Chapter 9

Conclusion

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Chapter 9: Conclusion

9.1 ATTAINMENT OUTLOOK

As required by EPA (72 *FR* 20601) and as explained in Chapter 2, all nonattainment areas are to attain the 1997 PM2.5 standard as expeditiously as practicable, but by an initial attainment deadline of April 5, 2010 (based on 2007, 2008, and 2009 data, making 2009 the compliance year). Areas demonstrating that attainment is impracticable by compliance year 2009 can receive an extension of up to five years, making the final attainment deadline April 5, 2015 (based on 2012, 2013, and 2014 data, with 2014 as the compliance year).

A full extension to compliance year 2014 is not automatic, and some areas may obtain shorter extensions. To be granted an extension, areas must show that attainment by 2009 is impracticable and that the area will attain the standard by an alternative date that is as expeditious as practicable. Areas must evaluate the attainment potential for each compliance year between 2009 and 2014. Regional modeling was performed for the design value for 2014 by ARB. Receptor modeling was performed for design values for all years from 2009 to 2014 and the year for each site to comply with the annual standard is reflected in Table 3-2. Receptor modeling analysis projects that Bakersfield will not attain prior to 2014. The Regional model evaluates sites in Bakersfield, not evaluated by the receptor modeling, that have higher projected values for the year 2014. The Receptor and Regional modeling predictions are in very close agreement as shown in Table 3-5 and therefore it is reasonable to conclude that both modeling approaches project attainment by but not before 2014. Additional support for this conclusion arises from review of proposed reductions. The commitment from ARB for extensive NOx reductions in 2014 is necessary to achieve attainment. Only if a significant portion of these reductions were implemented ahead of the proposed commitment would it be likely to achieve compliance by an earlier year.

Modeling conducted for this plan) indicates as discussed in Chapter 3 that NOx contributions to ammonium nitrate are the dominant source for annual PM2.5 levels in the Valley. Figure 9-1 shows that ammonium nitrate is, by far, the largest contribution to the Valley's annual PM2.5 concentration resulting in almost half of the annual concentration. Since NOx is the limiting compound for ammonium nitrate in the Valley[1], NOx controls reduce ammonium nitrate the most effectively. Other contributions are collectively equal to the impact of ammonium nitrate and must also be addressed through emission reductions. Principle sources of directly emitted PM2.5 include geologic material, motor vehicle emissions and tire and brake wear, organic carbon and vegetative burning. Atmospheric formation of secondary PM2.5 is dominated by NOx formation of ammonium nitrate followed by SOx formation of ammonium sulfate with

[1] See Section 3.2.6 of this plan; Lurmann, Frederick W. et al. (December 2006). "Processes Influencing Secondary Aerosol Formation in the San Joaquin Valley during Winter." *Journal of the Air and Waste Management Association* 56: 1679-1693; or Kleeman, Michael J.; Ying, Qi; and Kaduwela, Ajith (2005). "Control Strategies for the Reduction of Airborne Particulate Nitrate in California's San Joaquin Valley." *Atmospheric Environment* 39: 5325-5341.

small contributions of secondary organic aerosol from motor vehicles and other organic carbon sources. The contributions shown in Figure 9-1 are 2014 projections after implementation of all reductions. Even after the reductions in 2014, all of the source categories contribute a significant percentage of the annual concentration. It should also be noted that during some months the concentration of ammonium nitrate is very low and PM2.5 is dominated by directly emitted sources (geologic, motor vehicle, organic carbon and vegetative burning) and secondary ammonium sulfate.

Figure 9-1 Percent Contribution to Annual PM2.5 Concentrations

- Tire and brake wear includes on-road sources only
- Percentages shown are for the 2014 annual receptor modeling values in Bakersfield

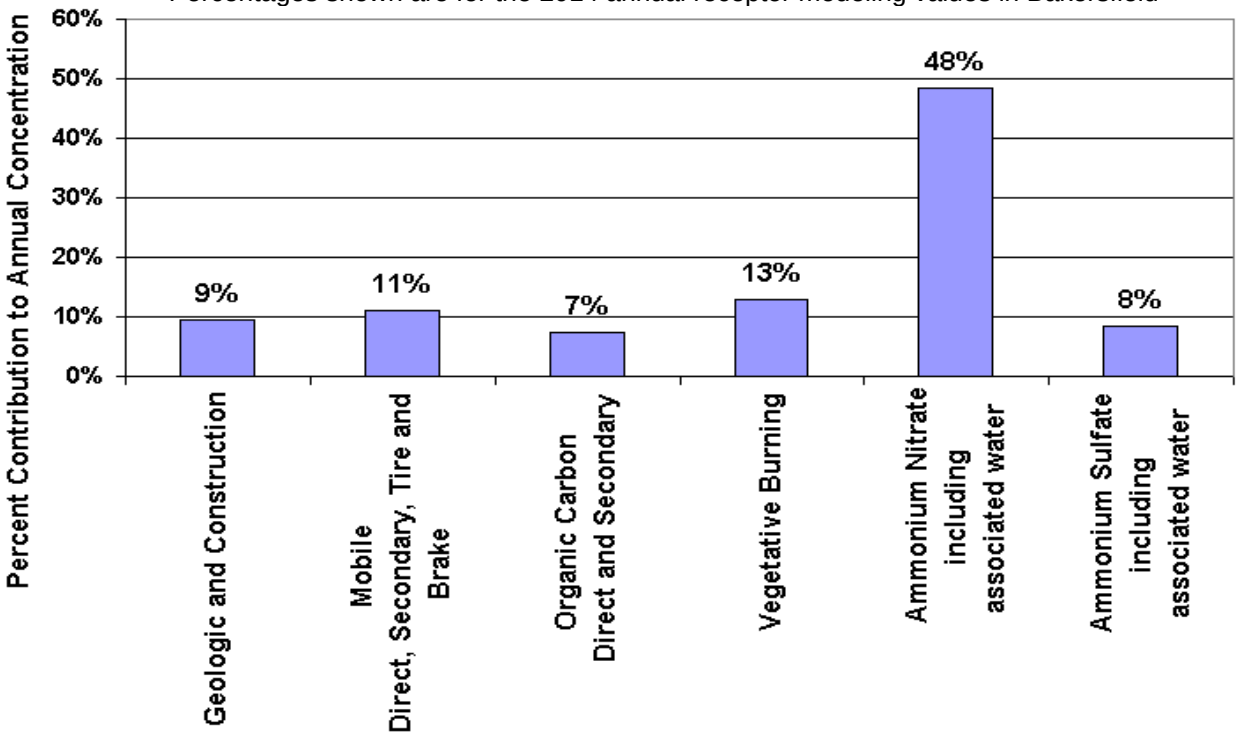

Table 9-1 shows the 1997 annual PM2.5 standard attainment outlook for the San Joaquin Valley as a basin-wide average for compliance years 2009 through 2014. The emissions inventory (including rules adopted as of December 2006) does not meet the emissions targets. Table 9-1 compares the emissions inventory that will result from this plan's aggressive control strategy to the attainment targets. Each possible attainment year is evaluated. According to this analysis, the San Joaquin Valley will reach attainment by 2014 with the reductions that will be achieved by the District's and ARB's regulatory control measures. However, the District has several reasons to expect that attainment will be achieved earlier than 2014.

Table 9-1 San Joaquin Valley PM2.5 Attainment Outlook

Ref#		2009	2010	2011	2012	2013	2014
1	Baseline annual NOx inventory, before Plan control strategy (Table B-2)	500.9	469.5	443.3	424.4	393.1	376.2
2	**NOx Emissions Target** (Chapter 3)[1]						**291.2**
3	District control measure commitments (Table 6-3a)	-2.43	-3.24	-4.26	-8.56	-8.82	-8.97
4	ARB control measure commitments (Chapter 7)	0.0	0.0	0.0	0.0	0.0	-76.0
5	**Emissions inventory with *2008 PM2.5 Plan* controls** (Lines 1, 3, and 4)	498.5	466.3	439.0	415.8	384.3	291.2
6	Baseline annual PM2.5 emissions inventory, before Plan control strategy (Table B-1)	79.8	79.0	77.9	77.0	75.9	75.0
7	**Direct PM2.5 Target** (Chapter 3)[1]						**63.3**
8	District control measure commitments (Table 6-3b)	-1.60	-2.96	-4.46	-6.69	-6.70	-6.70
9	ARB control measure commitments (Chapter 7)	0.0	0.0	0.0	0.0	0.0	-5.0
10	**Adjusted emissions inventory with *2008 PM2.5 Plan* controls** (Lines 6, 8, and 9)	78.2	76.0	73.4	70.3	69.2	63.3
11	Baseline annual SO_2 emissions inventory, before Plan control strategy (Table B-3)	26.4	23.0	23.3	23.6	23.8	25.5
12	**SO_2 Target** (Chapter 3)[1]						**24.6**
13	District control measure commitments (Table 6-3c)	-0.06	-0.11	-0.16	-0.92	-0.92	-0.92
14	ARB control measure commitments (Chapter 7)	0.0	0.0	0.0	0.0	0.0	0.0
15	**Adjusted emissions inventory with *2008 PM2.5 Plan* controls** (Lines 11, 13, and 14)	26.3	22.9	23.1	22.7	22.9	24.6
Attainment?		No	No	No	No	No	Yes
Projected attainment year		2014					

[1] Chapter 3 shows that the 2014 inventory with plan controls will bring the Valley into attainment

9.1.1 Attainment before 2014

As explained in Chapter 3, the receptor modeling conducted for this plan provides a conservative analysis. Often, the reductions target yielded from rollback is a high estimate of what will actually be required for attainment. This was evidenced in the District's PM10 plans: rollback projected attainment by 2010, but the Valley attained the PM10 standards based on 2004-2006 data. By using a similar, conservative analysis in this PM2.5 Plan, the Valley could attain the 1997 standard early (and subsequent reductions will help bring the Valley closer to the tougher, 2006 federal PM2.5 standard).

The estimated NOx, direct PM2.5, and SO_2 and other reductions expected from the District's exhaustive control measure analysis are based on the best technical information available at the time this plan was compiled. During the rule development

process for each measure, District staff will consider the most effective technologies available; rules may achieve more reductions than expected. Control measure feasibility studies may also reveal additional opportunities for reductions. ARB measures will achieve significant reductions that will greatly contribute to the Valley's 2014 attainment. However, ARB is not committed to pre-2014 emissions reductions at this time. It is probable that, in actuality, ARB measures will achieve some pre-2014 reductions, and these could also contribute to attainment before 2014.

The District's incentive programs (described in section 6.5) achieve further reductions that, for SIP creditability reasons, are not quantified for attainment. The District still expects that the reductions achieved by these highly successful programs will help ensure attainment of the 1997 PM2.5 standard early and faster progress towards the 2006 PM2.5 standards.

Figure 9-2 Annual PM2.5 Principal Components and Reductions

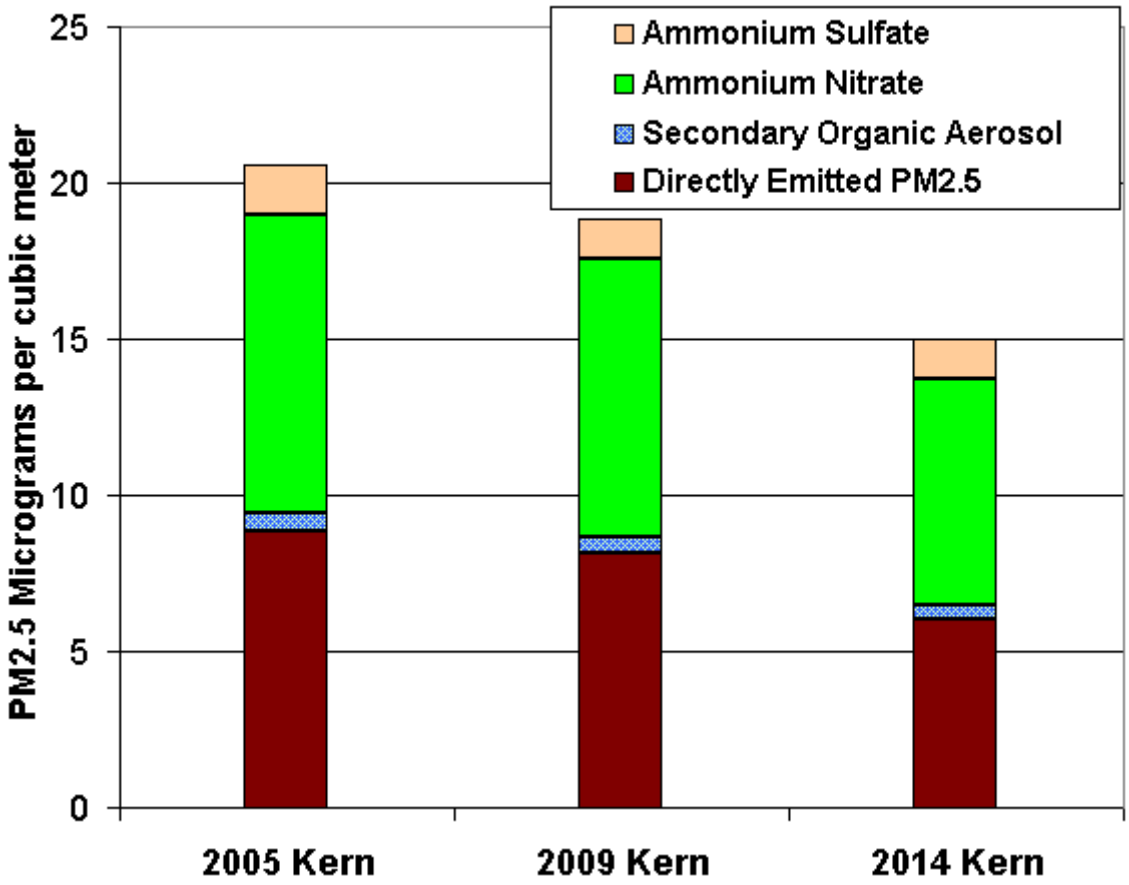

Figure 9-2 provides a graphic display of the improvement that will be provided by the combination of District reduction efforts, with the exception that District incentive reductions that are not yet funded cannot be included per EPA calculation procedures. This figure displays PM2.5 concentrations directly from the receptor model. EPA procedures for the calculation of a future year design value reduce the 2014 projection to 14 micrograms. The combined sources of directly emitted PM2.5 and ammonium nitrate are clearly the two largest segments and have the most significant associated reductions. Ammonium sulfate is not inconsequential and is also addressed by reduction efforts.

9.2 CONTINGENCY MEASURES

9.2.1 Introduction

Contingency measures achieve emission reductions beyond what is needed for the modeled attainment demonstration or the Reasonable Further Progress (RFP) demonstration. Then, if the emission reductions actually achieved are not enough to meet the RFP milestones or the attainment target, contingency measure reductions quickly make up the difference. The discussion of contingency measures in a state implementation plan (SIP) should include a trigger mechanism, an implementation schedule, and an indication that the reductions from the measures were not used to demonstrate RFP or attainment (72 *FR* 20642-20643).

Contingency measures must be fully adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date (72 *FR* 20643). EPA notes that nothing precludes a State from implementing contingency measures before they are triggered (72 *FR* 20643). All available measures needed to demonstrate attainment of the standards must be considered first; all remaining measures should be considered as candidates for contingency measures. EPA also notes, “It is important not to allow contingency measures to counteract the development of an adequate control strategy demonstration” (72 *FR* 20643) and that “The key is that the statute requires that contingency measures provide for additional emission reductions that are not relied on for RFP or attainment and that are not included in the demonstration (72 *FR* 20642).

The 1990 Amendments to the federal Clean Air Act do not specify the number of contingency measures that plans must include nor do they specify the magnitude of emission reductions to be covered by contingency measures. However, in the *PM2.5 Implementation Rule*, EPA **recommends** that the “emissions reductions anticipated by the contingency measures should be equal to approximately 1 year’s worth of emissions reductions necessary to achieve RFP for the area.” (72 *FR* 20643).

A nonattainment area subject to federal contingency measure provisions has two general options for providing emission reductions above and beyond those needed to meet federal requirements for reasonable further progress and for attainment demonstration:

- Option 1: Develop and adopt rules that would only be implemented should an area fail to meet a federal milestone; emission reductions from these rules would go into effect after an area fails to meet a federal milestone.
- Option 2: Determine if rules adopted to meet attainment requirements provide emission reductions above and beyond those required for reasonable further progress, and to use these reductions as contingency reductions since they are above and beyond those needed for meeting federal milestones. The second option is stronger in that the "extra" emission reductions are working year after year for expeditious attainment of the standard, and are not contingent upon failure of a milestone in order to go into effect. Option 2 also reflects EPA's position as given in the *PM2.5 Implementation Rule* (72 *FR* 20642): "The EPA has approved numerous SIPs under this interpretation—i.e., that use as contingency measures one or more Federal or local measures that are in place and provide reductions that are in excess of the reductions required by the attainment demonstration or RFP plan. (62 *FR* 15844, April 3, 1977; 62 *FR* 66279, December 18, 1997; 66 *FR* 30811, June 8, 2001; 66 *FR* 586 and 66 *FR* 634, January 3, 2001.)."

As noted in the *2007 AQMP* prepared by the South Coast Air Quality Management District (SCAQMD 2007), numerous issues affect the implementation of contingency measures. These include availability of District resources to implement and enforce the measure, cost effectiveness of the measure, effectiveness of the measure in reducing the emissions, availability of methods to quantify emission reductions, potential economic impacts, and potential adverse environmental impacts.

Nonattainment areas with significant attainment challenges have developed aggressive and far-reaching emission reduction measures to meet federal Clean Air Act requirements. The result of this "no stone left unturned" policy is that when viable emission reductions are identified, they are implemented in order to bring the area into attainment as expeditiously as practicable. The reductions are usually not held in reserve to be used only if an area fails to meet a milestone. Consequently, the Option 1 contingency measures are not realistic for areas such as the SJVAB and the South Coast Air Basin, which have pervasive ozone and particulate matter attainment challenges. Any feasible approach for reducing emissions that has been identified has been implemented. However, because areas such as these are driven by the need to obtain very large emission reductions to attain the standards, they usually have reductions in excess of those needed to meet reasonable further progress requirements; this consequence makes Option 2 more viable for contingency measure reductions in areas with substantial ozone and PM attainment challenges. Option 2 is also in line with EPA's direction to first develop the control program for attainment and then to use excess reductions as candidates for contingency measures (72 *FR* 20643).

Control measures developed and enhanced by the District since the passage of the 1990 federal Clean Air Act Amendments have become increasingly stringent, leaving little room for "extra" reductions that could be set aside to fulfill general contingency measure requirements. Three recent analyses prepared and adopted by the District to meet federal and state air quality planning requirements demonstrate that the District's control measures often lead the State in terms of stringency of emissions control. First, the analysis of rules affecting emissions of particulate matter and its precursors (including VOC and NOx measures) that was required by Section 39614 of the California Health and Safety Code (also referred to as the Senate Bill 656 analysis) shows that for the 103 control measures identified by ARB as required by this section of the Health and Safety Code, 37 of the District's measures had the best level of emission control statewide, and another 39 District measures were equivalent to the best level of control. The bulk (>92%) of the remaining measures were for source categories not found in the District (SJVAPCD 2005). This analysis shows that the District rules are the most stringent in the State, thus offering little room for further emission reductions. Second, the *RACT SIP Analysis* prepared by District staff to meet federal Clean Air Act planning requirements and adopted by the District Governing Board in August 2006 shows that District rules meet or exceed RACT for all applicable EPA source categories (SJVAPCD 2006). EPA's historic definition of RACT has been the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available, considering technological and economic feasibility (70 *FR* 66016). Third, ARB's analysis of the District's stationary source emission control program in late fall 2007 concluded that the District's control measures are as stringent as any in the state, and lead the state in many source categories (ARB 2007).

9.2.2 Contingency Measures

9.2.2.1 New Commitments

If the Valley fails to meet RFP in 2009 or 2012, or fails to attain the standard by April 2015, the District proposes to request that ARB proceed with accelerating the adoption and/or implementation of any remaining ARB control measures that have not yet been adopted or fully implemented, to the extent feasible. As shown in Chapter 7 of this *2008 PM2.5 Plan*, the state emission control measures proposed by ARB as part of the adopted state strategy do not begin to produce emission reductions until 2014; consequently, the state measures offer no potential to help with PM2.5 RFP milestones for 2009 and 2012. The timing of the state reductions is especially problematic, since about 80% of the NOx emission inventory in the Valley is caused by mobile sources under the control of the State of California. State emission reductions that occur prior to 2014 would go a long way to providing contingency reductions for 2009 and 2012. This request would be done through formal District Governing Board resolution at a regularly-scheduled Governing Board hearing within two months after EPA notification of a failure to meet an RFP milestone.

9.2.2.2 Surplus Reductions from Adopted Measures

9.2.2.2.1 Ozone Nonattainment Fee

In May 2002, the District adopted Rule 3170 (Federally Mandated Ozone Nonattainment Fee) that requires each affected major stationary source in the District to pay a fee, based on emissions, if the District does not attain the national ambient air quality standard for 1-hour ozone by the deadline for its classification. Since the District is classified as extreme nonattainment for the 1-hr ozone NAAQS, the attainment date is November 15, 2010. In its Final Rule implementing the 8-hr ozone standard, EPA indicated that collection of these fees would not be necessary after the June 15, 2005 revocation of the standard. However, in 2007, the D.C. Circuit Court directed EPA to reinstate the nonattainment fee provisions for the 1-hr ozone standard, even though the standard itself was revoked. The District has submitted adopted Rule 3170 through ARB to EPA, though EPA has not yet acted on the rule. Should the Valley fail to attain the 1-hr ozone standard by November 15, 2010, the District, under the current rule, would start assessing fees in May of 2012. The District would use the funds generated by these fees to implement other air pollution control programs identified by the District. Funding would reach District programs in time to help with the 2012 RFP milestone[2] or the 2014 PM2.5 attainment date.

It is important to note that inclusion of Rule 3170 as a contingency measure for PM2.5 does not imply that the District is counting on failing to attain the former 1-hr ozone NAAQS. On the contrary, current monitoring data show that the SJVAB is on track to attain the former 1-hr ozone NAAQS by its statutory attainment date of November 15, 2010. In the unlikely event that the SJVAB does not attain the former 1-hr ozone NAAQS, then emission reductions not used in demonstrating RFP or attainment for PM2.5 would be available in time to meet the federal requirements for PM2.5 contingency measures, and thus would be implemented.

The amount of emission reductions available as PM2.5 contingency from implementation of Rule 3170 is a function of the dollars/ton of the fee (which is tied to the rate of inflation), the number of affected sources, the cost of emission reductions in future years, and other factors. Thus it is premature at present to estimate the emission reductions from this contingency measure for the years 2013 or 2016.

9.2.2.2.2 Incentives

Section 6.5 of this *2008 PM2.5 Plan* identifies substantial incentive-based funding that will be spent by the District to achieve emissions reductions. Most of these emissions reductions were not used in RFP evaluations or attainment demonstrations in this plan, for a variety of reasons.[3] First and foremost is that while reductions from some funding are SIP creditable (e.g., Moyer Program funds), not all of the incentive-based reductions

[2] States failing to meet an RFP milestone generally have one calendar year to implement a remedy to correct the shortfall. So the District would have until December 31, 2013 to implement emission reductions equivalent to the shortfall that led to missing the 2012 RFP milestone.

[3] ARB staff included appropriated Moyer funds in the emission inventory used in this plan. Future Moyer and non-Moyer funds are not reflected in RFP or attainment demonstrations.

are SIP creditable at this time. As noted in a separate resolution adopted by the District Governing Board in April 2007 as part of adoption of the *2007 Ozone Plan*, the District has committed to implement various procedural, record keeping, and reporting requirements to ensure that the all incentive-based reductions achieved by the District meet EPA requirements and guidance for SIP creditability. These incentive program changes are planned to be in place in time for the 2009 and 2012 RFP milestone years for PM2.5, such that emission reductions from the District's substantial incentive funding over this time could be used as contingencies. And regardless of the timing of the incentive program changes, reductions from current programs such as Moyer are SIP-creditable but were not used for RFP or attainment demonstrations in this *2008 PM2.5 Plan*. Likewise, substantial reductions from anticipated funding sources such as Proposition 1B (Section 6.5.3) were also not used, even though they are interpreted to be SIP creditable, primarily because final decisions regarding allocation of these funds by ARB's Board will not occur until later in 2008. Based on information in Tables 6-6 through 6-8, the combination of incentive funds known at this time to be available to the District for possible use as PM2.5 contingency measures would generate about $90 million per year, which provides an estimated 3.6 tpd of NOx emissions each year.[4] After five years, for example, the cumulative reduction would be 18 tpd.

9.2.2.2.3 Excess Reductions

The bulk of the emission reductions needed to attain the standards in this plan are achieved through ARB's on-going mobile source emission control program, which has been very successful in reducing emissions in the Valley and throughout California. The methods used in Chapter 8 to calculate emission reductions needed to meet RFP goals withheld reductions that in turn become excess and thus meet the requirements of PM2.5 contingency measures. For 2009 and 2012, 1% of PM2.5 and 3 % of NOx baseline emissions are being reserved as contingencies; these result in reductions of about 1 tpd of PM2.5 direct and about 17 tpd of NOx. The 2015 mobile source program reductions from ARB are relied upon to meet 2014 contingency requirements.

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[4] This estimate is based on data from the 2007 Ozone Plan, which noted that 1 tpd of permanent NOx emission reductions cost about $25 million.

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