VENTURA COUNTY APCD
STAFF REPORT
REVISIONS TO RULE 74.19, GRAPHIC ARTS
June 14, 2011
EXECUTIVE SUMMARY

Staff is proposing to revise Rule 74.19, Graphic Arts, to reduce the reactive organic compound (ROC) emissions from graphic arts operations. This rule development will implement an All Feasible Measure as required by the California Clean Air Act (H&SC 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. In addition, the Environmental Protection Agency (EPA) has issued a revised control technique guideline (CTG) in September of 2006 on the "Control of Volatile Organic Compound Emissions from Offset Lithographic and Letterhead Printing." This document establishes the federal reasonably available control technology (RACT) guidelines for nonattainment areas such as Ventura County.

Staff is proposing to reduce ROC emissions from graphic arts operations in Ventura County by:

- Reducing the ROC content of cleaning solvents used for printing operations.
- Lowering the ROC content of fountain solutions used by lithographic printing operations.

The proposed revisions to Rule 74.19 will affect approximately 32 graphic arts operations. The permitted or potential ROC emissions from these graphic arts operations are approximately 125 tons per year. The estimated control effectiveness of the proposed revisions is about 40 percent or 51 tons of ROC per year. Almost all of the emission reductions are based on the use of low-ROC cleaners. Examples of low-ROC cleaners include vegetable/soy-based cleaners, water-based emulsions, and exempt organic compound cleaners (acetone or PCBTF). The existing rule allows printers to use low vapor pressure cleaners instead of low-ROC cleaners, and ROC emissions will be reduced when printers switch to low-ROC cleaners. The proposed revisions to the cleaner requirements are based on four existing air district regulations: South Coast AQMD Rules 1130 and 1171, Bay Area AQMD Regulation 8, Rule 20, San Joaquin Valley APCD Rule 4607, and Sacramento Metro AQMD Rule 450.

The other proposed change to Rule 74.19 establishes new ROC standards for fountain solutions used by lithographic printing operations. These standards are based on the recommendations published in the 2006 Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing by EPA's Office of Air Quality Planning and Standards. These new proposed ROC standards for fountain solutions are estimated to reduce ROC emissions by only about 3 tons per year since existing standards have been quite effective.

The estimated cost analysis for replacing existing cleaning products with low-ROC versions was based on work performed by the Bay Area AQMD (October 2008 Staff Report). The estimated price changes for the new products ranged from an increase of 7 percent to a decrease of 25 percent. The cost-effectiveness for these cleaner replacements ranged from a cost of $0.17 per pound of ROC reduced to a cost savings. 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).

EPA evaluated the costs of lowering or eliminating the use of alcohol concentration of fountain solutions in their 1993 control technique guideline. Also, costs of using blanket wash cleaners having a high-ROC content were compared to the use of low-ROC cleaners in the guidelines. According to EPA, the proposed fountain solution requirement produces a cost saving ranging from $700 to $1,500 per year for each printing operation. The cost-effectiveness of low-ROC content cleaner was about $0.31 per pound of ROC reduced according to the EPA control technique guideline.

This report contains five additional sections: (1) Background, (2) Proposed Rule Requirements, (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 to Rule 74.19. 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 and socioeconomic impacts. The last section examines the environmental impacts of compliance methods and the mitigations of those impacts.

BACKGROUND

Introduction

Ventura County APCD Rule 74.19, Graphic Arts, was first adopted on August 11, 1992. The analysis of the source emissions, rule requirements, and control technologies were summarized in the staff report associated with that rule adoption. The initial rule adoption was based on a July 18, 1991, RACT/BARCT guidelines developed by the Air Resources Board and a statewide committee of local air district representatives in 1991.

Rule 74.19 was updated in 2001 and was based on the September 1993 Control Techniques Guideline for Offset Lithographic Printers and a June 1994 Alternative Control Techniques document on offset lithographic printers. Also, a more recent RACT/BARCT guidance document dated May 28, 1992, was also used for this revision. The 2001 revision reduced the ROC content or vapor pressure of cleaning solvents and lowered the ROC content of fountain solutions, adhesives, and flexographic inks used on porous substrates. Another significant change was aligning the rule requirement threshold with the permitting requirement for graphic arts operations.

This staff report will focus only on those areas that will be most impacted by the proposed revisions, which include fountain solutions at lithographic printing operations and solvent cleaning at all printing operations. The proposed fountain solution standards are based on the 2006 federal CTG guidelines as adopted by the Sacramento Metro AQMD Rule 450 in 2008, while the proposed changes for cleaning solvents is based on a RACT analysis that reviewed the rules from four air districts: South Coast, Bay Area, San Joaquin, and Sacramento.

Graphic Arts Operations

The ROC emissions at graphic arts operations are based on organic solvent evaporation from the use of inks, coatings, adhesives, and solvent cleaners. With the use of waterborne or low-ROC coatings, adhesives and inks required by Rule 74.19, the cleaning of printing press rollers and blankets has become the largest source of ROC emissions. Fountain solutions, especially those containing alcohol, are another significant source of ROC emissions.

Graphic arts operations consist primarily of six types of printing: inkjet, gravure, screen printing, letterpress, flexography, and lithographic printing. Graphic arts operations currently in the county include all of the above except gravure printing. ROC emissions from screen printing are regulated by a different rule, Rule 74.19.1, Screen Printing Operations, which was adopted on June 11, 1996. Permitted printing operations in the county are predominantly lithography with some inkjet, flexography, and letterpress.

The current exemption in the rule for inkjet printing operations is being retained based on the fact that there is only one relatively large permitted source (about 5 tons per year) that is using solvent-based inks. Although water-based ink may be used in most inkjet printing operations, the performance properties of solvent-based inks are still superior for the more demanding applications such as outdoor billboards and signs.

Letterpress, the oldest type of printing, involves printing from a raised ink surface directly onto the paper. Flexography is similar to letterpress printing since both have a raised ink surface. The difference is that flexography uses a rubber image carrier on a steel mat mounted on a cylinder. Flexography can be used for a variety of substrates including toilet tissue, corrugated board, foil, cellophane, polyethylene, and other plastic films. Inkjet printing is where liquid ink is transferred at high velocity through small diameter opening(s) to any solid substrate, including vinyl, paper, plastic, or metal.

Lithography, the newest type of printing, dominates periodical and newspaper printing. The image and the nonimage areas are on the same plane. Using the principle that oil and water do not mix, the image area is receptive to oil-based ink and water repellent. The nonimage area is receptive to water and repels the ink.

The process known as offset lithography is when the ink is transferred from the plate to a rubber blanket and then to the substrate. Lithography uses a water system supplied by the fountain solution, which is used to continually wet the nonimage areas.

Emission Inventory

The graphic arts operations currently permitted by the District are shown in Table 1. This table provides the permitted or potential emissions from each source with the total of 125 tons of ROC per year. The actual emissions depend on the production level and type of inks, fountain solution, and cleaners used.

Table 1. Permitted Graphic Arts Operations in Ventura County[1]

Facility Name	Permitted ROC Emissions (tons/year)	Type of Printing	SIC Code
AA Printing	1.36	Offset Printing	2750
Amp Graphics	1.05	Lithography	2752
Arms Printing	1.05	Lithography	2759
Bestforms	4.99	Litho/Flexo/Letterpress	2752
Captured Image	0.62	Lithography	2754
Clarks Printing	4.22	Lithography	2759
Coast Index	3.45	Lithography/Screen	2752
Crockett Graphics	9.00	Lithography	2653
Crockett Graphics	4.99	Flexography	2653
Custom Printing	4.99	Lithography	2752
Fausset Printing	1.05	Lithography	2752
Flyer Web Printing	1.05	Lithography	2752
Herald Printing	3.80	Lithography	2759
Indigo Ink	4.99	Inkjet	2759
International Paper - Santa Paula	9.11	Flexography	2653
International Paper - Camarillo	4.85	Flexography	2653
Jano Graphics	4.75	Lithography	2752
John Devine Printing	1.05	Lithography	2759
Ojai Printing	1.05	Lithography	2752
Packaging Corp of America	4.58	Flexography	2653
Pepsi Bottling Company	0.25	Inkjet	2086
Pharmaceutic Litho & Label Company	3.68	Lithography/Flexography	2754
Precision Tag	1.05	Flexography	2752
Print N Image	1.05	Lithography	2752
Procter & Gamble	2.6	Inkjet	2676
Quickprint Plus	1.05	Lithography	2759
Signature Graphics	1.05	Lithography	2752
Sir Speedy -Camarillo	0.83	Lithography	2752
Taylor Printing	4.17	Lithography	2754
Technicolor Home Entertainment	10.00	Lithography/Screen	3652
TFP Data	3.6	Lithography	2752
The Printing Press	0.37	Lithography	2752
Ticket Factory	1.05	Letterpress	2752
Tod Road Jail	1.05	Lithography	9223
Vanguard Printing	2.94	Lithography	2752
Ventura County Star – Camarillo	10.41	Lithography	2752
Ventura Printing	7.60	Lithography	2759
TOTAL PERMITTED EMISSIONS	124.75		

[1] Screen printing operations are not included in this list and are regulated by a different rule (74.19.1).

PROPOSED RULE REQUIREMENTS

The proposed rule revisions will reduce ROC emissions by:

1. Lowering the ROC content of cleaning solvents.
2. Lowering the ROC content of fountain solutions at lithographic printing operations.

The proposed effective date for these new requirements is January 1, 2012. Bay Area AQMD Regulation 8, Rule 20, Graphic Art Printing and Coating Operation, was last amended on November 19, 2008. The effective dates for most of the cleaning requirements in Bay Area are July 1, 2010, with one exception for a specialty flexographic cleaning requirement, which becomes effective on July 1, 2011. The cleaning requirement in South Coast AQMD Rule 1171 for graphic arts operations have been in effect for several years, with the exception of the cleaning requirement for ultraviolet/electron beam cured ink applicators, which became effective January 1, 2010.

Section B.2: Fountain Solution Requirements

The existing limits on the applied ROC content of fountain solutions used at lithographic printing operations is 80 g/l (100 g/l if refrigerated to 55°F or lower at the supply tank). The new proposed limits are based on federal guidelines and are currently in effect in Sacramento Metro AQMD Rule 450. The fountain solution limit depends upon the type of printing operation, and are summarized in Table 2.

Table 2
Proposed Fountain Solution Requirements

FOUNTAIN SOLUTION LIMITS BY PRINTING METHOD	LIMITS ROC CONTENT Percent by weight - applied
a. HEATSET WEB-FEB OFFSET LITHOGRAPHIC PRINTING	
1) If no refrigeration and contains alcohol:	1.6
2) If refrigerated below 55°F and contains alcohol	3.0
3) If no alcohol in fountain solution	5.0
b. NON-HEATSET WEB-FED OFFSET LITHOGRAPHIC PRINTING (This fountain solution may not contain alcohol.)	5.0
c. SHEET-FED LITHOGRAPHIC PRINTING with maximum sheet size greater than 11X17 inches or total solution reservoir greater than one gallon	
1) If no refrigeration and contains alcohol	5.0
2) If refrigerated below 55°F and contains alcohol	8.5
3) If no alcohol in fountain solution	5.0
d. ALL OTHER PRESSES NOT LISTED ABOVE	
1) If no refrigeration	8.0
2) If refrigerated below 55°F	10.0

Another new federal requirement in this proposal states that any fountain solution at a Non-Heatset web-fed offset lithographic printing operation shall not contain any alcohol.

Alcohol is defined as a monohydric alcohol containing one hydroxyl group. Examples included methanol, ethanol, and iso-propyl alcohol. South Coast AQMD Test Method 313-91, "Determination of VOCs by Gas Chromatography/Mass Spectrometry (GC/MS) is referenced in the rule for alcohol content compliance determinations.

In Ventura County, most of the lithographic printing operations are using fountain solutions without any alcohol. Moreover, a few are using fountain solutions with zero ROC content. The most common practice is to use an alcohol substitute as a dampening aid to enhance the spreadability of the fountain solution across the lithographic plate. These alcohol replacements are made up of glycols, such as ethylene

glycol, glycol ethers, or cellosolve ethers, which are chemically similar to alcohol, but not defined as alcohols in the rule. They have the same surface tension reducing ability but have more complex structures and higher boiling points than alcohol. The ability to maintain the proper balance of ink and fountain solution depends on many factors, including the press, dampening system, rollers, ink, paper, water quality, and operator skill and training.

Although alcohol substitutes range from 0 to 100 percent ROC, only small quantities are used with large quantities of water with the ratio of 2 to 4 ounces per gallon of water. These mixtures result in a final solution with less than 3 percent ROC, by weight.

One available fountain solution from Amerikal Products is a one-step buffered fountain solution for UV/EB and cold set newsprint inks. The applied VOC for this product is about 0.11 percent by weight. Beside being low-VOC, this product has no regulated toxics and performs without alcohol. Other benefits include sharper dot, improved drying, and better ink mileage. Second-step chemicals containing ethylene glycol are not necessary for this one-step product.

Section B.2: Solvent Cleaning

The vapor pressure requirements related to cleaning solvents in graphic operations are proposed to be eliminated and replaced with new lower ROC content standards. Although lower vapor pressure cleaners will evaporate more slowly, the use of low-ROC cleaners are much more effective in reducing emissions. The ROC content of low vapor pressure cleaners may contain up to 6.6 pounds of ROC per gallon, while new low-ROC cleaners contain less than 0.83 pounds of ROC per gallon. This is the basis for the significant emission reductions anticipated by this rule proposal. The proposal summarized in Table 3 is based on identical requirements already adopted by the South Coast AQMD, Bay Area AQMD, San Joaquin Valley APCD, and the Sacramento Metro AQMD.

The graphics arts industry uses a variety of cleaning products to remove excess printing inks, oils, grease, coatings, and adhesives, and to remove unwanted dust, debris, and other pressroom contaminants. Cleaning solvents are defined in Rule 74.19 as the removal of uncured inks, coatings, and adhesives.

Table 3
Proposed Solvent Cleaning Requirements

SOLVENT CLEANING ACTIVITY	LIMITS - ROC Content g/l (lb/gal)
a. Surface Preparation	25 (0.21)
b. Repair and Maintenance Cleaning	25 (0.21)
c. Other Press Parts	25 (0.21)
d. Cleaning of Coatings or Adhesives Application Equipment	25 (0.21)
e. Cleaning of Ink Application Equipment	
1) General, unless listed below	25 (0.21)
2) Flexographic Printing	
a)Specialty Flexographic	100 (0.83)
b)Other Flexographic	25 (0.21)
3) Gravure Printing	
a)Publication	100 (0.83)
b)Packaging	25 (0.21)
4) Lithographic or Letter Press Printing	
a)Roller Wash	100 (0.83)
b)Blanket Wash	100 (0.83)
c)Metering Roller Cleaner	100 (0.83)
d)Plate Cleaner	100 (0.83)
e)Removable Press Components	25 (0.21)
5) Radiation Curing Ink Removal	100 (0.83)

Many graphic arts operators use ROC-containing cleaning products to clean external parts of the printing press manually and to clean internal areas of the press manually and mechanically. Press operators apply small amounts of cleaning solvent to a cloth and hand wipe blankets, rollers, cylinders, drums, ink tools, ink trays, ink cans, ink rails, pipe rollers, and spray bars. Used cloths, if contaminated by toxic solvents, are disposed as hazardous waste. Automated systems using specially formulated cleaners are used to clean internal parts of the press such as automatic blanket washes on lithographic presses. One of the advantages of the automatic press cleaning feature is that operators may clean a press while simultaneously printing a job.

Another source of ROC emissions relates to the cleaning of press parts that are not directly involved in the creation or application of images or that do not usually come into contact with inks, otherwise known as "other press parts." Other press parts may be cleaned with solvents and include non-image areas of printing plates, catwalks, motors, belts, die cutters, side frames, gripper bars, delivery units, ink pumps, dryer boxes, drip pans, and ink trays.

The proposed solvent cleaning categories are almost identical to those in the existing rule. Based on the Bay Area rule, staff is proposing to define two new categories: Other Press Parts and Removable Press Components. Other Press Parts are defined as any press parts that do not come into contact with inks, adhesives, or coatings. Examples include pressure rollers, motors, and belts. The new category, Removable Press Components, is similar but only applies to lithographic printing operations. It applies to any part, component, or accessory of a press that is physically attached to the press but does not come into contact with ink, and which is removed from the press prior to being cleaned. The following are <u>not</u> considered to be removable press components or other press components: rollers, blankets, metering rollers, fountains, impression cylinders, and plates. The proposed ROC content limit for each new category is identical at 25 grams per liter.

Several graphic arts suppliers including Amerikal Products, SoyGold, Prisco, Gans Ink & Supply, Pitman, and Day International Chemical Products are currently manufacturing pressroom cleaners in compliance with the proposed standards for rollers, blankets, and impression cylinders. Mention of company names or products are to demonstrate availability, and no endorsement by the District should be implied.

Operators should choose carefully when selecting a solvent to clean rubber blankets and rollers. The strongest solvents such as acetone and MEK will remove the plasticizer from the rubber and harden the rollers. The roller will then become unusable for printing and their lifetime will be shortened. Blanket and roller washes must offer the printer strong cleaning. Fortunately vegetable-based cleaners are now available that provide strong cleaning without the use of petroleum-based products. For example, LA Graphico, a printer located in Burbank in the South Coast AQMD, has been successfully using a Amerikal Products vegetable-based cleaner (Brigl Wash) since 2004. This cleaner does not contain any acetone, water, petroleum products, or hazardous air pollutants, and has an ROC content under 50 grams per liter.

Other contributing factors to roller degradation include solvent-containing inks, alcohol from fountain solutions, high temperatures, and strong acids or alkalis. Proper maintenance and careful monitoring of process parameters will help preserve the life of rubber rollers and blankets.

Section B.6: Add-On Emissions Controls

Staff is proposing to raise the combined capture and control efficiency for optional add-on emission control equipment from 75 to 80 percent for graphic arts operations other than publication rotogravure. This is based on a recommendation from the federal Control Technique Guidelines for Flexographic Printing. Moreover, the control efficiency of catalytic oxidizers is typically greater than 95 percent if inlet temperatures are maintained above 475 degrees F.

No printers operating in the county are using add-on control equipment to comply with the requirements of Rule 74.19. Based on the availability of low-ROC cleaners that comply with the proposed amendments, staff anticipates that none of the printers in the county will need to install add-on controls.

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.

Comparison with Federal NSPS and NESHAPS

The only federal NSPS that may impact graphic arts operations is found in Title 40, Part 60, Subpart QQ, Graphic Arts Industry: Publication Rotogravure Printing. The federal NESHAPS that will impact graphic arts operations may be found in Title 40, Part 63, Subpart KK, NESHAP for the Printing and Publishing Industry. The elements of the NSPS and NESHAPS were compared to proposed amendments to VCAPCD Rule 74.19. None of the proposed amendments to Rule 74.19 affect the:

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

No emission averaging provisions or reporting requirements are contained in Rule 74.19. In summary, there are no conflicting requirements with the federal NSPS or NESHAPS.

It is worth noting that VCAPCD Rule 76, Federally Enforceable Limits on Potential to Emit, contains requirements for recordkeeping and reporting of Hazardous Air Pollutants that may impact some existing graphic arts operations. For example, sources that are larger than De Minimis levels and smaller than major source levels must keep records of hazardous air pollutant emissions.

Comparison with BACT Requirements

Health and Safety Code Section 40727.2 (a) requires that the proposed amendments to Rule 74.19 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 graphic arts industry was determined by surveying the BACT determinations from the South Coast AQMD and the Air Resources Board BACT Clearinghouse. The SCAQMD BACT guideline is published on their website for permitting purposes in Appendix B. The BACT Clearinghouse is published on the Air Resources Board website and is a compilation of permit applications submitted by air districts in California that show BACT requirements imposed on new sources. BACT determinations were found for the following types of printing:

- Lithographic Offset Printing – Non-Heatset
- Lithographic Offset Printing – Heatset
- Flexographic Printing Line
- Rotogravure Printing – Publication and Packaging

The proposed Rule 74.19 ROC emissions controls for printing processes are comparable to BACT requirements. The lowest ROC content limits for inks for all printing processes and for fountain solution for lithographic offset printing processes are equivalent or more stringent.

The results indicate that BACT limits (5% to 8% by wt.) for inks are equal or more stringent than the ink ROC content limit of 300 grams per liter in existing Rule 74.19. A similar result is found when comparing the fountain solution ROC content limits. The ROC limit of fountain solutions proposed for Rule 74.19 are based on CTG limits and the existing requirements in Sacramento Metro AQMD Rule 450.

The proposed amendments to Rule 74.19 cleaning requirements are based on existing in South Coast AQMD, Bay Area AQMD, San Joaquin Valley APCD, and Sacramento AQMD, and are considered to be BACT.

IMPACT OF THE PROPOSED RULE

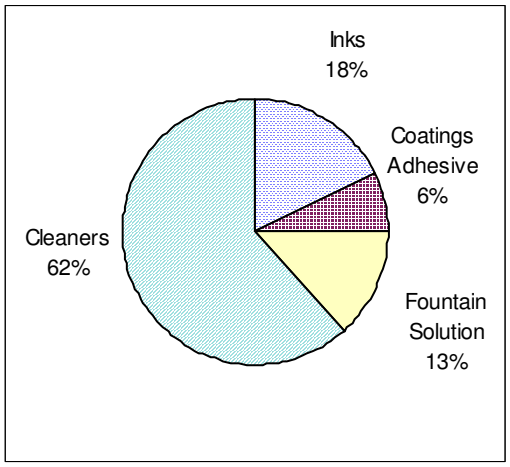
Table 4. Baseline ROC Emissions Factors for Graphic Arts Operations Sources

ROC Emission Source	Baseline Emission Factor (lb/gal)
Inks	0.25
Fountain Solution	0.9
Cleaners	6.6
Coatings/Adhesives	1.25

ROC Emissions Impacts

As shown earlier in Table 1, the permitted emissions (ROC) from graphic arts operations are about 125 tons per year. The relative ROC emissions were estimated using data from permitted sources in the county that are currently subject to Rule 74.19. The average factors in Table 4 above were used to compute the relative contribution of each graphic arts emission source.

Figure 1. Percentage of ROC Emissions by Graphic Arts Category



The results of this analysis in Figure 1 clearly shows that the largest source of ROC emissions in graphic arts operations are from the use of cleaning solvents. The next largest ROC emission source at 18 percent is from inks is based on an emission factor of 0.25 pounds per gallon. This factor was derived from the current standard of 2.5 pounds per gallon times a correction factor of 10 percent. This correction factor is based on the assumption that nonheatset ink solvents are retained in substrate. This solvent retention occurs because these inks dry by oxidation or absorption and not by evaporation of the ink oils.

The derivation of the projected potential ROC emission reductions of 51 tons per year from the proposed amendments to Rule 74.19 are shown in Table 5. The more wide spread use of lower ROC cleaning solvents will contribute to over 95 percent of the total reductions. The much smaller projected emission reductions resulting from the new standards for fountain solutions are based on the fact that most if not all printers are already in compliance with these new proposed standards.

Staff also analyzed actual emission reductions that would have occurred based on recent production levels. These results indicate much lower emission reductions at about 20 tons per year, which reflect the slowdown in recent economic activity. Presumably, the potential emission reductions will increase once more normal production rates are reached.

The projected emission reductions from this proposed rule change at 51 tons per year is a more conservative projection than the one determined for the recently adopted amendments to Bay Area AQMD Regulation 8, Rule 20. Bay Area AQMD staff projected an emission reduction of 1.65 tons per day, which is equivalent to about 66 tons per year in Ventura County based on population differences.

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

Table 5. Projected ROC Emission Reductions

Source Category	Baseline ROC Emissions	Estimated Control Efficiency	Projected ROC Emission Reductions
Cleaners	60 tons/yr	80 %	48 tons/y
Fountain Solution	13 tons/yr	23 %	3 tons/yr
TOTAL			51 tons/yr

Cost-Effectiveness

The estimated cost analysis for replacing existing cleaning products with low-ROC versions was based on work performed by the Bay Area AQMD (October 2008 Staff Report). The estimated price changes for the new products ranged from an increase of 7 percent to a decrease of 25 percent. The cost-effectiveness for these cleaner replacements ranged

from a $0.17 per pound of ROC reduced to a cost savings. In addition, staff contacted LA Graphico, the Burbank printer currently using the low-ROC vegetable-based cleaners. According to the plant manager, the cost of the new cleaners is equivalent to the high-ROC cleaners previously used.

Based on cost data from the EPA control technique guideline for offset Lithographic printing (September 1993), the proposed ROC standard for fountain solutions will save businesses from $779 to $1,494 per year for small sheetfed printers where alcohol use is reduced. Larger facilities that reduce alcohol use will save more. This cost savings is based on reduced alcohol raw material costs.

Similar cost savings will result if alcohol is completely eliminated. If alcohol substitutes are used, the cost saving is the difference between the savings from reduced alcohol usage and the cost of the alcohol replacement. EPA estimates the cost savings with the use of alcohol substitutes from $732 to $1,403 per year for the same types of sheetfed printing operations. Although the cost of the alcohol substitute at $1.55 per pound is much higher than isopropyl alcohol at $0.46 per pound, approximately 90 percent less alcohol substitute is needed in the fountain solution.

When operators are trained in the use of substitute cleaners, they often use much less than was needed with a regular blanket wash. In Europe, a program called SUBSPRINT was developed to eliminate the use of organic solvents in the printing industry. Two of the companies in this program showed that with training, blanket wash consumption can be cut by as much as 80 percent compared to the regular blanket wash. This type of performance will actually result in a cost saving when using low-emission cleaners.

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 Rule 74.19 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 Rule 74.19.

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

The adoption of amendments to Rule 74.19 will directly affect thirty-two permitted graphic art operations in the county (see Table 1). The inkjet printers listed in Table 1 will not be impacted because the proposed rule amendments do not change the current exempt status for this type of printing.

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

Revisions to Rule 74.19 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 to Rule 74.19, some segments of the graphic arts industry 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.

Probable savings will range from $732 to $1,403 per each facility that reduces the use of alcohol in their fountain solutions. Costs of switching to low-emission cleaners will range from a cost savings to a cost of $0.17 per pound of ROC reduced.

(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.

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

The anticipated emission reduction potential of the proposed rule is about 51 tons per year of ROC emissions. These emission reductions result from the use of low-ROC cleaners and low-ROC fountain solutions.

(6) The necessity of adopting, amending, or repealing the rule or regulation in order to attain state and federal ambient air standards pursuant to Chapter 10 (commencing with Section 40910).

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.

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

Table 6
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 fountain solutions and 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 fountain solution and cleaning solvents may cause water impacts	Compliance with wastewater discharge standards and waste disposal requirements will mitigate these impacts.
	Human Health Impacts: Fountain solutions and cleaning 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 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 Rule 74.19 will not have a significant effect on the environment due to unusual circumstances.

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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.