

## Executive Summary

South Coast Air Quality Management District  
*Cleaning the air that we breathe...™*



# **EXECUTIVE SUMMARY**

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## **INTRODUCTION**

The long-term trend of the quality of air we Southern Californians breathe shows continuous improvement, although the slowing rate of improvement in ozone levels causes concern. The remarkable historical improvement in air quality since the 1970's is the direct result of Southern California's comprehensive, multiyear strategy of reducing air pollution from all sources as outlined in its Air Quality Management Plans (AQMPs). Yet the air in Southern California is far from meeting all federal and state air quality standards and, in fact, is among the worst in the nation. Stemming from the preponderance of latest health evidence, new federal fine particulate (PM<sub>2.5</sub>) and 8-hour surface-level ozone standards are more stringent than the previous standards. To reach federal Clean Air Act (CAA) deadlines over the next two decades, Southern California must significantly accelerate its pollution reduction efforts.

Continuing the Basin's progress toward clean air is a challenging task, not only to recognize and understand complex interactions between emissions and resulting air quality, but also to pursue the most effective possible set of strategies to improve air quality, maintain a healthy economy, and coordinate efforts with other key public and private partners to meet a larger set of transportation, energy and climate objectives. To ensure continued progress toward clean air and comply with state and federal requirements, the South Coast Air Quality Management District (SCAQMD or District) in conjunction with the California Air Resources Board (CARB), the Southern California Association of Governments (SCAG) and the U.S. Environmental Protection Agency (U.S. EPA) have prepared the Final 2012 AQMP (Plan). The Plan employs the most up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources and area sources.

The Final Plan demonstrates attainment of the federal 24-hour PM<sub>2.5</sub> standard by 2014 in the South Coast Air Basin (Basin) through adoption of all feasible measures. The Final Plan also updates the U.S. EPA approved 8-hour ozone control plan with new measures designed to reduce reliance on the CAA Section 182 (e)(5) long-term measures for NO<sub>x</sub> and VOC reductions.

The Final 2012 AQMP also addresses several state and federal planning requirements, incorporating new scientific information, primarily in the form of updated emissions inventories, ambient measurements, and new meteorological air quality models. This Plan builds upon the approaches taken in the 2007 AQMP for the South Coast Air Basin for the attainment of federal PM and ozone standards, and highlights the significant

amount of reductions needed and the urgent need to engage in interagency coordinated planning to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under the federal Clean Air Act.

The Final 2012 AQMP also includes an update on the air quality status of the Salton Sea Air Basin (SSAB) in the Coachella Valley, a discussion of the emerging issues of ultrafine particle and near-roadway exposures, an analysis of the energy supply and demand issues that face the Basin and their relationship to air quality. The Plan also includes new demonstrations of 1-hour ozone attainment and vehicle miles travelled (VMT) emissions offsets, as per recent U.S. EPA requirements.

This Final Plan as well as other key supporting information are available electronically and can be downloaded from the District's home page on the Internet (<http://www.aqmd.gov/aqmp/2012aqmp/index.htm>).

## **WHY IS THIS FINAL PLAN BEING PREPARED?**

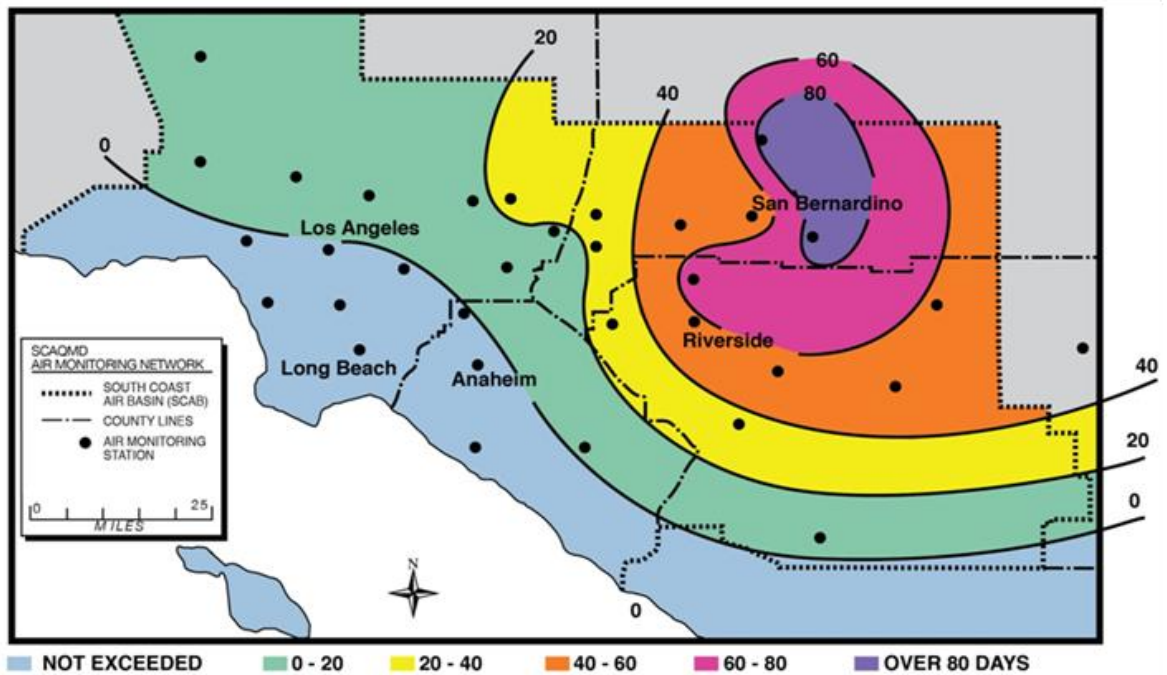
The federal Clean Air Act requires a 24-hour PM<sub>2.5</sub> nonattainment area to prepare a State Implementation Plan (SIP) which must be submitted to U.S. EPA by December 14, 2012. The SIP must demonstrate attainment with the 24-hour PM<sub>2.5</sub> standard by 2014, with the possibility of up to a five-year extension to 2019, if needed. U.S. EPA approval of any extension request is based on the lack of feasible control measures to move forward the attainment date by one year. The District's attainment demonstration shows that, with implementation of all feasible controls, the earliest possible attainment date is 2014, and thus no extension of the attainment date is needed.

In addition, the U.S. EPA requires that transportation conformity budgets be established based on the most recent planning assumptions (i.e., within the last five years) and approved motor vehicle emission models. The Final Plan is based on the most recent assumptions provided by both CARB and SCAG for motor vehicle emissions and demographic updates and includes updated transportation conformity budgets.

## **IS AIR QUALITY IMPROVING?**

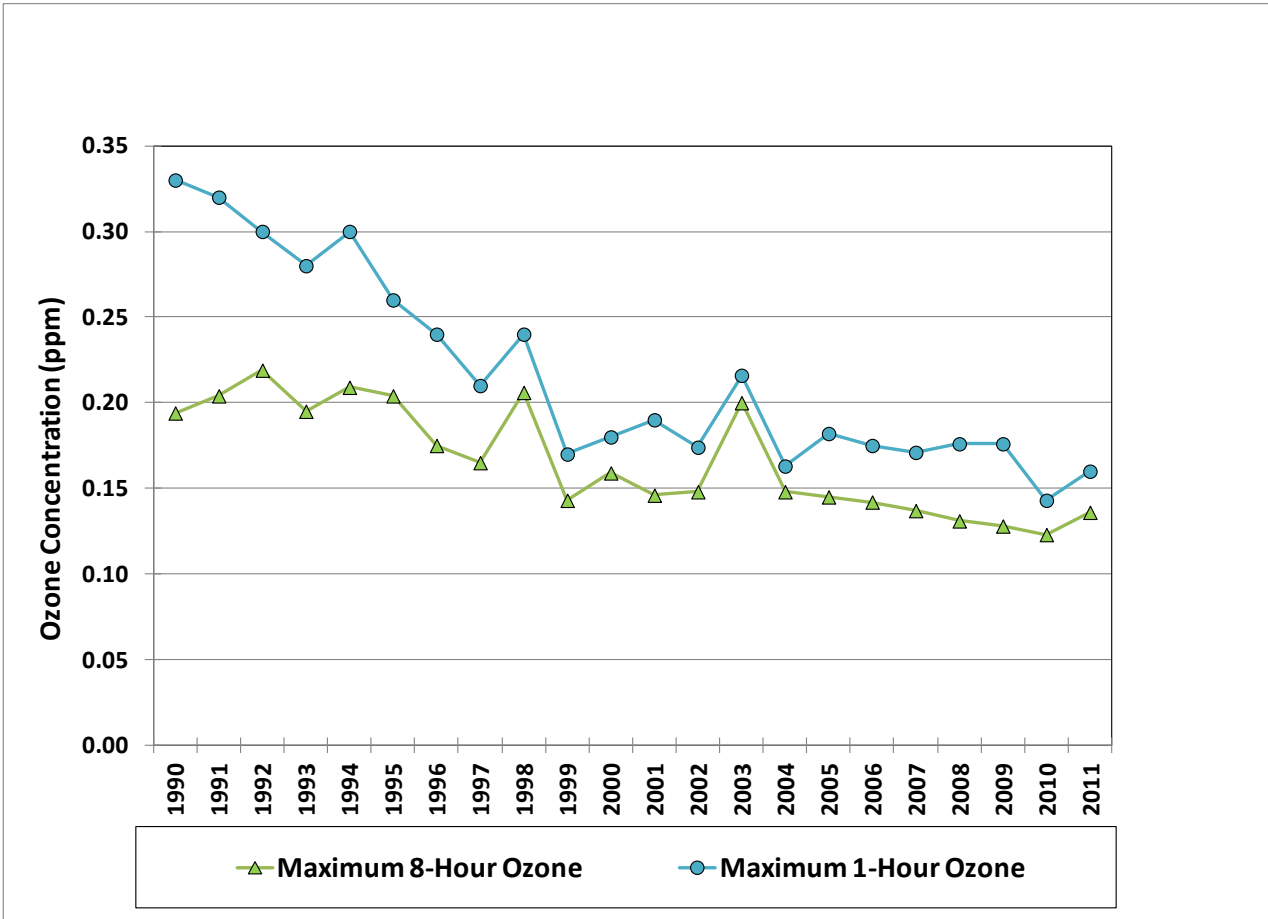
Yes. Over the years, the air quality in the Basin has improved significantly, thanks to the comprehensive control strategies implemented to reduce pollution from mobile and stationary sources. For instance, the total number of days on which the Basin

experiences high ozone levels has decreased dramatically over the last two decades. As shown in Figure ES-1, the majority of exceedances occur in the mountains and valleys of Southwestern San Bernardino County. The maximum 8-hour ozone levels measured in the Basin were well above 200 ppb in the early 1990s, and are now less than 140 ppb. Figure ES-2 shows the long-term trend in ambient 8-hour average and 1-hour average ozone levels since 1990. However, the Basin still exceeds the federal 8-hour standard more frequently than any other location in the U.S. Under federal law, the Basin is designated as an "extreme" nonattainment area for the 8-hour ozone standard.



**FIGURE ES-1**

2011 8-Hour Ozone: Number of Days Exceeding the Current Federal Standard (8-hour average ozone > 0.075 ppm)



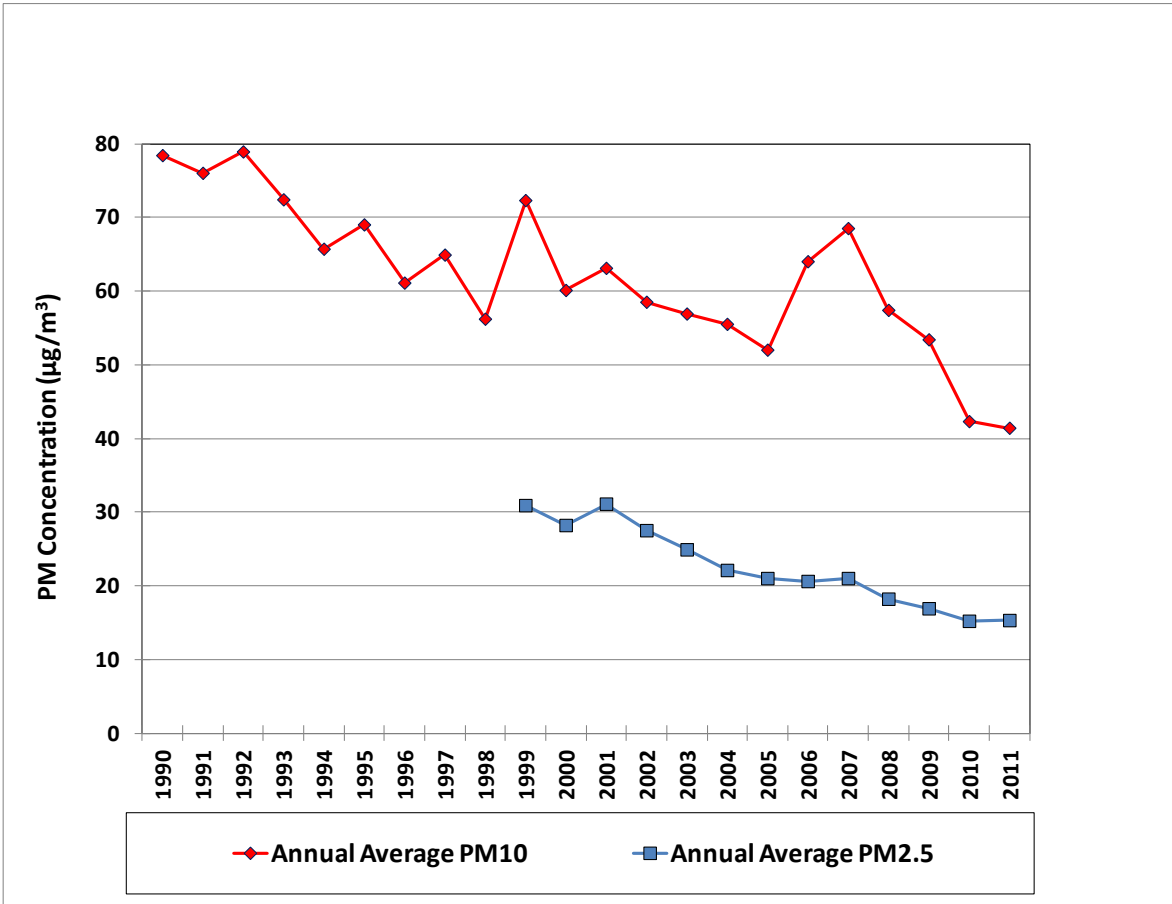
**FIGURE ES-2**

Maximum 1-Hour and 8-Hour Average Ozone Trends in the Basin

The rate of progress in improving ozone air quality has slowed for the last several years. The District has conducted extensive analysis, held technical forums, and reviewed all available scientific literature examining the issue of why progress has slowed, including the accuracy of emissions inventories, the effectiveness of control strategies, and the knowledge of photochemical processes. The overall result is that a strategy focusing primarily on NO<sub>x</sub> reductions has been deemed the best way to achieve long-term ozone attainment objectives. However, a recurring policy question is whether another approach, such as significant VOC reductions, would be as effective at reducing ozone levels. But given that NO<sub>x</sub> reductions are needed not only to achieve the ozone standards but also to achieve the PM<sub>2.5</sub> standards, and given that a heavy VOC reduction strategy alone could not achieve the ozone standards, a NO<sub>x</sub>-heavy control strategy is considered best. VOC reductions are, however, still needed to provide additional ozone benefits, especially in the western areas of the Basin.

Relative to the 1-hour ozone standard, which was revoked by the U.S. EPA in favor of the new 8-hour ozone standard, the past air pollution control programs have had an overall positive impact. The number of days in which the Basin exceeds the federal 1-hour ozone standard has continually declined over the years. But as seen in Figure ES-2, the rate of progress has slowed since 2000. The Basin currently still experiences ozone levels over the revoked 1-hour federal standard on approximately 5% of the days. U.S. EPA guidance has indicated that while certain planning requirements remained in effect, a new SIP would not be required if an area failed to attain the standard by the attainment date. However, recent litigation and court decisions have suggested that there is likely a need for the District to prepare a new 1-hour ozone SIP in the near future. If a 1-hour ozone SIP is requested by U.S. EPA, the SIP would be due within 12 months of such a SIP call. The attainment demonstration in the SIP would have to show attainment within 5 years with a potential 5-year extension, which would be a similar time frame as the 1997 8-hr ozone standard deadline of 2023. Based on previous modeling estimates, the control strategies that are needed to attain the 8-hour ozone standard are nearly identical to those that would be needed to attain the 1-hour ozone standard.

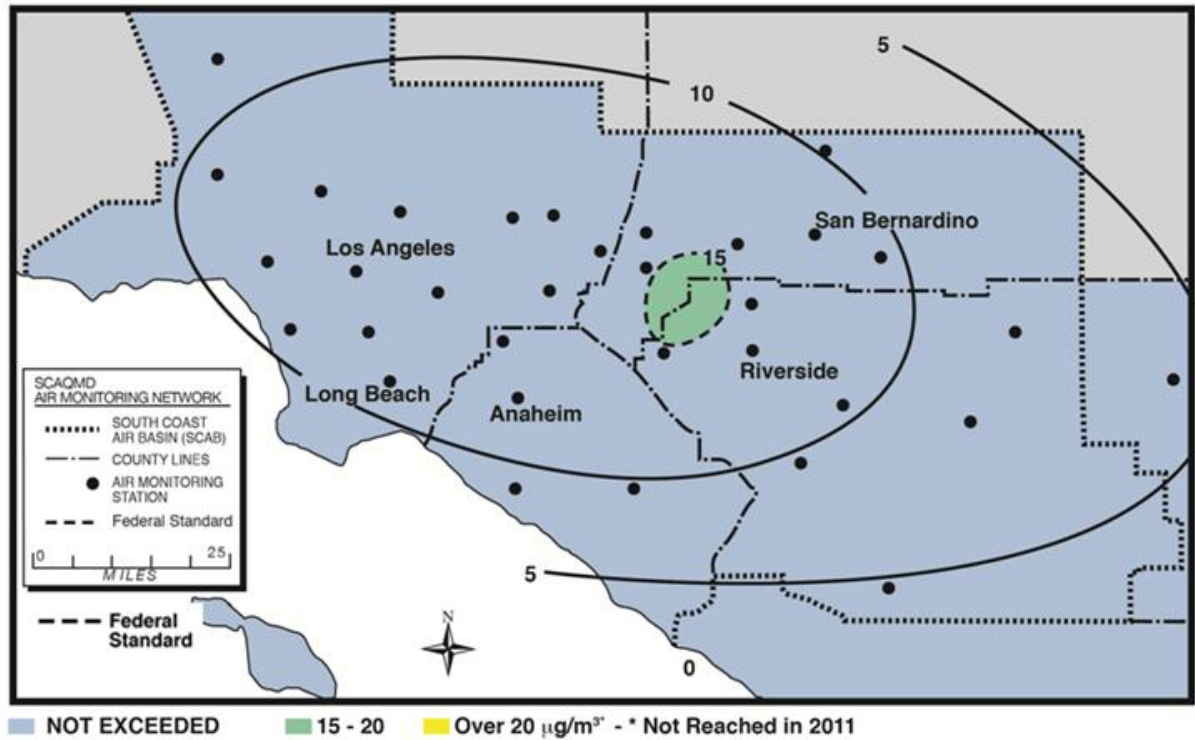
Both PM<sub>10</sub> and PM<sub>2.5</sub> levels have improved dramatically over the past two decades. Annual average PM<sub>10</sub> concentrations have been cut in half since 1990, and likewise, annual average PM<sub>2.5</sub> concentrations have been cut in half since measurements began in 1999 (Figure ES-3). The Basin has met the PM<sub>10</sub> standards at all stations and a request for re-designation to attainment is pending with U.S. EPA. In 2011, both the annual PM<sub>2.5</sub> standard (15 µg/m<sup>3</sup>) and the 24-hour PM<sub>2.5</sub> standard (98<sup>th</sup> percentile greater than 35 µg/m<sup>3</sup>) were exceeded at only one air monitoring station, Mira Loma, in Northwestern Riverside County (Figure ES-4). The primary focus of this Final 2012 AQMP is to bring the Basin into attainment with the 24-hour PM<sub>2.5</sub> standard.



**FIGURE ES-3**

Maximum-Site Annual Average PM10, PM2.5 Trends in the Basin





**FIGURE ES-4**

2011 PM<sub>2.5</sub>: Annual Average Concentration Compared to the Federal Standard  
(Federal standard = 15 µg/m<sup>3</sup>, annual arithmetic mean)

In 2011, the Basin did not exceed the standards for carbon monoxide, nitrogen dioxide, or sulfur dioxide<sup>1</sup>.

Although exposure to pollution has decreased substantially in the Basin through several decades of implementing pollution controls, increases in the population over that time have made further emissions reductions more difficult. Many sources, such as automobiles and stationary sources have been significantly controlled. However, increases in the number of sources, particularly those growing proportionately to population, can offset the potential air quality benefits of past and existing regulations. The net result is that unless additional steps are taken to further control air pollution, growth itself may begin to reverse the gains of the past decades.

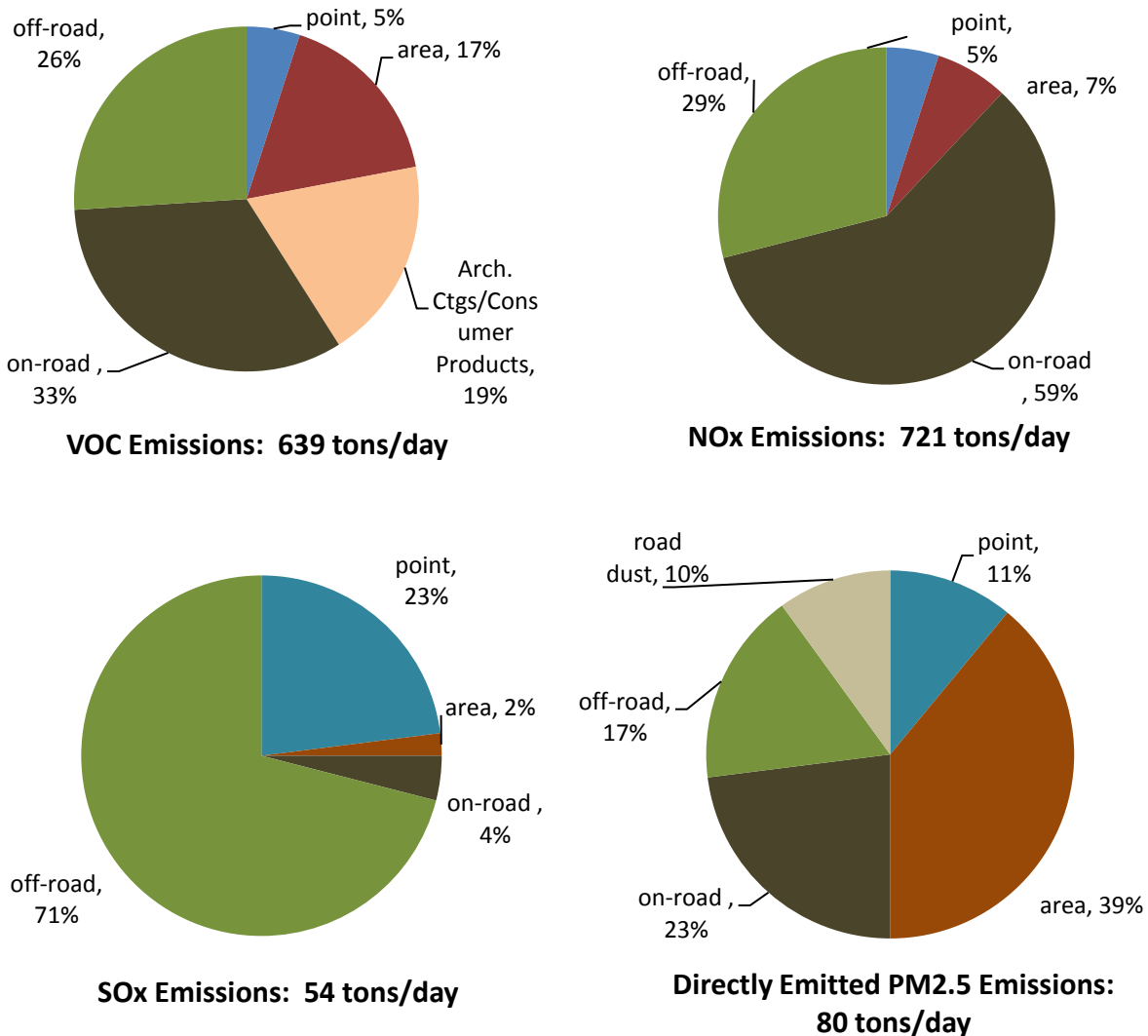
<sup>1</sup> U.S. EPA recently revised the NO<sub>2</sub> and SO<sub>2</sub> air quality standards, but analysis to date shows continued compliance with these newly mandated levels.

## **HOW DID THE RECENT RECESSION AFFECT AIR QUALITY?**

As shown above, air quality has improved over the last five years. Many factors affect air quality, including meteorological conditions, emissions, and control programs designed to reduce those emissions. The recession that began in late 2007, and continued reduced economic activity in the Basin, has also impacted pollutant emission levels. For example, goods movement activity declined by more than 20%, construction activity dropped by approximately 40%, and high fuel prices led to less vehicle miles travelled. It is difficult to determine exactly which portion of the air quality gains seen over the last five years are related to the economic downturn, but a rough estimate suggests that 15 - 20% of the recent improvements in air quality are attributable to economic factors. As the economy recovers, commercial activity will increase, and there is the potential for some emissions increases. The Final 2012 AQMP utilizes the most recent economic data and projections, including data from SCAG, which include some levels of economic growth. Using these assumptions, the analysis demonstrates that air quality will continue to improve in the future, but not to the degree necessary to achieve air quality standards without additional control programs.

## **WHAT ARE THE MAJOR SOURCES CONTRIBUTING TO AIR QUALITY PROBLEMS?**

Figure ES-5 shows the sources of NO<sub>x</sub>, VOC, SO<sub>x</sub>, and direct PM<sub>2.5</sub> emissions for 2008. PM<sub>2.5</sub> levels benefit from reductions in all four pollutants. On a per ton basis, the greatest PM<sub>2.5</sub> benefit results from SO<sub>x</sub> and direct PM<sub>2.5</sub> emissions reductions. In the Basin, ozone levels benefit from both NO<sub>x</sub> and VOC reductions.



**FIGURE ES-5**

Relative Contribution by Source Category to 2008 Emission Inventory  
(VOC & NOx – Summer Planning; SOx, & PM2.5 – Annual Average Inventory)

**WHAT IS THE OVERALL CONTROL STRATEGY IN THE 2012 AQMP?**

The Final 2012 AQMP outlines a comprehensive control strategy that meets the requirement for expeditious progress towards attainment with the 24-hour PM2.5 NAAQS in 2014 with all feasible control measures. The Plan also includes specific measures to further implement the ozone strategy in the 2007 AQMP to assist attaining the 8-hour ozone standard by 2023. The 2007 AQMP demonstrated attainment with the

2023 8-hour ozone standard using a provision of the federal CAA, Section 182(e)(5), that allows credit for emissions reductions from future improvements in control techniques and technologies. These “black box” emissions reductions are still needed to show attainment with the 2023 8-hour ozone NAAQS. Accordingly, these Section 182(e)(5) reductions still account for about 65% of the remaining NOx emissions reductions needed in 2023. Given the magnitude of these needed emission reductions, it is critical that the Basin maintain its continuing progress and work actively towards achieving as many specific emissions reductions as possible, and not wait until subsequent AQMPs to begin to address this looming shortfall.

As stated above, the only air monitoring station that is currently exceeding or projected to exceed the 24-hour PM2.5 standard by 2014 is Mira Loma in Western Riverside County. Consistent with U.S. EPA guidance, seasonal or episodic controls that focus on bringing the Mira Loma station into compliance can be considered as a method to bring the Basin into attainment.

The control measures contained in the Final 2012 AQMP can be categorized as follows:

*Basin-wide Short-term PM2.5 Measures.* Measures that apply Basin-wide, have been determined to be feasible, will be implemented by the 2014 attainment date, and are required to be implemented under state and federal law. The main short-term measures are episodic, in that they only apply during high PM2.5 days and will only be implemented as needed to achieve the necessary air quality improvements.

*Contingency Measures.* Measures to be automatically implemented if the Basin fails to achieve the 24-hour PM2.5 standard by 2014.

*8-hour Ozone Measures.* Measures that provide for necessary actions to maintain progress towards meeting the 2023 8-hour ozone NAAQS, including regulatory measures, technology assessments, key investments, and incentives.

*Transportation Control Measures.* Measures generally designed to reduce vehicle miles travelled (VMT) as included in SCAG’s 2012 Regional Transportation Plan.

Many of the control measures proposed are not regulatory in form, but instead focus on incentives, outreach, and education to bring about emissions reductions through voluntary participation and behavioral changes needed to complement regulations.

## **WHY NOT REQUEST THE FULL 5-YEAR EXTENSION TO MEET THE 24-HOUR PM2.5 STANDARD?**

The U.S. EPA deadline for meeting the 24-hour PM2.5 NAAQS is 2014, with a possible extension of up to five years. The extension is not automatic, and approval of an extension request will be based on a demonstration that there are no additional feasible control measures available to move up the attainment date by one year. As demonstrated in Chapter 5 of this Final 2012 AQMP, with the existing control program the Basin can attain the 24-hour PM2.5 standard by 2019, the latest possible attainment date with a full five-year extension granted by U.S. EPA. Under the federal CAA, the Basin must achieve the federal NAAQS “as expeditiously as practicable.” Therefore, if feasible measures to advance attainment are available, they must be adopted and implemented in the SIP. With all feasible measures implemented, including the episodic controls proposed, the Basin can achieve attainment by 2014 without requesting an extension.

## **WHY AND HOW IS THE 8-HOUR OZONE PLAN BEING UPDATED?**

Given the continuing challenge of achieving the magnitude of emissions reductions needed to meet the federal 2023 8-hour ozone deadline, this Plan updates the previous 8-hour ozone plan with new emission reduction commitments from a set of new control measures, which further implement the 2007 AQMP commitments. The 2023 deadline is fast approaching and the magnitude of needed emission reductions remains about the same as it was in the 2007 AQMP. It is not a prudent or efficient strategy to wait for future plans and controls to achieve all of these reductions when they are possible today. Thus, these Final 2012 AQMP measures serve as a down payment for the much larger reductions that will be needed in future years.

Furthermore, these additional emissions reductions are needed to demonstrate attainment with the revoked 1-hour ozone standard. Due to a recent court decision, U.S. EPA has proposed to require a new 1-hour ozone attainment demonstration. The 1-hour ozone attainment strategy is essentially identical to the 8-hour ozone attainment strategy, including the updates in the Final 2012 AQMP. The 1-hour ozone attainment demonstration is included as an appendix to this Plan.

The U.S. EPA approved the 8-hour ozone SIP portion of the 2007 AQMP in 2011. The submittal of the Final 2012 AQMP will update certain portions of that SIP submittal. Namely, the new 8-hour ozone control measures will be submitted into the SIP with commitments for corresponding emissions reductions.

**GIVEN THE CURRENT DIFFICULT AND UNCERTAIN ECONOMIC CONDITIONS, SHOULD THE DISTRICT WAIT BEFORE ADDING REFINED CONTROL COMMITMENTS INTO THE SIP?**

No. The PM<sub>2.5</sub> measures are required to be submitted by December 14, 2012. As for ozone, the challenges are too great, the stakes too high, and the deadlines too soon. Waiting until the last few years to try and achieve the necessary emission reductions will make the efforts more difficult, disruptive, and probably more expensive. However, the district remains sensitive to the current economic climate and the struggles that many local businesses are experiencing. That is why this Final 2012 AQMP strives to identify the most cost-effective and efficient path to achieve federal clean air standards. A number of the measures proposed in the Plan are voluntary incentive and/or education programs that aim to achieve emission reductions without imposing new regulatory requirements. The episodic control approach seeks to minimize overall cost and economic impacts by focusing on the limited numbers of days and locations still experiencing the exceedances of the federal standards.

Furthermore, the effort to achieve multiple clean air goals will require significant public investments in the region over a long period of time. These investments need to be accomplished in an optimum fashion starting now. This also has the potential to create new Southern California jobs in clean technology sectors such as renewable power, energy efficiency, clean products, and advanced emissions controls. Fulfilling this unique opportunity to concentrate these clean air investments and jobs in the region where the air quality problems exist will require strong partnerships among all levels of government and business interests.

**IS THE 2012 AQMP BEING COORDINATED WITH THE STATE'S GREENHOUSE GAS REDUCTION EFFORTS?**

The Basin faces several ozone and PM attainment challenges, as strategies for significant emission reductions become harder to identify and the federal standards continue to become more stringent. California's Greenhouse Gas reductions targets under AB32 add new challenges and timelines that affect many of the same sources that emit criteria pollutants. In finding the most cost-effective and efficient path to meet multiple deadlines for multiple air quality and climate objectives, it is essential that an integrated planning approach is developed. Responsibilities for achieving these goals span all levels of government, and coordinated and consistent planning efforts among multiple government agencies are a key component of an integrated approach.

To this end, and concurrent with the development of the 2012 AQMP, the District, the Air Resources Board, and San Joaquin Valley Air Pollution Control District engaged in a joint effort to take a coordinated and integrated look at strategies needed to meet California's multiple air quality and climate goals, as well as its energy policies. California's success in reducing smog has largely relied on technology and fuel advances, and as health-based air quality standards are tightened, the introduction of cleaner technologies must keep pace. More broadly, a transition to zero- and near-zero emission technologies is necessary to meet 2023 and 2032 air quality standards and 2050 climate goals. Many of the same technologies will address air quality, climate and energy goals. As such, strategies developed for air quality and climate change planning should be coordinated to make the most efficient use of limited resources and the time needed to develop cleaner technologies. The product of this collaborative effort, the draft *Vision for Clean Air: A Framework for Air Quality and Climate Planning*, examines how those technologies can meet both air quality and climate goals over time. A public review draft of this document is now available at <http://www.aqmd.gov/aqmp/2012aqmp> and serves as context and a resource for the 2012 AQMP.