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| <b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b> |
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**Draft Staff Report for  
Proposed Amended Rule 1171 - Solvent Cleaning Operations**

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**EXECUTIVE SUMMARY**

Proposed Amended Rule (PAR) 1171 – Solvent Cleaning Operations will delay by one year the implementation of the 100 gram per liter VOC limit scheduled to take effect on January 1, 2008 for the cleaning of ultraviolet or electron beam (UV/EB) inks from lithographic printing ink application equipment. Staff's proposal supports the printing industry's position that additional time is needed to fully develop compliant cleaning materials. The Printing Industry Association (PIA) has indicated that the users need to conduct further tests in order to have enough actual production experience in the use of these products. For the same reason, staff is also proposing to extend by one year the limited exemption for the cleaning of metering rollers, dampening rollers and printing plates in lithographic UV/EB ink application equipment, including cleaning of UV/EB lamps and reflectors. The emission impact of this proposal will result in delayed emission reduction of about 0.11 tons per day.

For clean up of rollers and blankets in lithographic ink application equipment using conventional inks, and the clean up of screen printing equipment, the VOC limit of 100 grams per liter will be implemented on January 1, 2008 as currently required in Rule 1171. The expected VOC emission reduction from implementing the 100 gram per liter VOC limit for lithographic ink application equipment using conventional inks is 1.83 tons per day beginning year 2008.

However, staff is proposing to add a limited exemption for on-press cleaning of screens in screen printing equipment, and for automatic cleaning equipment used in screen reclamation. Such limited exemptions will allow screen printers to continue using solvents that comply with the current VOC limit of 500 grams per liter for an additional one year and at the same time continue testing low VOC solvent formulations. Clean up solvents used in other screen reclamation activities must comply with the 100 grams per liter VOC limit beginning January 1, 2008. The expected VOC emission reduction from manual screen reclamation is 0.47 tons per day.

The delayed VOC emission reduction as a result of the limited exemption for on-press screen cleaning and automatic cleaning equipment for screen reclamation is estimated at 0.10 tons per day. Including the impact of delaying the VOC limit for UV/EB ink application equipment, the total delayed emission reduction resulting from PAR 1171 would be 0.21 tons per day.

Other proposed amendments to Rule 1171 include:

- expanding the rule applicability to include solvent suppliers who supply, sell or offer for sale solvent cleaning materials;
- adding clarifying language for solvent supplier, full service solvent provider, on-press screen cleaning, screen reclamation, and removable press component;
- addition of recordkeeping requirements for solvent suppliers;
- requiring operators to maintain, and for solvent suppliers to provide, correct written instructions if dilution is necessary to meet the applicable VOC limits;
- adding labeling requirements for solvent cleaning materials pursuant to Rule 443.1 – Labeling of Materials Containing Organic Solvents;
- adding rule language prohibiting full service solvent providers from aiding, abetting or assisting a solvent cleaning operations to use a supplied solvent in a non-compliant manner; and

- removal of outdated rule provisions pertaining to technology assessments and the limited exemption for UV/EB adhesive application equipment.

## BACKGROUND

Rule 1171 – Solvent Cleaning Operations, a key component of South Coast Air Quality Management District’s (AQMD) ozone reduction strategy, was adopted on August 2, 1991 to reduce VOC emissions from the use of solvents and solvent wastes generated during the production, repair, maintenance, or servicing of products, tools, machinery, and general work areas. Subsequent rule amendments expanded the scope of the rule to cover all solvent cleaning activities at all facilities.

On October 8, 1999, Rule 1171 established low-VOC limits for all solvent cleaning activities identified in the rule. Achievement of the target VOC limits was expected through greater use of aqueous cleaning technologies and VOC-exempt solvents, and through the development of new low-VOC cleaning materials. Most of the VOC limits established in 1999 for Rule 1171 have now been implemented except for certain solvent cleaning activities involving ink application equipment. Facilities engaged in lithographic and screen printing are directly affected by this pending VOC limit of 100 grams per liter set to take effect on January 1, 2008.

Since establishing the 100 gram per liter VOC limit in 1999 for the clean up of ink application equipment, the compliance date for the use of low-VOC solvents for such application has been delayed twice due to infeasibility of the VOC limits at that time. The original compliance date was July 1, 2005. Furthermore, unforeseen delays in the completion of the AQMD-sponsored technology assessment for lithographic ink application equipment provided additional justification for delaying the implementation of the low-VOC limits.

In May 2006, the technology assessment to support the target VOC limits for lithographic ink application equipment was completed. The results of the study indicated that low-VOC alternative cleaning materials such as water-based cleaners, blends of VOC-exempt solvents, and methyl esters can be used to clean press rollers and blankets. The final report titled “Assessment, Development and Demonstration of Low-VOC Materials for Cleaning Lithographic Printing Ink Application Equipment” dated May 2006 is available to the public.

The last amendment to Rule 1171 in July 2006 provided an 18-month extension in the compliance date for the use of 100 gram per liter formulations for clean up of ink application equipment used in lithographic and screen printing. The delay in compliance date allowed the printing industry and solvent formulators additional time to evaluate the results of the technology assessment, develop and further test new formulations, and transition to the new cleaning materials. The industry has been largely successful in this effort.

During the past several months, the printing industry, solvent formulators, and the AQMD have been working together in developing and testing solvent formulations that meet the 100 gram per liter VOC limit for cleaning press rollers and blankets. Compliant products were tested in actual production environment for several months at various printing facilities. Test results indicated significant success in the performance of low-VOC cleaning materials for removing conventional inks from rollers and blankets in lithographic ink application equipment. This success was achieved for both manual (hand wipe) and automatic cleaning of rollers and

blankets.

AQMD staff visited several printing facilities involved in the test program (Taylor Graphics, The Castle Press, The Foster Printing, Huhtamaki) and verified the positive performance results of the low-VOC cleaners. Taylor Graphics successfully tested both an ester-based product and a water-miscible cleaner. The Castle Press and The Foster Printing tested ester-based cleaners from different solvent formulators. Huhtamaki tested an ester-based cleaner for removing EB inks and reported positive results. However, the company continues to test other compliant formulations.

Staff has also visited other facilities using compliant materials for cleaning rollers and blankets. LA Graphico has been successful in using an ester-based product (34 g/l VOC) in automatic roller and blanket wash system for cleaning conventional inks. This product is currently available in the market.

Based on the results of the test program, the printing industry believes that there is enough evidence indicating that low-VOC products can meet the performance requirements of the printers for cleaning ink application equipment using conventional inks. In addition, solvent formulators have indicated to AQMD staff that more compliant formulations will be available in the near future for clean up of conventional inks, and that the printing industry should be able to meet the 100 gram per liter VOC limit which takes effect on January 1, 2008.

A similar test program is taking place for the clean up of UV/EB inks. However, industry's efforts in testing compliant products were focused more on the clean up of conventional inks rather than on UV/EB inks because most of the VOC clean up emissions in lithographic printing come from conventional inks. Staff estimates that the clean up of conventional inks accounts for 96% of the total lithographic clean up solvent emissions. As a result, very few compliant formulations have been developed by solvent formulators for UV/EB ink clean up and made available for testing. Industry believes that a research approach similar to the one used for conventional inks can be used for UV/EB inks in finding acceptable compliant formulations.

Although considerable progress has been made in finding low-VOC alternative cleaners for UV/EB inks, the printing industry has requested a one year extension to the compliance date for the use of 100 gram per liter formulations for clean up of UV/EB inks only. Since earlier research efforts were focused in finding alternative cleaning materials for conventional inks, industry believes that additional time is needed to develop more new formulations for UV/EB ink clean up and to test these solvents in actual production environment.

It is worthwhile to note that staff has visited a few facilities that are already in compliance with the 100 gram per VOC limit for clean up of UV/EB inks. House of Packaging uses ester-based products for removing UV inks from rollers and blankets. Another facility, Money Mailer, is already in compliance with the 100 gram per liter VOC limit for roller and blanket wash. While the presence of a limited number of low-VOC cleaning solvent formulations that work well for certain applications is highly encouraging, more time is needed for the development and testing of additional formulations that perform well for the entire spectrum of UV/EB applications and substrates over extended time frames.

Based on the information presented by the printing industry, as well as field data gathered, staff believes that an extension of the compliance date for the 100 gram per liter VOC limit is

justifiable and reasonable. Staff has also reconsidered its earlier proposal and is now proposing a one year extension in the compliance date to allow industry additional time in developing and testing compliant formulations. The industry has committed to provide regular progress reports to the Stationary Source Committee on its test program during this time period.

Another cleaning application where the 100 gram per liter VOC limit will take effect beginning 2008 is in the clean up of screen printing equipment. Screens used in the printing process are cleaned periodically with solvents during press runs to remove excess inks and/or contaminants. This process is called on-press screen cleaning. Another process where solvents are used to remove inks is in reclamation where screens are completely cleaned for recycling or reuse of the screens for other production runs.

The Specialty Graphic Imaging Association (SGIA), an association of screen printers, coordinated a test program to find low-VOC alternative cleaners that meet the 100 gram per liter VOC limit in Rule 1171 for clean up of screen printing equipment. The SGIA worked with various vendors/formulators of screen chemicals and several screen printers to develop and test low-VOC cleaning materials for cleaning of screens on-press and during screen reclamation. SGIA's test program, however, was focused on finding compliant formulations for screen reclamation since this cleaning activity accounts for about ninety (90) percent of the total solvent clean up emissions in screen printing operation. Graphics screen printing facilities that use UV and solventborne inks, and textile screen printers using plastisol inks, participated in the test program.

SGIA has yet to submit the final test results but data gathered by AQMD staff from various sources indicate that compliant formulations performed well in removing UV and solventborne inks during screen reclamation. In one instance, the user indicated to AQMD staff that the test product performed better than the current high-VOC cleaner. In addition, several solvent formulators/suppliers informed AQMD that compliant products are also available for clean up of plastisol inks in screen reclamation, and that such cleaning application should not be a problem in meeting the 100 gram per liter VOC limit. These solvent formulators also indicated that additional compliant cleaning materials will be available for removing UV and solventborne ink during screen reclamation in time for the January 1, 2008 compliance date.

Similar to lithographic printing, an AQMD-sponsored technology assessment to support the low-VOC limits for screen printing ink application equipment was completed last year. The study indicated that low-VOC alternative cleaning materials such as water-based cleaners, blends of VOC-exempt solvents and methyl esters can be used for removing inks from screens. Details of the study can be found in the final report titled "Low VOC, Low Toxicity Clean up Solvents for Screen Printing: Safer Alternatives" dated May 2006. This report is available to the public.

For on-press cleaning of screens, the screen printing industry stated that they have not been successful in finding acceptable alternative cleaners due to the lack of sufficient testing of compliant formulations. The industry focused their research efforts on manual screen reclamation, and it was only during the last few months that solvent formulators have started looking at potential raw materials that can be used to formulate compliant products for on-press screen cleaning. This was confirmed during AQMD staff's recent conversations with solvent formulators. However, the SGIA continues to work with solvent manufacturers and formulators to develop commercially viable cleaning materials that meet the 100 gram per liter

VOC limit.

In spite of the progress made in demonstrating the effectiveness of compliant formulations for certain screen printing clean up applications, the SGIA recently submitted a letter to the AQMD requesting a one year delay in the compliance date for the 100 grams per liter VOC limit for both on-press screen cleaning and screen reclamation. Based on available information, staff believes that the 100 grams per liter VOC limit for clean up of screen printing equipment can be implemented beginning January 1, 2008, and that additional compliant clean up solvents for screen reclamation will be available by the start of 2008. For on-press cleaning of screens, staff supports delaying the implementation of the 100 gram per liter VOC limit for one year in order for the screen printing industry to develop and test compliant formulations for on-press cleaning of screens. Staff also supports delaying the compliance date for automatic cleaning equipment used in screen reclamation.

## LEGISLATIVE AUTHORITY

The California Legislature created the South Coast Air Quality Management District (AQMD) in 1977 (The Lewis-Presley Air Quality Management Act, Health and Safety Code Section 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin). By statute, the AQMD is required to adopt an Air Quality Management Plan (AQMP) demonstrating compliance with all state and federal ambient air quality standards for the Basin [California Health and Safety Code Section 40460(a)]. Furthermore, the AQMD must adopt rules and regulations that carry out the AQMP [California Health and Safety Code Section 40440(a)].

## RULE PROPOSAL

Staff is proposing to amend Rule 1171 as follows:

### 1. Amend the rule's applicability, subdivision (a)

Staff is proposing to expand the rule's applicability to include all solvent suppliers who supply, sell, or offer for sale solvent cleaning materials for use in solvent cleaning operations.

### 2. Add definition language

Staff's proposal will add clarifying language for the following terms used in the rule:

- Full service solvent provider, paragraph (b)(16);
- On-press screen cleaning, paragraph (b)(37);
- Removable press component; paragraph (b)(45);
- Screen reclamation; paragraph (b)(51); and
- Solvent supplier, paragraph (b)(55).

For the definition of removable press components, staff is proposing to add ink trays to the list of press parts that are not considered removable press components. Similar to the cleaning of rollers and blankets, the current industry practice is to clean ink trays while the trays are still physically attached to the press. Occasionally, ink trays are removed from the press for subsequent cleaning. The VOC limit for cleaning on-press components shall apply

for such cleaning application.

For solvent supplier definition, home improvement retailers or hardware stores such as Home Depot, Lowe's, Ace Hardware, TrueValue, Orchard Supply Hardware, etc. would fall under the definition if such retailer sells and delivers or arranges to deliver solvent cleaning materials to a solvent cleaning operations.

**3. Add a recordkeeping requirement for solvent suppliers, paragraph (c)(7)**

Staff is proposing to add rule language that requires a solvent supplier to keep records, for up to 3 years, of solvent cleaning materials sold to solvent cleaning operations. This requirement takes effect July 1, 2008.

Under California Health & Safety Code section 42303.2, AQMD has the authority to request information from suppliers of volatile organic compounds and chemical substances the use of which results in air contaminants subject to regulations by AQMD. The proposed recordkeeping requirement simply codifies specific information that the AQMD may request from solvent suppliers as allowed under the California Health & Safety Code.

The type of information requested includes the following: product name of the supplied solvent cleaning material; name and address of the solvent cleaning operation the product was supplied to; dates and quantities in which the product was supplied during the time period specified by the Executive Officer; and the VOC content of the product as supplied.

**4. Require operators to maintain, and for solvent suppliers to provide, correct written dilution instructions, paragraph (c)(8)**

The intent of this proposal is to assist end users of solvent cleaning materials in complying with the VOC requirements in the rule. The proposed rule language would require the user or operator of a solvent cleaning operation to maintain at all times the correct written dilution instructions for solvent cleaning products requiring dilution to meet the VOC requirements, and make these dilution instructions available to the Executive Officer upon request. These dilution instructions should be specific for each solvent cleaning product, and should be obtained from the solvent supplier. Staff believes that the ultimate responsibility for maintaining dilution instructions and operating at the appropriate dilution ratio rests on the user or operator.

In addition, the proposed rule language would require solvent suppliers providing solvent cleaning material for use in solvent cleaning operations to provide, upon the operator's or user's request, the correct written dilution instructions for each supplied solvent cleaning material. If the solvent cleaning material provided already meets the applicable VOC limit, then dilution information would not be necessary. For multi-purpose solvents, dilution instructions may have to be provided for all applicable solvent cleaning applications.

Dilution instructions may be printed on product data sheets, formulation data sheets, Material Safety Data Sheets, product labels, or on any other written form, including making the dilution instructions available on the solvent supplier's website.

**5. Add language pertaining to labeling of solvent cleaning materials, paragraph (c)(9)**

Staff is adding language for solvent suppliers to label solvent cleaning materials, as they are already required to do, in accordance with the provisions of Rule 443.1 – Labeling of

Materials Containing Organic Solvents.

**6. Prohibit full service solvent providers from assisting solvent cleaning operations in using solvents in a non-compliant manner, paragraph (d)(5)**

Staff is proposing rule language that would prohibit a full service solvent provider from aiding, abetting or assisting a solvent cleaning operation in the non-compliant use of solvent cleaning materials. By definition, a full service solvent provider is any person that provides both solvents and services to a solvent cleaning operation. Such services may include, but are not limited to, one or more of the following: filling or refilling solvent cleaning equipment with solvent, collection or pick up of customer's solvent-related waste stream, equipment sales or rental, or maintenance of solvent cleaning equipment.

A full service solvent provider typically has direct contact with its customers and knows more about their customers' operations, such as cleaning activities and solvent products used, than any other type of solvent supplier. Many of its customers, particularly small businesses, rely on the full service solvent provider to supply them with solvent cleaning materials that comply with Rule 1171 requirements. However, field data indicates that some of these full service solvent providers actively assist their customers in their use of solvent materials in a non-compliant manner.

The intent of this proposal is to place some responsibility on the full service solvent provider to keep its customers in compliance when the provider is aware or should be aware that its customers are using the supplied solvents in a non-compliant manner. Thus, the proposed rule will place liability on the full service solvent provider for aiding, abetting or assisting a solvent cleaning operation to use a supplied solvent in a non-compliant manner. For example, a full service solvent provider that fills or refills solvent cleaning equipment with concentrated non-compliant solvent cleaning material should take affirmative steps to ensure that the solvent will be properly diluted to meet the applicable VOC limits in the rule. One such step would be to actually dilute the concentrated solvent for the customer. At a minimum, a full service solvent provider should educate its customers on how to dilute the concentrated solvent to meet the applicable limits. On the other hand, a full service solvent provider that fills or refills a solvent cleaning reservoir with a pre-mixed product, intended to be used for cleaning without dilution, would be liable if the pre-mixed solution does not meet the applicable VOC limits in the rule.

Another situation that may be considered aiding, abetting or assisting a solvent cleaning operation to use a supplied solvent in a non-compliant manner is when a full service solvent provider represents to its customer that a non-compliant product is actually compliant.

**7. Delay the 100 gram per liter VOC limit compliance date for clean up of UV/EB ink application equipment, clause (c)(1)(D)(vi)**

The printing industry has requested a one year extension in the compliance date for the use of 100 gram per liter formulations to allow additional time to develop more new formulations for UV/EB ink clean up and test these solvents in actual production environment. Industry believes that similar test approach used in conventional inks can be applied in UV/EB inks to find acceptable compliant formulations. Previously, staff supported a shorter test period but has reconsidered its initial proposal.

Staff is now proposing a one year delay in the implementation of the 100 gram per liter VOC limit for solvents used in the clean up of UV/EB ink application equipment in lithographic/letterpress printing. Currently, the VOC limit for this cleaning application is 650 grams per liter until the end of 2007. The proposed new compliance date for the 100 grams per liter VOC limit is January 1, 2009.

**8. Extend the exemption for the cleaning of UV/EB lamps and reflectors, subparagraph (g)(3)(H)**

Staff's proposal will extend until January 1, 2009 the exemption for the cleaning of UV/EB lamps and reflectors, consistent with the one year extension in compliance date provided to UV/EB ink application equipment. This proposal is in response to public comments received during the Public Workshop for PAR 1171.

**9. Add a limited exemption for on-press cleaning of screens and automatic cleaning equipment for screen reclamation, paragraph (g)(9)**

Until January 1, 2009, staff is proposing to exempt from the 100 gram per liter VOC limit the on-press cleaning of screens in screen printing equipment, including automatic cleaning equipment used in screen reclamation. These limited exemptions allow industry to continue using solvents with VOC content of no more than 500 grams per liter, for an additional one year, and at the same time test 100 gram per liter formulations that would meet their performance requirements. The addition of the limited exemption for automatic cleaning equipment is in response to public comments received during the Public Workshop for PAR 1171.

**10. Extend the exemption for the cleaning of metering rollers, dampening rollers and printing plates in UV/EB ink application equipment, paragraph (g)(10)**

Staff is proposing to extend by one year the limited exemption for cleaning of metering rollers, dampening rollers and printing plates in UV/EB ink application equipment, provided the clean up solvent used for such cleaning contains no more than 800 grams of VOC per liter.

**11. Remove outdated rule requirements**

Staff's proposal will remove outdated rule language as follows:

- a. Technology assessment provision in paragraph (d); and
- b. Limited exemption for cleaning of UV/EB adhesive application equipment, subparagraph (g)(5)(D).

## **EMISSIONS INVENTORY AND REDUCTIONS**

The VOC emissions inventory data presented in the June 2006 Final Staff Report for PAR 1171 (July 2006 amendment) were used in determining emissions impacts of the proposed amendments to Rule 1171. Staff did not include annual growth factors to the emissions data, which were based on year 2004 currency.

Staff's proposal to delay implementation of the 100 gram per liter VOC limit for lithographic UV/EB ink application equipment would result in a one year delay in achieving VOC emission

reductions of about 0.11 tons per day. Instead, such reductions will occur beginning January 1, 2009.

For lithographic printing using conventional inks, the 100 grams per liter VOC limit will be implemented as scheduled on January 1, 2008. Implementing this VOC limit for this cleaning application will result in VOC emission reduction of 1.83 tons per day.

In the area of screen printing, extending the compliance date to January 1, 2009 the 100 grams per liter VOC limit for on-press screen cleaning and screen reclamation using automatic cleaning equipment will delay the expected VOC emission reduction of about 0.10 tons per day from these cleaning applications. For manual screen reclamation, the VOC limit of 100 grams per liter will be implemented beginning January 1, 2008, and will result in VOC emission reduction of 0.47 tons per day.

The total VOC emission reduction as a result of implementing the 100 grams per liter VOC limit starting January 1, 2008 is as follows:

VOC Emission Reduction from Lithographic-Conventional Inks = 1.83 tons per day

VOC Emission Reduction from Manual Screen Reclamation = 0.47 tons per day

Total VOC Emission Reduction beginning 2008 = 1.83 tons per day + 0.47 tons per day  
= 2.30 tons per day

The total VOC emission reduction delayed to 2009 as result of staff's proposals to extend the compliance date for the use of cleaning materials with 100 grams per liter or less VOC in certain cleaning applications is:

Delayed VOC Emission Reduction from UV/EB inks = 0.11 tons per day

Delayed VOC Emission Reduction from Screen Printing = 0.10 tons per day

Total VOC Emissions Delayed = 0.11 tons/day + 0.10 tons/day  
= 0.21 tons per day

Table 1 shows the VOC emissions inventory and reductions for cleaning applications affected by the proposed amendments. (Source: Final Staff Report for PAR 1171, June 2006)

**Table 1 – VOC Emission Inventory and Reductions for PAR 1171**

| <b>Ink Application Equipment</b>        | <b>2007 VOC Emissions Inventory (tons/day)</b> | <b>1/1/08 VOC Emission Reductions (tons/day)</b> | <b>Delayed VOC Emission Reductions (tons/day)</b> | <b>Final VOC Emissions Inventory (tons/day)</b> |
|-----------------------------------------|------------------------------------------------|--------------------------------------------------|---------------------------------------------------|-------------------------------------------------|
| <b>Lithographic – Conventional Inks</b> | <b>2.27</b>                                    | <b>1.83</b>                                      | <b>0</b>                                          | <b>0.44</b>                                     |
| <b>Lithographic – UV/EB Inks</b>        | <b>0.13</b>                                    | <b>0</b>                                         | <b>0.11</b>                                       | <b>0.02</b>                                     |
| <b>Screen Printing</b>                  |                                                |                                                  |                                                   |                                                 |
| <b>a) Reclamation<sup>(1)</sup></b>     | <b>0.64</b>                                    | <b>0.47</b>                                      | <b>0.04</b>                                       | <b>0.13</b>                                     |
| • Manual Cleaning                       | 0.59                                           | 0.47                                             | 0                                                 | 0.12                                            |
| • Automatic Cleaning <sup>(2)</sup>     | 0.05                                           | 0                                                | 0.04                                              | 0.01                                            |
| <b>b) On-Press Cleaning</b>             | <b>0.07</b>                                    | <b>0</b>                                         | <b>0.06</b>                                       | <b>0.01</b>                                     |
| <b>Total Screen Printing</b>            | <b>0.71</b>                                    | <b>0.47</b>                                      | <b>0.10</b>                                       | <b>0.14</b>                                     |
| <b>Total</b>                            | <b>3.11</b>                                    | <b>2.30</b>                                      | <b>0.21</b>                                       | <b>0.60</b>                                     |

Notes:

(1) VOC emissions from screen reclamation are about 90% of total screen printing clean up solvent emissions.

(2) The VOC emissions from screen reclamation using automatic cleaning equipment are calculated based on data provided by industry.

## **COST**

Staff's proposal to delay the implementation of the 100 gram per liter VOC limit for cleaning of lithographic UV/EB ink application equipment, on-press screen cleaning from screen printing equipment, and screen reclamation using automatic cleaning equipment is a relaxation of an existing requirement in Rule 1171 and, therefore, does not impose additional cost to the affected industry. The staff report for the 1999 amendment of Rule 1171 provides a detailed cost-effectiveness analysis, including an incremental cost analysis, for the 100 gram per liter VOC limit for these cleaning applications.

## **SOCIOECONOMIC IMPACTS**

The proposed amendments to Rule 1171 (PAR 1171) would delay by one year (until January 1, 2009) the compliance date for solvents with VOC content of 100 grams per liter or less used in lithographic printing using UV/EB inks, on-press screen cleaning, and screen reclamation using automatic cleaning equipment. The cost associated with using the low-VOC solvent would thus be delayed by one year.

PAR 1171 would also extend an existing exemption for the cleaning of metering rollers, dampening rollers, printing plates, and UV/EB lamps and reflectors in UV/EB ink application equipment. There is no additional cost resulting from this extension. Instead, the provision allows flexibility to the affected printing operations as they gain experience in using products with lower VOC content.

PAR 1171 would require solvent suppliers to provide correct written dilution instructions to the end user if dilution is necessary to meet the applicable VOC limits in the rule. Staff believes that there is no additional cost associated with this proposal because most solvent suppliers of cleaning materials sold in the AQMD already provide dilution instructions if needed to meet the VOC limits in the rule.

In addition, PAR 1171 would also require solvent suppliers to keep records of solvent cleaning materials sold for up to three years, and such records be made available to AQMD in an approved format upon request. Under California Health & Safety Code section 42303.2, AQMD has the authority to request information from suppliers of volatile organic compounds and chemical substances the use of which results in air contaminants subject to regulations by AQMD. PAR 1171 recordkeeping requirement codifies specific information that the AQMD may request from solvent suppliers. Furthermore, keeping records of business transactions for at least five years for tax purposes is already part of current business practice. Based on the above information, staff has concluded that this proposal will not result in additional cost to the solvent suppliers.

In conclusion, PAR 1171 does not have any cost impact and would thus have no adverse socioeconomic impacts.

### **CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ANALYSIS**

The SCAQMD, as lead agency, has prepared a Draft Subsequent Environmental Assessment (SEA) pursuant to CEQA Guidelines §15162 and §15252 for the proposed amendments to Rule 1171 because the proposed project constitutes a modification of a previously approved project that was analyzed in a Final EA that was certified by the SCAQMD Governing Board in October 1999. The proposed project involves extending final compliance with a lower volatile organic compound (VOC) content limit for three cleaning categories for one year until January 1, 2009, establishing new requirements for labeling and reporting from solvent suppliers, as well as removing outdated rule requirements. Delaying the final compliance date will result in emission reductions foregone that would exceed the SCAQMD's daily VOC operational significance threshold, so the air quality impacts have been determined to be significant. No significant adverse impacts were identified for any other environmental topics. The Draft SEA was circulated for a 45-day public review period on November 21, 2007. After the close of the public review period, responses to all comments will be prepared and included in the SEA, at which time the document will become a Final SEA.

### **COMPARATIVE ANALYSIS**

The only federal requirement applicable to similar sources is the National Emission Standards for Hazardous Air Pollutants (NESHAP) requirement for handwipe cleaning in the aerospace industry. The requirements of Rule 1171, however, do not apply to handwipe cleaning in the aerospace industry; therefore, Rule 1171 is not in conflict with any federal requirement. Additionally, AQMD Rule 1401 - New Source Review of Toxic Air Contaminants and Rule 1402 - Control of Toxic Air Contaminants from Existing Sources, control the emissions of solvent containing toxic or hazardous air pollutants. Rule 1401 limits emissions from new and modified permitted sources exceeding certain thresholds, and Rule 1402 limits emissions from

existing sources.

## DRAFT FINDINGS UNDER THE CALIFORNIA HEALTH AND SAFETY CODE

Before adopting, amending, or repealing a rule, the California Health and Safety Code requires the AQMD to adopt written findings of necessity, authority, clarity, consistency, non-duplication, and reference, as defined in Section 40727. The draft findings are as follows:

**Necessity** – The AQMD Governing Board has determined that a need exists to amend Rule 1171 – Solvent Cleaning Operations, in order to delay the compliance date of VOC limits that are infeasible at this time for certain cleaning applications.

**Authority** – The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from the California Health and Safety Code sections 39002, 40000, 40001, 40440, 40441, 40702, 41508, and 41700.

**Clarity** – The AQMD Governing Board has determined that the proposed amendment to Rule 1171 is written or displayed so that its meaning can be easily understood by persons directly affected by it.

**Consistency** – The AQMD Governing Board has determined that Proposed Amended Rule 1171 is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

**Non-Duplication** – The AQMD Governing Board has determined that the proposed amendment to Rule 1171 does not impose the same requirements as any existing state or federal regulations, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

**Reference** – In adopting this regulation, the AQMD Governing Board references the following statutes which the AQMD hereby implements, interprets or makes specific: California Health and Safety Code sections 40001, 40440, and 40702.

## PUBLIC COMMENTS AND RESPONSES

This section summarizes the comments received as result of the Public Workshops conducted on November 7, 2007 and December 4, 2007.

**COMMENT:** Reformulated cleaners meeting the 100 g/l VOC requirement for screen reclamation have not been available in quantities that allow for testing in automatic cleaning machines. We are asking AQMD to consider delaying implementation of the 100 g/l VOC limit for this cleaning application to allow adequate time to test lower VOC products and evaluate any effects the products may have on the equipment.

**RESPONSE:** Staff agrees that low-VOC cleaners developed for screen reclamation have not been extensively tested in automatic cleaning equipment. Staff's latest proposal now includes a limited exemption for screen reclamation using automatic cleaning equipment until January 1, 2009 to

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|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | allow industry additional time to develop and test more compliant formulations for use in the cleaning equipment. Furthermore, the extension in compliance date allows solvent manufacturers more time to produce compliant formulations in larger quantities to support the needs of the screen printing industry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>COMMENT:</b>  | Low VOC cleaning solvents require the use of haze removers to clean screens during final reclamation which means the use of additional chemicals to comply with Rule 1171.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>RESPONSE:</b> | Staff disagrees. Screen printers already use haze removers even when using high-VOC cleaning solvents. Some of the cleaning materials successfully tested that meet the 100 g/l VOC limit were effective in removing both inks and ghost images (haze) during screen reclamation; thus, potentially eliminating the need for haze removers during screen reclamation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>COMMENT:</b>  | It is not clear what staff means by on-press screen cleaning and screen reclamation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>RESPONSE:</b> | The preliminary draft staff report differentiates on-press screen cleaning from screen reclamation. Staff has now added definition language in the rule for both terms to clarify rule intent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>COMMENT:</b>  | Solvent manufacturers have indicated that low VOC products are expected to cost close to twice as much as the cleaning products currently being used. Furthermore, it is possible that larger quantities of low VOC products may be necessary to achieve the same results as those products with higher VOC content.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>RESPONSE:</b> | <p>Staff disagrees. Data obtained during field visits indicate that low VOC products may cost just slightly higher than cleaners currently being used. The cost effectiveness analysis presented in Final Staff Report for the 1999 Rule 1171 amendment concluded that lowering the VOC limit to 100 g/l to achieve emission reduction is cost effective in spite of higher solvent replacement cost. Staff does not expect a significant increase in the cost of low VOC solvents as more compliant solvents become available in the market.</p> <p>As far as solvent usage is concerned, staff believes that facilities may end up using less volume of the low VOC solvents for the same cleaning application because most of the compliant formulations available do not readily evaporate as compared to high VOC solvents. Staff noted in visits to several printing facilities testing low VOC cleaners that solvent</p> |

usage remained the same, or was even lower in certain applications; thus making the transition to the 100 g/l formulation even more cost effective.

**COMMENT:** It seems that the AQMD and its contractor (IRTA) believe that soy is the answer to lowering VOCs in cleaning materials. Soy bean derived cleaning materials do not work well in removing UV and conventional inks from screens especially in automated cleaning systems. Furthermore, automatic cleaning machines were designed for the use of conventional solvent cleaners. Existing cleaning machines may need to be retrofitted or re-designed to make them compatible with low VOC products.

**RESPONSE:** AQMD does not specify the use of any product or raw material to achieve the VOC limits in the rule. The technology assessment conducted by IRTA found successful use of certain soy-based formulations for cleaning screens. However, the findings from this technology assessment did not indicate soy as the only solution to lowering the VOC content of cleaning materials.

Staff is aware of other ester-based formulations (non-soy) that were successfully tested at different printing facilities for manual screen reclamation. The limited exemption added to the initial rule proposal would allow solvent formulators and screen printing facilities additional time to develop and test other low VOC products for screen reclamation using automatic cleaning equipment.

**COMMENT:** The existing exemption for the clean up of UV/EB lamps and reflectors in Rule 1171 (g)(3)(H) will expire the end of this year. We are requesting a one year extension of the exemption similar to UV/EB ink application equipment because industry has not tested alternative cleaners for such application.

**RESPONSE:** Staff agrees. Rule language is modified to allow one a year extension of the exemption for cleaning UV/EB lamps and reflectors. The additional time will allow the printing industry to work with UV/EB equipment manufacturers and solvent formulators in developing and testing alternative cleaners for cleaning UV/EB lamps and reflectors. Staff is recommending this extension with the commitment from the industry to provide regular progress reports to the Stationary Source Committee on the test program.

**COMMENT:** A representative from Huhtamaki clarified that the company has not converted to an ester-based cleaner as implied in the Preliminary Draft

- Staff Report. However, the company continues to test other low-VOC cleaners.
- RESPONSE:** Staff has modified language in the Draft Staff Report to clarify that the company tested an ester-based cleaner with positive results but continues to test other compliant formulations. In a telephone conversation with Huhtamaki, a company representative indicated that more products will be tested in order to find the best performing cleaner for their application.
- COMMENT:** The AQMD should provide a list of compliant formulations so that industry can be aware of potential low-VOC alternatives.
- RESPONSE:** Staff is currently working with the printing industry and solvent formulators in developing a list of low-VOC cleaners that have been successfully tested for various lithographic printing cleaning applications. The PIA will establish a database on their website of these compliant formulations and there will be a link to PIA also available on the AQMD website. Information to be presented includes product name, solvent manufacturer or supplier, VOC content, contact person, cleaning application, etc. The list will be updated as more compliant products become available.
- COMMENT:** Heatset presses utilize dryers to set the ink. The use of highly volatile, low flashpoint exempt solvents such as acetone increases the risk of explosion or fires in the dryers, presenting an unacceptable safety risk.
- RESPONSE:** The AQMD is not requiring the use of acetone to comply with the VOC limit for cleaning lithographic printing ink application equipment. Acetone is a good cleaner but may not be a suitable alternative cleaner for certain applications, e.g., heatset presses. Other compliant solvent formulations with lower flashpoint and volatility have been developed and tested with acceptable results for lithographic printing applications.
- COMMENT:** The testing by PIA and IRTA did not demonstrate success of 100 g/l cleaners for web-fed, high-speed lithographic presses. Sheet fed, coldset presses that were used during the tests allowed for extensive hand washing because the presses were frequently down during cleaning. Web-fed, high-speed lithographic presses are cleaned with the press running and cannot be stopped for manual cleaning without significant loss in productivity. Furthermore, build up of solvent residue causes solvent to drip onto the printed products thus creating quality problems.
- RESPONSE:** The PIA selected printers with sheet fed presses as test sites from a

segment of the industry that accounts for a significant fraction of the total amount of solvent consumed by all lithographic printers. Rollers and blankets from sheet fed presses are washed more often than in web presses because of shorter printing runs and frequent color changes in sheet fed presses; therefore, any productivity loss as a result of using low VOC cleaning materials will be greatly felt by printers with sheet fed presses. The feedback obtained from the PIA indicated that the compliant formulations tested performed well enough with no significant loss in productivity. In addition, staff is aware of a facility that has been using low VOC cleaning material in its web-fed, heatset presses for about three (3) years now without quality or productivity problems.

It is important to reiterate that low VOC cleaners are not drop-in replacements for high VOC washes for rollers and blankets. Printers need to spend time to test and learn how to use these low VOC cleaners to make them work. This may require a few changes in their cleaning process.

The commenter has indicated that his company has identified a compliant product and is ready to transition to the 100 g/l formulation when the new VOC limit takes effect on January 1, 2008. AQMD staff suggests that the company continue testing other 100 g/l formulations if it is not completely satisfied with the performance of their cleaner.

**COMMENT:** There is no way for solvent suppliers to keep track of day to day use of their products to ensure that the products are being used in a compliant manner. If the AQMD intends to regulate a specific type of solvent supplier, then the proposed language in (d)(5) should reflect that explicitly rather than categorize all solvent suppliers under one general category.

**RESPONSE:** The intent of the proposed language is to hold certain solvent suppliers liable in the event they are assisting its customers in the non-compliant use of solvent cleaning materials. Recently, AQMD's compliance staff has reported non-compliant solvent cleaning activities where certain solvent suppliers have provided non-compliant cleaning materials to its customers or may have represented non-compliant solvents provided to its customers as being compliant with the VOC requirements in Rule 1171. These solvent suppliers, commonly known in the industry as full service solvent providers, supply both solvents and other services to their customers such as cleaning equipment sales or rentals, filling or refilling of cleaning equipment with solvent, pick up or collection of customer's solvent-related waste stream, etc.; thus, the term "full service." Because of their direct contact with users, these full service solvent providers know what products their customers are using, what cleaning applications these products are used for, and how these products are

being used relative to Rule 1171 requirements. These solvent suppliers are in the best position to recommend and provide to their customers products that comply with rule requirements.

Currently, Rule 1171 does not have a provision that would subject such solvent suppliers to liability for aiding, abetting or assisting their customers in the non-compliant use of solvent cleaning materials. Examples of non-compliance activities that may be considered “aiding, abetting or assisting” under this prohibition are discussed in the “Rule Proposal” section in this Draft Staff Report.

In order to make the proposed rule language consistent with the original intent, staff has modified the language and limited the prohibition to full service solvent providers. Staff has added a definition for full service solvent provider to clarify rule intent.

**COMMENT:** Rule compliance has always been the user’s responsibility and PAR 1171’s efforts to add responsibility and potential liability to a supplier for an operator using non-compliant solvent seems unnecessary. The District should not pass on compliance efforts to solvent suppliers in the event the District has been ineffective in overseeing solvent cleaning operators.

**RESPONSE:** Staff agrees that the ultimate responsibility for rule compliance is with the user or operator of solvent cleaning operations, and that the District has the responsibility for enforcing its rules and regulations. The proposed prohibition language in (d)(5) is not intended to have certain solvent suppliers police its customers to ensure that compliance with the rule is achieved. As mentioned in the response to the previous comment, such prohibition language would allow the AQMD to prosecute certain solvent suppliers, i.e., full service solvent providers, who know the rule requirements and their customers’ needs but continue to provide them with non-compliant cleaning materials or assist them in the use of solvents in a non-compliant manner. Many of these users of solvent cleaning materials assume that they are receiving compliant cleaning materials from their full service solvent providers. The prohibition language has been modified to limit the liability to full service solvent providers to be consistent with staff’s original intent.

**COMMENT:** PAR 1171 needs to be clear as to what “supplier” means. Our company offers solvents to distributors and we have no way of knowing where they are selling the solvents and to whom, not to mention the specific application. The same is true for solvents suppliers located outside the AQMD or California. We suggest that the definition for solvent supplier include the language “last point of sale for a solvent cleaning material” to

clarify that the liability would clearly belong to the company that last sold the material to the end user.

**RESPONSE:** For the purpose of this rule, a solvent supplier is a person who sells *and* delivers or arranges to deliver solvent cleaning materials to a solvent cleaning operation. Anyone who sells to a distributor is not considered a solvent supplier. Retailers and hardware stores such as Home Depot, Lowe's, Ace Hardware, TrueValue, Orchard Supply Hardware, etc. would fall under the solvent supplier definition if such retailer sells and delivers or arranges to deliver solvent cleaning materials to a solvent cleaning operation. Likewise, United Parcel Service or similar delivery services are not solvent suppliers under this rule.

Staff has added clarifying language to the solvent supplier definition.

**COMMENT:** The AQMD should provide information on what is an approved electronic format as stated in the proposed recordkeeping requirements in order to evaluate any potential additional cost burden to the solvent supplier. It is also difficult for certain solvent suppliers to capture information as to how the customer will use the product or the intended VOC content of the product as applied.

**RESPONSE:** In implementing the recordkeeping provision in the rule, AQMD staff intends to request data in a simple spreadsheet format using computer software commonly used by businesses such as Microsoft Excel. Staff does not believe that this would impose an additional cost burden to the solvent suppliers given the fact that most businesses use computers.

With regard to information required from solvent suppliers, staff has modified the original proposed rule language to exclude data on intended use of the product as well as intended VOC of the product as applied. Staff's revised language requires only information on name and VOC content of the supplied solvent cleaning material, name and address of the solvent cleaning operation that the product was supplied to, and dates and quantities in which the product was supplied during the time period specified by the Executive Officer.

**COMMENT:** We suggest that AQMD allows solvent suppliers enough lead time to comply with the recordkeeping and dilution provision in the rule.

**RESPONSE:** Staff agrees and has added a compliance date of July 1, 2008 for both recordkeeping and dilution requirements.

**COMMENT:** AQMD needs to hold another Public Workshop to address proposed

rules changes regarding solvent suppliers. The workshop notice should clearly identify that rule changes will impact solvent suppliers.

**RESPONSE:** Staff disagrees. The two Public Workshops conducted for PAR 1171 were adequate in informing the public and soliciting information from them regarding the proposed changes to Rule 1171. AQMD notices for both public workshops clearly identify those facilities affected by PAR 1171, including solvent suppliers who supply solvent cleaning materials to solvent cleaning operations.

**COMMENT:** We have not been successful in finding cleaning solution that meets the VOC limit for cleaning metering rollers in our electrophotographic printing process. Our customers will have to replace the metering rollers since AQMD has not proposed extending the exemption for cleaning these rollers.

**RESPONSE:** Staff has met with the commenter several months ago and suggested to the company representative several options to meet the requirements of the rule. Such options include: testing other potential cleaning solvents with low viscosity to clean the metering rollers in the Binary Image Developer (BID) unit of the electrophotographic printing process; the use of compressed air; or the use of an emission control system such as carbon adsorber. In addition, AQMD also provided a list of solvent formulators for the company to contact and work with on alternative cleaning materials.

At that time, the company agreed to continue testing other alternative cleaning methods and submit a detailed report to AQMD on the results of alternative cleaning materials tested. To date, AQMD has not received any report from the company on what products have been tested to clean the BID units. The only input received from the commenter prior to the workshop pertains to the company's plan to discard the old BID units and replace them with new ones that do not require cleaning.

Staff believes that the company should pursue all options including those suggested by AQMD.