

Appendix A

State Implementation Plan Revision

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A-1
Revisions to the 8-hour Ozone SIP
Reasonable Further Progress Calculations

South Coast

(Summer Season, tons per day)

	2002	2008	2011	2014	2017	2020	2023
Baseline ROG	880.5	632.0	579.9	535.2	519.8	513.9	513.4
CA MVCP/RVP Adjustment	0.0	56.1	73.0	86.6	93.7	98.3	101.6
RACT Corrections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adjusted 2002 Baseline ROG in milestone year	880.5	824.5	807.6	793.9	786.8	782.3	778.9
RFP commitment for ROG reductions from new measures	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future Year ROG with existing and proposed measures		632.0	579.9	535.2	519.8	513.9	513.4
Required % change since previous milestone year (ROG or NOx) compared to 2002		18%	9%	9%	9%	9%	9%
Required % change since 2002 (ROG or NOx)		18%	27%	36%	45%	54%	63%
Target ROG levels		676.1	599.8	533.4	479.0	431.7	389.8
Apparent shortfall in ROG		-44.1	-19.9	1.7	40.8	82.2	123.6
Apparent shortfall in ROG, %		-5.3%	-2.5%	0.2%	5.2%	10.5%	15.9%
ROG shortfall previously provided by NOx substitution, %		0%	0.0%	0.0%	0.2%	5.2%	10.5%
Actual ROG shortfall, %		-5.3%	-2.5%	0.2%	5.0%	5.3%	5.4%
NOx							
Baseline NOx	1024.1	728.3	591.2	532.1	478.8	428.2	378.4
CA MVCP Adjustment	0.0	64.7	80.6	93.0	98.3	102.4	105.9
Adjusted 2002 Baseline NOx in milestone year	1024.1	959.4	943.4	931.1	925.8	921.7	918.2
RFP commitment for NOx reductions from new measures	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Change in NOx since 2002		231.1	352.3	398.9	447.0	493.5	539.7
Change in NOx since 2002, %		24.1%	37.3%	42.8%	48.3%	53.5%	58.8%
NOx reductions since 2002 already used for RFP substitution and contingency through last milestone year, %		0.0%	3.0%	3.0%	3.2%	8.2%	13.5%
NOx reductions since 2002 available for RFP substitution and contingency in this milestone year, %		24.1%	34.3%	39.8%	45.1%	45.4%	45.3%
Change in NOx since 2002 used for ROG substitution in this milestone year, %		0.0%	0.0%	0.2%	5.0%	5.3%	5.4%
Change in NOx since 2002 available for contingency in this milestone year, %		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Change in NOx since 2002 surplus after meeting substitution and contingency needs in this milestone year, %		21.1%	34.3%	39.6%	40.1%	40.0%	39.9%
RFP Met?		YES	YES	YES	YES	YES	YES
Contingency Met?		YES	YES	YES	YES	YES	YES

A-1
Revisions to the 8-hour Ozone SIP
Reasonable Further Progress Calculations

San Joaquin Valley
 (Summer Season, tons per day)

	2002	2008	2011	2014	2017	2020	2023
Baseline ROG	457.5	407.6	354.1	331.0	328.9	330.5	339.0
CA MVCP/RVP Adjustment	0.0	12.4	17.8	22.4	25.4	26.4	26.5
RACT Corrections	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Adjusted 2002 Baseline ROG in milestone year	457.5	445.1	439.7	435.0	432.0	431.0	431.0
RFP commitment for ROG reductions from new measures	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future Year ROG with existing and proposed measures		407.6	354.1	331.0	328.9	330.5	339.0
Required % change since previous milestone year (ROG or NOx) compared to 2002		18%	9%	9%	9%	9%	9%
Required % change since 2002 (ROG or NOx)		18%	27%	36%	45%	54%	63%
Target ROG levels		365.0	327.2	293.5	264.4	239.7	218.1
Apparent shortfall in ROG		42.6	26.9	37.5	64.5	90.9	121.0
Apparent shortfall in ROG, %		9.6%	6.1%	8.6%	14.9%	21.1%	28.1%
ROG shortfall previously provided by NOx substitution, %		0%	9.6%	9.6%	9.6%	14.9%	21.1%
Actual ROG shortfall, %		9.6%	-3.4%	-0.9%	5.4%	6.1%	7.0%
NOx							
Baseline NOx	565.2	425.4	359.0	307.4	258.8	224.9	194.6
CA MVCP Adjustment	0.0	16.8	21.2	24.8	26.9	27.8	28.2
Adjusted 2002 Baseline NOx in milestone year	565.2	548.5	544.1	540.4	538.4	537.4	537.1
RFP commitment for NOx reductions from new measures	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Change in NOx since 2002		123.1	185.1	233.0	279.5	312.5	342.5
Change in NOx since 2002, %		22.4%	34.0%	43.1%	51.9%	58.1%	63.8%
NOx reductions since 2002 already used for RFP substitution and contingency through last milestone year, %		0.0%	12.6%	12.6%	12.6%	17.9%	24.1%
NOx reductions since 2002 available for RFP substitution and contingency in this milestone year, %		22.4%	21.4%	30.6%	39.4%	40.2%	39.7%
Change in NOx since 2002 used for ROG substitution in this milestone year, %		9.6%	0.0%	0.0%	5.4%	6.1%	7.0%
Change in NOx since 2002 available for contingency in this milestone year, %		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Change in NOx since 2002 surplus after meeting substitution and contingency needs in this milestone year, %		9.9%	21.4%	30.6%	34.0%	34.1%	32.7%
RFP Met?		YES	YES	YES	YES	YES	YES
Contingency Met?		YES	YES	YES	YES	YES	YES

A-2
Revisions to the 8-hour Ozone and PM2.5 SIP
Transportation Conformity Budgets

South Coast
8-hour Ozone SIP Transportation Conformity Budgets*
 (Summer Season, tons per day)

	2011		2014		2017		2020		2023	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
South Coast Air Basin	172	328	136	277	119	224	108	185	99	140

*Budgets are rounded up to the nearest ton.

In addition, at the time the 2007 SIP was adopted, a 2008 budget year was a necessary MPO analysis year for federal transportation conformity purposes. Since 2008 has passed, it is no longer applicable as a conformity analysis year, and was therefore not included in these budgets.

San Joaquin Valley
8-hour Ozone SIP Transportation Conformity Budgets**
 (Summer Season, tons per day)

County Subarea	2011		2014		2017		2020		2023	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Fresno	14.3	36.2	10.7	30.0	9.3	22.6	8.3	17.7	8.0	13.5
Kern (SJV)	12.7	50.3	9.7	42.7	8.7	31.7	8.2	25.1	7.9	18.6
Kings	2.8	10.7	2.1	8.9	1.8	6.7	1.7	5.3	1.6	4.0
Madera	3.4	9.3	2.5	7.7	2.2	5.8	2.0	4.7	1.9	3.6
Merced	5.1	19.9	3.7	16.7	3.2	12.4	2.9	9.9	2.8	7.4
San Joaquin	11.1	24.6	8.4	20.5	7.2	15.6	6.4	12.4	6.3	10.0
Stanislaus	8.5	16.9	6.4	13.9	5.6	10.6	5.0	8.4	4.7	6.4
Tulare	8.8	16.0	6.7	13.2	5.8	10.1	5.3	8.1	4.9	6.2

** Budgets are rounded up to the nearest tenth ton (0.1).

In addition, at the time the 2007 SIP was adopted, a 2008 budget year was a necessary MPO analysis year for federal transportation conformity purposes. Since 2008 has passed, it is no longer applicable as a conformity analysis year, and was therefore not included in these budgets.

**South Coast
PM2.5 SIP Transportation Conformity Budgets***
(Annual Average, tons per day)

	2012			2014		
	ROG	NOx	PM2.5	ROG	NOx	PM2.5
South Coast Air Basin	154	326	37	132	290	35

*Budgets are rounded up to the nearest ton.

Per Section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2014, a trading mechanism is established to allow future decreases in NOx emissions from on-road mobile sources to offset any on-road increases in PM2.5, using a NOx:PM2.5 ratio of 10:1. This trading mechanism will only be used, if needed, for conformity analyses for years after 2014. To ensure that the trading mechanism does not impact the ability to meet the NOx budget, the NOx emission reductions available to supplement the PM2.5 budget shall only be those remaining after the 2014 NOx budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis.

In addition, at the time the 2007 SIP was adopted, a 2009 budget year was a necessary MPO analysis year for federal transportation conformity purposes. Since 2009 has passed, it is no longer applicable as a conformity analysis year, and was therefore not included in these budgets.

**San Joaquin Valley
PM2.5 SIP Transportation Conformity Budgets****
(Annual Average, tons per day)

County Subarea	2012		2014	
	PM2.5	NOx	PM2.5	NOx
Fresno	1.5	35.7	1.1	31.4
Kern (SJV)	1.9	48.9	1.2	43.8
Kings	0.4	10.5	0.3	9.3
Madera	0.4	9.2	0.3	8.1
Merced	0.8	19.7	0.6	17.4
San Joaquin	1.1	24.5	0.9	21.6
Stanislaus	0.7	16.7	0.6	14.6
Tulare	0.7	15.7	0.5	13.8

** Budgets are rounded up to the nearest tenth ton (0.1).

Per Section 93.124 of the conformity regulations, for transportation conformity analyses using these budgets in analysis years beyond 2014, a trading mechanism is established to allow future decreases in NOx emissions from on-road mobile sources to offset any on-road increases in PM2.5, using a NOx:PM2.5 ratio of 9:1. This trading mechanism will only be used, if needed, for conformity analyses for years after 2014. To ensure that the trading mechanism does not impact the ability to meet the NOx budget, the NOx emission reductions available to supplement the PM2.5 budget shall only be those remaining after the 2014 NOx budget has been met. Clear documentation of the calculations used in the trading should be included in the conformity analysis.

In addition, at the time the 2007 SIP was adopted, a 2009 budget year was a necessary MPO analysis year for federal transportation conformity purposes. Since 2009 has passed, it is no longer applicable as a conformity analysis year, and was therefore not included in these budgets.

A-3
Revisions to the 8-hour Ozone SIP
Rulemaking Calendar for Agricultural Equipment

ARB adopted revisions to the rulemaking calendar for California’s PM2.5 SIPs on May 18, 2011. The updated rulemaking calendar is also intended for inclusion in the South Coast and San Joaquin Valley 8-hour ozone SIPs, with the following addition: the rulemaking calendar for the cleaner in-use agricultural equipment measure, has an action date of 2013 consistent with the updated calendar for the remaining ozone measures identified in the 2007 SIP. This measure is included in the San Joaquin Valley 8-hour ozone SIP but not the PM2.5 SIP. A copy of the PM2.5 SIP Rulemaking Calendar is included in Appendix D to this report for reference.

An incentive program is also being implemented to achieve early reductions in ozone precursors from agricultural equipment, primarily tractors. To date, about \$70 million has been allocated by the San Joaquin Valley Air District and federal agencies to modernize off-road agricultural equipment. Benefits from this incentive program will be incorporated into the 8-hour ozone SIP for the San Joaquin Valley as emission reductions are achieved and accounting is completed.

Revisions to the
8-hour Ozone SIP Rulemaking Calendar
for Agricultural Tractors

	Agency	Actions	Implementation
Off-Road Equipment			
Cleaner In-use Agricultural Equipment ¹	ARB	2013	See note

¹ The final implementation schedule would be determined in the rulemaking process as described in the currently adopted ozone SIP. This measure is included in the San Joaquin Valley 8-hour ozone SIP and not the PM2.5 SIP.

A-4

Actions for Identifying and Implementing Advanced Technology Measures

Commitment to Reduce Emissions via Long-Term Strategy

Consistent with section 182(e)(5) of the federal Clean Air Act, this SIP includes long-term commitments to achieve the last increment of emission reductions necessary to fully meet attainment goals in the South Coast and San Joaquin Valley. As the State agency charged with ensuring California's SIP compliance, the ARB is ultimately responsible for ensuring that measures are identified no later than 2020 (three years prior to the attainment year) and the emission reductions achieved by 2023.

No later than 2020, ARB and the two air districts will prepare a revision to the 8-hour ozone SIP that: (1) reflects any modifications to the 2023 emission reduction target based on updated science, and (2) identifies any additional strategies, including the implementing agencies, needed to achieve the necessary emissions reductions by 2023. In accordance with section 182(e)(5)(B) of the Clean Air Act, ARB will submit enforceable commitments to develop and adopt contingency measures if the advanced technology measures do not achieve planned reductions.

To implement the Long-term Strategy, ARB:

- a) commits to share the results of its efforts to identify emerging emission reduction opportunities, promising technologies, and the progress made in developing long-term emission reduction measures with the public through periodic briefings to the Board, workshops, conferences, symposia, website postings, and other means;
- b) commits to work to secure resources in the future for continuing research and development of new technologies; and
- c) commits to develop schedules for moving from control technology research to implementation.

While the Clean Air Act establishes timelines well into the future, ARB recognizes the challenges presented are near enough that action is needed in order to bridge the attainment gap in the South Coast and San Joaquin Valley. While not exhaustive, the following section describes on-going activities to identify and deploy the technologies needed to attain the ozone standard in the South Coast and San Joaquin Valley and to fulfill ARB's commitment under section 182(e)(5) of the Clean Air Act.

Clean Air Technology Initiative

U.S. EPA, along with ARB, the South Coast and San Joaquin Valley Air Districts and the California Environmental Protection Agency, signed a memorandum of agreement (MOA) to commit to developing and testing new technologies to accelerate progress in meeting current and future national air quality standards. The goal of the MOA is to improve air quality by aligning agency research resources, where possible and appropriate, to evaluate innovative

technologies that have the potential to reduce emissions of pollutants and pollutant precursors, and to develop and assess new monitoring equipment that could improve the measurement of emissions from mobile and stationary sources of pollution.

As part of this agreement, the agencies intend to coordinate research efforts with other public and private stakeholders, including other federal departments and agencies and other State and local entities, in order to utilize the resources and capacities of a wide sector of government and the business community in projects to develop, demonstrate, and assess new technologies that can help achieve clean air goals.

A key element of the MOA was the creation of the Clean Air Technology Initiative, through which the partner agencies identify regionally important emission sources contributing to the region's attainment challenges. Both the South Coast and San Joaquin Valley Air Districts selected focus areas that are impacted by a mixture of mobile and stationary sources, especially sources representing major contributors to the SIP inventories and key air toxic exposures in the community. The partner agencies then coordinate actions to align local, State, and federal resources to accelerate the identification and implementation of advanced clean technologies. The technologies demonstrated are intended to achieve significant reductions for SIP purposes as well as reduce local air toxics exposure. Below is a brief description of the focus areas for the two regions.

South Coast Air Basin Focus Area

The City of San Bernardino has a large intermodal railyard with the highest health risk of all railyards in Southern California. This city is also impacted by goods movement activities that originate at the ports and move east via trucks and trains through San Bernardino and out of the State, as well as triggering new warehouse and distribution projects in inland areas. In addition, there are more than 1,000 stationary sources in the area holding South Coast Air District permits, such as autobody and automotive repair shops; transportation facilities; concrete and aggregate operations; military installations; printing and coating operations; and manufacturing facilities.

San Joaquin Valley Air Basin Focus Area

The southern San Joaquin Valley focus area houses 1.2 million residents, and frequently exceeds health-based air standards when regional pollutants are trapped by surrounding mountains and atmospheric inversion layers. The focus area straddles Kern and Tulare counties, with mobile source emissions from the goods movement corridor of Highway 99 and Interstate 5, and stationary source emissions from a variety of energy production facilities, farms, and agricultural processing operations. The focus area includes the city of Bakersfield with the Valley's highest wintertime particulate matter concentrations, and the city of Arvin, with some of the Valley's highest 8-hour ozone concentrations in the summer.

Co-Benefits of Climate Change Programs

California is committed to reducing the State's impacts on global climate change. California's major initiatives for reducing climate change or greenhouse gas (GHG) emissions are outlined in Assembly Bill 32 – the Global Warming Solutions Act of 2006 (AB 32). These efforts aim at reducing GHG emissions to 1990 levels by 2020 – a reduction of approximately 30 percent. Reducing emissions from combustion sources is at the core of California's program to meet the federal ozone standard and is also central to the AB 32 Scoping Plan for meeting the 2020 greenhouse gas emissions target. California's climate and criteria pollutant programs are complementary, and the AB 32 regulations ARB is adopting will provide emission reductions that will be incorporated into future air quality plans for ozone and fine particles.

Air Quality Improvement Program (AQIP)

The *California Alternative and Renewable Fuel, Vehicle Technology, Clean Air, and Carbon Reduction Act of 2007* (Assembly Bill (AB) 118, Statutes of 2007, Chapter 750) creates the Air Quality Improvement Program (AQIP). This incentive program is administered by ARB to fund clean vehicle and equipment projects, research on biofuels production and the air quality impacts of alternative fuels, and workforce training. The AQIP expands California's portfolio of air quality incentives, providing the opportunity to fund projects that do not fit within the statutory framework of existing incentive programs such as the Carl Moyer Air Quality Standards Attainment Program (Carl Moyer Program), Goods Movement Emission Reduction Program, and Lower-Emission School Bus Program.

AQIP is ARB's only incentive program structured to allow for investments in technology advancing projects which also provide immediate emission reductions, and ARB is using AQIP funds for this purpose. AQIP investments support the deployment of hybrid-electric vehicles, zero-emission vehicles (ZEV), and other advanced technologies critical to meeting California's post-2020 SIP and climate change emission reduction goals. California must start placing these zero- and near-zero emission vehicles on its roadways today to achieve large-scale emission reductions in future decades because of the time it takes for significant fleet turnover. The cornerstone of the AQIP for FY 2009-10 is the \$20.4 million Hybrid Truck and Bus Voucher Incentive Project (HVIP), aimed at accelerating California deployment of new hybrid medium- and heavy-duty vehicles. California's large funding commitment for hybrid truck technology not only provides emission benefits today, but is likely to enable heavy-duty hybrids to become commonplace in the near future, much the way hybrid cars have become commonplace in the light-duty sector. Hybrid technology for trucks is near a tipping point, and the State's investment over several years should help it become self-sustaining through production economies of scale.

AQIP is also funding vehicle purchaser incentives for other cleaner technologies – ZEV's and plug-in hybrid cars, electric lawnmowers, and demonstration projects for cleaner marine and locomotive engines. These projects are on track as well. In nearly all cases, demand for funding is meeting or exceeding ARB's expectations.

Annual Research Program

Annually, ARB adopts a research plan intended to provide timely scientific and technical information that will help the Board and local air pollution control districts to most effectively implement air pollution control programs in California. Specifically, this plan supports ARB's mission to protect public health based on a strong scientific understanding of health effects and exposures; continue developing and implementing strategies to reduce GHG emissions and energy consumption; develop effective strategies to safeguard health and welfare against adverse impacts of ambient air pollution; and support development of technologies and non-technological strategies that address multiple priorities related to air quality. The 2010/2011 research program identified 25 projects to receive more than \$6.5 million dollars in research funding. Cumulatively, California has granted nearly \$24 million dollars in research funds since the 2007 8-hour ozone SIPs were adopted.

South Coast and San Joaquin Valley Air District Efforts

South Coast

The South Coast Air District has been a leader in identifying and implementing strategies to improve air quality through the use of innovative strategies and advanced technologies. In order to meet the region's 2023 attainment goal, emissions of nitrogen oxides (NOx) will need to decline by an additional two-thirds by 2023. Achieving this goal will require a fundamental shift in business-as-usual to a clean-energy future. The South Coast Air District has identified a clean energy vision of the future that would guide the way as the region begins to recover from the economic recession that has affected the entire nation.

This vision would have local, State and federal government and business leaders focus on utilizing the cleanest, greenest technologies in their planned growth. In order to fully realize the vision, the region would need to change how people and freight are moved – using electrification and hybridization technologies to convert existing infrastructure to near-zero emissions. Land-use decisions would put people closer to their destinations and would empower people to choose energy efficient mass transit. Energy generation and use would be cleaner. Solar and fuel cell distributed generation would play a significant role in meeting the region's energy needs. Old inefficient power plants would be modernized with more efficient equipment. Building energy use would be improved and energy consumers would be given the tools needed to use energy more wisely.

San Joaquin Valley

The San Joaquin Valley Air District is also pursuing innovative strategies to reduce ozone-forming emissions, through the local "Fast Track" strategy. The Fast Track strategy focuses on using innovative strategies to reduce emissions from sources that cannot be regulated or have already been well controlled at the local level. Key long-

term elements of the Fast Track strategy include opportunities to reduce emissions from heavy-duty trucks by shifting goods movement to lower-emission alternatives. The San Joaquin Valley Air District has explored and advocated for the use of short sea shipping opportunities to shift goods movement from trucks to waterways. In 2010, the U.S. Department of Transportation awarded the Ports of Stockton, West Sacramento, and Oakland with a \$30 million grant to move goods between Oakland and the two inland ports over the San Joaquin-Sacramento Delta.

The San Joaquin Valley Air District also recognizes the need for transformational changes in technology, and has adopted a Technology Advancement Program to support technological advancements through partnerships with universities, State agencies, and the federal government. The San Joaquin Valley Air District also established a Regional Energy Efficiency Strategy to support technology development and deployment in the Valley. The Regional Energy Efficiency Program lays out goals and measures that will guide the District's actions to reduce emissions caused by electricity and natural gas consumption in residential, industrial, and institutional organizations in the Valley.

Conclusion

Achieving the emission reductions needed to fully attain the federal 8-hour ozone standard in the South Coast and the San Joaquin Valley will require significant penetration of the cleanest technologies. ARB, the South Coast Air District and the San Joaquin Valley Air District have a long history of pursuing innovative strategies to bring low and ultra-low emission technologies into use. ARB staff will periodically update the Board on these efforts and will revise the SIP as appropriate when advanced technologies become viable emission control strategies. Additionally, ARB will revise the SIP if needed, as California addresses future air quality standards.