Current Nonattainment Counties for All Criteria Pollutants

Data is current as of November 30, 2021

The 8-hour Ozone (1997) standard was revoked on April 6, 2015 and the 1-hour Ozone (1979) standard was revoked on June 15, 2005.
The asterisk (*) indicates only a portion of the county is included in the designated nonattainment area (NA).

Download National Dataset of all designated areas (currently nonattainment, maintenance, revoked):
dbf | xls | Data dictionary (PDF)

Listed by State, County, NAAQS (Classification, if applicable) * Part County NA NA Area Name

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ALASKA
Fairbanks North Star Borough
PM-2.5 (2006) *Fairbanks, AK - (Serious)
ARIZONA
Cochise County
PM-10 (1987) *Paul Spur/Douglas (Cochise County), AZ - (Moderate)
Gila County
Lead (2008) *Hayden, AZ
PM-10 (1987) *Hayden, AZ - (Moderate)
PM-10 (1987) *Miami, AZ - (Moderate)
Sulfur Dioxide (2010) *Hayden, AZ
Sulfur Dioxide (2010) *Miami, AZ
8-Hour Ozone (2015) *Phoenix-Mesa, AZ - (Marginal)
Maricopa County
PM-10 (1987) *Phoenix, AZ - (Serious)
8-Hour Ozone (2008) *Phoenix-Mesa, AZ - (Moderate)
8-Hour Ozone (2015) *Phoenix-Mesa, AZ - (Marginal)
Pima County
PM-10 (1987) *Rillito, AZ - (Moderate)
Pinal County
Lead (2008) *Hayden, AZ
PM-10 (1987) *Hayden, AZ - (Moderate)
PM-10 (1987) *Miami, AZ - (Moderate)
PM-10 (1987) *Phoenix, AZ - (Serious)
PM-10 (1987) *West Pinal, AZ - (Serious)
PM-2.5 (2006) *West Central Pinal, AZ - (Moderate)
Sulfur Dioxide (1971) *Hayden (Pinal County), AZ
Sulfur Dioxide (2010) *Hayden, AZ
8-Hour Ozone (2008) *Phoenix-Mesa, AZ - (Moderate)
8-Hour Ozone (2015) *Phoenix-Mesa, AZ - (Marginal)
Santa Cruz County

- *PM-10 (1987)* *Nogales, AZ - (Moderate)
- *PM-2.5 (2006)* *Nogales, AZ - (Moderate)

Yuma County
- *PM-10 (1987)* *Yuma, AZ - (Moderate)
- *8-Hour Ozone (2015)* *Yuma, AZ - (Marginal)

CALIFORNIA

Alameda County
- *PM-2.5 (2006)* San Francisco Bay Area, CA - (Moderate)
- *8-Hour Ozone (2008)* San Francisco Bay Area, CA - (Marginal)
- *8-Hour Ozone (2015)* San Francisco Bay Area, CA - (Marginal)

Amador County
- *8-Hour Ozone (2015)* Amador County, CA - (Marginal)

Butte County
- *8-Hour Ozone (2008)* Chico (Butte County), CA - (Marginal)
- *8-Hour Ozone (2015)* Butte County, CA - (Marginal)

Calaveras County
- *8-Hour Ozone (2008)* Calaveras County, CA - (Marginal)
- *8-Hour Ozone (2015)* Calaveras County, CA - (Marginal)

Contra Costa County
- *PM-2.5 (2006)* San Francisco Bay Area, CA - (Moderate)
- *8-Hour Ozone (2008)* San Francisco Bay Area, CA - (Marginal)
- *8-Hour Ozone (2015)* San Francisco Bay Area, CA - (Marginal)

El Dorado County
- *PM-2.5 (2006)* *Sacramento, CA - (Moderate)
- *8-Hour Ozone (2008)* *Sacramento Metro, CA - (Severe 15)
- *8-Hour Ozone (2015)* *Sacramento Metro, CA - (Serious)

Fresno County
- *PM-2.5 (1997)* San Joaquin Valley, CA - (Serious)
- *PM-2.5 (2006)* San Joaquin Valley, CA - (Serious)
- *PM-2.5 (2012)* San Joaquin Valley, CA - (Moderate)
- *8-Hour Ozone (2008)* San Joaquin Valley, CA - (Extreme)
- *8-Hour Ozone (2015)* San Joaquin Valley, CA - (Extreme)

Imperial County
- *PM-2.5 (2006)* *Imperial Co, CA - (Moderate)
- *PM-2.5 (2012)* *Imperial County, CA - (Moderate)
- *8-Hour Ozone (2008)* Imperial County, CA - (Moderate)
- *8-Hour Ozone (2015)* Imperial County, CA - (Marginal)

Inyo County
- *PM-10 (1987)* *Owens Valley, CA - (Serious)

Kern County
- *PM-10 (1987)* *East Kern Co, CA - (Serious)
- *PM-2.5 (1997)* *San Joaquin Valley, CA - (Serious)
- *PM-2.5 (2006)* *San Joaquin Valley, CA - (Serious)
- *PM-2.5 (2012)* *San Joaquin Valley, CA - (Moderate)
- *8-Hour Ozone (2008)* *Kern Co (Eastern Kern), CA - (Severe 15)
- *8-Hour Ozone (2008)* *San Joaquin Valley, CA - (Extreme)
- *8-Hour Ozone (2015)* *Kern County (Eastern Kern), CA - (Serious)
- *8-Hour Ozone (2015)* *San Joaquin Valley, CA - (Extreme)

Kings County
- *PM-2.5 (1997)* San Joaquin Valley, CA - (Serious)
- *PM-2.5 (2006)* San Joaquin Valley, CA - (Serious)
- *PM-2.5 (2012)* San Joaquin Valley, CA - (Moderate)
- *8-Hour Ozone (2008)* San Joaquin Valley, CA - (Extreme)
- *8-Hour Ozone (2015)* San Joaquin Valley, CA - (Extreme)

Los Angeles County
- *Lead (2008)* *Los Angeles County-South Coast Air Basin, CA
- *PM-2.5 (1997)* *Los Angeles-South Coast Air Basin, CA - (Moderate)
- *PM-2.5 (2006)* *Los Angeles-South Coast Air Basin, CA - (Serious)

PM-2.5 (2012)	*Los Angeles-South Coast Air Basin, CA - (Serious)
8-Hour Ozone (2008)	*Los Angeles-San Bernardino Counties (West Mojave Desert), CA - (Severe 15)
8-Hour Ozone (2008)	*Los Angeles-South Coast Air Basin, CA - (Extreme)
8-Hour Ozone (2015)	*Los Angeles-San Bernardino Counties (West Mojave Desert), CA - (Severe 15)
8-Hour Ozone (2015)	*Los Angeles-South Coast Air Basin, CA - (Extreme)
Madera County	
PM-2.5 (1997)	San Joaquin Valley, CA - (Serious)
PM-2.5 (2006)	San Joaquin Valley, CA - (Serious)
PM-2.5 (2012)	San Joaquin Valley, CA - (Moderate)
8-Hour Ozone (2008)	San Joaquin Valley, CA - (Extreme)
8-Hour Ozone (2015)	San Joaquin Valley, CA - (Extreme)
Marin County	
PM-2.5 (2006)	San Francisco Bay Area, CA - (Moderate)
8-Hour Ozone (2008)	San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015)	San Francisco Bay Area, CA - (Marginal)
Mariposa County	
8-Hour Ozone (2008)	Mariposa County, CA - (Moderate)
8-Hour Ozone (2015)	Mariposa County, CA - (Marginal)
Merced County	
PM-2.5 (1997)	San Joaquin Valley, CA - (Serious)
PM-2.5 (2006)	San Joaquin Valley, CA - (Serious)
PM-2.5 (2012)	San Joaquin Valley, CA - (Moderate)
8-Hour Ozone (2008)	San Joaquin Valley, CA - (Extreme)
8-Hour Ozone (2015)	San Joaquin Valley, CA - (Extreme)
Mono County	
PM-10 (1987)	*Mono Basin, CA - (Moderate)
Napa County	
PM-2.5 (2006)	San Francisco Bay Area, CA - (Moderate)
8-Hour Ozone (2008)	San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015)	San Francisco Bay Area, CA - (Marginal)
Nevada County	
8-Hour Ozone (2008)	*Nevada Co. (Western part), CA - (Serious)
8-Hour Ozone (2015)	*Nevada County (Western part), CA - (Serious)
Orange County	
PM-2.5 (1997)	Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	Los Angeles-South Coast Air Basin, CA - (Serious)
PM-2.5 (2012)	Los Angeles-South Coast Air Basin, CA - (Serious)
8-Hour Ozone (2008)	Los Angeles-South Coast Air Basin, CA - (Extreme)
8-Hour Ozone (2015)	Los Angeles-South Coast Air Basin, CA - (Extreme)
Placer County	
PM-2.5 (2006)	*Sacramento, CA - (Moderate)
8-Hour Ozone (2008)	*Sacramento Metro, CA - (Severe 15)
8-Hour Ozone (2015)	*Sacramento Metro, CA - (Serious)
Plumas County	
PM-2.5 (2012)	*Plumas County, CA - (Moderate)
Riverside County	
PM-10 (1987)	*Coachella Valley, CA - (Serious)
PM-2.5 (1997)	*Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	*Los Angeles-South Coast Air Basin, CA - (Serious)

PM-2.5 (2012)	*	Los Angeles-South Coast Air Basin, CA - (Serious)
8-Hour Ozone (2008)	*	Los Angeles-South Coast Air Basin, CA - (Extreme)
8-Hour Ozone (2008)	*	Morongo Band of Mission Indians - (Serious)
8-Hour Ozone (2008)	*	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation - (Moderate)
8-Hour Ozone (2008)	*	Riverside Co, (Coachella Valley), CA - (Severe 15)
8-Hour Ozone (2015)	*	Los Angeles-South Coast Air Basin, CA - (Extreme)
8-Hour Ozone (2015)	*	Morongo Band of Mission Indians, CA - (Serious)
8-Hour Ozone (2015)	*	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation, CA - (Marginal)
8-Hour Ozone (2015)	*	Riverside County (Coachella Valley), CA - (Severe 15)
Sacramento County		
PM-2.5 (2006)		Sacramento, CA - (Moderate)
8-Hour Ozone (2008)		Sacramento Metro, CA - (Severe 15)
8-Hour Ozone (2015)		Sacramento Metro, CA - (Serious)
San Bernardino County		
PM-10 (1987)	*	San Bernardino Co, CA - (Moderate)
PM-10 (1987)	*	Trona, CA - (Moderate)
PM-2.5 (1997)	*	Los Angeles-South Coast Air Basin, CA - (Moderate)
PM-2.5 (2006)	*	Los Angeles-South Coast Air Basin, CA - (Serious)
PM-2.5 (2012)	*	Los Angeles-South Coast Air Basin, CA - (Serious)
8-Hour Ozone (2008)	*	Los Angeles-San Bernardino Counties (West Mojave Desert), CA - (Severe 15)
8-Hour Ozone (2008)	*	Los Angeles-South Coast Air Basin, CA - (Extreme)
8-Hour Ozone (2015)	*	Los Angeles-San Bernardino Counties (West Mojave Desert), CA - (Severe 15)
8-Hour Ozone (2015)	*	Los Angeles-South Coast Air Basin, CA - (Extreme)
San Diego County		
8-Hour Ozone (2008)	*	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation - (Moderate)
8-Hour Ozone (2008)	*	San Diego County, CA - (Severe 15)
8-Hour Ozone (2015)	*	Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation, CA - (Marginal)
8-Hour Ozone (2015)	*	San Diego County, CA - (Severe 15)
San Francisco County		
PM-2.5 (2006)		San Francisco Bay Area, CA - (Moderate)
8-Hour Ozone (2008)		San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015)		San Francisco Bay Area, CA - (Marginal)
San Joaquin County		
PM-2.5 (1997)		San Joaquin Valley, CA - (Serious)
PM-2.5 (2006)		San Joaquin Valley, CA - (Serious)
PM-2.5 (2012)		San Joaquin Valley, CA - (Moderate)
8-Hour Ozone (2008)		San Joaquin Valley, CA - (Extreme)
8-Hour Ozone (2015)		San Joaquin Valley, CA - (Extreme)
San Luis Obispo County		
8-Hour Ozone (2008)	*	San Luis Obispo (Eastern San Luis Obispo), CA - (Marginal)
8-Hour Ozone (2015)	*	San Luis Obispo (Eastern part), CA - (Marginal)
San Mateo County		
PM-2.5 (2006)		San Francisco Bay Area, CA - (Moderate)

8-Hour Ozone (2008) San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015) San Francisco Bay Area, CA - (Marginal)

Santa Clara County

PM-2.5 (2006) San Francisco Bay Area, CA - (Moderate)
8-Hour Ozone (2008) San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015) San Francisco Bay Area, CA - (Marginal)

Solano County

PM-2.5 (2006) *Sacramento, CA - (Moderate)
PM-2.5 (2006) *San Francisco Bay Area, CA - (Moderate)
8-Hour Ozone (2008) *Sacramento Metro, CA - (Severe 15)
8-Hour Ozone (2008) *San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015) *Sacramento Metro, CA - (Serious)
8-Hour Ozone (2015) *San Francisco Bay Area, CA - (Marginal)

Sonoma County

PM-2.5 (2006) *San Francisco Bay Area, CA - (Moderate)
8-Hour Ozone (2008) *San Francisco Bay Area, CA - (Marginal)
8-Hour Ozone (2015) *San Francisco Bay Area, CA - (Marginal)

Stanislaus County

PM-2.5 (1997) San Joaquin Valley, CA - (Serious)
PM-2.5 (2006) San Joaquin Valley, CA - (Serious)
PM-2.5 (2012) San Joaquin Valley, CA - (Moderate)
8-Hour Ozone (2008) San Joaquin Valley, CA - (Extreme)
8-Hour Ozone (2015) San Joaquin Valley, CA - (Extreme)

Sutter County

8-Hour Ozone (2008) *Sacramento Metro, CA - (Severe 15)
8-Hour Ozone (2015) *Sacramento Metro, CA - (Serious)
8-Hour Ozone (2015) *Sutter Buttes, CA - (Marginal)

Tehama County

8-Hour Ozone (2008) *Tuscan Buttes, CA - (Marginal)
8-Hour Ozone (2015) *Tuscan Buttes, CA - (Marginal (Rural Transport))

Tulare County

PM-2.5 (1997) San Joaquin Valley, CA - (Serious)
PM-2.5 (2006) San Joaquin Valley, CA - (Serious)
PM-2.5 (2012) San Joaquin Valley, CA - (Moderate)
8-Hour Ozone (2008) San Joaquin Valley, CA - (Extreme)
8-Hour Ozone (2015) San Joaquin Valley, CA - (Extreme)

Tuolumne County

8-Hour Ozone (2015) Tuolumne County, CA - (Marginal)

Ventura County

8-Hour Ozone (2008) *Ventura County, CA - (Serious)
8-Hour Ozone (2015) *Ventura County, CA - (Serious)

Yolo County

PM-2.5 (2006) *Sacramento, CA - (Moderate)
8-Hour Ozone (2008) Sacramento Metro, CA - (Severe 15)
8-Hour Ozone (2015) Sacramento Metro, CA - (Serious)

COLORADO

Adams County

8-Hour Ozone (2008) Denver-Boulder-Greeley-Ft. Collins-Loveland, CO - (Serious)
8-Hour Ozone (2015) Denver Metro/North Front Range, CO - (Marginal)

Arapahoe County

8-Hour Ozone (2008) Denver-Boulder-Greeley-Ft. Collins-Loveland, CO - (Serious)
8-Hour Ozone (2015) Denver Metro/North Front Range, CO - (Marginal)

Boulder County

8-Hour Ozone (2008) Denver-Boulder-Greeley-Ft. Collins-Loveland, CO - (Serious)
8-Hour Ozone (2015) Denver Metro/North Front Range, CO - (Marginal)

Monterey Bay Air Resources District

2012 - 2015

Air Quality Management Plan

Adopted by District Board of Directors on March 15, 2017

24580 Silver Cloud Ct. | Monterey, CA 93940

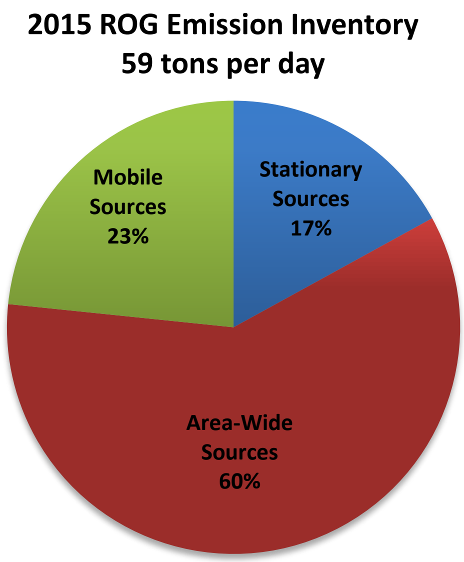
Executive Summary

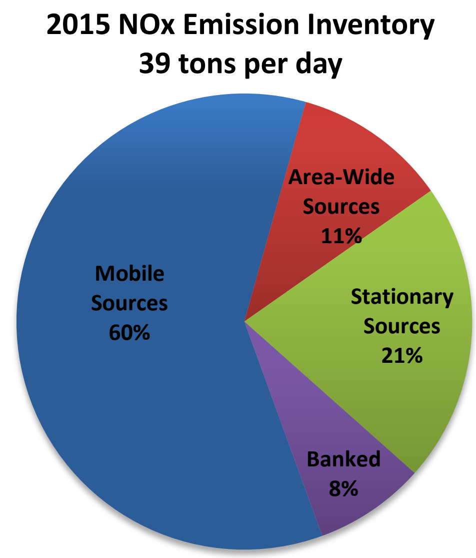
The Monterey Bay Air Resources District (District) is one of 35 air districts established to protect air quality in California. Its jurisdiction is the North Central Coast Air Basin (NCCAB), comprised of Monterey, Santa Cruz and San Benito counties. In 1988, the State Legislature adopted the California Clean Air Act (CCAA), which required each nonattainment district in the State to adopt a plan showing how the State Ambient Air Quality Standard (AAQS) for ozone would be met in their area of jurisdiction.

The CCAA (Health & Safety Code §40910 et seq.) required initial preparation of an Air Quality Management Plan (AQMP) in 1991, with subsequent updates every three years. This is the seventh update to the 1991 AQMP. There have been many changes both in terms of air quality and the regulatory setting since the initial AQMP in 1991. This report is an update to elements included in the 2012 AQMP based on a review of the time period 2012-2015. It shows that the region continues to make progress toward meeting the State ozone standard.

The District's focus continues to be on achieving the 8-hour component of the California ozone standard as the region has already attained the 1-hour standard. The primary elements from the 2012 AQMP updated in this revision include the air quality trends analysis, emission inventory, and mobile source programs. The District has jurisdiction over stationary emission sources which continue to be the smallest portion of both the reactive organic gas (ROG) and oxides of nitrogen (NOx) emissions inventories (see below). Area-wide sources are the main contributor to ROG emissions in the region.

Mobile sources emissions continue to dominate the District's NOx emissions inventory. As found in historical ozone transport studies, ozone concentrations at the Pinnacles National Park monitor are significantly impacted by Bay Area NOx emissions. In addition, the region is "NOx sensitive" or NOx limited, meaning that ozone formation due to local emissions is more limited by the availability of NOx as opposed to the availability of ROGs (Umeda & Martien, 2002). The recent changes that contributed to reducing estimated NOx emissions compared to the 2012 AQMP include lower vehicle miles traveled. Cleaner exhaust standards for mobile sources also remain an important factor in reducing regional ROG and NOx emissions over the lifetime of the AQMP series.





Reducing NOx emissions is crucial for reducing ozone formation. Seeing that the primary source of NOx emissions are from mobile sources, the District will continue to focus on our mobile source grant programs which reduce NOx from both on road and off road mobile sources. Additionally, NOx emissions from the upwind San Francisco Bay Area and San Joaquin Air Basins are forecast to decline through the year 2030. This decline should help reduce the number of exceedances at Pinnacles National Park, which is heavily impacted by ozone transport from these upwind regions and is the primary reason the NCCAB is nonattainment for the State ozone standard.

A review of the latest 3 years of monitoring data (2013-2015) indicates there were fewer exceedance days in the time period 2013-2015 (9 days) compared to 2006-2008 (63) as well as the 2009-2011 (16) period used in the prior AQMP. Therefore, the control measures presented in the 2008 AQMP have not been implemented as the District has determined progress is continuing to be made toward attaining the 8-hour ozone standard during the latest three-year period reviewed (2013-2015).

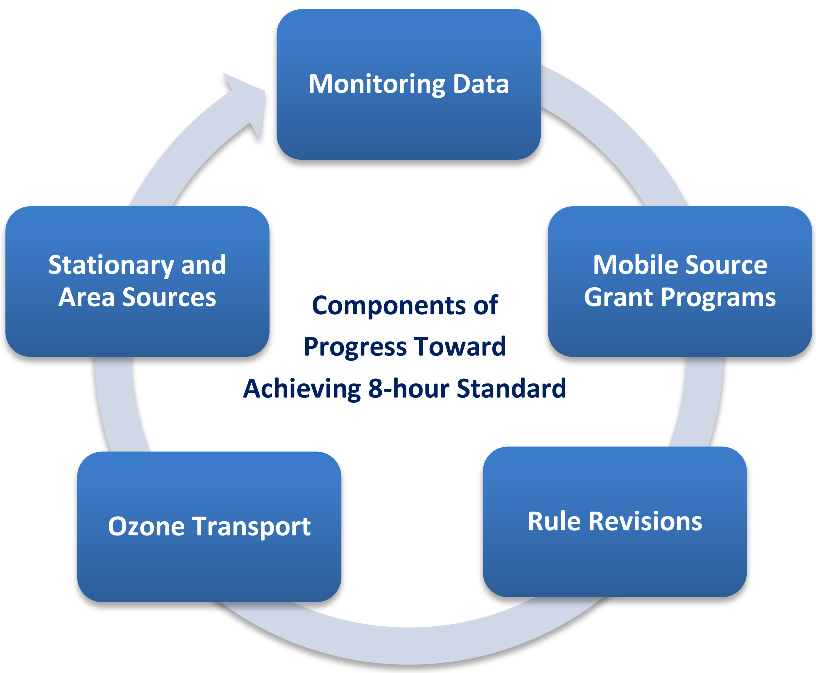


Table of Contents

Acronym List

AAQS	Ambient Air Quality Standard
AB32	Assembly Bill 32
AB923	Assembly Bill 923
AB2766	Assembly Bill 2766
AMBAG	Association of Monterey Bay Area Governments
APCD	Air Pollution Control District
APCO	Air Pollution Control Officer
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
CAPCOA	California Air Pollution Control Officers Association
CCAA	California Clean Air Act of 1988
CASTNET	Federal Clean Air Status and Trends Network
CEPAM	California Emissions Projection Analysis Model
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DMV	Department of Motor Vehicles
DOF	California Department of Finance
EIC	Emission Inventory Category
EMFAC	Emission Factor Estimation Model (On-Road Motor Vehicles)
EPA	United States Environmental Protection Agency
EPDC	Expected Peak Day Concentration
ERC	Emission Reduction Credit
H&SC	Health & Safety Code
HDT	Heavy Duty Truck
HDV	Heavy Duty Vehicle
LDT	Light Duty Truck
LDV	Light Duty Vehicle
LESBP	Lower Emission School Bus Program
MBARD	Monterey Bay Air Resources District
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MDT	Medium Duty Truck
MDV	Medium Duty Vehicle
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
MTIP	Metropolitan Transportation Improvement Program
µg	Microgram
$\mu g/m^3$	Micrograms Per Cubic Meter
NAAQS	National Ambient Air Quality Standards
NCCAB	North Central Coast Air Basin
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NMHC	Non-Methane Hydrocarbons
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
O_3	Ozone
OFFROAD	Off-road Emission Estimation Model
PEV	Plug-in Electric Vehicle
PM	Particulate Matter
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
ppb	Parts Per Billion
ppm	Parts Per Million
ROG	Reactive Organic Gases
RTDM	Regional Travel Demand Model
RTP	Regional Transportation Plan
SFBAAB	San Francisco Bay Area Air Basin
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
TCM	Transportation Control Measure
TPD	Tons Per Day
TPY	Tons Per Year
VMT	Vehicle Miles Travelled

1. Introduction

The California Clean Air Act (CCAA) requires attainment of State ambient air quality standards by the earliest practicable date. For air districts in violation of the State ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide standards, attainment plans were required by July 1991. The Monterey Bay Unified Air Pollution Control District dba the Monterey Bay Air Resources District was required to develop an attainment plan to address ozone violations. The CCAA requires the District to periodically prepare and submit a report to the Air Resources Board (ARB) that assesses its progress toward attainment of the State ambient air quality standards [Health and Safety Code §40924]. The 1991 Air Quality Management Plan (AQMP) was the first plan prepared in response to the CCAA that established specific planning requirements to meet the 1-hour ozone standard. In 2006, the ARB revised the State Ambient Air Quality Standards (AAQS) and made it considerably more stringent by adding an 8-hour average to the standard, which previously only included a 1-hour average. Both components of the standard must now be met before the ARB can designate that an area has attained the standard. This report is the seventh update to the 1991 AQMP with plans completed in 1994, 1997, 2000, 2004, 2008, and 2012.

This report only addresses attainment of the State ozone standard. It is an assessment and update to the 2012 Triennial Plan. In 2012, EPA designated the North Central Coast Air Basin (NCCAB) as attainment of the national 8-hour ozone standard of 0.075 ppm. In 2015, the national standard was revised to 0.070 ppm. The NCCAB continues to be in attainment with the stricter national standard.

2. AQMP Report Requirements

The 2016 AQMP documents the District's progress toward attaining the State ozone standard. This report is the District's review and update to the 2012 Triennial Plan. In preparing this report, the District reviewed the following areas required by §40924 and §40925 of the Health and Safety Code:

- Extent of air quality improvement based upon ambient measurements and air quality indicators.
- Expected and revised reductions for each measure scheduled for adoption.
- Incorporate new data or projections into the attainment plan, including, but not limited to population-related, industry-related, and vehicle-related emissions growth.
- Compare the new data to the rate of emission reductions and growth projected in the previous triennial plan revision.

The 2016 AQMP update builds on information developed in past AQMPs. Consequently, some sections of the 2008 AQMP and 2012 Triennial Plan are incorporated by reference for those elements that have not been updated.

3. Ambient Air Quality

Ozone, the primary constituent of smog and the main pollutant of concern for the North Central Coast Air Basin (NCCAB), is formed in the atmosphere through complex chemical interactions involving reactive organic gases (ROG)[1] and nitrogen oxides (NO_X) in the presence of sunlight. The primary sources of ROG within the planning area are on- and off-road motor vehicles, petroleum production and marketing, solvent evaporation, and prescribed burning. As indicated in the Emissions Inventory Chapter 4, the primary sources of NO_X are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes.

The District is responsible for measuring pollutant concentrations in the NCCAB, which consists of Monterey, Santa Cruz, and San Benito counties. There are seven monitoring stations within the NCCAB (see Figure 3-1). The air basin forms an area of more than 5,100 square miles, with Monterey County covering over 3,320 square miles and Santa Cruz County covering only 445 square miles. The air basin is situated downwind of the San Francisco Bay Area Air Basin (SFBAAB). Transport of ozone precursor emissions from the SFBAAB plays a dominant role in ozone concentrations measured in San Benito and Santa Cruz counties.

Ambient air quality standards (AAQS) establish levels of air quality that are required to be maintained to protect the public from the adverse effects of air pollution. California State standards are established to protect public health, including the most sensitive members of the population. National Ambient Air Quality Standards, or NAAQS, include a primary standard to protect public health and a secondary standard to protect the public welfare including property, vegetation and visibility. AAQS are established for “criteria air pollutants”, which include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, respirable particles (PM_{10}), and fine particles ($PM_{2.5}$). The current AAQS for ozone are presented in Table 3-1.

Table 3-1
Ambient Air Quality Standards for Ozone

		CALIFORNIA STANDARDS	NATIONAL STANDARDS*	
Pollutant	**Averaging Time**	**Concentration**	**Primary Concentration**	**Secondary Concentration**
Ozone	1 hour	0.09 ppm	--	--
	8 hour	0.070 ppm	0.070 ppm	0.070 ppm

ppm=parts per million
**In 2015 National Standards were strengthened to 0.070 ppm from 0.075 ppm*
Source: California Air Resources Board 2016

In 2012, the EPA issued final designations for the 2008 8-hour NAAQS (0.075 ppm) for ozone which show the NCCAB as an attainment area based on monitoring data for the years 2009-2011. In 2015 EPA lowered the National Standard to 0.070 ppm while at the same time issuing a preliminary designation of attainment in the NCCAB based on 2013-2015 data. EPA will make final designations for the 2015

[1] ROG and volatile organic compounds (VOC) are considered equivalent in this report.

standard in October 2017 based on 2014-2016 data. Based on a review of preliminary data for the 2016 ozone season, it appears that the area will meet the 2015 standard.

For the State ozone AAQS, ARB revised the standard in 2006 to include an 8-hour average of 0.070 ppm, while retaining the existing 1-hour standard at 0.09 ppm. Both the 1-hour and 8-hour components of the State standard must be met in order for the standard to be achieved. The NCCAB is designated by the ARB as a nonattainment-transitional area for the State ozone standard. The reason EPA and ARB may have different designations for the same level of the standard (0.070 ppm) is that different attainment tests are used for the State and Federal standards with ARB's method being more stringent. Table 3-2 presents the current attainment status.

Table 3-2
Attainment Status for the North Central Coast Air Basin

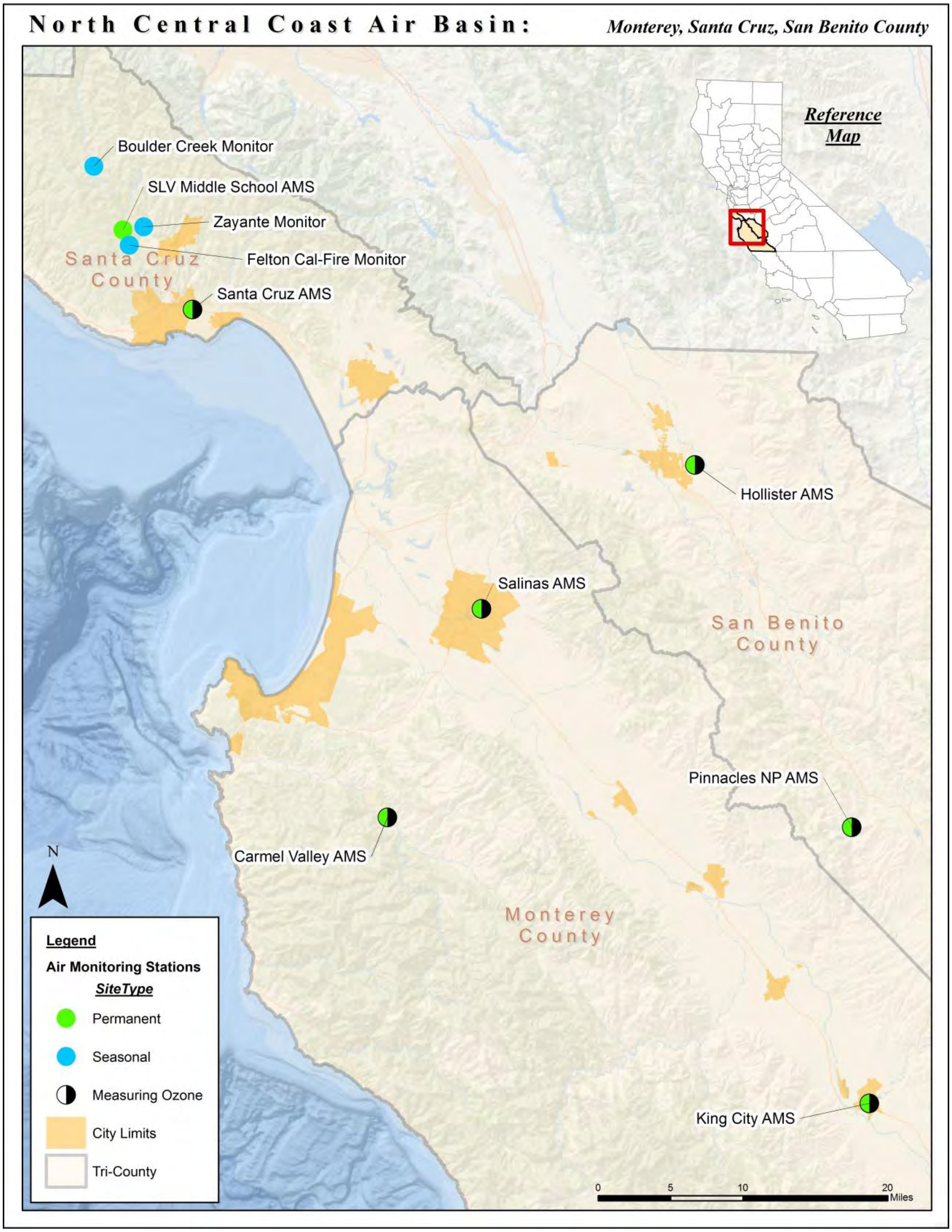
Pollutant	State Designation	Federal Designation
Ozone (O_3)	Nonattainment-Transitional	Attainment
Inhalable Particulates (PM_{10})	Nonattainment	Attainment
Fine Particulates ($PM_{2.5}$)	Attainment	Attainment
Carbon Monoxide (CO)	Monterey Co.-Attainment	Attainment
	San Benito Co.-Unclassified	Attainment
	Santa Cruz Co.-Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment

<u>*Sources:*</u> *California Air Resources Board 2016*
U.S. Environmental Protection Agency 2017

3.1 Monitoring Network

Ambient air quality is currently monitored at seven permanent stations in the NCCAB. The network includes six stations operated by the District and one station operated by the National Park Service at Pinnacles National Park. The data from the Pinnacles National Park monitor are also used by both ARB and EPA to designate the NCCAB as attainment or non-attainment of the ozone standards. The Pinnacles National Park monitor is part of the Clean Air Status and Trends Network (CASTNET). This is a federal air quality monitoring network designed to provide data to assess trends in air quality, atmospheric deposition, and ecological effects due to changes in air pollutant emissions. The locations of the monitoring stations are shown in Figure 3-1.

Figure 3-1
Ozone and Particulate Monitoring Stations



3.2 Ozone Monitoring Data and Overall Progress

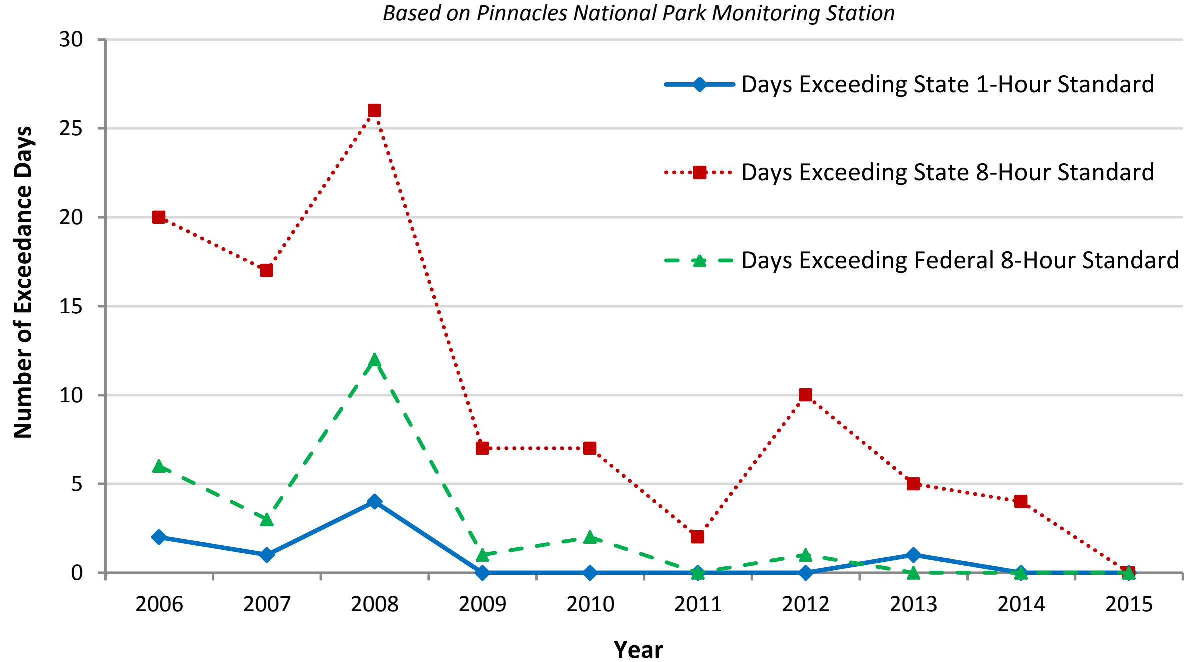
Long-term trends for ozone concentrations at monitoring stations throughout the NCCAB show that progress has been made towards achieving the standards. The 10-year trend (2006-2015) in exceedances of the ozone standards are shown in Figure 3-2 for the concentrations measured at the Pinnacles National Park station. The year-to-year variations tend to be driven by variations in weather, while the overall decline tends to be driven by a reduction in emissions across the region.

Ambient ozone is comprised of a mix of transported ozone, ozone originating in the NCCAB and natural background ozone. Background ozone can originate from biogenic VOC's emitted by plants and trees and biogenic NOx, which generally come from soil. Human and naturally caused wildfires can also create ozone. On rare occasions, background ozone may originate from intrusions of stratospheric ozone from high the in atmosphere. ARB research suggests that background ozone can represent nearly half the level of the standard (California Environmental Protection Agency, 2005).

Currently, the NCCAB is in attainment with the federal 8-hour standard. For comparison, exceedances of the federal 8-hour ozone standard are included in Figure 3-2. These ozone exceedances follow a similar pattern to the State exceedances, although the number of exceedances of the federal standard is less than the State standard. The State 8-hour standard, however, is more protective of public health than both the prior State 1-hour standard and the 2008 federal 8-hour standard. As shown in Figure 3-2 (also 3-3), the introduction of the stringent State 8-hour standard has increased the number of exceedances (red line) of the State ozone standard as compared to the 1-hour standard (blue line). This is another indicator that the 8-hour standard is more stringent than the 1-hours standard.

Figure 3-2
Number of Days Exceeding Ozone Standards

Based on Pinnacles National Park Monitoring Station



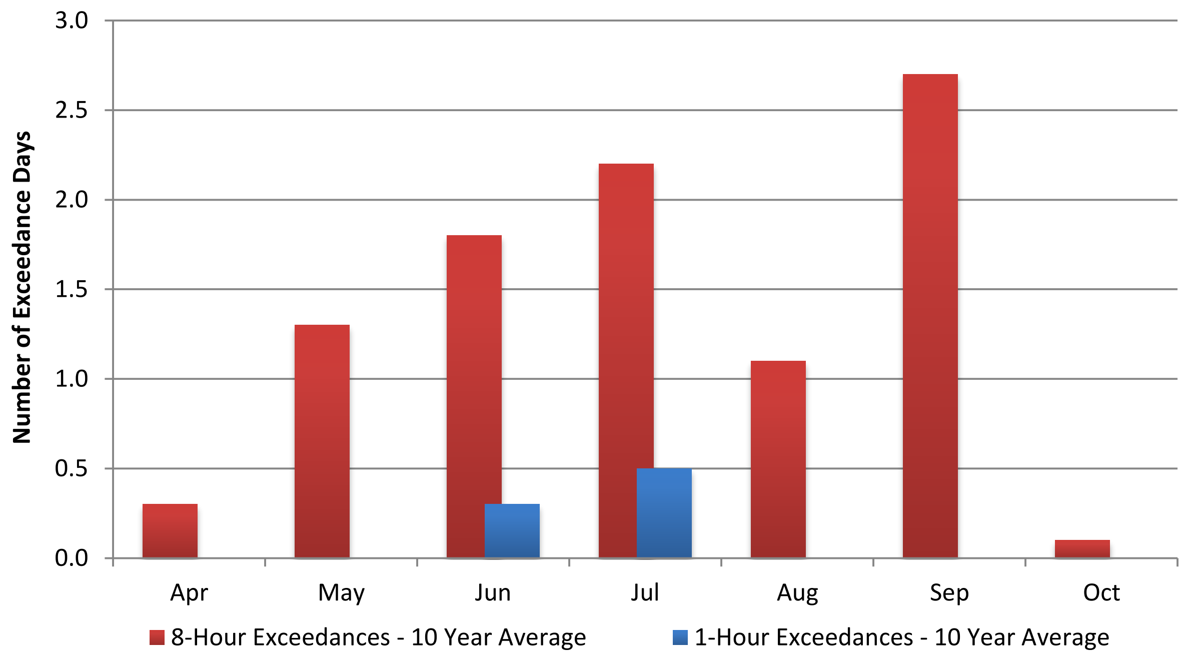
Source: California Air Resources Board 2016

Conversely, the 1-hour standard was attained in 2009. Figure 3-2 shows that there was one exceedance of the State 1-hour standard during the entire period 2009-2015. As a result, the NCCAB currently meets the 1-hour component of the State ozone standard. This is an indicator of continued progress in meeting the California standard.

Ozone tends to be a seasonal pollutant which develops primarily in the summertime when the sunlight is strongest. As shown in the Figure 3-3, most NCCAB exceedances follow the typical May through October seasonal pattern as seen elsewhere in the State. However, with the introduction of the State 8-hour standard, exceedances become much more frequent and start as early as April. While the seasonal exceedance patterns for both the 1-hour and 8-hour standards are similar, the 8-hour standard greatly increases the number of exceedances and causes the ozone season to start earlier.

Figure 3-3
10-Year Average of Exceedance Days
During the Ozone Season

Based on Pinnacles National Park Monitoring Station, 2006-2015



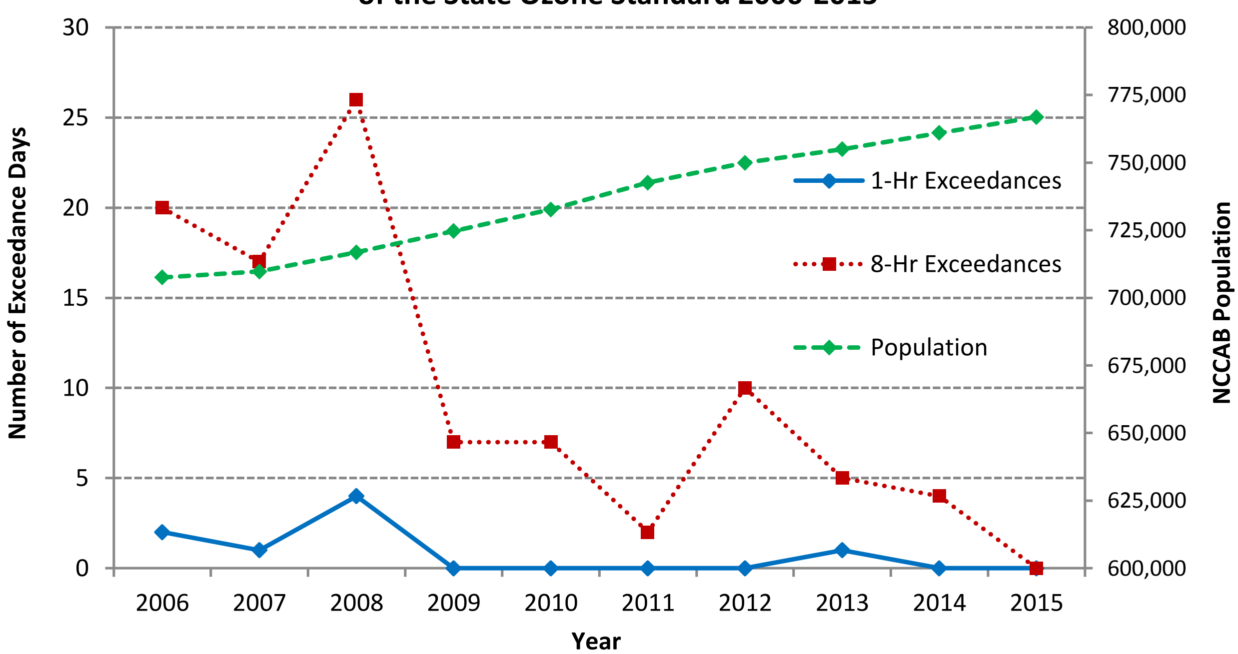
<u>Source:</u> California Air Resources Board 2016

3.3 Ozone and Population Trends

Population data for the region are developed by federal, State, and local agencies. U.S. Census data are used in Figure 3-4 which demonstrates how progress has been made toward achieving the California ozone standard between 2006 and 2015 even with some population growth during that same period. Without emission controls, increases in precursor emissions would correspond directly with increases in population. Although the population trend has increased slightly, the number of exceedance days continued to decline during the past 10 years. There was only one exceedance of the 1-hour standard since the 2008 Basin Complex wildfire while population slightly increased during this time period. Exceedances of the 8-hour standard have also dropped from a high of about 26 per year in 2008 down to typically less than 5 per year. This illustrates a key relationship between population growth and air pollution control. More stringent and protective emissions standards for automobiles, power plants and other sources of ozone precursors have outpaced population growth with the net result being an improvement in air quality. Specifically, the following list summarizes a number of key programs and rules which have and will continue to reduce emissions while population increases.

- **ARB's Low Emission Vehicle Program** – This program is key to understanding the major declines shown in Table 4-1 and 4-2 for NOx and ROG emissions from on-road motor vehicles.
- **ARB's Off Road Motor Vehicle Program** – Similar to the above program, ARB's off-road motor vehicle program is responsible for the major declines shown in Tables 4-1 and 4-2 for NOx and ROG emissions from the "Other Mobile Source" emission category. This has reduced NOx emissions from diesel powered off-road trucks, agricultural equipment and other heavy duty equipment.
- **ARB's Advanced Clean Cars** – This ARB program promotes new technologies for motor vehicles including low emission and zero emission vehicles as well as clean fuels.
- **Pavley Fuel Standards** – This program increases fuel mileage goals for new passenger cars and trucks, which will reduce fuel consumption and related emissions through 2016.
- **District Rule 431, Emissions from Electric Power Boilers** – This rule reduced the District's NOx inventory by about 20 tons/day due to reductions from the Moss Landing Power Plant. Total NOx emissions from the plant, including its newer high efficiency gas turbines are less than 2 tons/day.
- **District Rule 1002 Transfer of Gasoline into Vehicle Fuel Tanks** – This rule continues to produce a better than 90% reduction in ROG as well as toxic emissions from the gasoline vapors emitted during refueling of motor vehicles.
- **District Rule 426 Architectural Coatings**—The purpose of this Rule is to limit the emissions of Volatile Organic Compounds (VOC) in the formulation of various architectural coatings.

Figure 3-4
Population Growth vs. Exceedances
of the State Ozone Standard 2006-2015



Source: California Environmental Protection Agency 2014, U.S. Census Bureau 2006-2015

3.4 Air Quality Indicators

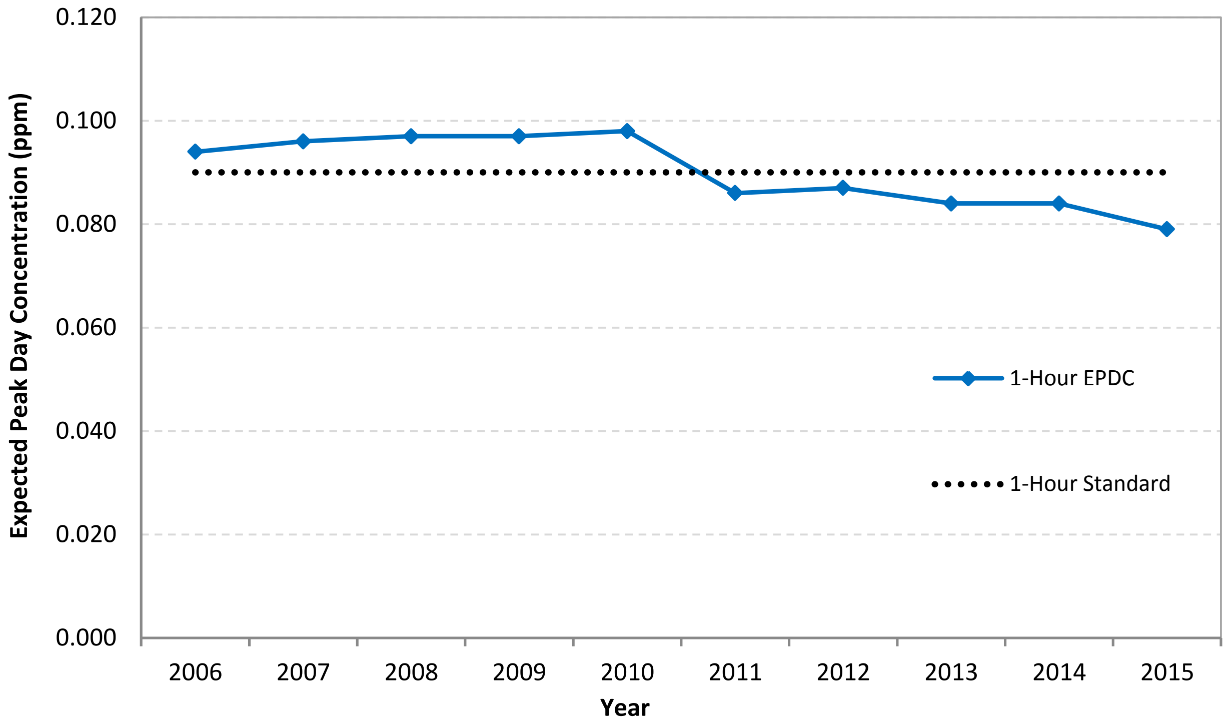
The California Clean Air Act (CCAA) requires the ARB to evaluate and identify air quality related indicators for districts to use in assessing their progress toward attainment of the State standards [Health and Safety Code section 39607(f)]. An indicator is a way of summarizing measured air quality data to represent aspects of air quality in a specific area. Typically, indicator data are used in the District's triennial reports to the ARB that assesses progress toward attaining the ozone standard. The assessment must address (1) the peak concentrations in the peak "hot spot" subarea, (2) the population weighted average of the total exposure, and (3) the area-weighted average of the total exposure (ARB Resolution 90-96, November 8, 1990). The exposure data, items (2) and (3), are typically provided by ARB and have been presented in previous plans. However, ARB is no longer providing area-weighted and population-weighted exposure data to air districts. As an alternative indicator, the mean of the highest 30 measured ozone concentrations are included in this plan. The following sections present the peak concentrations and the mean of the 30 highest concentrations.

3.5 Peak Concentration or "Hot Spot" Indicator

The "hot spot" indicator is assessed in terms of the Expected Peak Day Concentration (EPDC). The EPDC is calculated by ARB based on ambient data from each monitoring site in the air basin. The EPDC is the calculated peak concentration, in units of parts per million (ppm), that is statistically expected to occur once per year, on average from each site during a consecutive three-year period providing a stable indicator. The EPDC indicator is based on a three year average which smooths out the peaks and valleys that would otherwise occur with a one year indicator.

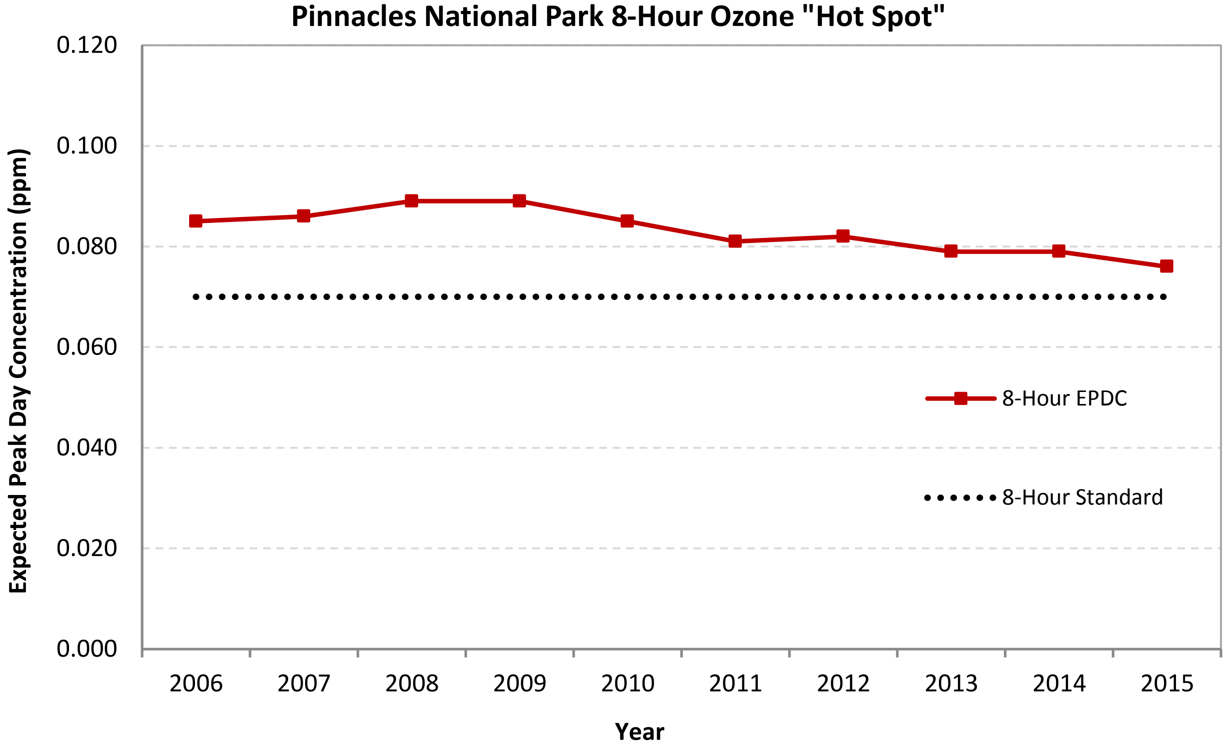
The Pinnacles National Park monitoring station is the NCCAB's peak "hot spot" station, being the monitoring site with the highest measured ozone concentrations in terms of the EPDC. The majority of NCCAB exceedances (and as a result, the site that determines the NCCAB attainment status) occur at this remote location which is far from urban sources of pollution. Figures 3-5 and 3-6 show the 10-year trend in 1-hour and 8-hour EPDCs for the Pinnacles National Park monitoring station, respectively. As shown in the figures, the EPDC trend has slightly decreased over the past 10 years.

Figure 3-5
Pinnacles National Park 1-Hour Ozone "Hot Spot"



Source: California Environmental Protection Agency 2016

Figure 3-6
Pinnacles National Park 8-Hour Ozone "Hot Spot"



Source: California Environmental Protection Agency 2016

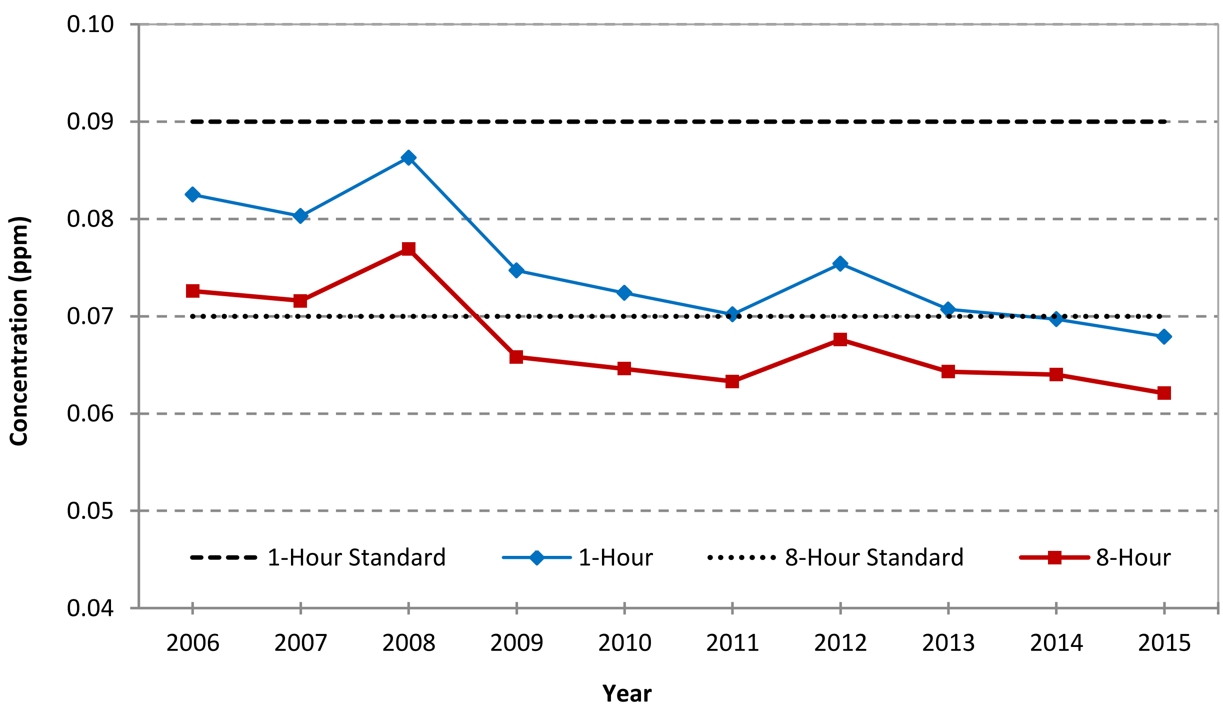
3.6 Mean of the Highest 30 Ozone Concentrations

As an additional indicator of progress toward achieving the CAAQS for ozone, the ARB provided a "Top 30 Mean" summary to the District. This is the average of the highest 30 daily 1-hour and 8-hour ozone measurements by year and by station. Since the summaries are based on the average of the highest 30 measurements by year, it provides a weighted indicator of long-term progress driven more by emissions and less by natural variation.

3.6.1 Nonattainment Stations

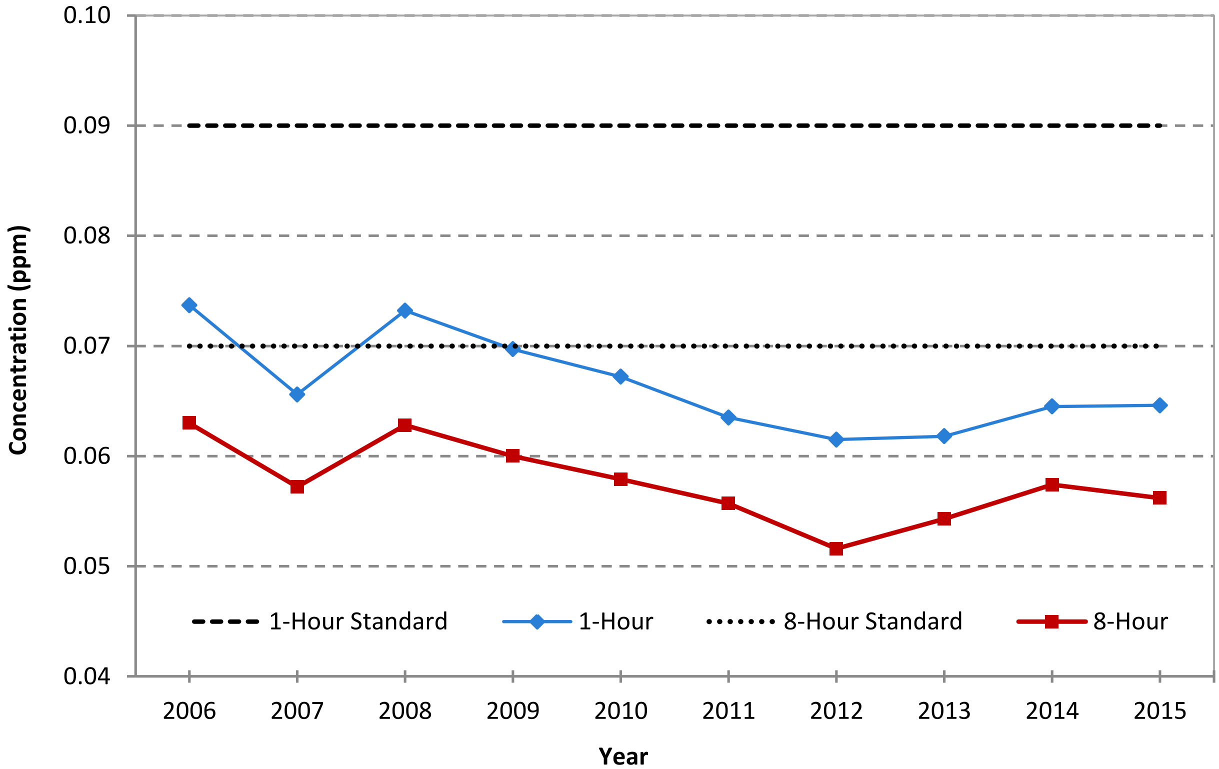
Figures 3-7a and 3-7b present progress for the Top 30 indicator over the period 2006 to 2015 for Pinnacles National Park and Hollister; the two remaining stations in the NCCAB which have yet to achieve the CAAQS for ozone. The charts indicate that while there is year-to-year variation, both Pinnacles National Park and Hollister have shown measureable progress toward achieving the ozone standard. The charts also indicate greater progress was made for the 1-hour standard at both stations in comparison to the 8-hour standard. The slower progress for the 8-hour standard is partially due to the natural background ozone concentrations.

Figure 3- 7a
Mean of the Top 30 Daily Maximum Ozone Concentrations
Pinnacles National Park



Source: *California Environmental Protection Agency 2016*

Figure 3-7b
Mean of the Top 30 Daily Maximum Ozone Concentrations
Hollister

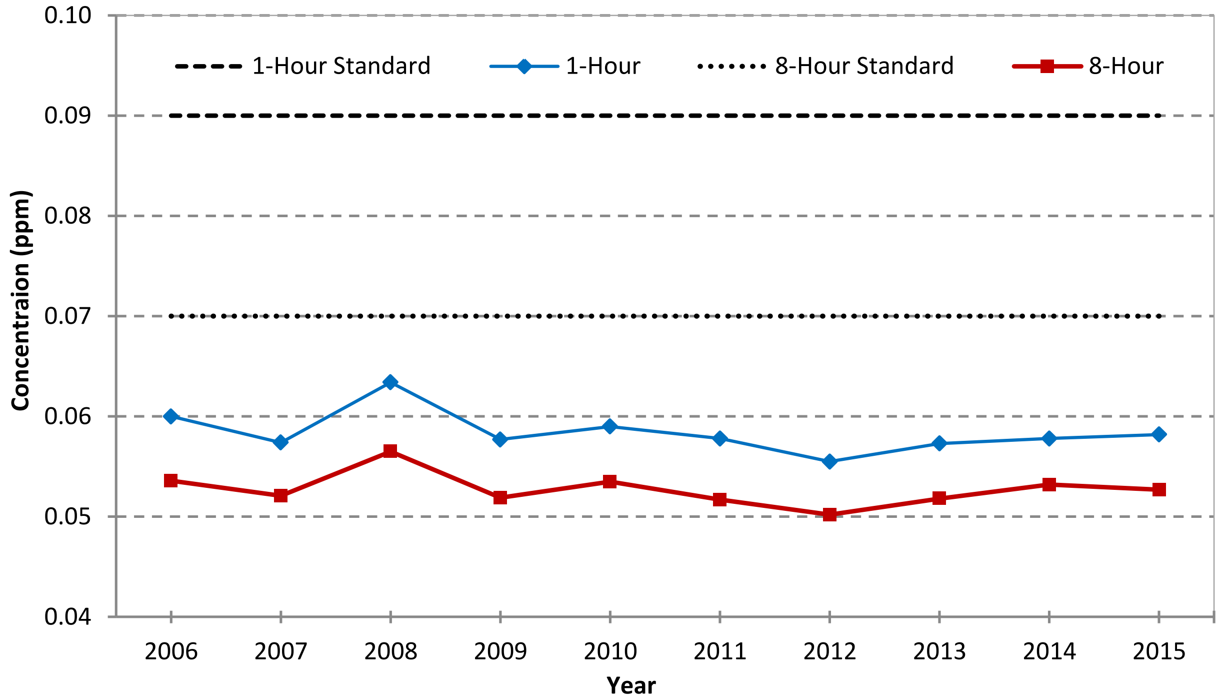


Source: *California Environmental Protection Agency 2016*

Attainment Stations

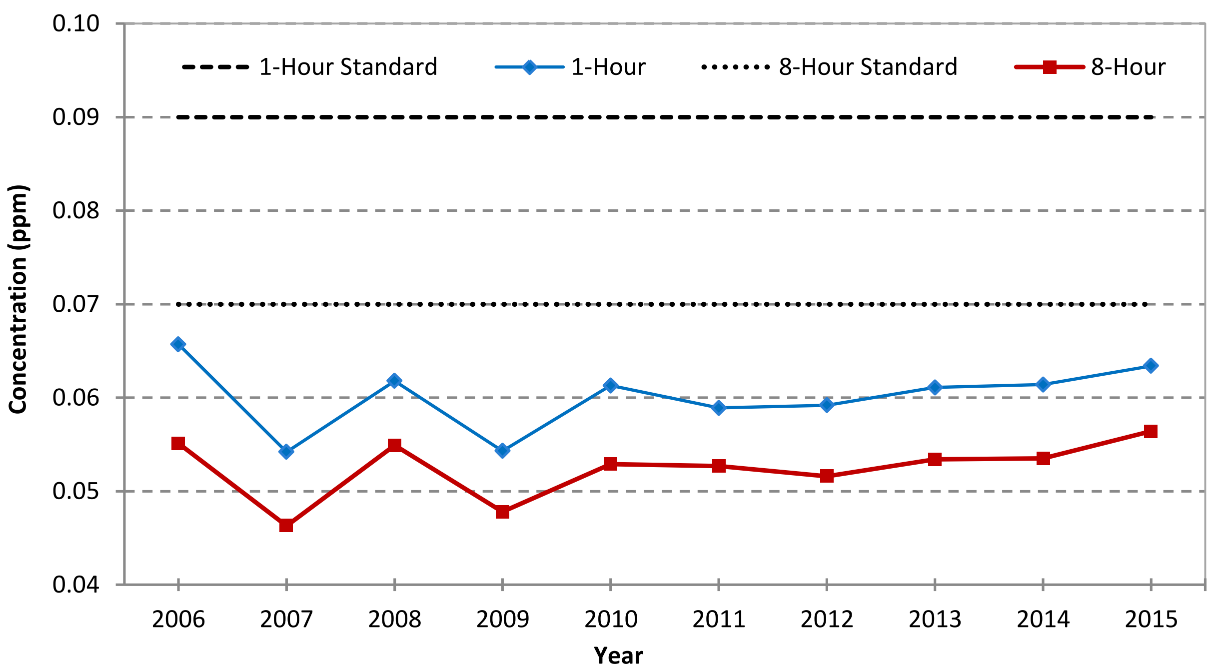
“Top 30 Mean” charts are also included for Carmel Valley, King City, Salinas, and Santa Cruz. These stations have met the 1-hour and 8-hour requirements of the CAAQs. Figures 3-8a, 3-8b, 3-8c, 3-8d demonstrate that these sites continue to show some progress and are not in a State of reverse progress or “backsliding” whereby ozone levels are increasing, possibly leading to future nonattainment. The indicator suggests that all four stations are in a good position to remain in attainment with the ozone standard. All four figures show no significant changes at any of our ambient air monitoring stations between 2006 and 2015. Annual changes are due primarily to natural variation in year to year weather conditions, which are not indicative of a permanent increase in ozone levels. The most important factor is that the designation values of all stations for both the 1 and 8-hour components of the State standard remain well within attainment.

Figure 3-8a
Mean of the Top 30 Daily Maximum Ozone Concentrations
Carmel Valley



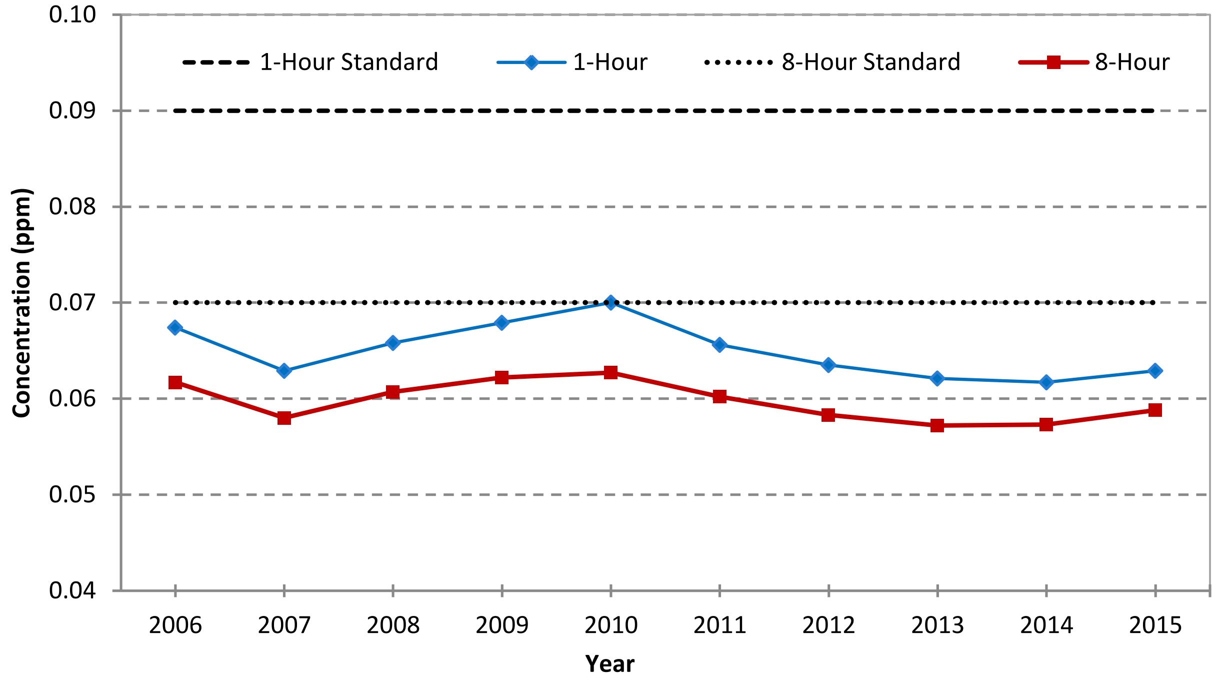
Source: California Environmental Protection Agency 2016

Figure 3-8b
Mean of the Top 30 Daily Maximum Ozone Concentrations
King City



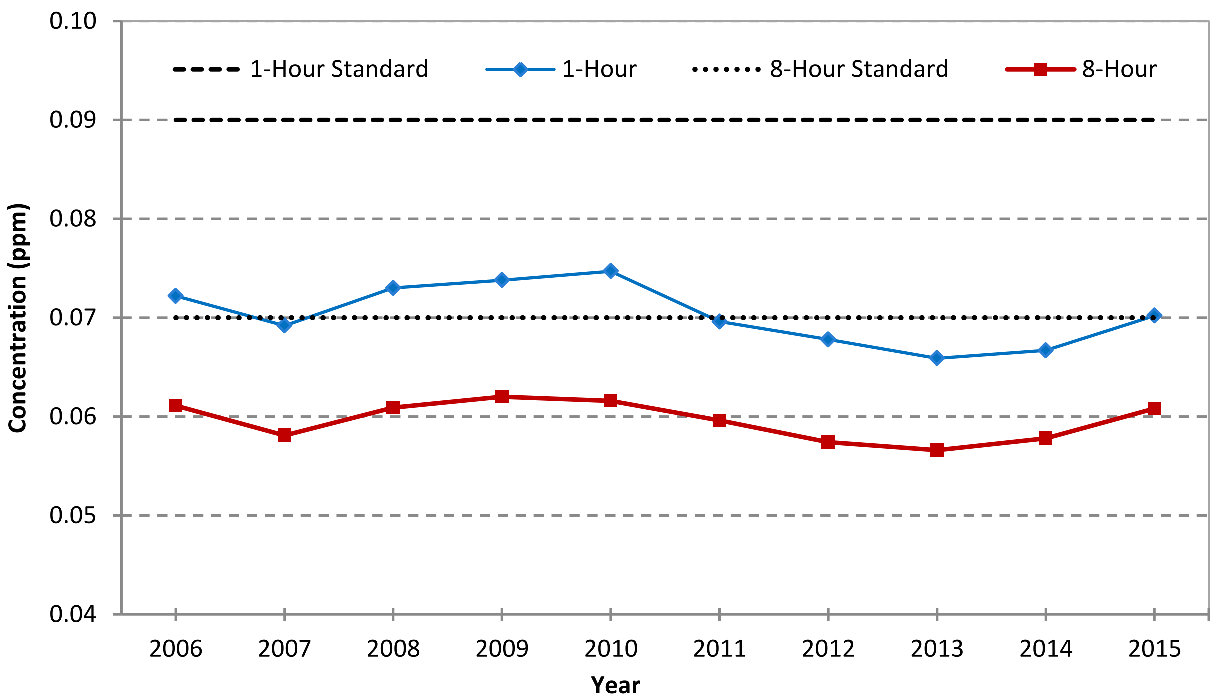
Source: California Environmental Protection Agency 2016

Figure 3-8c
Mean of the Top 30 Daily Maximum Ozone Concentrations
Salinas



Source: California Environmental Protection Agency 2016

Figure 3-8d
Mean of the Top 30 Daily Maximum Ozone Concentrations
Santa Cruz



Source: California Environmental Protection Agency 2016

4. Emission Inventory Trends

The emission inventory is an estimate of the amount of air pollutants emitted into the air each day by anthropogenic activities. Ambient ozone levels depend largely on the amount of precursors (NOx and ROG) emitted into the atmosphere. Therefore, the planning inventory trend is used to assess the region's progress toward attaining the State ambient air quality standards. The emission inventory is used to compare contributions from different emission sources, develop plans and regulations to reduce ozone concentrations, evaluate control measures, and forecast future pollution.

The inventory presented in this report represents emissions of ozone precursors, NOx and ROG, in units of tons per day, for a typical weekday during the May through October ozone season. This inventory is often referred to as a "summer day" planning inventory.

4.1 Emission Inventory Basics

The air basin anthropogenic inventory is basically a multi-level emissions accounting system. Its overall structure follows a four level hierarchy, with each successive level providing a greater level of detail.

In the first or Division level, the inventory is divided into three major divisions; Stationary Sources, Area-wide Sources and Mobile Sources. The second level is the Major Source level, which sub-divides Stationary Sources into five categories, Area Sources into two categories and Mobile Sources into two categories. In the third level, each of the nine Major Source categories are further divided into anywhere from two to eighteen Summary level categories, with mobile sources having the greatest number of subcategories. The inventory presented in this chapter is resolved to the third or summary level of the hierarchy. Beyond this exists a fourth level, which is the detailed or Emission Inventory Category (EIC) level, which further disaggregates the Summary level categories into literally hundreds of smaller categories. An EIC level of the inventory is available upon request or can be downloaded from the District's website.

Stationary sources typically include large facilities such as power plants or cement plants, while area-wide sources include an aggregate of individually smaller sources such as consumer products or residential fuel consumption which, when grouped together, have significant emissions. Mobile sources consist of the numerous cars and trucks that travel the streets and highways of the NCCAB, as well as other mobile sources such as off-road agricultural and construction equipment, trains and aircraft.

Emission inventories and inventory estimation methods are periodically updated to provide more accurate estimates and to better reflect current trends. These changes, along with the need to periodically reassess progress toward achieving the standard, are primary reasons for periodically updating the AQMP.

4.2 Inventory Models

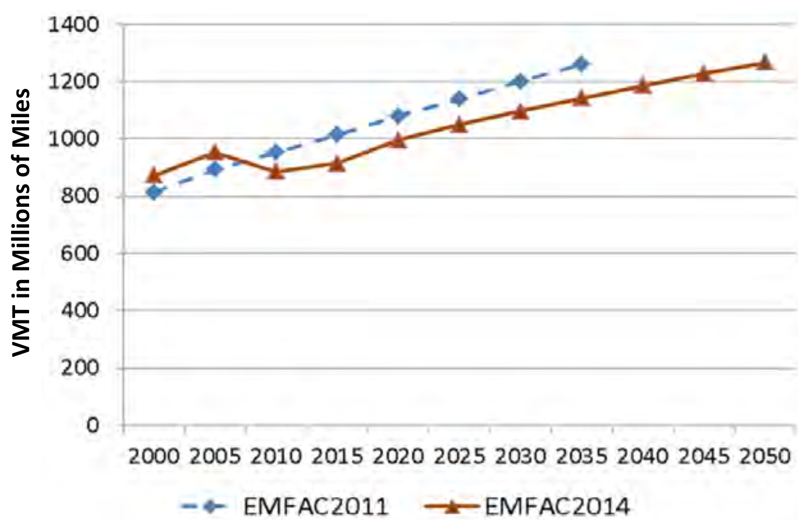
The California Emissions Projection Analysis Model (CEPAM), formerly the California Emission Forecasting System, is the ARB computer tool used to develop the emission projections in this plan. The CEPAM projections cover the period 2010 to 2035. Consequently a horizon year of 2035 was used since that was the most future year available in CEPAM. "Backcasts" to the historical reference year 1990 are no longer available in CEPAM. For this inventory update, the year 2012 was the base year for projecting emissions from stationary and area-wide sources. The emission estimates are based on the most current growth and control data available at the time of the forecast runs.

For mobile sources, CEPAM integrates the emission estimates from ARB's EMFAC and OFFROAD mobile source emission models to provide a comprehensive anthropogenic emission inventory. ARB's latest model for estimating emissions from on-road motor vehicles is EMFAC2014. Emissions from off-road motor vehicles are based on ARB's OFFROAD2007 model with modular updates to some categories.

EMFAC2014 includes the following updates from the prior model EMFAC2011:

- Vehicle miles travelled (VMT) derived from fuel usage data rather than MPO derived data to be consistent with ARB's GHG inventory
- Updated DMV registration data to 2012 from 2009
- Although VMT increases through the 2035 forecast horizon in both EMFAC2011 and EMFAC2014, the projections are lower in EMFAC2014 (See Figure 4-1)
- New vehicle emission standards
- The benefits of lower emissions from advanced clean car technologies

Figure 4-1
Comparison of Statewide Daily VMT from EMFAC2011 vs. EMFAC2014



Source: California Environmental Protection Agency 2016

Future year forecasted emission inventories were updated to account for the most recent Emission Reduction Credits (ERC) that were in the District's bank as of July 2016. ERC's are previous reductions in emissions that can be credited to allow increased emissions from a new or modified stationary source. For future year forecasts (2020 and 2035), ERC's were treated as potential growth. For historical years (2000-2010), the ERCs were represented as 0.1 tons per day to be consistent with prior AQMPs.

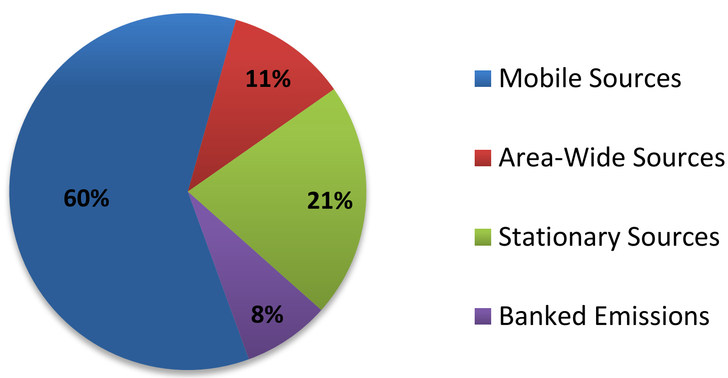
As with any other type of forecast, inventory forecasts become less reliable the further they are projected into the future. This is due to the increased uncertainty in what the actual level of growth and control will be in the future.

The emission inventories for NOx and ROG are presented in the following figures and tables. A more detailed version of the inventory for both is available upon request or can be downloaded from the District's website.

4.3 NOx Emission Inventory

Figure 4-2 illustrates the 2015 NOx inventory for the stationary, area-wide and mobile source categories. As can be seen, mobile sources, for which the District has no real authority, account for more than half the inventory (60%) while stationary sources, where the District has the most authority, only accounts for about 21% of the NOx inventory. Fortunately, the District has already adopted feasible rules to reduce emissions from stationary facilities, such as District Rule 431, Electric Utility Boilers which reduced the NOx inventory by nearly 20 tons per day. Additionally, the District has experienced NOX reductions due to plant closures such as the CEMEX Cement Plant which had emitted 3 to 4 tons per day of NOx. The absence of additional reductions from stationary sources highlights the importance of obtaining continued reductions in mobile source emissions in order to maintain continuing progress toward achieving the State ozone standard.

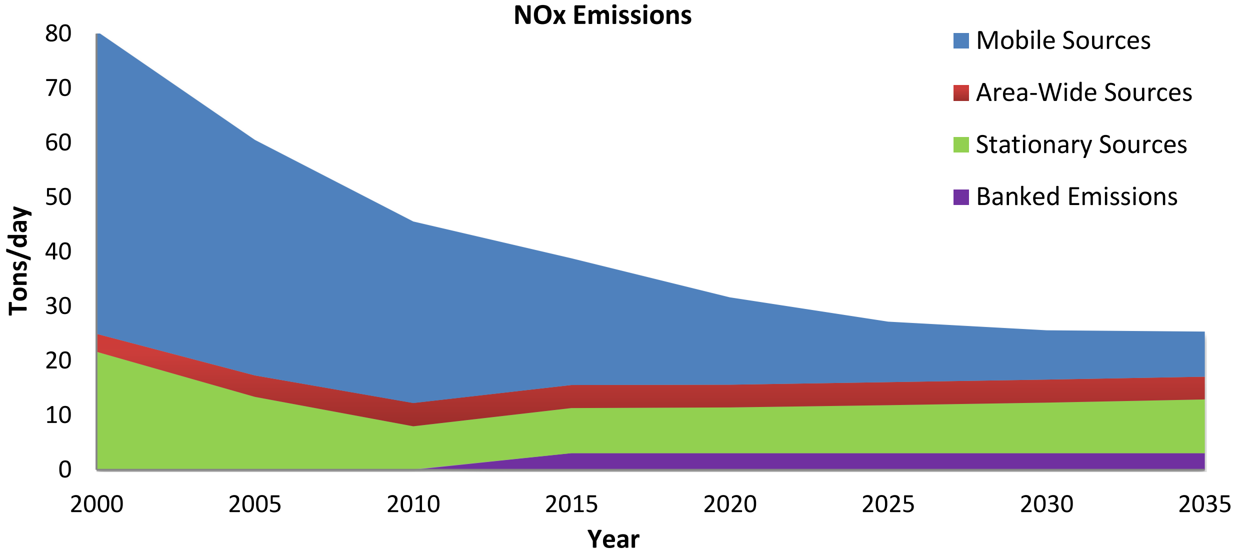
Figure 4-2
2015 NOx Emission Inventory
39 tons per day



Source: California Air Resources Board 2016

Figure 4-3 illustrates the NOx emission forecasts out to 2035. As can be seen, overall emissions decline from about 80 tons/day in 2000 to about 30 tons per day in 2035 for a nearly threefold reduction through the period. Reductions in the all-important mobile source sector drive the overall decline. Emissions tend to flat-line out beyond the year 2030 due to a slight projected increase in stationary source emissions but that possibility will be re-visited in subsequent updates to the AQMP.

Figure 4-3
NOx Emissions



Source: California Air Resources Board 2016

Table 4-1 provides greater numerical detail on the contribution from various source categories to the overall NOx inventory. From this table you can see that the major reductions in the mobile source category come from cleaner on-road motor vehicles while the slight increase in stationary source emissions comes from a projected increase in industrial processes; a trend which will be evaluated in subsequent AQMPs.

Table 4-1
Emission Inventory and Forecasts for NOx (tons per day)
Summer Season Planning Inventory

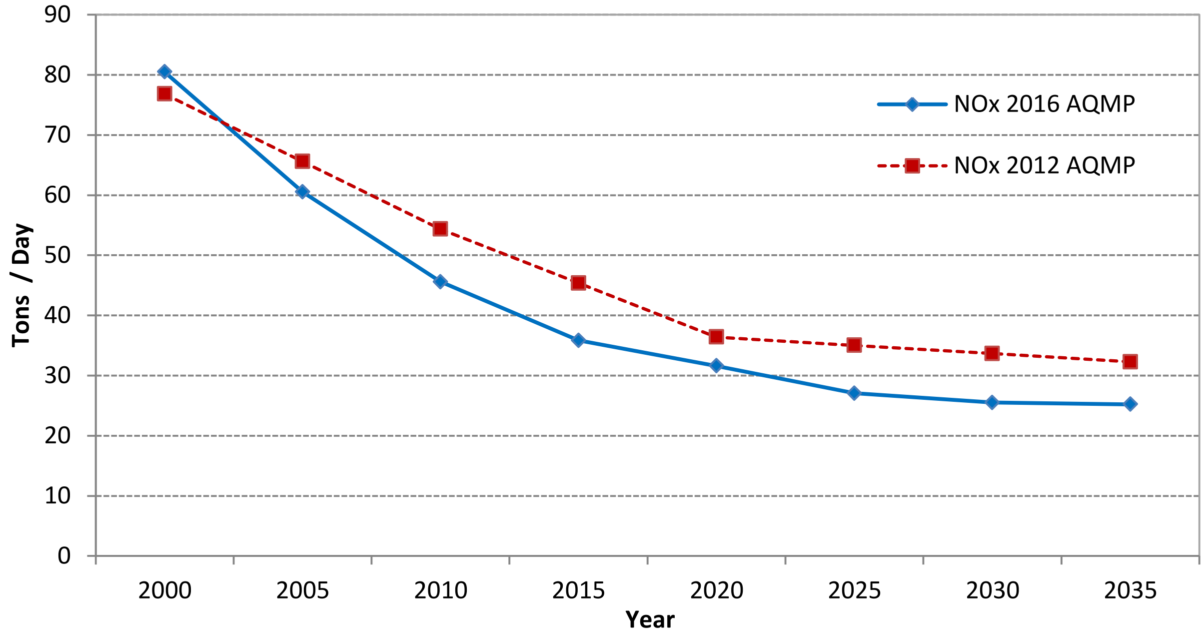
Source Category	Planning Inventory Years							
	2000	2005	2010	2015	2020	2025	2030	2035
STATIONARY SOURCES								
Electric Utilities Fuel Combustion	9.15	1.31	0.77	0.95	0.98	1.02	1.07	1.11
Other Fuel Combustion	5.94	5.24	4.55	4.10	3.64	3.59	3.56	3.63
Waste Disposal	0.03	0.03	0.01	0.02	0.02	0.02	0.02	0.02
Industrial Processes	6.46	6.72	2.55	3.18	3.72	4.13	4.60	5.10
TOTAL (tons/day)	21.59	13.30	7.89	8.26	8.36	8.77	9.25	9.86
Emission Reduction Credits[1)]	0.10	0.10	0.10	3.06	3.06	3.06	3.06	3.06
AREA-WIDE SOURCES								
Miscellaneous Processes	3.24	3.91	4.25	4.24	4.22	4.23	4.21	4.19
TOTAL (tons/day)	3.24	3.91	4.25	4.24	4.22	4.23	4.21	4.19
MOBILE SOURCES								
On-Road Motor Vehicles	41.98	33.59	24.39	15.58	9.69	5.94	4.59	4.15
Other Mobile Sources	13.60	9.64	8.95	7.66	6.28	5.18	4.51	4.09
TOTAL (tons/day)	55.57	43.23	33.34	23.25	15.97	11.12	9.09	8.23
TOTAL ALL SOURCES	**80.49**	**60.53**	**45.58**	**38.81**	**31.61**	**27.18**	**25.62**	**25.34**

Source: CEPAM, California Air Resources Board 2016

Notes:
1) ERCs as of July 2016. For consistency with prior AQMPs, the emission reduction credits for historical years are reported as 0.1 tons per day. For the future years (2020 and 2035), the emission reduction credits equal the total banked emissions in the District's company held and community banks to account for future potential growth.
2) Emissions data based on ARB CEPAM database, EMFAC2014, and AMBAG VMT projections.

Figure 4-4 compares the NOx inventories from the 2012 update with the most recent inventory in this current plan. As shown in the chart, the overall NOx inventory is somewhat lower than in the previous plan. Again the difference is driven by the mobile source category with the previously mentioned causes likely being lower VMT beyond 2015, new vehicle emission standards, and the benefits of lower emissions from advanced clean car technologies as reflected in EMFAC2014.

Figure 4-4
Comparison of NOx Emission Inventory Trends
2012 and 2016 AQMP Updates

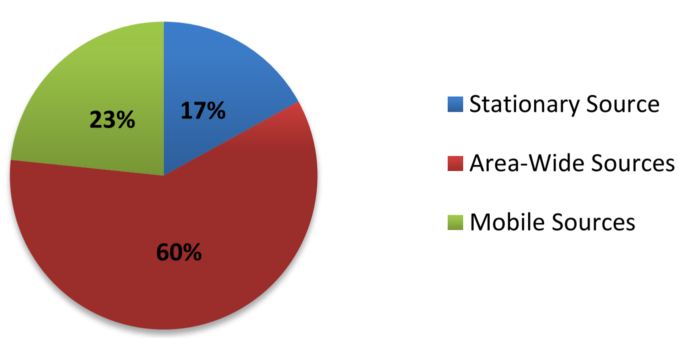


Source: Monterey Bay Unified Air Pollution Control District 2013, MBARD 2016

4.4 ROG Emission Inventory

Figure 4-5 shows the distribution of 2015 ROG emissions by the major source categories of the inventory. Unlike NOx emissions which are dominated by mobile source emissions, area-wide sources account for 60% of the inventory with the remainder shared fairly equally between the mobile and Stationary Source categories. Solvent evaporation from pesticides, consumer products and architectural coatings are important contributors to this category.

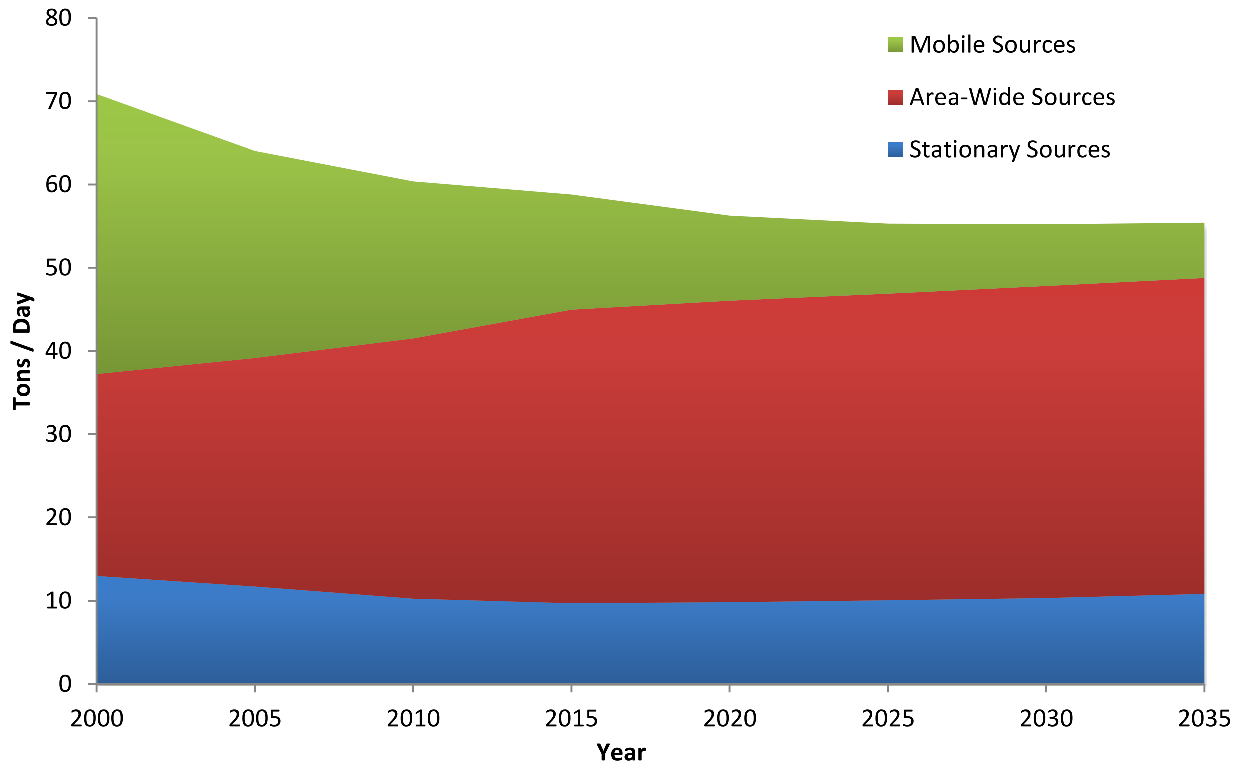
Figure 4-5
2015 ROG Emission Inventory
59 tons per day



Source: California Air Resources Board 2016

Figure 4-6 illustrates the ROG emission forecasts out to 2035. The reduction in the ROG inventory is not expected to be quite as dramatic as that expected for the NOx inventory. As can be seen, overall emissions are projected to decline from about 71 tons/day in 2000 to about 56 tons per day in 2035 for an overall reduction of about 20% through the period. Emissions plateau beyond 2025 due to continued reductions in the Mobile Source category offset by slight increases in the Area-Wide and Stationary Source categories. However, the air basin may meet the ozone standard by then at which point the apparent leveling of the inventory in these future years could become a subject for maintenance planning.

Figure 4-6
ROG Emissions 2000 to 2035
Tons per Day



<u>Source:</u> California Air Resources Board 2016

Table 4-2 provides greater numerical detail on the contribution from various source categories to the overall ROG inventory for the years 2000 to 2035. From this table a five-fold reduction in the mobile source category can be seen due to cleaner on-road motor vehicles while the stationary and area-wide source categories increase slightly, primarily due to the solvent evaporation related processes.

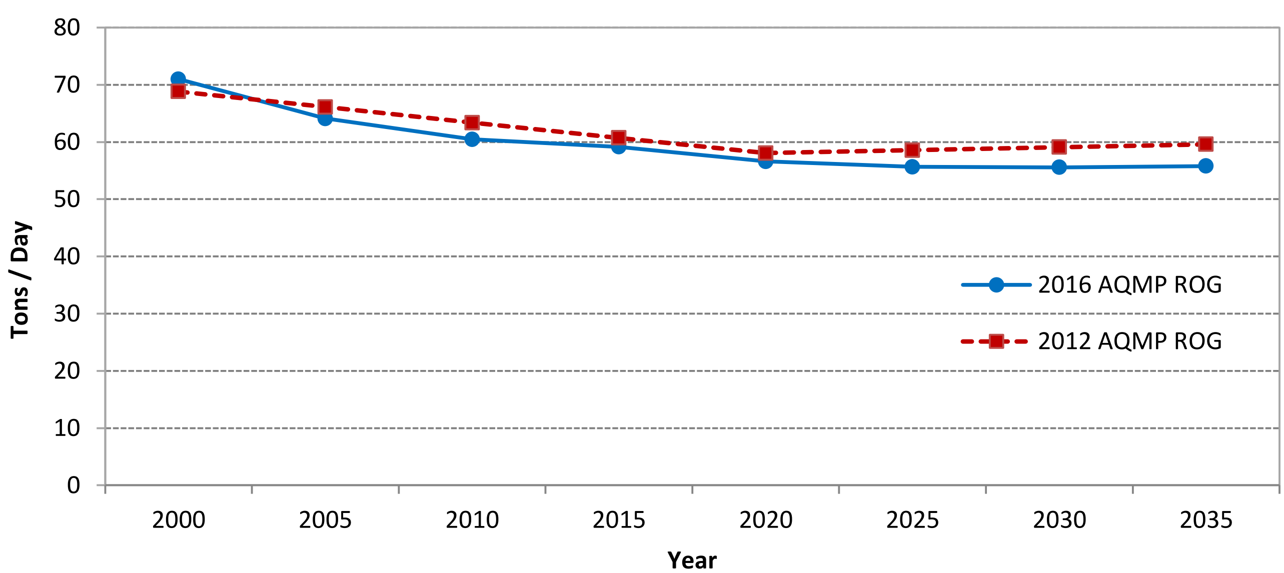
Table 4-2
Emission Inventory and Forecasts for ROG (tons per day)
Summer Season Planning Inventory

Source Category	Planning Inventory Years							
	2000	2005	2010	2015	2020	2025	2030	2035
STATIONARY SOURCES								
Fuel Combustion	2.38	1.48	1.26	1.15	1.20	1.29	1.38	1.48
Waste Disposal	1.56	1.58	1.60	1.67	1.73	1.79	1.85	1.90
Cleaning and Surface Coating	3.50	3.51	2.67	3.03	3.29	3.61	3.97	4.44
Petroleum Production & Marketing	4.93	4.14	4.06	3.07	2.74	2.41	2.14	1.94
Industrial Processes	0.63	1.01	0.66	0.78	0.87	0.94	1.00	1.06
Total (tons/day)	12.99	11.73	10.26	9.70	9.83	10.04	10.34	10.82
Emission Reduction Credits*	0.1	0.1	0.1	0.37	0.37	0.37	0.37	0.37
AREA-WIDE SOURCES								
Solvent Evaporation	13.84	15.11	15.81	19.59	20.49	21.11	21.75	22.18
Miscellaneous Processes	10.39	12.30	15.44	15.68	15.70	15.72	15.73	15.75
Total (tons/day)	24.23	27.41	31.24	35.26	36.19	36.82	37.48	37.93
MOBILE SOURCES								
On-Road Motor Vehicles	22.56	14.89	10.68	7.21	4.68	3.51	2.88	2.41
Other Mobile Sources	11.08	9.98	8.20	6.61	5.56	4.92	4.52	4.27
Total (tons/day)	33.65	24.87	18.88	13.82	10.24	8.44	7.40	6.68
TOTAL ALL SOURCES	70.97	64.11	60.48	59.16	56.63	55.67	55.59	55.80

Source: CEPAM, California Air Resources Board 2016

Figure 4-7 compares the ROG inventories from the 2012 update with the most recent inventory in this current plan. As with the NOx inventory, the chart shows that the overall ROG inventory is somewhat lower than in the previous plan. The difference is driven by the mobile source category with the previously mentioned cause likely lower VMT beyond 2015, new vehicle emission standards and the benefits of lower emissions from advanced clean car technologies being reflected in EMFAC2014.

Figure 4-7
Comparison of 2012 vs. 2016 AQMP ROG Inventories



Source: Monterey Bay Unified Air Pollution Control District 2013, MBARD 2016

4.5 Local vs. Regional Emissions

While local emissions and trends in our local emissions are important they are not a major cause of exceedances of the ozone standard in the NCCAB. As described in the next section, the major contributor to NCCAB exceedances is ozone transport from major urban areas upwind of our area (ARB Planning and Technical Support Division, 2001). Fortunately, emissions from these areas have diminished over the years which have helped our area make significant progress toward achieving the ozone standard.

5. Ozone Transport

In addition to emissions generated locally within the NCCAB, ARB has determined that emissions transported into the NCCAB from urban areas outside the air basin can have a significant impact on violations of the ozone standard. This is particularly true at monitoring stations that currently do not meet the State standard, including Pinnacles National Park, which is the air basin's design site for meeting the State standard. Data monitored in the most populated area of the basin, Salinas, show that the basin is attaining the State ozone standard while data monitored at the Pinnacles National Park, located in an unpopulated area, show that the basin is not attaining the standard. The exceedances measured at the Pinnacles National Park monitoring station are primarily due to emissions transported from the Bay Area. The most significant transport couple affecting the NCCAB is the upwind relationship of the San Francisco Bay Area Air Basin (SFBAAB), which is due in part to a continuous terrain feature (Santa Clara Valley/San Benito River Valley) which links the two areas (Garcia, Gouze, Wright, & Hackney, 2001). This is referred to as the SFBAAB to NCCAB transport couple. This couple was initially identified in the first transport assessments in 1990 and has been reaffirmed in subsequent assessments, including the ARB’s most recent transport review in 2001. One of the blue arrows in Figure 5-1 shows the transport trajectory from the SFBAAB to Pinnacles National Park in San Benito County.

Figure 5-1
Transport Trajectory from SFBAAB

Source: Air Resources Board 2001, MBARD 2017

Transport from the SFBAAB has a particularly strong influence on the NCCAB attainment status. The transport assessments for 1994 and 1995 indicate that 50 percent of NCCAB exceedances are the result of "overwhelming" transport from the SFBAAB, meaning that the exceedance would have occurred even with little or no emission contribution from the NCCAB. Thirty percent of the exceedances are classified as significant, meaning that emissions from both the upwind and local areas contributed measurably to exceedances of the standard. The remaining exceedances are classified as extreme concentration events or inconclusive. Since the ARB transport assessments indicate that emissions transported from the SFBAAB, as well as emissions from the NCCAB contribute to violations, continuing emission reductions in the entire region will likely be necessary to maintain the 1-hour standard and continue progress towards achieving the State 8-hour standard.

5.1 Current Assessments

This upwind/downwind relationship was considered for the current plan period, again using trajectory analysis. This time, back trajectories from the HYSPLIT trajectory model were used. A back trajectory traces the origin of air arriving at a specific place and time (i.e. Pinnacles National Park during an exceedance period) by going back in time to establish a possible source area. The back trajectories presented in the figures trace the path of the air parcel 24-hours back from the time exceedances were recorded at Pinnacles.

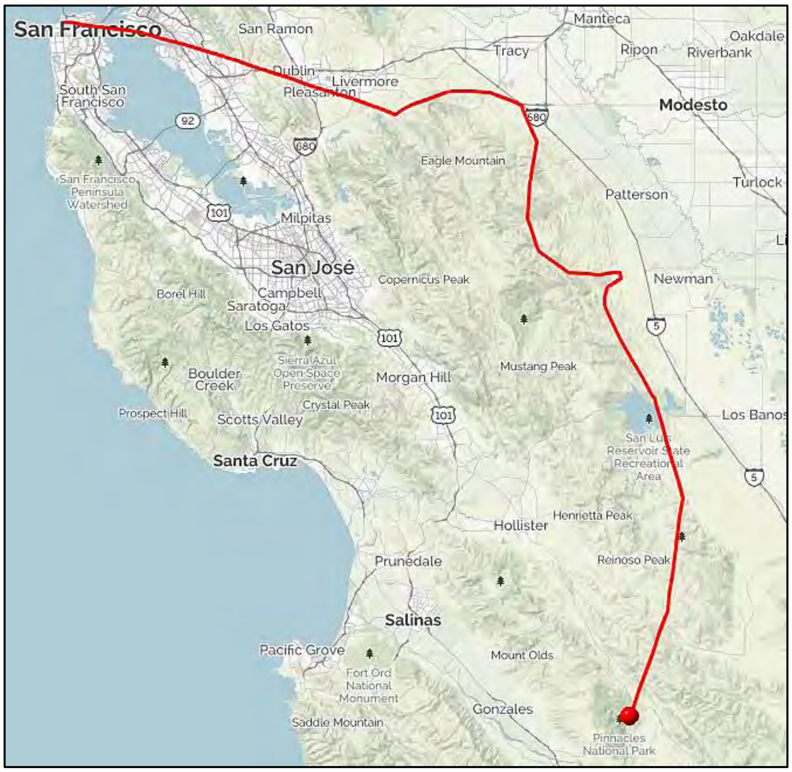
Figure 5-2 shows the calculated 24-hour back trajectory of air arriving at Pinnacles on the evening of July 10, 2012 when a 0.072 ppm exceedance was recorded at the site. This was actually in the middle of a four day exceedance period extending from July 9th to July 12th. The trajectory suggests that the air originated in the San Jose area of the SFFBAB the day before and then traveled southeastward through South Santa Clara Valley, along the Diablo Range until eventually arriving at the remote Pinnacles area through San Benito County on the evening of July 10th. It should be noted that transport exceedances often occur late in the day due to the large distances often involved.

Figure 5-2
Back Trajectory from Pinnacles National Park
Arriving 6 pm PDT July 10, 2012

Source: *NOAA 2016*

Figure 5-3 shows the back trajectory for an exceedance occurring on the evening of June 7, 2013. This was a rare day when Pinnacles recorded exceedances of both the 1 hour and 8 hour components of the State standard. The figure suggests that the air originated the day before in the SFBAAB, this time from the San Francisco/East Bay area of the SFBAAB. Again the late afternoon/evening arrival of the urban air transporting ozone is an indicator of transport.

Figure 5-3
Back Trajectory from Pinnacles National Park
Arriving 6 pm PDT June 7, 2013



Source: *NOAA 2016*

Although not a rigorous evaluation, the results of the current trajectory assessments suggest that ARB's original upwind/downwind findings are still relevant. This is not entirely surprising since, despite changes in emissions, the wind patterns driving transport tend to remain similar over time.

5.2 2016 Soberanes Wildfire

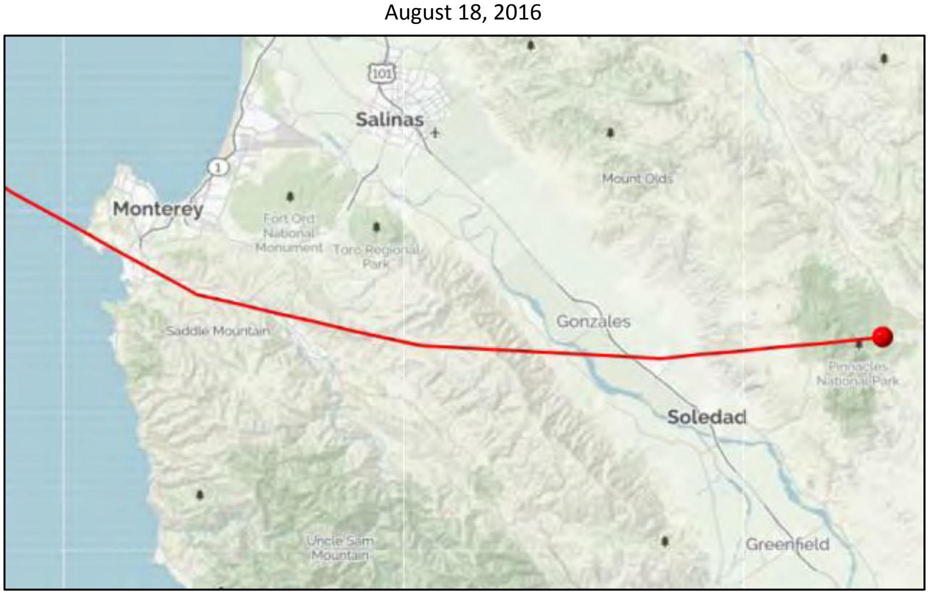
Aside from ozone transport from upwind urban areas, smoke from wildfires can contain significant quantities of ozone precursors which then contribute to exceedances of the ozone standard. 2016 was a good example of this as there were five exceedances recorded at Pinnacles during the Soberanes Wildfire in the Los Padres National Forest located directly across the Salinas Valley from the Pinnacles. On August 18, 2016, a 0.078 ppm exceedance of both the State and National 8-hour ozone standard was recorded at the Pinnacles. This was the one of the highest exceedances in the NCCAB in the past 5 years. The Soberanes Wildfire appears to have contributed to it.

Figure 5-4 is a satellite image showing smoke from the Soberanes extending over the Salinas in the direction of the Pinnacles. Figure 5-5 is a back trajectory from the Pinnacles at the time of the exceedance tracing a pathway back to the area of the burn. Together these images suggest that the Soberanes Wildfire contributed to the exceedance on that date. The impact of the Soberanes Fire on air quality for 2016 will be evaluated in the next AQMP as data collected for 2016 have not been certified at the time of the development of this current plan.

Figure 5-4
Veil of Smoke from Soberanes over Pinnacles National Park
July 24, 2016

Source: NASA EOSDIS 2017

Figure 5-5
Back Trajectory from Pinnacles National Park
August 18, 2016



Source: NOAA 2016

6. Control Measures

The basic strategy for improving air quality is to reduce emissions of those air pollutants which cause violations of ambient air quality standards. Ozone is a regional pollutant which forms over large areas as the source pollutants, NOx and ROG, travel downwind. Consequently, reductions in NOx and ROG emissions over the entire region, including the NCCAB as well as adjacent major urbanized air basins, are needed. As discussed in Section 5, pollution transported from areas outside of the NCCAB significantly contributes to violations of the 8-hour ozone standard.

Following the release of the 1991 AQMP, the District adopted a number of rules which reduced NOx and ROG by many tons per day. The most productive of these rules, Rule 431 Electric Utility Boilers, reduced NOx emissions by more than 15 tons per day as a single measure. Since those earlier years of rule adoption, the availability of high yield measures has diminished significantly with potential control measures only reducing the inventory by a few tenths of a percent at most.

The 2008 AQMP documented that the air basin continued to attain the 1-hour standard and recommended adoption of five control measures to make progress towards achieving the 8-hour standard. The control measures considered in the 2008 AQMP were for solvent cleaning operations, spray booths, degreasing, adhesives and sealants, and natural gas-fired fan-type furnaces and residential water heaters. As described in the 2008 AQMP, the measures were selected based on a screening level analysis of the emission reduction potential and cost effectiveness. As shown in Figure 3-2, without implementation of these measures, the number of ozone exceedance days continues to decline slightly. Since the 2012 AQMP, emissions for NOx and ROG have declined by 3 and 4 tons per day, respectively. In fact, as shown in Tables 4-1 and 4-2, emissions for both NOx and ROG are projected to continue to decline through the 2035 forecast horizon.

Santa Barbara County Air Pollution Control District has a similar situation as the District in that their air basin has been designated nonattainment transitional and has already implemented the more effective control measures. Santa Barbara's 2016 AQMP was reviewed to see if there were any innovative control measures that could be beneficial for our area. A NOx control measure for natural gas fired heaters had been implemented which yielded low emission benefits for a fairly high cost per ton of emissions reduced. Relating this lesson back to the NCCAB, since minor reductions would not be beneficial in reducing exceedances of the State ozone standard at the Pinnacles air monitoring site, which is dominated by ozone transported from outside the area, similar measures would not be productive for this plan.

Additionally, it has been recently announced that the electric utility boilers powering the two huge 750 MW 1960's era generators at the Moss Landing Power Plant may soon be decommissioned. Although the units have only been emitting about 0.1 tons per day of NOx in recent years, they are permitted and capable of emitting over 1 ½ tons per day. The NOx emission reductions associated with the shutdown of these older inefficient units will likely achieve similar reductions as achieved by implementing the marginally effective control measures noted above.

The five control measures from the 2008 AQMP have not been implemented as the District determined progress continued to be made toward attaining the 8-hour ozone standard during the four-year period reviewed (2012-2015). Significant reductions in ozone concentrations are not anticipated with implementation of the five measures because the primary pollutant addressed is ROG emissions. As noted earlier in this document, the region is "NOx sensitive" or NOx limited, meaning that ozone formation due to local emissions is more limited by the availability of NOx as opposed to ROGs (Umeda & Martien, 2002). Furthermore, at least one of the control measures identified in the 2008 AQMP, natural gas fired fan-type central furnaces and residential water heaters, is likely already being achieved in practice because surrounding air districts have long standing rules in place regarding NOx emissions from these sources. The District commits to further evaluating these and other control measures over the upcoming three-year period and will implement the most beneficial measures if the District fails to make progress toward attaining the 8-hour ozone standard. In the meantime, other regional planning strategies will be pursued instead of directing resources toward implementing these marginally effective measures.

6.1 Alternative Approach

Moving forward, the District does not recommend new rules for adoption unless it is shown to be cost-effective, technologically feasible, and appropriate for Monterey, San Benito, and Santa Cruz counties. As a result the District will focus on grant programs to reduce ROG and NOx emissions by offering incentives to reduce emissions from transportation sources, marine vessels, agricultural irrigation pumps, and off-road vehicles.

The District continues to provide grant funding opportunities to reduce both ROG and NOx emissions, primarily from mobile sources. The emission reductions achieved through these programs have resulted in greater NOx emission reductions than implementation of the five control measures would achieve. The following section discusses the District's mobile source grant programs and demonstrates that the District continues to achieve emission reductions through these programs.

7. Mobile Source Programs

The 2008 AQMP described transportation control measures (TCMs) contained in AMBAG's Metropolitan Transportation Improvement Program (MTIP); however, these measures have not been listed in more recent updates of the MTIP (AMBAG, 2012). Concurrently, air quality conformity analysis is no longer required by EPA since 2008 when the region came into attainment of all NAAQS.

To support reducing on-road vehicle emissions, the District's AB2766 grant program focuses funding on direct emission reduction projects such as roundabout design and construction and the application of adaptive traffic signal control at intersections. In 2016 the District implemented the Monterey Bay Clean Vehicle Program, which offered cash rebates to the public for the purchase or lease of battery electric and plug-in hybrid electric vehicles. With the passage of SB 513, the District is authorized to use local fees from the AB 923 program to fund alternate fuel and electric vehicle charge station infrastructure, which is fundamental to incentivizing the growth of the alternative fuel vehicle fleet within the District's jurisdictional boundaries.

The Plug-in Monterey Bay Electric Vehicle (EV) Charge Station Infrastructure program was implemented in January 2017. The program will utilize an advanced technology and design approach to establish DC fast charge and Level 2 charge station multi-centers in strategic locations for electric vehicle drivers. The District is also evaluating whether to implement a voluntary accelerated vehicle retirement (VAVR) and/or voluntary repair of vehicles (VRV) to reduce light-duty vehicle emissions in accordance with the Carl Moyer Program.

Notwithstanding the technological advances in automobile engine emissions and the advances in clean fuel formulations, the State of California still leads the nation with the dirtiest air. Vehicles continue to produce much of the State's criteria pollutant emissions, including ozone precursors ROG and NOx. Therefore, the District targets State funding received to reduce motor vehicle emissions.

The District continues to utilize grant programs as the primary strategy to reduce on-road and off-road mobile source emissions in the NCCAB. The three active programs are:

- The Carl Moyer Memorial Air Quality Standards Attainment Program
- The AB923 grant program
- The AB2766 Mobile Source Emissions Reduction Program

Pursuant to §44220 of the California Health and Safety Code, local DMV fees collected by the District are used to fund the AB923 and AB2766 grant programs as well as augmenting the Carl Moyer program. The Carl Moyer and AB923 programs are due to sunset in January 2024 unless program extending legislation is passed before 2024. Typical grant funding amounts are shown in Table 7-1.

Table 7-1
Annual Program Funding Amounts

Funding Program	Average Annual Funding ($)
Carl Moyer	**$750,000**
AB923	**$1,200,000**
AB 2766	**$1,400,000**

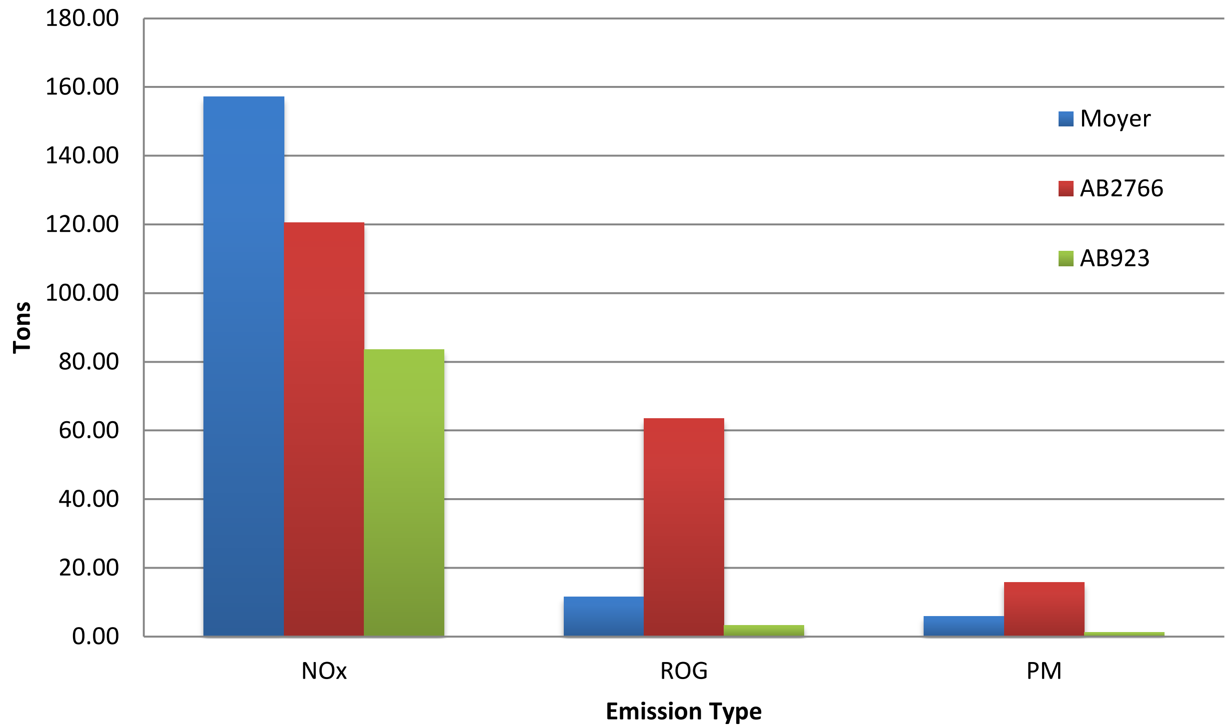
Source: MBARD 2016

Estimated annual emission reductions from projects funded by the grant programs are shown in Figure 7-1. Emission reduction data for the Carl Moyer Program represent projects funded from Moyer Year 13 to present and were calculated by the ARB CARL database tool. Data for the AB2766 program represent emission reductions from regional vanpools, fleet vehicle replacements, new transit, roundabouts and adaptive traffic signal control operations. The 2012 to present emission reduction was calculated using the ARB EMFAC 2014, v1.0.7 Emission Factor Tables (December 2015) and ARB CMAQ Emission Factor Tables, May 2013.

Further mobile source emission reductions are being achieved with the implementation of two AB 2766 zero emission programs for mobile sources. The AB2766 Public Agency EV Voucher Program was initiated in 2015 and the Public EV Rebate Program was initiated in 2016. Combined, these mobile source grant programs have reduced annual NOx emissions by 361 tons and annual ROG emissions by 78 tons. In terms of emission reductions, these are more effective than the five control measures in the 2008 AQMP. In fact, the NOx reductions achieved by the grant programs far outweigh the reductions associated with the NOx control measure, A-5, from the 2008 AQMP (Natural Gas-Fired Fan-Type

Central Furnaces and Residential Water Heaters). As noted above, reducing NOx emissions is important for making progress toward attaining the 8-hour ozone standard because the NCCAB is NOx limited.

Figure 7-1
Grant Program Emission Reductions, 2012 - 2015



<u>Source:</u> *Monterey Bay Unified Air Pollution Control District 2013, MBARD 2016*

8. Public Outreach

The District conducts public outreach through a variety of methods including the District's website, brochures, attendance at local events, annual calendar art contest, and social media. These programs are important for raising public awareness about how each person can contribute to improving air quality. The following is a brief summary of the District's outreach activities.

- **Website and Social Media:** The District website is an important communication tool used to provide information to the public such as press releases, meeting notices, grant program announcements, and current air quality data. The District also maintains Facebook and Twitter accounts to post current information.

- **Participation in Local Events and Committees:** The District participates in local events to inform the public about air quality and sources that contribute to air pollution such as cars and smoke from wood burning for home heating. The District also participates in events such as county fairs, Earth Day, speaking engagements for local groups, non-voting member of the Transportation Agency of Monterey County's Board, member of technical advisory committees for the local regional transportation planning agencies and AMBAG, and member of the

Monterey Bay Electric Vehicle Alliance.

- **Annual Calendar Art Contest:** The District hosts a calendar art contest each year to promote air quality awareness for elementary and middle school students. The focus of the calendar themes are generally on air quality and transportation. Past calendar themes include; *Make a Clean Air Choice, Travel Without Your Car* and *What's Your Solution to Air Pollution*.

- **Air Expressions:** The District has a grant program available for projects from high school (9-12th grades) and college undergraduate students. Projects are encouraged that advance the understanding of relevant air quality and climate change issues in relation to transportation.

9. Emission Reduction Strategy

This report has shown that the District continues to make progress toward attaining the 8-hour ozone standard; however, the significant contribution of transported emissions to exceedances will challenge achieving full attainment. The District will continue to foster and support programs that reduce ozone precursor emissions, implement rules when necessary, and continue to maintain robust permitting and enforcement programs. The District's successful past efforts in rule development; permitting and enforcement have left few remaining options available to reduce emissions of ozone precursor emissions. To address ROG emissions in the upcoming years the District will work to refine the area source ROG emissions inventory to evaluate whether the inventory properly reflects local conditions. This will help identify the sources to consider for additional emission reduction strategies.

The District's priority is to continue to pursue reduction of ozone precursor emissions from mobile sources as this is the primary contributor of emissions, especially for NOx. This approach to reducing mobile source emissions can be achieved through the District's incentive and grant programs as outlined in Chapter 7. These programs include AB2766 grants to local agencies for vanpools, plug-in electric vehicles (PEVs) and infrastructure, support of local rideshare and bike to work events, and AB923 funds for school buses and Carl Moyer Program projects. A potential program improvement occurred when the State senate passed SB513 in 2015. This law has opened up the opportunity for the District to use AB923 and Carl Moyer Program Funds for electric vehicle infrastructure. Additionally, the District will continue to aggressively pursue grants to advance accessibility to alternative fuels for medium duty fleets.

9.1 Regional Planning

Air pollution knows no geographic boundaries which is why the District must shift towards more comprehensive regional planning approaches in addition to incentive programs. The fact that the highest concentrations of ozone recorded in the region are at the Pinnacles National Park air monitoring station, a remote location far removed from population centers, indicates that this location is not a complete representation of the air quality for the entire District, but rather portrays the effects of air pollution transported from distant regions. The District is located downwind of two densely populated and highly polluting air basins—the San Francisco Bay and San Joaquin Valley. These two air basins are directly tied to our ability as a District to reach attainment for the State AAQS.

A long range strategy to reduce ozone precursor emissions is to be involved in inter- and intra-district planning efforts such as “The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) which supports the State’s climate action goals to reduce greenhouse gas (GHG) emissions through coordinated transportation and land use planning with the goal of developing more sustainable communities” (ARB: Sustainable Communities). Under SB 375, the ARB sets regional targets for GHG emissions reductions from passenger vehicle use. While this law is an effort to reduce regional GHG emissions, the co-benefits of reducing other emissions including ozone precursors is clear. The ARB has established targets for 2020 and 2035 for each region covered by one of the State’s metropolitan planning organizations (MPO) and/or regional transportation planning agency (RTPA). The Association of Monterey Bay Area Governments (AMBAG) is the MPO/RTPA for the Monterey Bay Area which is responsible for coordinating with all the Regional Transportation Planning Agencies, such as San Benito County Council of Governments, the Santa Cruz County Regional Transportation Commission, and the Transportation Agency of Monterey County. The District will work closely with AMBAG and its constituents to include appropriate air quality components in the “Sustainable Communities Strategy Implementation Project (SCSIP)”, the “2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS)”, and other local and regional projects to ensure the most comprehensive regional best management practices possible. New State-wide incentives emerging from California’s Global Warming Solutions Act of 2006 (AB 32) may also contribute toward progress in meeting the 8-hour standard. Many of the incentives focus on reducing energy use, fuel combustion and travel. These types of measures also have cross-pollutant benefits in terms of reducing emissions of ozone precursors. Evaluation of potential cross-pollutant benefits of AB 32 will be considered in subsequent updates of the AQMP.

The District continues to address indirect source emissions by reviewing development projects subject to the California Environmental Quality Act. District staff reviews and comments on all Environmental Impact Reports (EIRs) and Statements (EISs) and Negative Declarations (MNDs and NDs) and responds to all Notices of Preparation (NOPs) prepared for projects within the region. Due to the recognized transport of ozone from the Bay Area Air Basin into the NCCAB, the District also reviews environmental documents for major projects in southern Santa Clara Valley. The District will continue to review and comment on environmental documents submitted by lead agencies throughout the region to evaluate land use projects’ construction and operational emissions for significant impacts on air quality.

Under grant funding opportunities from the California Energy Commission (CEC), the District will continue to compete for transportation sector grant funds that become available. Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVT Program). The statute, subsequently amended by AB 109 (Núñez) Chapter 313, Statutes of 2008), authorizes the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the State’s climate change policies. The Energy Commission has an annual program budget of about $100 million and provides financial support for projects that:

- Develop and improve alternative and renewable low-carbon fuels.
- Enhance alternative and renewable fuels for existing and developing engine technologies.
- Produce alternative and renewable low-carbon fuels in California.
- Decrease, on a full-fuel-cycle basis, the overall impact and carbon footprint of alternative and renewable fuels and increased sustainability.
- Expand fuel infrastructure, fueling stations, and equipment.
- Improve light-, medium-, and heavy-duty vehicle technologies.

- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets.
- Expand infrastructure connected with existing fleets, public transit, and transportation corridors.
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

The District has been the recipient of three grants from the CEC, two of which have been successfully completed and one recently awarded to the District (GFO-16-601, Monterey Bay EV Acceleration Program). The development and implementation of the Monterey Bay Region Plug-In Electric Vehicle (PEV) Readiness Plan was completed in 2014. The PEV Readiness plan focused on public EV outreach and establishing EV infrastructure policy and guidelines for local governments. The Monterey Bay Region Alternative Fuel Vehicle (AFV) Readiness Plan was completed in 2016, which focused on the development of AFV readiness policies and infrastructure for the Monterey Bay region.

Using local public funds, the District has also successfully administered the EV Voucher Incentive Replacement Program for public agencies adding over 50 electric vehicles to public agency fleets. In 2016, the District introduced two key regional programs; the Monterey Bay EV Rebate Program and the Plug-In Monterey Bay EV Infrastructure Program. The EV rebate program incentivized the addition of 177 new electric vehicles to the region. The Plug-In Monterey Bay EV Infrastructure program will allocate $1.2M annually over the next five years to implement EV charge station infrastructure in strategic locations throughout San Benito, Santa Cruz and Monterey counties.

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Appendix A – Regional Population Forecasts

Regional Population Forecasts

Population and changes in population are important factors affecting the air quality of a region. Regions with high population, such as the Los Angeles area tend to have higher levels of ozone while regions with lower population, like the NCCAB tend to have lower levels of ozone. Population data are used in the AQMP to help develop the emission inventory.

In the tri-county MBARD region, population forecasts and other demographic information are developed by the region's Metropolitan Planning Organization, the Association of Monterey Bay Area Governments (AMBAG). These are periodically updated to reflect the regions latest factors affecting current and future population levels. The latest population forecasts were adopted by the AMBAG Board in June 2014 and are called the 2014 Regional Growth Forecasts (RGF). The next update is expected in 2018. The 2014 RGFs population forecasts are presented in the table on the following page.

Additional AMBAG demographic data can be obtained at http://www.ambag.org/programs-services/planning/regional-growth-forecast .

Table * - AMBAG Regional Population Growth Forecast by City and County

AREA	2010 [1]	2015 [2]	2020 [3]	2025 [4]	2030 [4]	2035 [4]	Change 2010-35	% Change
AMBAG Region	**732,708**	**766,354**	**800,000**	**827,000**	**856,000**	**885,000**	**152,292**	**21%**
Monterey County	**415,057**	**431,287**	**447,516**	**463,884**	**479,487**	**495,086**	**80,029**	**19%**
Carmel-By-The-Sea	3,722	3,632	3,541	3,661	3,789	3,917	195	5%
Del Rey Oaks	1,624	1,757	1,889	2,345	2,806	3,468	1,844	114%
Gonzales	8,187	10,764	13,340	13,955	16,194	19,333	11,146	136%
Greenfield	16,330	18,836	21,341	22,061	22,835	23,609	7,279	45%
King City	12,874	13,721	14,568	16,398	17,759	18,620	5,746	45%
Marina	18,991	19,373	19,755	20,441	21,178	21,915	2,924	15%
CSUMB (portion)	727	1,144	1,560	2,210	2,210	2,310	1,583	
Monterey	27,810	27,907	28,004	28,839	29,743	30,647	2,837	10%
Pacific Grove	15,041	15,218	15,394	15,914	16,472	17,030	1,989	13%
Salinas	150,441	153,617	156,793	161,405	166,912	172,499	22,058	15%
Sand City	334	691	1,048	1,198	1,414	1,550	1,216	364%
Seaside	30,624	29,788	28,952	31,342	32,390	33,438	2,814	9%
CSUMB (portion)	2,401	4,785	7,168	8,918	8,918	8,818	6,417	
Soledad	15,690	18,725	21,759	22,493	23,282	24,071	8,381	53%
SVSP & CTF	10,048	9,803	9,557	9,557	9,557	9,557	(491)	
Balance Of County	100,213	101,530	102,847	103,147	104,028	104,304	4,091	4%
San Benito County	**55,269**	**64,186**	**73,103**	**75,604**	**78,418**	**81,332**	**26,063**	**47%**
Hollister	34,928	37,452	39,975	41,704	43,551	45,397	10,469	30%
San Juan Bautista	1,862	1,928	1,993	2,015	2,053	2,092	230	12%
Balance Of County	18,479	24,807	31,135	31,885	32,814	33,843	15,364	83%
Santa Cruz County	**262,382**	**270,882**	**279,381**	**287,512**	**298,095**	**308,582**	**46,200**	**18%**
Capitola	9,918	9,519	9,119	9,427	9,758	10,088	170	2%
Santa Cruz	43,646	45,503	47,360	48,958	50,675	52,392	8,746	20%
UCSC	16,300	17,900	19,500	21,100	22,700	24,300	8,000	
Scotts Valley	11,580	11,609	11,638	11,696	11,754	11,813	233	2%
Watsonville	49,229	54,338	59,446	61,452	63,607	65,762	16,533	34%
Balance Of County	129,739	131,029	132,318	134,879	139,601	144,227	14,488	11%

Notes:

1) Figures for 2010 represent Decennial Census counts.
2) Figures for 2015 reflect E-4/E-5 estimates from the California Department of Finance.
3) Figures for 2020 represent AMBAG/PRB forecast estimates, where change in the distribution across the region's cities and counties was projected using an implicit shift-share method. This method first estimates population change using an implicit share population change using the total regional growth rate. It then modifies the estimate based on the historic shift in population distribution within the region between 2010 and 2015.
4) Figures for 2025, 2030, and 2035 represent AMBAG and PRB forecast estimates, where the distribution is equal to that projected for 2020.