

ATTACHMENT B

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**2016 AQMP Reasonably Available Control Technology (RACT) Demonstration**

**May 22, 2014**

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## TABLE OF CONTENTS

INTRODUCTION.....	1
REGULATORY HISTORY.....	1
FACT EVALUATION.....	2
FURTHER EVALUATION.....	3
CONCLUSION.....	4
REFERENCES.....	R-1

## **INTRODUCTION**

The South Coast Air Basin (Basin) is classified as “extreme” and the Coachella Valley located in Riverside County is classified as “severe-15” non-attainment areas with respect to the 2008 8-hour Ozone National Ambient Air Quality Standards (NAAQS). The Clean Air Act requires that areas classified as moderate nonattainment or higher must develop and submit a demonstration that their current air pollution rules fulfill the 8-hour ozone Reasonably Available Control Technology (RACT) Demonstration. The RACT analysis provides a comparison of the SCAQMD rules and regulations governing emissions to those established by the U.S. EPA guidance and representative agencies within California and elsewhere throughout the U.S. The purpose of the RACT analysis is to review and where applicable update an agency’s toolkit to advance emissions controls to meet the current state of the science. The RACT State Implementation Plan (SIP) must be submitted by CARB to the U.S. EPA by July 20, 2014.

## **REGULATORY HISTORY**

RACT analyses were incorporated as components of the 2007 and 2012 Air Quality Management Plan (AQMP) Reasonably Available Control Measures (RACM)/RACT Demonstrations submitted to the U.S. EPA for inclusion of the California SIP. The 2007 demonstration was a comprehensive analysis conducted to identify and select control measures to reduce ozone and particulate precursor NO<sub>x</sub>, VOC, SO<sub>x</sub> and particulate emissions (to meet the 8-hour ozone and annual PM<sub>2.5</sub> standards). The 2012 analysis focused primarily on precursors of PM<sub>2.5</sub> including NO<sub>x</sub>, VOC and SO<sub>x</sub> (to attain the 24-hour average PM<sub>2.5</sub> standard). Staff studied more than 100 rules and regulations, and 100 control measures developed in the 2007-2012 timeframe by other nonattainment air districts in the nation. The demonstrations concluded that the SCAQMD’s rules and regulations were in general equivalent to, or more stringent than other districts’ rules and regulations (RACT) and their proposed control measures in their respective SIPs (RACM).

The 2007 and 2012 RACM/RACT demonstrations documents are included in the 2007 AQMP (Table 3 of the 2007 AQMP “Appendix VI: Reasonably Available Control Measures (RACM) Demonstration”) and the 2012 AQMP (Tables VI-3, VI-4 and VI-5 of the 2012 AQMP “Appendix VI: Reasonably Available Control Measures (RACM) Demonstration”) and they are available from the SCAQMD website at the links below:

### **2007 AQMP**

<http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/2007-air-quality-management-plan>

### **2012 AQMP**

<http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan>

## **RACT EVALUATION**

The 2016 AQMP RACT Demonstration analysis provides an update to the corresponding analyses discussed above. In conducting the review, staff worked closely with the U.S. EPA adhering to the provided criteria and guidance. Since the 2012 AQMP submittal, the U.S. EPA has not issued new Control Technique Guidelines (CTG) for VOC sources and Alternative Control Techniques (ACTs) documents for VOC and NOx sources. Regardless, the 2016 AQMP RACT analysis evaluated more than 30 rules recently developed and / or amended by other ozone nonattainment air districts from September 2012 to March 2014 (Table 1). The air districts in California included:

- Bay Area Air Quality Management District (BAAQMD)
- San Joaquin Valley Air Pollution Control District (SJVAPCD)
- Sacramento Metro Air Quality Management District (SMAQMD)
- Mojave Desert Air Quality Management District (MDAQMD)
- Antelope Valley Air Quality Management District (AVAQMD)
- Ventura County Air Pollution Control District (VCAPCD)

and state agencies for ozone impacted:

- Texas
- Maryland
- Delaware

The evaluation indicates that SCAQMD rules and regulation closely matched those of the other agencies, and only eight SCAQMD rules covering six source categories were identified for further evaluation. Table 2 is formatted to compliment the comparison summaries presented in the 2007 and 2012 AQMP RACM analyses. A brief description of the issues requiring further evaluation follows.

First, SCAQMD Rule 223 applies to large confined animal facilities while the companion SJVAPCD Rule 4570 has lower thresholds for regulation of dairy and poultry (chicken and duck) facilities. Rule 4570 specifies mandatory measures, and it has livestock feeding time restrictions based on a local feeding practice (wet feed) which is not employed in the Basin where dry feed is used. The primary difference between the rules focuses on the limitation placed on feeding times where the wet feed practice is restricted to two hours duration due to the composition of the feed. SCAQMD Rule 223 has a 48-hour time limit on the dry feeding application. More detailed evaluation will be conducted as part of the 2016 AQMP control measure development to determine the applicability of such feeding time restriction on District's sources, and the extension of rule applicability to certain livestock categories using a lower size threshold.

Second, BAAQMD (Reg. 8, Rule 33) VOC limit for gasoline bulk terminal and cargo tank operations was found to be more restrictive than the companion SCAQMD Rule 462. BAAQMD Rule 33 establishes an emission limit of 0.04 lbs per 1000 gallons of organic liquid loaded while the SCAQMD Rule 462 has 0.08 lbs per 1000 gallons limit. However, the compliance test protocol needs to be further compared to determine the applicability of the emissions limit to the District sources.

Rule 71.5 of VCAPCD regulates VOC emissions from glycol dehydrators in natural gas dehydration. VOC emissions from glycol dehydration system need to be evaluated to determine if existing SCAQMD Rule 1148.1 and Rule 1173 already cover these emissions.

SCAQMD Rule 1130 regarding flexographic specialty ink for facilities emitting more than 10 tons per year (tpy) is more restrictive than companion AVAPCD Rule 1130. For facilities that emit less than 10 tons per year and that use less than 2 gallons per day and less than 120 gallons per year, Antelope Valley Rule 1130 has a more restrictive VOC content limit of flexographic specialty ink for flexible package printing (383 g/l) than SCAQMD Rule 1130 (460 g/l for metallic ink and 535 g/l for matte finish ink for no more than 125 gallons per year and 2 gallons per day). The SCAQMD inventory records indicate that the emission reduction potential for this category to be *de minimis* based on the number of affected facilities (0.006 tons per day (TPD) for all permitted flexographic printing operations in the District). Nevertheless, SCAQMD will analyze the viability of creating a new sub-category.

SJVAPCD Rule 4311 regulates flares emitting greater than 10 tpy of VOC or NOx regardless of source category with the exemption of municipal solid waste landfills. SCAQMD Rules 1118 and 1150.1 cover flare emissions (including NOx and VOC) from refineries, sulfur recovery plants, hydrogen production plants, and landfills. Potential flare emissions from other District sources need to be evaluated to determine the local applicability of the SJVAPCD Rule 4311.

Finally, NOx emission rate limits for cement kilns in the Basin are slightly higher (2.73 vs. 2.3 lbs/ton of clinker) when comparing SCAQMD Best Available Retrofit Control Technology level in Rule 2002 with the BAAQMD Reg. 9, Rule 13. It should be noted that the SCAQMD averaging time for the NOx limit is one year using a continuous emission monitoring system while BAAQMD is 30 days. SCAQMD will assess the feasibility of reducing NOx emissions from cement kilns through the Regional Clean Air Incentives Market program that proposed amendments are underway.

## **FUTURE EVALUATION**

While no new CTG has been issued since the 2012 AQMP submittal, U.S. EPA staff has suggested that the SCAQMD look into the recent developments of warm mix asphalt (WMA) technologies. WMA allows the mixing and placement of asphalt mix at

temperature about 35 to 100°F lower than conventional hot mix asphalt (HMA), resulting in a reduction of fuel consumption, as well as reduced emissions from the manufacturing plant and at the location where the asphalt is laid. In a white paper developed by the SCAQMD in 2008, staff concluded that lower-energy warm mix asphalt technologies were promising in reducing energy use and reduction in air emissions; despite the fact that mix and structural design, material processing requirements, construction procedures, and quality control specifications were not yet finalized to date.

WMA has been increasingly used in the United States. Caltrans promotes the use of WMA because of its many improvements over HMA. WMA suppliers reported 19-50% VOCs reduction and 60-70% NOx reduction in plant emissions in Europe, although increased emissions of VOCs and CO were observed in the United States. The University of California Pavement Research Center measured VOCs and semi-volatile organic compounds emission of WMA and HMA at the pavement surface during construction. Results showed that depending on the mix type and the temperature inside the chamber, TOC emission flux of WMA could be higher or lower than HMA. Based on current information, the emission reduction of WMA technology is highly uncertain. Therefore, staff suggests further evaluation of the emission reduction and cost-effectiveness for WMA technology as part of the 2016 control measure development.

## CONCLUSION

Overall, for the 2016 AQMP RACT Demonstration, SCAQMD makes the following findings:

1. SCAQMD's current rules, in large part, meet the U.S. EPA's criteria for RACT acceptability and inclusion in the SIP.
2. SCAQMD commits to further evaluate the six categories identified above for potential emission reductions as part of the 2016 AQMP control development.

**Table 1**  
Rules Evaluated for RACT Demonstration

Air District/State/Agency	Rule Number/Title
San Joaquin Valley Air Pollution Control District	Rule 4308 (Boilers, Steam Generators, and Process Heaters); Rule 4311 (Flares); Rule 4570 (Confined Animal Facilities); Rule 4605 (Aerospace Assembly and Component Coating); Rule 4621 (Gasoline Transfer into Motor Vehicle); Rule 4622 (Gasoline Transfer into Stationary Storage Containers); Rule 4702 (Internal Combustion Engines); and Rule 9610 (SIP Credit for Emission Reductions)
Ventura County Air Pollution Control District	Rule 54 (Sulfur Compounds); Rule 71.5 (Glycol Dehydrators); Rule 74.11.1 (Large Water Heaters and Small Boilers); Rule 74.13 (Aerospace Assembly and Component Manufacturing); Rule 74.15.1 (Boilers, Steam Generators and Process Heaters); Rule 74.19 (Graphic Arts); Rule 74.20 (Adhesives and Sealants); Rule 74.24 (Marine Coatings); and Rule 74.31 (Metalworking Fluids and Direct-contact Lubricants)
Bay Area Air Quality Management District	Reg. 2, Rule 4 (Emissions Banking); Reg. 3 (Fees); Reg. 5 (Open Burning); Reg. 6, Rule 4 (Metal Recycling and Shredding Operations); Reg. 8, Rule 33 (Gasoline Bulk Terminals and Gasoline Delivery Vehicles); Reg. 9, Rule 10 (Boilers, Steam Generators and Process Heaters in Petroleum Refineries); Reg. 9, Rule 13 (Portland Cement Manufacturing); and Reg. 12, Rule 13 (Foundry and Forging Operations)
Sacramento Metro Air Quality Management District	Rule 107 (Alternative Compliance); Rule 205 (Community Bank and Priority Reserve Bank); Rule 301 (Permit Fees); and Rule 306 (Air Toxics Fees)
Antelope Valley Air Quality Management District	Rule 1113 (Architectural Coatings) and Rule 1130 (Graphic Arts)
Texas Commission on Environmental Quality	Rule 101b (Failure to Attain Fee); Rule 101h (Emission Banking and Trading); Rule 106e (Aggregate and Pavement); Rule 106o (Oil and Gas); Rule 111b (Outdoor Burning); Rule 113c (National Emission Standards for Hazardous Air Pollutants); Rule 114b (Motor Vehicle Anti-tampering); Rule 114c (Vehicle Inspection and Maintenance); Rule 115e (Surface Coating Processes); and Rule 117d (Minor Sources)
Delaware Department of Natural Resources and Environment Control	Reg. 1138, Section 6.0 (Chromium Electroplating and Anodizing Tanks); Reg. 1138, Section 10.0 (Plating and Polishing Operations); and Reg. 1138, Section 17.0 (Prepared Feeds Manufacturing Facilities)



**Table 2**  
**Evaluation of SCAQMD Rules and Regulations**

RULE	TYPE	RULE TITLE	CURRENT REQUIREMENTS	OTHER DISTRICTS' 2012-2014 RULES	EVALUATION (2016 AQMP RACT)
223	VOC	Emission Reduction Permits for Large Confined Animal Facilities (Adopted 6/2/06)	Rule 223 applies to large confined animal facilities (CAF). It requires owners/operations to obtain a permit describing the control measures the facility chooses to implement from a list of mitigation measure requirements. Administrative requirements such as recordkeeping and noticing are also needed.	San Joaquin Valley Rule 4570 (Amended 10/21/10) regulates large CAF while using a lower applicability threshold for dairy (500 milking cows) and poultry (400,000 for both chicken and duck) facilities, and it has more stringent requirements in the following areas: <ul style="list-style-type: none"> <li>• Timeframe for feeding total mixed rations in the dairy feed menu is 2 hours</li> <li>• Specify both mandatory and optional mitigation measure.</li> </ul>	Southern California dairy industries generally use dry lot dairies, in comparison with the common practice of feeding wet corn silage in the Central Valley. The more stringent feeding requirement in Rule 4570 may not be applicable at SCAQMD. More detailed evaluation will be conducted as part of the 2016 AQMP control measure development to determine the applicability of such feeding time restriction on District's sources, and the extension of the rule applicability to dairies and certain poultry facilities using a lower size threshold. SCAQMD staff will continue to reach out and solicit input from potentially impacted stakeholders and assess the feasibility of reducing emissions in future rule making.
462	VOC	Organic Liquid Loading (Amended 5/14/99)	Limit in Rule 462 is 0.08 lbs per 1000 gallons of liquid loaded for Class A facility loading of 20,000 gallons or more. This limit is not applicable to small facilities (Class B and C).	Bay Area, Regulation 8, Rule 33 (Amended 4/15/09) has a limit of 0.04 lbs per 1000 gallons of liquid loaded and requires stringent monitoring requirements.	SCAQMD staff will compare compliance test protocols to determine applicability to our emission sources. SCAQMD staff will continue to assess the feasibility of reducing the VOC limits as part of the 2016 AQMP control measure development.
1118 1150.1	NOx, VOC	Control of Emissions from Refinery Flares (Amended 11/4/05)	<ul style="list-style-type: none"> <li>• Minimize flare emissions &amp; require smokeless operations</li> <li>• Specify SO<sub>2</sub> gradually decreasing performance target to less than 0.5 tons per million barrels of crude by 2012.</li> <li>• If the performance target is exceeded, the operator must 1) pay mitigation fee; or 2) submit a Flare Mitigation Plan to reduce emissions</li> <li>• Require Cause Analysis for event exceeding 100 lbs VOC, 500 lbs of SO<sub>2</sub>, or 500,000 scfm of vent gas, excluding planned shutdown, startup and turnarounds</li> <li>• Require 160 ppmv H<sub>2</sub>S, 3 hour average by 1/1/2009, and no limits for NOx, VOC, PM and CO.</li> </ul>	San Joaquin Valley Rule 4311 (Amended 6/18/09) has VOC/NOx limits for ground-level enclosed flares; SO <sub>2</sub> Targets (1.50 tons/million barrels of crude by 2011, and 0.5 tons/million barrels by 2017); Flare Minimization Plan for refinery flares more than 5 mmbtu/hr; and operational requirements for all flares that have potential to emit more than 10 tons/yr VOC and more than 10 tons/yr of NOx.	SCAQMD Rule 1150.1 covers flare emissions from active landfills, and SCAQMD Rule 1118 also applies to hydrogen production and sulfur recovery facilities. It should be noted that the SJVAPCD Rule 4311 exempts emergency use of flares. SCAQMD staff will evaluate flare emissions from sources other than refineries, hydrogen production, sulfur recovery facilities and landfills for potential controls.

**Table 2**  
**Evaluation of SCAQMD Rules and Regulations (continued)**

RULE	TYPE	RULE TITLE	CURRENT REQUIREMENTS	OTHER DISTRICTS' 2012-2014 RULES	EVALUATION (2016 AQMP RACT)
1130	VOC	Graphic Arts (Amended 5/2/14)	Rule 1130 allows for higher VOC content for matte (535 g/l) and metallic flexographic inks (460 g/l) used on non-porous substrates for facilities that emit less than 10 tons per year and that use less than 2 gallons per day and less than 125 gallons per year of the specified ink.	For facilities that emit less than 10 tons per year and that use less than 2 gallons per day and less than 120 gallons per year of the specified ink, Antelope Valley Rule 1130 allows for higher VOC content for matte (535 g/l) and metallic flexographic (460 g/l) inks used on non-porous substrates, and the VOC content limit is 383 g/l for metallic ink and matte finish ink applied on flexible package printing.	SCAQMD Rule 1130 has been amended, pursuant to U.S. EPA CTG. It is in general equivalent to, or more stringent than the companion rule in Antelope Valley except for facilities that emit less than 10 tons per year and that use less than 2 gallons per day and less than 120 gallons per year (125 gallons per year for SCAQMD) of flexographic specialty ink. Antelope Valley Rule 1130 has a more restrictive VOC content limit of metallic and matte finish ink for flexible package printing (383 g/l) than SCAQMD Rule 1130 (460 g/l for metallic ink and 535 g/l for matte finish ink). The SCAQMD inventory records indicate that the emission reduction potential for this category to be <i>de minimis</i> based on the number of affected facilities, but staff will continue to assess the feasibility of reducing the VOC limits as part of the 2016 AQMP control measure development.
1148.1 1173	VOC	Oil and Gas Production Wells (Adopted 3/5/04)	Rule 1148.1 controls VOC emissions from wellheads, well cellars and untreated produced gas at oil and gas production operations. This rule requires concentration of total organic compounds to be ≤ 500 ppm in well cellar, and other good management practices for the storage and transfer of organic liquids. Emissions of produced gas shall be collected and controlled by: (A) A system handling gas for fuel, sale, or underground injection; or (B) A device with a VOC vapor removal efficiency demonstrated to be at least 95% by weight or by demonstrating an outlet VOC concentration of 50 ppm.	Rule 71.5 of Ventura County (Adopted 12/13/94) controls VOC emissions from glycol dehydrators used in natural gas dehydration through: (A) Condenser/vapor disposal; or (B) Flare/incinerator; or (C) Emission control system that controls glycol regenerator vent VOC emissions by at least 95%.	SCAQMD has no current rule specifically regulating glycol dehydrators. Emissions from glycol dehydrators are regulated through Rules 1148.1 (Oil and Gas Production Wells) and 1173 (Leaks from Petroleum Facilities). SCAQMD staff will evaluate VOC emissions from glycol dehydration system.

**Table 2**  
**Evaluation of SCAQMD Rules and Regulations (continued)**

RULE	TYPE	RULE TITLE	CURRENT REQUIREMENTS	OTHER DISTRICTS' 2012-2014 RULES	EVALUATION (2016 AQMP RACT)
2002	NOx	Allocations for Oxides of Nitrogen and Oxides (NOx) of Sulfur (Amended 11/5/10)	The current best available retrofit control technology (BARCT) is 2.73 lbs/tons of clinker.	<p>Bay Area Regulation 9, Rule 13 (Adopted 9/17/12) limits the emissions of nitrogen oxides, particulate matter, and toxic air contaminants from the manufacture of Portland cement:</p> <ul style="list-style-type: none"> <li>•The 30-operating day rolling average of nitrogen oxides emissions from the kiln shall not exceed 2.3 pounds per ton of clinker produced;</li> <li>•The 30-operating day rolling average of total hydrocarbon emissions from the kiln shall not exceed 24 ppmv, dry at 7 percent oxygen; or as an alternative, provided the provisions of Section 9-13-403 have been completed, the 30-operating day rolling average of total organic Hazardous Air Pollutants (HAP) emissions from the kiln shall not exceed 12 ppmv, dry at 7 percent oxygen.</li> </ul>	<p>SCAQMD plans to reduce cement kiln emissions through the SCAQMD's Control Measure CMB-01 - Further Reductions from NOx RECLAIM. Current rulemaking proposes to lower the current BARCT limit of 2.73 lbs/tons of clinker. The proposed amendment to the NOx RECLAIM is currently underway.</p>

**REFERENCES**

## REFERENCES

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