

**VENTURA COUNTY APCD
STAFF REPORT
REVISIONS TO SOLVENT CLEANING REQUIREMENTS:
Rule 74.13, Aerospace Assembly and Component Manufacturing Operations
Rule 74.20, Adhesives and Sealants
Rule 74.24, Marine Coating Operations
Rule 74.24.1, Pleasure Craft Coating and Commercial Boatyard Operations
DRAFT – January 2012
EXECUTIVE SUMMARY**

Staff is proposing to revise Rule 74.13, Aerospace Assembly and Component Manufacturing Operations, Rule 74.20, Adhesives and Sealants, Rule 74.24, Marine Coating Operations, Rule 74.24.1, Pleasure Craft Coating and Commercial Boatyard Operations, to reduce the reactive organic compound (ROC) emissions from the use of solvent cleaners, especially those solvents used to clean coating or adhesives spray equipment. This rule development will implement an All Feasible Measure as required by the California Clean Air Act (HSC Section 40914). Ventura County APCD's 2007 Air Quality Management Plan relies on adopting All Feasible Measures as a strategy to attain the ozone ambient air quality standard.

Proposed solvent cleaning requirements are based on ROC content limits in existing Ventura County coating rules and South Coast AQMD Rule 1171, Solvent Cleaning Operations. Existing Ventura County coating rules that already contain the proposed requirements include:

- Rule 74.12, Surface Coating of Metal Parts
- Rule 74.14, Polyester Resin Material Operations
- Rule 74.18, Motor Vehicle Equipment & Mobile Equipment Coating Operations
- Rule 74.19, Graphic Arts
- Rule 74.30, Wood Product Coatings

Staff is proposing to reduce ROC emissions from solvent cleaning operations at aerospace facilities (Rule 74.13) in Ventura County by limiting the ROC content of coating application equipment cleaners to 25 g/l. An exemption from this requirement is proposed for cleaning space vehicle coating and radiation-effect coating application equipment.

New ROC cleaning requirements for facilities subject to Rule 74.20, Adhesives and Sealants, include a new solvent cleaning ROC content limit of 25 g/l, except for inkjet printer head assembly, which would continue to have the existing ROC content limit of 200 g/l. In addition, adhesive cleanup including spray equipment cleaning would also be subject to the new 25 g/l ROC content limit.

Similarly, the proposed new ROC content limit of 25 g/l is proposed for substrate surface preparation, cleanup, and spray gun cleaning at marine coating

operations (Rule 74.24), and Pleasure Craft Coating and Commercial Boatyard Operations (Rule 74.24.1).

The proposed revisions may affect approximately 20 coating and/or adhesive spray operations (see Table 1). The permitted or potential ROC emissions from these operations are approximately 23 tons per year. The estimated control effectiveness of the proposed revisions is about 50 percent or 11 tons of ROC per year. All of the emission reductions are based on using low-ROC cleaners. Ultra-low ROC cleaners can contain either exempt organic compound or water-based cleaners. Examples of exempt organic compounds include acetone, acetone/methyl acetate blends, propylene carbonate, PCBTF, and t-butyl acetate. The existing rules allow the use of low vapor pressure cleaners with a limit of 45 mm Hg for spray equipment cleanup. Switching to low-ROC cleaners for this cleaning process will reduce over 90 percent of the emissions because the low-ROC cleaners are 0.2 pounds ROC per gallon versus 6.6 pounds ROC per gallon for the low-vapor pressure cleaners.

The estimated cost analysis for replacing existing cleaning products with low-ROC versions was based on the 2003 technology assessment performed by the Institute for Research and Assistance (IRTA) for South Coast AQMD Rule 1171 and the 2008 Ventura County APCD Staff Report for revisions to Rule 74.12, Coating of Metal Parts and Products. The cost-effectiveness for these cleaner replacements ranged from a cost savings to \$0.18 per pound of ROC reduced. This indicates that the proposal is very cost-effective especially relative to new sources, which may be required under New Source Review to spend \$9 per pound of ROC reduced to install best available control technologies (BACT).

This report contains five additional sections: (1) Background, (2) Proposed Rule Revisions, (3) Comparison of Proposed Rule Requirements with Other Air Pollution Control Requirements, (4) Impact of the Proposed Rule, and (5) Environmental Impacts of Methods of Compliance. The first section provides background information including regulatory history, latest air pollution control technology and source description. The second section explains the key features of the proposed

revisions. The third section compares the proposed requirements with existing federal requirements and Best Available Control Technology (BACT). The fourth section is an analysis of the proposed amendment's effect on ROC emissions, cost-

effectiveness, and socioeconomic impacts. The last section examines the environmental impacts of compliance methods and the mitigations of those impacts.

BACKGROUND

Introduction

Several of the coatings and adhesives regulations in Ventura County have not had significant amendments in almost a decade. These include Rule 74.13, Aerospace Assembly and Component Manufacturing Operations, Rule 74.20, Adhesives and Sealants, Rule 74.24, Marine Coating Operations, and Rule 74.24.1, Pleasure Craft Coating and Commercial Boatyard Operations. In the meantime, recent developments in low-ROC cleaning solvent technology and the availability of low-reactive newly exempted organic solvents such as t-butyl acetate and propylene carbonate has allowed the formulation of ultra-low (less than 25 grams per liter) cleaning solvents to replace high-ROC cleaners in a wide range of cleaning applications. This has provided the opportunity to further reduce ROC emissions from both coating and adhesives sources, particularly in the area of spray equipment cleaning.

The technical justification for the more stringent cleaning ROC limits in these rules is based on the following:

1. These new low-ROC solvents have been used successfully at coating and adhesive operations in both Ventura County and the South Coast for several years.
2. These requirements have been in effect in a number of existing Ventura County APCD rules and in South Coast AQMD Rule 1171 since July 2005.
3. The South Coast AQMD has published technology assessments on the new low-ROC solvent cleaners to determine both cost and applicability.

In 2003, IRTA prepared a report for the South Coast AQMD, entitled "Assessment, Development and Demonstration of Low-VOC Cleaning Systems for SCAQMD Rule 1171." IRTA investigated and tested low and Non-VOC alternatives in a variety of cleaning processes. The aim was to identify cleaning technologies that could be substituted for existing high VOC technologies. The target VOC content for

the spray equipment application for this study was 25 grams per liter, which is the same as the new ROC content limit being proposed. The spray equipment cleaning operations at three aerospace companies (Hydro-Aire, Gulfstream, and California Propeller) and two companies (Hickory Springs and VACCO) using adhesives were evaluated by IRTA.

Besides performing technology assessments on the new low-ROC cleaners, the South Coast AQMD maintains a current list of Clean Air Solvents on their website. Clean Air Solvents have been certified by SCAQMD to be less than 25 grams of ROC per liter. The current list may be found in Appendix A of this report.

Although the coatings and adhesives rules subject to this proposed revision have not been amended in a long time, the proposal will only focus on the solvent cleaning requirements associated with those rules rather than those impacting individual coatings or adhesives. Focusing on the solvent cleaning operations for these rules provides the most cost-effective way to achieve the most emission reductions. However, some minor changes to recordkeeping requirements, definitions, or test methods may be proposed for clarification purposes or to achieve consistency with other district rules.

Aerospace Operations – Case Studies

The 2003 IRTA report focused on reducing ROC emissions from many different types of solvent cleaning operations at numerous industries. The aerospace industry was one of the main industries analyzed by their technology assessment. This study evaluated the effectiveness of replacing high-ROC cleaning solvents with low-ROC cleaning alternatives for cleaning aerospace coating spray equipment. On site demonstrations were successful at three different aerospace facilities, including Californian Propeller, Gulfstream, and Hydro-Aire.

California Propeller, a small aerospace subcontractor located in Burbank, was able to successfully switch to the low-ROC exempt solvent acetone instead of MEK solvent. Acetone is an exempt solvent because of its low photochemical reactivity. The acetone at \$3.32 per gallon is thirty-five percent less expensive than

MEK, which is priced at \$5.12 per gallon. The coatings used at this facility are typical aerospace coatings, including chromated epoxy primer and polyurethane topcoat.

Similarly, the aerospace coatings used at the Gulfstream aircraft manufacturing facility in Long Beach are easily cleaned using the exempt ROC solvent acetone. According to the 2003 Technology Assessment, when this facility switched from the existing lacquer thinner to acetone, it reduced overall cleaning costs by 75 percent.

Another aerospace company that switched from MEK to acetone to clean aerospace coating spray equipment is Hydro-Aire, a Boeing subcontractor based in Burbank. Hydro-Aire was able to continue using their existing spray gun washer and their cleaning costs were reduced by approximately 31 percent.

Adhesive Bonding Operations – Case Studies

The 2003 IRTA report also focused on reducing ROC emissions from solvent cleaning of adhesive spray equipment. This study evaluated the effectiveness of replacing high-ROC cleaning solvents with low-ROC cleaning alternatives. On site demonstrations were successful at two different facilities using adhesive spray equipment, including Hickory Springs and Medtronics.

Hickory Springs, a furniture manufacture located in Commerce, California, produces flexible slabstock foam, and uses an acetone-based adhesive to bond the foam pieces. Originally, this company was using lacquer thinner to clean the adhesive spray equipment. Two successful cleaning alternatives include acetone and a blend of Soy Gold 2000 (a soy-based cleaner) and water. The acetone alternative reduced cleaning costs by 12 percent while the soy-based cleaner was 85 percent less costly than using the lacquer thinner.

Medtronics Diabetes is a medical device manufacturer located in Northridge that uses UV radiation-cured adhesives in its packaging and manufacturing operation. The Northridge facility produces both insulin pump therapy and continuous glucose monitoring systems. One of the operations used to bond polycarbonate sensors to a medical patch was able to switch to a complying water-based cleaner called Mirachem 500. Cleaning of other automated medical device assembly machines was accomplished using acetone in place of isopropyl

alcohol, and there was no additional cost for this replacement.

Marine Coating Operation – Case Study

Metrex, a valve manufacturer from Glendora, rebuilds, refurbishes, and builds various valves designed to withstand the marine environment. They were using lacquer thinner to clean the spray equipment used to spray solvent-based coatings. They successfully switched to an acetone cleaner that reduced material costs by 18 percent.

Emission Source Inventory

The twenty operations currently permitted by the District that are subject to the proposed rule revisions are shown in Table 1. This table provides the permitted or potential emissions from solvent cleaning operations located at each listed facility. The estimated total permitted emissions from this source category is approximately 23 tons of ROC per year. The actual emissions depend on the production level and the corresponding coating or adhesive usage at each of the affected facilities.

Table 1. Permitted Operations Subject to Proposed Rule Revisions

Facility Name	Permitted ROC Emissions (tons/year)	Type of Operation	SIC Code
Anchors Way Marine Centers, Inc.	1.4	Boat Repair	3732
Aquaria Inc.	0.42	Aquarium Products	3231
Bellport Group Inc.	0.2	Boat Repair	3732
California Air National Guard	0.81	Military	9711
CP Aviation, Inc.	0.04	Aircraft Parts	3728
Custom Industrial Finishes, LLC	1.7	Coating Application	3479
Elite Metal Finishing	0.05	Electroplating	3471
ERG International	0.8	Furniture	2522
General MagnaPlate	0.73	Electroplating	3471
L-3 Communications Corp.	0.8	Radar/Sonar	3812
Meggitt Safety Systems Inc.	1.21	Aircraft Parts	3728
Metalcrafters	1.81	Coating Application	3499
Milgard Manufacturing	4.03	Window/Door Mfg.	3211
Naval Base Ventura County	3.31	Military	9711
Packaging Corp	0.28	Corrugated Box Mfg.	2653
Pentair Pool Products	0.13	Pool Products	3648
Ricoh Printing Systems	0.1	Inkjet Printer Mfg.	3955
Royal Coatings	1.21	Coating Application	3479
Talley Actuators	1.0	Aircraft Parts	3728
Ventura Harbor Boatyard Inc.	3.3	Boat Repair	3732
TOTAL PERMITTED EMISSIONS	23.33		

PROPOSED RULE REVISIONS

The proposed rule revisions will reduce ROC emissions from solvent cleaning processes at aerospace facilities (Rule 74.13), bonding operations (Rule 74.20), marine coating operations (Rule 74.24), and pleasure craft coating operations (Rule 74.24.1). Even though there are many similarities in the cleaning processes from each of the source categories, it is necessary to review each rule separately to account for any significant differences in each of the operations.

Rule 74.13, Aerospace Assembly and Component Manufacturing Operations

Staff is proposing to reduce ROC emissions from cleaning coating application equipment by replacing the current vapor pressure limit of 45 mm Hg with a mass-based ROC content limit of 25 g/l (Subsection B.2.b). South Coast AQMD has determined that mass-based limits are much more effective in controlling ROC emissions. For example, a typical solvent based cleaner contains over 800 grams per liter. Reducing the limit to 25 grams per liter is equivalent to a 96 percent emission reduction.

An exemption from this requirement is proposed for cleaning space vehicle coating and radiation-effect coating application equipment (Subsection C.7). This exemption is based on an identical provision in South AQMD Rule 1171, Solvent Cleaning Operations.

The draft rule proposal also contains many changes designed to clarify existing requirements without changing the rule stringency. These proposed changes to Rule 74.13 are summarized in Table 2.

Rule 74.20, Adhesives and Sealants

The proposed change to the solvent cleaning requirements in Subsection B.4 impact the substrate surface preparation solvents used to clean surfaces prior to bonding. The new requirement for this operation is an ROC content limit of 25 grams per liter in place of the 70 g/l limit in the existing rule. Staff is not proposing to change the special allowance for inkjet printer head cleaning, in which the ROC content limit remains at 200 grams per liter. This exception is based on current operations at the inkjet head manufacturer, Ricoh of Simi Valley. The other significant proposed change to this requirement is the

replacement of the ROC vapor pressure limit of 45 mm Hg with the mass-based ROC content limit of 25 grams per liter for Single Ply Roof Membrane Installation. Prior to adopting this change, staff will contact the Single Ply Roof Institute to obtain feedback on this proposal.

In Subsection B.5 and B.7, staff is proposing to replace the existing vapor pressure limit of 45 mm Hg for adhesive cleanup (Subsection B.5) and for cleaning adhesive spray equipment (Subsection B.7) with the mass-based ROC content limit of 25 grams

per liter. Adhesive cleanup is the removal of uncured adhesive from parts, tools, or work areas. As discussed earlier, the proposed change from a vapor pressure limit to a low-ROC content limit results in a 96 reduction in emissions.

This draft rule proposal also contains many changes designed to clarify existing requirements without changing the rule stringency. These proposed changes to Rule 74.20 are summarized in Table 3.

Table 2. Summary of Clarifications to Rule 74.13, Aerospace Assembly and Component Manufacturing

RULE SUBSECTION(S)	CLARIFICATION	OBJECTIVE/EXPLANATION
B.2 and G.48	Define “Solvent Cleaning”	Consistent with Rule 74.6
B.4	Storage of ROC Containing Materials	Consistent with Rule 74.12
B.5e and B.5.f	Clarify HVLP Spray Equipment Requirements	Allow alternative test methods
B.10	Low-Solid Adhesives and Coatings	Allow use of complying low solid materials
C.2	Clarify Low Use Exemption for Coatings and Adhesives	Consistent with Rule 74.12
C.6	Clarify existing exemption for vapor degreasers.	Consistent with current practice
D	Clarify Recordkeeping Requirements	Consistent with Rule 74.12
E.6 and E.7	Clarify Test Methods	Consistent with Rule 74.12

Table 3. Summary of Clarifications to Rule 74.20, Adhesives and Sealants

RULE SUBSECTION(S)	CLARIFICATION	OBJECTIVE/EXPLANATION
B.6	Storage of ROC Containing Materials	Consistent with Rule 74.12
B.8.b – B.8.d	No longer specifies control equipment parameters	Duplicates APCD permit conditions
C.6	Deletes Provision Allowing Sell Through of Adhesives	No longer needed because the deadline for this allowance is past.
D	Clarify Recordkeeping Requirements	Consistent with Rule 74.12
E.4	Clarify Test Method	Consistent with Rule 74.12

Rule 74.24, Marine Coating Operations

Staff is proposed to replace the vapor pressure limit of 45 mm Hg for general coating cleanup and coating spray equipment cleaning with the mass-based ROC content limit of 25 grams per liter (Subsection B.4.a). In Subsection B.4.b, staff is proposed to lower the ROC content limit for substrate surface cleaning from 200 to 25 grams ROC per liter of material. The only other proposed change to the solvent cleaning requirements is the proposed deletion of the exemption in Subsection C.5, which allows the use of up to 5 gallons per year of noncomplying solvents. Since acetone is an exempt ROC solvent, this exemption is no longer needed.

This draft rule proposal also contains many changes designed to clarify existing requirements without changing the rule stringency. These proposed changes to Rule 74.24 are summarized in Table 4.

Table 4. Summary of Clarifications to Rule 74.24, Marine Coating Operations

RULE SUBSECTION(S)	CLARIFICATION	OBJECTIVE/EXPLANATION
B.1 and B.2	Allow the Use of Complying Low-Solid Coatings	Consistent with other coating rules
B.3	No longer specifies control equipment parameters	Duplicates APCD permit conditions
B.5	Storage of ROC Containing Materials	Consistent with Rule 74.12
D	Clarify Recordkeeping Requirements	Consistent with Rule 74.12
E.3	Clarify Test Method	Consistent with Rule 74.12

Table 5. Summary of Clarifications to Rule 74.24.1 Pleasure Craft Coatings and Commercial Boatyard Operations

RULE SUBSECTION(S)	CLARIFICATION	OBJECTIVE/EXPLANATION
B.3.b and B.3.c	Clarify HVLP Spray Equipment Requirements	Allow alternative test methods
B.5	Storage of ROC Containing Materials	Consistent with Rule 74.12
D	Clarify Recordkeeping Requirements	Consistent with Rule 74.12
E.3	Clarify Test Method	Consistent with Rule 74.12

Rule 74.24.1, Pleasure Craft Coating and Commercial Boatyard Operations

In Subsection B.4, staff is proposed to lower the ROC content limit for substrate surface cleaning from 200 to 25 grams ROC per liter of material. The other new requirement is the proposed replacement of the vapor pressure limit of 45 mm Hg for general coating cleanup and coating spray equipment cleaning with the mass-based ROC content limit of 25 grams per liter (Subsection B.8). The only other proposed change to the solvent cleaning requirements is the proposed deletion of the exemption in Subsection C.5, which allows the use of noncomplying solvents for the preparation of fiberglass substrates. This exemption is no longer needed because of the availability of exempt ROC solvents.

This draft rule proposal also contains many changes designed to clarify existing requirements without changing the rule stringency. These proposed changes to Rule 74.24.1 are summarized in Table 5.

**COMPARISON OF PROPOSED RULE REQUIREMENTS
WITH OTHER AIR POLLUTION CONTROL REQUIREMENTS**

Health and Safety Code Section 40727.2 requires Districts to compare the requirements of a proposed revised rule with other air pollution control requirements. These other air pollution control requirements include federal New Source Performance Standards (NSPS), federal National Emissions Standards for Hazardous Air Pollutants (NESHAPS), Best Available Control Technology (BACT) and any other District rule that applies to the same equipment.

- Units used for emission standards
- Monitoring Frequency
- Test Methods
- Recordkeeping Requirements

No emission averaging provisions or reporting requirements are contained in these rules. In summary, there are no conflicting requirements with the federal NSPS, NESHAPS, or CTGs.

Comparison with Federal NSPS and NESHAPS

Comparison with BACT Requirements

The federal NESHAPS that may impact aerospace operations is the 1998 Maximum Achievable Control Technology (MACT) for Aerospace. The federal NESHAPS that will impact the shipbuilding and ship repair industry is the 1996 Control Techniques Guidelines for Shipbuilding and Ship Repair Operations. The federal Control Techniques Guidelines (CTG) for adhesive operations is the 2008 CTG for Miscellaneous Industrial Adhesives. Finally, the 2006 CTG for Industrial Cleaning Solvents is the most applicable federal guidance on the proposed solvent cleaning requirements for this rule development. The elements of the NSPS, NESHAPS, and CTGs were compared to proposed amendments to Rules 74.13, 74.20, 74.24, and 74.24.1. None of the proposed amendments to these rules affect the:

Health and Safety Code Section 40727.2 (a) requires that the proposed amendments to Rules 74.13, 74.20, 74.24, and 74.24.1 be compared with Best Available Control Technology. The CAPCOA Engineering Manager Rule Development Subcommittee developed guidance on this matter. Under this guidance, it was recommended that BACT be interpreted as a District’s BACT determination.

BACT for the industrial solvent cleaning was determined by comparing the proposal to South Coast AQMD Rule 1171, Solvent Cleaning Operations, the most stringent rule of this type in California. Besides using the South Coast rule as BACT, existing VCAPCD Rules 74.12, 74.14, 74.18, 74.19, and 74.30 also have the BACT ROC content limit for cleaning solvents at 25 grams per liter.

IMPACT OF THE PROPOSED RULE

ROC Emissions Impacts

feasibility, and cost-effectiveness of the proposed cleaning solvents make this proposal worthwhile.

As shown earlier in Table 1, the permitted emissions (ROC) from solvent cleaning operations subject to proposed rule revisions are about 23 tons per year. The derivation of the projected ROC emission reductions of 11 tons per year from the proposed amendments are shown in Table 6. The more wide spread use of low ROC cleaning solvents for spray gun cleaning will contribute to over 90 percent of the total reductions.

Table 6. Projected ROC Emission Reductions

The ROC emission reductions from this source category are significant, and all emission reductions are needed to reach the federal and state ambient ozone air quality standards. The availability,

Source Category	Baseline ROC Emissions (tons/yr)	Estimated Control Efficiency	ROC Emission Reductions (tons/yr)
Spray Gun Cleaning	10.7	97 %	10.4
Surface Prep	0.4	88%	0.35
Cleanup	0.26	97 %	0.25
TOTAL			11.0

Cost-Effectiveness

According to the IRTA technology assessment, the costs were reduced when replacing spray gun cleaning solvent with low-ROC versions for many different source categories. The cost reductions are summarized in Table 7 from the case studies of aerospace, adhesive, and marine coating operations described earlier in the background section of this report. The range of cost reduction varied from 85 percent reduction to no change in costs.

Table 7. Cost Reductions from Solvent Replacement

Company	Type of Operation	% Cost Reduction
Calif Propeller	Aerospace	35
Gulfstream	Aerospace	75
Hydro-Aire	Aerospace	31
Hickory Springs	Adhesive	85
Medtronics Diabetes	Adhesive	No change
Metrex	Marine	18

Another source of cost information was the 2008 Ventura County APCD Staff Report for revisions to Rule 74.12, Coating of Metal Parts and Products, which involved similar requirements for the replacement of spray gun cleaning solvents. The cost-effectiveness for these cleaner replacements ranged from a cost savings to \$0.18 per pound of ROC reduced. This indicates that the proposal is very cost-effective especially relative to new sources, which may be required under New Source Review to spend \$9 per pound of ROC reduced to install best available control technologies (BACT).

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, carbon monoxide (CO), sulfur oxides (SOx), nitrogen oxides (NOx), 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 to the solvent cleaning requirements of Rule 74.13, 74.20, 74.24, and 74.24.1 will require the most stringent viable ROC limits and no other viable control option can achieve the same amount of emission reductions. Therefore, the incremental cost-effectiveness analysis does not apply to this rulemaking.

Socioeconomic Analysis

Assembly Bill 2061 (Polanco), which became effective January 1, 1992, requires that the District Board consider the socioeconomic impacts of any new rule. The Board must evaluate the following socioeconomic information on proposed amendments to Rules 74.13, 74.20, 74.24, and 74.24.1.

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

The adoption of amendments to these rules may directly affect the twenty permitted operations in the county (see Table 1). These include aerospace, marine coating, pleasure craft coating, commercial boatyards, and other operations that involve the use of commercial adhesives.

- (2) The impact of the rule amendments on employment and the economy of the region.

Revisions to these rules are not expected to have a negative impact on either employment or the economy of Ventura County. According to the cost analysis of the proposed revisions, some companies may benefit from reduced material costs, which should help economic growth.

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

Cost reductions were noted for several industries including aerospace, marine, and adhesive bonding operations. Based on an earlier staff report, a maximum cost-effectiveness of \$0.18 per pound of ROC reduced may be expected for replacement of cleaning solvents used for spray gun cleaning.

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

Since the proposed rule amendments are the most cost-effective control option, no other alternatives were analyzed.

state and federal ambient air standards pursuant to Chapter 10 (commencing with Section 40910).

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

The anticipated emission reduction potential of the proposed rule is about 11 tons per year of ROC emissions. These emission reductions result from the use of low-ROC cleanup solvents and solvents used to clean application equipment.

Ventura County is classified as a serious nonattainment area for the federal Ambient Air Quality Standards for ozone. These proposed rule amendments will reduce ROC emissions that are precursors to the formation of ozone. According to the 2007 AQMP, these emission reductions will help the District in its effort to attain the standards. California Health and Safety Code Section 40914(b)(2) requires that the District adopt every feasible measure to reduce ozone precursors.

- (6) The necessity of adopting, amending, or repealing the rule or regulation in order to attain

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 74.19:

- (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.

Table 8 lists all reasonably foreseeable compliance methods, the environmental impacts of those methods, and measures that could be used to mitigate the environmental impacts.

Table 8
Environmental Impacts and Mitigations of Methods of Compliance

Compliance Methods (including all reasonably foreseeable alternative means of compliance)	Reasonably Foreseeable Environmental Impacts	Reasonably Foreseeable Mitigation Measures
Reformulation of cleaning solvents	Air Quality Impacts: Reformulation may result in the use of toxic materials.	Operators may use reformulated products with less or no toxic materials.
	Water Impacts: Improper disposal of cleaning solvents may cause water impacts	Compliance with wastewater discharge standards and waste disposal requirements will mitigate these impacts.
	Human Health and Safety Impacts: Cleaning solvents may be replaced with products containing more toxic or more flammable 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 cause 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 that the adoption of revisions to Rules 74.13, 74.20, 74.24, and 74.24.1 will not have a significant effect on the environment due to unusual circumstances.

REFERENCES

1. Dow Corning OS-2 Silicone Cleaner and Surface Prep Solvent, Midland, MI.
www.dowcorning.com/applications/search/default.aspx?R=1241EN
2. Environmental Protection Agency (EPA): Control Techniques Guideline for Industrial Cleaning Solvents, Sept 2006. EPA-453/R-06-001.
3. EPA: "National Emission Standards for Hazardous Air Pollutants (NESHAP) and Control Techniques Guideline (CTG) for Source Categories: Aerospace Manufacturing and Rework Facilities." March 27, 1998. Federal Register Vol 63, No.59.
4. Institute for Research and Technical Assistance (IRTA), "Assessment, Development, and Demonstration of Low-VOC Cleaning Systems for South Coast Air Quality Management District (SCAQMD) Rule 1171," August 2003
5. Institute for Research and Technical Assistance (IRTA), "Assessment, Development, and Demonstration of Low-VOC Materials for Cleaning Ultraviolet and Electron Beam Curable Coatings and Adhesives for South Coast Air Quality Management District Rule 1171," May 2006.
6. PCL Data Sheet for PCL 2040 NOVOC Compliant Universal Solvent, Los Angeles, California, March 2009.
www.pclautomotive.com/cleanAir.pdf
7. South Coast AQMD, Clean Air Certification Program, updated November 2009.
<http://aqmd.gov/rules/cas/index.html>
8. SCAQMD staff report, "Technology Assessment to Determine the Relationship of Solvent Vapor Pressure and VOC Mass Emissions, Diamond Bar, California, April 10, 2002.
9. SCAQMD Rule 1171, Solvent Cleaning Operations, last amended May 1, 2009.
10. SCAQMD Workshop, "Safer Alternatives to Toxic Cleanup Solvents," Diamond Bar, California, March 7, 2007.
11. Ventura County Air Pollution Control District (VCAPCD) Rule 74.12, Surface Coating of Metal Parts and Products, last revised April 8, 2008.
12. VCAPCD Staff Report, "Revisions to Rule 74.12, Surface Coating of Metal Parts and Products," February 28, 2008.
13. VCAPCD Rule 74.14, Polyester Resin Material Operations, last revised April 12, 2005.
14. VCAPCD Rule 74.18, Motor Vehicle and Mobile Equipment Coating Operations, last revised November 11, 2008.
15. VCAPCD Rule 74.19, Graphic Arts, last revised June 14, 2011.
16. VCAPCD Rule 74.30, Wood Product Coatings, last revised June 27, 2006.
17. Ventura County Air Quality Management Plan, 2007 AQMP, adopted May 13, 2008.

DISCLAIMER

This report contains references to company and product names to illustrate product availability. Mention of these names is not to be considered an endorsement by the Ventura County Air Pollution Control District.

APPENDIX A. List of Certified Clean Air Solvent Products & Companies

Company	Products	Contact Name	Telephone
1st-Enviro Safety, INC.	ORGANIC CLEANER/DEGREASER MILITARY STRENGTH	Ted Tidwell	(239) 283-2511 (239) 283-1222
3M Chemicals	3M NOVEC ENGINEERED FLUID HFE-7200 3M NOVEC ENGINEERED FLUID 8200	Kurt Werner	(651) 733-8494
Ace Coating Co.	ENVIRO-POWER GREASE & TAR REMOVER ENVIRO-POWER INDUSTRIAL CLEANER	Benjamin Heilbrunn	(800) 672-7100 (619) 697-3300
AG Environmental	SOYGOLD 1000, SOYCLEAR 1500	Kathy Radachi Steve Nogel	(402) 492-3316 (402) 492-3353
American Bio-Clean Corp	ABC Weapons Cleaner (WC), ABC Parts Cleaner (PC), Nature's Way HS	Tammy Dunn John Finn	(714) 758-1402
Armick Chemicals	NAVSOLVE	Blair Heethuis	(616) 656-1819
Ashland Inc.	Presstige FB 8535, Presstige FB 8536	James Woodward	(302) 594-5667
Baker Petrolite	CLO 3074, CLW 3075	Rebecca Goff	(281) 276-5444
Bortz Distributing Co.	LACQUER THINNER LVLTO 1	Steve Bortz	(818) 342-8922
Brulin & Co	FORMULA 515 DD, FORMULA 815 GD FORMULA 815 GD-NF, FORMULA 815 MX BRULIN 1696B, BRULIN 1990 GD TERRA GREEN DEGREASER, AQUAVANTAGE 3800B, AQUAVANTAGE 3800GD, AQUAVANTAGE 3887GD	David Keller	(317) 923-3211
Buckeye International, Inc.	SHOP MASTER RTU	Tim Patridge	(314) 291-1900
Castrol Industrial Inc.	COME-CLEAN 900, TECHNICLEAN 2000, CASTROL KLEEN 3602	Greg Golminas	(630) 961-6683
Chemex Industries, Inc.	PG-5000	Barry Greenberg	(714) 832-8441
Chem Free Corp	SW-1, SW-3, SW-4, SW-6/8, SW-6LF, SW-7, SW-LF	Onofre Ortiz	(770) 564-5593
ChemSolv Consultants	ChemSolv 8002	Robert Gaeta	(714) 340-8134

Church & Dwight Co Inc	ARMAKLEEN MM-Recycle, ARMAKLEEN M HP-2, ARMAKLEEN M-GP, ARMAKLEEN MPC ARMAKLEEN MM-DIP, ARMAKLEEN MM-Spray- HD, ARMAKLEEN 4 IN 1 CLEANER	Ray Ashley	(609) 497-7571
Clea Care Essentials	CLEA DEGREASER CL46540, CLEA DEGREASER CL46650	Randy Block	(888) 323-2532
DeltaGreen, LLC	Delta Green Concentrate	Julie Gayevska Alex Sklar Anthony Miremadi	(310) 329-1883
Diana Industries International, Inc.	HS-1000 ENGINE AND PARTS CLEANER	Jason Medina	(800) 275-3951 (714) 964-1480
Domino Amjet, Inc.	WL-880 WASH, WL-890 WASH, MC-890 MAKE UP, W-0029 WASH	Karen Farrell	(847) 244-2501
Ecolink	ECOLINK 250 SS, NAVSOLVE	Donald Beck	(800) 886-8240 (770) 621-8240
Ellis Paint Co.	PCL 1720B, PCL 2040, PCL 2071B, PCL 4040, Ellis Paint 80/20	Ruben Laguna Karen Hollinhurst	(323) 261-8114 (800) 752-1566
Force Dry Cleaning	COLD PLUS CLEANER	John Kelleher	(562) 422-1257
Gemtek Products	SAFECARE AIRCRAFT(SC-AIRCRAFT), SC-1000	Sarah Kristoff	(602) 265-8586
Global RES, Inc.	RENEWABLE PRODUCT 291	Heidi Gautschi	(909) 627-1177
Graymills Corp	GM 330, GM 550, GM 660	Robert E. Schmalz	(773) 477-4100
Green Nest LLC	Green Nest All Purpose Cleaner	Lisa Beres	(949) 387-3804
Hitachi America, Ltd.	CL 1000 Low VOC Cleaning Solution	Mike McKinney	(704) 494-3008
Hondo, Inc.	POWERHOUSE A	Jess Karr	(661) 589-1042
Imperial Western Products	SOY ME E-12, ENFORCE MOLD RELEASE E-46, ENFORCE CONCRETE RELEASE E-44	Jayson Cabanyog	(760) 427-9377
Integra Environmental, Ltd (formerly NW Technologies)	NATURE'S WAY HS HARD SURFACE CLEANER, NATURE'S WAY PC PARTS CLEANER	Cathy Kaiser Dr. Jock R. Collins D.E. Wantz Irina Jackson	(713) 680-1234 (626) 969-7531 (800) 883-1458
IPAX of California	GREEN UNIKLEEN	Alex Sklar Julie Gayevska	(310) 532-0353
Jayne Products	Power Wash-Steam Wash 1, Power Wash- Steam Wash 2	Melinda Lussier	(310) 715-3070
JNJ Industries, Inc.	GLOBAL TECH AQUA SONIC AQUEOUS CLEANER FOR SOLDER PASTE AND FLUX,	Bob Enterkin	(800) 554-9994

	GLOBALTECH HEAVY DUTY DEGREASER		
Kafko International	OIL EATER	Rick Morgando	(847) 763-0333 (800) 528-0334
Kelleher Equipment Supply, Inc.	COLD PLUS CLEANER	John Kelleher	(562) 422-1257
Keteca USA, Inc.	WATER WORKS	Marilyn Romero	(877) 418-1306 (602) 278-7789
Kyzen Corp.	AQUANOX A4512P, AQUANOX A4520, METALNOX M6314, METALNOX M6435	Joan Quitmeyer Carolyn Leary	(615) 831-0888
Lubricating Specialties Co.	SUPER BLUE MEDIUM/ HEAVY DUTY INDUSTRIAL CLEANER	Antoria Louie	(562) 776-4000
Magnaflux	DARACLEAN 200, DARACLEAN 238, DARACLEAN 257, DARACLEAN 282 GF	Kimberly Hayes Tamie Simmons	(847) 657-5300
Mamco International Corp	BIO-T MAX	Michael McCauley	(800) 442-4686 (925) 376-7921
Master Chemical	TRIM TASK 2, TRIM CLEAN 2020	Joe Snyder Michael Pitman	(419) 874-7902 (419) 450-1114
Metalube Corp.	MC-509/4U CLEANER, SC-510/4U CLEANER, AMC-511/4U CLEANER	Diana Willis	(951) 279-9181
Mirachem	MIRACHEM 250, MIRACLEAN 250, MIRACHEM 500, MIRACLEAN 500, MIRACHEM 750, MIRACLEAN 750, MIRACLEAN PRESSROOM CLEANER, MIRACHEM 500 COMMERCIAL PARTS WASHER FLUID	Pat Doughty Peter Davy	(800) 847-3527 (800) 662-0333 (602) 272-6066
NAVAIR	NAVSOLVE	EL SAYED ARAFAT	(301) 342-8054
NCH Corp.	MULTI-MIST POW'R BLAST, ANIMAL	Carolyn Seroka	(972) 438-0264
Orison Marketing, LLC	VPW SC-1000, EVAPO-RUST	M'Lissa Bergan	(800) 460-2403 (325) 692-1135
Packaging Service Co., Inc.	CROWN LOW-VOC LACQUER THINNER, CROWN LACQUER THINNER NEXT	Katia Baizan	(281) 485-1458
PCI Of America	HURRISAFE 9450 [PARTS WASHER DEGREASER], HURRISAFE 9100, HURRISAFE 9065 CAST IRON DEGREASER WITH RUST INHIBITOR	Bobbie Pettit	(301) 468-1700 (800) 222-1455
Petroferm, Inc.	CLEAN SAFE 787C, HYDREX LV	Beth Bivins Bill Breault	(859) 312-4602
Service Line, Inc	RENEGADE PARTS WASHER DETERGENT	Tim Silvius	(800) 774-7900

Sierra Technologies & Industrial Specialties	Ecomate - FN, Ecomate - MPC, Ecomate - SDIP	Olabisi Carlton-Carew	(480) 966-2892
State Industrial Products	NEW ERA	Julie Kasprisin	(800) 782-2436
Summit Industrial Products	SUR-CLEAN	Danna Hafner	(903) 534-8021
Sunshine Makers	SIMPLE GREEN CLEAN BUILDING ALL PURPOSE CLEANER	Theresa Provolt	(800) 228-0709
System One Technologies, Inc.	QSOL 200 Cleaner, QSOL 220 Cleaner, QSOL 300 Cleaner	Paul Mansur	(305) 593-8015
Walter Surface Technologies	AF-Weld, Alustar 300, Bio-Rust, E-Weld 3, Star 200, UNO S, UNO S F	Nathalie Vezina	(514) 630-2800
WaterWorks	PREG MAGIC, DEPARTURE, PREFLIGHT	Nancy Layman	(706) 698-4405 (800) 858-4111
Zestron Corp	ATRON AC-300, ATRON SP-200	Sylvain Chamousset	(703) 589-1198 (888) 999-9116
Zymo International (formerly ABC, Inc.)	SURFZYME HD	Rob Whiteman	(904) 213-7994