

**SACRAMENTO METROPOLITAN
AIR QUALITY MANAGEMENT DISTRICT**

2003 TRIENNIAL REPORT

APPENDIX A

**DESCRIPTION OF PROPOSED 2003 TRIENNIAL
“ALL FEASIBLE MEASURES”**

APRIL 2005

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Description of SMAQMD “Committed – All Feasible Measures”

Note that the following District control measure and program commitments are described and evaluated in terms of the following main topics:

- Control Measure Description
- Targeted Emission Categories and Inventory
- Emission Reductions
- Cost Effectiveness
- Evaluation Criteria regarding characterizing emission reductions in terms of Real, Quantifiable, Permanent, Enforceable, and Surplus
- Implementation
- Needed Resources and Authority
- Overall Feasibility
- References

CONTROL MEASURE NUMBER: Rule 460

Control Measure Title: Adhesives and Sealants

Evaluating Firm: SMAQMD

Control Measure Description

Adhesives are used to bond one surface to another by attachment. A variety of adhesives are available for applications including, but not limited to, architectural applications such as carpet, flooring, and roofing, as well as adhesives for plastic, tires, traffic marking tape, metal, fiberglass, and marine applications. Contact adhesives, for example, provide a quick bond between two surfaces by applying pressure without requiring fastening. Large quantities of adhesives are used in manufacturing furniture, automotive industry, and in the construction industry.

Sealants have adhesive properties and are generally used to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces. They are used heavily in the construction industry.

Targeted EIC Categories and Inventory

2006

District	EIC codes	Description	Non-Attainment Inventory					
			NOx (tpd)	VOC/ ROG (tpd)	PM10 (tpd)	PM2.5 (tpd)	SOx (tpd)	CO (tpd)
SAC	25029282000000	Adhesives And Sealants (Unspecified)	--	0.036	--	--	--	--
SAC	25029282020000	Adhesives And Sealant Organic Solvent Based	--	0.127	--	--	--	--
SAC	25029282500000	Adhesives And Sealants Water Based	--	0.260	--	--	--	--
TOTAL				0.423				

Emission Reductions

Based on information contained in South Coast AQMD's staff report for the May 2000 revision of Rule 1168, emission reductions may be expected primarily in the organic solvent-based adhesive categories, and approximately 80% of that inventory could be affected by lower VOC limits. South Coast estimates show a 90% VOC reduction in the affected categories; since some of the lower VOC limits are already in place, 50% reduction is assumed. The inventory for water-based adhesives and sealants is not expected to change. Where there is an EIC code for unspecified adhesives and sealants, it is assumed that 50% of these emissions are solvent-based and subject to reduction. Based on these assumptions the estimated percent control by EIC would be:

Unspecified = (50% solvent based)(80% emissions affected)(50% control) = 20%
 Solvent Based = (80% emissions affected)(50% control) = 40%

2006

District	EIC codes	NO _x		VOC or ROG		PM10		PM2.5		SO _x		CO	
		Tpd	%	Tpd	%	Tpd	%	Tpd	%	Tpd	%	Tpd	%
SAC	25029282000000	-	-	0.007	20	-	-	-	-	-	-	-	-
SAC	25029282020000	-	-	0.051	40	-	-	-	-	-	-	-	-
SAC	25029282500000	-	-	-	-	-	-	-	-	-	-	-	-
Total		-	-	0.06	14	-	-	-	-	-	-	-	-

Timeframe and Cost Effectiveness

Cost estimates are based on information from the South Coast AQMD May 2000 staff report for rule 1168.

	2005	2007	2010
		X	X
Pollutant	Cost Effectiveness (\$/ton)		
NO _x	\$ n/a	\$n/a	\$n/a
ROG	\$ n/a	\$373	\$373
NO _x + ROG	\$ n/a	\$373	\$373

Evaluation Criteria

Criterion	Justification
Real	VOC emissions from adhesives and sealants are quantified in the emission inventories. Control levels include rules already in place. Requiring the use of lower-VOC-content products will result in lower emissions as these products replace their predecessors.
Quantifiable	Emission reductions resulting from the use of lower-VOC products are quantified by comparing VOC content of products that are phased out with the VOC content of newer products for equivalent usage quantities.
Permanent	Promulgation of District rules limiting VOC content will prevent the re-introduction of higher VOC content products, resulting in permanent emission reductions.
Enforceable	VOC content will be clearly marked on products, recorded by permitted users, and able to be calculated by a District if necessary.
Surplus	Emissions from adhesives and sealants can be reduced by requiring the use of lower-VOC products, which produce the same results in use as the higher VOC counterparts.

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Air District	California Health and Safety Code, Clean Air Act

Legislative Needs	No legislative changes would be required
Funding Needs and Sources	Funding requirements limited to those associated with rulemaking and enforcement efforts
Implementation Location	Affected locale includes Sacramento County

Needed Resources and Authority

Implementation of this control measure requires rulemaking efforts from the district. This is within the district's authority and subject to the approval of the governing board.

Barriers	Opportunities
Rulemaking effort required	Emission reductions available
Costs associated with lower-VOC products	Reasonable cost-effectiveness

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	4	The reduction for Sacramento County would be 0.06 tpd.
Cost Effectiveness	1	Products available and require little additional capital investment
Public Acceptability	2-3	Primarily acceptable; some suggested limits may create public input
Implementation/ Enforcement	2-3	Rulemaking authority exists
Technical Feasibility	2	Many of the lower South Coast limits have been in place since 2000

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0-\$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001-\$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001-\$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001-\$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. South Coast AQMD Rule 1168
2. May 2000 Staff Report supporting amendments to South Coast AQMD Rule 1168
3. San Joaquin Valley UAPCD Rule 4653
4. 1999 Amendment to the 1997 Ozone SIP Revision for the South Coast Air Basin
5. South Coast AQMD 2003 Draft Air Quality Management Plan
6. San Joaquin 2001 Amendment to the 1994 Ozone ADP
7. San Joaquin 2002 and 2005 Rate of Progress Plan

CONTROL MEASURE NUMBER: Rule 411

Control Measure Title: Boilers, Steam Generators, and Process Heaters/Space Heaters
Evaluating Firm: SMAQMD

Control Measure Description

Boilers and steam generators are used to provide steam and hot water for many applications such as space heating, food processing, laundry, and for manufacturing process. Process heaters are used in manufacturing processes where heat is part of the manufacturing. The equipment can be fired on gaseous, liquid and solid fuels. NOx and CO emissions are the main pollutants resulting from the combustion process. Other pollutants such as SOx, PM10, and ROG also result from the combustion process.

SJUAPCD adopted amendments to their boiler regulation in September 2003 that reduced the NOx limit for the greater than 5 mmBTU/hr boilers. SCAQMD and VCAPCD have had low NOx requirements in place for a number of years for the less than 5 mmbtu/hr boilers. Based on these rules, the proposed control measure for NOx emission reductions is requiring boilers and process heaters which operate more than a specified fuel usage rated at or greater than 5 mmBtu/hr and less than 20 mmBtu/hr to meet a 15 ppm NOx emissions limit and requiring boilers greater than or equal to 20 mmBtu/hr input to meet a 9 ppm NOx emissions limit. The measure will also require boilers from 1 – 5 mmbtu/hr which operate more than a specified fuel usage to meet a 30 ppm NOx emission limit. Boilers installed after the date of amendment would have to meet their specified limit regardless of their fuel usage.

Targeted EIC Categories and Inventory

2006

EIC codes	Description	Fuel	NOx (tpd)	VOC/ROG (tpd)	PM10 (tpd)	PM2.5 (tpd)	SOx (tpd)	CO (tpd)
1000501100000	electric utilities - boilers	natural gas	0.001	0.001	0.001	0.001	0	0.002
5000501100000	manufacturing and industrial - boilers	natural gas	0.026	0.002	0.006	0.006	0	0.014
5000501240000	manufacturing and industrial - boilers	propane	0.001	0	0	0	0	0
5001001240000	manufacturing and industrial – process heaters	natural gas	0.009	0	0.001	0.001	0	0.003
5200501100000	food and agricultural processing - boilers	natural gas	0.018	0.001	0.004	0.004	0	0.01
5201001100000	food and agricultural processing - process heaters	natural gas	0.002	0	0	0	0	0
6000501100000	service and commercial - boilers	natural gas	0.050	0.003	0.01	0.01	0.001	0.025
6000501420000	service and commercial - boilers	landfill gas	0.005	0.001	0.002	0.002	0	0
6099501100000	Other – Service & Commercial – Natural Gas	Natural Gas	0.533	0.102	0.215	0.215	0.003	0.538

EIC codes	Description	Fuel	NOx (tpd)	VOC/ROG (tpd)	PM10 (tpd)	PM2.5 (tpd)	SOx (tpd)	CO (tpd)
6099501200000	service and commercial - other	liquefied petroleum gas (lpg)	0.042	0.002	0.002	0.002	0	0.009
Total			0.687	0.112	0.241	0.241	0.004	0.601

Emission Reduction

The NOx emission reduction were calculated assuming that there would be a control efficiency of 64% for the 1-5 mmbtu/hr boilers, a 50% for 5 – 20 mmbtu/hr boilers, and a 70% for greater than 20 mmbtu/hr. In estimating the potential emission reductions, it will be assumed that the lowest percent control will apply. It is assumed that the measure would affect 25% of the emissions in each category.

2006

EIC codes		NOx	NOx	Inventory	Reductions
		Tpd	%	Affected %	Tpd
1000501100000	electric utilities – boilers- natural gas	0.001	50%	25%	0.000
5000501100000	manufacturing and industrial – boilers -natural gas	0.026	50%	25%	0.003
5000501240000	manufacturing and industrial – boilers -propane	0.001	50%	25%	0.000
5001001100000	manufacturing and industrial – boilers -natural gas	0.009	50%	25%	0.001
5200501100000	food and agricultural processing – boilers -natural gas	0.018	50%	25%	0.003
5201001100000	food and agricultural processing - process heaters -natural gas	0.002	50%	25%	0.000
6000501100000	service and commercial – boilers - natural gas	0.050	50%	25%	0.006
6000501420000	service and commercial – boilers - landfill gas	0.005	50%	25%	0.001
6099501100000	Other – Service & Commercial – Natural Gas	0.533	50%	25%	0.067
6099501200000	service and commercial – other-liquefied petroleum gas (lpg)	0.042	50%	25%	0.005
TOTAL		0.687			0.086

Cost Effectiveness

The cost effectiveness listed below are only estimates since the retrofit or replacement cost varies depending on the size of the boiler and the annual capacity factor (percent of annual rated capacity the boiler is operated). The cost effectiveness is high for boilers that generally have low annual capacity factors. The larger boilers have low cost effectiveness values since these units tend to operate more, which makes the retrofit more cost effective. The total cost for this control measure will be based on the total number of boilers in all districts and the size of these boilers.

	2005	2007	2010
	X		
Pollutant	Cost Effectiveness (\$/ton)		
NO _x	\$12,664 - \$ 40,000	\$12,664 - \$ 40,000	\$12,664 - \$40,000
ROG	NA	NA	NA
NO _x + ROG	\$12,664 - \$ 40,000	\$12,664 - \$40,000	\$12,664 - \$40,000

Evaluation Criteria

Criterion	Justification
Real	Actual emissions of NO _x are decreased by retrofitting the existing boilers and process heaters or replacing them with ones that have lower NO _x emission levels.
Quantifiable	Emission reduction can be quantified based on annual emission inventory data that shows fuel usage for the boilers and process heaters.
Permanent	Emission reductions continue as long as boiler or the process heater is operated properly.
Enforceable	NO _x emission limits are enforceable through district rules and permit conditions.
Surplus	Reductions are surplus to existing requirements.

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Air District	California Health and Safety Code, Clean Air Act

Needed Resources and Authority

Districts have the needed authority per the California Health and Safety Codes to adopt regulations to reduce NO_x and VOC emissions.

Legislative Needs	Not needed
Funding Needs and Sources	Rule development and Implementation.
Implementation Location	Sacramento County

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	2-3	
Cost Effectiveness	2-4	Cost effectiveness is high for low usage boilers
Public Acceptability	2-4	High costs may be opposed for some facilities.
Implementation/ Enforcement	2	
Technical Feasibility	1-3	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0-\$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001-\$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001-\$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001-\$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. Cost data for boiler replacement/retrofit provided by RF MacDonald.
2. Cost data for boiler replacement/retrofit provided by Clyde Equipment Company, Inc.
3. SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT, FINAL DRAFT STAFF REPORT, Proposed Amendments to: Rule 4305 (Boilers, Steam Generators, and Process Heaters - Phase 2) and Rule 4351 (Boilers, Steam Generators, and Process Heaters - Phase 1) and New Rule 4306 (Boilers, Steam Generators, and Process Heaters - Phase 3), Appendices B and C, July 17, 2003.
4. Ventura County Air Pollution Control District, Final Staff Report, Rule 74.15.1, Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, May 1993.
5. South Coast Air Quality Management District, Final Staff Report, Proposed Rule 1146.2, Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers, December 12, 1997.

CONTROL MEASURE NUMBER: Rules 454/466

Control Measure Title: Degreasing Operations/Solvent Cleaning

Evaluating Firm: SMAQMD

Control Measure Description

Degreasing and solvent cleaning operations are performed by many commercial and industrial facilities. Solvents are used for surface preparation for further processing and cleaning after manufacturing. Degreasing is widely used by automotive repair and maintenance facilities and by other types of commercial and manufacturing facilities. Solvent are also used by coating operations for cleaning of coating application equipment such as spray guns, brushes, etc.

This measure proposes to further lower the 50 grams per liter standard in Rule 454/466 to the VOC limit of 25 grams per liter for materials used in general cleaning and degreasing operations similar to the limits recently adopted by the South Coast District, which has 2007 for the forecasted implementation year. Other coating rules with specific cleaning/surface prep limits may also be changed (e.g. Rule 450 – Graphic Arts).

The rulemaking for this measure won't occur until 2006 so that the technology assessments that are still due in SCAQMD for implementing 25 g/l on some cleaning categories will be completed. The reductions from this measure won't occur until 2007 which is outside this triennial period.

Targeted EIC Categories and Inventory

2007

CES/EIC Codes	Material Description	Planning Inventory VOC Emissions (forecasted from CCOS Inventory)
22020405000000	Cold Cleaning – Petroleum Naphtha	0.5293
22020430220000	Cold Cleaning – Alcohol	0.0128
22020430830000	Cold Cleaning – Chlorofluoro-carbons	0.0026
22020431760000	Cold Cleaning – Glycol Ethers	0.0014
22020432040000	Cold Cleaning – Ketones	0.0008
22020433330000	Cold Cleaning – Terpenes	0.006
22020481060000	Cold Cleaning – Unspecified	0.0551
22020805000000	Handwiping – Petroleum Naphtha	0.0617
22020832040000	Handwiping – Ketones	0.0211
22020830220000	Handwiping – Alcohols	0.0280
22020830830000	Handwiping - Chlorofluoro-carbons	0.0003
22020831760000	Handwiping – Glycol Ethers	0.0058
22020833390000	Handwiping – Toluene/Xylene	0.0055
22020881040000	Handwiping – Pure Unspecified	0.0040
22020881060000	Handwiping – Unspecified	0.0129
Total		0.7473

Emission Reductions

The proposed VOC emission reductions are based on further lowering of the VOC limit to 25 grams per liter for materials used in general cleaning and degreasing operations as recently adopted by the South Coast District (SCAQMD, Rule 1171.1, Solvent Cleaning Operation, amended August 2, 2002).

CES/EIC Codes	Material Description	ROG Emissions tpd	ROG % Reduction	ROG Reduction tpd
22020405000000	Cold Cleaning – Petroleum Naphtha	0.5293	50	0.2647
22020430220000	Cold Cleaning – Alcohol	0.0128	50	0.0064
22020430830000	Cold Cleaning – Chlorofluoro-carbons	0.0026	0	0
22020431760000	Cold Cleaning – Glycol Ethers	0.0014	62	0.0009
22020432040000	Cold Cleaning – Ketones	0.0008	62	0.0005
22020433330000	Cold Cleaning – Terpenes	0.0060	50	0.003
22020481060000	Cold Cleaning – Unspecified	0.0551	50	0.0276
22020805000000	Handwiping – Petroleum Naphtha	0.0617	50	0.0309
22020832040000	Handwiping – Ketones	0.0211	50	0.0106
22020830220000	Handwiping – Alcohols	0.0280	50	0.014
22020830830000	Handwiping - Chlorofluoro-carbons	0.0003	0	0
22020831760000	Handwiping – Glycol Ethers	0.0058	50	0.0029
22020833390000	Handwiping – Toluene/Xylene	0.0055	50	0.0028
22020881040000	Handwiping – Pure Unspecified	0.0040	50	0.002
22020881060000	Handwiping – Unspecified	0.0129	50	0.0065
Total		0.7473		0.3728

The 50% reduction is assuming that all of the cleaning materials will be reduced to 25 g/l which may not be realistic. The emissions and emission reductions may be updated in the future to reflect the most accurate information and the exemptions that may be included in the rulemaking due to technical feasibility/cost effectiveness issues.

Cost Effectiveness

There are no expected increases in cost for the lowering the VOC limit from 50 grams per liter to 25 grams per liter. (Based on telephone conversation with Louis Yuhas, South Coast AQMD, there were no additional costs resulted from lowering the VOC limit from 50 grams per liter to 25 grams per liter VOC limit.) This is because the majority of low VOC solvents that currently being used to comply with the 50 grams per liter VOC limit have a VOC content of 25 grams per liter or less.

From past rulemaking files in the District, the cost effectiveness for adopting lower VOC cleanup/surface prep materials has ranged from \$800/ton for the adoption of the 50 g/l limits to an average of \$4200/ton for the cleanup used in graphic arts.

	2005	2007	2010
		X	
Pollutant	Cost Effectiveness (\$/ton)		
NO _x		\$	\$
ROG	\$0 – \$4,200	\$0 – \$4,200	\$0 – \$4,200
NO _x + ROG	\$0 – \$4,200	\$0 – \$4,200	\$0 – \$4,200

Evaluation Criteria

Criterion	Justification
Real	Actual emissions of VOCs are decreased by lowering the VOC limit for solvents used in general cleaning and degreasing to 50 grams per liter.
Quantifiable	Emission reductions can be quantified based on annual emission inventory data that shows solvent usage for general cleaning and degreasing operations.
Permanent	VOC emission reductions are permanent as long as low VOC solvents are used by affected businesses.
Enforceable	The use of low VOC cleaning solvents is enforceable through district rules and permit conditions.
Surplus	Reductions are surplus to existing requirements.

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Local District	California Health and Safety Code

Legislative Needs	Not needed
Funding Needs and Sources	Rule development and implementation.
Implementation Location	All Districts

Needed Resources and Authority

Districts have the needed authority per the California Health and Safety Codes to adopt regulations to reduce NO_x and VOC emissions.

Barriers	Opportunities
Additional resources are required to adopt regulations or develop programs for this category including workshops and meeting with manufacturers and the general public	This proposed control measure will generate large reductions in VOC emissions.
	The proposed control measure is cost effective and will not result in an adverse impact on affected businesses.

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	2	The reductions for the nonattainment area are greater than 1 tpd. The reductions from this amendment in Sacramento County are 0.37 tpd.
Cost Effectiveness	1	
Public Acceptability	2	
Implementation/ Enforcement	2-3	
Technical Feasibility	1	Technology assessments due in SCAQMD through 2005

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. Sacramento Metropolitan AQMD, Staff Report, Rule 454, Degreasing Operation and Rule 466, Solvent Cleaning, May 23, 2003.
2. South Coast Air Quality Management District, Rule 1171, Solvent Cleaning Operations, August 2, 2002.
3. Louis Yuhas, South Coast AQMD

CONTROL MEASURE NUMBER: Rule 414

Control Measure Title: Natural Gas Fired Water Heaters
Evaluating Firm: Sierra Nevada Air Quality Group

Control Measure Description

This measure would require all new boilers and water heaters within the heat input range of 75,000 to 1,000,000 Btu/hr to meet low NOx limits. This category includes small commercial/industrial boilers and hot water heaters that predominantly burn natural gas and are used to heat water and generate steam. These units are used to heat water or create steam for a variety of purposes. Users of these units include restaurants, retail stores, schools, hotels and office buildings. The smaller units in this size range (<300,000 Btu/hr) use the natural draft created by combustion of natural gas and air to transfer heat to the confined water and do not rely on fans or blowers to transport either air or combustion gases. These combustion units are known as “atmospheric” and are rather simple in their operation. Units with heat inputs larger than 300,000 Btu/hr usually resemble small boilers because water circulates through a series of water tubes or water jackets close to the flow of hot gases and are heated as the gases flow around them. Burners on these units can be either atmospheric or forced draft.

In addition, this would also include lowering the NOx limits to the limits currently in place in SCAQMD for the less than 75,000 btu/hr water heaters.

Targeted EIC Categories and Inventory

The inventory category for service and commercial covers more equipment than just water heaters. The remainder of the equipment would most likely be boilers.

2006

CES/EIC Codes	Description	Planning Inventory Emissions (tpd)				
		NOx	ROG	PM10	Sox	CO
06099501100000	Service & Commercial (Incl. Water Heating) – Natural Gas	0.533	0.102	0.215	0.003	0.538
61060801100000	Residential Water Heating – Natural Gas	1.416	0.071	0.167	0.009	0.608
	Total	1.949	0.173	0.382	0.012	1.146

During the one hour SIP update work, it was estimated that there are 22,000 units in this category within the Sacramento region. The fuel use for these units was estimated to be approximately 4,500 mmcf/yr. Emissions are based on an uncontrolled emission rate used by the Ventura County APCD. Different emission factors were used for units smaller than 400,000 Btu/hr (0.137 lb/MMBtu) and units larger than 400,000 Btu/hr (0.170 lb/MMBtu). To estimate the potential number of units in Sacramento County, the number of units in the nonattainment area was proportioned by the emissions from this category in Sacramento County versus the emissions from this category in the nonattainment area. The estimated number of units for Sacramento County is 11,500 and the estimated fuel use is 2300 mmcf/yr. Because information for the Sacramento

region was not available on the number of sources in these size categories, the ratio of the number of sources in Ventura County for each size range was used for this estimate.

Emission Reductions

Current technology is available to reduce NO_x emissions from these units. Residential atmospheric water heaters have been meeting a 40 ng/j NO_x limit in the basin since 1996. Furthermore, many manufacturers, particularly those located in Southern California have provided units in this size range that meet this limit for several years. Several manufacturers offer small boilers and process heaters with low-NO_x forced draft burners. These manufacturers guarantee NO_x emission limits substantially lower than 40 ng/j. In addition to reducing emissions, an increase in thermal efficiency is also realized with these controls.

There are also manufacturers that offer atmospheric technologies that can meet a 40 ng/j limit. These technologies limit peak flame temperature and reduce the amount of air flowing to the burner. By substantially reducing the excess air from these units, the thermal efficiency can be raised by up to 5 percent thereby resulting in fuel savings of 10 percent or more.

NO_x emission reduction techniques generally focus on the pollutants generated during fuel combustion. However, other techniques to reduce emissions from large water heaters and small boilers include electric water heaters, heat recovery water heaters and heat pump water heaters. Electric water heaters would have the potential of increasing electricity demand. Heat recovery units do not emit pollutants other than the pollution generated by the utility power plant that supplies electricity to the unit. Heat recovery units use waste heat and emit no pollution.

Estimated NO_x emission reductions were based on a limit of 20 ng/j for new units that are less than or equal to 75,000 btu/hr (a 50% control), and 40 ng/j for new units that are greater than 75,000 Btu/hr and less than or equal to 400,000 Btu/hr (57% control). For new units greater than 400,000 Btu/hr, and less than or equal to 1,000,000 Btu/hr the emission reductions were based on a 30 ppm emission limit (a 70% control). Because these limits would only apply to new sources, it is estimated that this reduction would occur gradually over at least 10 years as natural replacement of existing units occurs in the market place. Based on the 1999 Milestone Report Technical Appendix, it is assumed that 10% of the water heaters are turned over every year. If the measure was implemented in 2005, emission reductions would be first realized in 2006 and could be fully implemented by 2016 or later. For the residential water heating category, a control of 50% was assumed with 10% turning over per year. This gives an overall control of 5% which accumulates each year. For the Service & Commercial category which would include both water heaters and boilers, it was assumed from the boiler regulation that 25% of this inventory would be affected by the boiler rule. It is unknown how much of this category is water heaters. It will be assumed that 10% of this category is water heaters to be conservative. The overall control efficiency for this inventory category will be $(10\%)(70\%)(10\% \text{ turnover}) = 0.7\%$.

2006

EIC Codes	Material Description	NOX Emissions Tpd	%	NOx Reductions Tpd
06099501100000	Service & Commercial (Incl. Water Heating) – Natural Gas	0.533	0.7	0.004
61060801100000	Residential Water Heating – Natural Gas	1.416	5.0	0.071
	Total	1.949		0.075

Timeframe

It is recommended that this measure be adopted in the short term. However, because the measure would only apply to new units, it is estimated that the emission reduction benefits would occur gradually over at least 10 years after adoption of the measure. Because complying units are now available, it is recommended that the limits of this measure take effect no longer than one year after adoption of the regulation.

Short Term (2005)	Midterm (2007)	Long-Term (2010)	Future (>2010)
X			

Cost Effectiveness

Several assumptions were used to determine cost and cost effectiveness. First, a life of 10 years was assumed with an interest rate of 3 percent. An average capacity factor was assumed to be similar to Ventura County capacity factors for the same size units (12 percent). Most boiler and several hot water manufacturers at that time offered units for sale that would meet the limits of their rule of 40 nanograms of NO_x per joule for units between 75,000 Btu/hr and 400,000 Btu/hr and 30 ppm of NO_x for larger units. These costs were determined based on the differential cost of installing a typical size new low-NO_x unit (150,000 Btu/hr unit and 400,000 Btu/hr unit) versus a standard unit. While the cost-effectiveness for these units is very reasonable, the differential cost of an electric unit (zero emissions) over a standard non-complying unit was estimated to exceed \$200,000 per ton of NO_x reduced. Therefore, it is unrealistic to assume that sources will convert to electric units.

	2005	2007	2010
		X	X
Pollutant	Cost Effectiveness (\$/ton)		
NO _x		\$1,200 to \$10,600	\$1,200 to \$10,600
ROG		NA	NA
NO _x + ROG		\$1,200 to \$10,600	\$1,200 to \$10,600

Evaluation Criteria

Criterion	Justification
Real	Measure would require use of low-NOx Burners on all new units
Quantifiable	Emission reductions would verified by an independent testing laboratory
Permanent	New certified units would be permanently installed for continuous emission reductions
Enforceable	Each manufacturer would be required to certify models for sale in the planning area and District Inspectors could enforce the standards at the point of sale or at any facility permitted with one of these units
Surplus	All new units would be required to meet an emission limit beyond current SIP requirements

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Local	Health & Safety and Government Codes

Legislative Needs	None
Funding Needs and Sources	Staff resources to develop regulation
Implementation Location	Counties & districts in the planning area

Needed Resources and Authority

The resources necessary to develop this measure are relatively low in cost. Consideration should be given to adopting a common rule throughout the planning area to simplify implementation and enforcement of the rule. The technology is commercially available and other districts have adopted a similar measure.

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	4	
Cost Effectiveness	1	
Public Acceptability	1	Replaces equipment only through normal turnover.
Implementation/ Enforcement	2	
Technical Feasibility	1	Compliant equipment is already available and proven.

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0-\$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001-\$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001-\$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001-\$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. SMAQMD Method Summary for natural gas consumption by commercial gas combustion categories by Hao Quinn, November 12, 2002.
2. Sonoma Technology Method Summary for Commercial Gas Fuel Usage and Emissions, September 16, 2002
3. California Energy Commission 2000 natural gas database by natural gas usage and number of accounts by county and SIC code.
4. Database query of stationary fuel combustion and residential combustion from 7-15-03 CEFS forecast output (provided by Larry Hunsaker, CARB).
5. Communication with Ali Mohamad of the SMAQMD on July 24, 2003 to discuss SMAQMD staff report on Rule 411, Boiler NOx.
6. Communication with Hao Quinn of the SMAQMD on July 29, 2003 to determine estimated fuel use and number of sources for large water heaters and small boilers.
7. Staff Report, Rule 1146.2, Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers, South Coast Air Quality Management District, January 9, 1998
8. Staff Report, Rule 74.11.1, Large Water Heaters and Small Boilers, Ventura County Air Pollution Control District, August 31, 1999
9. Staff Report, Rule 360, Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers, Santa Barbara County Air Pollution Control District, October 17, 2002.

CONTROL MEASURE NUMBER: New Rule 461

Control Measure Title: Oil and Gas Fugitive Emissions

Evaluating Firm: Sierra Nevada Air Quality Group

Control Measure Description

This measure focuses on fugitive emissions of VOC from components serving gas production facilities and components at natural gas processing facilities. A natural gas processing facility is defined as a facility engaged in the separation of natural gas liquids from field gas and/or fractionation of the liquids into natural gas products, such as ethane, propane, butane, and natural gasoline. Although there are no processing facilities in the planning area, there are production wells, fields and/or lease operations where fugitive emissions occur from well cellars, compressors, valves and flanges. This measure focuses on enhanced inspection and maintenance and other housekeeping work practices to reduce fugitive emissions from material transfer, storage, and processing. While process modifications are also considered an effective control option to minimize or eliminate emission sources, the primary method to reduce emissions from this category is enhanced housekeeping rules for fugitive emissions. This will include increasing frequency of inspections and repairs.

Targeted EIC Categories and Inventory

2006

CES/EIC Codes	Material Description	ROG Emissions tpd
310-302-1600-0000	Fugitive Losses - Valves	0.175
310-304-1600-0000	Fugitive Losses - Fittings	0.139
310-306-1600-0000	Fugitive Losses - Pumps	0.002
310-308-1600-0000	Fugitive Losses - Compressors	0.006
310-312-1600-0000	Fugitive Losses – Well Cellars	0.018
	Total	0.34

Emission Reductions

The strategy for reducing emissions from this measure would be to reduce the leak threshold for components in light liquid, gas, and vapor service, increase the inspection frequency and/or to reduce the repair time for a leak. There are no rules in place although Rule 443 applies similar requirements to leaking components at chemical plants that manufacture synthetic organic chemicals .

We reviewed South Coast AQMD staff report for rule 1173, Control of Organic Compound Leaks and Releases from Components at Petroleum Refineries and

Chemical Plants, and Ventura County APCD staff report for Rule 74.10, Components at Crude Oil and Natural Gas Production and Processing Facilities. Ventura County amended Rule 74.10 to go from weekly to daily inspections for pumps, compressors and pressure relief valves. In addition, they adopted a tighter deadline for repair of leaks and lowered the leak detection definition from 10,000 to 1000 ppm. It was estimated that emissions would be reduced by 66 percent. The SCAQMD estimates reducing the leak threshold from 1000 ppm to 500 ppm would reduce VOC emissions by 50 percent. Due to the uncertainty in the emission reductions until rule development is completed, it will be assumed that estimated control will be 50%. However, it should be noted that the SCAQMD has estimated even higher emissions reductions for reducing the repair time from 14 days to 7 days.

2006

CES/EIC Codes	Material Description	ROG Emissions Tpd	% reduction	ROG Reduction tpd
310-302-1600-0000	Fugitive Losses - Valves	0.175	50	0.088
310-304-1600-0000	Fugitive Losses - Fittings	0.139	50	0.069
310-306-1600-0000	Fugitive Losses - Pumps	0.002	50	0.001
310-308-1600-0000	Fugitive Losses - Compressors	0.006	50	0.003
310-312-1600-0000	Fugitive Losses – Well Cellars	0.018	50	0.009
	Total	0.34		0.17

Cost Effectiveness

The cost effectiveness was estimated for those reducing the leak threshold from 1,000 ppm to 500 ppm. This estimate is based on the costs estimated by the SCAQMD. Annual costs are related only to leak repair and the associated annual repair costs were \$20,136. However, this number is based on the large number of components in the South Coast Air Basin. Since the number of components for facilities in the Sacramento area is not available, we assumed the same cost effectiveness calculated by the AQMD. The cost effectiveness is based on an average repair time per valve of 10 minutes for valves and fittings, and 1 hour for other components. Labor costs were assumed to be \$30 per hour with an equipment life of 10 years. Leaking component rate is 1,000 ppm.

	2005	2007	2010
	x	x	x
Pollutant	Cost Effectiveness (\$/ton)		
NO _x	\$	\$	\$
ROG	\$ 9,957	\$ 9,957	\$ 9,957
NO _x + ROG	\$	\$	\$

Evaluation Criteria

Criterion	Justification
Real	Measure would require lower leak detection limits
Quantifiable	Inspections would be based on approved portable leak detection devices and approved test methods
Permanent	Inspection and maintenance requirements would require all leaks to be repaired within a specific timeframe.
Enforceable	Each operator would be required to maintain records and maintain them for review by District staff upon request
Surplus	All components would be required to be inspected and maintained to a level beyond that required in current SIP requirements

Implementation

This measure should be implemented in Sacramento, and Yolo-Solano districts as these are the only districts with activities related to this measure.

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Government	California Health and Safety Code

Needed Resources and Authority

Legislative Needs	None
Funding Needs and Sources	Staff resources to develop regulation and implement
Implementation Location	Sacramento County

Barriers	Opportunities
Additional resources are required to revise existing regulations to include enhanced maintenance requirements.	
Difficult to quantify reductions, estimate cost-effectiveness.	
Increased maintenance and housekeeping could be costly without significant emissions reductions	

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	3	Very small reduction available for this measure
Cost Effectiveness	1	Cost difficult to determine due to lack of information on components, maybe higher than noted
Public Acceptability	2	
Implementation/ Enforcement	2-3	Based on enhanced inspection and maintenance of existing permitted sources
Technical Feasibility	1-2	No controls required, but new program for this area

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0-\$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001-\$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001-\$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001-\$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. Final Staff Report for Proposed Amended Rule 1173-Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants, November 21, 2002.
2. Staff Report, Amendments to Rule 74.10, Components at Crude Oil and Natural Gas Production and Processing Facilities, March 2, 1998.
3. California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, February 1999 CAPCOA-Air Resources Board.
4. Protocol for Equipment Leak Emission Estimates, United States EPA, Office of Air Quality Planning and Standards, EPA-453/R-95-017, November 1995

CONTROL MEASURE NUMBER: Rule 447

Control Measure Title: Organic Liquid Loading

Evaluating Firm: SMAQMD

Control Measure Description

VOC emissions from gasoline terminals and bulk plants result from the evaporation of liquid gasoline or the escape of gasoline vapors from multiple locations throughout the facilities.

Terminals receive gasoline from a pipeline and store it in very large (300,000 gallon to 3 million gallon) aboveground tanks, then when needed, transfer the gasoline through a network of pipes to a loading rack to fill tanker trucks, which deliver the gasoline to local gas stations. VOC emissions arise from a number of points, including the fittings on the fixed-roof or floating-roof tanks, fugitive emissions from the piping (valves and flanges), and from the loading rack (displaced vapor space from the tankers).

Bulk plants generally receive their gasoline from tanker trucks, unload into tanks through a loading rack, and store it in large (approximately 20,000 to 40,000 gallon) aboveground tanks. Then, when needed, the gasoline is transferred through a loading rack into tanker trucks for delivery to gas stations. The emission points at a bulk plant are similar to those at gasoline bulk terminals.

In a comparison of district rules, it was identified that there are more restrictive limits in place in BAAQMD for bulk plants. Their emission limitation is 0.5 lbs/mgal rather than 0.6 lbs/mgal. In addition, SCAQMD has leak inspection requirements and repair time requirements.

Targeted EIC Categories and Inventory

2006

EIC codes	Description	VOC/ ROG (tpd)
33032414200000	FLOATING ROOF TANKS – WORKING LOSSES – JET NAPHTHA	0.001
33038411000000	BULK PLANTS/TERMINALS – GASOLINE STORAGE – WORKING LOSSES – GASOLINE	0.101
33039011000000	TANK CARS AND TRUCKS – WORKING LOSSES – GASOLINE	0.126
33039511000000	CARGO TANKS – PRESSURE RELATED FUGITIVE LOSSES – GASOLINE	0.391
33099511000000	GASOLINE - OTHER	0.014
33039611000000	CARGO TANKS – VAPOR HOSE FUGITIVE LOSSES – GASOLINE	-0.016
33039711000000	CARGO TANKS – PRODUCT HOSE FUGITIVE LOSSES - GASOLINE	0.100
Total		0.749

Emission Reductions

This control measure would look at lowering the bulk plant limit from 0.6 lbs/mgal to 0.5 lbs/mgal. It would also look at establishing leak inspection/repair requirements. In reviewing the permits for the bulk plants that are under permit in the district, it was identified that all of those bulk plants have either a balance system or an assist system that complies with 95% control. These plants would already comply with the proposed lower limit of 0.5 lbs/mgal.

Establishing leak inspection/repair requirements would assist in enforcement of the rule, but there are no calculated emission reductions to attribute to this addition because the rule already requires no leaks.

2006 – no reductions attributable

Timeframe and Cost Effectiveness

There would be no additional costs for complying with the 0.5 lbs/mgal limit since the facilities already meet 95% control. Costs would still need to be determined for implementing a leak inspection/repair requirement. It is anticipated that the costs would be low because these facilities would probably already implement a leak detection program.

Evaluation Criteria

Criterion	Justification
Real	Reducing the emission limits for bulk plants would not necessarily result in emission reductions, because it is likely that most facilities are already meeting the lower limit.
Quantifiable	Current and future emission rates can be quantified with source tests.
Permanent	Implementing more stringent requirements would produce only permanent, not temporary, reductions.
Enforceable	Bulk plants and terminals are required to hold district permits, and enforcement of new requirements would easily be incorporated into the existing permitting and inspection systems.
Surplus	Any VOC emission reductions that can be achieved by lowering the emission limit are in excess of any existing requirements.

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Air District	California Health and Safety Code, Clean Air Act

Legislative Needs	No legislative changes would be required
Funding Needs and Sources	Funding requirements limited to those associated with rulemaking and enforcement efforts
Implementation Location	Affected locale includes Sacramento County

Needed Resources and Authority

Implementation of this control measure requires rulemaking efforts from the district. This is within the district's authority and subject to the approval of the governing board.

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	5	
Cost Effectiveness	1	Near zero cost as most sources may already be meeting requirement.
Public Acceptability	1	Already in place in other districts
Implementation/ Enforcement	1	Incorporate into existing rulemaking, permitting, and enforcement programs.
Technical Feasibility	1	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0-\$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001-\$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001-\$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001-\$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. South Coast AQMD Rule 462
2. BAAQMD Reg 8 Rule 39

CONTROL MEASURE NUMBER: Rule 412

Control Measure Title: Stationary IC Engines

Evaluating Firm: SMAQMD

Control Measure Description

Internal combustion (IC) engines are in place at a wide variety of stationary sources. Use times range from a few hours a month for emergency standby engines to full-time for engines that are used as prime power. Standby engines tend to have small horsepower ratings (under 300) and may be in place to operate fire pumps or to provide backup power in case of an electrical outage, while engines that provide prime power are larger (often over 600 hp) and usage may be constant.

The most common fuel type for emergency standby engines is diesel, and for prime power engines, natural gas. Other fuels such as propane, gasoline, and landfill gas are also used occasionally, depending on the engine application. Many of the natural gas engines are in remote locations and used to compress natural gas from natural gas wells. These engines can be either lean burn or rich burn. The pollutants of primary concern that result from the combustion process are NO_x and CO; however, recent rulemaking efforts at the statewide level have focused on diesel PM, which has been identified as a carcinogen and a toxic air contaminant. SO_x and ROG also result from the combustion process.

The currently adopted district rule only applies to engines located at major stationary sources. This proposed amendment would expand the rule applicability to engines located at minor sources. Emission limits would be established for these engines.

There are three control method options proposed for this category. The first option is establishing emission limits that match the least stringent requirements of any district in the nonattainment area with a rule that applies to all sources. The second option is setting emission limits that match ARB's RACT/BARCT requirements for Engines. The third option is establishing an emission limit equivalent to EPA's Tier I, II, or III certified engines as technically feasible and cost effective. In addition, electrification may be possible in some cases.

Targeted EIC Categories and Inventory

2006

EIC codes	Description	Fuel	Emissions Inventory				
			NOx (tpd)	VOC/ROG (tpd)	PM10 (tpd)	SOx (tpd)	CO (tpd)
Sacramento							
3004001000000	Oil & Gas Prod Recip IC Eng	NG	0.043	0	0	0	0.239
3004001100000	Oil & Gas Prod Recip IC Eng	Unspec	0.039	0.002	0.001	0	0.005
5004001100000	Mfg & Ind Recip IC Eng	NG	0.01	0.008	0.001	0	0.026
5004011000000	Mfg & Ind Recip IC Eng	Gasoline	0.001	0.002	0	0	0.03
5004012000000	Mfg & Ind Recip IC Eng	Diesel	0.086	0.003	0.003	0.001	0.011
6004001100000	Svc & Comml Recip IC Eng	NG	0.024	0.03	0.008	0	0.095
6004001420000	Svc & Comml Recip IC Eng	Landfill gas	0	0	0	0	0
6004011000000	Svc & Comml Recip IC Eng	Gasoline	0	0	0	0	0.001
6004012000000	Svc & Comml Recip IC Eng	Diesel	0.017	0.001	0.001	0.001	0.004
9904012000000	Other Fuel Comb Sty IC Eng	Diesel	0.591	0.054	0.02	0	0.207
	Total		0.811	0.1	0.034	0.002	0.618

Emission Reductions

The California Air Resources Board is developing an air toxics control measure (ATCM) to limit diesel PM emissions from stationary IC engines. The ATCM is projected to initiate reductions in 2005. District rulemaking efforts are expected to complement the ATCM to reduce emissions from the diesel component of this source category. However, the state's efforts focus on diesel PM without specifically addressing NOX emission problems, which are of primary concern for attainment purposes; district regulations must be balanced to take state requirements into consideration.

Three alternative methods of control are proposed:

First, establish emission limits that match the least stringent requirements of any district in the nonattainment area with a rule that applies to all sources. This would set NOx emission limits for rich burn at 90 ppm, lean burn over 100 hp at 150 ppm, and lean burn below 100 hp at 300 ppm.

Second, limits could be set to match RACT/BARCT requirements, which is also the most stringent current requirement of current rules in the nonattainment area. RACT/BARCT sets limits of 25 ppm NOx and 250 ppm VOC for rich burn, 50 ppm NOx and 250 ppm VOC for waste gas-fueled rich burn, 200 ppm NOx and 750 ppm VOC for lean burn less than 100 hp, and 65 ppm NOx and 750 ppm VOC for all other lean burn.

Option three is to establish an emission limit equivalent to EPA's Tier I, II, or III certified engines as is technically feasible and cost effective.

Where electrification is possible and cost effective, this option should also be looked at. Requiring electrification where possible would increase the emission reduction potential.

2006 – To be determined.

Timeframe and Cost Effectiveness To be determined.

Evaluation Criteria

Criterion	Justification
Real	Internal combustion engines produce NOx and PM emissions as a byproduct of the combustion process for creating power
Quantifiable	Tests and control devices exist that quantify and control emissions from this source category
Permanent	Once control equipment is installed, an engine is removed from service, or replaced with a newer model less-emitting engine, the past emission levels cannot reoccur.
Enforceable	Stationary engines are currently under the permit system within the local air pollution control districts and additional regulations can be rolled into the current programs.
Surplus	Methods exist that reduce emissions from existing sources. Since emissions can be reduced with the source operating at current levels, the reduced emissions are excess.

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Local air districts	California Health and Safety Code

Legislative Needs	If legislation allows districts to regulate agricultural sources, opportunities for reductions within this source category would multiply
Funding Needs and Sources	Rulemaking and enforcement effort within local air districts
Implementation Location	Sacramento County

Needed Resources and Authority

Authority for regulating stationary internal combustion engines is within the California Health and Safety Code for local air districts. Regulating agricultural sources may or may not be achievable.

Barriers	Opportunities
Resistance to the wide-reaching requirement for control devices	Large opportunity for emission reductions
Cost effectiveness of control devices is high on some low-horsepower engines	Cost effectiveness on the majority of engines is well within the reasonably accepted range

Overall Feasibility

Criteria	Score	Comments
Emission Reduction		Unknown
Cost Effectiveness		Unknown
Public Acceptability	3-4	Higher number pertains to agricultural regulation
Implementation/ Enforcement	3-4	Higher number pertains to agricultural regulation
Technical Feasibility	2	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. San Joaquin Valley Unified APCD Rule 4701
2. San Joaquin Valley Unified APCD Rule 4702
3. Staff report for San Joaquin Valley Unified APCD Rule 4701
4. Staff report for San Joaquin Valley Unified APCD Rule 4702
5. South Coast AQMD Rule 1110.2, Emissions from Gaseous and Liquid-Fueled Engines
6. 1999 Amendment to the 1997 Ozone SIP Revision for the South Coast Air Basin
7. South Coast AQMD 2003 Draft Air Quality Management Plan
8. San Joaquin 2001 Amendment to the 1994 Ozone ADP
9. San Joaquin 2002 and 2005 Rate of Progress Plan

CONTROL MEASURE NUMBER: Rule 440

Control Measure Title: Unspecified Coating

Evaluating Firm: SMAQMD

Control Measure Description

This category is comprised of VOC emissions from coatings that are not otherwise captured in a specific coating category. Particular sources may consist of coatings of glass or plastic parts and products, including polyester resin (fiberglass) coatings in addition to wood and metal parts and products, aerospace coatings, and automotive refinishing.

The control measure will impose VOC limitations for coating operations that have not been covered by the existing rules. Several different VOC content limitations are recommended for different coating operations to further reduce the potential VOC emissions from particular coating operations that can be classified into specific categories. A general VOC content limit is applied for this control measure for emission reduction calculation purpose due to the inability to further categorize the unspecified coating into specific categories.

Targeted EIC Categories and Inventory

The emission numbers shown in the table below were disaggregated to plastic parts and products coating and “other” from the general unspecified coating category based on population and business type information. These numbers need to be confirmed, and at the current time, are considered only rough estimates of actual emissions from miscellaneous coating operations, including plastic parts and products. Since the actual breakdown into subcategories is yet to be determined, these emissions likely include coating emissions from plastic, wood, and metal parts and products, aerospace, automotive, and others such as rubber and glass coating operations.

2006

EIC codes	Description	Non-Attainment Inventory					
		NOx (tpd)	VOC/ROG (tpd)	PM10 (tpd)	PM2.5 (tpd)	SOx (tpd)	CO (tpd)
23099590000000	Unspecified Coating - Other	0	1.678	0	0	0	0
23099592000000	Unspecified Coating – Water Based	0	0.016	0	0	0	0
Total		0	1.694	0	0	0	0

Emission Reductions

In the district, there are no specific regulations that specify solvent content limits for unspecified coatings; however, rules exist that regulate specific coatings such as wood,

metal parts and products, aerospace products, and automotive refinishing. The unspecified coating category would include both coating usages for processes that are subject to specific coating rules as well as processes that do not currently have a specific coating limit.

Rules are in place in other districts that establish emission limits for coatings used on miscellaneous objects, including rubber, glass, and plastic parts and products. These limits range from 2.3 pounds per gallon to 6.7 pounds per gallon depending on the coating type. Installing a control device that achieves at least 85% control of VOC's is another option available for reducing VOC emissions in this category.

Based on rule in place in Bay Area Air Quality Management District, an average VOC emission limit of 3.5 pounds per gallon for coatings on a variety of surfaces is technologically feasible with the inclusion of several source specific VOC content limitation for different categories, such as flat wood paneling or plastic part and products category. Certain categories that haven't been subjected to any particular rule in Sacramento County, such as flat wood paneling or plastic part and products, has been limited to lower VOC content restriction in other air districts; the VOC content limitation of 1.7 to 2.5 pounds per gallons of coatings has been achieved in practice.

Since the emission sources that fall under unspecified coatings cannot be differentiated into different categories, the emission reduction resulted from the more restrictive VOC content limitations applicable to different categories, such as flat wood paneling or plastic part and products category cannot be quantified. Therefore for the emission reduction calculation purposes, the 3.5 pounds per gallons VOC content limitation is applied throughout the whole inventory. Upon the separation of the unspecified coatings inventory, further reduction can be realized and quantified.

Based on the survey conducted in the previous year for permitted facilities that used coating materials, the VOC contents range from 0.73 to 8.15. For the emission reduction calculations, 4.2 pounds per gallon is determined to be the average VOC contents of the coatings used commercially.

In order to determine a conservative estimate of the potential emission reductions from this category, a control efficiency based on reducing the VOC content limit from an average of 4.2 pounds per gallon to 3.5 pounds per gallon was assumed (16% control) for the unspecified coating – other category. Since this category includes coatings that already have to comply with specific VOC limits and since the rule will establish lower VOC limits, where appropriate, for some of the unspecified coatings, the reductions that can be obtained from the inventory should be greater than 16%.

The following emission reduction estimates would result from a generalized coating rule.

2006

EIC codes	NOx		VOC or ROG		PM10		PM2.5		SOx		CO	
	Tpd	%	Tpd	%	Tpd	%	Tpd	%	Tpd	%	Tpd	%
23099590000000	0	0	0.268	16	0	0	0	0	0	0	0	0
23099592000000			0	0								
Total			0.268									

Timeframe

Short Term (2005)	Midterm (2007)	Long Term (2010)	Future (>2010)
X			

Cost Effectiveness

The cost effectiveness is based on the difference between the compliance materials and the non-compliance materials. In most cases due to the lower VOC contents limitations, the compliance materials have a higher usage quantity. Using lower VOC content materials might require further treatment of the waste material, which will contribute to a higher cost in implementing this control measure. At present, the unspecified coatings inventory is a lump inventory that is composed of coatings usage not otherwise covered by any particular EIC codes. No data is available to further analyze the percentage contribution of any particular coatings to the unspecified coatings inventory. As an estimate of the potential cost effectiveness for this measure, it will be assumed that the range of cost effectiveness from the rulemaking for the specific rules would be applicable.

	2005	2007	2010
Pollutant	Cost Effectiveness (\$/ton)		
NO _x	N/A	N/A	N/A
ROG	\$800 - \$14,440	N/A	N/A
NO _x + ROG	N/A	N/A	N/A

Evaluation Criteria

Criterion	Justification
Real	Actual emissions of VOC are reduced by requiring of lower-VOC-content products or adding control device.
Quantifiable	Emission reductions resulting from the use of lower-VOC products are quantified by comparing VOC content of products that are phased out with the VOC content of newer products for equivalent usage quantities.
Permanent	Promulgation of District rules limiting VOC content will prevent the re-introduction of higher VOC content products, resulting in permanent emission reductions.
Enforceable	VOC content will be clearly marked on products, recorded by permitted users, and able to be calculated by a District if necessary.
Surplus	Reductions are surplus to existing requirements.

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Local Air Districts	California Health and Safety Code, Clean Air Act

Legislative Needs	Rule adoption by district.
Funding Needs and Sources	Funding requirements limited to those associated with rulemaking efforts
Implementation Location	Sacramento County

Needed Resources and Authority

Implementation of this control measure requires rulemaking efforts from each district with potential emission reductions. This is within each district's authority and subject to the approval of each governing board.

Barriers	Opportunities
Rulemaking effort required	Emission reductions available
Costs associated with lower-VOC products	

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	3	Total reduction ranges from 0.268 tpd
Cost Effectiveness	1-3	Products available and require little additional capital investment
Public Acceptability	1	Primarily acceptable
Implementation/ Enforcement	1	Rulemaking authority exists
Technical Feasibility	1	Has been implemented in Bay Area

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

References

1. Proposed Amendments to Regulation 8, Rule 4, 14, 19, and 31 Draft Staff Report, BAAQMD, May 21, 2002.
2. BAAQMD Regulation 8, Rule 4 and 31

MOBILE SOURCE CONTROL MEASURE:

Control Measure Title: Vehicle and Engine Technology Market Based Incentive Program

Evaluating Firm: SMAQMD

Control Measure Description

The Vehicle and Engine Technology Program uses market-based incentive programs to promote the accelerated introduction of lower emission technologies into the Sacramento Federal Ozone Non-Attainment Area. The Program focuses on reducing the emissions from heavy-duty diesel engines, primarily oxides of nitrogen (NOx).

There are three major strategies for achieving the desired NOx emission reductions:

1. Introducing new, low-emission, heavy-duty vehicles when older vehicles are being replaced or when new vehicles are being added to a fleet;
2. Replacing an older existing engine with a newer, lower emission engine, referred to as repowering;
3. Replacing an older truck with a newer truck when the older truck owner would not otherwise purchase a newer truck (Fleet Modernization);
4. Retrofitting an older engine to operate at a lower emission level;
5. Using a lower emission fuel.

Targeted engines generally fall into one of the following categories:

1. On-road vehicles with a gross vehicle weight rating greater than 14,000 pounds;
2. Off-road self-propelled vehicles with a diesel engine greater than 50 horsepower;
3. Agricultural engines used for pumping water greater than 50 horsepower.

Engines that meet the criteria are eligible to receive an incentive to use a lower emission technology. Eligibility requirements include:

1. A minimum of at least 30% NOx reduction for new vehicle/engine projects compared to baseline emissions. Retrofit projects must show a minimum of 15% NOx reduction;
2. NOx reductions must not be required by any existing regulation, memoranda of understanding/agreement, or other legally binding documents;
3. Reduced emission engines and technologies must be certified for sale in California and must comply with durability and warranty requirements;
4. Projects must operate for a minimum of five years and meet the contracted vehicle usage requirements for the Sacramento Federal Ozone Non-Attainment Area (SFNA);
5. Projects must meet a lifetime cost-effectiveness criterion of \$13,600 per ton of NOx reduced.

Cost-effectiveness is calculated for each vehicle/engine and is based on emission reduction, usage, engine load, and a reasonable capitol recovery factor. The greater

the emission reductions, the greater amount of incentive a particular project may qualify. The incentive amount is capped either by the incremental cost of the introduction of the lower emission technology or the cost-effectiveness calculation. In no case can the incentive exceed the incremental cost of the project.

Emission reductions are determined by subtracting the lower NOx emission level from the NOx emission level of the base engine. For new vehicles, the reduction is the difference between the certified NOx emission level of the new heavy-duty engine meeting an optional NOx emission credit standard from the NOx emission level of the new engine meeting the current standard. For engine repower projects, the reduction is the difference between the certified NOx emission standard of the new engine from the NOx emission level of the older engine. For engine retrofit projects, the reduction is the difference between the certified NOx emission rate of the retrofitted engine and the original NOx emission certification for that engine.

The basic formula used to determine emission reduction is based on how much cleaner the replacement engine is than the baseline engine, how the engine is operated, and how much the engine operates. The equation to determine emission reductions is shown below:

$$[\text{baseline NOx level} - \text{replacement NOx level}] * [\text{engine load}] * [\text{usage}]$$

Factors used to determine the emission reductions and cost-effectiveness are from the California Air Resources Board's "Carl Moyer Memorial Air Quality Standards Attainment Program" (CMP) guidelines (September, 2003).

Through the end of 2003, this market-based emission reduction incentive program has achieved the NOx emission reductions shown in the below table.

Project Category	Number of Engines	NOx Reductions (tons/day)
On-Road Heavy-Duty Vehicles	1889	1.57
Off-Road Self-Propelled Vehicles	213	0.62
Agricultural Water Pumping Engines	862	2.25
Total	2,964	4.44

For the time period 2004 to 2006, the Mobile Source Division anticipates receiving at least \$5 million dollars for incentive projects (\$3 million for on-road, \$2 million for off-road). In addition to the \$5 million dollars there are potential new funding streams being proposed by both Federal and State governments. If these funds materialize, they could range in the amount of \$5 to \$61 million dollars. The table down below shows the

minimum and maximum estimated benefits for all of these funding streams and the cost effectiveness is based on a 5 year life expectancy with a 3% interest rate.

Projected Emission Reductions for 2004-2006

Project Category	Estimated Funding Amount (in millions)		NOx Reductions (tons/day)		Cost Effectiveness (\$/ton)
	Min.	Max.	Min.	Max.	
On-Road Heavy-Duty Vehicles	3	49	0.18	2.94	\$10,000-\$11,000
Off-Road Self-Propelled Vehicles & Agricultural Water Pumping Engines	2	12	0.4	2.4	\$3,000-\$4,000
Total	5	61	0.58	5.34	

Evaluation Criteria

Criterion	Justification
Real	Emission reductions due to new engines/vehicles or technology introduction
Quantifiable	Emission factors and verified test results used to find benefits
Permanent	Changes to vehicles and vehicle population is permanent
Enforceable	Measure is voluntary, incentive based
Surplus	There are no current similar programs in the same time frame as the measure

Implementation

Potential Implementing Agency	Agency Type	Authority Origin
SMAQMD	Air District	Program is voluntary. The Air District can set up events to distribute and test on a voluntary basis

Barriers	Opportunities
Funding for incentives	Truck and engine replacement increase fuel economy
Voluntary program means lower participation	Older trucks are replaced with newer trucks with higher safety standards
	Some elements could decrease dependency on foreign oil production

Needed Resources and Authority

SMAQMD has the authority to conduct a voluntary program to implement reductions of heavy-duty NOx emissions from mobile sources. Programmatic funding is required.

Funding Needs and Sources	Funding is required for program costs, costs for public outreach and the incentive dollars needed to run program.
Implementation Location	SFNA

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	2	Depends on the mix of funds available with the participation of the different segments
Cost Effectiveness	1	Overall program cost effectiveness estimated to be in this range
Public Acceptability	1	Moyer and SECAT programs are in place
Implementation/ Enforcement	3	Funding needed
Technical Feasibility	2	Some technologies evaluated could be a three, timing dependent
Total Score	9	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0-\$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001-\$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001-\$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001-\$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

The following pages show examples of how the on-road and off-road calculations are performed. Default values for all of the calculations come from the EMFAC 2002 model and the CMP guidelines.

References

1. EMFAC2002 V2.2 Sept 23 2002
2. Moyer Program Guidelines, September 2003
3. SECAT, Fleet Modernization Guidelines, January 2002

On-Road Example 1: New Alternative Fuel Vehicle Purchase (Calculations based on Mileage)

A line haul trucking company proposes to purchase a heavy heavy-duty diesel line haul equipped with a CNG engine certified to 1.8 gm/bhp-hr NOx + NMHC. This vehicle operates 90% of the time in the SFNA.

Emission Reduction Calculation

Baseline NOx Emission factor:	6.7 g/mile
Baseline NOx Emission Factor (using fuel correction factor):	(6.7 g/mile)(0.87) = 5.83 g/mile NOx
Reduced NOx+NMHC Emission Factor:	1.8 g/bhp-hr
Reduced NOx Emission Factor (using default NOx fraction):	(0.80)(1.8 g/bhp-hr) = 1.44g/bhp-hr NOx
Conversion Factor:	2.6 bhp-hr/mile
Converted Reduced Emission Factor:	(1.44 g/bhp-hr NOx)*(2.6 bhp-hr/mi) = 3.74 g/mile NOx
Annual Miles:	60,000 miles
% Operated in SFNA:	90%
Convert grams to tons:	1 ton = 907,200 g

The estimated reductions are:

Baseline: (5.83 g/mile) * 60,000 mile/year * 90% * ton/907,200 g = 0.347 ton/yr

Reduced: (3.74 g/mile) * 60,000 mile/year * 90% * ton/907,200 g = 0.222 ton/yr

NOx Emission Reductions: 0.347 – 0.222 = 0.125 tons/year NOx emissions reduced

Cost and Cost-Effectiveness Calculations

The annualized cost is based on the portion of incremental project costs funded by the CMP, any matching funds that were used to fund the project, the expected life of the project (10 years default life for heavy-duty trucks), and the interest rate (3%) used to amortize the project cost over the project life. The incremental capital cost to the fleet operator for this purchase and the maximum amount that could be funded through the CMP fund are determined as follows:

Incremental Capital Cost:	\$ 135,000 (new CNG vehicle) - \$ 90,000 (new diesel vehicle) = \$ 45,000
Maximum Amount Funded:	\$ 45,000
Capital Recovery:	$[(1 + 0.03)^{10} (0.03)] / [(1 + 0.03)^{10} - 1] = 0.117$
Annualized Cost:	(0.117)(\$ 45,000) = \$ 5,265/year
Cost-Effectiveness:	(\$ 5,265/year)/(0.125 tons/year) = \$42,120/ton

The cost-effectiveness for the example exceeds the \$13,600 per ton cost-effectiveness requirement. In order to meet the \$13,600 per ton cost-effectiveness requirement, this project would only qualify for about \$14,530, a fraction of the incremental cost. This amount is determined by multiplying the maximum allowed cost-effectiveness by the estimated annual emission reductions and dividing by the capital recovery factor (i.e., $13,600 * 0.125 / 0.117$).

On-Road Example 2: Diesel to Diesel On-Road Repower (Calculations based on Mileage)

(Note: Fleet Modernization uses the same methodology as a Repower)

A line haul trucking company proposes to repower a 1983 heavy heavy-duty diesel line haul truck with a model year 1991 certified diesel engine. This vehicle operates 90% of the time in SFNA.

Emission Reduction Calculation

Baseline NOx Emission factor: 27.2 g/mile
Adjusted Baseline NOx Emission factor (using fuel correction factor):
(27.2 g/mile)(0.94) = 25.57 g/mile

Replacement Engine (Reduced) NOx Emission factor: 16.0 g/mile
Adjusted Replacement Engine NOx Emission factor (using fuel correction factor):
(16.0 g/mile)(0.87) = 13.92 g/mile

Annual Miles: 60,000 miles
% Operated in CA: 90%
Convert grams to tons: 1 ton = 907,200 g

The estimated reductions are:

Baseline: (25.57 g/mile) * 60,000 mile/year * 90% * ton/907,200 g = 1.52 ton/yr
Reduced: (13.92 g/mile) * 60,000 mile/year * 90% * ton/907,200 g = 0.83 ton/yr

NOx Emission Reductions: 1.52-0.83=0.69 tons/year NOx emissions reduced

Cost and Cost-Effectiveness Calculations

The annualized cost is based on the portion of incremental project costs funded by the CMP, any matching funds that were used to fund the project, the expected life of the project (7 years default life for heavy-duty truck repowers), and the interest rate (3%) used to amortize the project cost over the project life. The incremental capital cost to the fleet operator for this purchase and the maximum amount that could be funded through the CMP fund are determined as follows:

Replacement Engine Cost \$30,000
Exist engine rebuild cost \$7,000
Incremental Capital Cost: \$ 30,000 - \$ 7,000 = \$ 23,000
Maximum Amount Funded: \$ 23,000
Capital Recovery (Table 2.10) $[(1 + 0.03)^7 (0.03)] / [(1 + 0.03)^7 - 1] = 0.161$
Annualized Cost: (0.161)(\$ 23,000) = \$ 3,703/year
Cost-Effectiveness: (\$ 3,703/year)/(0.69 tons/year) = \$ 5,367/ton

The cost-effectiveness for the example is less than \$13,600 per ton of NOx reduced. This project qualifies for the maximum amount of grant funds requested.

Off-Road Example 3: Construction Equipment Repower (Calculations Based on Hours of Operation)

An equipment owner applies for a CMP grant for the purchase of a new 2003 model year Tier 2 off-road diesel engine rated at 180 hp to replace a 1985 uncontrolled diesel engine rated at 150 hp used in a construction loader. The owner does not know the load factor for this application. Both the old and new engine will operate 700 hours annually and 100% of the time in the SFNA. The cost of the new emission-certified diesel engine is \$16,000, whereas the cost to rebuild the existing engine is \$8,000. Installation and re-engineering cost (to install the new engine into the existing equipment) is \$6,000.

Emission Reduction Calculation

Existing Engine NOx Emission Factor:	11 g/bhp-hr
Adjusted Existing Engine NOx Emission Factor (using fuel correction factor):	$(11 \text{ g/bhp-hr})(0.94) = 10.34 \text{ g/bhp-hr}$
Proposed Replacement Engine NOx+NMHC Emission Factor:	4.9 g/bhp-hr
Adjusted Replacement Engine NOx Emission Factor (using default NOx fraction and fuel correction factor):	$(4.9 \text{ g/bhp-hr})(0.95)(0.87) = 4.05 \text{ g/bhp-hr NOx}$
Existing (Baseline) Engine Horsepower:	150 hp
Replacement Engine Horsepower:	180 hp
Baseline Load Factor:	0.55
Replacement Engine Load Factor:	$0.55(150\text{hp}/180\text{hp}) = 0.46$
Annual Hours of Operation:	700 hours
% Operated in the SFNA:	100%

Hence, the estimated reductions are:

Baseline Engine:

$$(10.34\text{g/bhp-hr} * 0.55 * 150 \text{ hp}) * 700 \text{ hrs/yr} * 100\% * \text{ton}/907,200 \text{ g} = 0.66 \text{ t/yr}$$

Reduced-Emission Engine:

$$(4.05 \text{ g/bhp-hr} * 0.46 * 180 \text{ hp}) * 700 \text{ hrs/yr} * 100\% * \text{ton}/907,200 \text{ g} = 0.26 \text{ t/yr}$$

NOx Emission Reductions: $0.66 - 0.26 = 0.40$ tons/year NOx emissions reduced

Cost-Effectiveness Calculations

The annualized cost is based on the incremental project cost of the repower project, the expected life of the project (7 years default life), and the interest rate (3%) used to amortize the project cost over the project life. The incremental capital cost to the equipment owner for this purchase and the maximum amount of CMP funding are determined as follows:

Total installed cost of new engine:	$\$ 16,000 + \$ 6,000 = \$ 22,000$
Incremental Capital Cost:	$\$ 22,000 - \$ 8,000 = \$ 14,000$
Max. Amount Funded:	$\$ 14,000$
Capital Recovery (Table 3.8):	$[(1 + 0.03)^7 (0.03)] / [(1 + 0.03)^7 - 1] = 0.161$
Annualized cost:	$(0.161)(\$ 14,000) = \$ 2,254/\text{year}$
Cost-Effectiveness:	$(\$ 2,254/\text{year}) / (0.40 \text{ tons/year}) = \$5,635/\text{ton}$

The project meets the cost-effectiveness limit of \$13,600 per ton NOx reduced. This project would qualify for the maximum amount of grant funds requested.

Off-Road Example 4: Agricultural Irrigation Pump Repower

Consider a farmer faced with the opportunity to replace a 1980 model year diesel engine rated at 120 hp used in an irrigation water pump with a new, certified off-road MY 2003 diesel engine rated at 150 hp during the normal rebuild period. In this case, the cost of the new, emission-certified diesel engine is \$15,000 whereas the cost to rebuild the existing engine would be \$6,000. The cost of a non-reset hour meter is \$500. The old engine operated 2,000 hours annually. The project life is 7 years.

Emission Reduction Calculation

Baseline NOx Emissions:	13.0 g/bhp-hr
Adjusted Existing Engine NOx Emission Factor (using fuel correction factor):	(13 g/bhp-hr)(0.94) = 12.22 g/bhp-hr
Baseline Horsepower:	120 hp
Baseline Load Factor:	0.65
Reduced NOx+NMHC Emissions:	4.9 g/bhp-hr
Adjusted Replacement Engine NOx Emission Factor (using default NOx fraction) (fuel correction factor):	(4.9 g/bhp-hr)(0.95) = 4.66 g/bhp-hr NOx (4.66 g/bhp-hr)(0.87) = 4.05 g/bhp-hr NOx
Replacement Horsepower:	150 hp
Reduced Load Factor:	120 hp / 150 hp * 0.65 = 0.52
Annual Operating Hours:	2,000 hours/year
Conversion factor	1 ton=907,200 grams

$((12.22 \text{ g/bhp-hr} * 120 \text{ hp} * 0.65) - (4.05 \text{ g/bhp-hr} * 150 \text{ hp} * 0.52)) * 2,000 \text{ hrs/yr} * \text{ton}/907,200 \text{ g} = 1.4 \text{ ton/year NO emissions reduced}$

Cost-Effectiveness Calculations

The annualized cost is based on the incremental project costs funded by the CMP, the expected life of the project (5 years at a minimum), and the interest rate (3%) used to amortize the project cost over the project life.

Incremental Capital Cost	= \$ 15,500 - \$ 6,000 = \$ 9,500
Max. Amount Funded	= \$ 9,500
Capital Recovery	= $[(1 + 0.03)^7 (0.03)] / [(1 + 0.03)^7 - 1] = 0.161$
Annualized cost	= \$ 9,500 * 0.161 = \$ 1530/year
Cost-Effectiveness	= (\$ 1530/year)/(1.4 tons/year) = \$1,093/ton NOx reduced

The project meets the cost-effectiveness limit of \$13,600 per ton NOx reduced. This project qualifies for the maximum amount of requested of \$9,500 assuming no local funding caps imposed by participating district.

LAND USE CONTROL MEASURE:

Control Measure Title: CEQA Construction Mitigation Program
Evaluating Firm: SMAQMD

Control Measure Description

SMAQMD established standard construction mitigation requirements for all land use and transportation project construction activities that exceed the District’s adopted 85 lbs/day of NOx threshold of significance under the California Environmental Quality Act (CEQA). Construction mitigation requires a developer to reduce 20 percent of NOx and 45 percent of particulate matter from the off-road mobile construction equipment used on the project, such as scrapers, graders, dozers, excavators, and other equipment. The emission reduction standards are measured against the statewide average for all off-road mobile construction equipment, based on data provided by the California Air Resources Board. The standard mitigation becomes a legally enforceable requirement when the lead agency adopts the construction mitigation as a mitigation measure (usually in an Environmental Impact Report) and incorporates that mitigation in the Mitigation Monitoring and Reporting Program (MMRP) for the project. The types of lead agencies for which the District frequently recommends construction mitigation include the County of Sacramento, incorporated cities, and state and federal agencies.

Despite their temporary nature, off-road mobile construction equipment produces approximately 4,000 tons of NOx and PM emissions each year in Sacramento County, predominantly during the summer ozone season. The construction mitigation program targets emissions created during the construction of commercial, industrial, retail, and residential projects.

Targeted EIC Categories and Inventory (Calendar Year 2006)

EIC codes	Description	Category	SMAQMD Inventory					
			NOx (tpd)	ROG (tpd)	PM10 (tpd)	PM2.5 (tpd)	SOx (tpd)	CO (tpd)
860	Off-road	Construction and Mining	10.55	1.05	0.72	0.66	0.01	4.46

The inventories above do not include the on-road vehicle emissions related to construction activities. Most of the emission reductions are expected to result from off-road construction equipment. Also, only a portion of the construction and mining activities are construction.

Emission Reductions (in Calendar Year 2006)

For the purposes of this evaluation, we employed a deliberately conservative approach to quantifying emission reductions. First, the estimates are based only on residential development. Emission reductions are achieved from mitigating commercial, retail, other non-residential development, as well as transportation projects, but their emission reductions are not included in this analysis because fewer non-residential projects are

subject to mitigation. Second, we assumed a 50% effectiveness factor to account for unmitigated projects and potential field non-compliance.

The total number of permitted dwelling units in 2006 for the Sacramento metropolitan region, defined as Sacramento, Placer, and El Dorado Counties, is projected at 16,361. Most of the permitted dwelling units will be located in Sacramento County, but the exact number by county is unknown. (Source: "Sacramento Metropolitan Area Economic Forecast", Caltrans, 2002, pg 138). SMAQMD staff assumes 60% of the dwelling units to be in Sacramento County. Using URBEMIS 2002 to estimate construction emissions by assuming an average residential project size of 200 dwelling units, and after applying the 50% effectiveness factor, the NO_x associated with mitigable construction is 7,357 lb/day. A 20 percent reduction results in 1,471 lb/day, or 0.74 ton per day.

2006

EIC codes	Description	Category	NO _x Reduction		ROG Reduction	
			tpd	%	tpd	%
860	Off-road	Construction and Mining	0.74		0.00	0

Cost and Cost Effectiveness

Cost effectiveness for NO_x is based on Carl Moyer guidelines. Actual cost effectiveness varies from project to project depending on the age and type of existing construction fleet, and the amount and type of emission reduction strategies chosen for implementation.

Pollutant	2006 (\$/ton)
	Cost Effectiveness
NO _x	13,600
ROG	N/a
NO _x + ROG	13,600

Evaluation Criteria

Criterion	Justification
Real	Mandatory emission reductions will occur with equipment changes
Quantifiable	Emission modeling using URBEMIS
Permanent	The emissions are permanently reduced during the program
Enforceable	Legal action under CEQA for non-participation
Surplus	Emissions are surplus unless individual parts of the program overlap with other new programs not yet implemented

Implementation

Implementing Agency	Agency Type	Authority Origin
SMAQMD and lead agencies	Air District	Program is implemented through CEQA

Legislative Needs	None
Funding Needs and Sources	Funding is required for operating programs and replacing equipment
Implementation Location	SNA

Needed Resources and Authority

The primary authority for this measure is the California Environmental Quality Act (CEQA).

H&S section 40716 allows air districts to “adopt and implement regulations to...reduce or mitigate emissions from indirect and areawide sources of air pollution”.

Barriers	Opportunities
Requires aggressive applications of diesel retrofits, repowers, replacements with new equipment, with costs borne by land use development/developer	SFNA indirect sources create significant unregulated annual emissions. Measure captures a percentage of those sources, equitably sharing need/costs for attainment
Diesel engine NOx reduction retrofit/repower tech's limited in type and availability	Criteria pollutant reductions from this measure add incremental benefits to public health.
Resistance from equipment owners and developers for mandated emission reductions on their equipment on their significant land use projects	Provides positive economic stimulus to development of new mobile source emission reduction strategies.
Some increased costs for emission reduction strategies	
Some construction equipment (e.g. scrapers) long-lived (high emissions) and expensive (>\$500,000) to replace	
Enforcement and monitoring will be challenging with existing resources.	

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	2	
Cost Effectiveness	1	Based on Carl Moyer Guidelines
Public Acceptability	1	
Implementation/ Enforcement	3	
Technical Feasibility	2	
Total Score	11	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

LAND USE CONTROL MEASURE:

Control Measure Title: CEQA Land Use Operational Mitigation Program
Evaluating Firm: SMAQMD

Control Measure Description

SMAQMD continues to implement an operational mitigation program for major land use projects that are considered significant under the California Environmental Quality Act (CEQA). Any land use project that creates operational emissions equal to or greater than 65 pounds per day of ROG or 65 pounds per day of NOx is considered significant by SMAQMD, and is subject to CEQA mitigation requirements. In most cases, the project is required to identify mitigation that will reduce 15 percent of the operational emissions. SMAQMD provides a comprehensive menu of operational mitigation measures that can be used to reduce emissions. Land use project proponents select measures from the SMAQMD menu, and in some cases identify other emission reduction measures that are specific to the project. Each mitigated land use project has a unique set of mitigation measures, but in all cases achieves at least a 15 percent reduction in emissions. SMAQMD uses a database to track all significant land use projects, the adopted mitigation measures that apply to the project, and the resulting emission reductions.

Targeted EIC Categories and Inventory (Calendar Year 2006)

EIC Codes	Description	Category	SMAQMD Inventory	
			NOx (tpd)	ROG (tpd)
710	LDA, Light Duty Passenger	All	7.72	10.69
722	LDT1, Light Duty Trucks 1	All	3.45	4.51
723	LDT2, Light Duty Trucks 2	All	4.24	3.64
TOTAL			15.41	18.84

Emission Reductions (in Calendar Year 2006)

Emission reductions from land use projects are calculated based on an analysis of the total project emissions using URBEMIS 2002. The construction phase of many large projects may last several years, and emission reductions only occur on the occupied portion of a project. The total emissions are scaled down based on the amount of the project that is constructed and occupied. The emission reduction is calculated based on the measures selected for the project mitigation plan. The emission reductions shown below are based on the following land use projects:

Land Use Project Name	2006 ROG Reduction (tpd)	2006 NOx reduction (tpd)
Vineyard Springs Comprehensive Plan	0.005	0.010
East Franklin Specific Plan	0.009	0.010
Laguna Ridge Specific Plan	0.023	0.024
TOTAL	0.037	0.044

2006

EIC Codes	Description	Category	NOx Reduction (tpd)	ROG Reduction (tpd)
710	LDA, Light Duty Passenger	All	0.04	0.04
722	LDT1, Light Duty Trucks 1	All	0.00	0.00
723	LDT2, Light Duty Trucks 2	All	0.00	0.00
TOTAL			0.04	0.04

Note: Emission reductions will occur from light duty passenger cars and trucks, however the ratio of affected inventory categories is unknown. Most of the reduced trips will be from light duty passenger cars. Given the relatively small daily emission reduction, all benefits are allocated to light duty passenger cars.

Cost and Cost Effectiveness

Cost effectiveness can not be quantified for this measure. Actual cost effectiveness depends on the project specific emission reduction measures selected by the developer. In some cases, there is no cost or potentially a cost savings. For example, reducing street widths and providing a system of connected streets may reduce the cost of paving, while resulting in operational emission benefits. In other cases, the cost of a measure may depend on the rate negotiated by the developer/builder and a product supplier.

Evaluation Criteria

Criterion	Justification
Real	Emission reductions will occur with reduced trips and VMT
Quantifiable	Emission modeling through EMFAC 2002
Permanent	The emissions are permanently reduced throughout the operational phase
Enforceable	Mitigation measures are a condition of approval and/or CEQA mitigation measure
Surplus	Emissions are surplus unless individual measures overlap with other new programs not yet implemented

Implementation

Implementing Agency	Agency Type	Authority Origin
SMAQMD and land use jurisdictions	Air District; County of Sacramento; Incorporated Cities	Program is implemented through adoption of mitigation measures by the "lead agency" under CEQA.

Legislative Needs	None
Funding Needs and Sources	Existing program with staff funding supported by Measure A
Implementation Location	SMAQMD (Sacramento County)

Needed Resources and Authority

Authority exists through the California Environmental Quality Act.

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	5	Emission reductions are conservative and likely to be higher than quantified
Cost Effectiveness	2	Estimated cost effectiveness based on evidence that some mitigation has no cost; the market determines actual cost effectiveness
Public Acceptability	1	CEQA mitigation is an established program
Implementation/ Enforcement	3	Enforcement available through CEQA, however some jurisdictions do not allocate sufficient resources to monitor mitigation. SMAQMD staff may assist in the identification of non-compliance on behalf of CEQA lead agency.
Technical Feasibility	2	Varies based on specific mitigation measures
Total Score	13	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

TRANSPORTATION CONTROL MEASURE:

Control Measure Title: Folsom Light Rail Extension
Evaluating Firm: SMAQMD

Control Measure Description

Regional Transit's light rail extension to Folsom is designed to improve public transit service within a corridor following Highway 50 between the Amtrak Station in Downtown Sacramento and the City of Folsom. The \$230.5 million Amtrak/Folsom Corridor Project consists of five areas of improvements that will add 10.9 miles of additional track, 10 stations, enhanced signaling and 14 new light rail vehicles. Scheduled to be completed in 2005, the project will increase transit capacity, while providing faster and more convenient travel between the two cities. (Source: sacrt.com, 2004)

Targeted EIC Categories and Inventory (Calendar Year 2006)

EIC Codes	Description	Category	SMAQMD Inventory	
			NOx (tpd)	ROG (tpd)
710	LDA, Light Duty Passenger	All	7.72	10.69
722	LDT1, Light Duty Trucks 1	All	3.45	4.51
723	LDT2, Light Duty Trucks 2	All	4.24	3.64
TOTAL			15.41	18.84

Emission Reductions (in Calendar Year 2006)

EIC Codes	Description	Category	NOx Reduction (tpd)	ROG Reduction (tpd)
710	LDA, Light Duty Passenger	All	tbd	tbd
722	LDT1, Light Duty Trucks 1	All	tbd	tbd
723	LDT2, Light Duty Trucks 2	All	tbd	tbd
TOTAL			tbd	tbd

Cost and Cost Effectiveness

Cost effectiveness is unknown, because the emission reductions from the new light rail service are unknown. Ridership data will be available from Regional Transit after the service begins, and cost effectiveness can be calculated based on published CARB guidance for estimating the cost effectiveness of new transit service.

Evaluation Criteria

Criterion	Justification
Real	Emission reductions will occur with reduced trips and VMT
Quantifiable	Methodology established by CARB in "Methods to Find the Cost-Effectiveness of Funding Air Quality Projects"
Permanent	The emissions are permanently reduced during the light rail service life
Enforceable	Regional Transit must commit to provide the light rail service; the provision of service is independently verifiable

Surplus	Emissions are surplus as long as credit for Folsom light rail ridership is not allocated and claimed in specific land use project mitigation plans
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Implementation

Implementing Agency	Agency Type	Authority Origin
Sacramento Regional Transit	Transit provider	Regional Transit is the designated transit provider for Sacramento County.

Legislative Needs	None
Funding Needs and Sources	Funding has already been allocated and project is under construction.
Implementation Location	Sacramento County, City of Sacramento, City of Folsom

Needed Resources and Authority

None.

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	n/a	Ridership is unknown, therefore emission reductions are unknown
Cost Effectiveness	n/a	Cost effectiveness is unknown but can be calculated when ridership data is available
Public Acceptability	1	
Implementation/ Enforcement	1	
Technical Feasibility	1	
Total Score	n/a	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

COMMUNITY EDUCATION PROGRAM CONTROL MEASURE:

Control Measure Title: Spare The Air Program

Evaluating Firm: SMAQMD

Control Measure Description

SMAQMD's "Spare The Air" voluntary driving curtailment program marked its ninth year of operation in 2003. Spare The Air was created as an outreach program to engage the general public in helping to solve the problem of air pollution. It provides residents in the Sacramento region with information and resources to protect their health during the summer smog season by encouraging them to be aware of ozone levels and asking motorists to reduce their driving on days when unhealthy air is predicted. A Spare The Air day notice is issued when ozone levels in the Sacramento region are forecast to exceed 127 (8-hour average of 0.095 ppm) on the Air Quality Index during the current day or the next day. A 127 is near the middle of the "unhealthy for sensitive groups" category (101-150 AQI scale). Highlights of the Spare The Air program efforts include:

- Daily air quality forecasts and episodic Spare The Air advisories.
- Continuation of Ozone Movies updated hourly between 8 a.m. and 10 p.m. from May through October and distributed over the Internet at: www.sparetheair.com.
- Continued production and placement of Spare The Air advisories on television and radio stations.
- The expansion of "AirAlert", an e-mail, text pager, and digital cellular phone notification system that issues Spare The Air advisories and alerts subscribers when air quality reaches certain unhealthy AQI (Air Quality Index) levels.
- Partnership with the Sacramento County Department of Transportation by using its five electronic changeable message signs on four major thoroughfares to publicize Spare The Air days.
- Continued public outreach through Century Theaters by displaying slides with air quality messages before the start of movies and providing air quality posters for the lobby.
- Since 2001, created and distributed Save Planet Polluto, a CD-ROM adventure game that teaches children the causes and effects of air pollution and what they can do to clean up the air.
- Continued use and promotion of the "Smog City" interactive air pollution simulator on the Internet at: www.sparetheair.com.

Additional Public Outreach Efforts

SMAQMD continued existing public outreach efforts, including:

- American Lung Association's outreach featuring the High School Challenge, school curriculum, Clean Air Month and health effects study.
- Continued news media and public inquiry response.
- Development of information brochures, newsletters and fact sheets.
- General air quality awareness advertising including radio and television announcements.
- Free media coverage of Spare The Air advisories.
- Complete re-design and expansion of the SpareTheAir.com Web site to provide additional real-time health information, historical data and services.

Evaluation of Spare The Air Program

Regional awareness of the air quality problem and the Spare The Air programs remains high. Phone surveys conducted immediately after Spare The Air episodes indicate that about 40 percent of the respondent drivers knew the air was forecasted to be unhealthy and 25 percent of these aware drivers said they reduced driving by one or more trips. (Cleaner Air Partnership's Spare The Air Campaign 2002 Evaluation Report, December 2002, page 32.)

Employer participation remained strong. Over 480 businesses participated in our employer outreach network. This encompasses over 1,000 work sites comprising nearly 200,000 employees. The Employee Transportation Coordinators at these businesses distributed Spare The Air advisories via FAX, e-mail and signage at their work sites.

Estimated Emission Reductions

As a result of extensive research conducted by the U.S. EPA and ARB, enhanced procedures to adequately quantify participation in the Spare The Air program were developed. That methodology has been incorporated into Spare The Air surveys conducted by the Cleaner Air Partnership and its contract surveying vendor. In case there is a tendency for the individuals to overstate their driving reduction on Spare The Air days, the use of control (non-Spare The Air) day interviewing provides a means of calculating an adjustment factor to derive results attributed only to the Spare The Air day program. During the summer of 2003, 2,678 telephone interviews were conducted with Sacramento region drivers. In order to be counted as trip reducers, respondents have to:

- 1) be aware of the Spare The Air episode the previous day (using the ARB-worded question), and
- 2) consciously reduce the number of driving trips they took on the Spare The Air day, and
- 3) do so specifically for air quality reasons.

Overall, the results and conclusions will tend to be conservative and are not likely to overestimate the impact of the Spare The Air program. The following table contains the estimated number of Sacramento County trips reduced and associated emission reductions on an average Spare The Air day due to the efforts of the Spare The Air program during 2001-2003.

**2001-2003 Triennial Estimated Emission Reductions
from the “Spare The Air” Program in Sacramento County**

Year	STA Daily Trips Reduced ^a	ROG ^b Emission Factor (grams/trip)	NOx ^b Emission Factor (grams/trip)	ROG Reductions (tons/day)	NOx Reductions (tons/day)
2001 (15 STA days)	115,963	5.38	4.96	0.69	0.63
2002 (22 STA days)	98,712	4.81	4.35	0.52	0.47
2003 (14 STA days)	29,120	4.36	3.83	0.14	0.12

^a The average number of Sacramento County trips reduced on Spare The Air (STA) days are from Cleaner Air Partnership Spare The Air Evaluation Reports for 2001, 2002, and 2003.

^b Emission factors from EMFAC2002, V2.2 for average emissions/trip for Sacramento County light duty automobiles and light duty truck categories for specific years indicated during the summer season.

Cost Effectiveness Estimates

The following table contains cost effectiveness estimates for the Sacramento Metropolitan Air Quality Management District “Spare The Air” program based on region-wide results.

**2001-2003 Triennial Cost Effectiveness Estimates
for the SMAQMD “Spare The Air” Program**

Year	STA Daily Trips Reduced Region-wide ^a	ROG and NOx ^b Emission Factor (grams/trip)	ROG and NOx Reductions (tons/day)	No. of STA Days	ROG and NOx Reductions (tons/year)	STA Program Expenses ^c (\$/year)	Cost Effectiveness (\$/ton)
2001	126,000	10.34	1.43	15	21.52	219,000	~10,000
2002	135,894	9.16	1.37	22	30.14	255,000	~8,500
2003	44,636	8.19	0.40	14	5.60	290,000	~52,000

^a The average number of Sacramento region trips reduced on Spare The Air (STA) days are from Cleaner Air Partnership Spare The Air Evaluation Reports for 2001, 2002, and 2003. However, 2001 regional trips reduced had to be estimated by proportioning Sacramento County trip data.

^b Emission factors from EMFAC2002, V2.2 for average emissions/trip for Sacramento County light duty automobiles and light duty truck categories for specific years indicated during the summer season.

^c Spare The Air program expenses are from Cleaner Air Partnership Spare The Air Evaluation Reports for 2001 and 2003. 2002 expenses were not reported in the 2002 Cleaner Air Partnership report, so it is estimated from the average of 2001 and 2003.

Recommendation and Proposed Commitments for 2004-2006

The District is proposing a commitment to continue its Spare The Air program and other various public outreach activities during the next triennial period (2004-2006). The Sacramento Area Council of Governments recently approved the extension of the regional Spare The Air program to be funded with federal transportation funds through the smog seasons of 2004, 2005, and 2006. Based on the previous three years (2001-2003) data and taking into account slightly declining fleet motor vehicle emission factors, the expected Sacramento County emission reductions for the Spare The Air program in the next 2004-2006 triennial period are estimated to be about 0.1-0.5 ton per day of ROG and NOx each. In addition, the estimated cost effectiveness of the Spare The Air program is approximately \$10,000-\$50,000 per ton of combined ROG and NOx emission reductions region-wide.

Overall Feasibility

Criteria	Score	Comments
Emission Reduction	3	
Cost Effectiveness	1-4	Variable, depending on number of Spare The Air days and public response.
Public Acceptability	1	
Implementation/ Enforcement	1	
Technical Feasibility	2	
Total Score	8-11	

Scoring	Emission Reduction	Cost Effectiveness	Public Acceptability	Implementation/ Enforcement	Technical Feasibility
1	>10 tpd	\$0- \$13,000	Already happening	Authority and resources exist	Commercially available, widely used, easy installation
2	>1-10 tpd	\$13,001- \$20,000	Consensus obvious/easy	Augments an existing program	Commercially available, widely used, extensive installation
3	>0.1-1 tpd	\$20,001- \$30,000	Compromise may be needed	Authority available, need resources	Commercially available not widely used in specific application
4	0.05-0.1 tpd	\$30,001- \$100,000	Difficult/strong opposition	No authority, but could be accomplished	Demonstrated, commercially available in 1-2 yr.
5	<0.05 tpd	> \$100,000	Unlikely to be approved	Impossible, no authority or resources	Developmental technology

**Description of SMAQMD
“Further Study Measures”**

CONTROL MEASURE NUMBER: Rule 459

Control Measure Title: Automotive Refinishing

Evaluating Firm: SMAQMD

Control Measure Description

Automotive refinishing coatings are used on motor vehicles and other mobile equipment, primarily by autobody repair and paint shops and automotive dealerships. VOC emissions from the surface coating operations result from the evaporation of the organic solvents used in the coatings. These emissions occur in a number of places during the operation, including surface preparation and cleanup, application of the coating, drying of the parts, and cleanup of the application equipment. The rule establishes VOC limits for coatings and surface prep/cleanup that have been in effect since January 1998.

The SCAQMD has had more stringent requirements in place for precoat, primer sealer, multistage topcoat, topcoat, and metallic/iridescent topcoats since December 1998. In addition both SCAQMD and SJUAPCD have more restrictive VOC limits for some surface prep and cleanup either in place or going into place by July 2005.

During 2000 – 2003, amendments were evaluated for the automotive refinishing rule and determined to be not cost effective. A decision was made at that time to wait for a Suggested Control Measure for auto refinishing. A SCM still has not been drafted for this category.

Recommendation

The lower surface prep and cleanup requirements will be evaluated in 2006 as part of the solvent cleaning/degreasing evaluation. A separate evaluation of the lower coating VOC limits will be performed in 2006 as well. This measure is listed as a further study measure because the emission reduction potential and cost effectiveness of the measure still needs to be evaluated.

CONTROL MEASURE NUMBER: New Rule

Control Measure Title: Concentrated Animal Feeding Operations
Evaluating Firm: SMAQMD

Control Measure Description

This measure would affect operations including dairies, cattle feedlots, poultry ranches, and other agricultural operations involving animal husbandry. The exact number of affected facilities will be determined during the rule development process based on exemption levels derived from the cost effectiveness of available options. There has been one poultry ranch identified with up to 600,000 birds.

Operations involved with the raising of fowls or animals were previously exempted from District permitting pursuant to state law that was rescinded effective January 1, 2004. VOC emissions may be reduced by controlling emissions from feedlots and from supporting operations such as waste treatment lagoons. The BARCT emission limits and compliance schedule for CAFOs will be developed pursuant to the requirements of CH&SC 40724.6 and will reflect the technical and economic feasibility of candidate control options.

The districts that are designated a serious federal nonattainment area for applicable ambient air quality standards for particulate matter are required to adopt rules by July 1, 2006 with an implementation schedule on or before July 1, 2007. SMAQMD is designated as a moderate federal nonattainment area for particulate matter. For large confined animal facilities, based on the work done by the State Air Resources Board, the district may be required by CH&SC 40724.6 to adopt and implement a rule to reduce emissions from large confined animal facilities.

Before determining whether this is an "all feasible" measure inventory work needs to be done to identify potentially impacted facilities. The District should monitor rule development work being performed in by CARB and in SCAQMD and SJUAPCD.

Recommendation

This measure is recommended to be a further study measure and will evaluate the feasibility based on the outcome of the ARB work and data gathering efforts for existing CAFOs.

CONTROL MEASURE NUMBER: Unnumbered Rule

Control Measure Title: Food Product Manufacturing and Processing
Evaluating Firm: SMAQMD

Control Measure Description

On September 15, 2000, the SCAQMD Board adopted Rule 1131 – Food Product Manufacturing and Processing Operations to reduce emissions of isopropyl alcohol and hexane from food manufacturing and processing operations such as extraction, blending, separation, crystallization, and drying. The current rule sets volatile organic compound (VOC) concentration limits on both manufacturing processes and sterilization of the equipment used to manufacture and process food products, or allows the use of add-on control equipment to capture and destroy VOC emissions at a minimum of 85.5%. These emission limits became effective October 1, 2002.

The purpose of Rule 1131 is to reduce emissions of Volatile Organic Compounds (VOCs) from the use of solvents in food product manufacturing and processing operations. Food products are considered to be any combination of carbohydrates, proteins, or fats intended for human consumption. Colorings, flavorings, spices and extracts that are manufactured and subsequently used in the preparation of human consumable foods are considered to be food products.

The VOC content requirements for Rule 1131 are: 120 grams of VOC per liter of material for general process solvents; 400 grams of VOC per liter of material for solvents used for sterilization; and 200 grams of VOC per liter of material for solvents used for sterilization (effective October 1, 2005)

The requirements went into effect October 1, 2002 (except for the 200 g/l sterilization requirement).

Rule 1131 also includes several general housekeeping and recordkeeping requirements. Equipment with leaks, visible tears, or cracks that result in VOC emissions to the atmosphere must be repaired within 48 hours or the equipment shall be drained of all solvent and shut down until replace or repaired. Records must be maintained for any equipment with a leak, visible tear, or crack. The record shall contain the date and time the leak, crack or tear was detected, as well as the time and date the equipment was repaired. Additionally, records for solvents used in operations subject to the rule must be kept pursuant to SCAQMD District Rule 109.

Several food product manufacturing and processing industries that are regulated under other SCAQMD District rules and regulations are exempt from the requirements of Rule 1131. These include: Equipment subject to Rule 472 – Reduction of Animal Matter; Operations, materials, and equipment subject to Rule 1103 – Pharmaceutical and Cosmetic Manufacturing Operations; Operations subject to Rule 1138 – Control of Emissions from Restaurant Operations; and Operations subject to Rule 1153 – Commercial Bakery Ovens.

Additionally, Rule 1131 does not apply to: facilities with an aggregate total of VOC emissions from food product manufacturing operations of less than 440 pounds per calendar month; operations exclusively using solvents containing no more than 50 grams of VOC per liter of material; deep fat frying operations; and operations conducted at breweries, wineries, or distilleries.

VOC emissions from breweries, wineries, and distilleries are from fermentation processes and not from direct solvent use and require separate analysis. VOC emissions from deep-fat frying operations are negligible but particulates from such operations are significant and are controlled by other District rules.

Recommendation

This measure needs to be further studied to determine whether it is an “all feasibles” measure. Work needs to be performed in order to identify any potential facilities that would be affected by the requirements. If potential sources are identified, then an evaluation of the feasibility and cost effectiveness of this rule may be included with the amendments to the degreasing/solvent cleaning rules.

CONTROL MEASURE NUMBER: Rule 465

Control Measure Title: Polyester Resins

Evaluating Firm: SMAQMD

Control Measure Description

Rule 465 applies to all polyester resin (composite) operations in the district, which include but are not limited to, the manufacturers of the bathware products, vanity installations, hulls for recreational and commercial watercraft, bodies for recreational vehicles, building panels and appliances, automotive, aerospace and aircraft components, and structural components for chemical process equipment and storage tanks. The rule establishes limits for monomer content and the use of vapor suppressants that have been in effect since January 1998.

In November 2001, the SCAQMD adopted amendments to their polyester resin rule to further reduce VOC emissions from these operations. The amendments included: requiring nonatomizing application techniques for spraying gel coat and resin materials; reduced monomer content of the polyester resin materials such as clear gel coat, pigmented gel coat, general purpose resins, fire retardant and high strength resins; and requires that the applied tub/shower resin materials to be vapor suppressed. The amendments went into effect in July 2002, except for nonatomizing spray technology for gel coats which goes in effect July 2004.

The SCAQMD estimated that the use of nonatomizing application technologies, low monomer resin material, fillers and vapor suppressants will reduce waste and emissions. Resin material savings from waste and emission reductions are expected to offset most of the cost impacts associated with the amendment, and may potentially lead to a total net cost savings.

Recommendation

This measure needs to be further studied to determine whether it is an "all feasible" measure. The last of the requirements in SCAQMD went into effect in July 2004 and in addition there have been changes to the emission factors for polyester resins that need to be included in the evaluation for potential emission reductions. Rule 465 will be evaluated in 2006 for the potential feasibility and cost effectiveness of imposing the SCAQMD limits.

MOBILE SOURCE CONTROL MEASURE:

Control Measure Title: Accelerated Vehicle Retirement
Evaluating Firm: SMAQMD

Control Measure Description

Light and medium-duty on-road vehicles constitute nearly 24% of the emissions inventory in Sacramento County. Only 3% of the vehicle fleet was 15 years old or older in 1970, but by 2001 the proportion had increased to 16%. As vehicle costs and quality have increased over the past 30 years, turnover has decreased. Studies indicate that although older vehicles can account for as little as 12% of the vehicle miles traveled (VMT), they may emit more than 50% of the reactive organic gases (ROG). The SMAQMD has not considered an accelerated vehicle retirement program because the District was focused on reducing oxides of nitrogen (NO_x). However, managers of the Old Vehicle Buy-Back Program operated by the Bay Area Air Quality Management District (BAAQMD) indicate that nearly equal benefits of both ROG and NO_x have been realized.

If adopted, this measure would establish eligibility criteria for an accelerated vehicle retirement program, including establishing collection and disposal processes, and payment, and reporting procedures. A number of outstanding issues need to be resolved. These include:

- Integrating a District-level program with the State program scheduled to begin operation in October, 2004 where incentives may be much higher than a local district could afford to implement (e.g., the BAAQMD is recently offering \$650 per vehicle vs. \$1,000 offered by the State);
- If the District contributes funding to the State to retire more vehicles in our District, a mechanism would have to be developed to ensure that additional vehicles would be retired over and above the number that would have participated in the State's program;
- Some studies indicate that emission reductions have been exaggerated, so a methodology is needed to evaluate:
 - The remaining life of a retired vehicle;
 - The actual emission levels of the scrapped vehicle;
 - The emission levels of the vehicle it is replaced with or is an alternative mode of travel being chosen;
- Eligibility criteria would have to be established to provide some level of assurance that:
 - without an incentive program, participating vehicles would not be retired;
 - they are being replaced with a vehicle that reduces emissions;
 - a market for old cars is not created, encouraging importation of older vehicles into the District;

In addition, funding alternatives need to be evaluated. The BAAQMD uses DMV surcharge fees and that would be a possibility for the SMAQMD as well, but it may also be worthwhile evaluating the feasibility of establishing a tax on the sales of full-size Sport Utility Vehicles (SUV) or other alternatives.

Recommendation

The SMAQMD will study the feasibility and cost effectiveness of implementing a program of this type in 2006.

MOBILE SOURCE CONTROL MEASURE:

Control Measure Title: Free Gas Caps

Evaluating Firm: SMAQMD

Control Measure Description

Light and medium-duty on-road vehicles constitute nearly 24% of the emissions inventory in Sacramento County. A source of reactive organic gases (ROG) is missing or faulty gas caps on vehicles. In vehicle inspection programs around the country, as many as 60% of the evaporative system inspection failures are due to faulty gas caps. The visual test failure rate for gas caps in the California Smog Check Program is very low, less than 0.4%. Data was not immediately available for the functional test, but in other states the failure rate averages around four percent.

Several states operate programs where they give away new gas caps or charge a nominal fee for the one's with unusual configurations.

Certain areas in the Sacramento region exceed standards for ROG. In order to generate emission benefits separate from the Smog Check Program, the District is considering the implementing a program where a promotional event would be held at a shopping mall to conduct voluntary testing on motorist's gas caps. A free gas cap would be offered to the motorist if their gas cap fails or if the motorist indicates that they have lost their gas cap altogether. One metropolitan area program offers a voucher to Auto Zone automotive parts supplier for 10 dollars if the motorist has an unusual type of gas cap.

There are approximately 10 different types of gas caps commonly used on the existing fleet of vehicles. To conduct an event like this, the District would have to obtain a stock of these gas caps, several gas cap test stands and arrange for staff to conduct the events. In addition, arrangements would have to be made with an auto parts supplier if the District wants to hand out vouchers for unusual types of gas caps.

Recommendation

The SMAQMD will study the feasibility and cost effectiveness of implementing a program of this type in 2006.

LAND USE CONTROL MEASURE: Rule 1052 (Concept)

Control Measure Title: Indirect Source Rule (ISR) for Construction

Evaluating Firm: SMAQMD

Control Measure Description

The proposed Indirect Source Rule (ISR) for construction of land use and transportation projects will establish an enforceable mechanism to mitigate the impact of heavy duty construction equipment on air quality. Construction equipment is a significant component of the mobile source inventory. Other than CEQA mitigation, there are no local regulations that control exhaust emissions from construction equipment, and state and federal emission standards do not apply retroactively to older, highly polluting equipment.

Contractors who use heavy duty off-road or on-road mobile equipment during the construction phase of an indirect source (such as residential dwelling units, commercial, office, retail, and roadway projects) would be required to comply with the rule. The primary compliance approach would be payment of a mitigation fee, which would be administered by SMAQMD and used to purchase off-site emission reductions. Additionally, a voluntary compliance option would allow for a reduction in the overall emissions of mobile construction equipment used on the project, either by using relatively newer equipment or applying other emission reduction technologies. A combination of mitigation fee and voluntary on-site emission reduction could be used, at the discretion of the applicant.

Revenue from the mitigation fee would be used to fund a variety of emission reduction strategies. It is anticipated that funded projects would be similar to projects that are funded currently through the Carl Moyer Memorial Air Quality Program, such as off-road equipment repowers. A minimum cost effectiveness standard will be established to ensure that off-site emission reductions are roughly proportional to the impact being mitigated through the rule.

The mitigation fee is likely to be based on an assessment of reductions that can be achieved through voluntary on-site emission reduction options, using the statewide average for all mobile construction equipment as a baseline. Averages for on-road vehicles and off-road equipment may have to be calculated separately. The preferred approach is to develop typical equipment use profiles for different projects based on acreage. The emissions associated with the typical equipment could be calculated and result in a quantified standard emission rate for each acre of a construction project. Rule compliance would be achieved by either paying the standard mitigation fee, or partially or completely reducing the fee through the application of on-site mitigation.

Recommendation

Proposed Rule 1052 will be developed on a conceptual basis in 2004. If the measure is determined to be feasible and cost effective, then public workshops will be held in 2005, with potential rule adoption following in late 2006.

LAND USE CONTROL MEASURE:

Control Measure Title: Indirect Source Rule (ISR) for Land Use Operational Phase
Evaluating Firm: SMAQMD

Control Measure Description

The proposed Indirect Source Rule (ISR) is intended to reduce operational emissions of significant new land use development projects. Land use developments routinely generate large amounts of ozone precursors each year in Sacramento County. Land uses are also called indirect sources, because most of the emissions are created by mobile sources that travel to and from the land use. After the construction phase is complete, land uses create ongoing mobile and area source emissions over the project lifetime, generally 30 years or more, attracting VMT from residents, employees, customers, and delivery vehicles.

The implementation approach is expected to include a mitigation fee program, which would enable an off-site mitigation fund. A voluntary on-site mitigation component would provide the opportunity to implement emission reduction strategies such as trip reduction (transit, bike and pedestrian facilities), alternative transportation incentives, parking management, energy conservation, and other strategies.

The San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) is currently developing two rules that would regulate indirect sources of emissions. Proposed Rule 3180 (Indirect Source Mitigation Fee) and Proposed Rule 9510 (Indirect Source Mitigation Program) would regulate the operational emissions from residential, commercial, and industrial sources. The expected adoption date for the SJVUAPCD rules is unknown.

Recommendation

The control measure will be developed on a conceptual basis beginning in late 2005.

TRANSPORTATION CONTROL MEASURE:

Control Measure Title: Additional Transit: Light Rail and Bus Rapid Transit
Evaluating Firm: SMAQMD

Control Measure Description

Vehicle trips and vehicle miles traveled continue to increase at a rate of approximately double the rate of population growth. These increases in vehicle use can lessen the benefits that have been achieved through technology. Transit, particularly light rail transit and bus rapid transit, can assist in reducing vehicle trips and associated emissions. All transit programs being developed or implemented continue to be evaluated to determine whether they can be included actual control measures. At this time there are no specific projects that have been identified.

Constraints on operating funds have limited the ability to implement new service, and unfortunately, many transit operators have underserved communities. The need to continually address a variety of service requirements to maintain service limits the amount of growth in these types of facilities that can be accommodated.

The SMAQMD will work with Regional Transit and the Sacramento Area Council of Governments to identify specific new light rail facilities and bus rapid transit routes with financial commitments that could be included as a control measure.

Recommendation

The SMAQMD will study the feasibility of implementing a control measure of this type in 2006-2007.

TRANSPORTATION CONTROL MEASURE:

Control Measure Title: Promote Bicycle and Pedestrian Programs

Evaluating Firm: SMAQMD

Control Measure Description

The lack of bicycle and pedestrian facilities has long been recognized as a deterrent to bicycling and walking. Bicycling and walking reduce vehicle trips and associated emissions. Bicycle and Pedestrian Master Plans have been or are being developed for many of the jurisdictions within the Sacramento area. The goal of these plans is to create a regional bicycle and pedestrian system with an emphasis on improving conditions for both bicycling and walking in the area.

The District has been involved in the development of these plans and has worked to ensure their consistency and interconnectivity. As these plans are implemented and specific funding commitments are made, they will continue to be examined for inclusion into the plan effort and emission estimates included in progress toward attainment.

Recommendation

The SMAQMD will study the feasibility and cost effectiveness of implementing a measure of this type in the Sacramento region. This further study measure is expected to be evaluated during 2006-2007.

COMMUNITY EDUCATION PROGRAM CONTROL MEASURE:

Control Measure Title: Clean Air Consortium for Spare The Air
Evaluating Firm: SMAQMD

Control Measure Description

SMAQMD's "Spare The Air" was created as an outreach program to engage the general public in helping to solve the problem of air pollution. It provides residents in the Sacramento region with information and resources to protect their health during the summer smog season by encouraging them to be aware of ozone levels and asking motorists to reduce their driving on days when unhealthy air is predicted. The Clean Air Consortium measure is intended to be an added element to the Spare The Air program.

The Clean Air Consortium measure would be a partnership with cities, counties, and other public agencies that voluntarily minimize polluting activities on Spare The Air days by rescheduling lawn maintenance, painting, vehicle refueling, and vehicle trips. This measure is expected to be patterned after a similar effort implemented in the Bay Area AQMD as part of their Spare The Air program.

In addition, this Spare The Air measure will also study whether there are creditable reductions from the seasonal public outreach campaign. Those drivers who routinely cut back on their driving during the summer to reduce air pollution are typically not counted as Spare The Air day reducers, since the methodology only includes those drivers that say they drove less than usual on Spare The Air days for air quality reasons. This part of the study will evaluate whether travel models represent regular or routine driving habits, including reductions that occur because of the seasonal public education campaign, and whether voluntary seasonal trip reduction benefits are already included in the overall baseline travel data incorporated in the current on-road motor vehicle emissions inventory. Therefore, this information needs to be evaluated in conjunction with the overall methodology of trip generation in EMFAC and with policies on determining voluntary control measure emission reductions.

Recommendation

The SMAQMD will study the feasibility and cost effectiveness of implementing a measure of this type within the Sacramento region. This further study measure is expected to be evaluated during 2005-2006.

**Description of Ordinances Developed
For Implementation By Local Jurisdictions**

MOBILE SOURCE CONTROL MEASURE:

Control Measure Title: Model Limitation on Engine Idling Ordinance
Evaluating Firm: SMAQMD

Control Measure Description

The Model Limitation on Engine Idling Ordinance is one of three control measures developed as a result of the Sacramento Ozone Summit (SOS) meeting between regional APCO, government agencies, and private industry to reduce peak ozone levels in the Sacramento Federal Nonattainment Area (SFNA). The Model Limitation on Engine Idling Ordinance requires jurisdictions that adopt the ordinance to restrict the idling of all heavy-duty vehicles and off-road equipment to no more than 5 minutes in a given location. Engine idling is a major source of NOx emissions in the SFNA and is unnecessary in most cases.

This ordinance allows jurisdictions to enforce and cite violations of excessive engine idling. Most diesel engines do not need to idle, and the NOx and PM emissions from each idling engine are a significant source of air pollution. In many cases, the end user will actually save money as a result of this ordinance in lower fuel and maintenance costs. Exemptions are allowed in special cases, however the main emission benefit will be from commercial heavy-duty vehicles. The California Air Resources Board is developing regulations for on-road vehicles similar to the model ordinance.

The emission benefit from this measure cannot be calculated independently of the other two SOS model ordinances and requires full regional adoption to be effective. Currently, there is no quantification of off-road engine idle emissions beyond those found in the certification cycle, however the “breather benefit” of reduced off-road engine idling assists our efforts to improve regional air quality.

Recommendation

Section 39002 of the Health and Safety (H&S) Code indicates that the Air Resources Board is solely responsible for the control of vehicular emissions except under a few special circumstances. This does not prevent the District from documenting violations of the H&S Code, but it does prevent the District from pursuing any penalties or taking any punitive action against violators. However, the cities in the region have been encouraged to adopt the low-emission fleet policy, the idle-limiting rule and a green contracting rule as local ordinances because they can take enforcement action, including collecting penalties, against violators under the general provisions of their police powers and cite them for creating a nuisance. Therefore, local government will have stronger enforcement capability, making this a better approach initially.

An ordinance designed to limit engine idling on heavy-duty vehicles has been adopted by Placer County and the City of Auburn, and is scheduled for adoption by the City of Sacramento on September 7, 2004. These policies and ordinances are being evaluated by other local government agencies regionwide.

MOBILE SOURCE CONTROL MEASURE:

Control Measure Title: Model Low Emission Vehicle “Green” Contracting Ordinance
Evaluating Firm: SMAQMD

Control Measure Description

The Model Low Emission Vehicle “Green” Contracting Ordinance is one of three control measures developed as a result of the Sacramento Ozone Summit (SOS) meeting between regional APCO, government agencies, and private industry to reduce peak ozone levels in the Sacramento Federal Nonattainment Area. The Model Low Emission Vehicle “Green” Contracting Ordinance requires jurisdictions which adopt the ordinance to give bidding preference on government projects to companies operating clean vehicle & equipment fleets. Bidders would receive extra points by operating cleaner light, medium, and heavy duty vehicles and encouraging employees to use mass transit.

This ordinance provides an incentive for regional fleets to increase their vehicle & equipment turnover to reduce mobile source emissions and encourage their employees to reduce vehicle trips. It is expected that the preference points would provide enough additional revenue to justify the expense of replacing or retrofitting a company’s fleet. There is an assumed spillover effect from fleets replacing all of their equipment to obtain the preference points, instead of only upgrading the engines needed for each project.

The emission benefit from this measure cannot be calculated independently of the other two SOS model ordinances and requires full regional adoption to be effective. Several jurisdictions are developing this concept as a policy, rather than an adopted ordinance. Nevertheless, the overall benefit will remain the same.

Recommendation

Section 39002 of the Health and Safety (H&S) Code indicates that the Air Resources Board is solely responsible for the control of vehicular emissions except under a few special circumstances. This does not prevent the District from documenting violations of the H&S Code, but it does prevent the District from pursuing any penalties or taking any punitive action against violators. However, the cities in the region have been encouraged to adopt the low-emission fleet policy, the idle-limiting rule and a green contracting rule as local ordinances because they can take enforcement action, including collecting penalties, against violators under the general provisions of their police powers and cite them for creating a nuisance. Therefore, local government will have stronger enforcement capability, making this a better approach initially.

The Model Low Emission Vehicle “Green” Contracting Ordinance has been adopted in policy form by Placer County and is under evaluation regionwide.

MOBILE SOURCE CONTROL MEASURE:

Control Measure Title: Model Low Emission Vehicle & Fleet Ordinance
Evaluating Firm: SMAQMD

Control Measure Description

The Model Low Emission Vehicle & Fleet Ordinance is one of three control measures developed as a result of the Sacramento Ozone Summit (SOS) meeting between regional APCO, government agencies, and private industry to reduce peak ozone levels in the Sacramento Federal Nonattainment Area (SFNA). The Model Low Emission Vehicle & Fleet Ordinance requires jurisdictions which adopt the ordinance to purchase only the cleanest vehicles & off-road equipment available in each use category and take steps to clean up their existing fleet.

This ordinance allows jurisdictions to purchase only vehicles certified to the most stringent emission standards, retrofit or replace older equipment, and promotes the use of alternative fuels. By using only the cleanest equipment, emissions from government fleets can be cut significantly. It also provides a good example to the region on how using new, low emission technology can reduce ozone and improve fleet operations.

The emission benefit from this measure cannot be calculated independently of the other two SOS model ordinances and requires full regional adoption to be effective. The main emission benefit will come from the accelerated purchase of low emission vehicles & off-road equipment in government fleets. Older engines will either be replaced or retrofitted to meet the requirements. Several jurisdictions are developing this concept as a policy, rather than an adopted ordinance. Nevertheless, the overall benefit will remain the same.

Recommendation

Section 39002 of the Health and Safety (H&S) Code indicates that the Air Resources Board is solely responsible for the control of vehicular emissions except under a few special circumstances. This does not prevent the District from documenting violations of the H&S Code, but it does prevent the District from pursuing any penalties or taking any punitive action against violators. However, the cities in the region have been encouraged to adopt the low-emission fleet policy, the idle-limiting rule and a green contracting rule as local ordinances because they can take enforcement action, including collecting penalties, against violators under the general provisions of their police powers and cite them for creating a nuisance. Therefore, local government will have stronger enforcement capability, making this a better approach initially.

The Model Low Emission Vehicle & Fleet Ordinance has been adopted by Placer County and the City of Sacramento¹ and is under evaluation regionwide.

¹Sacramento City Council meeting July 27, 2004 afternoon, item 5-4.