Chapter 6

Federal and State Clean Air Act Requirements

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

CHAPTER 6
FEDERAL & STATE CLEAN AIR ACT REQUIREMENTS

INTRODUCTION

The purpose of the 2012 revision to the AQMP for the South Coast Air Basin is to set forth a comprehensive program that will assist in leading the Basin and those portions of the Salton Sea Air Basin under the District's jurisdiction into compliance with all federal and state air quality planning requirements. Specifically, the Final 2012 AQMP is designed to satisfy the SIP submittal requirements of the federal CAA to demonstrate attainment of the 24-hour PM2.5 ambient air quality standards, the California CAA triennial update requirements, and the District's commitment to update transportation emission budgets based on the latest approved motor vehicle emissions model and planning assumptions. Specific information related to the air quality and planning requirements for portions of the Salton Sea Air Basin under the District's jurisdiction are included in the Final 2012 AQMP and can be found in Chapter 7 – Current and Future Air Quality – Desert Nonattainment Area. The Final 2012 AQMP will be submitted to U.S. EPA as SIP revisions once approved by the District's Governing Board and CARB.

SPECIFIC 24-HOUR PM2.5 PLANNING REQUIREMENTS

In November 1990, Congress enacted a series of amendments to the CAA intended to intensify air pollution control efforts across the nation. One of the primary goals of the 1990 CAA amendments was to overhaul the planning provisions for those areas not currently meeting the National Ambient Air Quality Standards (NAAQS). The CAA identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and an attainment demonstration, and incorporates more stringent sanctions for failure to attain or to meet interim milestones. There are several sets of general planning requirements, both for nonattainment areas [Section 172(c)] and for implementation plans in general [Section 110(a)(2)]. These requirements are listed and briefly described in Chapter 1 (Tables 1-4 and 1-5). The general provisions apply to all applicable criteria pollutants unless superseded by pollutant-specific requirements. The following sections discuss the federal CAA requirements for the 24-hour PM2.5 standards.

FEDERAL AIR QUALITY STANDARDS FOR FINE PARTICULATES

The U.S. EPA promulgated the NAAQS for Fine Particles (PM2.5) in July 1997. Following legal actions, the statements were eventually upheld in March 2002. The annual standard was set at a level of 15 micrograms per cubic meter ($\mu g/m^3$), based on the 3-year average of annual mean PM2.5 concentrations. The 24-hour standard was set

at a level of 65 μg/m^3 based on the 3-year average of the 98th percentile of 24-hour concentrations. U.S. EPA issued designations in December 2004, which became effective on April 5, 2005.

In January 2006, U.S. EPA proposed to lower the 24-hour PM2.5 standard. On September 21, 2006, U.S. EPA signed the "Final Revisions to the NAAQS for Particulate Matter." In promulgating the new standards, U.S. EPA followed an elaborate review process which led to the conclusion that existing standards for particulates were not adequate to protect public health. The studies indicated that for PM2.5, short-term exposures at levels below the 24-hour standard of 65 μg/m^3 were found to cause acute health effects, including asthma attacks and breathing and respiratory problems. As a result, the U.S. EPA established a new, lower 24-hour average standard for PM2.5 at 35 μg/m^3. No changes were made to the existing annual PM2.5 standard which remained at 15 μg/m^3 as discussed in Chapter 2. On June 14, 2012, U.S. EPA proposed revisions to this annual standard. The annual component of the standard was set to provide protection against typical day-to-day exposures as well as longer-term exposures, while the daily standard protects against more extreme short-term events. For the 2006 24-hour PM2.5 standard, the form of the standard continues to be based on the 98th percentile of 24-hour PM2.5 concentrations measured in a year (averaged over three years) at the monitoring site with the highest measured values in an area. This form of the standard was set to be health protective while providing a more stable metric to facilitate effective control programs. Table 6-1 summarizes the U.S. EPA's PM2.5 standards.

TABLE 6-1

U.S. EPA's PM2.5 Standards

	1997 STANDARDS		**2006 STANDARDS**	
	Annual	**24-Hour**	**Annual**	**24-Hour**
PM2.5	15 μg/m^3 Annual arithmetic mean, averaged over 3 years	65 μg/m^3 24-hour average, 98th percentile, averaged over 3 years	15 μg/m^3 Annual arithmetic mean, averaged over 3 years	35 μg/m^3 24-hour average, 98th percentile, averaged over 3 years

On December 14, 2009, the U.S. EPA designated the Basin as nonattainment for the 2006 24-hour PM2.5 NAAQS. A SIP revision is due to U.S. EPA no later than December 14, 2012, which is three years from the effective date of designation, demonstrating attainment with the standard by 2014. Under Section 172 of the CAA,

U.S. EPA may grant an area an extension of the initial attainment date for a period of up to five years. With implementation of all feasible measures as outlined in this Plan, the Basin will demonstrate attainment with the 24-hour PM2.5 standard by 2014, so no extension is being requested.

FEDERAL CLEAN AIR ACT REQUIREMENTS

For areas such as the Basin that are classified nonattainment for the 2006 24-hour PM2.5 NAAQS, Section 172 of subpart 1 of the CAA applies. Section 172(c) requires states with nonattainment areas to submit an attainment demonstration. Section 172(c)(2) requires that nonattainment areas demonstrate Reasonable Further Progress (RFP). Under subpart 1 of the CAA, all nonattainment area SIPs must include contingency measures. Section 172(c)(1) of the CAA requires nonattainment areas to provide for implementation of all reasonably available control measures (RACM) as expeditiously as possible, including the adoption of reasonably available control technology (RACT). Section 172 of the CAA requires the implementation of a new source review program including the use of "lowest achievable emission rate" for major sources referred to under state law as "Best Available Control Technology" (BACT) for major sources of PM2.5 and precursor emissions (i.e., precursors of secondary particulates).

This section describes how the Final 2012 AQMP meets the 2006 24-hour PM2.5 planning requirements for the Basin. The requirements specifically addressed for the Basin are:

1. Attainment demonstration and modeling [Section 172(a)(2)(A)];
2. Reasonable further progress [Section 172(c)(2)];
3. Reasonably available control technology (RACT) and Reasonably available control measures (RACM) [Section 172(c)(1)] ;
4. New source review (NSR) [Sections 172(c)(4) and (5)];
5. Contingency measures [Section 172(c)(9)]; and
6. Transportation control measures (as RACM).

Attainment Demonstration and Modeling

Under the CAA Section 172(a)(2)(A), each attainment plan should demonstrate that the area will attain the NAAQS "as expeditiously as practicable," but no later than five years from the effective date of the designation of the area. If attainment within five years is considered impracticable due to the severity of an area's air quality problem and the lack

of available control measures, the state may propose an attainment date of more than five years but not more than ten years from designation.

This attainment demonstration consists of: (1) technical analyses that locate, identify, and quantify sources of emissions that contribute to violations of the PM2.5 standard; (2) analysis of future year emission reductions and air quality improvement resulting from adopted and proposed control measures; (3) proposed emission reduction measures with schedules for implementation; and (4) analysis supporting the region's proposed attainment date by performing a detailed modeling analysis. Chapter 3 and Appendix III of the Final 2012 AQMP present base year and future year emissions inventories in the Basin, while Chapter 4 and Appendix IV provide descriptions of the proposed control measures, the resulting emissions reductions, and schedules for implementation of each measure. The detailed modeling analysis and attainment demonstration are summarized in Chapter 5 and documented in Appendix V.

Reasonable Further Progress (RFP)

The CAA requires SIPs for most nonattainment areas to demonstrate reasonable further progress (RFP) towards attainment through emission reductions phased in from the time of the SIP submission until the attainment date time frame. The RFP requirements in the CAA are intended to ensure that there are sufficient PM2.5 and precursor emission reductions in each nonattainment area to attain the 2006 24-hour PM2.5 NAAQS by December 14, 2014.

Per CAA Section 171(1), RFP is defined as "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." As stated in subsequent federal regulation, the goal of the RFP requirements is for areas to achieve generally linear progress toward attainment. To determine RFP for the 2006 24-hour PM2.5 attainment date, the plan should rely only on emission reductions achieved from sources within the nonattainment area.

Section 172(c)(2) of the CAA requires that nonattainment area plans show ongoing annual incremental emissions reductions toward attainment, which is commonly expressed in terms of benchmark emissions levels or air quality targets to be achieved by certain interim milestone years. The U.S. EPA recommends that the RFP inventories include direct PM2.5, and also PM precursors (such as SOx, NOx, and VOCs) that have been determined to be significant.

40 CFR 51.1009 requires any area that submits an approvable demonstration for an attainment date of more than five years from the effective date of designation to also submit an RFP plan. The Final 2012 AQMP demonstrates attainment with the 24-hour PM2.5 standard in 2014, which is five years from the 2009 designation date. Therefore, no separate RFP plan is required.

Reasonably Available Control Measures (RACM) and Reasonably Available Control Technology (RACT) Requirements

Section 172(c)(1) of the CAA requires nonattainment areas to

> *Provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and shall provide for attainment of the national primary ambient air quality standards.*

The District staff has completed its RACM analysis as presented in Appendix VI of the Final 2012 AQMP.

The U.S. EPA provided further guidance on the RACM in the preamble and the final "Clean Air Fine Particle Implementation Rule" to implement the 1997 PM2.5 NAAQS which were published in the Federal Register on November 1, 2005 and April 25, 2007, respectively.[1, 2] The U.S. EPA's long-standing interpretation of the RACM provision stated in the 1997 PM2.5 Implementation Rule is that the non-attainment air districts should consider all candidate measures that are available and technologically and economically feasible to implement within the non-attainment areas, including any measures that have been suggested; however, the districts are not obligated to adopt all measures, but should demonstrate that there are no additional reasonable measures available that would advance the attainment date by at least one year or contribute to reasonable further progress (RFP) for the area.

With regard to the identification of emission reduction programs, the U.S. EPA recommends that non-attainment air districts first identify the emission reduction programs that have already been implemented at the federal level and by other states and local air districts. Next, the U.S. EPA recommends that the air districts examine additional RACM/RACTs adopted for other non-attainment areas to attain the ambient air quality standards as expeditiously as practicable. The U.S. EPA also recommends

[1] See 70FR 65984 (November 1, 2005)
[2] See 72FR 20586 (April 25, 2007)

that the air districts evaluate potential measures for sources of direct PM2.5, SOx and NOx first. VOC and ammonia are only considered if the area determines that they significantly contribute to the PM2.5 concentration in the non-attainment area (otherwise they are pressured not to significantly contribute). The PM2.5 Implementation Rule also requires that the air districts establish RACM/RACT emission standards that take into consideration the condensable fraction of direct PM2.5 emissions after January 1, 2011. In addition, the U.S. EPA recognizes that each non-attainment area has its own profile of emitting sources, and thus neither requires specific RACM/RACT to be implemented in every non-attainment area, nor includes a specific source size threshold for the RACM/RACT analysis.

A RACM/RACT demonstration must be provided within the SIP. For areas projected to attain within five years of designation, a limited RACM/RACT analysis including the review of available reasonable measures, the estimation of potential emission reductions, and the evaluation of the time needed to implement these measures is sufficient. The areas that cannot reach attainment within five years must conduct a thorough RACM/RACT analysis to demonstrate that sufficient control measures could not be adopted and implemented cumulatively in a practical manner in order to reach attainment at least one year earlier.

In regard to economic feasibility, the U.S. EPA did not propose a fixed dollar per ton cost threshold and recommended that air districts include health benefits in the cost analysis. As indicated in the preamble of the 1997 PM2.5 Implementation Rule:

> *In regard to economic feasibility, U.S. EPA is not proposing a fixed dollar per ton cost threshold for RACM, just as it is not doing so for RACT…Where the severity of the non-attainment problem makes reductions more imperative or where essential reductions are more difficult to achieve, the acceptable cost of achieving those reductions could increase. In addition, we believe that in determining what are economically feasible emission reduction levels, the States should also consider the collective health benefits that can be realized in the area due to projected improvements.*

Subsequently, on March 2, 2012, the U.S. EPA issued a memorandum to confirm that the overall framework and policy approach stated in the PM2.5 Implementation Rule for the 1997 PM2.5 standards continues to be relevant and appropriate for addressing the 2006 24-hour PM2.5 standards.

As described in Appendix VI, the District has concluded that all District rules fulfill RACT for the 2006 24-hour PM2.5 standard. In addition, pursuant to California Health

and Safety Code Section 39614 (SB 656), the District evaluated a statewide list of feasible and cost-effective control measures to reduce directly emitted PM2.5 and its potential precursor emissions (e.g., NOx, SOx, VOCs, and ammonia). The District has concluded that for the majority of stationary and area source categories, the District was identified as having the most stringent rules in California (see Appendix VI). Under the RACM guidelines, transportation control measures must be included in the analysis. Consequently, SCAG has completed a RACM determination for transportation control measures in the Final 2012 AQMP, included in Appendix IV-C.

New Source Review

New source review (NSR) for major and in some cases minor sources of PM2.5 and its precursors are presently addressed through the District's NSR and RECLAIM programs (Regulations XIII and XX). In particular, Rule 1325 has been adopted to satisfy NSR requirements for major sources of directly-emitted PM2.5.

Contingency Measures

Contingency Measure Requirements

Section 172(c)(9) of the CAA requires that SIPs include contingency measures.

> *Such plan shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or the Administrator.*

In subsequent NAAQS implementation regulations and SIP approvals/disapprovals published in the Federal Register, U.S. EPA has repeatedly reaffirmed that SIP contingency measures:

1. Must be fully adopted rules or control measures that are ready to be implemented, without significant additional action (or only minimal action) by the State, as expeditiously as practicable upon a determination by U.S. EPA that the area has failed to achieve, or maintain reasonable further progress, or attain the NAAQS by the applicable statutory attainment date (40 CFR § 51.1012, 73 FR 29184)

2. Must be measures not relied on in the plan to demonstrate RFP or attainment for the time period in which they serve as contingency measures and should provide SIP-creditable emissions reductions equivalent to one year of RFP, based on "generally

linear" progress towards achieving the overall level of reductions needed to demonstrate attainment (76 FR 69947, 73 FR 29184)

3. Should contain trigger mechanisms and specify a schedule for their implementation (72 FR 20642)

Furthermore, U.S. EPA has issued guidance that the contingency measure requirement could be satisfied with already adopted control measures, provided that the controls are above and beyond what is needed to demonstrate attainment with the NAAQS (76 FR 57891).

> *U.S. EPA guidance provides that contingency measures may be implemented early, i.e., prior to the milestone or attainment date. Consistent with this policy, States are allowed to use excess reductions from already adopted measures to meet the CAA sections 172(c)(9) and 182(c)(9)contingency measures requirement. This is because the purpose of contingency measures is to provide extra reductions that are not relied on for RFP or attainment, and that will provide a cushion while the plan is being revised to fully address the failure to meet the required milestone. Nothing in the CAA precludes a State from implementing such measures before they are triggered.*

Thus, an already adopted control measure with an implementation date prior to the milestone year or attainment year would obviate the need for an automatic trigger mechanism.

Air Quality Improvement Scenario

The U.S. EPA Guidance Memo issued March 2, 2012, "Implementation Guidance for the 2006 24-Hour Fine Particle (PM2.5) National Ambient Air Quality Standard (NAAQS)", provides the following discussion of contingency measures:

> *The preamble of the 2007 PM2.5 Implementation Rule (see 79 FR 20642-20645) notes that contingency measures "should provide for emission reductions equivalent to about one year of reductions needed for reasonable further progress (RFP)." The term "one year of reductions needed for RFP" requires clarification. This phrase may be confusing because all areas technically are not required to develop a separate RFP plan under the 2007 PM2.5 Implementation Rule. The basic concept is that an area's set of contingency measures should provide for an amount of emission reductions that would achieve "one year's worth" of air quality improvement proportional to the overall amount of air quality improvement to be achieved by the area's attainment plan; or alternatively, an amount of emission reductions (for all pollutants subject to control measures in the attainment plan) that would achieve one year's worth of emission reductions proportional to the overall amount of emission*

reductions needed to show attainment. Contingency measures can include measures that achieve emission reductions from outside the nonattainment area as well as from within the nonattainment area, provided that the measures produce the appropriate air quality impact within the nonattainment area.

The U.S. EPA believes a similar interpretation of the contingency measures requirements under section 172(c)(9) would be appropriate for the 2006 24-hour PM2.5 NAAQS.

The March 2, 2012 memo then provides an example describing two methods for determining the required magnitude of emissions reductions to be potentially achieved by implementation of contingency measures:

Assume that the state analysis uses a 2008 base year emissions inventory and a future year projection inventory for 2014. To demonstrate attainment, the area needs to reduce its air quality concentration from 41ug/m^3 in 2008 to 35 ug/m^3 in 2014, equal to a rate of change of 1 μg/m^3 per year. The attainment plan demonstrates that this level of air quality improvement would be achieved by reducing emissions between 2008 and 2014 by the following amounts: 1,200 tons of PM2.5; 6,000 tons of NOx; and 6,000 tons of SO2.

Thus, the target level for contingency measures for the area could be identified in two ways:

1) *The area would need to provide an air quality improvement of 1 ug/m^3 in the area, based on an adequate technical demonstration provided in the state plan. The emission reductions to be achieved by the contingency measures can be from any one or a combination of all pollutants addressed in the attainment plan, provided that the state plan shows that the cumulative effect of the adopted contingency measures would result in a 1 ug/m^3 improvement in the fine particle concentration in the nonattainment area; and*

2) *The contingency measures for the area would be one-sixth (or approximately 17%) of the overall emission reductions needed between 2008 and 2014 to show attainment. In this example, these amounts would be the following: 200 tons of PM2.5; 1,000 tons of NOx; and 1,000 tons of SO2.*

The two approaches are explicitly mentioned in regulatory form at 40 CFR § 51.1009:

(g) The RFP plan due three years after designation must demonstrate that emissions for the milestone year are either:

(1) At levels that are roughly equivalent to the benchmark emission levels for direct PM2.5 emissions and each PM2.5 attainment plan precursor to be addressed in the plan; or

(2) At levels included in an alternative scenario that is projected to result in a generally equivalent improvement in air quality by the milestone year as would be achieved under the benchmark RFP plan.

(h) The equivalence of an alternative scenario to the corresponding benchmark plan must be determined by comparing the expected air quality changes of the two scenarios at the design value monitor location. This comparison must use the information developed for the attainment plan to assess the relationship between emissions reductions of the direct PM2.5 emissions and each PM2.5 attainment plan precursor addressed in the attainment strategy and the ambient air quality improvement for the associated ambient species.

The first method in the example and the alternative scenario in the regulation, 40 CFR § 51.1009 (g)(2), base the required amount of contingency measure emission reductions on one year's worth of air quality improvements. The most accurate way of demonstrating that the emissions reductions will lead to air quality improvements is through air quality modeling such as that used in the attainment demonstration (40 CFR § 51.1009 (h) above). If the model results show the required air quality improvements, then the emissions reductions included in the model input are therefore shown to be sufficient to achieve those air quality improvements. The second method in the example, and (g)(1) in the regulation, is based solely on emission reductions, without a direct demonstration that there will be a corresponding improvement in air quality.

Logically, the method based on air quality is more robust than the method based solely on emissions reductions in that it demonstrates that emissions reductions will in fact lead to corresponding air quality improvements, which is the ultimate goal of the CAA and the SIP. The second method relying on overall emissions reductions alone does not account for the spatial and temporal variation of emissions, nor does it account for where and when the reductions will occur. As the relationship between emissions reductions and resulting air quality improvements is complex and not always linear, relying solely on prescribed emission reductions may not ensure that the desired air quality improvements will result when and where they are needed. Therefore, determining the magnitude of reductions required for contingency measures based on air quality improvements, derived from a modeling demonstration, is more effective in achieving the objective of this CAA requirement.

Magnitude of Contingency Measure Air Quality Improvements

The example for determining the required magnitude of air quality improvement to be achieved by contingency measures provided in the March 2, 2012 guidance memo uses the attainment demonstration base year as the base year in the calculation (2008). This is based on the memo's statement that "*contingency measures should provide for an amount of emission reductions that would achieve 'one year's worth' of air quality improvement proportional to the overall amount of air quality improvement to be achieved by the area's attainment plan."* The original preamble (79 FR 20642-20645) states that contingency measures *"should provide for emission reductions equivalent to about one year of reductions needed for reasonable further progress (RFP)."* The term "reasonable further progress" is defined in Section 171(1) of the CAA as *"such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable NAAQS by the applicable date."*

40 CFR 51.1009 is explicit on how emissions reductions for RFP are to be calculated. In essence, the calculation is a linear interpolation between base-year emissions and attainment-year (full implementation) emissions. The Plan must then show that emissions or air quality in the milestone year (or attainment year) are "roughly equivalent" or "generally equivalent" to the RFP benchmark. As stated earlier in this chapter, given the 2014 attainment year, there are no interim milestone RFP requirements. The contingency measure requirements, therefore, only apply to the 2014 attainment year. In 2014, contingency measures must provide for about one year's worth of reductions or air quality improvement, proportional to the overall amount of air quality improvement to be achieved by the area's attainment plan.

The 2008 base year design value in the 24-hour PM2.5 attainment demonstration is 47.9 $\mu g/m^3$, and the 2014 attainment year design value must be less than 35.5 $\mu g/m^3$ (see Chapter 5). Linear progress towards attainment over the six year period yields one year's worth of air quality improvements equal to approximately 2 $\mu g/m^3$. Thus, contingency measures should provide for approximately 2 $\mu g/m^3$ of air quality improvements to be automatically implemented in 2015 if the Basin fails to attain the 24-hour PM2.5 standard in 2014.

Satisfying the Contingency Measure Requirements

As stated above, the contingency measure requirement can be satisfied by already adopted measures resulting in air quality improvements above and beyond those needed

for attainment. Since the attainment demonstration need only show an attainment year concentration below 35.5 $\mu g/m^3$, any measures leading to improvement in air quality beyond this level can serve as contingency measures. As shown in Chapter 5, the attainment demonstration yields a 2014 design value of 34.28 $\mu g/m^3$. The excess air quality improvement is therefore approximately 1.2 $\mu g/m^3$.

In addition to these air quality improvements beyond those needed for attainment, an additional contingency measure is proposed that will result in emissions reductions beyond those needed for attainment in 2014. Control Measure CMB-01 Phase I seeks to achieve an additional two tons per day of NOx emissions reductions from the RECLAIM market if the Basin fails to achieve the standard by the 2014 attainment date. CMB-01 Phase I is scheduled for near-term adoption and includes the appropriate automatic trigger mechanism and implementation schedule consistent with CAA contingency measure requirements. Taken together with the 1.2 $\mu g/m^3$ of excess air quality improvement described above, this represents a sufficient margin of "about one year's of progress" and "generally linear" progress to satisfy the contingency measure requirements. Note that based on the most recent air quality data at the design value site, Mira Loma, the actual measured air quality is already better (by over 4 $\mu g/m^3$ in 2011) than that projected by modeling based on linear interpolation between base year and attainment year.

To address U.S. EPA's comments regarding contingency measures, the excess air quality improvements beyond those needed to demonstrate attainment should also be expressed in terms of emissions reductions. This will facilitate their enforceability and any future needs to substitute emissions reductions from alternate measures to satisfy contingency measure requirements. For this purpose, Table 6-2 explicitly identifies the portions of emissions reductions from proposed measures that are designated as contingency measures. Table 6-2 also includes the total equivalent basin-wide NOx emissions reductions based on the PM2.5 formation potential ratios described in Chapter 5.

TABLE 6-2

Emissions Reductions for Contingency Measures (2014)

MEASURE	ASSOCIATED EMISSIONS REDUCTIONS FROM CONTINGENCY MEASURES (TONS/DAY)
BCM-01 – Residential Wood Burning[1,2]	2.84(PM2.5)
BCM-02 – Open Burning [1,2]	1.84(PM2.5)
CMB-01 – NOx reductions from RECLAIM	2 (NOx)
Total	71 ($NOx_{(e)}$)[3]

[1]40% of the reductions from these measures, as shown in Table 4-2, are designated for contingency purposes.

[2] Episodic emissions reductions occurring on burning curtailment days.

[3] NOx equivalent emissions based on PM2.5 formation potentials described in Chapter 5 (Table 5-2). The PM2.5:NOx ratio is 14.83:1.

Transportation Control Measures

As part of the requirement to demonstrate that RACM has been implemented, transportation control measures meeting the CAA requirements must be included in the plan. Updated transportation control measures included in this plan for attainment of the federal 2006 24-hour PM2.5 standard are described in Appendix IV-C – Regional Transportation Strategy & Control Measures.

Section 182(d)(1)(A) of the CAA requires the District to include transportation control strategies (TCS) and transportation control measures (TCM) in its plans for ozone that offset any growth in emissions from growth in vehicle trips and vehicle miles traveled. Such control measures must be developed in accordance with the guidelines listed in Section 108(f) of the CAA. The programs listed in Section 108(f) of the CAA include, but are not limited to, public transit improvement projects, traffic flow improvement projects, the construction of high occupancy vehicle (HOV) facilities and other mobile source emission reduction programs. While this is not an ozone plan, TCMs may be

required if they are RACM.[3] TCMs have been developed for the Final 2012 AQMP and are described in Appendix IV-C. TCMs in the Final 2012 AQMP include the capital-based and non-capital-based facilities, projects and programs contained in the Regional Transportation Plan (RTP) and programmed through the Regional Transportation Implementation Plan (RTIP) process. As an additional measure to reduce mobile source emissions, Section 182(d)(1)(B) of the CAA allows the implementation of employer-based trip reduction programs that are aimed at improving the average vehicle occupancy (AVO) rates. As an alternative to trip reduction programs, Section 182(d)(1)(B) also allows the substitution of these programs with alternative programs that achieve equivalent emission reductions. Rule 2202 - On-Road Motor Vehicle Mitigation Options, adopted in December 1995, was developed to comply with CAA Section 182(d)(1)(B).

CALIFORNIA CLEAN AIR ACT REQUIREMENTS

The Basin is designated as nonattainment with the state ambient air quality standards for both PM10 and PM2.5. The California Clean Air Act (CCAA) requires that a plan for attaining the ozone standard be reviewed, and revised as necessary, every three years (Health & Safety Code § 40925). The Final 2012 AQMP satisfies this triennial update requirement. The CCAA established a number of legal mandates to facilitate achieving health-based state air quality standards at the earliest practicable date. The following CCAA requirements do not directly apply to particulate matter plans but are addressed for ozone in the remainder of this chapter:

(1) Demonstrate the overall effectiveness of the air quality program;

(2) Reduce nonattainment pollutants at a rate of 5% per year, or include all feasible measures and an expeditious adoption schedule;

(3) Reduce Population Exposure to severe nonattainment pollutants according to a prescribed schedule; and

(4) Rank control measures by cost-effectiveness.

Plan Effectiveness

The CCAA requires, beginning on December 31, 1994 and every three years thereafter, that the District assess its progress toward attainment of the state ambient air quality

[3] The District will in the future take actions as required to satisfy ozone TCM provisions when so directed by U.S. EPA.

standards [Health & Safety Code § 40924(b)] and that this assessment be incorporated into the District's triennial plan revision. To demonstrate the effectiveness of the District's program, air quality trends since 1990 depicting maximum pollutant concentrations are provided in Figure 6-1. While this statute does not apply to particulate matter, it is useful to discuss progress towards attainment of the PM10 and PM2.5 standards. Basin maximum annual average PM10 concentrations have decreased continuously since 1990 from a high of nearly 80 $\mu g/m^3$ to a 2011 level of just above 41 $\mu g/m^3$. PM2.5 annual concentrations have decreased nearly 50% since 1999 to a 2011 level of 15.3 $\mu g/m^3$. The State annual standards are 20 $\mu g/m^3$ and 12 $\mu g/m^3$ for PM10 and PM2.5, respectively.

1-hour ozone concentrations have decreased about 50% since 1990 to a 2011 level of 0.16 ppm. 8-hour ozone concentrations have also decreased continuously from 1990 levels of 0.194 ppm to 2011 levels of 0.136. The state annual standards are 0.09 ppm and 0.07 ppm for 1-hour ozone and 8-hour ozone, respectively.

NO_2 and CO air quality have also improved substantially since 1990. NO_2 and CO metrics are not shown since the Basin currently meets all state and federal NO_2 and CO standards. A comprehensive discussion of local air quality trends can be found in Chapter 2 and Appendix II – Current Air Quality.

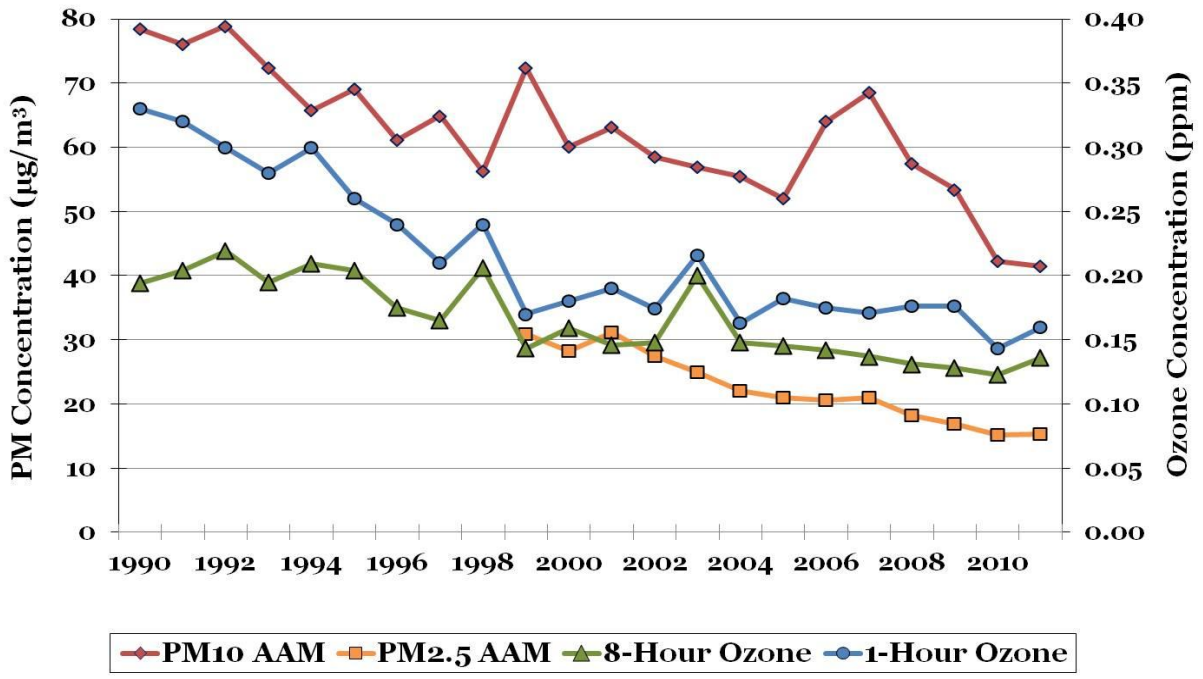

FIGURE 6-1

Ozone, PM10, and PM2.5 Trends Since 1990

Emission Reductions

The CCAA requires that each district plan be designed to achieve a reduction in district-wide emissions of 5% or more per year for each covered non-attainment pollutant or its precursors, averaged every consecutive three-year period (Health & Safety Code § 40914). This requirement does not apply to particulate matter, but does apply to ozone. If this cannot be achieved, a plan may instead show that it has implemented all feasible measures as expeditiously as possible. Nevertheless, all feasible measures should be implemented for particulate matter in order to assure attainment as expeditiously as practicable.

It is not practical nor does the federal CAA require an air district to develop an emissions inventory for every year between the base year and attainment year; therefore, consecutive three-year averages have not been explicitly calculated. Furthermore, based on the emissions projections provided in Chapter 3, 5% or more of reductions per year

cannot be achieved for all pollutants and precursors with all feasible measures implemented. As discussed earlier in this chapter with respect to the RACM / RACT analysis, this Plan implements all available feasible measures as expeditiously as possible.

Population Exposure

The CCAA also requires a reduction in overall population exposure to criteria pollutants. Specifically, exposure to the designated severe nonattainment pollutants (i.e., ozone) above standards must be reduced by at least:

(1) 25 percent by December 31, 1994;

(2) 40 percent by December 31, 1997; and

(3) 50 percent by December 31, 2000.

Reductions are to be calculated based on per-capita exposure and the severity of the exceedances. For the Basin, this provision is applicable to ozone [Health & Safety Code § 40920(c)]. The definition of exposure is the number of persons exposed to a specific pollutant concentration level above the state standard times the number of hours exposed. The per-capita exposure is the population exposure (units of pphm-persons-hours) divided by the total population. This requirement for the specific milestone years listed in the CCAA has been shown to have already been satisfied in previous AQMPs.

Cost-Effectiveness Ranking

The CCAA requires that each plan revision shall include an assessment of the cost-effectiveness of available and proposed control measures and contain a list which ranks the control measures from the least cost-effective to the most cost-effective. Table 6-3 provides a list of stationary source control measures for the 24-hour PM2.5 standard ranked by cost-effectiveness. Tables 6-4 and 6-5 provide a list of stationary and mobile source control measures for ozone ranked by cost-effectiveness.

In developing an adoption and implementation schedule for a specific control measure, the District shall consider the relative cost-effectiveness of the measure as well as other factors including, but not limited to, technological feasibility, total emission reduction potential, the rate of reduction, public acceptability, and enforceability (Health & Safety Code § 40922). These requirements also do not apply to particulate matter, but provide useful information. The PM2.5 control strategy and implementation schedule is provided in Chapter 4.

TABLE 6-3

Cost-Effectiveness Ranking of District's Stationary Source Control Measures for PM2.5 [a,b]

MEASURE NUMBER	DESCRIPTION	DOLLARS/TON[a,b]	RANKING BY COST EFFECTIVENESS
BCM-01	Further Reductions from Residential Wood Burning Devices [PM2.5]	Minimal	1
BCM-02	Further Reductions from Open Burning [PM2.5]	Minimal	1
CMB-01	Further NOx Reductions from RECLAIM [NOx] –*Phase I*	$7950/ton	2
BCM-03 (*formerly BCM-05*)	Emission Reductions from Under-Fired Charbroilers [PM2.5]	$15,000/ton[c]	3
BCM-04	Further Ammonia Reductions from Livestock Waste [NH3]	TBD[d]	
IND -01 (*formerly MOB-03*)	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Sources [NOx, SOx, PM2.5]	N/A[e]	
EDU-01 *(formerly MCS-02, MCS-03)*	Further Criteria Pollutant Reductions from Education, Outreach and Incentives [All Pollutants]*	N/A[e]	
MCS-01 (*formerly MCS-07*)	Application of All Feasible Measures Assessment [All Pollutants]	TBD[d]	

[a] The cost-effectiveness values of these measures are based on the Discount Cash Flow methodology and 4% real interest rate.
[b] Where a range exists, the ranking was done based on the low end of the range.
[c] preliminary estimate, actual cost-effectiveness will be determined by the Phase I technology assessment.
[d] TBD – emissions reductions and costs to be determined once the inventory and control approach are identified
[e] N/A – emissions reductions and costs cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs) or if the measure is designed to ensure reductions that have been assumed to occur will in fact occur.

TABLE 6-4

Cost-Effectiveness Ranking of Stationary Source Control Measures for Ozone[a,b]

MEASURE NUMBER	DESCRIPTION	DOLLARS/TON[a,b]	RANKING BY COST EFFECTIVENESS
FUG-01	Further VOC Reductions from Vacuum Trucks [VOC]	$3,000/ton	1
CTS-03	Further VOC Reductions from Mold Release Products [VOC]	$4,000-$8,000/ton	2
FUG-02	Emission Reduction from LPG Transfer and Dispensing [VOC] – *Phase II*	$4,000-$10,000/ton	3
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants [VOC]	$8,000-$12,000/ton	4
CTS-01	Further VOC Reductions from Architectural Coatings (R1113) [VOC]	$10,000-$20,000/ton	6
FUG-03	Further VOC Reductions from Fugitive VOC Emissions [VOC]	$11,000/ton	7
CMB-01	Further NOx Reductions from RECLAIM [NOx] – *Phase II*	$16,000/ton	8
CMB-02	NOx Reductions from Biogas Flares [NOx]	$20,000/ton	9
CMB-03	Reductions from Commercial Space Heating [NOx]	$20,000/ton	9
MCS-01 (*formerly MCS-07*)	Application of All Feasible Measures Assessment [All Pollutants]	TBD[c]	
MCS-02	Further Emission Reductions from Green Waste Processing (Chipping and Grinding Operations not associated with composting) [VOC]	TBD[c]	
MCS-03 (*formerly MCS-06*)	Improved Start-up, Shutdown and Turnaround Procedures [All Pollutants]	TBD[c]	
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies [NOx]	TBD[c]	
INC-02	Expedited Permitting and CEQA Preparation Facilitating the Manufacturing of Zero and Near-Zero Technologies [All Pollutants]	N/A[d]	
EDU-01 (*formerly MCS-02, MCS-03*)	Further Criteria Pollutant Reductions from Education, Outreach and Incentives [All Pollutants]*	N/A[d]	

[a] The cost-effectiveness values of these measures are based on the Discount Cash Flow methodology and 4% real interest rate.
[b] Where a range exists, the ranking was done based on the low end of the range.
[c] TBD – emissions reductions and costs to be determined once the inventory and control approach are identified
[d] N/A – emissions reductions and costs cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs)

TABLE 6-5
Cost-Effectiveness Ranking of Mobile Source Control Measures for Ozone [a,b]

MEASURE NUMBER	DESCRIPTION	DOLLARS/TON[a,b]	RANKING BY COST EFFECTIVENESS
OFFRD-03	Further Emission Reductions from Passenger Locomotives [NOx, PM]	$5,000/ton	1
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment [NOx]	$11,000/ton	2
OFFRD-02	Further Emission Reductions from Freight Locomotives [NOx, PM]	TBD[b, d]	
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards [NOx, PM]	TBD[b]	
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero- Emission Vehicles [VOC, NOx, PM]	TBD[b, c]	
ONRD-02	Accelerated Retirement of Older Light- and Medium-Duty Vehicles [VOC, NOx, PM]	TBD[b, c]	
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero-Emission Light-Heavy- and Medium-Heavy-Duty Vehicles [NOx, PM]	TBD[b, c]	
ONRD-04	Accelerated Retirement of Older On-Road Heavy-Duty Vehicles [NOx, PM]	TBD[b, c]	
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels While at Berth [NOx, PM]	TBD[b, c]	
OFFRD-05	Emission Reductions from Ocean-Going Marine Vessels [NOx]	TBD[b, c]	

[a] The cost-effectiveness values of these measures are based on the Discount Cash Flow methodology and 4% real interest rate.
[b] Emissions reductions and costs will be determined after projects are identified and implemented. See Appendix IV-B for cost information for specific measures.
[c] Voluntary incentive programs
[d] This measure was included in the 2007 Ozone SIP and is included in the Final 2012 AQMP with updated technical information.

TRANSPORTATION CONFORMITY BUDGETS

The Final 2012 AQMP sets forth the strategy for achieving the 2006 24-hour PM2.5 and 8-hour ozone standards. For on-road mobile sources, Section 176(c) of the CAA requires that transportation plans and programs do not cause or contribute to any new violation of a standard, increase the frequency or severity of any existing violation, or delay the timely attainment of the air quality standards. Therefore, on-road mobile sources must "conform" to the attainment demonstration contained in the SIP.

U.S. EPA's transportation conformity rule, found in 40 CFR parts 51 and 93, details the requirements for establishing motor vehicle emissions budgets in SIPs for the purpose of ensuring the conformity of transportation plans and programs with the SIP attainment demonstration. The on-road motor vehicle emissions budgets act as a "ceiling" for future on-road mobile source emissions. Exceedances of the budget indicate an inconsistency with the SIP, and could lead to a conformity "lapse" and its related consequences if not corrected before the next conformity deadline (e.g., during a lapse, certain categories of transportation projects cannot proceed). As required by the CAA, a comparison of regional on-road mobile source emissions to these budgets will occur during the periodic updates of regional transportation plans and programs.

The on-road motor vehicle emissions estimates for the Final 2012 AQMP were analyzed using CARB's EMFAC2011 emission factors for the transportation activity data provided by Southern California Association of Governments (SCAG) from their adopted 2012 Regional Transportation Plan (2012 RTP). For the Final 2012 AQMP, on-road motor vehicle emissions budgets are provided in Table 6-6 for 2014. The PM2.5 emissions budgets for PM2.5, and the PM2.5 precursors, VOC and NOx, are derived from the annual average inventory.

This approach is consistent with U.S. EPA's transportation conformity rule, which provides that if emissions budgets rely on new control measures, these measures must be specified in the SIP and the emissions reductions from each control measure must be quantified and supported by agency commitments for adoption and implementation schedules. Moreover, the rule provides that conformity analyses by transportation agencies may not take credit for measures which have not been implemented unless the measures are "projects, programs, or activities" in the SIP supported by written implementation commitments by the responsible agencies (40 CFR 93.122(a)(3)). The emissions budgets for PM2.5 are provided for the 2014 attainment year. However, since transportation analyses are needed beyond the attainment dates, the carrying capacities for the PM2.5 attainment demonstration also serve as the budgets for future years. For transportation conformity analysis, a trading mechanism can be established based on the PM2.5 forming potential developed through the modeling analysis for the emission budgets for various pollutants in SCAB.

TABLE 6-6

2014 Motor Vehicle Emissions Budgets: PM2.5
(Annual Average - Tons Per Day)*

	VOC	NOx	PM2.5
Baseline Inventory	115.6	263	11.9
PM2.5: Re-entrained Road Dust (paved)	--	--	7.09
PM2.5 Re-entrained Road Dust (unpaved)	--	--	0.58
Road Construction Dust	--	--	0.25
Adjusted Inventory	--	--	19.8
2014 Mobile Source Emission Budget**	**116**	**263**	**20**

* Derived based on EMFAC2011 and external adjustments associated with on-road mobile source incentive programs (Proposition 1B, Carl Moyer, AB1493). 2014 budget is applicable to all future years beyond 2014.
** Rounded up to the nearest whole number

In the Final 2012 AQMP the approximate weighting ratios of the precursor emissions for 24-hour PM2.5 formation in equivalent tons per day of NOx are: VOC: 0.3 (reducing one ton of VOC is equivalent to reducing 0.3 ton of NOx), NOx: 1.0, and PM2.5: 14.8 (i.e., reducing one ton of PM2.5 is equivalent to reducing 14.8 tons of NOx). This mechanism allows emissions below the budget for one pollutant to be used to supplement another pollutant exceeding the budget based on the ratios established herein. Clear documentation of the calculations used in the trading should be included in the conformity analysis. This trading approach is consistent with what U.S. EPA approved in 2011, The Revisions to the 2007 PM2.5 SIP, where the precursor substitution methodology was established.

The basic trading ratios are defined by the 24-hour PM2.5 regional modeling attainment demonstration. Briefly, NOx emissions reductions are scaled to the reduction of Basin ammonium nitrate (including water bonding). Similarly, reductions of VOC are scaled to changes in the organic carbon species while reductions in directly emitted particulates are scaled to the projected changes in the elemental carbon and "others" portions of the PM2.5 mass. Table 6-7 summarizes the trading equivalencies in TPD.

TABLE 6-7

Trading Equivalencies for PM2.5Motor Vehicle Emissions Budgets

ONE TON OF	IS EQUIVALENT IN TERMS OF PM2.5 FORMATION TO THIS MANY TONS OF		
	NOx:	**VOC:**	**PM2.5:**
NOx	1	3.151	0.067
VOC	0.317	1	0.021
PM2.5	14.833	46.792	1

An example of how the trading mechanism would work follows; If the amount of NOx calculated exceeds the budget by 0.75 TPD, then that overage could be offset by trading 2.36 TPD of excess VOC emissions reductions (e.g 3.151 VOC/1 ton of NOx x 0.75 TPD NOx required = 2.36 TPD VOC). In this case, "excess" VOC emission reductions would be those beyond what are needed to meet the VOC budget. Similarly 0.050 TPD of directly emitted PM2.5 emissions below the budgeted amount could also be traded to the NOx emissions category and subtracted from the NOx total to allow NOx to meet its budget. In other words, the trading mechanism can be multi-pollutant and multi-directions. It should be noted that the trading calculations are performed prior to the final rounding to demonstrate conformity with the budgets.

It is also important to note that the ratios and equivalencies are targeted for a 2014 application. Ratios beyond 2017 would need to be adjusted based on the projected emissions and regional modeling analyses. A comprehensive discussion of the calculation of the trading ratios is provided in Attachment 8 of Appendix V of this document.