SACRAMENTO METROPOLITAN
AIR QUALITY MANAGEMENT DISTRICT

STAFF REPORT

REVISION TO THE 2009 SACRAMENTO REGIONAL 8-HOUR OZONE ATTAINMENT AND
REASONABLE FURTHER PROGRESS PLAN:
REMOVAL OF CONTROL MEASURES
SMAQMD – 412, IC ENGINES
SMAQMD – 471, ASPHALTIC CONCRETE

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INTRODUCTION

The Sacramento Metropolitan Air Quality Management District (SMAQMD) included control measures SMAQMD – 412, IC Engines and SMAQMD – 471, Asphaltic Concrete in the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (Plan).¹ These measures require NOx reductions for IC engines and asphaltic concrete plants. Since the approval of the Plan by the districts of the Sacramento Federal Nonattainment Area (SFNA) and the California Air Resources Board (CARB), several factors have led Staff to recommend that these control measures be removed from the Plan and re-evaluated at a later time. These factors include:

- Recent impact of the economic downturn in the construction and development industry;
- Reduced emissions and estimated emissions reduction potential from the control measures, which increased the cost effectiveness well beyond other measures.

Staff has evaluated the removal of control measures SMAQMD – 412, IC Engines and SMAQMD – 471, Asphaltic Concrete from the Plan and has concluded that the removal will not change or interfere with the attainment demonstration or reasonable further progress (RFP) demonstration, and does not change the reasonably available control measure (RACM) and contingency measure conclusions.

This staff report will review the anticipated measures and public process to date, and the legal requirements associated with these measures and this action. Then the report will discuss the reasons for removing these measures from the Plan now, and an anticipated schedule for reconsideration.

BACKGROUND

Plan Overview

In January and February of 2009, the Governing Boards of the SFNA districts approved the Plan. The Plan includes the information and analyses to fulfill the federal Clean Air Act (CAA) requirements for demonstrating reasonable further progress and attainment of the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS) in the Sacramento region. In addition, the Plan establishes an updated emissions inventory, provides photochemical modeling results, proposes adoption of control measures to meet CAA RACM requirements, and sets new motor vehicle emission budgets for transportation conformity purposes. The Plan was approved by CARB on March 26, 2009 and submitted to the U.S. Environmental Protection Agency (EPA) on April 17, 2009. The Plan has not yet been approved by the EPA. The Plan includes the following elements:

- Attainment demonstration
- Reasonable further progress demonstration
- Reasonably available control measures
- Emissions inventory

¹ “Sacramento Regional 8-hour Ozone Attainment and Reasonable Further Progress Plan”, EDCAQMD, FRAQMD, PCAPCD, SMAQMD, YSAQMD, March 26, 2009
The two control measures to be revised, SMAQMD – 412 and SMAQMD – 471, and their associated emissions reductions were not included in or relevant in any way to the following Plan elements:

- Emissions inventory
- Motor vehicle emissions budgets
- General conformity
- Photochemical modeling

Control Measure SMAQMD – 412, IC Engines

The Plan’s SMAQMD – 412 control measure would revise Rule 412 that addresses emissions generated by stationary, prime power (non-emergency standby) internal combustion engines. Currently, Rule 412 only applies to ‘major sources’ of NOx. The control measure proposes to expand applicability to engines located at ‘minor sources’. ‘Minor sources’ refers to sources that emit less than 25 tpy of NOx. The emission benefits that were estimated in the plan relied on CARB’s Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Stationary Spark-Ignited Internal Combustion Engines and the limits in Rule 412 for diesel fueled engines.

Internal combustion (IC) engines are used at a wide variety of stationary sources including hospitals, farms, and natural gas fields. Approximately 93% of the permitted engines are emergency standby engines that only operate for maintenance and emergency purposes. These engines provide backup power or operate fire pumps. The other 7% are prime powered engines used intermittently or continuously for non-emergency conditions.

IC engines are typically classified by the method in which the fuel is ignited. Compression-ignited engines use diesel fuel and are typically used as emergency standby engines and in agricultural operations. Spark-ignited engines can use natural gas, propane, gasoline, or other fuels. Typically, natural gas is the most common fuel in prime powered spark ignited engines and most of these engines in Sacramento County are used to compress natural gas from wells. Spark-ignited engines can be further classified as rich or lean burn depending upon the amount of air that is mixed with the fuel before it is ignited. Compliance would be achieved through engine replacements, electrification, upgrading current control device with three-way catalyst or installation of new control device. The Plan estimated 0.0131 tons per day (tpd) NOx emissions reduction at an estimated cost effectiveness of $5.75/lb.

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2 Ibid. Section 5.5 states that the emissions inventory forecasts did not include benefits from measures that had not been adopted by December 31, 2006.
3 Ibid. Appendix F only includes regional reductions from on-road mobile incentive strategy.
4 Ibid. The general conformity inventory listed in Table 12-1 only includes aircraft and ground support emissions that would not be impacted by SMAQMD – 412 or SMAQMD – 471.
5 Ibid. Section 6.3 of Appendix B states that the forecasted emissions used in the modeling accounts for the effects of growth and the effects of adopted emission control rules.
6 Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Stationary Spark-Ignited Internal Combustion Engines (CARB, November 2001)
Control Measure SMAQMD – 471, Asphalitic Concrete

The Plan’s SMAQMD – 471 control measure would control NOx emissions from dryers used to manufacture asphalitic concrete, or hot-mix pavement material. The process involves heating aggregate in a rotary dryer to approximately 300 °F and mixing it with melted asphalt cement refined from petroleum. The emissions reductions may be accomplished by controlling the NOx emissions from burners used to heat the dryer. Compliance would likely be achieved by replacing existing burners with low NOx burners and flue gas recirculation (FGR). The proposed requirements are based on SJVAPCD Rule 4309\(^7\). The Plan estimated 0.1326 tpd NOx emissions reduction with an estimated cost effectiveness of $8.80/lb – 21.15/lb.

LEGAL MANDATES

Clean Air Act Plan Requirements

The District is part of the SFNA, which is designated as a “severe” nonattainment area for the federal 8-hour ozone standard. The federal CAA requires nonattainment areas to prepare and submit to EPA an 8-hour ozone plan that meets specific requirements, including:

- **Attainment demonstration.** Sections 172(c)(1) and 182(c)(2)(A) of the CAA require a demonstration that the plan will provide for attainment of the national ambient air quality standard as expeditiously as practicable by the applicable attainment date. The demonstration must be based on photochemical grid modeling. The attainment date for nonattainment areas classified as “severe” is 2018.

- **Reasonable Further Progress (RFP) demonstration.** Sections 182(c)(2)(B) and (C) require a demonstration that the plan will result in VOC emissions (and/or NOx emissions) reductions from the baseline emissions of an average of at least three percent each year.

- **Reasonably Available Control Measures (RACM).** Section 172(c)(1) of the CAA requires that the plan provide for the implementation of all reasonably available control measures as expeditiously as practicable. EPA’s RACM policy\(^8,9\) indicates that areas should consider all candidate measures that are potentially reasonably available. Areas should consider all reasonably available measures for implementation in light of local circumstances. However, areas need only to adopt measures if they are both economically and technologically feasible and cumulatively will advance the attainment date (by one year or more) or are necessary for RFP.

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\(^7\) Adopted December 15, 2005.

\(^8\) “Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard – Phase 2” (Federal Register, November 29, 2005, p. 71659-71661).

Contingency Measures. Sections 172(c)(9) and 182(c)(9) of the CAA requires plans to include contingency measures which will reduce emissions in the event an area fails to meet Reasonable Further Progress (RFP) milestones or fails to attain by its attainment date.

In February 2009, the districts of the SFNA adopted a plan[^10] to achieve the 1997 federal 8-hour ozone standard by 2018. The plan meets the requirements of the CAA, including an attainment demonstration, RFP, and includes control measures necessary to meet RACM and contingency measure requirements.

**Removal of Control Measures from the Plan**

Section 110(l) of the CAA requires that each revision to a State Implementation Plan be adopted after reasonable notice and public hearing. EPA cannot approve the revision if it would interfere with attainment, reasonable further progress, or any other applicable CAA requirement.

The 2009 plan includes commitments for the District to adopt measures to control emissions of NOx generated from stationary engines (SMAQMD – 412) and asphaltic concrete plants (SMAQMD – 471). The emissions reduction estimate in the plan for SMAQMD – 412 is 0.0131 tons per day of NOx, and for SMAQMD – 471, 0.1326 tons per day of NOx.

Staff is proposing to revise the State Implementation Plan to remove control measures SMAQMD – 412 and SMAQMD – 471 from the 2009 plan. In addition, the other air districts in the Sacramento Region with asphaltic concrete or IC engine commitments may request removal of their commitments. Even if all the districts remove these measures, the revision complies with Clean Air Act Section 110 (l) requirements because:

- The SIP revision will be adopted after 30 day notice and public hearing;
- The SIP revision does not change the attainment demonstration or interfere with attainment or RFP demonstration;
- The SIP revision does not change the RACM conclusions that control measures that are not included in the Plan collectively would not advance the attainment date for the Sacramento region because of the increased cost effectiveness and the insignificant amount of emissions reductions that they may potentially generate;
- The SIP revision has no impact on the contingency measure analysis or our ability to meet the Attainment Demonstration Contingency requirement; and
- The SIP revision does not interfere with any other applicable CAA requirement.

[^10]: Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (ECAQMD, FRAQMD, PCAPCD, SMAQMD, and YSAQMD, March 26, 2009).
Attainment demonstration

The attainment demonstration\(^{11}\) established that a minimum emission reductions target of 12.5% reduction in NO\(_x\) and 3.3% reduction in VOC is needed to meet the 1997 federal 8-hour ozone standard. The attainment demonstration showed that collectively all measures adopted in 2008 achieved this minimum emissions reduction target\(^{12}\). The Plan stated\(^{13}\) that the new control measures are included to meet CAA requirements for RACM. The IC engine and asphaltic concrete control measures were not adopted in 2008 and not relied on to demonstrate attainment. Therefore, they can be removed from the Plan for any or all districts without changing the attainment demonstration or interfering with attainment.

Reasonable Further Progress (RFP)

The RFP demonstration in the Plan shows the SFNA achieves the required 3% emission reduction for milestone years 2011, 2014, 2017, and 2018 without relying on NO\(_x\) and VOC emissions reductions from new federal, state, regional or local control measures\(^{14}\). Therefore, revising the Plan to remove the commitment to adopt IC engine and asphaltic concrete control measures in any or all districts would not affect the RFP demonstration.

Reasonably Available Control Measures (RACM)

Although new control measures adopted after 2008 were not required to demonstrate attainment or RFP, they were included to satisfy the RACM requirement\(^{15}\). Although these measures have a higher cost effectiveness and may not be “economically feasible,” the District has not established a cost effectiveness threshold. Therefore, Staff analyzed whether removing the total potential emissions reductions from the IC engine and asphaltic concrete control measures in the districts with commitments\(^{16}\) (up to 0.2 tpd NO\(_x\) combined) changed the RACM conclusions\(^{17}\). Staff determined that the IC Engine and Asphaltic Concrete, and all other available control measures that are not included in the Plan, collectively would not advance the attainment date or contribute to RFP for the Sacramento region because of the insignificant amount of emissions reductions that they may potentially generate. Therefore, the Plan may be revised to remove the IC engine and asphaltic concrete commitments without changing the conclusion that the Plan meets RACM requirements.

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\(^{11}\) “Sacramento Regional 8-Hour Ozone Attainment Demonstration and Reasonable Further Progress Plan, March 26, 2009.” Table 8-1, Line L, page 8-5

\(^{12}\) Ibid. Table 8-1, Line N

\(^{13}\) Ibid. page 8-2

\(^{14}\) Ibid, Section 13.5, page 13-4, and Table 13-1, Lines 4 and 13 page 13-5.

\(^{15}\) CAA Section 172(c)(1) and Section 181(a)(1), and 40 CFR 51.912(d)


Contingency Measures

Sections 172(c)(9) and 182 (c)(9) require plans to include contingency measures which will reduce emissions in the event an area fails to meet Reasonable Further Progress (RFP) milestones or fails to attain by its attainment date. Federal guidance requires that sufficient contingency measures be identified in the plan to provide for a 3% emission reduction beyond what is needed for the attainment demonstration\textsuperscript{18}. The demonstration that the 3% contingency measure requirement was met and did not include reductions associated with SMAQMD – 412 or SMAQMD – 471. As a result, removal of these measures has no impact on the contingency measure analysis or our ability to meet the Attainment Demonstration Contingency requirement.

Upcoming Ozone Standard Revision

In March 2008, EPA set a new 8-hour ozone standard of 0.075 parts per million (ppm). This standard is currently under reconsideration, and EPA is proposing to revise the standard in the range of 0.060 to 0.070 ppm (75 FR 2938, January 19, 2010). EPA’s current timeline is to finalize the new standard by July 29, 2011 and complete nonattainment area designations by July 29, 2012. If EPA meets these deadlines then the deadline for submitting plans to EPA for attaining the new standard will be in mind-2014.

The District will consider potential measures to achieve the revised 8-hour ozone standard. The IC engine and asphaltic concrete control measures will be re-evaluated at that time.

SUMMARY OF CHANGES

Staff is proposing to amend the 2009 Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan by removing control measures SMAQMD – 412 and SMAQMD – 471. The amendments will include all related changes to the attainment demonstration and RACM analysis. These changes to the Plan are in Chapters 1, 7, and 14, and its Appendices C and H. To clearly show the changes being made, deleted language is shown in strikeout format and new language is underlined.

REASONS FOR REMOVAL

Control Measure SMAQMD – 412, IC Engines

Emissions and Reductions:

The NOx emissions are lower than previously estimated, consequently the reduction potential of the measure is lower than the Plan’s estimate. Several factors have contributed to the decrease in the emissions and the measure’s reduction potential:

\textsuperscript{18} “General Preamble for Implementation of Title 1 of the Clean Air Act Amendments of 1990” (57 FR 13498, April 16, 1992) and SMAQMD 2009, Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan, Sacramento Metropolitan Air Quality Management District, (March 26, 2009, Section 7-21, p7-32).
A survey performed after the Plan was adopted showed many of the permitted engines operate for fewer hours than the proposed low use exemption. These engines would be exempt from the emissions standards; therefore, emissions reductions would be less than those estimated in the control measure.

The survey and permit information indicates that existing rich burn natural gas-fired engines use an add-on emissions control device that almost meets the control measure’s anticipated emission standards. Therefore, these rich burn natural gas-fired engines emit less than the plan estimates and would not achieve anticipated reductions.

Potential Costs:

The survey and permit information indicates that because existing rich burn natural gas-fired engines almost meet the control measure’s anticipated emission standards, the control measure achieves relatively small emission reduction benefits from these engines. A few lean burn natural gas and diesel engines would need to be modified or replaced to meet the control measure’s anticipated control levels. The potential compliance options include replacing the existing engine with an electric motor or a lower emitting spark-ignited engine, or adding an exhaust control device.

EPA typically expects regular monitoring and testing requirement to demonstrate compliance with emissions standards. This adds costs even where the engines already meet the proposed emission standards. Added monitoring and testing costs without corresponding emissions reductions increases the cost effectiveness of the measure.

Collectively, these changes to emissions, emission reduction potential, and costs increases the cost effectiveness of the measure from $5.75 per pound for SMAQMD – 412 to $28 per pound of NOx reduction. This is higher than prior rules adopted by the District to date.

Control Measure SMAQMD-471, Asphalitic Concrete

Emissions and Reductions:

The NOx emissions and reduction potential of the measure are lower than the Plan’s estimate. The Plan used 2002 base year emissions to estimate the emission reductions from the measure. Several factors have contributed to the decrease in the emissions and reduction potential:

- Due to the economic downturn, the decrease in construction activity has resulted in a decrease of nearly 50% in the production of asphaltic concrete in the District from 2002 to 2010. The 22% decrease in production for 2010 compared to 2009 shows that the downturn is not yet showing signs of a reversal.
- There are 5 asphaltic concrete facilities in Sacramento County. One facility switched from diesel fuel in 2004 to lower emission fuel (natural gas) after the facility changed

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20 “Sacramento Regional 8-Hour Ozone Attainment Demonstration and reasonable Further Progress Plan, March 26, 2009.” Appendix C, pC-134.
ownership. The emission factor has been changed from 0.12 lbs NOx/ton of asphalt to 0.025 lbs NOx/ton of asphalt.22

- Two facilities have lower NOx emissions based on recent source tests. The permits were changed to limit the facilities to these lower emission levels23 and increase their maximum annual production rate.
- One facility has installed cleaner equipment that would meet the proposed NOx emission limits24 as part of overall modifications to their facility including the installation of a hot oil heater.

Considered together, the NOx emissions from asphaltic concrete in the Plan year (2018) have been reduced from 0.21 tpd25 to 0.05 tpd and the reduction potential from asphaltic concrete in the Plan year have been reduced from 0.13 tpd25 to 0.014 tpd.

Potential Cost:

The decreased emission reduction potential increases the cost effectiveness from $8.80-$21.15 per pound26 to approximately $80 per pound of NOx reduced.

PUBLIC COMMENTS

Staff held a public workshop to discuss the proposed amendments on July 12, 2011. A public notice was sent to interested parties, including the affected sources, and was posted on the District website. The staff report and Plan revisions were made available for public review at that time.

Staff did not receive any comments at the workshop or at the meetings.

A meeting was held with one facility prior to the workshop and Staff briefed Breathe California and Cleaner Air Partnership on the proposed amendments to the SIP.

ENVIRONMENTAL REVIEW AND COMPLIANCE

The Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (Plan) included new regional and local control measures as part of the Plan. The measures included SMAQMD – 412 and SMAQMD – 471. All measures were evaluated under CEQA to determine whether or not they had the potential to generate adverse environmental impacts. A Final EIR was certified and the Plan was adopted by the SMAQMD Board of Directors on

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23 SMAQMD, “Permit to Operate #20400 and #20412” March 21, 2008 and July 30, 2009.
24 SMAQMD, “Permit to Operate #20866.” March 4, 2008.
25 “Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan, Sacramento Metropolitan Air Quality Management District, March 26, 2009.” Appendix C, pC-125
26 Ibid. pC-125.
January 22, 2009. The Final Environmental Impact Report (FEIR)\textsuperscript{27} filed on January 23, 2009, concluded that the Plan would have no significant adverse environmental impacts.

The District evaluated the removal of measures SMAQMD – 412 and SMAQMD – 471 under CEQA since removal of these measures is a discretionary action undertaken by a public agency\textsuperscript{28}. As discussed in the Plan Overview section of this report, emission reductions associated with this rule were not included or considered in the emissions inventory, motor vehicle emission budgets, general conformity, or photochemical modeling elements of the Plan. In addition, as discussed in the Legal Mandates section, this project does not change or alter the Attainment Demonstration, the Reasonable Further Progress demonstration, the Reasonably Available Control Measures, or Contingency Measures conclusions in the Plan and the Plan EIR. Rather, as discussed in the Plan and FEIR, the additional measures provide a safety margin to insure attainment in the unlikely event that existing proposed measures were not fully adopted or implemented. In addition, the measures were identified as Reasonably Available Control Measures. The RACM analysis identified measures that were not included in the Plan, because when considered individually or collectively they did not advance attainment by a year. When the IC engine and asphaltic concrete measures are considered in conjunction with those previously-excluded measures, the measures still do not advance attainment by a year and therefore are not required to be included in the Plan. The remaining Plan measures, after deletion of SMAQMD – 412 and SMAQMD-417 control measures, still provide an adequate safety margin and still constitute RACM measures. Accordingly, the Plan and FEIR anticipated that all or some of the new measures would not be adopted as noted in the Attainment Demonstration for the Final EIR\textsuperscript{29}. By definition, a margin of safety provides for contingencies, in this case, where the measure is not adopted or achieves fewer reductions than anticipated. Consequently, the possibility that the SMAQMD – 412 and SMAQMD – 471 measures would not be adopted was considered in the Final EIR. This project does not require any changes to the previous EIR and, therefore, the proposed revision to the Plan is exempt from CEQA pursuant to California Code of Regulations Title 14, Chapter 3, Section 15162(a)(1) - Subsequent EIRs and Negative Declarations.

CONCLUSION

The SMAQMD – 412 and SMAQMD – 471 control measures in the Plan would implement District rules requiring replacement or retrofit of engines and burners at asphalt manufacturing facilities. Since the approval of the Plan, several factors have led Staff to recommend removal of these control measures from the 2009 Plan and re-evaluate them at a later time.

The key reasons to remove these control measures from the plan at this time include:
1. **Potential cost impacts:** Implementing control measures 412 and 471 would impose additional costs on owners of IC engines and asphalt plants.

\textsuperscript{27} Final Environmental Impact Report, Sacramento Regional Non-Attainment Area 8-Hour Ozone Attainment and Reasonable Further Progress Plan, State Clearinghouse No. 2006102136, Sacramento Metropolitan Air Quality Management District, December 2008.

\textsuperscript{28} Public Resources Code, State of California 21065(a)

\textsuperscript{29} Final Environmental Impact Report, Sacramento Regional Non-Attainment Area 8-Hour Ozone Attainment and Reasonable Further Progress Plan, State Clearinghouse No. 2006102136, Sacramento Metropolitan Air Quality Management District, December 2008. Section 2.7 – Attainment Demonstration, Page 2-26.
2. **Potential emission reductions**: New information shows decreases in emissions and estimated emissions reductions from both control measures from a total of 0.15 tons per day of NOx to 0.03 tons per day of NOx.

The proposed revision to the State Implementation Plan to remove control measures SMAQMD – 412 and SMAQMD – 471 complies with the CAA because it does not change the attainment demonstration, interfere with attainment, or change the RFP demonstration, and the Plan revision does not change the RACM conclusions that control measures that are not included in the Plan collectively would not advance the attainment date for the Sacramento region because of the insignificant amount of emissions reductions that they may potentially generate, even if all air districts remove their IC engine and asphaltic concrete commitments.

Staff plans to re-consider these control measures as part of its process to evaluate potential strategies to meet future federal health based air quality standards. We anticipate that work to occur in 2014.