State of California

California Environmental Protection Agency
AIR RESOURCES BOARD

Staff Report

Analysis of the South Coast Air Basin PM10 Redesignation Request, Maintenance Plan, and Conformity Budgets

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EXECUTIVE SUMMARY

Background

The South Coast Air Basin (South Coast) is currently designated as a serious nonattainment area for the 24-hour national ambient air quality standard (NAAQS or standard) for particulate matter of 10 microns in diameter or smaller (PM10). The South Coast Air Quality Management District (District) adopted the first PM10 attainment plan for the South Coast in 1991. The plan focused on fugitive dust as the primary control strategy for attaining the national 24-hour and the annual PM10 standards. The 1997 plan revision requested extension of the attainment date to 2006. This revision was approved by the United States Environmental Protection Agency (U.S. EPA). In various plan revisions, the District adopted increasingly stringent dust measures. The 2003 plan revision added control measures to reduce emissions of particulate matter precursors. Adoption of District controls in the South Coast resulted in this area attaining the 24-hour PM10 standard by the 2006 attainment date.

On January 8, 2010, the District adopted the PM10 Redesignation Request and Maintenance Plan for the South Coast (South Coast PM10 Maintenance Plan). The plan officially requests this area be redesignated to attainment for the PM10 standard and charts the course for continued maintenance of the standard.

Shortly before plan adoption, the District developed revised transportation conformity budgets (budgets) for the Maintenance Plan based on U.S. EPA comments that the budgets only include emission reductions from adopted control measures. Because transportation conformity budgets are subject to a 30-day public notice requirement, ARB staff has posted the revised budgets to provide for the required public review period. ARB staff proposes adoption of the updated budgets for the South Coast.

Maintenance Plans Address Act Requirements

The South Coast PM10 Maintenance Plan includes the following components:

- Attainment emission inventories for directly emitted PM10 and for particulate matter precursor gases (NOx, SOx, and ROG);
- Demonstration that PM10 attainment concentrations at federal reference monitoring stations will be maintained for ten years after redesignation;
- Commitment to ongoing monitoring network operation for continued verification of attainment; and
- Contingency provisions to address any future violations.

In addition, eight years after the area is redesignated as attainment, the District will submit a revised South Coast PM10 Maintenance Plan providing for continued attainment for an additional ten years.

Staff Recommendation

Air Resources Board (ARB) staff concurs with the District's PM10 Redesignation Request and Maintenance Plan for the South Coast Air Basin. ARB staff recommends that the Board approve the District's South Coast PM10 Maintenance Plan, including the updated conformity budgets, as a revision to the California State Implementation Plan for submittal to U.S. EPA. In addition, ARB staff recommends that the Board approve the District's request that the South Coast Air Basin be redesignated from nonattainment to attainment for the national PM10 standard.

I. BACKGROUND

The South Coast Air Basin (South Coast) is designated as a serious nonattainment area for the 24-hour PM10 national ambient air quality standard (NAAQS or standard). The area is under the jurisdiction of the South Coast Air Quality Management District (District). In 1987, the United States Environmental Protection Agency (U.S. EPA) adopted the PM10 NAAQS consisting of a 24-hour PM10 standard of 150 micrograms per cubic meter ($\mu g/m^3$) and an annual standard of 50 $\mu g/m^3$. Effective December 18, 2006, U.S. EPA revoked the annual portion of the PM10 standard.

PM10 is a complex mixture of primary or directly emitted particles (dust and soot), and secondary particles or aerosol droplets formed in the atmosphere from precursor gases (NOx, SOx, ROG, and ammonia). PM10 includes the subsets of fine particles with a diameter of 2.5 microns or less (PM2.5) and of coarse particles with a diameter between 2.5 and 10 microns. Secondary particles are found mostly in the PM2.5 portion of PM10.

In the South Coast, currently, the fine fraction contributes approximately 56 percent and the coarse fraction 44 percent of the average peak PM10 concentrations. Dust is the main component of the coarse fraction in this area.

The District adopted the first PM10 Plan for the South Coast in 1991. This plan focused on a fugitive dust control strategy for attaining the national 24-hour and annual PM10 standards. Control measures were adopted to address fugitive dust emissions from paved and unpaved roads, agricultural activities, construction and demolition activities, and open area wind erosion. The District subsequently adopted Plan revisions in 1994, 1997, and 2003 providing dust control enhancements. The 2002 plan revision requested an extension of the PM10 attainment date to 2006. In addition to including control measures for directly emitted PM10, the 2003 Plan revision included controls for gaseous precursors of PM10. The 2007 revisions to the District's Air Quality Management Plan (AQMP) included an attainment demonstration showing continuous attainment of the standard through 2020.

On January 8, 2010, the District adopted the PM10 Redesignation Request and Maintenance Plan for the South Coast. The plan officially requests that the South Coast be redesignated to attainment for the PM10 standard and charts the course for continued maintenance of the standard through 2030.

Shortly before plan adoption, the District developed revised transportation conformity budgets (budgets) for the Maintenance Plan based on U.S. EPA comments that the budgets only include emission reductions from adopted control measures. Because transportation conformity budgets are subject to a 30-day public notice requirement, ARB staff has posted the revised budgets to provide for the required public review period. ARB staff proposes adoption of the updated budgets for the South Coast.

II. REDESIGNATION REQUIREMENTS

ARB staff reviewed the South Coast PM10 Maintenance Plan within the context of the Clean Air Act (Act), which identifies the following requirements each area must meet to be redesignated to attainment:

A. The PM10 standard has been attained;
B. The District has an approved State Implementation Plan (SIP) and the State has met all applicable Act requirements for PM10 in the nonattainment area;
C. The improvement in PM10 air quality is due to permanent and enforceable emission reductions; and
D. U.S. EPA has approved a maintenance plan.

The Act also sets the general framework for maintenance plans[1]. Each PM10 maintenance plan must provide for continued maintenance of the PM10 standard for ten years after redesignation and includes the following components:

1. Attainment emission inventory;
2. Maintenance demonstration;
3. Commitment to continue the monitoring network operation;
4. Commitment for verification of continued attainment; and
5. Contingency plan to promptly correct any violation of the PM10 NAAQS that occurs after the area has been redesignated.

III. EVALUATION OF THE SOUTH COAST AIR BASIN PLAN

Based on review of the South Coast PM10 Maintenance Plan and the District's supporting technical analysis, ARB staff concurs that the Plan meets the requirements. The following sections describe the major elements of the Plan and the redesignation request.

A. The South Coast Air Basin Attains the 24-Hour PM10 Standard

In the South Coast, PM10 concentrations are measured at nineteen federal reference monitors (FRMs) that collect PM10 samples on a 24-hour basis and ten real-time monitors that collect PM10 samples on an hourly basis (Figure 1). Table 1 lists air quality data for the three-year period of 2005-2007 for the FRMs demonstrating that the South Coast attains the 24-hour PM10 standard. The 24-hour standard is met when the estimated number of exceedances measured over a three year period averages one or less per year.

[1] Calcagni, John, Memorandum, *Procedures for Processing Requests to Redesignate Areas to Attainment, Office of Air Quality Planning and Standards*, Research Triangle Park, North Carolina, September 4, 1992. http://www.epa.gov/ttn/oarpg/t5/memoranda/redesignmem090492.pdf

Figure 1. PM10 Monitoring Stations in the South Coast Air Basin

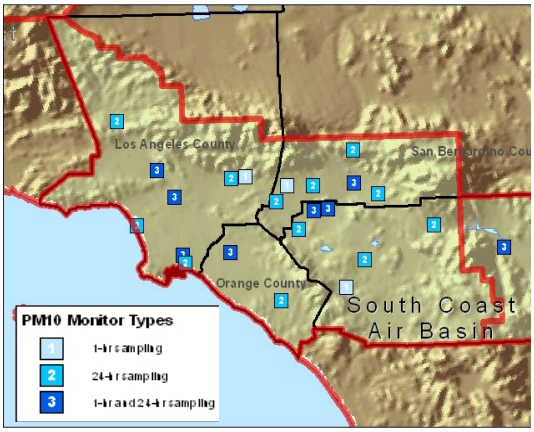

Table 1. South Coast Air Basin FRM PM10 Data from 2005 to 2007

Monitoring Station Name	Observed Maximum 24-hour Concentration[a] ($\mu g/m^3$)			Three-year Total Number of Days Exceeding the Standard
	2005	2006	2007	2005-2007
Los Angeles County				
Los Angeles-North Main	70	59	78	0
Los Angeles-Westchester	44	45	128	0
North Long Beach	66	78	75	0
South Long Beach	131	117	123	0
Burbank	92	71	109	0
Azusa	76	81	82	0
Santa Clarita	55	53	131	0
Orange County				
Anaheim	65	104	75	0
Mission Viejo	41	57	74	0
Riverside County				
Norco	79	74	93	0
Riverside-Rubidoux	123	109	118	0
Mira Loma	--	124	142	N/A[b]
Perris	80	125	120	0
Banning Airport	76	75	78	0
San Bernardino County				
Ontario	74	78	115	0
Fontana	108	142	111	0
San Bernardino	72	92	136	0
Redlands	61	103	97	0
Crestline	49	63	89	0

a. Data do not include PM10 concentrations caused by natural/exceptional events which are excluded from regulatory consideration.
b. Monitoring since 2006.

On three days over the 2005 to 2007 period, the 24-hour standard was exceeded due to high wind events or fireworks on a national holiday. These exceedances can be excluded under the federal rule for exceptional events since they are not reasonably preventable or controllable. Documentation for these three events has been submitted to U.S. EPA for concurrence as exceptional events.

B. U.S. EPA Approved the South Coast Air Basin PM10 SIP and the State Has Met Applicable Act Requirements

On April 18, 2003, U.S. EPA approved the PM10 elements of the 1997 South Coast AQMP and the 2002 plan update with a December 31, 2006 attainment deadline for the South Coast. In addition, ARB and the District have met all of the Act requirements applicable for a serious PM10 nonattainment area to be considered for redesignation.

C. Improvement in the South Coast Air Basin PM10 Air Quality is Due to Permanent and Enforceable Reductions in Emissions

The District has adopted the tighter dust control rules committed to in the Basin's 2003 PM10 attainment plan revision. In addition, the District has adopted rules controlling emissions of particulate matter precursors (NOx, SOx, and ROG). These measures have provided for continuous attainment of the 24-hour PM10 standard (excluding exceptional or natural events) in the region since 2004, despite regional growth. Adopted measures are fully enforceable.

Based on analyses of long-term meteorological variables, including rainfall, wind speeds, and stagnation, the District found that meteorological conditions during the 2005-2007 period were not unusually favorable to lower PM10 levels. Therefore, air quality improvements leading to PM10 attainment in the Basin are due to emission reductions from adopted, fully enforceable control measures.

D. Maintenance Plan

The South Coast PM10 Maintenance Plan includes the following components: attainment emission inventory; maintenance demonstration; commitment to continue monitoring network operation; commitment for verification of continued attainment; and contingency plan. In addition, transportation conformity budgets have been updated.

1. Attainment Emission Inventory

An emission inventory is a critical tool used to support evaluation, control, and mitigation of air pollution which is comprised of a systematic listing of the sources of air pollutants along with the amount of pollutants emitted from each source or category over a given period of time. Emission inventories are estimates of the air pollutant emissions released into the environment – they are not direct ambient concentration measurements. To determine the expected emissions in future years, emission inventories incorporate the effects of growth and existing regulations (baseline

inventories). An attainment inventory identifies the level of emissions during the period when air quality data show attainment.

The South Coast PM10 Maintenance Plan presents the updated 2007 AQMP baseline emission inventories for PM10, NOx, ROG, and SOx for 2002, 2006, and 2008, plus projected emissions for 2010 through 2012 (providing a bracket for the start of the maintenance period depending upon plan approval by U.S. EPA), 2014, 2020, and 2023 (bracketing the expected 10-year maintenance period), and 2030. 2007 AQMP inventory updates include the latest point and area source emission information; ARB EMFAC 2007 mobile source emission outputs; and planning assumptions in the Southern California Association of Government's (SCAG) Interim 2007 Regional Transportation Plan (2007 RTP).

2. Maintenance Demonstration

The 2003 PM10 attainment plan used linear rollback to demonstrate attainment of the 24-hour PM10 standard. Linear rollback assumes that future PM10 levels above background concentrations will decrease in proportion to projected emission reductions. The linear rollback technique was based on PM10 chemical components. For the five sites where PM10 component species were sampled, the components were matched to the appropriate emission inventory categories in the rollback analysis.

The South Coast PM10 Maintenance Plan demonstrates maintenance of the 24-hour PM10 standard by estimating the PM2.5 and the coarse portions of PM10 concentrations using two separate methodologies: 1) the PM2.5 portion using regional photochemical modeling, 2) the coarse portion using linear rollback simulations. This analysis employed baseline emission inventories for 2005 and 2010 through 2030. The projected PM2.5 and coarse fractions were added to estimate future-year maximum 24-hour PM10 concentrations. Table 2 lists the 2010 through 2012, 2014, 2020, 2023, and 2030 projected maximum 24-hour PM10 values per county, which demonstrate continued attainment of the 24-hour NAAQS throughout the Basin.

Table 2. Projected Maintenance of 24-hour PM10 NAAQS in the South Coast Air Basin

Year	Predicted County Maximum 24-hour PM10 Concentration ($\mu g/m^3$)			
	Los Angeles	Orange	Riverside	San Bernardino
2010	102	79	120	126
2011	101	79	119	125
2012	101	78	118	125
2014	102	79	117	126
2020	102	80	117	126
2023	103	81	118	128
2030	109	86	125	**136**

The South Coast is projected to maintain attainment with the PM10 standard due to ARB, District, and other local control measures already in place. In addition, future emissions in PM10 precursors are projected to decrease even further as a result of the implementation of controls in the 2007 AQMP for PM2.5 and ozone in the Basin.

3. PM10 Monitoring Network

The District commits to continue PM10 monitoring to verify sustained attainment of the PM10 standard in the South Coast. The existing PM10 monitoring network in the South Coast includes nineteen FRM and ten real-time PM10 monitors (Figure 1). Federal regulations require daily sampling at the site reporting peak PM10 concentrations. The real-time PM10 monitors will be used to meet the daily monitoring requirement.

4. Verification of Continued Attainment

To verify continued attainment of the PM10 standards, the District commits to reevaluate the South Coast PM10 Maintenance Plan as part of the AQMP revision currently scheduled for 2011. Eight years after the South Coast has been redesignated to attainment, the District will submit to U.S. EPA the required revision to the Plan demonstrating maintenance of the standard for the following ten year period. On a regular basis, the District will continue to analyze PM10 data from FRM and continuous monitors and compare daily PM10 values to the level of the 24-hour standard.

5. Contingency Plan

The Act requires the maintenance plan to include contingency provisions for prompt correction of any PM10 standard violation that might occur after the area has been redesignated to attainment. The maintenance plan is not required to contain fully adopted contingency measures that will go into effect without further state action as is required in attainment SIPs. Instead, for maintenance plans, the area must have a plan to ensure that contingency measures are adopted once they are triggered.

Implementation of the 2007 AQMP serves as an on-going contingency measure for maintaining the PM10 standard in the South Coast, since emission reductions from control measures designed to attain the PM2.5 and ozone standards will effectively reduce PM10 concentrations. If nonetheless the 24-hour PM10 standard is exceeded, and data evaluation shows the violation is not due to a natural or exceptional event, the District will evaluate further enhancements to key existing PM10 measures to achieve necessary emission reductions as expeditiously as possible.

6. Transportation Conformity Budgets

Under section 176(c) of the Act, transportation plans, programs, and projects that receive federal funding or require federal approval must be found to be fully consistent

with the SIP. The federal transportation conformity regulation[2] found in 40 CFR parts 51 and 93 requires SIPs to specify on-road motor vehicle emission budgets (budgets) that are consistent with attainment and maintenance of NAAQS. The conformity regulation requires metropolitan planning organizations to demonstrate that emissions from regional transportation plans and programs do not exceed these "emission budgets."

The District updated the South Coast transportation conformity budgets using ARB's latest on-road mobile source emission factor model EMFAC2007 and transportation activity data from the 2008 RTP, Amendment 1 as adopted by SCAG in December 2008. The budgets U.S. EPA previously approved as part the 2003 PM10 Attainment Plan were based on EMFAC 2002 and SCAG's 2001 RTP.

The District conducted an attainment modeling sensitivity analysis to evaluate the impact of increased motor vehicle emissions from potential growth on ambient PM10 concentrations. Even if PM10 baseline emissions from motor vehicles were to increase by up to 20 tons per day (tpd), the South Coast would continue to show attainment through 2030 (Table 3).

Table 3. Projected 24-hour PM10 Concentrations Assuming a 20 tpd Increase in the South Coast Air Basin Baseline PM10 Emissions

Year	Predicted County Maximum 24-hour PM10 Concentration ($\mu g/m^3$)			
	Los Angeles	Orange	Riverside	San Bernardino
2010	105	81	124	131
2011	105	82	123	131
2012	105	81	122	130
2014	105	82	121	131
2020	106	83	121	132
2023	107	84	123	133
2030	113	89	129	**141**

Prior to the District's Board hearing, the District revised the transportation conformity budgets in the South Coast PM10 Maintenance Plan, to reflect U.S. EPA's comment that the budgets only include emission reductions from already adopted control measures. Table 4 lists the revised on-road motor vehicle emission budgets for transportation conformity established for the years 2010, 2020, and 2030. After consultation with the District and SCAG, 5 tpd of PM10 were added to the conformity budget for 2030 and 7 tpd, 4 tpd, and 3 tpd of ROG to the budgets for 2010, 2020, and 2030, respectively. Appendix C of the ARB Staff Report for the 2007 South Coast

[2] U.S. EPA maintains online information on its transportation conformity program, including access to relevant rulemakings, policy guidance, and reports at: http://www.epa.gov/otaq/stateresources/transconf/index.htm

PM2.5 SIP presented the relative emissions contribution to the South Coast PM2.5 formation from precursor gases, including ROG. Based on the established ratios, the additional ROG emissions translate to adding 1 tpd of PM10 emissions (rounding to whole tpd) for 2010, 2020, and 2030, respectively. Total additions for the 2030 budget are therefore the equivalent of 6 tpd of PM10. The additional 6 tpd of PM10 represents only 30 percent of the 20 tpd PM10 included in the District's attainment modeling sensitivity analysis. The 6 tpd of PM10 facilitates anticipated growth while setting an emissions budget that ensures continued maintenance of the standard. ARB staff posted the revised budgets on ARB's website to provide for the required 30-day public review. The revised emission budgets fulfill the requirements of the Act and U.S. EPA regulations to ensure that transportation activities support continued maintenance of the PM10 standard.

Table 4. Transportation Conformity Emissions Budgets for PM10 in the South Coast Air Basin
(Annual average)

Emission Budget (tons per day)	**2010**	**2020**	**2030**
PM10	159	164	175
NOx	372	180	116
ROG	182	110	81

IV. STAFF RECOMMENDATION

ARB staff has reviewed the PM10 Redesignation Request and Maintenance Plan for the South Coast Air Basin and consulted with the District staff during this review. ARB staff finds that the South Coast Air Basin PM10 Maintenance Plan meets all applicable Act requirements. ARB staff believes that implementation of this plan will continue to maintain PM10 levels below the national air quality standard in the South Coast. Therefore, we recommend that the Board adopt the South Coast PM10 Maintenance Plans and the updated transportation conformity budgets for the South Coast, as a revision to the California SIP for submittal to U.S. EPA. In addition, ARB staff recommends that the Board approve the District's request that the South Coast Air Basin be redesignated from nonattainment to attainment for the national PM10 standard.