFP DEMONSTRATION FOR THE COACHELLA VALLEY 75 PPB OZONE SIP

Year	2011	2017	2020	2023	2026	2029	2031
VOC emissions	16.27	13.48	13.16	12.75	12.72	12.75	12.81
MVEB Rounding Margin*		0.00	0.00	0.05	0.09	0.04	0.05
Baseline VOC + Rounding Margin		13.48	13.16	12.80	12.81	12.79	12.86
Required % change since 2011		18%	27%	36%	45%	54%	60%
Target VOC Level		13.34	11.88	10.42	8.95	7.49	6.51
Shortfall (-)/ Surplus (+) in VOC		-0.14	-1.28	-2.38	-3.86	-5.31	-6.35
Shortfall (-)/ Surplus (+) in VOC, %		-1%	-8%	-15%	-24%	-33%	-39%
Year	**2011**	**2017**	**2020**	**2023**	**2026**	**2029**	**2031**
NOx emissions	27.49	19.45	17.42	14.64	14.19	14.00	13.95
MVEB Rounding Margin*		0.00	0.00	0.01	0.01	0.09	0.00
Baseline NOx + Rounding Margin		19.45	17.42	14.66	14.20	14.08	13.95
Change in NOx since 2011		8.04	10.07	12.84	13.30	13.41	13.54
Change in NOx since 2011, %		29%	37%	47%	48%	49%	49%
NOx reductions since 2011 used for VOC substitution in this milestone year, %		1%	8%	15%	24%	33%	39%
Shortfall (-)/ Surplus (+), %		28%	29%	32%	25%	16%	10%
RFP shortfall (-), if any		0%	0%	0%	0%	0%	0%
RFP Met?		**YES**	**YES**	**YES**	**YES**	**YES**	**YES**

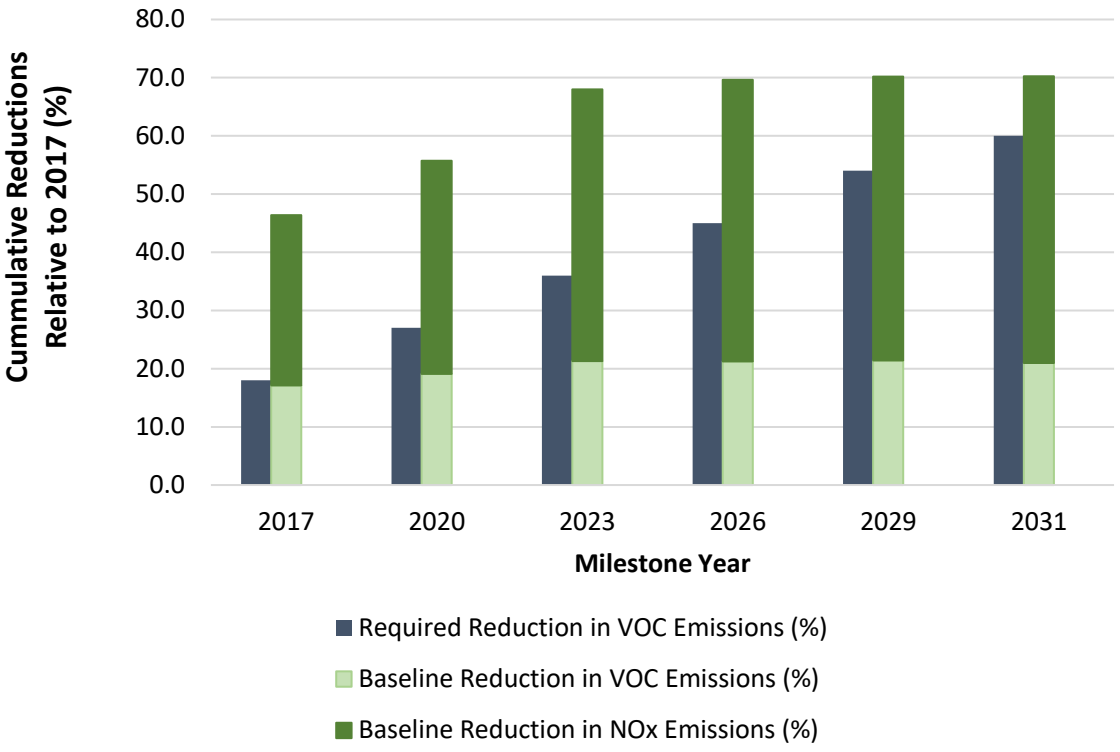

FIGURE 6-1

RFP DEMONSTRATION SHOWING THAT CUMULATIVE VOC AND NOX REDUCTIONS SURPASS THE VOC EMISSION REDUCTION TARGETS

Chapter 7 – Motor Vehicle Emissions Budgets

Introduction

Methodology

Motor Vehicle Emissions Budget

Introduction

The California Air Resources Board (CARB) has prepared the motor vehicle emissions budget (MVEB)[32] for the 75 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 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 (SCAG) 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 75 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, and 2031.

Methodology

The MVEB for the 75 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 Act 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 75 ppb 8-hr ozone SIP establishes budgets for reactive organic gases (ROG) and nitrogen oxide (NOx) emissions, which are ozone precursors, using emission rates from California's motor vehicle emission

[32] 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. 40 CFR Part 93, Subpart A of this chapter was revised by the U.S. EPA in the August 15, 1997 Federal Register.

model, EMFAC2017 (V.1.0.3)[33], using activity data (vehicle miles traveled [VMT] and speed distributions) from SCAG's 2020 regional transportation plan (RTP)/sustainable communities strategy (SCS).[34]

On August 15, 2019, U.S. EPA approved EMFAC2017 for use in SIPs and to demonstrate transportation conformity.[35] The EMFAC model estimates emissions from two combustion processes (start and running) and four evaporative processes (hot soak, running loss, diurnal, and resting loss). EMFAC calculates current and future motor vehicle emissions at the state, air district, air basin, county, and project levels.

The MVEB for this SIP was developed to be consistent with the on-road emissions inventory[36] and reasonable further progress, using the following method:

1) Used the EMFAC2017 model to produce the on-road motor vehicle emissions totals (average summer day) for the appropriate pollutants (ROG and NOx) using 2020 RTP/SCS activity data.
2) Rounded the totals for both ROG 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 consultation[37] with SCAG, the South Coast AQMD, U.S. EPA, Federal Highway Administration, and Federal Transit Administration. The MVEB is consistent with the emission inventories and control measures in the 75 ppb 8-hr ozone SIP. These budgets will be effective once U.S. EPA determines it is adequate. Table 7-1 provides the updated Coachella Valley MVEB. The MVEB is based on SCAG's 2020 Connect SoCal activity data,[38] including vehicle miles traveled and speed, and EMFAC2017.

[33] 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.

[34] SCAG Connect SoCal 2020 RTP/SCS.

https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf?1606001176.

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

[36] More information about the on-road motor vehicle emission budgets can be found in Chapter 5 of the plan.

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

[38] https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal-plan_0.pdf.

TABLE 7-1

MOTOR VEHICLE EMISSIONS BUDGETS FOR THE 2008 8-HOUR OZONE STANDARD (SUMMER)

Year	2023		2026		2029		2031	
Coachella Valley Pollutant (Tons/Day)	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx
Vehicular Exhaust	2.65	5.98	2.41	5.79	2.26	5.71	2.15	5.69
Total [a]	2.65	5.98	2.41	5.79	2.26	5.71	2.15	5.69
Motor Vehicle Emissions Budget [b]	2.7	6.0	2.5	5.8	2.3	5.8	2.2	5.7

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

[b] Motor Vehicle Emissions Budgets are rounded up to the nearest tenth of a tpd.

Source: EMFAC2017 v1.03

Chapter 8 – California Environmental Quality Act Analysis

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Sections 15002(k) and 15061, the proposed project is exempt from CEQA pursuant to CEQA Guidelines Sections 15061(b)(3) and 15308. Further, there is no substantial evidence indicating that any of the exceptions in CEQA Guidelines Section 15300.2 apply to the proposed project. A Notice of Exemption has been prepared pursuant to CEQA Guidelines Section 15062 and is included as Attachment C. If the proposed project is approved, the Notice of Exemption will be filed for posting with the county clerks of Los Angeles, Orange, Riverside, and San Bernardino Counties, and with the State Clearinghouse of the Governor's Office of Planning and Research.

Chapter 9 – Public Process

Public outreach was conducted to notify interested parties regarding the request for reclassification of Coachella Valley and MVEB update for the 2008 8-hour ozone standard. Notifications, including newspaper postings and email notifications were sent to all interested parties. The item was heard before South Coast AQMD's Mobile Source Committee on August 19, 2022. Additionally, staff conducted a public consultation meeting on Friday, September 23, 2022 at 1:00 p.m. During the meeting, a member of public expressed support to the reclassification and updated MVEB to resolve the transportation conformity lockdown and alleviate economic penalty associated with the lockdown. A draft staff report was released on September 16, 2022 to solicit public review and comments. The public comment period was closed on October 18, 2022 and no written comment was received.

Chapter 10 – Staff Recommendation

Staff recommends a voluntary reclassification of the 2008 8-hour ozone standard nonattainment status for Coachella Valley from severe to extreme to resolve the current transportation conformity lockdown and allow new transportation projects to proceed. According to SCAG, $26 billion worth of transportation projects are currently impacted. This reclassification will also provide up to 5 years of additional time for the Coachella Valley to attain the standard. Since the Coachella Valley is already in extreme nonattainment for the 1997 8-hour ozone NAAQS, extreme area planning requirements under CAA 182(e) such as Title V and NSR have been satisfied. Consequently, no planning or regulatory impact is expected from this reclassification.

Typically, a SIP revision is not required until the U.S. EPA grants the reclassification request and sets a timeline to submit extreme area SIP requirements. However, considering the economic burden on Coachella Valley residents, including those who already suffer from economic and environmental inequities, staff recommends pursuing the reclassification request and concurrently submitting the SIP elements required to establish a new MVEB, which include a baseline emissions inventory, a Reasonable Further Progress (RFP) demonstration and an updated MVEB for “extreme” nonattainment for the 2008 8-hour ozone standard for Coachella Valley. This will expedite the process to update the MVEB and allow SCAG to move forward with their subsequent FTIP and RTP amendments without further delay. The remaining extreme area SIP elements will be developed and brought before the Board for consideration in late 2023 or early 2024.

Appendix I – Summer Planning Emissions Inventory by Major Source Category

2011

2017

2020

2023

2026

2029

2031

Appendix II – Emissions Inventory Methodology for the 2008 8-Hour Ozone Extreme Area Plan Using Write-Up for the Coachella Valley 75 ppb 8-Hour Ozone Reasonable Further Progress SIP

Emissions Inventory Background

Emissions Inventory Overview

Emission Inventory Components

2011 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0	0.023
50	Manufacturing and Industrial	0.016	0.121
52	Food and Agricultural Processing	0	0
60	Service and Commercial	0.063	0.318
99	Other (Fuel Combustion)	0.014	0.135
	Total Fuel Combustion	**0.093**	**0.597**
Waste Disposal			
110	Sewage Treatment	0	0
130	Incineration	0.001	0.014
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.001**	**0.014**
Cleaning and Surface Coatings			
210	Laundering	0.004	0
220	Degreasing	0.227	0
230	Coatings and Related Processes	1.042	0
240	Printing	0.022	0
250	Adhesives and Sealants	0.121	0
299	Other (Cleaning and Surface Coatings)	0.021	0.003
	Total Cleaning and Surface Coatings	**1.437**	**0.003**
Petroleum Production and Marketing			
330	Petroleum Marketing	0.551	0
	Total Petroleum Production and Marketing	**0.551**	**0**
Industrial Processes			
410	Chemical	0.097	0
420	Food and Agriculture	0.025	0
430	Mineral Processes	0.017	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0.001	0
499	Other (Industrial Processes)	0.087	0
	Total Industrial Processes	**0.226**	**0**
Solvent Evaporation			
510	Consumer Products	2.783	0
520	Architectural Coatings and Related Solvent	0.372	0
530	Pesticides/Fertilizers	0.159	0
540	Asphalt Paving/Roofing	0.051	0
	Total Solvent Evaporation	**3.365**	**0**

(Continued)

2011 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.098	0.376
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.016	0.015
690	Cooking	0.021	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.211**	**0.393**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	2.069	1.3
722	Light Duty Trucks 1 (T1)	0.597	0.432
723	Light Duty Trucks 2 (T2)	0.765	0.887
724	Medium Duty Trucks (T3)	0.745	0.95
732	Light Heavy Duty Gas Trucks 1 (T4)	0.105	0.098
733	Light Heavy Duty Gas Trucks 2 (T5)	0.017	0.019
734	Medium Heavy Duty Gas Trucks (T6)	0.043	0.079
736	Heavy Heavy Duty Gas Trucks ((HHD)	0.01	0.027
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.014	0.59
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.005	0.211
744	Medium Heavy Duty Diesel Truck (T6)	0.081	1.357
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.805	12.761
750	Motorcycles (MCY)	0.331	0.073
760	Diesel Urban Buses (UB)	0.004	0.027
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.008	0.005
772	Diesel School Buses (SB)	0.006	0.086
777	Gas Other Buses (OB)	0.003	0.012
778	Motor Coaches	0.002	0.029
779	Diesel Other Buses (OB)	0.002	0.03
780	Motor Homes (MH)	0.007	0.05
	Total On-Road Motor Vehicles	**5.621**	**19.023**
Other Mobile Sources			
810	Aircraft	0.094	0.359
820	Trains	0.210	3.188
840	Recreational Boats	1.069	0.123
850	Off-Road Recreational Vehicles	0.181	0.003
860	Off-Road Equipment	2.695	2.592
861	Off-Road Equipment (PERP)	0.056	0.723
870	Farm Equipment	0.128	0.477
890	Fuel Storage and Handling	0.337	0.000
	Total Other Mobile Sources	**4.770**	**7.465**
Total Stationary and Area Sources		5.884	1.007
Total On-Road Vehicles		5.621	19.023
Total Other Mobile		4.770	7.465
Total		**16.275**	**27.495**

2017 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0.026	0.632
50	Manufacturing and Industrial	0.015	0.105
52	Food and Agricultural Processing	0.001	0.006
60	Service and Commercial	0.047	0.222
99	Other (Fuel Combustion)	0.021	0.112
	Total Fuel Combustion	**0.109**	**1.076**
Waste Disposal			
110	Sewage Treatment	0.013	0
130	Incineration	0	0.006
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.014**	**0.006**
Cleaning and Surface Coatings			
210	Laundering	0.005	0
220	Degreasing	0.251	0
230	Coatings and Related Processes	1.189	0
240	Printing	0.023	0
250	Adhesives and Sealants	0.133	0
299	Other (Cleaning and Surface Coatings)	0.022	0
	Total Cleaning and Surface Coatings	**1.622**	**0**
Petroleum Production and Marketing			
330	Petroleum Marketing	0.366	0
	Total Petroleum Production and Marketing	**0.366**	**0**
Industrial Processes			
410	Chemical	0.108	0
420	Food and Agriculture	0.026	0
430	Mineral Processes	0.027	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0	0
499	Other (Industrial Processes)	0.07	0
	Total Industrial Processes	**0.231**	**0**
Solvent Evaporation			
510	Consumer Products	2.962	0
520	Architectural Coatings and Related Solvent	0.294	0
530	Pesticides/Fertilizers	0.252	0
540	Asphalt Paving/Roofing	0.06	0
	Total Solvent Evaporation	**3.567**	**0**

(Continued)

2017 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.094	0.285
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.015	0.006
690	Cooking	0.025	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.21**	**0.293**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	1.201	0.651
722	Light Duty Trucks 1 (T1)	0.386	0.24
723	Light Duty Trucks 2 (T2)	0.622	0.562
724	Medium Duty Trucks (T3)	0.603	0.562
732	Light Heavy Duty Gas Trucks 1 (T4)	0.095	0.075
733	Light Heavy Duty Gas Trucks 2 (T5)	0.019	0.017
734	Medium Heavy Duty Gas Trucks (T6)	0.025	0.055
736	Heavy Heavy Duty Gas Trucks ((HHD)	0.001	0.003
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.011	0.381
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.005	0.149
744	Medium Heavy Duty Diesel Truck (T6)	0.049	0.999
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.256	6.467
750	Motorcycles (MCY)	0.351	0.078
760	Diesel Urban Buses (UB)	0.006	0.035
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.001	0.001
772	Diesel School Buses (SB)	0.001	0.083
777	Gas Other Buses (OB)	0.002	0.006
778	Motor Coaches	0.001	0.018
779	Diesel Other Buses (OB)	0.001	0.02
780	Motor Homes (MH)	0.003	0.031
	Total On-Road Motor Vehicles	**3.638**	**10.434**
Other Mobile Sources			
810	Aircraft	0.101	0.392
820	Trains	0.164	3.471
840	Recreational Boats	0.812	0.107
850	Off-Road Recreational Vehicles	0.143	0.003
860	Off-Road Equipment	2.109	2.746
861	Off-Road Equipment (PERP)	0.045	0.541
870	Farm Equipment	0.091	0.380
890	Fuel Storage and Handling	0.262	0.000
	Total Other Mobile Sources	**3.727**	**7.640**
Total Stationary and Area Sources		6.119	1.375
Total On-Road Vehicles		3.638	10.434
Total Other Mobile		3.727	7.640
Total		**13.484**	**19.449**

2020 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0.02	0.925
50	Manufacturing and Industrial	0.016	0.107
52	Food and Agricultural Processing	0	0.003
60	Service and Commercial	0.049	0.229
99	Other (Fuel Combustion)	0.012	0.095
	Total Fuel Combustion	**0.098**	**1.36**
Waste Disposal			
110	Sewage Treatment	0.014	0
130	Incineration	0.001	0.009
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.015**	**0.009**
Cleaning and Surface Coatings			
210	Laundering	0.005	0
220	Degreasing	0.279	0
230	Coatings and Related Processes	1.355	0
240	Printing	0.027	0
250	Adhesives and Sealants	0.145	0
299	Other (Cleaning and Surface Coatings)	0.026	0
	Total Cleaning and Surface Coatings	**1.836**	**0**
Petroleum Production and Marketing			
330	Petroleum Marketing	0.331	0
	Total Petroleum Production and Marketing	**0.331**	**0**
Industrial Processes			
410	Chemical	0.128	0
420	Food and Agriculture	0.029	0
430	Mineral Processes	0.025	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0	0
499	Other (Industrial Processes)	0.071	0
	Total Industrial Processes	**0.253**	**0**
Solvent Evaporation			
510	Consumer Products	3.272	0
520	Architectural Coatings and Related Solvent	0.319	0
530	Pesticides/Fertilizers	0.221	0
540	Asphalt Paving/Roofing	0.068	0
	Total Solvent Evaporation	**3.88**	**0**

(Continued)

2020 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.097	0.32
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.011	0.006
690	Cooking	0.026	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.211**	**0.328**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	0.942	0.466
722	Light Duty Trucks 1 (T1)	0.306	0.171
723	Light Duty Trucks 2 (T2)	0.536	0.397
724	Medium Duty Trucks (T3)	0.522	0.4
732	Light Heavy Duty Gas Trucks 1 (T4)	0.071	0.056
733	Light Heavy Duty Gas Trucks 2 (T5)	0.015	0.013
734	Medium Heavy Duty Gas Trucks (T6)	0.021	0.043
736	Heavy Heavy Duty Gas Trucks ((HHD)	0	0.001
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.009	0.262
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.004	0.103
744	Medium Heavy Duty Diesel Truck (T6)	0.031	0.786
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.186	5.398
750	Motorcycles (MCY)	0.378	0.085
760	Diesel Urban Buses (UB)	0.001	0.006
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.001	0.001
772	Diesel School Buses (SB)	0.001	0.082
777	Gas Other Buses (OB)	0.002	0.005
778	Motor Coaches	0.001	0.014
779	Diesel Other Buses (OB)	0.001	0.019
780	Motor Homes (MH)	0.002	0.025
	Total On-Road Motor Vehicles	**3.027**	**8.334**
Other Mobile Sources			
810	Aircraft	0.092	0.360
820	Trains	0.176	3.880
840	Recreational Boats	0.708	0.103
850	Off-Road Recreational Vehicles	0.134	0.003
860	Off-Road Equipment	2.017	2.244
861	Off-Road Equipment (PERP)	0.036	0.394
870	Farm Equipment	0.100	0.406
890	Fuel Storage and Handling	0.244	0.000
	Total Other Mobile Sources	**3.507**	**7.390**
Total Stationary and Area Sources		6.624	1.697
Total On-Road Vehicles		3.027	8.334
Total Other Mobile		3.507	7.390
Total		**13.158**	**17.421**

2023 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0.02	0.837
50	Manufacturing and Industrial	0.017	0.112
52	Food and Agricultural Processing	0	0.003
60	Service and Commercial	0.052	0.237
99	Other (Fuel Combustion)	0.013	0.095
	Total Fuel Combustion	**0.101**	**1.285**
Waste Disposal			
110	Sewage Treatment	0.015	0
130	Incineration	0.001	0.009
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.015**	**0.009**
Cleaning and Surface Coatings			
210	Laundering	0.005	0
220	Degreasing	0.299	0
230	Coatings and Related Processes	1.47	0
240	Printing	0.031	0
250	Adhesives and Sealants	0.141	0
299	Other (Cleaning and Surface Coatings)	0.027	0
	Total Cleaning and Surface Coatings	1.973	0
Petroleum Production and Marketing			
330	Petroleum Marketing	0.325	0
	Total Petroleum Production and Marketing	**0.325**	**0**
Industrial Processes			
410	Chemical	0.138	0
420	Food and Agriculture	0.03	0
430	Mineral Processes	0.027	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0	0
499	Other (Industrial Processes)	0.074	0
	Total Industrial Processes	**0.269**	**0**
Solvent Evaporation			
510	Consumer Products	3.261	0
520	Architectural Coatings and Related Solvent	0.344	0
530	Pesticides/Fertilizers	0.222	0
540	Asphalt Paving/Roofing	0.073	0
	Total Solvent Evaporation	**3.901**	**0**

(Continued)

2023 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.097	0.305
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.011	0.006
690	Cooking	0.028	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.211**	**0.313**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	0.805	0.368
722	Light Duty Trucks 1 (T1)	0.255	0.127
723	Light Duty Trucks 2 (T2)	0.496	0.298
724	Medium Duty Trucks (T3)	0.455	0.277
732	Light Heavy Duty Gas Trucks 1 (T4)	0.054	0.041
733	Light Heavy Duty Gas Trucks 2 (T5)	0.012	0.01
734	Medium Heavy Duty Gas Trucks (T6)	0.02	0.035
736	Heavy Heavy Duty Gas Trucks ((HHD)	0	0.001
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.007	0.174
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.003	0.069
744	Medium Heavy Duty Diesel Truck (T6)	0.003	0.371
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.123	3.996
750	Motorcycles (MCY)	0.409	0.092
760	Diesel Urban Buses (UB)	0.001	0.006
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.001	0.001
772	Diesel School Buses (SB)	0.001	0.08
777	Gas Other Buses (OB)	0.002	0.004
778	Motor Coaches	0	0.006
779	Diesel Other Buses (OB)	0	0.009
780	Motor Homes (MH)	0.001	0.021
	Total On-Road Motor Vehicles	**2.647**	**5.985**
Other Mobile Sources			
810	Aircraft	0.082	0.401
820	Trains	0.178	4.070
840	Recreational Boats	0.621	0.099
850	Off-Road Recreational Vehicles	0.119	0.003
860	Off-Road Equipment	1.957	1.845
861	Off-Road Equipment (PERP)	0.030	0.291
870	Farm Equipment	0.086	0.343
890	Fuel Storage and Handling	0.230	0.000
	Total Other Mobile Sources	**3.303**	**7.052**
Total Stationary and Area Sources		6.795	1.607
Total On-Road Vehicles		2.647	5.985
Total Other Mobile		3.303	7.052
Total		**12.745**	**14.644**

2026 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0.019	0.801
50	Manufacturing and Industrial	0.018	0.116
52	Food and Agricultural Processing	0	0.003
60	Service and Commercial	0.053	0.239
99	Other (Fuel Combustion)	0.013	0.095
	Total Fuel Combustion	**0.103**	**1.255**
Waste Disposal			
110	Sewage Treatment	0.015	0
130	Incineration	0.001	0.009
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.016**	**0.009**
Cleaning and Surface Coatings			
210	Laundering	0.005	0
220	Degreasing	0.313	0
230	Coatings and Related Processes	1.556	0
240	Printing	0.034	0
250	Adhesives and Sealants	0.147	0
299	Other (Cleaning and Surface Coatings)	0.029	0
	Total Cleaning and Surface Coatings	**2.084**	**0**
Petroleum Production and Marketing			
330	Petroleum Marketing	0.318	0
	Total Petroleum Production and Marketing	**0.318**	**0**
Industrial Processes			
410	Chemical	0.145	0
420	Food and Agriculture	0.032	0
430	Mineral Processes	0.028	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0	0
499	Other (Industrial Processes)	0.077	0
	Total Industrial Processes	**0.283**	**0**
Solvent Evaporation			
510	Consumer Products	3.456	0
520	Architectural Coatings and Related Solvent	0.363	0
530	Pesticides/Fertilizers	0.222	0
540	Asphalt Paving/Roofing	0.076	0
	Total Solvent Evaporation	**4.118**	**0**

(Continued)

2026 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.097	0.291
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.011	0.006
690	Cooking	0.029	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.212**	**0.299**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	0.7	0.3
722	Light Duty Trucks 1 (T1)	0.209	0.094
723	Light Duty Trucks 2 (T2)	0.456	0.229
724	Medium Duty Trucks (T3)	0.398	0.194
732	Light Heavy Duty Gas Trucks 1 (T4)	0.045	0.032
733	Light Heavy Duty Gas Trucks 2 (T5)	0.009	0.008
734	Medium Heavy Duty Gas Trucks (T6)	0.02	0.028
736	Heavy Heavy Duty Gas Trucks ((HHD)	0	0.001
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.005	0.119
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.002	0.048
744	Medium Heavy Duty Diesel Truck (T6)	0.003	0.4
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.133	4.125
750	Motorcycles (MCY)	0.421	0.096
760	Diesel Urban Buses (UB)	0.001	0.006
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.001	0.001
772	Diesel School Buses (SB)	0.001	0.073
777	Gas Other Buses (OB)	0.002	0.003
778	Motor Coaches	0	0.007
779	Diesel Other Buses (OB)	0	0.011
780	Motor Homes (MH)	0.001	0.018
	Total On-Road Motor Vehicles	**2.408**	**5.792**
Other Mobile Sources			
810	Aircraft	0.084	0.454
820	Trains	0.175	4.194
840	Recreational Boats	0.546	0.096
850	Off-Road Recreational Vehicles	0.106	0.003
860	Off-Road Equipment	1.943	1.562
861	Off-Road Equipment (PERP)	0.028	0.235
870	Farm Equipment	0.073	0.289
890	Fuel Storage and Handling	0.221	0.000
	Total Other Mobile Sources	**3.176**	**6.833**
Total Stationary and Area Sources		7.134	1.563
Total On-Road Vehicles		2.408	5.792
Total Other Mobile		3.176	6.833
Total		**12.718**	**14.188**

2029 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0.016	0.709
50	Manufacturing and Industrial	0.018	0.114
52	Food and Agricultural Processing	0	0.003
60	Service and Commercial	0.054	0.238
99	Other (Fuel Combustion)	0.014	0.095
	Total Fuel Combustion	**0.102**	**1.159**
Waste Disposal			
110	Sewage Treatment	0.016	0
130	Incineration	0.001	0.009
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.016**	**0.009**
Cleaning and Surface Coatings			
210	Laundering	0.005	0
220	Degreasing	0.319	0
230	Coatings and Related Processes	1.605	0
240	Printing	0.036	0
250	Adhesives and Sealants	0.151	0
299	Other (Cleaning and Surface Coatings)	0.029	0
	Total Cleaning and Surface Coatings	**2.146**	**0**
Petroleum Production and Marketing			
330	Petroleum Marketing	0.314	0
	Total Petroleum Production and Marketing	**0.314**	**0**
Industrial Processes			
410	Chemical	0.148	0
420	Food and Agriculture	0.034	0
430	Mineral Processes	0.029	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0	0
499	Other (Industrial Processes)	0.08	0
	Total Industrial Processes	**0.291**	**0**
Solvent Evaporation			
510	Consumer Products	3.635	0
520	Architectural Coatings and Related Solvent	0.383	0
530	Pesticides/Fertilizers	0.223	0
540	Asphalt Paving/Roofing	0.078	0
	Total Solvent Evaporation	**4.319**	**0**

(Continued)

2029 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.096	0.277
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.011	0.006
690	Cooking	0.029	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.213**	**0.285**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	0.632	0.268
722	Light Duty Trucks 1 (T1)	0.176	0.073
723	Light Duty Trucks 2 (T2)	0.427	0.189
724	Medium Duty Trucks (T3)	0.361	0.147
732	Light Heavy Duty Gas Trucks 1 (T4)	0.042	0.026
733	Light Heavy Duty Gas Trucks 2 (T5)	0.008	0.006
734	Medium Heavy Duty Gas Trucks (T6)	0.02	0.023
736	Heavy Heavy Duty Gas Trucks ((HHD)	0	0.001
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.005	0.081
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.002	0.035
744	Medium Heavy Duty Diesel Truck (T6)	0.003	0.423
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.14	4.232
750	Motorcycles (MCY)	0.439	0.099
760	Diesel Urban Buses (UB)	0.001	0.006
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.001	0.001
772	Diesel School Buses (SB)	0.001	0.063
777	Gas Other Buses (OB)	0.002	0.002
778	Motor Coaches	0	0.007
779	Diesel Other Buses (OB)	0	0.013
780	Motor Homes (MH)	0.001	0.015
	Total On-Road Motor Vehicles	**2.26**	**5.713**
Other Mobile Sources			
810	Aircraft	0.084	0.508
820	Trains	0.181	4.412
840	Recreational Boats	0.484	0.094
850	Off-Road Recreational Vehicles	0.089	0.003
860	Off-Road Equipment	1.950	1.366
861	Off-Road Equipment (PERP)	0.027	0.202
870	Farm Equipment	0.062	0.243
890	Fuel Storage and Handling	0.216	0.000
	Total Other Mobile Sources	**3.093**	**6.828**
Total Stationary and Area Sources		7.401	1.453
Total On-Road Vehicles		2.260	5.713
Total Other Mobile		3.093	6.828
Total		**12.754**	**13.994**

2031 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Fuel Combustion			
10	Electric Utilities	0.016	0.673
50	Manufacturing and Industrial	0.018	0.114
52	Food and Agricultural Processing	0	0.003
60	Service and Commercial	0.054	0.237
99	Other (Fuel Combustion)	0.014	0.095
	Total Fuel Combustion	**0.102**	**1.123**
Waste Disposal			
110	Sewage Treatment	0.016	0
130	Incineration	0.001	0.009
199	Other (Waste Disposal)	0	0
	Total Waste Disposal	**0.017**	**0.009**
Cleaning and Surface Coatings			
210	Laundering	0.006	0
220	Degreasing	0.321	0
230	Coatings and Related Processes	1.627	0
240	Printing	0.037	0
250	Adhesives and Sealants	0.151	0
299	Other (Cleaning and Surface Coatings)	0.029	0
	Total Cleaning and Surface Coatings	**2.17**	**0**
Petroleum Production and Marketing			
330	Petroleum Marketing	0.316	0
	Total Petroleum Production and Marketing	**0.316**	**0**
Industrial Processes			
410	Chemical	0.148	0
420	Food and Agriculture	0.034	0
430	Mineral Processes	0.03	0
440	Metal Processes	0	0
450	Wood and Paper	0	0
470	Electronics	0	0
499	Other (Industrial Processes)	0.083	0
	Total Industrial Processes	**0.295**	**0**
Solvent Evaporation			
510	Consumer Products	3.792	0
520	Architectural Coatings and Related Solvent	0.396	0
530	Pesticides/Fertilizers	0.224	0
540	Asphalt Paving/Roofing	0.08	0
	Total Solvent Evaporation	**4.491**	**0**

(Continued)

2031 Summer Planning Emissions by Source Category in Coachella Valley (Tons/Day)

MSC	DESC	VOC	NOX
Miscellaneous Processes			
610	Residential Fuel Combustion	0.096	0.271
620	Farming Operations	0.069	0
630	Construction and Demolition	0	0
640	Paved Road Dust	0	0
645	Unpaved Road Dust	0	0
650	Fugitive Windblown Dust	0	0
660	Fires	0.007	0.002
670	Waste Burning and Disposal	0.011	0.006
690	Cooking	0.03	0
699	Other (Miscellaneous Processes	0	0
	Total Miscellaneous Processes	**0.213**	**0.279**
On-Road Motor Vehicles			
710	Light Duty Passenger Auto (LDA)	0.586	0.253
722	Light Duty Trucks 1 (T1)	0.152	0.061
723	Light Duty Trucks 2 (T2)	0.401	0.169
724	Medium Duty Trucks (T3)	0.337	0.126
732	Light Heavy Duty Gas Trucks 1 (T4)	0.039	0.023
733	Light Heavy Duty Gas Trucks 2 (T5)	0.007	0.005
734	Medium Heavy Duty Gas Trucks (T6)	0.02	0.022
736	Heavy Heavy Duty Gas Trucks ((HHD)	0	0.002
742	Light Heavy Duty Diesel Trucks 1 (T4)	0.004	0.062
743	Light Heavy Duty Diesel Trucks 2 (T5)	0.002	0.028
744	Medium Heavy Duty Diesel Truck (T6)	0.003	0.438
746	Heavy Heavy Duty Diesel Trucks (HHD)	0.144	4.303
750	Motorcycles (MCY)	0.447	0.1
760	Diesel Urban Buses (UB)	0.001	0.006
762	Gas Urban Buses (UB)	0	0
771	Gas School Buses (SB)	0.002	0.001
772	Diesel School Buses (SB)	0.001	0.056
777	Gas Other Buses (OB)	0.002	0.002
778	Motor Coaches	0	0.007
779	Diesel Other Buses (OB)	0	0.015
780	Motor Homes (MH)	0.001	0.014
	Total On-Road Motor Vehicles	**2.15**	**5.695**
Other Mobile Sources			
810	Aircraft	0.085	0.543
820	Trains	0.181	4.507
840	Recreational Boats	0.447	0.093
850	Off-Road Recreational Vehicles	0.081	0.004
860	Off-Road Equipment	1.962	1.276
861	Off-Road Equipment (PERP)	0.028	0.199
870	Farm Equipment	0.056	0.218
890	Fuel Storage and Handling	0.215	0.000
	Total Other Mobile Sources	**3.055**	**6.840**
Total Stationary and Area Sources		7.604	1.411
Total On-Road Vehicles		2.150	5.695
Total Other Mobile		3.055	6.840
Total		**12.809**	**13.946**

Appendix II - Emissions Inventory Methodology for the 2008 8-Hour Ozone Extreme Area Plan Using CEPAM 2022 v1.01

(August 2022)

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Emissions Inventory Background

Emissions inventories are required by the Clean Air Act (CAA) and the Ozone SIP Requirements Rule for the 2008 ozone National Ambient Air Quality Standards (NAAQS), also called the Ozone Implementation Rule.[1] Specifically, they are required for those areas that exceed the health-based NAAQS. These areas are designated as nonattainment based on monitored exceedances of these NAAQS. These nonattainment areas must develop an emissions inventory as the basis of a State Implementation Plan (SIP) that demonstrates how they will attain the NAAQS by specified dates. This document describes the emissions inventory included in the Coachella Valley 75 ppb 8-Hour Ozone Extreme Reasonable Further Progress SIP (Coachella Valley Extreme RFP Plan), which encompasses all sources within the Coachella Valley ozone nonattainment area.

Emissions Inventory Overview

Emissions inventories are estimates of the amount and type of pollutants emitted into the atmosphere by facilities, mobile sources, and areawide sources. They are fundamental components of an air quality plan and serve critical functions such as:

1. the primary input to air quality modeling used in attainment demonstrations;
2. the emissions data used for developing control strategies; and
3. a means to track progress in meeting the emission reduction commitments.

The California Air Resources Board (CARB) and the South Coast Air Quality Management District (South Coast AQMD) have developed a comprehensive current emissions inventory consistent with the requirements set forth in Section 182(a)-(f) of the federal Clean Air Act[2]. CARB and South Coast AQMD staff conducted a thorough review of the inventory to ensure that the emission estimates reflect accurate emissions reports for point sources and that estimates for mobile and areawide sources are based on the most recent approved models and methodologies.

CARB also reviewed the growth profiles for point and areawide source categories and worked with South Coast AQMD staff to update them as necessary to ensure that the emission projections are based on data that reflect historical trends, current conditions, and recent economic and demographic forecasts.

The United States Environmental Protection Agency (U.S. EPA) regulations require that the emissions inventory for an ozone SIP contain emissions data for the two precursors to ozone formation: oxides of

[1] Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements; (40 CFR part 51 Subpart AA; see also *https://www.epa.gov/ground-level-ozone-pollution/implementation-2008-national-ambient-air-quality-standards-naaqs-ozone*).

[2] Section 182(a)-(f) of the Act. *https://www.govinfo.gov/content/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapI-partD-subpart2-sec7511a.htm*

nitrogen (NOx) and volatile organic compounds (VOC)[3]. The inventory included in this plan substitutes VOC with reactive organic gases (ROG), which, in general, represent a slightly broader group of compounds than those in U.S. EPA's list of VOCs.

Inventory Base Year

40 CFR 51.1115(a) requires that the inventory year be selected consistent with the baseline year for the reasonable further progress (RFP) plan as required by 40 CFR 51.1110(b), which states that the baseline year emissions inventory shall be the emissions inventory for the most recent calendar year of which a complete triennial inventory is required to be submitted to EPA under the provisions of subpart A of 40 CFR part 51, Air Emissions Reporting Requirements, 40 CFR 51.1–50. For the this Plan, an RFP baseline year of 2011 was selected since that was the most recent calendar year of which a complete triennial inventory was required at the time of the final designations of Coachella Valley as nonattainment for the 75 ppb 8-Hour Ozone NAAQS[4]. CEPAM 2022 v1.01 uses a 2018 base year; the inventory was calibrated to 2018 emissions and activity levels, and inventories for other years were backcasted or forecasted from that base inventory.

The 2011 baseline year inventory and the 2018 base year inventory are consistent with each other as required by the Ozone Rule. For both, stationary source emissions reflect actual emissions reported from industrial point sources. Stationary emissions also include stationary aggregate sources, such as gasoline dispensing facilities, that are estimated as a group and reported as an aggregated total. The 2011 baseline year emissions for areawide and stationary aggregate sources are backcasted from the 2018 base year, relying on the same growth and control methodology as used for future years. 2011 mobile source emissions were modeled using the EMFAC2017 and off-road models. In addition, both inventories are comprehensive, accurate, and current inventory of actual emissions from all sources of the relevant pollutant or pollutants in each area as required by the Act.

Forecasted Inventories

In addition to base year emissions, emissions projections are needed for a variety of reasons, including redesignation maintenance plans, the attainment projected inventory for a nonattainment area (NAA), and air quality modeling for attainment plans[5].

For stationary and area sources, forecasted inventories are a projection of the base year inventory that reflects expected growth trends for each source category and emissions reductions due to adopted control measures. CARB develops emission forecasts by applying growth and control profiles to the base year inventory. The stationary and area source emissions inventory for this Plan is modeled by the

[3] Section 182(a)(1) of the Act. *https://www.govinfo.gov/content/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapI-partD-subpart2-sec7511a.htm*

[4] *https://www.epa.gov/green-book/green-book-8-hour-ozone-2008-area-information*.

[5] 40 CFR 51.114. *https://www.govinfo.gov/content/pkg/CFR-2000-title40-vol2/pdf/CFR-2000-title40-vol2-sec51-114.pdf*.

California Emission Projection Analysis Model (CEPAM), 2022 Emission Projections, Version 1.01, of which emissions were incorporated as baseline inventory for the 2022 Air Quality Management Plan.

Growth profiles for point and areawide sources are derived from surrogates, such as economic activity, fuel usage, population, and housing units, that best reflect the expected growth trends for each specific source category. Growth projections were obtained primarily from government entities with expertise in developing forecasts for specific sectors, or, in some cases, from econometric models. Control profiles, which account for emission reductions resulting from adopted rules and regulations, are derived from data provided by the regulatory agencies responsible for the affected emission categories.

Projections for on-road mobile source emissions are generated by CARB's EMFAC2017 model, which predicts activity rates and vehicle fleet turnover by vehicle model year, along with activity inputs from the metropolitan planning organization (MPO). Off-road mobile sources are forecasted with category-specific model or, where not available, CARB's OFFROAD2007. CEPAM integrates the emission projections derived from these mobile source models to develop a comprehensive forecasted emission inventory. As with stationary sources, the mobile source models include control algorithms that account for adopted regulatory actions.

Temporal Resolution

40 CFR 51.1115(c) requires emissions values included in the base year inventory to be actual ozone season day emissions as defined by 40 CFR 51.1100(q). Since ozone concentrations tend to be highest during the summer months, the emissions inventory used in the this Plan is based on the summer season (May through October), i.e. summer planning emissions inventory.

Quality Assurance and Quality Control

CARB has established a quality assurance and quality control (QA/QC) process to ensure the integrity and accuracy of the emission inventories used in the development of air quality plans. QA/QC occurs at the various stages of SIP emission inventory development. Base year emissions are assembled and maintained in the California Emission Inventory Development and Reporting System (CEIDARS). CARB inventory staff works with air districts, which are responsible for developing and reporting point source emission estimates, to verify these data are accurate. The locations of point sources, including stacks, are checked to ensure they are valid. Area-wide source emissions estimates are developed by both CARB and South Coast AQMD staff, and the methodologies are reviewed by both agencies before their inclusion in the emissions inventory. Mobile categories are verified with CARB mobile source staff for consistency with the on-road and off-road emission models. Additionally, CEIDARS is designed with automatic system checks to prevent errors, such as double counting of emission sources. At the final stage, CEPAM is thoroughly reviewed to validate the accuracy of growth and control application, and the output emissions are compared against prior approved versions of CEPAM to identify data anomalies.

Emission Inventory Components

A summary of the components that make up this Plan emissions inventory is presented in the following sections. These include mobile (on- and off-road) sources, stationary point sources, and areawide sources. Natural sources are not included.

Mobile Source Emissions

CARB develops the emission inventory for the mobile sources using various modeling methods. These models account for the effects of various adopted regulations, technology types, fleet turnover, and seasonal conditions on emissions. Mobile sources in the emission inventory are composed of both on-road and off-road sources, described in the sections below.

On-Road Mobile Source Emissions

Emissions from on-road mobile sources, which include passenger vehicles, buses, and trucks, were estimated using outputs from CARB's EMFAC2017 model. The on-road emissions were calculated by applying EMFAC2017 emission factors to the transportation activity data from Southern California Association of Governments' 2020 Regional Transportation Plan/Sustainable Community Strategy (RTP/SCS).

EMFAC2017 includes data on California's car and truck fleets and travel activity. Light-duty motor vehicle fleet age, vehicle type, and vehicle population were updated based on 2016 DMV data. The model also reflects the emissions benefits of CARB's recent rulemakings such as the Pavley Standards and Advanced Clean Cars Program and includes the emissions benefits of CARB's Truck and Bus Rule and previously adopted rules for other on-road diesel fleets.

EMFAC2017 utilizes a socio-econometric regression modeling approach to forecast new vehicle sales and to estimate future fleet mix. Light-duty passenger vehicle population includes 2016 DMV registration data along with updates to mileage accrual using Smog Check data. Updates to heavy-duty trucks include model year specific emission factors based on new test data, and population estimates using DMV data for in-state trucks and International Registration Plan (IRP) data for out-of-state trucks.

The emissions reflected in this on-road inventory for Coachella Valley are the EMFAC2017 "baseline" emissions without the impact of Advanced Clean Trucks (ACT), Omnibus, and Heavy-Duty I/M.

Additional information and documentation on the EMFAC2017 model is available at: *https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/msei-road-documentation*

EMFAC2017 SAFE Vehicles Rules Off-Model Adjustment Removal

On September 27, 2019, U.S. EPA and National Highway Traffic Safety Administration (NHTSA) published the "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program"

(SAFE-1).[6] SAFE-1 revoked California's authority to set its own greenhouse gas emissions standards and set zero-emission vehicle mandates in California. On April 28, 2021, U.S. EPA reconsidered the 2019 SAFE-1 by finding that the actions taken as a part of SAFE-1 were decided in error and are now entirely rescinded[7]. Therefore, any previously applied off-model adjustments as a result of SAFE-1 were removed in this inventory, resulting in a minor reduction in emissions.

Off-Road Mobile Source Emissions

Emissions from off-road sources are estimated using a suite of category-specific models or, where a new model was not available, the OFFROAD2007 model. Many of the newer models are developed to support recent regulations, including in-use off-road equipment, ocean-going vessels, and others. The sections below summarize the updates made by CARB to specific off-road categories.

Recreational Marine Vessels

Pleasure craft or recreational marine vessel (RMV) is a broad category of marine vessel that includes gasoline-powered spark-ignition marine watercraft (SIMW) and diesel-powered marine watercraft. It includes outboards, sterndrives, personal watercraft, jet boats, and sailboats with auxiliary engines. This emissions inventory was last updated in 2014 to support the evaporative control measures. The population, activity, and emission factors were revised using new surveys, DMV registration information, and emissions testing.

Staff used economic data from a 2014 UCLA Economic Forecast to estimate the near-term annual sales of RMV(2014 to 2019). To forecast long-term annual sales (2020 and later), staff used an estimate of California's annual population growth as a surrogate.

Additional information is available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-offroad

Recreational Vehicles

Off-highway recreational vehicles include off-highway motorcycles (OHMC), all-terrain vehicles (ATV), off-road sport vehicles, off-road utility vehicles, sand cars, golf carts, and snowmobiles. A new model was developed in 2018 to update emissions from recreational vehicles. Input factors such as population, activity, and emission factors were re-assessed using new surveys, DMV registration information, and emissions testing. OHMC population growth is determined from two factors: incoming population as estimated by future annual sales and the scrapped vehicle population as estimated by the survival rate.

[6] 84 FR 51310. *https://www.govinfo.gov/content/pkg/FR-2019-09-27/pdf/2019-20672.pdf*.
[7] 87 FR 14332. *https://www.govinfo.gov/content/pkg/FR-2022-03-14/pdf/2022-05227.pdf*.

Additional information is available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-offroad

Fuel Storage and Handling

Emissions from portable fuel containers (gas cans) were estimated based on past surveys and CARB in-house testing. This inventory uses a composite growth rate that depends on occupied household (or business units), percent of households (or businesses) with gas cans, and average number of gas cans per household (or business) units.

Additional information is available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-offroad

Small Off-Road Engines (SORE)

Small off-road engines (SORE) are spark-ignition engines rated at or below 19 kilowatts (i.e., 25 horsepower). Typical engines in this category are used in lawn and garden equipment as well as other outdoor power equipment and cover a broad range of equipment. The majority of this equipment belongs to the Lawn & Garden (e.g., lawnmower, leaf blower, trimmer) and Light Commercial (e.g., compressor, pressure washer, generator) categories of CARB's SORE emissions inventory model.

The newly developed, stand-alone SORE2020 Model reflects the recovering California economy from the 2008 economic recession and incorporates emission results from CARB's recent in-house testing as well as CARB's most recent Certification Database. CARB also has conducted an extensive survey of SORE operating within California through the Social Science Research Center (SSRC) at the California State University, Fullerton (CSUF). Data collected through this survey provides the most up-to-date information regarding the population and activity of SORE equipment in California. The emissions reflected in this SORE inventory for Coachella Valley are "baseline" emissions and do not include reductions from the SORE rule amendments of 2021. The SORE annual sales were forecasted using historic growth of the number of California households (DOF household forecasts, 2000 – 2008 and 2009 - 2018).

Additional information on SORE baseline emissions is available at:
https://ww2.arb.ca.gov/sites/default/files/2020-09/SORE2020_Technical_Documentation_2020_09_09_Final_Cleaned_ADA.pdf

Ocean Going Vessels

Ocean going vessels (OGVs) were updated in 2021 based on AIS (transponder) data. This data, along with vessel information supplied by South Coast AQMD and IHS Fairplay provides vessel visit counts, speed, engine size, and other vessel characteristics. The inventory adopts US EPA's methodology for emissions based on vessel speed, engine model year and horsepower. The inventory includes transit, maneuvering, anchorage and at-berth emissions, updating the 2019 at-berth-only inventory. The

comprehensive national model Freight Analysis Framework (FAF) was used to develop growth rates for forecasting.

Additional information on CARB's general OGV update is available at:
https://ww2.arb.ca.gov/sites/default/files/2022-03/CARB_2021_OGV_Documentation_ADA.pdf

Commercial Harbor Craft

Commercial Harbor Crafts (CHC) are grouped into 18 vessel types: articulated tug barge (ATB), bunker barge, towed petrochemical barge, other barge, dredge, commercial passenger fishing, commercial fishing, crew and supply, catamaran ferry, monohull ferry, short run ferry, excursion, ATB tug, push and tow tug, escort/ship assist tug, pilot boat, research boat, and work boat.

The CHC inventory was updated in 2021 and includes vessels used around harbors such as tug and tow boats, fishing vessels, research vessels, barges, and similar. The inventory was updated based on CARB's reporting data for these vessels, as well as inventories from the Ports of Los Angeles and Long Beach and Oakland and Richmond. This supplied vessel characteristics, and the population was scaled up to match U.S. Coast Guard data on the annual number of vessels in California waters. Activity and load factors were based on a mix of reporting data and port-specific inventories. Emission factors were based on certification data for harbor craft engines. Population and activity growth factors were estimated based on historical trends in the past decade.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2021/chc2021/apph.pdf

Locomotives

All locomotive inventories were updated in 2020 and include linehaul (large national companies), switchers (used in railyards), passenger, and Class 3 locomotives (smaller regional companies). Data for each sector was supplied by rail operations, including Union Pacific and Burlington Northern, and Santa Fe Railway (BNSF) for linehaul and switcher operations. Data for other categories was supplied by the locomotive owners. Emission factors for all categories were based on U.S. EPA emission factors for locomotives. The inventory reflects the 2005 memorandum of understanding (MOU) with Union Pacific and BNSF. Growth rates were primarily developed from the FAF.

More information is available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road

Military and Industry Locomotives

This new category includes military and Industrial (M&I) locomotive emission inventory and relies on the annual fuel consumption and engine information collected from 2011 to 2018. The M&I locomotive data was supplied by 39 private companies, 4 military rail groups, with a total of 85 locomotives. The subject locomotives typically consist of smaller, older switchers and medium horsepower (MHP, 2,301 to 3,999 hp) locomotives operating within the boundaries of a granary, plant, or industrial facility.

The updated methodology is currently in the process of being posted online. When it is completed, the methodology will be available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road

Diesel Agricultural Equipment

The agricultural equipment inventory covers all off-road vehicles used on farms or first processing facilities (of all fuel types). It was updated in 2021 using a 2019 survey of California farmers and rental facilities, and the 2017 U.S. Department of Agriculture (USDA) agricultural census. Emission factors are based on the 2017 off-road diesel emission factor update. The inventory reflects incentive programs for agricultural equipment that were implemented earlier than August 2019. Agricultural growth rates were developed using historical data from the County Agricultural Commissioners' reports.

Additional information is available at:
https://ww2.arb.ca.gov/sites/default/files/2021-08/AG2021_Technical_Documentation_0.pdf

In-Use Off-Road Equipment

This category covers off-road diesel vehicles over 25 horsepower in construction, mining, industrial, and oiling drilling categories. The inventory was updated in 2022 based on the DOORS registration program. Activity was updated based on a 2021 survey of registered equipment owners, and emission factors were based on the 2017 off-road diesel emission factor update. The inventory reflects the In-Use Off-Road Equipment Regulations, as amended in 2011.

The updated methodology is currently in the process of being posted online. When it is completed, the methodology will be available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road

Cargo Handling Equipment

The Cargo Handling Equipment (CHE) inventory covers equipment (of all fuels) used at California ports and intermodal railyards, such as cranes, forklifts, container handling equipment, and more. The inventory population and activity were updated in 2021 based on the port inventories for the Ports of Los Angeles and Long Beach and Richmond, and the CARB reporting data for other ports and railyards, which had a more comprehensive inventory than available through reporting. Load factors were based on the previous inventory in 2007, and emission factors were based on the 2017 off-road diesel emission factor update. The inventory reflects the CHE Airborne Toxic Control Measures (ATCM), adopted in 2005 and completed in 2017.

The updated methodology is currently in the process of being posted online. When it is completed, the methodology will be available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road

Transportation Refrigeration Units

The Transportation Refrigeration Units (TRU) inventory was updated in 2020 based on the TRU reporting program at CARB. The activity was developed based on 2010 surveys of facilities served by TRUs and 2017 to 2019 telematics data purchased from TRU manufacturers. Emission factors were developed specifically for TRUs based on TRU engine certification data reported to U.S. EPA as of 2018. The inventory reflects the TRU ATCM and 2021 amendments. Forecasting was based on IBISWorld reports forecast for related industries, and turnover forecasting was based on the past 20 years equipment population trends.

Additional information is available at:
https://ww2.arb.ca.gov/sites/default/files/barcu/board/rulemaking/tru2021/apph.pdf

Portable Equipment

Portable equipment inventory includes non-mobile diesel, such as generators, pumps, air compressors, chippers, and other miscellaneous equipment over 50 horsepower. This inventory was developed in 2017 based on CARB's registration program, 2017 survey of registered owners for activity and fuel, and the 2017 off-road diesel emission factor update. The inventory also reflects the Portable ATCM and 2017 amendments.

Because registration in PERP is voluntary, the PERP registration data was used as the basis for equipment population, with an adjustment factor used to represent the remaining portable equipment in the state. Estimates of future emissions beyond the base year were made by adjusting base year estimates for population growth, activity growth, and the purchases of new equipment (i.e. natural and accelerated turnover).

Additional information is available at:
https://ww3.arb.ca.gov/msei/ordiesel/perp2017report.pdf

Large Spark Ignition/Forklifts

The large spark ignition (LSI) inventory includes gasoline and propane forklifts, sweeper/scrubbers, and tow tractors. The inventory was updated in 2020 based on the LSI/forklift registration in the DOORS reporting system at CARB, and the sales data was provided by the Industrial Truck Association (ITA). Activity was based on a survey of equipment owners in the DOORS system, and emission factors were based on U.S. EPA's latest guidance for gasoline and propane engines. The inventory reflects the LSI regulation requirements and 2016 amendments.

The updated methodology is currently in the process of being posted online. When it is completed, the methodology will be available at:
https://ww2.arb.ca.gov/our-work/programs/mobile-source-emissions-inventory/road-documentation/msei-documentation-road

Stationary Point Sources

The stationary source inventory is composed of point sources and area-wide sources. The data elements in the inventory are consistent with the data elements required by the AERR. The inventory reflects actual emissions from industrial point sources reported to the South Coast AQMD by the facility operators through calendar year 2018.

More information regarding the South Coast AQMD's facility point source inventory is available at: *https://www.aqmd.gov/home/rules-compliance/compliance/annual-emission-reporting*

Stationary point sources also include smaller point sources, such as gasoline dispensing facilities and laundering, that are not inventoried individually, but are estimated as a group and reported as a single source category. Emissions from these sources are estimated using various models and methodologies. Estimation methods include source testing, direct measurement by continuous emissions monitoring systems, or engineering calculations. Emissions for these categories are estimated by both CARB and South Coast AQMD.

Estimates for the categories below were developed by CARB and has been reviewed by CARB staff to reflect the most up-to-date information.

Stationary Nonagricultural Diesel Engines

This category includes emissions from backup and prime generators and pumps, air compressors, and other miscellaneous stationary diesel engines that are widely used throughout the industrial, service, institutional, and commercial sectors. The emission estimates, including emission forecasts, are based on a 2003 CARB methodology derived from the OFFROAD2007 model.

Additional information on this methodology is available at: *https://ww3.arb.ca.gov/ei/areasrc/arbfuelcombother.htm*

Agricultural Diesel Irrigation Pumps

This category includes emissions from the operation of diesel-fueled stationary and mobile agricultural irrigation pumps. The emission estimates are based on a 2003 CARB methodology using statewide population and include replacements due to the Carl Moyer Program.

Additional information on this category is available at: *https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full1-1.pdf*

Wine Fermentation and Aging

This category includes emissions from the fermentation and aging of wine. Wine fermentation volumes in California are reported by the U.S. Alcohol and Tobacco Tax and Trade Bureau. CARB staff derived the emission factors from a computer model developed by Williams and Boulton. Emissions were initially estimated for 2002 and grown to later years using beverage manufacturing (Alcoholic & Non-Alcoholic) economic output.

An emission factor for brandy was derived by Hugh Cook of the Wine Institute. Emissions were initially estimated for 1992 then grown to 2012 using economic output for food manufacturing.

Additional information on this methodology is available at:
http://www.arb.ca.gov/ei/areasrc/arbindprofandag.htm

Laundering

This category includes emissions from perchloroethylene (perc) dry cleaning establishments. The emission estimates are based on a 2002 CARB methodology that used nationwide perc consumption rates allocated to the county level based on population and an emission factor of 10.125 pounds per gallon used.

Additional information on this methodology is available at:
https://ww3.arb.ca.gov/ei/areasrc/arbcleanlaund.htm

Gasoline Dispensing Facilities

This category uses a 2015 CARB methodology to estimate emissions from fuel transfer and storage operations at gasoline dispensing facilities (GDFs). The methodology addresses emissions from underground storage tanks, vapor displacement during vehicle refueling, customer spillage, and hose permeation. The updated methodology uses emission factors developed by CARB staff that reflect more current in-use test data and also accounts for the emission reduction benefits of onboard refueling vapor recovery (ORVR) systems. The emission estimates are based on 2012 statewide gasoline sales data from the California Board of Equalization that were apportioned to the county level using fuel consumption estimates from EMFAC 2014. Emissions were grown based on EMFAC2017.

Additional information on this category is available at:
https://ww2.arb.ca.gov/arb-petroleum-production-and-marketing-methodologies-petroleum-marketing

Gasoline Cargo Tank

This category uses a 2002 CARB methodology to estimate emissions from gasoline cargo tanks. These emissions do not include the emissions from loading and unloading of gasoline cargo tank product; they are included in the gasoline terminal inventory and gasoline service station inventory. Pressure-related fugitive emissions are volatile organic vapors leaking from three points: fittings, valves, and other connecting points in the vapor collection system on a cargo tank. 1997 total gasoline sales were obtained from the California Department of Transportation. The emission factors are derived from the data in the report, "Emissions from Gasoline Cargo Tanks, First Edition," published by the Air and Waste Management Association in 2002.

The initial emission estimates for 1997 were grown to 2012 using a growth parameter developed by Pechan based on gasoline and oil expenditures data. Emissions were grown according to fuel consumption from CARB's EMFAC 2017 mobile sources emission factors model.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/arb-petroleum-production-and-marketing-methodologies-petroleum-marketing

Marine Petroleum Loading

These categories are used to inventory 1987 hydrocarbon emissions associated with loading crude oil, residual oil, gasoline, and jet fuel into marine tankers and gasoline into barges. Emissions result from the displacement of vapors existing in the tank before loading and those generated as new product is loaded.

The amounts of crude oil, gasoline, jet fuel, and residual oil shipped off from California ports were obtained from a United States Army Corps of Engineers report "Waterborne Commerce of the United States, Calendar Year 1986" Part 4.

The emission factor for crude oil loading into tankers was obtained from the report "Hydrocarbon Emissions During Marine Loading of Crude Oils" from Western Oil and Gas Association (1977). The gasoline emission factors for loading into tankers and barges and jet fuel into tankers were obtained from CARB's "Report to the Legislature on Air Pollutant Emissions from Marine Vessels" (1984). The emission factor for residual oil loading into tankers was obtained from the "Inventory of Emissions from Marine Operations within California Coastal Waters, Preliminary Draft" report by Scott Environmental Technology, Inc. (1980). No growth was assumed for these emissions.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/arb-petroleum-production-and-marketing-methodologies-petroleum-marketing

Marine Petroleum Unloading

These categories are used to estimate hydrocarbon emissions associated with lightering crude oil and ballasting marine vessels after unloading crude oil or gasoline.

The amounts of crude oil and gasoline unloaded at California ports were obtained from the United States Army Corps of Engineers report "Waterborne Commerce of the United States, Calendar Year 1986" Part 4.

Crude oil lightering data was obtained from the Bay Area AQMD for 1987. Crude oil and gasoline ballasting data for San Luis Obispo for 1987 was obtained from the Army Corps of Engineers. The volume of water used for ballasting following a cargo discharge was obtained from CARB's "Report to the Legislature on Air Pollutant Emissions from Marine Vessels" (1984).

The crude oil lightering emission factor was obtained from "Hydrocarbon Emissions During Marine Loading of Crude Oils," Western Oil and Gas Association (1977).

Ballasting crude oil and gasoline vessels emission factors were obtained from "Inventory of Emissions from Marine Operations within the California Coastal waters," by Scott Environmental Technology, Inc. (1981). No growth is assumed for this category.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/arb-petroleum-production-and-marketing-methodologies-petroleum-marketing

Oil and Gas Production

The oil and natural gas production inventory is estimated by a 2015 CARB methodology. This category is related to fugitive emissions from production-related fuel consumption, fugitive losses (sumps, pits, pumps, compressors, well heads, separators, valves and fittings), vapor recovery and flares, tank and truck working and breathing losses, wastewater treatment, tertiary production, and wet and dry gas stripping. Emissions were calculated using U.S. EPA's Oil and Natural Gas Tool v1.4 with default emissions factors from ENVIRON Int'l Corp's 2012 report, "2011 Oil and Gas Emission Inventory Enhancement Project for CenSARA States," and activity data taken from California's Division of Oil, Gas, and Geothermal Resources (DOGGR) (which was renamed to Geologic Energy Management Division (CalGEM) in 2020). CARB also incorporated data from the 2007 Oil and Gas Industry Survey (e.g., typical component counts) and feedback from individual air districts (e.g., minimum controls required to operate in a certain district, with associated control factors) to improve these parameters and further adjust the tool's output.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/resources/documents/oil-and-gas-industry-survey
https://ww3.arb.ca.gov/ei/areasrc/oilandgaseifinalreport.pdf

Area-Wide Sources

Area-wide sources include categories where emissions take place over a wide geographic area, such as consumer products. Emissions from these sources are estimated using various models and methodologies. Estimation methods include source testing, direct measurement by continuous emissions monitoring systems, or engineering calculations. Emissions for these categories are estimated by both CARB and the South Coast AQMD.

Estimates for the categories below were developed by CARB and has been reviewed by CARB staff to reflect the most up-to-date information:

Consumer Products and Aerosol Coatings

The Consumer Product emission estimates utilized sales and formulation data from the CARB's mandatory survey of all consumer products sold in California for calendar years 2013 through 2015 (2015 Consumer Product Survey). The aerosol coatings estimates utilized sales and formulation data from a survey conducted by CARB in 2010. Based on the survey data, CARB staff determined the total product sales and total VOC emissions for the various product categories. Growth for personal care products are based on real disposable personal income projections per REMI version 2.4.3. No growth is assumed for aerosol coatings. Growth for all other consumer products are based on SCAG population projections.

Additional information on CARB's consumer products surveys is available at: *https://ww2.arb.ca.gov/our-work/programs/consumer-products-program/consumer-commercial-product-surveys*

Pesticides

The California Department of Pesticide Regulation (DPR) develops month-specific emission estimates for agricultural and structural pesticides. Each calendar year, DPR updates the inventory based on the Pesticides Use Report, which provides updated information from 1990 through the 2018 calendar year. Agricultural pesticide emission forecasts for years 2019 and beyond are based on the average of the most recent five years. Growth for agricultural pesticides is based on CARB projections of farmland acres per FMMP, 2016. Growth for structural pesticides is based on SCAG housing units.

Additional information about CARB's pesticides program is available at: *https://ww2.arb.ca.gov/carb-solvent-evaporation-methodologies-agricultural-and-non-agricultural-pesticides*

Residential Wood Combustion

Residential Wood Combustion estimates are based off a 2011 CARB methodology. It reflects recent survey data on types of wood burning devices and wood consumption rates, updates to the 2002 U.S. EPA National Emission Inventory (NEI) emission factors, and improved calculation approaches. The update reflects wood combustion surveys conducted by several districts including South Coast AQMD in 2003 and 2006.

CARB assumes no growth for this category based on the relatively stagnant residential wood fuel use over the past decade (according to the American Community Survey and US Energy Information Administration).

Additional information on this methodology is available at: *https://ww2.arb.ca.gov/carb-miscellaneous-process-methodologies-residential-fuel-combustion*

Fires

Emissions from structural and automobile fires were estimated based on a 1999 CARB methodology using the number of fires and the associated emission factors. Estimates for structural fires are calculated using the amount of the structure that is burned, the amount and content of the material burned, and emission factors derived from test data. Estimates for automobile fires are calculated using the weight of the car and components and composite emission factors derived from AP-42 emission factors. No growth is assumed for this category.

Additional information on this methodology is available at: *https://ww2.arb.ca.gov/carb-miscellaneous-process-methodologies-fires*

Managed Burning & Disposal – Range Improvement and Forest Management

The Range Improvement Managed Burning and Disposal category provides emission estimates from prescribed burning performed on rangelands. Rangeland is land used to support grazing by livestock. The Forest Management Managed Burning and Disposal category provides emission estimates from prescribed burning performed in natural vegetation types such as forests and woodlands.

Burn project perimeters and ignition dates are provided by the 2019 California Department of Forestry and Fire Protection (FRAP) geodatabase. Range Improvement and forest management prescribed burning emissions are estimated using the First Order Fire Effects Model (FOFEM 6.0) and a custom geoprocessing tool (Emission Estimation System, EES) developed for CARB by researchers at UC Berkeley. Future year estimates are based on a 10-year average, held flat in the forecast.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/district-miscellaneous-process-methodologies-managed-burning-and-disposal

Managed Burning & Disposal – Agricultural Burning

The Agricultural Burning Managed Burning and Disposal category includes the open burning of agricultural residues (such as crop stubble and orchard pruning), weed abatement (such as ditch and canal bank burning), and other materials. CARB updated the emissions inventory to reflect burn data reported by air district staff for 2017. Emissions are calculated using crop specific emission factors and fuel loadings. Temporal profiles reflect monthly burn activity. Growth for agricultural burning is based on CARB projections of FMMP farmland acres, 2016. No growth is assumed for burning associated with weed abatement.

Additional information on this methodology is available at:
https://ww2.arb.ca.gov/district-miscellaneous-process-methodologies-managed-burning-and-disposal

Point and Areawide Source Emissions Forecasting and Control Rules

Emission forecasts (2019 and subsequent years) are based on growth profiles that in many cases incorporate historical trends up to the base year or beyond. The growth surrogates used to forecast the emissions from these categories were largely based on Southern California Association of Governments (SCAG) data. The emissions inventory also reflects emission reductions from point and areawide sources subject to South Coast AQMD's rules and CARB regulations. The rules and regulations reflected in the inventory are listed below in Table 1.

Table 1: South Coast AQMD and CARB Control Rules and Regulations Included in the Inventory

Agency	Rule/Reg No.	Rule Title	Source Categories Impacted
SC_AQMD	1106.0	Marine Coating Operations	Coatings and related process solvents
SC_AQMD	1106.1	Pleasure Craft Coating Operations	Coatings and related process solvents
SC_AQMD	1107	Coating of Metal Parts and Products	Coatings and related process solvents
SC_AQMD	1110.1	Emissions from Stationary Internal Combustion Engines	Fuel combustion
SC_AQMD	1110.2	Emissions from Gaseous- and Liquid-Fueled Engines	Fuel combustion
SC_AQMD	1111	Reduction of NOx Emissions from Natural-Gas-Fired, Fan-Type Central Furnaces	Fuel combustion
SC_AQMD	1113	Architectural Coatings	Architectural coatings
SC_AQMD	1114	Petroleum Refinary Coking Operations	Petroleum refining
SC_AQMD	R1118.1	Non-Refinery Flares	Various processes - flares

Agency	Rule/Reg No.	Rule Title	Source Categories Impacted
SC_AQMD	1121	Control of Nitrogen Oxides from Residential - Type, Natural-Gas-Fired Water Heaters	Fuel combustion
SC_AQMD	1122	Solvent Degreasers	Solvent degreasing
SC_AQMD	1124	Aerospace Assembly and Component Manufacturing Operations	Coatings and related process solvents
SC_AQMD	1127	Emission Reductions from Livestock Waste	Livestock waste
SC_AQMD	1128	Paper, Fabric, and Film Coating Operations	Coatings and related process solvents
SC_AQMD	1130	Graphic Arts	Printing operations
SC_AQMD	1130.1	Screen Printing Operations	Printing operations
SC_AQMD	R1134	Stationary Gas Turbines	Internal combustion engines / turbines
SC_AQMD	R1135	Electricity Generating Facilities	Electric generation / boilers
SC_AQMD	1136	Wood Products Coatings	Coatings and related process solvents
SC_AQMD	1137	PM10 Emission Reductions from Woodworking Operations	Woodworking operations
SC_AQMD	1138	Control of Emissions from Restaurant Operations	Cooking
SC_AQMD	1143	Consumer Paint Thinnners & Multi-Purpose Solvents	Architectural coatings and related process solvents

Agency	Rule/Reg No.	Rule Title	Source Categories Impacted
SC_AQMD	1144	Metalworking Fluids and Direct-Contact Lubricants	Other processes / multi-purpose lubricants
SC_AQMD	1145	Plastic, Rubber, Leather, and Glass Coatings	Coatings and related process solvents
SC_AQMD	1146.1	Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters	Fuel combustion / boilers, process heaters, and steam generators
SC_AQMD	1146.2	Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters	Fuel combustion / boilers, process heaters, and steam generators
SC_AQMD	1146	Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators, and Process Heaters	Fuel combustion / boilers, process heaters, and steam generators
SC_AQMD	1147	NOx Reductions from Miscellaneous Sources	Fuel combustion
SC_AQMD	1148.1	Oil and Gas Production Wells	Oil and gas production
SC_AQMD	1149	Storage Tank and Pipeline Cleaning and Degassing	Petroleum marketing
SC_AQMD	1151	Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations	Coatings and related process solvents
SC_AQMD	1153	Commercial Bakery Ovens	Commercial bakery
SC_AQMD	1162	Polyester Resin Operations	Chemical / fiberglass manufacturing

Agency	Rule/Reg No.	Rule Title	Source Categories Impacted
SC_AQMD	1168	Adhesive and Sealant Applications	Adhesive and sealant applications
SC_AQMD	1171	Solvent Cleaning Operations	Degreasing / solvent cleaning operations
SC_AQMD	1173	Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants	Oil and gas production
SC_AQMD	1176	VOC Emissions from Wastewater Systems	Oil and gas production
SC_AQMD	1177	Liquefied Petroleum Gas Transfer and Dispensing	Petroleum marketing
SC_AQMD	461	Gasoline Transfer and Dispensing	Petroleum marketing
SC_AQMD	462	Organic Liquid Loading	Petroleum marketing
EX_RECLAIM	R1109.1	Ex-RECLAIM Refinery Equipment	Fuel Combustion
EX_RECLAIM	EXRECL_ADJ	Ex-Reclaim Adjustment	Adjustment to normalize to 2024 RECLAIM NOx allocation for post-sunset projection
CARB	ARB_R003 & ARB_R003_B	Consumer Product Regulations & Amendments	Consumer products
CARB	ARB_R007	Aerosol Coating Regulations	Aerosol coatings
CARB	GDF_HOSREG	Gasoline Dispensing Facility (GDF) Hose Emission Regulation	Petroleum marketing

Agency	Rule/Reg No.	Rule Title	Source Categories Impacted
CARB	ORVR	Fueling Emissions from ORVR Vehicles	Petroleum marketing
CARB	AG_IC_ENG	AG IC Engine Emission Scalars	Agricultural IC Engines
CARB	NONAGICENG	Non-Ag IC Engine Emission Scalars	Non-agricultural IC Engines