

Advisory Committee Meeting – August 26, 2003
Ventura County Air Pollution Control District
Proposed Amended Standards - APCD Rule 74.6, Surface Cleaning and Degreasing; Rule 74.6.1, Batch Loaded Vapor Degreasers; and Rule 23.F, Exemptions From Permit

EXECUTIVE SUMMARY

State law requires Ventura County to implement "every feasible measure" in its efforts to attain the California ambient air quality standard for ozone. The California Air Resources Board determined that limiting the reactive organic compound (ROC) content of solvents used for cold surface cleaning is a feasible control measure. The air pollution control agencies for Los Angeles, the San Francisco Bay Area, the San Joaquin Valley, and Sacramento have all adopted rules prohibiting the use of ROC solvent for this purpose.

With some exceptions, staff is proposing to prohibit the use of cleaning solvents containing more than 25 grams of reactive organic compounds (ROC) per liter (25 g/l). This restriction would apply to cold surface cleaning operations conducted in degreasing equipment as well as cleaning outside of degreasing equipment (e.g., handwipe cleaning). For most cleaning activities, prohibited solvents can be replaced with water-based (aqueous) solvents. Staff is proposing less restrictive ROC-content limits for cleaning electrical components, aerospace components, medical devices, and for application equipment cleanup (i.e., cleaning of coatings, adhesives, inks, or resins from spray guns, paint brushes, ink rollers, etc.). In addition, staff is proposing exceptions for a list of cleaning activities where the use of low-ROC solvents is not feasible.

This proposal will affect any person using hydrocarbon solvents such as mineral spirits or alcohol to clean a wide variety of surfaces such as: parts, products, tools, equipment, and work areas associated with manufacturing and maintenance; repair of automotive, truck, bus, and other machinery; metal-working facilities; oilfield operations, and others.

The proposed revisions to Rule 74.6 will affect both permitted and un-permitted sources that use cleaning

solvents. APCD staff estimates that the proposed requirements would reduce ROC emissions by approximately 333 tons of ROC per year (0.9 tons per day).

Surface Cleaning Activity	Proposed ROC and Vapor Pressure Standards
Application Equipment Cleanup (e.g., paintbrushes, spray guns, etc)	900 grams of ROC per liter and 33 mm Hg
Electrical Components Medical Devices, and Aerospace Components	900 grams of ROC per liter and 33 mm Hg
All Other Surface Cleaning	25 grams of ROC per liter (no VP limit)

Cost analyses performed by the South Coast AQMD and the San Joaquin Valley APCD determined that the cost-effectiveness of converting cold solvent cleaning operations to use compliant solvents and equipment ranges from a cost savings of \$1.66 per pound of ROC emissions reduced, to a cost of \$6.47 per pound of ROC emissions reduced. Emission reduction costs up to \$9.00 per pound of ROC or NOx are considered cost-effective in Ventura County.

Staff is also proposing revisions to the District's vapor degreasing requirements to implement the "every feasible measure" requirement in state law. The amended rule will require batch loaded vapor degreasers to be retrofit with automated parts handling equipment, and either a refrigerated freeboard chiller or a superheated vapor zone. These new requirements will affect 8 vapor degreasers and reduce emissions by an estimated 4 tons per year.

BACKGROUND

Evaporation of reactive organic compounds (ROC) is a major component of Ventura County's air quality problem. In the presence of sunlight, ROC reacts with oxides of nitrogen (NOx – a pollutant emitted when fuel is burned) to form ozone – also known as photochemical smog. The California Clean Air Act requires Ventura County to implement "every feasible measure" in its efforts to attain the California ambient air quality standard for ozone. The pertinent section of the Act is reprinted below (California Health and Safety Code Section 40914 a & b):

40914 (a) Each district plan shall be designed to achieve a reduction in districtwide emissions of 5 percent or more per year for each nonattainment pollutant or its precursors, averaged every consecutive three-year period, unless an alternative measure of progress is approved pursuant to Section 39607.

(b) A district may use an alternative emission reduction strategy which achieves less than an average of 5 percent per year reduction in districtwide emissions if the district demonstrates to the state board, and the state board concurs in, either of the following:

(1) That the alternative emission reduction strategy is equal to or more effective than districtwide emission reductions in improving air quality.

(2) That despite the inclusion of every feasible measure in the plan, and an expeditious adoption schedule, the district is unable to achieve at least a 5-percent annual reduction in districtwide emissions.

The California Air Resources Board (ARB) determined that prohibiting the use of ROC solvents for many cold surface cleaning operations is a feasible control measure. ARB's feasibility determination is based on the fact that the air pollution control agencies for Los Angeles, the San Francisco Bay Area, the San Joaquin Valley, and Sacramento have all adopted similar rules prohibiting the use of ROC solvent.

ARB also determined that additional feasible control measures can be implemented in Ventura County for batch loaded vapor degreasers. Staff is proposing rule revisions to implement these new control measures.

Ventura County APCD Rule 74.6 was originally adopted in 1979 to reduce emissions from surface cleaning equipment. The rule was revised eight times since 1979 to meet increasingly more restrictive state and federal mandates, and to make it consistent with other District rules.

RULE DEVELOPMENT PROCESS

The APCD uses a four-step process for developing air quality regulations. First, APCD staff holds a "Public Consultation Meeting" to discuss the purpose of the new rule requirements and to solicit public input on alternatives. For the proposed revisions to Rule 74.6, staff mailed 3,279 meeting notices to potentially affected businesses. Thirty people attended the August 13, 2002, Public Consultation Meeting. Staff then prepared draft rule revisions after reviewing comments received at the public consultation meeting and by mail and telephone. The draft rule revisions were discussed at a public workshop on April 29, 2003. Twenty-nine persons attended the public workshop. Staff revised the draft rule again based on public input received at the

workshop. Staff contacted facilities with vapor degreasers individually to develop the rule revisions to implement the proposed new controls for those devices. The third step in this rule development process will be consideration of the revised draft rule by the APCD Advisory Committee. The Advisory Committee is a group of up to 20 representatives appointed by the Air Pollution Control Board to review proposed rule revisions. The Committee meets as necessary on the fourth Tuesday of the month at 7:30 p.m. Meeting notices are sent to all persons who have expressed an interest in the rule revisions. The Committee discusses concerns brought by anyone attending the meeting. If the Committee recommends approval of the rule

revisions, a public hearing is scheduled for adoption of the new rules by the Air Pollution Control Board.

Implementation and enforcement of the new rules commences at a later date specified in the rule.

PROPOSED RULE REVISIONS

APCD staff is proposing to prohibit, where feasible, the use of cleaning solvents containing more than 25 grams of reactive organic compounds (ROC) per liter (25 g/l) in degreasing tanks and handwipe operations. For most cleaning activities, prohibited solvents can be replaced with water-based (aqueous) solvents. This proposal would affect a wide range of cleaning activities that use hydrocarbon solvents such as mineral spirits or alcohol. Examples of surfaces that are cleaned using solvent include parts, products, tools, equipment, and work areas associated with manufacturing, repair, and maintenance. Affected repair and maintenance operations include those that service automobiles, trucks, busses, farm equipment, lawn and garden equipment, production equipment, and other machinery. Metal-working facilities, oilfield operations, and others would also be affected.

The rule exempts or specifies less restrictive limits for cleaning activities where the use of solvent meeting the 25 g/l limit is not feasible.

APCD staff is proposing to rewrite the District's surface cleaning and degreasing rules as follows:

The following existing rules would be repealed effective 7/1/2004:	The following new replacement rules would take effect on 7/1/2004:
Rule 74.6, Surface Cleaning and Degreasing	Rule 74.6, Surface Cleaning and Degreasing
Rule 74.6.1, Cold Cleaners	
Rule 74.6.2, Batch Loaded Vapor Degreasers	Rule 74.6.1, Batch Loaded Vapor Degreasers,
Rule 74.6.3, ConveyORIZED Degreasers	(No replacement rule for conveyORIZED degreasers)

In general, existing Rule 74.6 regulates surface cleaning conducted outside of a degreasing tank (e.g., handwipe cleaning, cleaning with handheld spray bottles). Existing Rule 74.6.1 regulates cold cleaners

(e.g; dip tanks and sink-on-drum units). Staff is proposing to combine these requirements in new Rule 74.6. The new ROC-content restrictions are in Section B.1 of new Rule 74.6.

Existing Rules 74.6.2 and 74.6.3 regulate batch loaded vapor degreasers and conveyORIZED degreasers. Eight batch loaded vapor degreasers are in use in Ventura County, and there are no conveyORIZED degreasers in use in the county.

Staff is proposing new control requirements to reduce emissions from batch loaded vapor degreasers. These requirements can be found in subsections B.9 and B.10 of proposed new Rule 74.6.1. Additionally, staff is proposing an exemption from these new requirements for small vapor degreasers. However, no existing vapor degreasers are expected to qualify for the proposed exemption.

The remaining requirements in proposed new Rule 74.6.1 for batch loaded vapor degreasers were rewritten and rearranged from existing Rule 74.6.2 for clarity and to delete obsolete language.

Staff is proposing the repeal of the conveyORIZED degreaser requirements in Rule 74.6.3. ConveyORIZED degreasers are subject to Rule 26, New Source Review.

Proposed Amended Standards Rule 74.6, Surface Cleaning and Degreasing

New Rule 74.6 will further reduce ROC emissions by restricting the ROC content and vapor pressure (evaporation rate) of solvents used in cleaning operations. The rule applies to any non-boiling surface cleaning operation, including handwipe cleaning, flushing, and cleaning conducted in degreasing tanks and other non-boiling surface cleaning apparatus. The principal emission control requirements will continue to be grouped into the following categories:

1. Solvent Composition Requirements :
 - Limits on ROC-content
 - Limits on vapor pressure (evaporation rate)

2. One of the following four approved cleaning methods must be used if the solvent used contains more than 25g/l ROC:
 - A) Handwipe (e.g., solvent-wetted cloth)
 - B) A cleaning system where liquid solvent runoff is recovered. (If the solvent capacity of the system is more than one gallon, specific equipment and operating practices are required).
 - C) Cleaning with solvent liquid dispensed from small (less than one liter) hand-held containers (no recovery of solvent runoff is required).
 - D) Use of an approved spray gun cleaner.

Most of the requirements in proposed new Rule 74.6 are carried over from existing Rules 74.6 and 74.6.1 without revision. The rule provisions that were revised in a manner requiring persons to modify their cleaning operations are described below:

1) Solvent Composition Requirements (Rule 74.6.B.1)

A cleaning activity will be exempt from all provisions of proposed Rule 74.6 if the solvent contains less than 25 grams of ROC per liter, or if the solvent is certified by the South Coast Air Quality Management District (SCAQMD) as a Clean Air Solvent. (Rule 74.6.E.1.a) For a list of certified Clean Air Solvents, see www.aqmd.gov/tao/cas/prolist.html.

Staff is proposing, except as noted below, all surface cleaning operations must use solvent containing no more than 25 g/l ROC. By restricting the ROC content of the solvent, there is less ROC potentially available for evaporation. (see section 74.6.B.1) Exceptions from the 25 g/l ROC limit are described below:

Solvent used for application equipment cleanup (e.g., paintbrushes, rollers, etc.) and cleanup (cleaning of over-spray, spills, etc. of paint, ink, resin or adhesive) may not contain more than 900 g/l ROC, and may not have a ROC composite vapor pressure exceeding 33 mm Hg. Many solvents, including mineral spirits and paint thinner comply with this requirement. The ROC composite vapor pressure is a measure of evaporation rate. By restricting evaporation rate, less solvent is needed to complete a cleaning task.

Solvent used for cleaning electrical components, medical devices, or aerospace components may not contain more than 900 g/l ROC, and may not have a

ROC composite vapor pressure exceeding 33 mm Hg. Many solvents, including mineral spirits and isopropyl alcohol (IPA) comply with this requirement.

Exemptions are listed for cleaning activities for which ROC restrictions are not feasible. Additionally, cleaning activities already regulated by certain other air pollution control rules are exempted. Section E of Rule 74.6 contains a proposed list of these exemptions.

2) Cleaning Devices and Methods Requirements (Rule 74.6.B.2)

These requirements apply only to operations using solvent containing more than 25 g/l ROC (i.e., application equipment cleanup, electrical components, medical devices, aerospace components, and operations exempted by subsection E.2). Except for Rule 74.6.B.2.b, the "Cleaning Devices and Methods Requirements" of existing Rule 74.6 are carried forward to proposed new Rule 74.6 without change. Proposed new section 74.6.B.2.b would require all cleaning equipment having a liquid solvent capacity more than one gallon to meet the equipment and operating requirements for "cold cleaners" in sections C and D or Rule 74.6. These equipment and operating requirements were moved to Rule 74.6 from existing Rule 74.6.1 without significant change.

Proposed new Rule 74.6.1, Batch Loaded Vapor Degreasers

Batch loaded vapor degreasers are currently regulated by Rule 74.6.2. Staff is proposing the repeal of Rule 74.6.2. Proposed new Rule 74.6.1 would regulate batch loaded vapor degreasers thereafter. The most significant revisions to the vapor degreaser requirements are: 1) a new requirement to retrofit existing units with an automated parts handling system, and 2) a new requirement to retrofit existing units with either a superheated vapor zone or a refrigerated freeboard chiller.

The cleaning location in a vapor degreaser is the vapor area directly above the boiling solvent. Solvents used in vapor degreasers typically have high vapor densities. Condensing coils create a cool air layer above the dense vapor, setting up a contained vapor zone. The workload (a basket of parts to be cleaned) is lowered through the cool air layer and suspended in the hot vapor zone where solvent vapor condenses on surfaces and carries away contaminants. Equipment can be added to a vapor

degreaser to create a superheated vapor zone. A superheated vapor zone is generated by heating the vapor to a temperature higher than the boiling point of the solvent. Liquid condensation on the workload evaporates into the vapor zone when the workload surfaces rise to the superheated vapor temperature, thereby reducing emissions by allowing the parts to be removed dry. According to EPA, a superheated vapor zone can reduce emissions by as much as 50 percent.

A refrigerated freeboard chiller reduces emissions by further stabilizing the vapor zone. A refrigerated freeboard chiller is a second set of condensing coils located above the primary condensing coils. The chiller generates a very cold air layer above the vapor zone. According to ARB, a refrigerated freeboard chiller reduces emissions by 10 to 40 percent.

An automated parts handling system consists of a powered hoist to move workloads into and out of the vapor zone. Such a system reduces emissions by minimizing the disturbance of the vapor zone when workloads enter or leave the degreaser. In accordance with EPA and ARB guidance, the District's current rule requires workloads to enter and leave the degreaser at a speed slower than 11.2 feet per minute. EPA has found that human workers are generally unable to move workload baskets at a constant speed lower than the limit – and typical speed is in excess of 60 feet per minute. EPA estimates that degreaser emissions can be reduced by 35% by reducing the speed from 60 ft/min to 11 ft/min.

There are eight vapor degreasers operating in Ventura County. Staff received retrofit cost estimates from the owners of four of those units. Staff's cost effectiveness estimates are attached (Table 1). It shows that control costs range from \$1.55 to \$51.57 per pound of ROC reduced. Other federal, state, and local analyses of the freeboard chillers and automated parts handling systems result in better cost-effectiveness than staff's analysis. This is probably due to the low throughputs of the existing vapor degreasers in Ventura County. Emission

reduction costs up to \$9.00 per pound of ROC are considered cost-effective in Ventura County. Table 1 demonstrates that all but one of the vapor degreasers in Ventura County can be cost-effectively controlled by the proposed rule revisions. The single unit that has costs exceeding \$9.00 per pound of ROC reduced can probably avoid the installation of a hoist pursuant to Section F of Rule 74.6.1, Alternative Cleaning System. This particular degreaser installation is unique because the unit is operated in a total enclosure vented to a control device.

New Rule 74.6.1 for batch loaded vapor degreasers was rewritten and rearranged from existing Rule 74.6.2 for clarity and to delete obsolete language. The new requirements are modeled after the requirements of South Coast AQMD Rule 1122, Solvent Degreasers.

Proposed Revisions to Rule 23, Exemptions From Permit

Rule 23 specifies which sources of air pollution are not required to have an APCD Permit to Operate. Sources that are not described in Rule 23 are required to obtain APCD permits. The revisions to Rule 23 are mainly corrections, clarifications, synchronization of terms, and deletion of obsolete language. The revisions are not intended to require any facility that does not currently have a permit to obtain one, or to exempt anyone currently having a permit from that requirement.

Currently, Rule 23.F.10.a exempts from permit cleaning agents containing 2 percent or less organic solvent. Staff is proposing to revise this requirement to exempt from permit any surface cleaning operation using Clean Air Solvent certified by the SCAQMD, and any cleaning operation using solvent containing no more than 25 grams per liter of ROC and no more than 5 percent by weight combined of methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, and chloroform.

COMPARISON OF PROPOSED RULE REQUIREMENTS WITH OTHER AIR POLLUTION CONTROL REQUIREMENTS

California Health and Safety Code Section 40727.2 requires the District to prepare a written analysis identifying all federal air pollution control requirements, including, but not limited to, emission

control standards constituting best available control technology for new or modified equipment, that apply to the same equipment or source type as the rule or regulation proposed for modification by the

district. The analysis must compare the elements of each of the identified air pollution control requirements to the corresponding element of the district's proposed amended rule.

regulated by any federal air pollution control requirements.

If one or more elements of a district's proposed new or amended rule or regulation differs from corresponding elements of any existing air pollution control requirement or guideline applicable to the same equipment or source type, the analysis shall note the difference or differences.

Comparison with BACT Requirements

BACT for surface cleaning operations was determined from the SCAQMD document entitled "BACT Guidelines for Non-Major Polluting Facilities." The SCAQMD BACT guidelines indicate compliance with SCAQMD Rule 1171 is equivalent to BACT. Proposed revised Rule 74.6 is similar to SCAQMD Rule 1171, except several more stringent ROC standards in the South Coast rule as shown in the table below, are not being proposed for inclusion in Rule 74.6. The more stringent SCAQMD standards are either technology forcing or have only recently taken effect.

Comparison with Federal Regulations

The surface cleaning operations regulated by proposed amended Rules 74.6 or 74.6.1 are not also

ROC Standards in Rule 74.6 vs. SCAQMD Rule 1171 (BACT)

<u>SURFACE CLEANING ACTIVITY</u>	<u>PROPOSED RULE 74.6 ROC Content /Vapor Pressure</u>	<u>SCAQMD RULE 1171 (BACT) ROC g/l</u>
Electric/electronic Components - Manufacturing or Surface Preparation	900 g/l and 33 mm HG	500 g/l
Electric/electronic Components – Repair and Maintenance Cleaning	900 g/l and 33 mm HG	900 g/l
Medical Devices - Manufacturing or Surface Preparation	900 g/l and 33 mm HG	800 g/l
Medical Tools and Machinery – Repair and Maintenance	900 g/l and 33 mm HG	800 g/l
Medical Work Surfaces - Repair and Maintenance	900 g/l and 33 mm HG	600 g/l
Application Equipment Cleaning – Coatings or Adhesives	900 g/l and 33 mm HG	550 g/l
Polyester Resin Application Equipment Cleaning	Not Applicable (Rule 74.14 applies) except where conducted in a degreaser 900 g/l and 33 mm HG	25 g/l

IMPACT OF THE PROPOSED RULE REVISIONS

ROC Emissions Impacts

Sources that use cleaning solvent and are subject to Rule 74.6 include point sources and area sources. Generally, point sources are facilities that have emission rates high enough to trigger the APCD's requirement to have a Permit to Operate. All other sources subject to Rule 74.6 are un-permitted area sources. Sources subject to Rule 74.6 can also be divided into handwipe operations (e.g; solvent on a rag, solvent dispensed from spray bottles) and cold

cleaners (e.g., dip tanks, sink-on-a-drum units). Staff estimates emissions in 2001 for Ventura County for these categories as follows:

Point Source Cold Cleaners --- 20 Tons of ROC/yr
Point Source Handwipe----- 18 Tons of ROC/yr
Vapor Degreasers----- 9 Tons of ROC/yr

Area Source Cold Cleaners --- 856 Tons of ROC/yr
Area Source Handwipe ----- 61 Tons of ROC/yr

Areas source estimates were derived from Ventura County employment data using a method developed by the California Air Resources Board contained in report #93-341 entitled "Solvent Cleaning/Degreasing Source Category Emission Inventory."

Staff estimated the amount of area source emissions subject to the proposed 25 g/l limit is about 43 percent by excluding source categories exempted by Rule 74.6, and source categories that will continue to be eligible to use high ROC-content solvents (e.g., aerospace, electronics, medical devices, etc.). Staff estimated a control efficiency of 97 percent by assuming the solvent ROC content will drop from 900 g/l to 25 g/l, and that cleaning operations will continue to use the same volume solvent. Staff further assumed 80 percent rule effectiveness (a measure of actual compliance).

Using the above estimates, staff derived control efficiencies of 33 percent for area sources and 78 percent for point sources with an overall control efficiency of about 35 percent. Emissions from vapor degreasers are estimated to be reduced by about 4 tons per year. Staff therefore estimates the emission reduction for the proposed rule revisions to be 336 tons of ROC reduced per year (0.9 tons per day).

These emission reductions will be realized beginning in 2004.

Cost-Effectiveness

California Health and Safety Code Section 40703 requires the District, in adopting a regulation, to consider and make public its findings related to cost-effectiveness of control measures. This information is detailed in the Socioeconomic Impacts section of this report.

Incremental Cost-Effectiveness Analysis

Health and Safety Code Section 40920.6(a) requires districts to identify one or more potential control options, assess the cost-effectiveness of those options, and calculate the incremental cost-effectiveness. Health and Safety Code Section 40920.6 also requires an assessment of the incremental cost-effectiveness for proposed regulations relative to ozone, CO, SO_x, NO_x, and their precursors.

Incremental cost-effectiveness is defined as the difference in control costs divided by the difference in emission reductions between two potential control options achieving the same emission reduction goal of a regulation. The proposed amendments would result in an ROC emission reduction of about 0.9 ton per day. There is no other viable control option that can achieve the same amount of emission reductions. Therefore, the incremental cost-effectiveness analysis does not apply to this rulemaking.

Socioeconomic Impacts

California Health and Safety Code Section 40728.5 requires the APCD Board to consider the socioeconomic impact of any new rule or amendment to any existing rule if air quality or emission limits are affected. The Board must consider the following socioeconomic information on the proposed revisions:

- (1) *The type of industries or business, including small business, affected by the rule or regulation.*

The revised rules apply to any person using hydrocarbon solvents such as mineral spirits or alcohol to clean a wide variety of surfaces. Included are commercial and industrial facilities maintaining or manufacturing parts, products, tools, vehicles, or equipment. Affected facilities also include oilfield operations and others.

- (2) *The impact of the rule or regulation on employment and the economy of the region affected by the adoption of the rule or regulation.*

Staff solicited public comment and responded by providing feasible limits or exemptions for every surface cleaning operation for which it is demonstrated that the proposed limits are not feasible. Because compliance costs are low, staff believes the proposed rule revisions will have no effect on the employment and economy of Ventura County.

- (3) *The range of probable costs, including costs to industry or business, including small business, of the rule or regulation.*

The costs and cost-effectiveness of switching from high-ROC surface cleaning to low-ROC surface

cleaning were estimated by the San Joaquin Valley APCD as follows:

Control Option: Switching from Two High-ROC Cold Cleaners to: _____:	Cost per year	Cost- Effectiveness (\$/pound of ROC reduced)
One Low-use Batch-loaded Automated Aqueous unit	-\$112 (savings)	\$1.28 (savings)
One Average-use Batch-loaded Automated Aqueous unit	-\$362 (savings)	\$1.66 (savings)
One High-use Batch-loaded Automated Aqueous unit	-\$412 (savings)	\$0.94 (savings)

Control Option: Switching from one High-ROC Cold Cleaner to:	Cost per year	Cost- Effectiveness (\$/pound of ROC reduced)
Low-use Aqueous unit	\$545	\$6.47
Average-use Aqueous unit	\$903	\$4.28
High-use Aqueous unit	\$1,393	\$3.30
Low-use Enzyme unit	\$370	\$4.06
Average-use Enzyme unit	\$430	\$1.90
High-use Enzyme unit	\$470	\$1.04
Low-use Batch-loaded Automated Aqueous unit	\$130	\$4.72
Average-use Batch-loaded Automated Aqueous unit	\$240	\$1.16
High-use Batch-loaded Automated Aqueous unit	\$790	\$1.92

The above cost analysis was based on reducing the ROC content of solvents used in solvent cleaning from 900 grams per liter to 50 grams per liter. Because staff's proposal differs by limiting ROC content to 25 grams per liter, actual cost-effectiveness is slightly more attractive. The 25 gram per liter limit has been in effect in the South Coast

AQMD since January 1, 2003. Solvents meeting the 25 gram per liter limit are readily available from many sources. Staff solicited comments from industry regarding any differences between the 25 g/l vs. 50 g/l limits in effect in California, and received none. Staff concludes that the 25 g/l limit is equally as feasible for industry to comply with as the 50 g/l limit.

Cost analyses performed by the South Coast AQMD determined the cost-effectiveness of converting cleaning operations to use compliant solvents and equipment ranges from a cost savings of \$3,310 per ton of ROC reduced to a cost of \$12,940 per ton of ROC emissions reduced.

Staff estimated the cost effectiveness of the proposed new requirements for automated parts handling systems and refrigerated freeboard chillers for batch loaded vapor degreasers. These estimates are shown in Table 1.

The installed cost of automated parts handling equipment ranges from about \$2,000 for a simple manually actuated hoist, to almost \$25,000 for a programmable robotic hoist. Cost effectiveness estimates for hoists range from \$0.25 per pound of ROC reduced for a simple hoist on a degreaser with relatively high throughput, to \$51.57 per pound of ROC reduced for a programmable robotic hoist on a degreaser with very low throughput.

The installed cost of refrigerated freeboard chillers ranges from \$10,760 to \$16,333 per unit. Cost effectiveness estimates for refrigerated freeboard chillers range from \$1.55 to \$5.02 per pound of ROC reduced.

(4) The availability and cost-effectiveness of alternatives to the rule or regulation.

Staff believes that there are no alternatives to the rule that can attain equivalent or greater emission reductions at a better cost-effectiveness.

(5) The emission reduction potential of the rule or regulation.

Staff estimates the proposed rule amendments will reduce ROC emissions by 336 tons per year (0.9 tons per day).

(6) The necessity of adopting, amending, or repealing the rule or regulation in order to attain state and federal ambient air quality

standards pursuant to Chapter 10 (commencing with Section 40910).

goal of attaining the state ambient air quality standard for ozone.

The proposed revisions are necessary to comply with state law and to reduce ROC emissions towards the

Table 1
Vapor Degreaser Retrofit Costs
Automated Parts Handling Equipment and Refrigerated Freeboard Chiller
Cost Effectiveness Estimates

	Facility #00135	Facility #00287	Facilities #00458 & #07249 (3 units – as reported by owner)	Facility #01027	Facility #07015	Facility #00515
Permitted Emissions lb/yr ROC	2333 lb/yr	4500 lb/yr	7,777 lb/yr	1222 lb/yr	1389 lb/yr	200 lb/yr
Hoist Emission Reduction lb/yr (28%)	653	1260	2178	342	389	56
Freeboard Chiller Emission Reduction lb/yr (25%)	420	810	1400	NA (chiller already in use)	250	NA (chiller already in use)
Parts Hoist – Total Cost	\$24,720	\$24,720	\$74,160	\$24,720	\$24,720	\$24,720
Hoist - Annualized Cost	\$2,888	\$2,888	\$8,664	\$2,888	\$2,888	\$2,888
Freeboard Chiller -Total Cost	\$10,760	\$10,760	\$36,493 2 retrofits at @ \$16,333 each plus one replacement unit @ \$20,160	NA	\$10,760	NA
Freeboard Chiller - Annualized Cost	\$1,257	\$1,257	\$4,263	NA	\$1,257	NA
Hoist – Cost Effectiveness - \$/lb ROC Reduced	\$4.42	\$2.29	\$3.97	\$8.44	\$7.42	\$51.57
Chiller – Cost Effectiveness - \$/lb ROC Reduced	\$2.99	\$1.55	\$3.04	NA	\$5.02	NA

The following assumptions were used:

Life of equipment is 15 years (costs amortized over 15 years).

Interest Rate is 8%.

Repair, maintenance, utility and all other costs are fully offset by labor savings (hoist) and solvent savings.

The total cost for the hoist (\$24,720) is for a computerized programmable two-plane robotic device (Baron Blakeslee MLH-50) and includes \$1,250 for installation and \$320 for a new stainless steel parts basket. A similar programmable hoist is available from Branson (Model TDR-15) for \$18,000. An acceptable compliance method is to use a manually actuated one-plane electric wire rope hoist available from Grainger (# Z7668) for a cost of \$750.

Use of the manual hoist yields a much better cost effectiveness result - less than \$1.00 per pound of ROC reduced in all cases except facility # 00515.

Refrigerated freeboard chiller costs (\$10,760 per unit) includes the cost of retrofit kit from Thermal Equipment Corporation (\$9,500) plus \$1,260 for installation costs. Higher costs were reported (and used) for facility #00458/07249.

ENVIRONMENTAL IMPACTS OF METHODS OF COMPLIANCE

California Public Resources Code Section 21159 requires the District to perform an environmental analysis of the reasonably foreseeable methods of compliance. The analysis must include the following information on proposed revisions to Rule 74.20:

- (1) *An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.*
- (2) *An analysis of the reasonably foreseeable mitigation measures.*
- (3) *An analysis of the reasonably foreseeable alternative means of compliance with the rule or regulation.*

The following table lists all reasonably foreseeable compliance methods, the environmental impacts of those methods, and measures that could be used to mitigate the environmental impacts.

Compliance Methods (including all reasonably foreseeable alternative means of compliance)	Reasonably Foreseeable Environmental Impacts	Reasonably Foreseeable Mitigation Measures
Reformulation of Solvents	Air Quality Impacts: Reformulation may result in the use of toxic materials.	Operators may use existing reformulated products with less or no toxic materials.
	Water Impacts: Improper disposal of solvents may cause water impacts	Compliance with wastewater discharge standards and waste disposal requirements is required by law and will mitigate these impacts.
	Human Health Impacts: Solvents may be replaced with products containing more toxic compounds.	Compliance with OSHA safety guidelines (e.g., personal protective equipment, prevention and response, emergency first aid procedures) reduces these impacts.
Installation of Catalytic Oxidation Add-On Controls	Solid Waste Disposal Impacts: May increase quantities of solid waste (catalyst material).	Catalyst materials are valuable and are typically reclaimed and recycled.
	Noise Impacts: Fans and associated equipment with add-on controls may increase noise levels.	Sound wall or enclosures may be constructed around the control equipment.

This analysis demonstrates the adoption of revisions to Rules 74.6 and 74.6.1 will not have a significant effect on the environment due to unusual circumstances.