

REGULATING AIR EMISSIONS FROM PAINT:

*A Model Rule for
State & Local Air Agencies*

**State and Territorial Air Pollution Program Administrators (STAPPA)
Association of Local Air Pollution Control Officials (ALAPCO)**

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About STAPPA and ALAPCO

The State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) are the national associations representing state and local air quality officials in the states and territories and over 165 major metropolitan areas throughout the country. The members of STAPPA and ALAPCO have primary responsibility for implementing our nation's air pollution control laws and regulations. The associations serve to encourage the exchange of information and experience among air pollution

control officials; enhance communication and cooperation among federal, state and local regulatory agencies; and facilitate air pollution control activities that will result in clean, healthful air across the country. STAPPA and ALAPCO share joint headquarters in Washington, DC.

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The State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) are pleased to provide *Reducing Air Emissions from Paint – A Model Rule for State and Local Air Agencies*. This Model Rule is intended to provide states and localities with an alternative, more effective regulatory mechanism for achieving reductions in emissions of smog-forming volatile organic compounds from paint. Based on the Suggested Control Measure for architectural coatings recently approved in California, the more stringent, technologically and economically feasible VOC limits of this model will yield significantly more emissions reductions than the national coatings rule promulgated by EPA in 1998 and help areas across the country move closer to their clean air goals. The associations stress the need for all state and local agencies to conduct their own thorough analyses of the provisions of the Model Rule, to ensure that the specific conditions and circumstances of an area are adequately evaluated.

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Once again, STAPPA and ALAPCO believe that *Reducing Air Emissions from Paint – A Model Rule for State and Local Air Agencies* will serve as a useful and important tool and thank all those who contributed to its development.

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Preamble

Introduction

In 1990, Congress made the reduction of ground level ozone, also known as smog, a major goal of the Clean Air Act (“CAA”). To address the problem of chronic violation of the health-based National Ambient Air Quality Standard (“NAAQS”) for ozone throughout the country, Congress mandated that the U.S. Environmental Protection Agency (“EPA”) conduct a study of consumer and commercial products to determine their potential to contribute to ozone nonattainment.¹ Congress further instructed that, based upon the results of this study, EPA regulate those consumer and commercial products with the greatest potential to contribute to the ozone problem.²

In response to this mandate, and having determined that emissions of volatile organic compounds (“VOC”) from architectural coatings have the potential to contribute to ozone nonattainment, EPA promulgated National Volatile Organic Compound Emission Standards for Architectural Coatings (“National Rule”) on September 11, 1998.³ “Architectural coatings” are defined as “coatings applied to stationary structures and their appurtenances, and include such coatings as house paints, stains, industrial maintenance coatings, and traffic coatings.”⁴

Reductions in VOC emissions are essential for many states and localities that are attempting to reduce smog and demonstrate attainment and maintenance of the NAAQS as required by federal mandate. Thus, many states and localities hoped to move closer to the goal of improved air quality through anticipated reductions in VOC emissions from architectural coatings resulting from the implementation of the National

Rule, and have claimed in their State Implementation Plans (“SIPs”) the level of VOC reductions that EPA attributes to the National Rule. However, following an evaluation of the National Rule, the State and Territorial Air Pollution Program Administrators (“STAPPA”) and the Association of Local Air Pollution Control Officials (“ALAPCO”) concluded that the National Rule overestimates its emissions benefits and will leave many states and localities with a shortfall in the VOC reductions necessary for attainment.

Among the factors contributing to EPA’s overestimation of the emissions benefits of the National Rule are the exemptions and other “flexibility provisions” that are incorporated into the rule and that reduce the rule’s effectiveness. In addition, EPA’s estimates are based on the assumption that total compliance with the National Rule will be achieved within a short time frame.⁵ This overestimation of emissions reductions will ultimately put those states and localities that are close to, or currently exceeding, SIP budgets in a position where they will be forced to search for other elusive sources of VOC reductions. Such areas may be compelled either to regulate other source categories for which controls will not be as cost effective or to adopt their own more stringent standards for architectural coatings.⁶ Regulating less cost-effective categories would be inefficient, especially in light of the California Air Resources Board’s (“CARB’s”) successful development of a more stringent Suggested Control Measure for Architectural Coatings (“SCM”) that, when adopted and implemented by local air districts in California, will achieve substantial additional reductions as compared to the National Rule.

To assist other areas of the country that may need additional emissions reductions from the regulation of paints, STAPPA and ALAPCO have developed this Model Rule for State and Local Air Agencies (“Model Rule”) as an alternative means for achieving VOC reductions not attainable through implementation of the National Rule alone. The Model Rule is based entirely upon the recently issued CARB SCM, which provides VOC emissions reductions well beyond those achieved through implementation of the National Rule. State and local agencies may choose to adopt the Model Rule in its entirety or modify it as dictated by state or local conditions. Such conditions may include the level of emissions reductions needed by a particular area, which might lead to the adoption of only selected limits or a choice to regulate only certain categories based on the volume of a particular coating that is used in a particular region. For example, as suggested by the Model Rule, some areas may choose to adopt less stringent VOC limits for industrial maintenance coatings, due to certain climatic conditions. Others may determine that more stringent limits for some categories, such as lacquers, are in order.

This preamble provides information to assist state and local air pollution control agencies in assessing the Model Rule’s benefits and its technical feasibility, and in responding to questions raised and challenges posed regarding the Model Rule. However, STAPPA and ALAPCO stress the need for all state and local agencies to conduct their own thorough analysis of this Model Rule to ensure that the specific conditions and circumstances of an area are adequately evaluated.

In addition, state and local agencies that wish to use the Model Rule to develop their own regulations will need to consult the underlying CARB rulemaking record, which consists of a Staff Report and a Final Environmental Impact Report. Therefore, this Model Rule provides appropriate references to the California materials. These materials are available at www.arb.ca.gov/arch/docs.htm and are referenced throughout the Model Rule.

Regulatory History

In the Clean Air Act Amendments of 1990, Congress specifically targeted VOC emissions for reduction because of the extremely detrimental effect that these compounds have on air quality and the environment as a whole. Ground-level ozone is formed in our atmosphere by reactions involving VOCs and nitrogen oxides in the presence of sunlight.⁷ The ozone that is created in this reaction can have serious effects on anyone who participates in outdoor activities, particularly children. Section 183(e) of the CAA mandated that EPA conduct a study of consumer and commercial products. Upon completion of this study, EPA determined that architectural coatings account for nine percent of the total emissions from this category, making it one of the largest identifiable sources of unregulated VOC emissions among consumer and commercial products.⁸ Therefore, in 1992, EPA responded to

this statutory mandate to regulate such products, and began the process of developing a rule to reduce VOC emissions from architectural coatings.

The agency’s first attempt involved a regulatory negotiation with stakeholders that lasted from October 1992 to February 1994. The negotiations were ultimately unsuccessful, and EPA initiated a conventional rulemaking process, basing its proposed rule on a 1990 VOC Emissions Inventory Survey. EPA issued a proposed national architectural coatings rule on June 25, 1996.

During the comment period for the proposed National Rule, STAPPA and ALAPCO expressed significant concern regarding the proposal and objected to various fundamental aspects of it. Key among the associations’ concerns were that the proposed rule overestimated the emissions reductions that would result from the measure, and that the emissions limits chosen were less stringent than limits that had existed in some state rules for some time.⁹ STAPPA and ALAPCO were also concerned about provisions that would be difficult for both the states and industry to administer. Nevertheless, EPA issued its final National Rule on August 14, 1998, and published it in the *Federal Register* on September 11, 1998.

Because of the great need to reduce VOC emissions, various jurisdictions have proposed or enacted their own standards for architectural coatings. The most prominent, well-developed example is the CARB SCM, a model for California local air districts’ architectural coatings rules, upon which this Model Rule is based. The SCM is intended to promote feasible regulatory uniformity among California’s local air districts, while providing a model that still yields substantial VOC emissions reductions. Some of the California local air districts implemented their first architectural coatings rules in the 1970s, and periodically amend these rules. Other California local air districts may soon choose to issue their own architectural coatings rules, using the SCM as a guide in order to further reduce VOC emissions from this source category. These rules, including those that have been in effect in California local air districts for over a decade and those that are more recent, are generally more stringent than the National Rule.

The National Rule achieves “the degree of emissions reductions that the Administrator determines on the basis of technological and economic feasibility, health, and energy impacts is achievable.”¹⁰ The National Rule, however, “in no way prevents states from adopting more stringent regulations.”¹¹ The purpose of this Model Rule is to suggest more stringent VOC content limits for architectural coatings so that states and local areas can move closer to their clean air goals.

Expected Benefits

The Model Rule incorporates more stringent VOC content limits, will achieve significantly more VOC reductions, and is easier to administer than the National Rule. The National Rule includes several exceptions from its baseline standards and does not account

for the VOC reductions that will be lost through application of such provisions as the exceedance fee, the tonnage exemption, and the incentive to use recycled coatings. California predicts that its more stringent SCM standards will result in over 19 tons of VOC reductions per day statewide.¹² This will yield an annual VOC emissions reduction of more than 3,700 tons in California alone. If these standards were in effect nationwide, the total annual VOC reduction would be on the order of 53,000 tons.¹³ Although California is unique in its size and economy, the SCM VOC limits clearly offer a much greater potential benefit to air quality and could benefit many other areas of the country, as well.

The Model Rule, like the SCM, is easier to administer than the National Rule because it does not include the exceedance fee, the tonnage exemption, or the recycled coatings compliance option. These three provisions create most of the administrative burden of the National Rule. The Model Rule also features fewer coatings categories and has no significant recordkeeping, reporting, or labeling requirements, which further simplifies administrative responsibilities.

In addition, the Model Rule includes a sell-through provision that allows a three-year window during which manufacturers and distributors may continue to sell products that were produced before a set deadline even if they do not meet the more stringent VOC limits. This three-year window creates time for manufacturers to reformulate while continuing to sell their existing products. The sell-through period eases the burden of compliance without creating the additional administrative difficulties associated with the National Rule's exceedance fee, tonnage exemption, and the incentive to use recycled coatings. It should be noted, however, that most manufacturers turn over inventory quickly, and do not stock three year's worth of coatings. The sell-through period is simply a safeguard to prevent compliance action for occasional older products remaining on retail shelves. CARB officials do not believe that architectural coatings manufacturers will utilize the sell-through period to delay compliance with the SCM.

Finally the CARB SCM, which is designed for implementation in 2003, includes an optional averaging flexibility provision that sunsets in 2005. Despite the fact that there is evidence to support the proposition that the proposed SCM limits can stand on their own, CARB included the averaging provision to offer some flexibility. This optional provision is also included in the Model Rule as Appendix A. If a state or local regulatory agency chooses to pursue implementation of this Model Rule before January 2005, STAPPA and ALAPCO recommend that the averaging provision be considered. Interested agencies should note that CARB and the South Coast Air Quality Management District (SCAQMD) are currently developing an implementation guidance document to provide additional details on how a manufacturer can participate in the averaging program.

In summary, the Model Rule's fewer categories, more stringent emission limits, and generally more streamlined approach to regulating the VOC content of architectural coatings will provide

many states and localities that continue to face ozone problems with additional, much-needed, VOC reductions. These additional reductions could be critical to improving air quality and complying with the CAA.

National Applicability of the STAPPA/ALAPCO Model Rule

As discussed in the Introduction to this Model Rule, Congress recognized that many consumer and commercial products were exacerbating ozone problems throughout the nation because of their contribution of VOCs to the atmosphere. Therefore, Congress gave EPA two tasks. First, EPA was instructed to determine which categories of consumer and commercial products had the greatest potential to contribute to ozone nonattainment. Second, Congress instructed EPA to regulate VOC emissions from those categories. Congress recognized the contribution of VOCs to the atmosphere from sources, such as architectural coatings, as a national problem calling for a national solution.

The National Rule, however, does not achieve the greatest VOC reductions that are feasible from either an economic or technological standpoint. This Model Rule, therefore, offers more stringent limits that are technologically and economically feasible so that states and localities have the option to gain more reductions in any or all of the covered categories according to need.

The Model Rule opts to regulate fewer categories than the National Rule. By regulating fewer categories, the Model Rule achieves reductions by focusing on those types of coatings that will produce the greatest results. Dividing categories into increasingly smaller and more specific sub-categories, as the National Rule does, creates ambiguities in determining a particular coating's category designation.

Further, the VOC limits in the Model Rule are more stringent than those in the National Rule. These more stringent limits may elicit criticism from some, as they did in California. The following discussion explains how California regulators responded to those critiques and how their arguments could be applied to different states and localities.

Climate and Weather Patterns

Critics claim that many areas of the country have climate and weather patterns that are quite different from those found in California and, therefore, that California limits are not suitable for nationwide implementation. They also maintain that different climates may require products with a higher VOC content in order to achieve certain desirable performance characteristics.

In response to this challenge, several points should be considered. First, it is important to note that the SCM was designed to be applicable to and feasible in the entire State of California. In designing a rule for every region in the State of California, CARB needed to accommodate a wide range of weather patterns and climatic conditions, from cold air and high altitudes in the

mountainous regions, to hot, dry and lower elevations of the desert regions, to the humid oceanic air in the coastal regions. This range of elevations, temperatures, humidity, and weather patterns is not significantly different from the range of weather patterns and climates throughout the nation as a whole. CARB's description in the SCM of the variety of climate conditions that exists throughout the state includes such conditions as temperature, precipitation, elevation, humidity, and growing seasons:

California is approximately 800 miles in length and spreads over 10 degrees in latitude. Altitude ranges from 276 feet below sea level in Death Valley to 14,495 feet above sea level at the summit of Mt. Whitney. These wide ranges of altitude and latitude are responsible in part for the variety of climates found throughout California. Another significant factor is the continuous interaction of maritime air masses with those of continental origin. Along the western side of the Coast Range, the climate is dominated by the Pacific Ocean. Warm winters, cool summers, small daily and seasonal temperature ranges, and high relative humidities are characteristic. Areas more distant from the ocean experience a more continental climate with warmer summers, colder winters, greater daily and seasonal temperature ranges, and generally lower humidities.¹⁴

California receives a wide range of precipitation levels as well, from 100 inches in portions of the Coast Range near the Oregon border, to less than two inches in Death Valley.¹⁵ Nearly all areas of California report snowfall, however, it is infrequent west of the Sierra Nevada except in the higher mountainous elevations of the Coast Range and the Cascades.¹⁶ The growing seasons in the state range from 365 days per year, to less than 50 days at high elevations.¹⁷

While it is unrealistic to claim that all the various climate and weather patterns of the nation are identically duplicated somewhere in California, it is nonetheless true that the vast majority of conditions that would affect the performance of an architectural coating are represented in California. It is, therefore, not an unrealistic expectation that coatings meeting the VOC limits that have been approved for implementation in California would exhibit desirable performance characteristics throughout the nation.

It should also be noted that the SCM allows, by petition, a less stringent VOC limit for industrial maintenance coatings in specific areas of California with low temperature, high humidity, and persistent fog. This provision is needed primarily for essential public services and industrial facilities located near the coast because the majority of California's population areas are not subject to the severity or duration of extreme weather conditions prevalent in some parts of the nation. This option for a less stringent industrial maintenance coating VOC limit is also included in the Model Rule for consideration at the discretion of state and local agencies.

Additionally, because the various conditions that are present throughout California approximate the wide range of climate and weather conditions that appear throughout the entire nation, the

extensive testing that accompanied CARB's formulation of appropriate limits provides an analysis of the level of performance that should be expected from a coating, regardless of location. Information from trade journals, product information from manufacturers, and laboratory tests of complying and noncomplying products¹⁸ demonstrate that coatings meeting the proposed limits perform just as well as those with a higher VOC content. These coatings are similar to the higher-VOC-content coatings in performance characteristics, such as brushing properties, dry time, leveling, sag resistance, hiding, abrasion resistance, film flexibility, adhesion, corrosion resistance, water resistance, industrial chemical resistance, household chemical resistance, mar resistance, blocking resistance, scrub resistance, and dirt removal.¹⁹

Severity of Ozone Problem

Critics also claim that the degree of ozone pollution in California is greater than in other states and, as a result, California is forced to adopt more stringent VOC limits to achieve better air quality and to meet the ozone NAAQS. They argue that nationalizing VOC content limits that were established to address California's air quality problems is inappropriate and that doing so unnecessarily forces paint manufacturers to produce coatings with VOC levels far below those necessary to achieve or maintain compliance with ozone standards in other states.

While it is true that California has significant air quality problems, this situation is improving, bringing even the most polluted regions of California more closely in line with air pollution levels found in other seriously affected states. For example, the number of days that the South Coast Air Basin exceeded the ozone NAAQS decreased from 167 days in 1980 to 60 days in 1998.²⁰ This significant improvement suggests that California's air quality problems are not necessarily that much greater than other states and, at a minimum, are moving closer to the conditions in other states as time passes. Numerous states in various regions of the nation have areas classified as nonattainment for ozone and, like regions in California, these states need additional emissions reductions from architectural coatings and other emissions categories to improve air quality.

Clearly, not all states are in need of overall emissions reductions at the level that California must achieve. However, adoption of the Model Rule would afford states and local areas seeking VOC reductions great benefits. First, it would decrease or eliminate the need to search for emissions reductions from other sources in those areas needing only minor or moderate VOC emissions reductions. As stated in the Introduction, architectural coatings account for nine percent of VOC emissions from consumer and commercial products. Regulation of this industry is an efficient and effective way to achieve significant emissions reductions across the country. Additionally, the greater the number of states or localities adopting the limits suggested in this Model Rule, the larger the market for low-VOC coatings. Widespread adoption of the Model Rule will also promote regulatory unifor-

mity, allowing manufacturers to focus their efforts in a single direction.

Further, the limits proposed in the Model Rule are already being met by various manufacturers producing coatings for distribution in California and, therefore, cannot seriously be challenged as being technologically infeasible. In fact, the South Coast has already adopted additional VOC limits that will become effective in the future and are even more stringent than those in the SCM and the Model Rule.

Feasibility

Some have argued that the consumer market in California is much larger than in other states, creating a greater volume of sales that helps to balance the cost of reformulation. They are concerned that because a lower volume of coatings is sold in many other states, reformulating to meet the VOC limits in the Model Rule is economically infeasible, and would force manufacturers to charge much higher prices than the market will support.

There are several responses to this argument.

First, paints and architectural coatings, such as those regulated under this Model Rule, are one of the most widely used consumer and commercial product categories producing significant VOC emissions. The universal need for paints, particularly of the flat and non-flat varieties, creates a stable and extensive market for these products throughout the nation.

Additionally, many manufacturers that market their coatings nationally currently possess the technologies needed to produce the compliant coatings.

Finally, the SCM was found to be cost effective in terms of dollars spent per pound of VOC reduced. The average cost-effectiveness, weighted by emissions reductions across all the proposed limits, was estimated to be about \$3.20 per pound of VOC reduced, not only well within the typical range of existing CARB control measures and district rules,²¹ but also within the range of most state and local agencies. While no analysis has been done comparing the volume of architectural coatings sold in California to other states, the above-described factors decrease the likelihood that it is the sheer size of the consumer population in California that makes production of compliant coatings economically feasible.

National Rule Provisions Omitted from the STAPPA/ALAPCO Model Rule

The Model Rule omits three provisions included in the National Rule that undermine the overall effectiveness of the regulation: (1) the exceedance fee, (2) the tonnage exemption, and (3) the incentive to use recycled coatings. Although these provisions may offer a modicum of flexibility,²² they pose significant drawbacks in the form of diminished VOC emissions reductions and increased administrative burden.

Exceedance Fee

The exceedance fee provision of the National Rule allows manufacturers to pay a fee instead of conforming to the rule's VOC content limits. This fee is intended to create an incentive for manufacturers to reformulate, while not forcing them out of business;²³ it is designed to give a manufacturer extra time to lower the VOC content of a particular product if the manufacturer cannot meet the content limits at the time that the rule takes effect. "[T]he exceedance fee is intended to allow manufacturers and importers additional time to develop low-VOC formulations while providing an appropriate economic incentive to encourage reformulation."²⁴

STAPPA and ALAPCO chose not to include the exceedance fee in the Model Rule because this provision will jeopardize the overall effectiveness of the rule. An exceedance fee at any level creates enforcement and administrative difficulties for regulatory agencies. Moreover, the particular exceedance fee included in the National Rule makes the rule less effective from an emissions reduction standpoint, and does not provide manufacturers with an incentive to reformulate.

As stated in STAPPA and ALAPCO's comments on EPA's proposed National Rule, the fee for non-compliance is too low. In its current form, this fee will not create an incentive for manufacturers to reformulate their non-compliant coatings, nor will it cause a significant price increase that would be visible to the consumer, thus having no impact on a manufacturer's market share. Essentially, the multiplier set by the National Rule (\$0.0028 per gram or \$2,500 per ton)²⁵ is low enough that manufacturers could potentially afford to pay it, still make a profit, and avoid lowering the VOC content of their products.

EPA predicts that the National Rule will result in a certain level of VOC reductions, based on calculations involving all the coatings that will be regulated. These calculations will be rendered inaccurate, however, by variance provisions—such as the exceedance fee—that are not appropriately factored into the estimated reductions achieved. Research has demonstrated that the VOC limits in the Model Rule can be met;²⁶ manufacturers should use their financial resources to meet these limits and contribute to the achievement of clean air goals, rather than to avoid controls.

Tonnage Exemption

The tonnage exemption provision of the National Rule allows a manufacturer to "designate a limited quantity of coatings to be exempt from the VOC content limits."²⁷ The purpose of the tonnage exemption is to aid manufacturers who find it economically prohibitive to reformulate some of their specialty products that are produced in small quantities. The basic idea is that a manufacturer might have a specialty product that is produced in such a low volume that it does not have a severe environmental effect. This exemption "would prevent the elimination of specialty products for niche markets that could not easily be reformulated."²⁸

EPA believes that this exemption would also “mitigate the impact of the rule on small manufacturers for which costs of reformulation would be more significant”²⁹ and intended the exemption to prevent the extinction of specific market coatings and to level the playing field for the smaller manufacturers.³⁰

The Model Rule excludes the tonnage exemption because it reduces the level of emissions reductions that the National Rule can achieve, it is not tailored to its stated goal, and it does not protect smaller manufacturers or specialty products. The Model Rule, however, protects special market coatings by definition, instead of offering an unrestricted option to designate an amount of any coating and allow that portion not to be governed by the rule. Additionally, the Model Rule provides an exemption for coatings sold in containers of one liter or less, for applications where small quantities of coatings are needed. The National Rule’s tonnage exemption does not require that the designated coating be limited by the quantity that was produced in past years or by a manufacturer’s market share, meaning that the tonnage exemption can be used to protect any and all products, not just those products that are sold in low volume for a highly specific use.

The tonnage exemption would require manufacturers to record information about non-compliant coatings and would also require regulators to monitor the use of this exemption. The tonnage exemption is ineffective because it is available to the entire industry and does not provide any advantage to manufacturers based on size or market share. To be effective, the tonnage exemption would have to provide an advantage for smaller manufacturers and products that are produced in low volume, but not provide an exemption for all manufacturers and any coating. This provision does not succeed in protecting smaller manufacturers or specialty products.

In sum, the tonnage exemption jeopardizes the claimed reductions of the National Rule, while not even serving its stated purpose, and while increasing the administrative burden on the regulator and placing extra obligations on manufacturers.

Recycling Incentive Exemption

The National Rule creates an incentive to use recycled coatings based upon an adjusted calculation of the VOC content for coatings that use recycled materials.³¹ The Model Rule will encourage recycling by allowing a higher VOC limit for recycled coatings. However, the Model Rule does not create an incentive that is disproportionate to the benefit of recycling. The National Rule allows manufacturers that use post-consumer product in their coating to multiply the percentage of recycled coating in the product by the total VOC content of the product in order to get a number that is subtracted from the total VOC content of that product.³² This reduced content is then used to determine whether the coating meets the VOC limit established by the National Rule. Using this method means that the benefit provided to industry for using post-consumer product outweighs the merits of recycling.

Recycling is important, but it should not jeopardize the overall reductions that can be garnered from the rule.

Again, the incentive to use recycled coatings compromises the emissions reductions that the National Rule projects. By allowing manufacturers to re-calculate VOC contents, the incentive to use recycled coatings diminishes the environmental benefits of the National Rule. Additionally, the incentive to use recycled coatings poses the most daunting task for the enforcement agency. This incentive program would be the most difficult to administer because it requires monitoring of the specific composition of a particular coating. Like the CARB SCM, the Model Rule omits this provision, instead offering manufacturers that recycle old paint a less stringent VOC limit (i.e., 250 g/l) than the future-effective flat or non-flat limits (i.e., 100 g/l and 150 g/l, respectively, with the exception of 250 g/l for high-gloss non-flats). The Model Rule recognizes the importance of recycling, but does not encourage it at a cost to the environment.

Technical Justification of the STAPPA/ALAPCO Model Rule VOC Limits

To compile their extensive rulemaking records, CARB and SCAQMD hired independent testing agencies, surveyed publicly available information from manufacturers, evaluated existing markets and products, studied the available literature concerning these coatings, and received comments from the coatings manufacturers. In general, for each coating category regulated in the SCM, the CARB rulemaking record provides a detailed description of the product category itself, its use, marketing information, formulation information, and an explanation of the proposed VOC limit accompanied by a justification for the recommended limit. In addition, the SCM includes a synopsis of the comments received for each coating category, as well as a response to the comments. These responses explain why CARB selected the applicable limit. If comments persuaded CARB to modify its rule, those considerations are explained. If changes proposed in the comments were rejected, CARB explained its reasons for those decisions.

In an effort to condense all of the information that has been compiled by CARB, STAPPA and ALAPCO created the following matrix, which compares the Model Rule VOC limits to the National Rule limits. The purpose of the matrix is to provide state and local air pollution control agencies with information to help them implement architectural coatings rules in their own jurisdictions. The matrix can be used to justify the imposition of a limit that is more stringent than the current National Rule limit.

The CARB Staff Report is extremely detailed and the matrix seeks to condense and summarize the information it contains. The matrix is not meant to be used as a substitute for the CARB Staff Report. Rather, appropriate sections of the Staff Report are cited in the fourth column of the matrix, so that the matrix and the Report can be used more easily in conjunction with one another.

Technical justifications varied from coating category to coating category. For many categories, where a large percentage of the products sold in the California market were identified as products already in compliance with limits, the existence of these compliant coatings and their widespread use provided sufficient guarantee of feasibility. In other cases, where compliant products have not yet been produced, a variety of other sources have confirmed that the limits are technologically and commercially feasible.

Endnotes

¹ 42 U.S.C. § 7511(e)(2).

² 42 U.S.C. § 7511(e)(3).

³ National Volatile Organic Compound Emission Standards for Architectural Coatings, 63 Fed. Reg. 48848 (1998) (codified at 40 C.F.R. § 59) (“National Rule”).

⁴ Final Program Environmental Impact Report, Suggested Control Measure for Architectural Coatings, California Air Resources Board, February 2000, at I-1 (“CARB SCM Impact Report”).

⁵ National Rule, 63 Fed. Reg. 48848 (1998) (codified at 40 C.F.R. § 59).

⁶ Testimony of Josie Pradella on behalf of STAPPA/ALAPCO on EPA’s Proposal to Regulate Architectural Coatings, July 30, 1996, at 2 (“STAPPA/ALAPCO Testimony”).

⁷ National Rule, 63 Fed. Reg. 48850 (1998) (codified at 40 C.F.R. § 59).

⁸ *Id.*

⁹ STAPPA/ALAPCO Testimony, July 30, 1996.

¹⁰ National Rule, 63 Fed. Reg. 48850 (to be codified at 40 C.F.R. § 59), *citing* the Clean Air Act Amendments of 1990 section 183(e).

¹¹ *Id.* at 48873.

¹² CARB SCM Environmental Impact Report, SCH No. 99062093, June 2000, at II, 28. This figure excludes emission reductions in the South Coast Air Quality Management District, which has already adopted a rule similar to the SCM.

¹³ This figure is derived by estimating California emission reductions going from the National Rule to those in the SCM, which is

about 19.8 tons per day. This 19.8 tons/day is then multiplied by 365 days per year, then by 1/0.12, then by 0.88 to come up with a total of 53,000 tons per year. The 1/0.12 is to adjust the California population represented in the emissions reductions to the U.S. population, since 12 percent of the U.S. population lives in California. The 0.88 is to account for the fact that California already has the SCM. Note that the emissions reductions would be smaller if the emissions from states or local areas that already have a more stringent rule than the National Rule are subtracted from the 53,000 tons per year.

¹⁴ CARB SCM Environmental Impact Report, February 2000, at III-40.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.* at IV-61.

¹⁹ *Id.* at IV-61 - IV-73, IV-126. *See also* *Id.* at Appendix D, 6-7, 18.

²⁰ *Id.* at IV-74 - IV-75.

²¹ Staff Report for the Proposed Suggested Control Measure for Architectural Coatings, California Air Resources Board, June 2000, at p. 17 (“CARB SCM Staff Report”).

²² National Rule, 63 Fed. Reg. 48853 (1998) (to be codified at 40 C.F.R. § 59).

²³ *Id.* at 48859.

²⁴ *Id.*

²⁵ *Id.* at 48853.

²⁶ CARB SCM Environmental Impact Report, SCH No. 99062093, February 2000, at II-24 through 27.

²⁷ National Rule, 63 Fed. Reg. 48881 (1998) (to be codified at 40 C.F.R. § 59).

²⁸ *Id.* at 48864.

²⁹ *Id.*

³⁰ *Id.*

³¹ *Id.* at 48853.

³² *Id.*

A Comparison of the STAPPA/ALAPCO Model Rule and the National Rule

This matrix is designed to assist state and local air pollution control agencies that are seeking to achieve greater VOC reductions from the regulation of paints than those that will be provided by the National Rule. This matrix not only offers a line-by-line comparison of the two sets of limits, but it also offers a compilation of the research that was done in California to justify the promulgation of more stringent limits.

	National Rule VOC Limits (g/l)	STAPPA/ALAPCO Model Rule and CARB SCM VOC Limits (g/l)	Basis for Model Rule/CARB SCM VOC Limit (Considering both commercial and technological feasibility)
1. Flat Coatings ³³	250	100	This limit is feasible based upon a review of CARB survey data on market shares and product information from manufacturers. (See Staff Report for the proposed Suggested Control Measure for Architectural Coatings, prepared by the Stationary Source Division, California Air Resources Board, June 6, 2000 at chpt. 6, pp. 68-72. ("Staff Report").
2. Non-Flat High-Gloss Coatings	380	250	This limit is recommended based on consistency with currently effective limits in California, a high complying market share, laboratory testing, and enforcement concerns because of possible re-labeling where products overlap with quick-dry enamels. (Id. at 102-5).
3. Non-Flat Coatings ³⁴	380	150	This limit is feasible based on a review of CARB survey data on market shares, product information from manufacturers, laboratory performance tests, and information on available resin technology. (Id. at 84-91).
4. Antenna Coatings	530	530	This limit is consistent with the EPA National Rule; it is feasible because it would essentially cap the VOC content of existing products. (Id. at 106-7).
5. Antifouling Coatings	450	400	This limit is feasible because it places a cap on the VOC content of existing products sold in California and it is generally consistent with limits in California District marine coating rules. (Id. at 109).
6. Bituminous Roof Coatings ³⁵	500	300 ³⁶	This limit is feasible based on consistency with California District rules and data provided by the Roof Coating Manufacturers Association, which indicate a high complying market share. (Id. at 112-15).

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7. Bituminous Roof Primer Coatings ³⁷		350	This limit is feasible because California District rules have regulated at this level for about ten years, leading to the existence of complying products. (Id. at 117).
8. Clear Brushing Lacquer Coatings ³⁸		680	This limit reflects the current VOC content for products in this category. (Id. at 119-21).
9. Faux Finishing Coatings	700	350	This limit is feasible as demonstrated by the complying water-based products that are currently on the market and consistency with the limit in the SCAQMD. (Id. at 123-4).
10. Fire-Resistive Coatings	850	350	This limit is feasible based on the technology assessment and limit in effect in the SCAQMD, the fact that no variances have been requested from this limit in the SCAQMD, and the fact that this limit reflects current technology. (Id. at 128-9).
11. Floor Coatings	400	250	This limit is feasible based on review of literature and trade journals, complying market share, and information provided by manufacturers and resin suppliers. (Id. at 132-5).
12. Flow Coatings	450	420	This limit is feasible because it essentially places a cap on the VOC content of existing products sold in California. (Id. at 138).
13. High-Temperature Coatings ³⁹	650/420	420	This limit is feasible based on review of complying market share, currently available coatings, the Harlan Associates study, ⁴⁰ and currently effective District rules. (Id. at 140-1).
14. Industrial Maintenance Coatings ⁴¹	See Endnote 41.	250 ⁴²	This limit is feasible (except for certain climatic areas, when justified) based on review of complying market share, currently available coatings, the Harlan Associates study, the National Technical Systems (NTS) Study, ⁴³ trade journals, information from coatings and resins manufacturers, and field experience by users of these coatings. (Id. at 147-55).
15. Lacquer Coatings	680	550	This limit is feasible based on information from coatings manufacturers and complying market share. (Id. at 157-8).
16. Low-Solids Coatings ⁴⁴	120	120	This limit is feasible based on complying market share, the limit in current District rules, the EPA National Rule limit, and discussions with manufacturers and other parties. Additionally, low solids stains and low solids wood preservatives should be combined into one low solids category because both subcategories have the same VOC limit, therefore, this limit would act as a cap on the current VOC content. (Id. at 160-2).

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17. Multi-Color Coatings	580	250	This limit is feasible based on complying market share, discussions with manufacturers who have or soon will have complying products, limits currently in effect in California Districts, and a technology assessment performed by the SCAQMD in 1996. (Id. at 164-5).
18. Primer, Sealer, and Undercoater Coatings ⁴⁵	350/400	200	This limit is feasible based on a review of product data sheets, analysis of complying market share, information provided by manufacturers, and laboratory testing performed by Harlan Associates and the NTS study. (Id. at 169-73).
19. Quick-Dry Enamel Coatings	450	250	This limit is feasible based on a review of CARB survey data on market shares, product information from manufacturers, and laboratory performance tests conducted by Harlan Associates and the NTS study. (Id. at 176-80).
20. Quick-Dry Primer, Sealer, and Undercoater Coatings	450	200	This limit is feasible based on a review of product data sheets, analysis of complying market share, information provided by manufacturers, and laboratory performance testing by Harlan Associates and the NTS study. (Id. at 183-6).
21. Recycled Coatings		250	This limit can be met based on discussions with manufacturers, end users, and relevant state and federal agencies. (Id. at 189-90).
22. Roof Coatings	250	250	This limit is feasible based on complying market share, data provided by the Roof Coatings Manufacturer Association, and meetings with members of the industry. (Id. at 193-4).
23. Rust Preventative Coatings	400	400	This limit is feasible based on a review of complying market share and product data sheets. (Id. at 196-8).
24. Specialty Primers, Sealers, and Undercoater Coatings		350	This limit is feasible based on a review of product data sheets and information from the manufacturers, consistency with the interim limit in the SCAQMD, and the fact that this limit is consistent with the EPA National Rule limit (for primers, sealers and undercoater coatings). (Id. at 202-3).
25. Stains	550	250	This limit is feasible based on a review of the literature and trade journals, complying market share, existing regulatory limits, literature searches, and information provided by the manufacturers or resin suppliers. (Id. at 205-7).
26. Swimming Pool Coatings	600	340	This limit is feasible based on complying market share, a review of product literature on coatings included in this category, and discussions with manufacturers and retailers of these coatings. (Id. at 209-11).

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27. Swimming Pool Repair and Maintenance Coatings		340	This category applies only to chlorinated rubber coatings and will be phased out of District rules. Reformulation of chlorinated rubber coatings is probably not feasible, but the Model Rule limit is attainable with currently available technology (see Swimming Pool Coatings). (Id. at 212-3).
28. Temperature-Indicator Safety Coatings ⁴⁶	650	550	This limit is feasible based on a review of currently available coatings and discussions with the industry representatives. (Id. at 214-5).
29. Traffic Marking Coatings	150	150	This limit is feasible based on technological assessments at federal, state, and district levels, discussions with end users of this type of coating, complying market share, review of product literature, and the fact that this limit is consistent with the EPA National Rule. (Id. at 217-8).
30. Waterproofing Masonry/Concrete Sealers	600	400	This limit is feasible based on a review of the literature and trade journals, complying market share, information provided by manufacturers and resin suppliers, and testing conducted by the Harlan Associates and the NTS study. (Id. at 221-3).
31. Waterproofing Sealers	600	250	This limit is feasible based on a review of the literature and trade journals, complying market share, information provided by manufacturers and resin suppliers, and testing conducted by the Harlan Associates and the NTS study. (Id. at 226-8).
32. Bond Breakers	600	350	This limit is feasible based on the high complying market share, the limit in current California District rules, and the fact that this limit has been in effect in some areas for years; also, there have been no adverse comments received concerning this limit. (Id. at 230-1).
33. Concrete Curing Compounds	350	350	This limit is feasible based on the high complying market share, the fact that it is consistent with the limit in current California District rules that have been in effect for several years, and consistency with the EPA National Rule. (Id. at 232-3).
34. Dry Fog Coatings	400	400	This limit is feasible based on the high complying market share, the limit in current California District rules that have been in effect for several years, review of product literature, the fact that no adverse comments were received, and the fact that it is consistent with the EPA National Rule. (Id. at 234-5).

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35. Fire-Retardant Coatings – Clear ⁴⁷	850	650	This limit is feasible based on the high complying market share, consistency with California District limits that have been in effect for years, review of product literature, and discussions with manufacturers; also, no adverse comments were received concerning this limit. (Id. at 238-9).
36. Fire-Retardant Coatings – Opaque ⁴⁸	450	350	This limit is feasible based on the high complying market share, consistency with California District rules that have been in effect for years, a review of product literature, and discussions with manufacturers; also, no adverse comments were received about this limit. (Id. at 240-1).
37. Form Release Compounds	450	250	This limit is feasible based on the high complying market share, and consistency with California District rules that have been in effect for years; also, no adverse comments were received concerning this limit. (Id. at 242-3).
38. Graphic Arts Coatings	500	500	This limit is feasible based on the high complying market share, consistency with limits that have been in effect in California Districts for several years, and the fact that it is consistent with the EPA National Rule. (Id. at 244-5).
39. Magnesite Cement Coatings	600	450	This limit is feasible based on consistency with California District rules that have been in effect for years, discussions with a major manufacturer, and a technology assessment performed by the SCAQMD; also, no adverse comments were received concerning this limit. (Id. at 248-9).
40. Mastic Texture Coatings	300	300	This limit is feasible based on a high complying market share, comments justifying this limit based on performance requirements, consistency with the limits that have been in effect in California Districts for several years, a review of product literature, and the fact that it is consistent with the EPA National Rule. (Id. at 250-1).
41. Metallic Pigmented Coatings	500	500	This limit is feasible based on the high complying market share, consistency with limits that have been in effect in California Districts for several years, a review of product literature, the fact that no adverse comments were received, and the fact that it is consistent with the EPA National Rule. (Id. at 253-6).
42. Pre-Treatment Wash Primers	780	420	This limit is feasible based on the fact that it is consistent with California District rules that have been in effect for years. (Id. at 257-8).

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43. Sanding Sealers (Non-Lacquer)	550	350	This limit is feasible based on the fact that it is consistent with California District limits that have been in effect for years and the fact that complying products were reported in the survey; also, no adverse comments were received concerning this limit. (Id. at 261-2).
44. Shellac – Clear ⁴⁹	730	730	This limit is feasible based on the high complying market share, consistency with limits in California Districts that have been in effect for several years, and the fact that it is consistent with the EPA National Rule. (Id. at 264-5).
45. Shellac – Opaque ⁵⁰	550	550	This limit is feasible based on the high complying market share, consistency with limits in California Districts that have been in effect for several years, and the fact that it is consistent with the EPA National Rule. (Id. at 268).
46. Varnishes ⁵¹	450	350	This limit is feasible based on the high complying market share, the fact that it is consistent with California District limits that have been in effect for years, and performance testing conducted by the Harlan Associates; also, no adverse comments were received concerning this limit. (Id. at 271-3).
47. Wood Preservatives	550/550/550/350 ⁵²	350	This limit is feasible based on the high complying market share and the fact that it is consistent with California District limits that have been in effect for years; also, no adverse comments were received concerning this limit. (Id. at 276-8).

Endnotes

³³ The National Rule divides the Flat Coatings category into Interior Flat Coatings and Exterior Flat Coatings. However, both must meet the same VOC limit.

³⁴ The National Rule divides the Non-Flat Coatings category into Interior Non-Flat Coatings and Exterior Non-Flat Coatings, both having the same VOC limit.

³⁵ The National Rule regulates Bituminous Coatings in general, while the SCM and Model Rule apply only to Bituminous Roof Coatings. For an explanation of this choice, see Chapter VI of the Staff Report.

³⁶ This limit was raised from the SCM draft limit of 250 g/l in order to accommodate climatic conditions.

³⁷ This category was added to the SCM draft to deal with climatic conditions and in order to clarify coating definitions.

³⁸ This coating is a clear wood finish that is intended for application by brush only. Although this type of coating is currently included in the general lacquer coatings category in the District rules, a separate category was created for the Model Rule because a higher limit was necessary for the unique application and finish characteristics of Clear Brushing Lacquers.

³⁹ The National Rule treats the coatings covered by this category as two separate categories. The categories in the National Rule are High-Temperature Coatings and Heat-Reactive Coatings, and the limits noted above apply respectively.

⁴⁰ Harlan Associates study shows compliant coatings have similar performance characteristics as higher-VOC coatings. This study was contracted by CARB to test compliant coatings for characteristics such as hardness, stability, durability, application, and appearance, in direct comparison to higher-VOC coatings. While different tests and results applied to the varying categories, this study indicated at least comparable performance.

⁴¹ The National Rule contains an industrial maintenance coatings category with a VOC limit of 450 g/l. However, there are several subcategories of industrial maintenance coatings for special applications that have separate limits, as follows:

<u>Coating Category</u>	<u>VOC Limit (g/l)</u>
Anti-Graffiti	600
Chalkboard Resurfacers	450
Extreme High Durability	800
Heat Reactive	420
Impact Immersion	780
Nonferrous Ornamental Metal Lacquers and Surface Protectants	870
Nuclear	450
Repair and Maintenance Thermoplastic	650
Thermoplastic Rubber and Mastics	550

⁴² The SCM allows a VOC limit of 340 g/l through a petition process for areas of California with low temperature, high humidity, and persistent fog (see Staff Report, page 47). This Model Rule includes the same option, to be included at the discretion of state and local air pollution control agencies.

⁴³ National Technical Systems study showed lower-VOC coatings to exhibit similar performance characteristics as higher-VOC coatings. NTS is an independent testing company that performed various tests, such as brushing properties, dry time and sag resistance, under contract by the South Coast Air Quality Management District. These tests indicated that the compliant coatings demonstrated at least comparable performance levels.

⁴⁴ The National Rule divides this coating into Low Solids Stains and Low Solids Wood Preservatives, both having the same VOC limit.

⁴⁵ The National Rule has one category for Primers and Undercoaters (the first VOC limit listed above for this category under National Rule VOC limits), and another category for Sealers (the second VOC limit listed above).

⁴⁶ Products falling into this category are not treated individually in the National Rule, but rather would be covered by the High-Temperature Coatings category.

⁴⁷ The National Rule defines this category as Fire-Retardant and Fire-Resistive Coatings. The SCM and Model Rule, however, treat Fire-Retardant and Fire-Resistive Coatings separately.

⁴⁸ See Endnote 47.

⁴⁹ Note that the National Rule definition for this category is significantly different than the definition used in the SCM and Model Rule, with potentially higher VOC emissions resulting from the National Rule definition.

⁵⁰ See Endnote 49.

⁵¹ The Staff Report provides commercial feasibility information and justifications for both Semi-Transparent and Clear Varnishes.

⁵² The National Rule divides this category into Below Ground Wood Preservatives (550 g/l), Clear Wood Preservatives (550 g/l), Semitransparent Wood Preservatives (550 g/l), and Opaque Wood Preservatives (350 g/l).

STAPPA/ALAPCO Model Rule:

VOC Content Limits for Generating Greater VOC Reductions from Architectural Coatings

1. Applicability

- 1.1 Except as provided in subsection 1.2, this rule is applicable to any person who supplies, sells, offers for sale, or manufacturers any architectural coating for use within the (jurisdiction of the state or local air pollution control agency), as well as any person who applies or solicits the application of any architectural coating within the (jurisdiction of the state or local air pollution control agency).
- 1.2 This rule does not apply to:
 - 1.2.1 Any architectural coating that is sold or manufactured for use outside of the (jurisdiction of the state or local air pollution control agency) or for shipment to other manufacturers for reformulation or repackaging.
 - 1.2.2 Any aerosol coating product.
 - 1.2.3 Any architectural coating that is sold in a container with a volume of one liter (1.057 quart) or less.

2. Definitions

- 2.0 Adhesive: Any chemical substance that is applied for the purpose of bonding two surfaces together other than by mechanical means.
- 2.1 Aerosol Coating Product: A pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can

for hand-held application, or for use in specialized equipment for ground traffic/marketing applications.

- 2.2 Antenna Coating: A coating labeled and formulated exclusively for application to equipment and associated structural appurtenances that are used to receive or transmit electromagnetic signals.
- 2.3 Antifouling Coating: A coating labeled and formulated for application to submerged stationary structures and their appurtenances to prevent or reduce the attachment of marine or freshwater biological organisms. To qualify as an antifouling coating, the coating must be registered with both the U.S. EPA under the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. Section 136 et. seq.) and with the (appropriate state or local agency).
- 2.4 Appurtenance: Any accessory to a stationary structure coated at the site of installation, whether installed or detached, including but not limited to: bathroom and kitchen fixtures; cabinets; concrete forms; doors; elevators; fences; hand railings; heating equipment, air conditioning equipment, and other fixed mechanical equipment or stationary tools; lamp-posts; partitions; pipes and piping systems; rain gutters and downspouts; stairways; fixed ladders; catwalks and fire escapes; and window screens.
- 2.5 Architectural Coating: A coating to be applied to stationary structures or their appurtenances at the site of installation, to portable buildings at the site of installation, to pavements, or

- to curbs. Coatings applied in shop applications or to non-stationary structures such as airplanes, ships, boats, railcars, and automobiles, and adhesives are not considered architectural coatings for the purposes of this rule.
- 2.6 Bitumens: Black or brown materials including, but not limited to, asphalt, tar, pitch, and asphaltite that are soluble in carbon disulfide, consist mainly of hydrocarbons, and are obtained from natural deposits or as residues from the distillation of crude petroleum or coal.
 - 2.7 Bituminous Roof Coating: A coating which incorporates bitumens that is labeled and formulated exclusively for roofing.
 - 2.8 Bituminous Roof Primer: A primer which incorporates bitumens that is labeled and formulated exclusively for roofing.
 - 2.9 Bond Breaker: A coating labeled and formulated for application between layers of concrete to prevent a freshly poured top layer of concrete from bonding to the layer over which it is poured.
 - 2.10 Clear Brushing Lacquers: Clear wood finishes, excluding clear lacquer sanding sealers, formulated with nitrocellulose or synthetic resins to dry by solvent evaporation without chemical reaction and to provide a solid, protective film, which are intended exclusively for application by brush and which are labeled as specified in subsection 4.1.5.
 - 2.11 Clear Wood Coatings: Clear and semi-transparent coatings, including lacquers and varnishes, applied to wood substrates to provide a transparent or translucent solid film.
 - 2.12 Coating: A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.
 - 2.13 Colorant: A concentrated pigment dispersion in water, solvent, and/or binder that is added to an architectural coating after packaging in sale units to produce the desired color.
 - 2.14 Concrete Curing Compound: A coating labeled and formulated for application to freshly poured concrete to retard the evaporation of water.
 - 2.15 Dry Fog Coating: A coating labeled and formulated only for spray application such that overspray droplets dry before subsequent contact with incidental surfaces in the vicinity of the surface coating activity.
 - 2.16 Exempt Compound: A compound identified as exempt under the definition of Volatile Organic Compound (VOC), subsection 2.60. Exempt compounds content of a coating shall be determined by U.S. EPA Method 24 or South Coast Air Quality Management District (SCAQMD) Method 303-91 (Revised February 1993), incorporated by reference on subsection 6.5.10.
 - 2.17 Faux Finishing Coating: A coating labeled and formulated as a stain or a glaze to create artistic effects including, but not limited to, dirt, old age, smoke damage, and simulated marble and wood grain.
 - 2.18 Fire-Resistive Coating: An opaque coating labeled and formulated to protect the structural integrity by increasing the fire endurance of interior or exterior steel and other structural materials, that has been fire tested and rated by a testing agency and approved by building code officials for use in bringing assemblies of structural materials into compliance with federal, state, and local building code requirements. The fire-resistive coating and the testing agency must be approved by building code officials. The fire-resistive coating shall be tested in accordance with ASTM Designation E 119-98, incorporated by reference in subsection 6.5.2.
 - 2.19 Fire-Retardant Coating: A coating labeled and formulated to retard ignition and flame spread, that has been fire tested and rated by a testing agency approved by building code officials for use in bringing building and construction materials into compliance with federal, state, and local building code requirements. The fire-retardant coating and the testing agency must be approved by building code officials. The fire-retardant coating shall be tested in accordance with ASTM Designation E 84-99, incorporate by reference in subsection 6.5.1.
 - 2.20 Flat Coating: A coating that is not defined under any other definition in this rule and that registers gloss less than 15 on an 85-degree meter or less than five on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference in subsection 6.5.3.
 - 2.21 Floor Coating: An opaque coating that is labeled and formulated for application to flooring, including, but not limited to, decks, porches, steps, and other horizontal surfaces, which may be subjected to foot traffic.
 - 2.22 Flow Coating: A coating labeled and formulated exclusively for use by electric power companies or their subcontractors to maintain the protective coating systems present on utility transformer units.
 - 2.23 Form-Release Compound: A coating labeled and formulated for application to a concrete form to prevent the freshly poured concrete from bonding to the form. The form may consist of wood, metal, or some material other than concrete.
 - 2.24 Graphic Arts Coating or Sign Paint: A coating labeled and formulated for hand-application by artists using brush or roller techniques to indoor and outdoor signs (excluding structural components) and murals including letter enamels, poster colors, copy blockers, and bulletin enamels.
 - 2.25 High-Temperature Coating: A high performance coating labeled and formulated for application to substrates exposed

- continuously or intermittently to temperatures above 204°C (400°F).
- 2.26 Industrial Maintenance Coating: A high performance architectural coating, including primers, sealers, undercoaters, intermediate coats, and topcoats, formulated for application to substrates exposed to one or more of the following extreme environmental conditions listed in subsections 2.26.1 through 2.26.5, and labeled as specified in subsection 4.1.4:
- 2.26.1 Immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposures of interior surfaces to moisture condensation;
 - 2.26.2 Acute or chronic exposure to corrosive, caustic, or acidic agents, or to chemicals, chemical fumes, or chemical mixtures or solutions;
 - 2.26.3 Repeated exposure to temperatures above 121°C (250°F);
 - 2.26.4 Repeated (frequent) heavy abrasion, including mechanical wear and repeated (frequent) scrubbing with industrial solvents, cleansers, or scouring agents; or
 - 2.26.5 Exterior exposure of metal structures and structural components.
- 2.27 Lacquer: A clear or opaque wood coating, including clear lacquer sanding sealers, formulated with cellulosic or synthetic resins to dry by evaporation without chemical reaction and to provide a solid, protective film.
- 2.28 Low-Solids Coating: A coating containing 0.12 kilogram or less of solids per liter (1 pound or less of solids per gallon) of coating material.
- 2.29 Magnesite Cement Coating: A coating labeled and formulated for application to magnesite cement decking to protect the magnesite cement substrate from erosion by water.
- 2.30 Mastic Texture Coating: A coating labeled and formulated to cover holes and minor cracks and to conceal surface irregularities, and is applied in a single coat of at least 10 mils (0.010 inch) dry film thickness.
- 2.31 Metallic Pigmented Coating: A coating containing at least 48 grams of elemental metallic pigment per liter of coating as applied (0.4 pounds per gallon), when tested in accordance with SCAQMD Method 318-95, incorporated by reference in subsection 6.5.4.
- 2.32 Multi-Color Coating: A coating that is packaged in a single container and that exhibits more than one color when applied in a single coat.
- 2.33 Non-flat Coating: A coating that is not defined under any other definition in this rule and that registers a gloss of 15 or greater on an 85-degree meter and 5 or greater on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference in subsection 6.5.3.
- 2.34 Non-flat - High Gloss Coating: A non-flat coating that registers a gloss of 70 or above on a 60-degree meter according to ASTM Designation D 523-89 (1999), incorporated by reference into subsection 6.5.3.
- 2.35 Nonindustrial Use: Nonindustrial use means any use of architectural coatings except in the construction or maintenance of any of the following: facilities used in the manufacturing of goods and commodities; transportation infrastructure, including highways, bridges, airports and railroads; facilities used in mining activities, including petroleum extraction; and utilities infrastructure, including power generation and distribution, and water treatment and distribution systems.
- 2.36 Post-Consumer Coating: A finished coating that would have been disposed of in a landfill, having completed its usefulness to a consumer, and does not include manufacturing wastes.
- 2.37 Pre-Treatment Wash Primer: A primer that contains a minimum of 0.5 acid, by weight, when tested in accordance with ASTM Designation D 1613-96, incorporated by reference into subsection 6.5.5, that is labeled and formulated for application directly to bare metal surfaces to provide corrosion resistance and to promote adhesion of subsequent topcoats.
- 2.38 Primer: A coating labeled and formulated for application to a substrate to provide a firm bind between the substrate and subsequent coats.
- 2.39 Quick-Dry Enamel: A non-flat coating that is labeled as specified in subsection 4.1.8 and that is formulated to have the following characteristics:
- 2.39.1 Is capable of being applied directly from the container under normal conditions with ambient temperatures between 16 and 27°C (60 and 80°F);
 - 2.39.2 When tested in accordance with ASTM Designation D 1640-95, incorporated by reference in subsection 6.5.6, sets to touch in two hours or less, is tack free in four hours or less, and dries hard in eight hours or less by the mechanical test method; and
 - 2.39.3 Has a dried film gloss of 70 or above on a 60-degree meter.
- 2.40 Quick-Dry Primer Sealer and Undercoater: A primer, sealer, or undercoater that is dry to the touch in 30 minutes and can be re-coated in two hours when tested in accordance with ASTM Designation D 1640-95, incorporated by reference in subsection 6.5.6.
- 2.41 Recycled Coating: An architectural coating formulated such that not less than 50 percent of the total weight consists of

- secondary and post-consumer coating, with not less than 10 percent of the total weight consisting of post-consumer coating.
- 2.42 Residence: Areas where people reside or lodge, including, but not limited to, single and multiple family dwellings, condominiums, mobile homes, apartment complexes, motels, and hotels.
- 2.43 Roof Coating: A non-bituminous coating labeled and formulated exclusively for application to roofs for the primary purpose of preventing penetration of the substrate by water or reflecting heat and ultraviolet radiation. Metallic pigmented roof coatings, which qualify as metallic pigmented coatings, shall not be considered in this category, but shall be considered to be in the metallic pigmented coatings category.
- 2.44 Rust Preventive Coating: A coating formulated exclusively for nonindustrial use to prevent the corrosion of metal surfaces and labeled as specified in subsection 4.1.6.
- 2.45 Sanding Sealer: A clear or semi-transparent wood coating labeled and formulated for application to bare wood to seal the wood and to provide a coat that can be abraded to create a smooth surface for subsequent applications of coatings. A sanding sealer that also meets the definition of a lacquer is not included in this category, but it is included in the lacquer category.
- 2.46 Sealer: A coating labeled and formulated for application to a substrate for one or more of the following purposes: to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate.
- 2.47 Secondary Coating (Rework): A fragment of a finished coating or a finished coating from a manufacturing process that has converted resources into a commodity of real economic value, but does not include excess virgin resources of the manufacturing process.
- 2.48 Shellac: A clear or opaque coating formulated solely with the resinous secretions of the lac beetle (*Lacifer lacca*), thinned with alcohol, and formulated to dry by evaporation without a chemical reaction.
- 2.49 Shop Application: Application of a coating to a product or a component of a product in or on the premises of a factory or a shop as part of a manufacturing, production, or repairing process (e.g., original equipment manufacturing coatings).
- 2.50 Solicit: To require for use or to specify, by written or oral contract.
- 2.51 Specialty Primer, Sealer, and Undercoater: A coating labeled as specified in subsection 4.1.7 and that is formulated for application to a substrate to seal fire, smoke or water damage; to condition excessively chalky surfaces; or to block stains.
- An excessively chalky surface is one that is defined as having a chalk rating of four or less as determined by ASTM Designation D 4214-98, incorporated by reference in subsection 6.5.7.
- 2.52 Stain: A clear, semi-transparent, or opaque coating labeled and formulated to change the color of a surface, but not conceal the grain pattern or texture.
- 2.53 Swimming Pool Coating: A coating labeled and formulated to coat the interior of swimming pools and to resist swimming pool chemicals.
- 2.54 Swimming Pool Repair and Maintenance Coating: A rubber-based coating labeled and formulated to be used over existing rubber-based coatings for the repair and maintenance of swimming pools.
- 2.55 Temperature-Indicator Safety Coating: A coating labeled and formulated as a color-changing indicator coating for the purpose of monitoring the temperature and safety of the substrate, underlying piping, or underlying equipment, and for application to substrates exposed continuously or intermittently to temperatures above 204°C (400°F).
- 2.56 Tint Base: An architectural coating to which colorant is added after packaging in sale units to produce a desired color.
- 2.57 Traffic Marking Coating: A coating labeled and formulated for marking and striping streets, highways, or other traffic surfaces including, but not limited to, curbs, berms, driveways, parking lots, sidewalks, and airport runways.
- 2.58 Undercoater: A coating labeled and formulated to provide a smooth surface for subsequent coatings.
- 2.59 Varnish: A clear or semi-transparent wood coating, excluding lacquers and shellacs, formulated to dry by chemical reaction on exposure to air. Varnishes may contain small amounts of pigment to color a surface, or to control the final sheen or gloss of the finish.
- 2.60 Volatile Organic Compound (VOC): Any volatile compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding the following:
- 2.60.1 methane;
 methylene chloride (dichloromethane);
 1,1,1-trichloroethane (methyl chloroform);
 trichlorofluoromethane (CFC-11);
 dichlorodifluoromethane (CFC-12);
 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113);
 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114);
 chloropentafluoroethane (CFC-115);
 chlorodifluoromethane (HCFC-22);

1,1,1-trifluoro-2,2-dichloroethane (HCFC-123);
 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124);
 1,1-dichloro-1-fluoroethane (HCFC-141b);
 1-chloro-1,1-difluoroethane (HCFC-142b);
 trifluoromethane (HFC-23);
 pentafluoroethane (HFC-125);
 1,1,2,2-tetrafluoroethane (HFC-134);
 1,1,1,2-tetrafluoroethane (HFC-134a);
 1,1,1-trifluoroethane (HFC-143a);
 1,1-difluoroethane (HFC-152a);
 cyclic, branched, or linear, completely methylated
 siloxanes;

the following classes of perfluorocarbons:

1. cyclic, branched, or linear, completely fluorinated alkanes;
2. cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
3. cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
4. sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds only to carbon and fluorine; and

2.60.2 the following low-reactive organic compounds which have been exempted by the U.S. EPA:

acetone;
 ethane;
 parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene);
 perchloroethylene; and
 methyl acetate.

2.61 VOC Content: The weight of VOC per volume of coating, calculated according to the procedures specified in subsection 6.1.

2.62 Waterproofing Sealer: A coating labeled and formulated for application to a porous substrate for the primary purpose of preventing the penetration of water.

2.63 Waterproofing Concrete/Masonry Sealer: A clear or pigmented film-forming coating that is labeled and formulated for sealing concrete and masonry to provide resistance against water, alkalis, acids, ultraviolet light, and staining.

2.64 Wood Preservative: A coating labeled and formulated to protect exposed wood from decay or insect attack, that is registered with both the U.S. EPA under the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. section 136, et. seq.) and with the (appropriate state or local agency).

3. Standards

3.1 VOC Content Limits: Except as provided in subsections 3.2, 3.3, 3.8, 3.9, and 3.10, no person shall: (i) manufacture, blend, or repackage for sale within the (jurisdiction of the state or local air pollution control agency), (ii) supply, sell, or offer for sale within the (jurisdiction of the state or local air pollution control agency) or (iii) solicit for application or apply within the (jurisdiction of the state or local air pollution control agency), any architectural coating with a VOC content in excess of the corresponding limit specified in Table 1, after the specified effective date in Table 1.

3.2 Most Restrictive VOC Limit: If anywhere on the container of any architectural coating, or any label or sticker affixed to the container, or in any sales, advertising, or technical literature supplied by a manufacturer or anyone acting on their behalf, any representation is made that indicates that the coating meets the definition of or is recommended for use for more than one of the coating categories listed in Table 1, then the most restrictive VOC content limit shall apply. This provision does not apply to the coating categories specified in subsections 3.2.1 through 3.2.15.

3.2.1 Lacquer coatings (including lacquer sanding sealers).

3.2.2 Metallic pigmented coatings.

3.2.3 Shellacs.

3.2.4 Fire-retardant coatings.

3.2.5 Pretreatment wash primers.

3.2.6 Industrial maintenance coatings.

3.2.7 Low-solids coatings.

3.2.8 Wood preservatives

3.2.9 High-temperature coatings

3.2.10 Temperature-indicator safety coatings.

3.2.11 Antenna coatings.

3.2.12 Antifouling coatings

3.2.13 Flow coatings.

3.2.14 Bituminous roof primers.

3.2.15 Specialty primers, sealers, and undercoaters.

3.3 Sell-Through of Coatings: A coating manufactured prior to the effective date specified for that coating in Table 1, may be sold, supplied, or offered for sale for up to three years after the specified effective date. In addition, a coating manufactured before the effective date specified for that coating in Table 1 may be applied at any time, both before and after the specified effective date, so long as the coating complied

with the standards in effect at the time the coating was manufactured. This subsection 3.3 does not apply to any coating that does not display the date or date code required by subsection 4.1.1.

3.4 **Painting Practices:** All architectural coating containers used to apply the contents therein to a surface directly from the container by pouring, siphoning, brushing, rolling, padding, ragging, or other means, shall be closed when not in use. These architectural coatings containers include, but are not limited to, drums, buckets, cans, pails, trays, or other application containers. Containers of any VOC-containing materials used for thinning and cleanup shall also be closed when not in use.

3.5 **Thinning:** No person who applies or solicits the application of any architectural coating shall apply a coating that is thinned to exceed the applicable VOC limit specified in Table 1.

3.6 **Rust Preventive Coatings:** Effective January 1, 2004, no person shall apply or solicit the application of any rust preventive coating for industrial use, unless such a rust preventive coating complies with the industrial maintenance coating VOC limit specified in Table 1.

3.7 **Coatings Not Listed in Table 1:** For any coating that does not meet any of the definitions for the specialty coatings categories listed in Table 1, the VOC content limit shall be determined by classifying the coating as a flat coating or a non-flat coating, based on its gloss, as defined in subsections 2.20, 2.33, and 2.34 and the corresponding flat or non-flat coating limit shall apply.

3.8 **Industrial Maintenance Coatings:**

3.8.1 After January 1, 2004, a manufacturer, seller, or user may petition the (director of the state or local air pollution control agency) to apply an industrial maintenance coating with a VOC content up to 340 g/l if all of the following conditions are met:

[Note: the SCM specifies conditions that must be met for successful petitioning. For more information that will assist a state or local air pollution control agency in deciding what limit to choose, please consult the 2000 SCM, available at www.arb.ca.gov/arch/docs.htm]

3.8.1.1 The industrial maintenance coating is to be applied in an area located (insert specific information on locations where or conditions under which higher VOC content would be allowed).

3.8.1.2 The petition submitted to the (state or local air pollution control officer) contains the

following information, as applicable: job requirements and descriptions, volume of coating, maximum VOC content, and a certification that a complying coating meeting the job performance requirements is not available.

3.8.1.3 If the (director of the state or local air pollution control agency) grants written approval, such approval shall contain volume and VOC limit conditions. Until written approval is granted by the (director of the state or local air pollution control agency) and received by the petitioner, all provisions of this rule shall apply.

3.8.2 The (director of the state or local air pollution control agency) shall not approve any petition under subsection 3.8.1 if the approvals previously granted by the (director of the state or local air pollution control agency) during the calendar year, when combined with the petition under consideration, would result in excess VOC emissions for that calendar year which would be greater than five percent of the annual emission reduction achieved within the (jurisdiction of the state or local air pollution control agency) from implementing the January 1, 2004, VOC limit for industrial maintenance coatings.

3.8.3 Coatings subject to this provision shall be sold only if an approved petition (or a copy of it) is provided prior to the sale. Coatings subject to this provision shall not be available to the general public.

3.9 **Lacquers:** Notwithstanding the provisions of subsection 3.1, a person or facility may add up to 10 percent by volume of VOC to a lacquer to avoid blushing of the finish during days with relative humidity greater than 70 percent and temperature below 65°F, at the time of application, provided that the coating contains acetone and no more than 550 grams of VOC per liter of coating, less water and exempt compounds, prior to the addition of VOC.

3.10 **Averaging Compliance Option:** On or after January 1, 2003, in lieu of compliance with the specified limits in Table 1 for floor coatings; industrial maintenance coatings; primers, sealers, and undercoaters; quick-dry primers, sealers, and undercoaters; quick-dry enamels; roof coatings; rust preventative coatings; stains; waterproofing sealers, as well as flats and non-flats (excluding recycled coatings), manufacturers may average designated coatings such that their actual cumulative emissions from the averaged coatings are less than or equal to the cumulative emissions that would have been allowed under those limits over a compliance period not to exceed one year. Such manufacturers must also comply with

the averaging provisions contained in Appendix A, as well as maintain and make available for inspection records for at least three years after the end of the compliance period. This subsection 3.10 and Appendix A shall cease to be effective on January 1, 2005, after which averaging will no longer be allowed. [Please note that if a state or local air pollution control agency pursues implementation of this model rule before January 2005, STAPPA and ALAPCO recommend that this optional flexibility provision be considered.]

4. Container Labeling Requirements

4.1 Each manufacturer of any architectural coatings subject to this rule shall display the information listed in subsections 4.1.1 through 4.1.8 on the coating container (or label) in which the coating is sold or distributed.

4.1.1 **Date Code:** The date the coating was manufactured, or a date code representing the date, shall be indicated on the label, lid, or bottom of the container. If the manufacturer uses a date code for any coating, the manufacturer shall file an explanation of each code with the (director of the state or local air pollution control agency).

4.1.2 **Thinning Recommendations:** A statement of the manufacturer's recommendation regarding thinning of the coating shall be indicated on the label or lid of the container. This requirement does not apply to the thinning of architectural coatings with water. If thinning of the coating prior to use is not necessary, the recommendation must specify that the coating is to be applied without thinning.

4.1.3 **VOC Content:** Each container of any coating subject to this rule shall display either the maximum or the actual VOC content of the coating, as supplied, including the maximum thinning as recommended by the manufacturer. VOC content shall be displayed in grams of VOC per liter of coating. VOC content displayed shall be calculated using product formulation data, or shall be determined using the test methods in subsection 6.2. The equations in subsection 6.1 shall be used to calculate VOC content.

4.1.4 **Industrial Maintenance Coatings:** In addition to the information specified in subsection 4.1.1, 4.1.2, and 4.1.3, each manufacturer of any industrial maintenance coating subject to this rule shall display on the label or the lid of the container in which the coating is sold or distributed one or more of the descriptions listed in subsections 4.1.4.1 through 4.1.4.3.

4.1.4.1 "For industrial use only."

4.1.4.2 "For professional use only."

4.1.4.3 "Not for residential use" or "Not intended for residential use."

4.1.5 **Clear Brushing Lacquers:** Effective January 1, 2003, the labels of all clear brushing lacquers shall prominently display the statements "For brush application only," and "This product must not be thinned or sprayed."

4.1.6 **Rust Preventive Coatings:** Effective January 1, 2003, the labels of all rust preventive coatings shall prominently display the statement "For Metal Substrates Only."

4.1.7 **Specialty Primers, Sealers, and Undercoaters:** Effective January 1, 2003, the labels of all specialty primers, sealers, and undercoaters shall prominently display one or more of the descriptions listed in subsection 4.1.7.1 through 4.1.7.5.

4.1.7.1 For blocking stains.

4.1.7.2 For fire-damaged substrates.

4.1.7.3 For smoke-damaged substrates.

4.1.7.4 For water-damaged substrates.

4.1.7.5 For excessively chalky substrates.

4.1.8 **Quick Dry Enamels:** Effective January 1, 2003, the labels of all quick dry enamels shall prominently display the words "Quick Dry" and the dry hard time.

4.1.9 **Non-Flat - High-Gloss Coatings:** Effective January 1, 2003, the labels of all non-flat - high-gloss coatings shall prominently display the words "High Gloss."

5. Reporting Requirements

5.1 **Clear Brushing Lacquers:** Each manufacturer of clear brushing lacquers shall, on or before April 1 of each calendar year beginning in the year 2004, submit an annual report to the (director of the state or local air pollution control agency). The report shall specify the number of gallons of clear brushing lacquers sold in the state during the preceding calendar year, and shall describe the method used by the manufacturer to calculate state sales.

5.2 **Rust Preventive Coatings:** Each manufacturer of rust preventive coatings shall, on or before April 1 of each calendar year beginning in the year 2004, submit an annual report to the (director of the state or local air pollution control agency). The report shall specify the number of gallons of rust preventive coatings sold in the state during the preceding calendar year, and shall describe the method used by the manufacturer to calculate state sales.

- 5.3 Specialty Primers, Sealers, and Undercoaters: Each manufacturer of specialty primers, sealers, and undercoaters shall, on or before April 1 of each calendar year beginning in the year 2004, submit an annual report to the (director of the state or local air pollution control agency). The report shall specify the number of gallons of specialty primers, sealers, and undercoaters sold in the state during the preceding calendar year, and shall describe the method used by the manufacturer to calculate state sales.
- 5.4 Toxic Exempt Compounds: For each architectural coating that contains perchloroethylene or methylene chloride, the manufacturer shall, on or before April 1 of each calendar year beginning with the year 2004, report to the (director of the state or local air pollution control agency) the following information for products sold in the state during the preceding year:
- 5.4.1 the product brand name and a copy of the product label with the legible usage instructions;
 - 5.4.2 the product category listed in Table 1 to which the coating belongs;
 - 5.4.3 the total sales in (the jurisdiction of the state or local air pollution control agency) during the calendar year to the nearest gallon;
 - 5.4.4 the volume percent, to the nearest 0.10 percent, of perchloroethylene and methylene chloride in the coating.
- 5.5 Recycled Coatings: Manufacturers of recycled coatings must submit a letter to the (director of the state or local air pollution control agency) certifying their status as a Recycled Paint Manufacturer. The manufacturer shall, on or before April 1 of each calendar year beginning with the year 2004, submit an annual report to the (director of the state or local air pollution control agency). The report shall include, for all recycled coatings, the total number of gallons distributed in the state during the preceding year, and shall describe the method used by the manufacturer to calculate state distribution.
- 5.6 Bituminous Coatings: Each manufacturer of bituminous roof coatings or bituminous roof primers shall, on or before April 1 of each calendar year beginning with the year 2004, submit an annual report to the (director of the state or local air pollution control agency). The report shall specify the number of gallons of bituminous roof coatings or bituminous roof primers sold in the state during the preceding calendar year, and shall describe the method used by the manufacturer to calculate state sales.

6. Compliance Provisions and Test Methods

6.1 Calculation of VOC Content: For the purpose of determining compliance with the VOC content limits in Table 1, the VOC content of a coating shall be determined by using the procedures described in subsection 6.1.1 or 6.1.2, as appropriate. The VOC content of a tint base shall be determined without colorant that is added after the tint base is manufactured.

6.1.1 With the exception of low solids coatings, determine the VOC content in grams of VOC per liter of coating thinned to the manufacturer's maximum recommendation, excluding the volume of any water and exempt compounds. Determine the VOC content using equation 1 as follows:

$$(1) \quad \text{VOC Content} = \frac{(Ws - Ww - Wec)}{(Vm - Vw - Vec)}$$

Where:

VOC content = grams of VOC per liter of coating

Ws = weight of volatiles, in grams

Ww = weight of water, in grams

Wec = weight of exempt compounds, in grams

Vm = volume of coating, in liters

Vw = volume of water, in liters

Vec = volume of exempt compounds, in liters

6.1.2 For low solids coatings, determine the VOC content in units of grams of VOC per liter of coating thinned to the manufacturer's maximum recommendation, including the volume of any water and exempt compounds. Determine the VOC content using equation 2 as follows:

$$(2) \quad \text{VOC Content (ls)} = \frac{(Ws - Ww - Wec)}{(Vm)}$$

Where:

VOC Content (ls) = the VOC content of a low solids coating in grams per liter of coating

Ws	= weight of volatile, in grams
Ww	= weight of water, in grams
Wec	= weight of exempt compounds, in grams
Vm	= volume of coating, in liters

- 6.2 VOC Content of Coatings: To determine the physical properties of a coating in order to perform the calculations in subsection 6.1, the reference method for VOC content is U.S. EPA Method 24, incorporated by reference in subsection 6.5.11, except as provided in subsections 6.3 and 6.4. An alternative method to determine the VOC content of coatings is SCAQMD Method 304-91 (Revised February 1996), incorporated by reference in subsection 6.5.12. The exempt compounds content shall be determined by SCAQMD Method 303-91 (Revised August 1996), incorporated by reference in subsection 6.5.10. To determine the VOC content of a coating, the manufacturer may use U.S. EPA Method 24, or an alternative method, as provided in subsection 6.3, formulation data, or any other reasonable means for predicting that the coating has been formulated as intended (e.g. quality assurance checks, recordkeeping). However, if there are any inconsistencies between the results of a Method 24 test and any other means for determining VOC content, the Method 24 results will govern, except when an alternative method is approved as specified in subsection 6.3. The (director of the state or local air pollution control agency) may require the manufacturer to conduct a Method 24 analysis.
- 6.3 Alternative Test Methods: Other test methods demonstrated to provide results that are acceptable for purposes of determining compliance with subsection 6.2, after review and approved in writing by the staffs of the (state or local air pollution control agency), and the U.S. EPA, may also be used.
- 6.4 Methacrylate Traffic Coating Markings: Analysis of methacrylate multi-component coatings used as traffic marking coatings shall be conducted according to a modification of U.S. EPA Method 24 (40 CFR 59, subpart D, Appendix A), incorporated by reference in subsection 6.5.13. This method has not been approved for methacrylate multicomponent coatings used for other purposes than as traffic marking coatings or for other classes of multicomponent coatings.
- 6.5 Test Methods: The following test methods are incorporated by reference herein, and shall be used to test coatings subject to the provisions of this rule:
- 6.5.1 Flame Spread Index: The flame spread index of a fire-retardant coating shall be determined by the ASTM Designation E 84-99, "Standard Test Method for Surface Burning Characteristics of Building Materials," (see section 2, Fire-Retardant Coating).

- 6.5.2 Fire-Resistance Rating: The fire-resistance rating of a fire-resistive coating shall be determined by ASTM designation E 119-98, "Standard Test Methods for Fire Tests of Building Construction Materials," (see section 2, Fire-Resistive Coating).
- 6.5.3 Gloss Determination: The gloss of a coating shall be determined by ASTM Designation D 523-89 (1999), "Standard Test Method for Specular Gloss," (see section 2, Flat Coating, Non-flat Coating, Non-flat - High-Gloss Coating, and Quick Dry Enamel).
- 6.5.4 Metal Content of Coatings: The metallic content of a coating shall be determined by SCAQMD Method 318-95, "Determination of Weight Percent Elemental Metal in Coatings by X-Ray Diffraction," SCAQMD "Laboratory Methods of Analysis for Enforcement Samples," (see section 2, Metallic Pigmented Coating).
- 6.5.5 Acid Content of Coatings: The acid content of a coating shall be determined by ASTM Designation D 1613-96, "Standard Test Method for Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer and Related Products," (see section 2, Pre-Treatment Wash Primer).
- 6.5.6 Drying Times: The set-to-touch, dry-hard, dry-to-touch and dry-to-recoat times of a coating shall be determined by ASTM Designation D 1640-95, "Standard Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature," (see section 2, Quick-Dry Enamel and Quick-Dry Primer, Sealer, and Undercoater). The tack free time of a quick-dry enamel coating shall be determined by the Mechanical Test Method of ASTM Designation D 1640-95.
- 6.5.7 Surface Chalkiness: The chalkiness of a surface shall be determined using ASTM Designation D 4214-98, "Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films," (see section 2, Specialty Primer, Sealer, and Undercoater).
- 6.5.8 Exempt Compounds - Siloxanes: Exempt compounds that are cyclic, branched, or linear, completely methylated siloxanes, shall be analyzed as exempt compounds for compliance with section 6 by BAAQMD Method 43, "Determination of Volatile Methylsiloxanes in Solvent-Based Coatings, Inks, and Related Materials," BAAQMD Manual of Procedures, Volume III, adopted November 6, 1996, (see section 2, Volatile Organic Compound, and subsection 6.2).
- 6.5.9 Exempt Compounds - Parachlorobenzotrifluoride (PCBTF): The exempt compound parachlorobenzotrifluoride, shall be analyzed as an exempt

compound for compliance with section 6 by BAAQMD Method 41, "Determination of Volatile Organic Compounds in Solvent-Based Coatings and Related Materials Containing Parachlorobenzotrifluoride," BAAQMD Manual of Procedures, Volume III, adopted December 20, 1995, (see section 2, Volatile Organic Compound, and subsection 6.2).

6.5.10 Exempt Compounds: The content of compounds exempt under U.S. EPA Method 24 shall be analyzed by SCAQMD Method 303-91 (Revised 1993), "Determination of Exempt Compounds," SCAQMD "Laboratory Methods of Analysis for Enforcement Samples," (see section 2, Volatile Organic Compound, and subsection 6.2).

6.5.11 VOC Content of Coatings: The VOC content of a coating shall be determined by U.S. EPA Method 24 as it exists in appendix A of 40 Code of Federal Regulations (CFR) Part 60, "Determination of Volatile

Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings," (see subsection 6.2).

6.5.12 Alternative VOC Content of Coatings: The VOC content of coatings may be analyzed by either U.S. EPA Method 24 or SCAQMD Method 304-91 (Revised 1996), "Determination of Volatile Organic Compounds (VOC) in Various Materials," SCAQMD "Laboratory Methods of Analysis for Enforcement Samples," (see subsection 6.2).

6.5.13 Methacrylate Traffic Marking Coatings: The VOC content of methacrylate multicomponent coatings used as traffic marking coatings shall be analyzed by the procedures in 40 CFR part 59, subpart D, appendix A, "Determination of Volatile Matter Content of Methacrylate Multicomponent Coatings Used as Traffic Marking Coatings," (September 11, 1998), (see subsection 6.4).

Table 1

VOC Content Limits for Architectural Coatings

Limits are expressed in grams of VOC per liter¹ of coating thinned to the manufacturer's maximum recommendation, excluding the volume of any water, exempt compounds, or colorant added to tint bases. "Manufacturer's maximum recommendation" means the maximum recommendation for thinning that is indicated on the label or lid of the coating container.

Coating Category	VOC Content Limit (Effective in California Districts January 1, 2003)
Flat Coatings	100
Non-flat Coatings	150
Non-flat - High Gloss Coatings	250
<i>Specialty Coatings</i>	
Antenna Coatings	530
Antifouling Coatings	400
Bituminous Roof Coatings	300
Bituminous Roof Primers	350
Bond Breakers	350
Clear Wood Coatings	
• Clear Brushing Lacquers	680
• Lacquers (including lacquer sanding sealers)	550
• Sanding Sealers (other than lacquer sanding sealers)	350
• Varnishes	350
Concrete Curing Compounds	350
Dry Fog Coatings	400
Faux Finishing Coatings	350
Fire-Resistive Coatings	350
Fire-Retardant Coatings	
• Clear	650
• Opaque	350
Floor Coatings	250
Flow Coatings	420
Form-Release Compounds	250
Graphic Arts Coatings (Sign Paints)	500
High-Temperature Coatings	420
Industrial Maintenance Coatings	250 ²
Low-Solids Coatings ³	120
Magnesite Cement Coatings	450
Mastic Texture Coatings	300
Metallic Pigmented Coatings	500
Multi-Color Coatings	250
Pre-Treatment Wash Primers	420
Primers, Sealers, and Undercoaters	200
Quick-Dry Enamels	250
Quick-Dry Primers, Sealers and Undercoaters	200
Recycled Coatings	250
Roof Coatings	250
Rust Preventative Coatings	400

Coating Category	VOC Content Limit (Effective in California Districts January 1, 2003)
Shellacs	
• Clear	730
• Opaque	550
Specialty Primers, Sealers, and Undercoaters	350
Stains	250
Swimming Pool Coatings	340
Swimming Pool Repair and Maintenance Coatings	340
Temperature-Indicator Safety Coatings	550
Traffic Marking Coatings	150
Waterproofing Sealers	250
Waterproofing Concrete/Masonry Sealers	400
Wood Preservatives	350

Endnotes

¹ Conversion factor: one pound VOC per gallon (U.S.) = 119.95 grams per liter.

² In California, this limit is effective January 1, 2004 to allow more time for essential public service agencies to complete their separate technology assessment and their administrative processes before low-VOC coatings can be used.

³ Units are grams of VOC per liter (pounds of VOC per gallon) of coating, including water and exempt compounds.

APPENDIX A

Averaging Provision

A.1

The manufacturer shall demonstrate that actual emissions from the coatings being averaged are less than or equal to the allowable emissions, for the specified compliance period using the following equation:

$$\sum_{i=1}^n G_i M_i \leq \sum_{i=1}^n G_i V_i L_i$$

Where:

$$\sum_{i=1}^n G_i M_i = \text{Actual emissions.}$$

$$\sum_{i=1}^n G_i V_i L_i = \text{Allowable emissions.}$$

G_i = Total gallons of product (i) subject to averaging;

M_i = Material VOC content of product (i), in pounds per gallon;

$$M_i = \frac{(W_s - W_w - W_{ec})}{(V_m)}$$

V_i = Percent by volume solids and VOC in product (i);

$$V_i = \frac{(V_m - V_w - V_{ec})}{(V_m)}$$

Where: W_s , W_w , W_{ec} , V_m , V_w and V_{ec} are defined in subsection 6.1, except that in this appendix weights are in pounds and volumes are in gallons.

For non-zero VOC coatings:

$$V_i = \frac{\text{Material VOC (also known as VOC actual)}}{\text{Coating VOC (also known as VOC regulatory)}}$$

$$\text{Where: Coating VOC} = \frac{W_s - W_w - W_{ec}}{V_m - V_w - V_{ec}}$$

For zero VOC coatings

V_i = Percent solids by volume.

L_i = Regulatory VOC content for product(i), in pounds per gallon, as listed in Table 1.

The averaging is limited to coatings that are designated by the manufacturer. Any coating not designated in the averaging program shall comply with the VOC limit in Table 1. The manufacturer shall not include any quantity of coatings that it knows or should have known will not be used in the state, if statewide coatings data are used. If state-specific coatings data are used, the manufacturer shall not include any quantity of coatings that it knows or should have known will not be used in the (jurisdiction of the state or local air pollution control agency).

A.2 Averaging Program

At least six months prior to the start of the compliance period, manufacturers shall submit an Averaging Program (“Program”) to the (director of the state or local air pollution control agency). As used in this Appendix A, “Air Director” means the director of the state or local air pollution control agency. Averaging may not be implemented until the Program is approved in writing by the Air Director.

Within 45 days of submittal of a complete Program, the Air Director shall either approve or disapprove the Program. The Program applicant and the Air Director may agree to an extension of time for the Air Director to take action on the Program.

A.3 General Requirements

The Program shall include all necessary information for the Air Director to make a determination as to whether the manufacturer may comply with the averaging requirements over the specified compliance period in an enforceable manner. Such information shall include, but is not limited to, the following:

- A.3.1 An identification of the contact persons, telephone numbers, and name of the manufacturer who is submitting the Program.
- A.3.2 An identification of each coating that has been selected by the manufacturer for inclusion in this program that exceeds the applicable VOC limit in Table 1, its VOC content specified in units of both VOC actual and VOC regulatory, and the designation of the coating category.
- A.3.3 A detailed demonstration showing that the projected actual emissions will not exceed the allowable emissions for a single compliance period that the Program will be in effect. In addition, the demonstration shall include VOC content information for each coating that is below the compliance limit in Table 1. The demonstration shall use the equation specified in subsection A.1 of this Appendix for projecting the actual emissions and allowable emissions during each compliance period. The demonstration shall also include all VOC content levels and projected

volume within the state for each coating listed in the Program during each compliance period. The requested data can be summarized in a matrix form.

- A.3.4 A specification of the compliance period(s) and applicable reporting dates. The length of the compliance period shall not be more than one year or less than six months.
- A.3.5 An identification and description of all records to be made available to the Air Director upon request, if different than those identified under subsection A.3.6.
- A.3.6 An identification and description of specific records to be used in calculating emissions for the Program and subsequent reporting, and a detailed explanation as to how those records will be used by the manufacturer to verify compliance with the averaging requirements.
- A.3.7 A statement, signed by a responsible party for the manufacturer, that all information submitted is true and correct, and that records will be made available to the Air Director upon request.

A.4 Reporting Requirements

- A.4.1 For every single compliance period, the manufacturer shall submit a mid-term report listing all coatings subject to averaging during the first half of the compliance period, detailed analysis of the actual and allowable emissions at the end of the mid-term, and an explanation as to how the manufacturer intends to achieve compliance by the end of the compliance period. The report shall be signed by the responsible party for the manufacturer, attesting that all information submitted is true and correct. The mid-term report shall be submitted within 45 days after the midway date of the compliance period. A manufacturer may request, in writing, an extension of up to 15 days for submittal of the mid-term report.
- A.4.2 Within 60 days after the end of the compliance period or upon termination of the Program, whichever is sooner, the manufacturer shall submit to the Air Director a report listing all coatings subject to averaging during the compliance period, providing a detailed demonstration of the balance between the actual and allowable emissions for the compliance period, any identification and description of specific records used by the manufacturer to verify compliance with the averaging requirement, and any other information requested by the Air Director to determine whether the manufacturer complied with the averaging requirements over the specified compliance

period. The report shall be signed by the responsible party for the manufacturer, attesting that all information submitted is true and correct, and that records will be made available to the Air Director upon request. A manufacturer may request, in writing, an extension of up to 30 days for submittal of the final report.

A.5 Renewal of a Program

A Program automatically expires at the end of the compliance period. The manufacturer may request a renewal of the Program by submitting a renewal request that shall include an updated Program, meeting all applicable Program requirements. The renewal request will be considered conditionally approved until the Air Director makes a final decision to deny or approve the renewal request based on a determination of whether the manufacturer is likely to comply with the averaging requirements. The Air Director shall base such determination on all available information, including but not limited to, the mid-term and the final reports of the preceding compliance period. The Air Director shall make a decision to deny or approve a renewal request no later than 45 days from the date of the final report submittal, unless the manufacturer and the Air Director agree to an extension of time for the Air Director to take action on the renewal request.

A.6 Modification of a Program

A manufacturer may request a modification of the Program at any time prior to the end of the compliance period. The Air Director shall take action to approve or disapprove the modification request no longer than 45 days from the date of its submittal. No modification of the compliance period shall be allowed. A Program need not be modified to specify additional coatings to be averaged that are below the applicable VOC limits.

A.7 Termination of a Program

- A.7.1 A manufacturer may terminate its Program at any time by filing a written notification to the Air Director. The filing date shall be considered the effective date of the termination, and all other provisions of this rule, including the VOC limits, shall immediately thereafter apply. The manufacturer shall also submit a final report 60 days after the termination date. Any exceedance of the actual emissions over the allowable emissions over the period that the Program was in

effect shall constitute a separate violation for each day of the entire compliance period.

- A.7.2 The Air Director may terminate a Program if any of the following circumstances occur:

A.7.2.1 The manufacturer violates the requirements of the approved Program, and at the end of the compliance period, the actual emissions exceed the allowable emissions.

A.7.2.2 The manufacturer demonstrates a recurring pattern of violations and has consistently failed to take the necessary steps to correct those violations.

A.8 Change in VOC Limits

If the VOC limits of a coating listed in the Program are amended such that its effective date is less than one year from the date of adoption, the affected manufacturer may base its averaging on the prior limits of that coating until the end of the compliance period immediately following the date of adoption.

A.9 Labeling

Each container of any coating that is included in averaging program, and that exceeds the applicable VOC limit in Table 1, shall display the following statement: "This product is subject to architectural coatings averaging provisions in (the jurisdiction of your state or local air pollution control agency)." A symbol specified by the Air Director may be used as a substitute.

A.10 Violations

The exceedance of the allowable emissions for any compliance period shall constitute a separate violation for each day of the compliance period. However, any violation of the requirements of the Averaging Provision of this rule, which the violator can demonstrate, to the Air Director, did not cause or allow the emission of an air contaminant and was not the result of negligent or knowing activity may be considered a minor violation.

A.11 Sunset of Averaging Provision

The averaging provision set forth in Appendix A shall cease to be effective on January 1, 2005, after which averaging will no longer be allowed.