South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

BOARD MEETING DATE: November 8, 1996 AGENDA NO. 24

PROPOSAL: Amend Rule 1113 - Architectural Coatings

SYNOPSIS: The proposed amendment will clarify rule requirements, decrease VOC limits for clear and pigmented lacquers, flat coatings, traffic coatings, and multi-color coatings, and increase VOC limits for fire-proofing exterior coatings, japans/faux finishing coatings, and magnesite cement coatings to reflect current technology. The amendments will also implement a portion of the AQMP Control Measure for architectural coatings.

COMMITTEE: Stationary Source, September 20, 1996, Reviewed

RECOMMENDED ACTION:

1. Certify the Final Subsequent Environmental Assessment for Proposed Amended Rule 1113 - Architectural Coatings; and
2. Amend Rule 1113 - Architectural Coatings.

James M. Lents, Ph.D.
Executive Officer

PL:JPB:FL:NB

Background

On October 11, the Governing Board held a Public Hearing to consider amendments to Rule 1113 - Architectural Coatings. Staff presented the proposed amendments, and public testimony was presented. The Board continued the Public Hearing to allow additional time for public testimony and for interested parties to review the staff proposal, and supporting documentation. This letter summarizes the public testimony relative to the issues presented and provides the staff's responses. This letter supplements the October Board

letter and staff report. Substitute the attached proposed Board Resolution, proposed amended Rule 1113, and Attachment 1 for the previous proposed Board Resolution, proposed amended Rule 1113, and Attachment 1.

Although the architectural coatings rule was adopted nineteen years ago and has been revised eighteen times, eleven of the eighteen amendments were at the request of manufacturers or directed by the Board to define specialty coating categories, relax limits, and clarify requirements. Four of the amendments were in response to CARB comments, requiring SIP fixes and did not achieve any emission reductions. Only three amendments were designed to obtain significant emission reductions, and part of one of those amendments was stayed by the Superior Court. These three amendments were based on technology-forcing limits. In contrast, the current proposed amendments are based on currently available technology. The staff report contains a detailed history of the amendments to Rule 1113.

Current daily emissions from architectural and industrial maintenance (AIM) coatings are estimated at 60 tons per day (tpd), based on the latest CARB survey completed in 1994. The CARB has been conducting coating surveys and estimating AIM coating emissions for many years. Figures 1 and 2, included as Attachment D, show the results of these surveys since 1975. Figure 1 has AIM coating sales, VOC emissions and population for the state. Figure 2 shows per capita data for sales, VOC emissions, and VOC content. Figure 2 shows that coating usage has not significantly changed since Rule 1113 first went into effect in September 1979. However, the average VOC content of AIM coatings has decreased 42 %, from 2.06 to 1.19 lbs/gal of material, and the per capita VOC emissions declined 34 %, from 4.60 to 3.04 lbs/person-yr. These results demonstrate the success of technology advancements and the coating manufacturers in obtaining VOC emission reductions. These trends are consistent with national trends for AIM coatings.

Proposal

Proposed Amendments

Staff is proposing to establish future lower VOC limits for a few coating categories based on currently available technology. These categories are flats, lacquers, multi-color, and traffic coatings. Table 1 summarizes the key amendments.

Additionally, for flat coatings, the proposed amended rule (PAR) includes a provision for a technology assessment for feasibility by July 1, 2000 for the 100 g/l limit and by July 1, 2007 for the 50 g/l limit. The PAR also includes an averaging provision to allow manufacturers to average the VOC content of their flat coatings, on a sales weighted basis, upon plan submittal and approval. For lacquers, the PAR also includes a provision for a technology assessment for feasibility of the 275 g/l limit by January 1, 2004. In addition,

the PAR includes an exemption for lacquers to add up to 10% retarder above the VOC limit during cool, humid days to address blushing issues with acetone formulated lacquers.

TABLE 1					
Summary of Key Proposed Amendments					
Category	**Current Limits (g/l)**	**Implementation Date**	**Proposed Limits (g/l)**	**Emission Change (Tons/day)**	**Total Emission Change (Tons/day)**
Lacquers	680	1/98 1/2005	550 275	-1.4 -1.1	- 2.5
Traffic Coatings	250	1/98	150	-1.5	-1.5
Flats Interior Exterior	250	 7/2001 7/2008 7/2001 7/2008	 100 50 100 50	 -1.7 -2.6 -0.8 -1.3	-6.4
Multi-Color Coatings	420	1/98	250	-0.1	-0.1
					-10.5

Lowering the VOC limits for flats, traffic, multi-color, and lacquers will achieve an emission reduction of 10.5 tpd based on the current emission inventory. Partially offsetting these reductions will be an increase of 0.14 tpd for japans, magnesite, and fireproofing coatings, since staff is also recommending to increase the VOC limits for these specialty coating categories that are currently under variance.

Staff recommends deletion, consolidation, and addition of definitions, as well as reinstatement of VOC limits and definitions pursuant to the Superior Court judgment. The exemption for quick-dry primers, sealers and undercoaters will continue, provided the manufacturer continues to submit to the Executive Officer annual reports of those coatings sold in the AQMD. In addition, staff has reorganized the Table of Standards coating categories into alphabetical order, eliminated coating categories that have been at the default 250 g/l limit of paragraph (c)(1) for at least three years, and consolidated similar categories with the same VOC limit.

In a letter dated October 10, 1996, the EPA supported the proposed amended rule by indicating that the EPA, "...commends the District for its recognition of the current technology in low-VOC architectural coatings and for its inclusion of the averaging provisions." A copy of the letter is included in Attachment E.

Additional Proposed Amendments
Based on the comments and concerns received during the October public hearing, staff is proposing two new provisions to the rule, including a provision that addresses the impact on small manufacturers of flats and lacquers, and a reevaluation of the proposed limits for lacquers and flats based on a review of future CARB surveys. The first proposed provision will result in a loss of emission reductions of approximately 0.2 tpd in 2008.

Staff is further proposing an additional resolution for AQMD staff to monitor any job impacts as a result of these Rule 1113 amendments.

Key Policy Issues
Several issues were raised with respect to the proposed limits for flats and lacquers as part of the public testimony during the October 11, 1996 Board meeting. Some of these issues are listed in Attachment A along with staff's responses. The remaining key issues relative to the staff's proposal for these two categories are reviewed below. The staff's response is also provided.

Performance
Some manufacturers and painting contractors testified that the low- and zero-VOC flats and lacquers are not as durable and do not perform as well as products formulated at higher VOC levels. Specifically, it was stated that the lower VOC flats exhibit lower hiding ability, adhesion, and stain resistance. As such, these lower VOC products cover less and require more frequent recoating, and more touch-up and repair. For example, Dunn-Edwards' technical research director provided scrub resistance test results comparing some of the currently available zero-VOC products with currently available products formulated at 65 g/l and 130 g/l. Data was also presented comparing Behr Process' Interior Flat Wall Super Scrub (1400) paint (VOC = 161 g/l) with Dunn Edwards' Decoval and Suprema, that indicated both Dunn Edwards' products had overall superior scrub resistance.

Response
The proposed amendments would require flats to ultimately achieve a VOC limit of 50 g/l, which is closer to the 65 g/l flat coating tested by Dunn Edwards than the zero-VOC flats. Nevertheless, zero-VOC flats are currently manufactured by three different nationally recognized companies (ICI- Glidden, Benjamin Moore, and Frazee) and several smaller companies located in different parts of the country. Low (275 g/l) VOC lacquers, primarily water-based lacquers, are produced by several manufacturers. According to these manufacturers' technical information, these products have equivalent to superior performance characteristics. Zero-VOC flats and water-based lacquers provide similar coverage, including dry mil-thickness, as conventional systems. Surface preparation for these products is identical and the estimated life of

these products is also identical. However, any thinning or clean-up for these products is usually done with water, not VOCs.

In any event, staff has established a significant time period for implementation since only a limited number of manufacturers currently produce these products, and to provide adequate time for the other manufacturers to reformulate their products. This time period consists of five and 12 years to meet the proposed 100 and 50 g/l limits for flats respectively. For lacquers, it consists of 14 months and eight years to meet the proposed 550 and 275 g/l limits. These same limits for lacquers were previously proposed and adopted in February 1990. Moreover, staff has also proposed a technology review prior to implementing the 100 g/l, 50 g/l, and 275 g/l limits. For these reviews, staff will assess the state of the technology and propose amendments to the Board as necessary. Finally, for flats, the manufacturers can make use of the averaging provisions in the rule. Several manufacturers have already indicated to staff that they will utilize this provision in the rule to meet the proposed 2001 limit of 100 g/l. Presumably, industry will also make use of the averaging provision to comply with the final 50 g/l limit.

Flammability of Acetone-Based Lacquers

Some manufactures testified that lacquers formulated with acetone to meet the future 550 g/l limit in 1998, may cause an increase in fire risks in field applications.

Response

When compared to conventional solvents such as methyl ethyl ketone, toluene or butyl acetate, based on the 1994 Uniform Fire Code (UFC) hazard classifications, acetone has identical health and physical hazard classifications. Staff has relied upon Los Angeles and Orange County fire departments, which indicate that such products pose the same degree of fire hazard as conventional lacquers. Thus, acetone would not create an increased fire hazard, and as a solvent, handling characteristics would be identical relative to fire department procedures. The UFC treats all of the mentioned solvents as Class I Flammable liquids, and considers them all to present the same relative degree of fire hazard. Letters from the Los Angeles County Fire Department and Orange County Fire Authority addressing this issue are included in Attachment E

However, acetone is significantly less toxic than solvents used in traditional solvent-based lacquers. The daily exposure limits are more than seven times lower for xylenes, more than three times lower for toluene and MEK, and almost two times lower for isopropanol, as compared to the daily exposure limit for acetone. The extremely lower toxicity of acetone as compared to other, traditional solvents is further illustrated by the Immediate Danger to Life or Health (IDLH) exposure limits. Allowable acetone exposure limits are ten times greater than toluene, more than six times greater than MEK, and two times greater than xylene. In the Federal Register dated June 16, 1996, the EPA granted

a petition to delete acetone from the list of toxic chemicals under Section 313 of the Emergency Planning and Community Right-to-Know Act, better known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986.

Impact of Low-VOC Coatings on Painters

Several speakers raised concern over the impact lower-VOC products will have on the painting contracting industry. Specifically, the painters contend that since they are held accountable for the final product, that their jobs are at stake if the low- and zero-VOC flats do not perform as well as currently available products.

Response

Throughout the development of these amendments staff conducted numerous site visits and observations of painting in the field of low- and zero-VOC paints. Attachment B provides a short list of current users of low- and zero-VOC flats in the South Coast Air Basin (Basin).

During these field observations, painters indicated that both the low- and zero-VOC flats performed well, but the zero-VOC flats require a slightly different technique that must be employed due to the faster dry times. Namely that when painting walls using a roller, a smaller area is painted at a time to maintain a wet edge, as opposed to the current method, where the perimeter of a wall is painted first before proceeding to cover the full wall space.

Additionally, staff has proposed future effective limits for flats that are several years in the future. This is to allow sufficient time for manufacturers to incorporate the necessary technologies and for painters to become accustomed to their use. Furthermore, the AQMD, along with manufacturers of the zero-VOC paints, plan to initiate training programs for painters and the paint contracting community. AQMD staff will also develop literature with manufacturers for the do-it-yourself end users.

Interior Versus Exterior Flats

Representatives of Sherwin Williams, Benjamin Moore, and the National Paint and Coatings Association suggested that the Board establish a separate category for exterior flats with a limit of 200 g/l in 2001. They claim that due to the environmental conditions that these paints must meet, exterior flats generally must be formulated at a higher VOC content to provide the film forming characteristics for their softer resins. At present, they claim most exterior flats would not meet the proposed 2001 limit of 100 g/l. They also stated that zero-VOC exterior flats have only recently been introduced on the market, and have had only limited use.

Response
Exterior flats comprise approximately one-third of the total flats sold in the Basin. The 1994 CARB survey indicates that 31% of the flats sold in 1990 complying with the proposed 100 g/l limit are recommended for exterior use only, 53% for interior use only, and 16% for either interior or exterior use. Furthermore, since a significant portion of the interior flats sold already meet the future limit, manufacturers can utilize the averaging provision to meet the future limits. With regard to the zero-VOC limit for exterior flats, manufacturers have 12 years for the technology to continue to develop and refine the coatings to meet this future limit and the performance requirements. Additionally, staff will review the technology prior to the effective date of the rule and provide recommendations to the Board as necessary.

Impact on Small Manufacturers
A few speakers testified that the proposed limits for flats and lacquers will disproportionally impact small manufacturers in the Basin. These speakers testified that there may be small manufacturers that produce higher-VOC specialized products to meet specific niche markets. Further, these manufacturers cannot make use of the averaging provisions in the rule for flats since they do not produce lower-VOC products to offset their specialized products.

Response
CARB conducts an extensive survey of paint production and sales in California every few years. According to the latest CARB survey, there are approximately 19 manufacturers of flats and eight manufacturers of lacquers located in the Basin. In response to these potential impacts on small manufacturers, staff is proposing to add a provision to the rule which will address the concerns of small manufacturers by delaying the final January 1, 2005 compliance date for lacquers to January 1, 2007 and exempting them from the final July 1, 2008 VOC limit for flats. A small manufacturer includes any manufacturer that has total gross annual receipts of $2,000,000 or less and 100 or less employees, which is consistent with the definition used in Rule 1302 - Definitions.

Future Surveys and Studies
Finally, several speakers recommended that the Board not adopt the proposed limits for flats and lacquers and wait until several ongoing or soon-to-be-initiated studies are completed. Attachment C summarizes the ongoing study being conducted by Eastern Michigan University for staff, as well as the reactivity studies by North American Research Strategy for Tropospheric Ozone (NARSTO), CARB, and EPA. It also reviews the status of the CARB architectural coating survey and expected completion date.

Response
To the extent these studies are relevant to the proposed rulemaking, staff will consider the results of these studies as part of the required technology assessments, which should be conducted at approximately the time these studies will be completed. The AQMD staff study by Eastern Michigan University specifically examines the performance issues associated with specialty coatings which are not the subject of this proposed amendment. The reactivity studies by CARB and EPA have only been recently initiated and are not expected to be completed for several years. Finally, the CARB survey is anticipated to commence next year. CARB staff has indicated that it will take more than two years to collect the sales data through confidentiality agreements, as well as collect and analyze the samples from the over two hundred manufacturers of architectural coatings. Lastly, staff is monitoring work being done by NARSTO to evaluate research studies conducted at the national and local level.

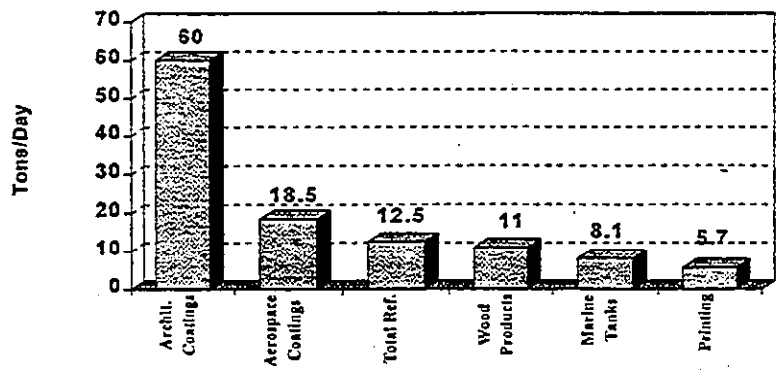
AQMD staff does not believe delaying these rule amendments to incorporate these future studies is appropriate, since the proposed limits are based on currently available technology and are required to be implemented pursuant to the 1994 AQMP.

AQMP and Legal Mandates
The 1994 AQMP, which included a specific control measure (CTS-07) to reduce AIM VOC emissions by 75 % by the year 2010, received SIP approval on September 26, 1996 and is therefore considered federally enforceable. The AQMP incorporates the concepts that each industry will reduce their fair share of emissions and there should be relative equity in the costs of these reductions.

These proposed Rule 1113 amendments implement a small portion of the 1994 AQMP because they include lowering the VOC limits for only a few of the coating categories discussed in the control measure. The proposed amendments will only reduce AIM emissions by 17.2%, which equates to approximately an 11.8 tpd reduction in 2010. This is only a fraction of the 75% emission reduction that will eventually be required from AIM coatings to provide their fair share of the required emission reductions.

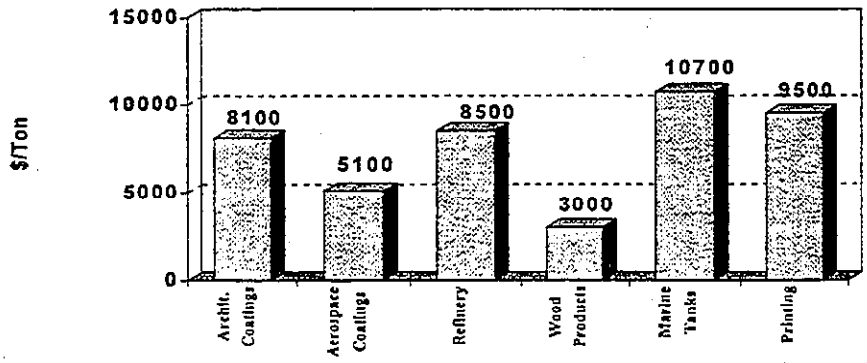
As presented to the board, emissions from architectural coatings are the largest stationary source category of emissions subject to AQMD requirements. They are larger than all of the refinery emissions, wood furniture facilities, printing, marine tanks, and aerospace facilities combined. Figure 1 compares emissions from these sources.

Figure 1
Comparison of Daily VOC Emissions



The additional proposed revisions contained in Attachment F were added to reduce cost impacts to small businesses. This cost savings however, is not easily quantifiable and for purposes of calculating cost-effectiveness figures, it is conservatively assumed that no cost savings is achieved while some emissions reductions are lost. As a result, cost-effectiveness figures are slightly, but insignificantly, changed for the proposed rule. These changes are listed in the attached revised Table 8 of the socioeconomic impact assessment (Attachment G). The cost-effectiveness of the proposed amendments is estimated to be $8,100 per ton and is not within the ranking order of control measures in the 1994 AQMP. Figure 2 illustrates a comparison between the cost-effectiveness of various VOC control rules and the proposed amendments. As can be seen, the cost effectiveness of the proposed amendments is within the range of other amended rules, including Rule 1124 - Aerospace Coatings, Rule 1173 - Fugitive Emissions of VOCs, Rule 1136 - Wood Products Coatings, Rule 1142 - Marine Tank Vessel Operations, and Rule 1130 - Graphic Arts. The draft 1997 AQMP considers this control measure to be a key element of its strategy to achieve the national standard for ozone by the year 2010.

Figure 2
Cost-Effectiveness Comparison



Attachments

Additional issues raised
Example of current low- and zero-VOC coating users
Ongoing and future studies
CARB Survey - Summaries
Letters from EPA and Fire Departments
Additional Proposed Amendments
Revised Table 8 of Socioeconomic Impact Assessment

ATTACHMENT A

ADDITIONAL ISSUES RAISED

Rule 1113	
Issue	Response
Thinning of lacquers in the field due to increased solids content	Manufacturers can reformulate existing lacquers using acetone or water, as accomplished by manufacturers of lacquers for the Wood Products Industry, without increasing the solids content or viscosity of the coating. However, if thinning is necessary, the coating would be thinned with acetone or water. Even assuming thinning with lacquer retarder under a worst case scenario of 12% addition of butyl cellusolve for 365 days, the proposed amendments still result in significant emission reductions. The 275 g/l waterborne lacquers and the waterborne flat coatings would be thinned with water, if necessary.
1980 CARB survey is accurate and should be used as a starting point for per capita emissions. Questions validity of 1975 and 1979 data.	According to the 1984 CARB survey, CARB staff indicated that for the 1980 survey, "the response to the survey was somewhat limited" and go on to indicate that the 1980 survey "represented about 70% of the architectural coatings sold in California that year." In comparison, the 1984 CARB survey represented about 95% of all architectural coatings. The data for the 1975 and 1979 points were obtained from CARB memos pertaining to emissions from architectural coatings. The 1975 data is considered an important starting point, since the data preceded the 1979 implementation of AIM coating rules in California. Furthermore, it clearly illustrates the incompleteness of the 1980 survey. The figures are included in Attachment D. Even if the disputed 1975, 1979, and 1980 data points are not considered, the remaining data points clearly show a reduction in per capita emissions.

ATTACHMENT A

ADDITIONAL ISSUES RAISED

CONTINUED

Rule 1113	
Issue	Response
Acetone-based lacquers do not perform as well as conventional lacquers	Staff believes that acetone-based lacquers perform as well as conventional lacquers. This is based on site visits and other manufacturers' data collected during the extensive rulemaking for Rule 1136 - Wood Products Coatings. Staff has found that acetone-based lacquers are a little more sensitive to high humidity conditions than conventional lacquers and experience blushing, thus the proposed rule allows for addition of retarder (up to 10% butyl cellusolve) to eliminate the blushing problems during days when relative humidity is above 70% and temperature is below 65 degrees Fahrenheit.
Averaging proposal favors larger companies with many product lines and is unenforceable	The proposed averaging program parallels the CARB's Alternative Control Plan Regulation for Consumer Products which some manufacturers are already using. Staff has added additional language in the averaging provision to clarify the requirements of the averaging plan based on industry's comments. Staff has also determined that some smaller manufacturers have created a market niche by offering low- or zero-VOC coatings. For example, seven of the ten manufacturers of interior, zero-VOC flat coatings are smaller companies. Staff has evaluated and resolved concerns expressed by CARB regarding enforceability of the averaging provision by adding a specific violations section to the averaging provision. Neither CARB or EPA have expressed any additional concerns regarding the enforceability of the averaging provision.

ATTACHMENT A

ADDITIONAL ISSUES RAISED

CONTINUED

Rule 1113	
Issue	Response
Proposed amended Rule 1113 creates a confusing difference in limits for stains with Rule 1136	The proposed amendments do not affect limits for stains, but do add a definition for stains to consolidate the categories of "semi-transparent stains" and "opaque stains" into one category, "stains" without affecting the applicable VOC limit. Under Rule 1136, high-solids stains are stains containing more than 1 pound of solids per gallon of material, and include wiping stains, glazes, and opaque stains. Many coating suppliers agreed that reformulating with acetone could reduce VOC emissions for high-solids stains. Several suppliers have successfully reformulated their stains with acetone to achieve the final compliance VOC content limit of 240 g/l, but feel that colder, humid days may cause blushing. Recently amended Rule 1136 also allows for addition of retarder (up to 10%) to eliminate any blushing problems
No reliable test method at lower VOC levels	Test Method 24, which is approved and required by EPA, may be used to test the VOC content of coatings at lower levels of VOC. While there is an issue of the sensitivity of the test calculation at lower VOC levels, that concern does not render the lower limits unenforceable. In addition, other test methods are being developed to test coatings with low-VOC content by various educational institutions, manufacturers, and regulatory agencies, including California Polytechnic University, San Luis Obispo, Midwest Research Institute, USEPA, and AQMD. In particular, the AQMD is currently working on a direct measurement test method using a GC/MS to evaluate the overall VOC content.

ATTACHMENT A

ADDITIONAL ISSUES RAISED

CONTINUED

Rule 1113	
Issue	Response
There are a variety of uses and coatings under the flat coating category. Flats should be divided at least into interior and exterior flat categories subject to different VOC limits.	Compliant coatings for flats are currently available for both interior and exterior uses. Staff has found these compliant coatings to have equivalent performance characteristics found in some higher-solvent containing flat coatings. Staff recognizes that there are limited, special use flat coatings which may require additional development to meet the 50 g/l limit, such as elastomeric coatings. Staff has proposed, in accordance with industry comments, additional time for reformulation and market acceptance, nearly five years to meet the interim limit and nearly twelve years to meet the final limit. Staff notes that based on the CARB survey, over 40% of all flat coatings sold in California comply with the interim limit. In addition, staff has included a commitment for a detailed technology assessment one year prior to the implementation dates to re-evaluate available coatings. Lastly, and most importantly, staff has included an averaging provision for manufacturers to enable them to average the emissions from the flat coatings. This provision would allow them to continue selling non-compliant coatings, as long as the average sales weighted emissions are equivalent or lower than emissions based on the VOC limits.

ATTACHMENT A

ADDITIONAL ISSUES RAISED

CONTINUED

Rule 1113	
Issue	Response
Socioeconomic report flawed	The AQMD has satisfied all the requirements in the California Health and Safety Code Sections 40440.5, 40440.8, 40728.5 and 40920.6. The socioeconomic analysis (Appendix H) was performed based on the assumption that existing coatings will be reformulated to meet future VOC limits, given the currently available compliant coatings. The socioeconomic impact assessment for the proposed amendments analyzes affected industries, a range of control costs, cost-effectiveness, incremental cost-effectiveness, and employment impacts by ethnicity, by industry, and by occupation group. The average annual compliance cost of the proposed amendments is about $14.5 million. The impacts of the proposed amendments on end users were analyzed in the socioeconomic impact assessment. Painting contractors (SIC 172) and do-it-yourself paint users would pay higher prices for reformulated coatings. The impacts on independent retail dealers are presented as impacts on the retail sector (SICs 52-75, 59). The socioeconomic assessment also covers other potential economic impacts, including impacts on competitiveness of affected industries, small business impacts, and impacts on the price index of consumption by different income groups.

ATTACHMENT B

EXAMPLE OF CURRENT LOW/ZERO VOC USERS*

User of Zero-VOC Coatings (<50 g/l)	Users of Low-VOC Coatings (<100 g/l)
City of Hope	Do-it-yourself market
City of San Diego	Los Angeles Unified School District
Disneyland	McDonnell Douglas
Do-it-yourself market	Paramount Studios
Jet Propulsion Laboratories	J. Paul Getty Museum
Kaiser Hospital	Universal Studios
Lockheed Martin	Various Contractors
Parks Water District	
Rockwell	
SBV Junior College	
SCAQMD	
The Gas Company	
TRW	
U.S. Air Force	
Vandenberg Air Force Base	
Various Contractors	

* - Based upon SCAQMD site visits and telephone discussions

ATTACHMENT C

ONGOING AND FUTURE STUDIES

Rule 1113	
Study	Comment
Eastern Michigan University	Contract #96136 was awarded to Eastern Michigan University, Coatings Research Institute, on June 7, 1996 to perform an informational study of currently available low-VOC specialty coatings, an evaluation of the lowest VOC limits achievable for some of the specialty coating categories by 2000 and 2005, and to assess and address six specific issues raised by industry for the specialty coatings. A Draft Final Report is due on December 31, 1996.
CARB Survey	The CARB plans to conduct another architectural coatings use survey in 1997, which will be completed in approximately two years from the starting date.
NARSTO Study	AQMD staff is also continuing to monitor studies being conducted by NARSTO, both at the local and national level regarding atmospheric measurements. This is a long-term study and will take several years to complete.
CARB Reactivity Studies	The CARB has recently contracted a research study to Dr. William Carter to assess the reactivity of solvents found in consumer products and industrial solvents. The CARB has prioritized the need for better reactivity factors for solvents used in waterborne coatings. The EPA and Dr. Carter have indicated a need for better reactivity data before promulgating a reactivity-based ozone control strategy. This is a two-year study and is expected to be completed by the end of 1998.

ATTACHMENT D

CARB SURVEYS - 1975 TO 1990 DATA

Figure 1
California AIM Coating Sales,
VOC Emissions and Population

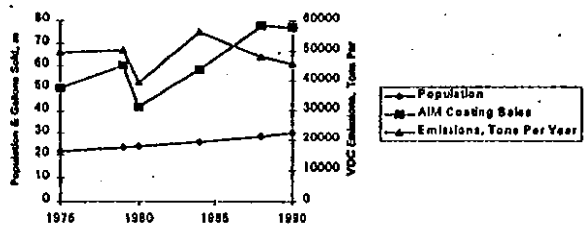
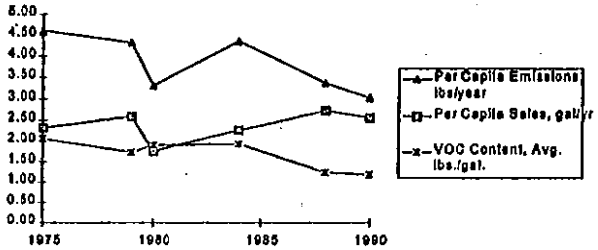


Figure 2
California Per Capita AIM Coating Sales,
VOC Emissions and VOC Content



ATTACHMENT E - Letters

USEPA
Orange County Fire Authority
Los Angeles County Fire Department

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

October 10, 1996

Ms. Patricia Leyden
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

Re: Proposed Amended Rule 1113 - Architectural Coatings

Dear Ms. Leyden:

EPA has reviewed the 9/23/96 version of Proposed Amended Rule 1113 - Architectural Coatings, and commends the District for its recognition of the current technology in low-VOC architectural coatings and for its inclusion of averaging provisions that provide flexibility to coating manufacturers. EPA considers adoption of the proposed changes to Rule 1113, representing a mass emissions based strategy, to be an important part of the AQMD's ozone control strategy and the AQMP.

Although Proposed Amended Rule 1113 will achieve significant emission reductions through use of currently available compliant coatings, EPA recognizes that there are some coating situations where these compliant coatings may not perform adequately. EPA also recognizes that the proposed Rule 1113 allows significant time for development to enhance the performance characteristics of these compliant coatings. As a result, EPA understands that the District will continue to assess the feasibility of low-VOC technologies. If, in the future, the District decides to revise Rule 1113, EPA would be able to approve a revision to the applicable state implementation plan (SIP) provided that the District demonstrates that the revision will not interfere with reasonable further progress, attainment, or any other requirement of the Clean Air Act. EPA understands that the District believes such a demonstration may be made if revision of Rule 1113 is necessitated because the technologies relied upon in this rule have been found to be technologically infeasible or ineffective in achieving emission reductions in the near-term. In addition, EPA realizes the importance of minimizing the amount of time it takes to approve a revision to the SIP and will expedite its review of any revisions to Rule 1113.

EPA urges adoption of Rule 1113 by the South Coast AQMD Governing Board and looks forward to receiving a fully approvable version of Rule 1113 for incorporation into the SIP. The attainment strategy in the ozone SIP necessarily counts on still further emission reductions from this very large VOC source category.

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EPA looks forward to working with the District to ensure that continued progress occurs and these additional emission reductions are achieved.

Sincerely,

David P. Howekamp
Director, Air & Toxics Division

cc: Jack Broadbent, SCAQMD
Naveen Berry, SCAQMD
Peter Venturini, CARB

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294
(213) 890-4132

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

June 12, 1996

Mr. David DeBoer
Air Quality Management District
21685 E. Copley Dr.
Diamond Bar, CA 91765-4182

Re: RELATIVE HAZARDS OF SOLVENTS USED IN PAINTS

Dear Mr. DeBoer:

After our phone conversation concerning the substitution of acetone for other solvents commonly used in paints, I reviewed the properties of the materials you named:

SOLVENT	NFPA 704 HEALTH	NFPA 704 FIRE	FP	BP	FLAMMABLE RANGE	IGNITION TEMP
ACETONE	1	3	-4	133	2.5 -- 13	869
BUTYL ACETATE	1	3	72	260	1.7 -- 7.6	797
MEK	1	3	16	176	1.4 -- 11.4	759
XYLENE	2	3	81	282	1.1 -- 7.0	982

Xylene is the least flammable and is listed as a Class I-C Flammable Liquid, but has a higher health hazard. The other three are Class I-B Flammable Liquids.

The Uniform Fire Code treats all four of the above solvents as Class I Flammable Liquids, considering them all to present the same relative degree of fire hazard. The Fire Code sets the same requirements for the storage, use and handling of all ~~three~~ four.

TRW
7/96

There are many factors that would contribute to the fire hazard when any of these solvents are used in paint. When spread thinly over a surface at normal ambient temperature (70 degrees fahrenheit), the first three would emit a sufficient quantity of vapors to be ignited. Spraying paint with these solvents in it, greatly increases the fire hazard.

SERVING THE UNINCORPORATED AREAS OF LOS ANGELES COUNTY AND THE CITIES OF:

AGOURA HILLS, ARTESIA, AZUSA, BALDWIN PARK, BELL, BELLFLOWER, BELL GARDENS, BRADBURY, CALABASAS, CARSON, CERRITOS, CLAREMONT, COMMERCE, CUDAHY, DIAMOND BAR, DUARTE, GLENDORA, HAWAIIAN GARDENS, HIDDEN HILLS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA FLINTRIDGE, LAKEWOOD, LA MIRADA, LANCASTER, LA PUENTE, LAWNDALE, LOMITA, MALIBU, MAYWOOD, NORWALK, PALMDALE, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROLLING HILLS, ROLLING HILLS ESTATES, ROSEMEAD, SAN DIMAS, SANTA CLARITA, SIGNAL HILL, SOUTH EL MONTE, SOUTH GATE, TEMPLE CITY, WALNUT, WEST HOLLYWOOD, WESTLAKE VILLAGE, WHITTIER

In my opinion, acetone presents the highest degree of fire hazard of the four solvents considered, but is not significantly more hazardous than the others. All four should be used with extreme caution, with proper safeguards in place.

Should you need further information or assistance on this matter, please contact me at (213) 890-4132.

Sincerely,

Michael R. Lee

Michael R. Lee
Captain, Petroleum-Chemical Unit
Fire Prevention Division

cc:
Burciaga
Lyle
Lee
x

ORANGE COUNTY FIRE AUTHORITY
HAZARDOUS MATERIALS DISCLOSURE OFFICE
180 South Water St. • Orange, CA 92666-2175 • (714) 744-0463
Larry J. Holms, Director of Fire Services

RECEIVED
AUG - 1 1996
SCAQMD
OFFICE OF PLANNING & RULES

July 24, 1996

Mr. Darren W. Stroud
Office of Planning & Development
South Coast AQMD
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

SUBJECT: Rule 1113 Amendments -Acetone As A Reducing Agent
Draft Subsequent Environmental Assessment (SEA)

Dear Mr. Stroud:

This letter is in response to the draft SEA pertaining to the relative hazards of utilizing Acetone as a substitute reducing agent for Toluene, MEK, Butyl Acetate or Xylene in the formulation of architectural coatings. These comments are based upon the relative hazards of these materials as defined by the 1994 Uniform Fire Code (UFC).

I have reviewed the UFC hazard classifications of these materials and have found that Acetone has identical physical and health hazard classifications when compared to Toluene, MEK and Butyl Acetate. Acetone is classified as a class 1B flammable liquid and as an irritant material. Xylene is classified as a class 1C flammable liquid, irritant and other health hazard material. I have also reviewed the flammable limits range for these four materials and found them to be very similar, with MEK presenting the widest flammable range (1.4 -11.4 %/volume).

Based upon the identified hazard classifications, Acetone would not pose any greater relative physical or health hazard when compared to Toluene, MEK or Butyl Acetate. Acetone does pose a somewhat increased flammability hazard when compared to Xylene. This comparison *assumes that the revised formulation of the architectural coatings will allow for an equivalent* percentage of Acetone when compared to the other reducing agents.

I would also note that the storage and use of all of these materials are specifically regulated under Articles 79 & 80 of the 1994 Uniform Fire Code (1995 California Fire Code) which has been adopted by the State of California at Title 24, Part 9, CCR. The fire code limits the allowable quantities of these materials for both interior/ exterior storage and use. The fire code also requires various safety control systems and specifies handling methods.

I hope the information provided is useful to the AQMD in developing amendments to rule 1113. If you have any additional questions, I may be contacted at (714) 744-0465.

Respectfully,

Brett Petroff
Senior Fire Safety Specialist

pc: *Christine Boyd/ OCFA/ Manager/ Hazardous Materials Disclosure Office*
Laura Blaul/ OCFA/ Deputy Fire Marshal/ Planning & Development

ATTACHMENT F

Additional Proposed Amendments

Small Business Manufacturers Provision

(g) Exemptions

(4) The January 1, 2005 VOC limit for lacquers shall not be applicable until January 1, 2007 and the July 1, 2008 VOC limit for flat coatings shall not be applicable to any manufacturer which meets all of the following criteria.

(A) The total gross annual receipts are $2,000,000 or less, and

(B) The total number of employees is 100 or less, and

(C) The manufacturer requesting this exemption files a written request with the Executive Officer annually which includes, but is not limited to,

(i) The total gross annual receipts for each of the last three years.

(ii) The total number of employees for each of the last three years

For the purposes of determining the total gross annual receipts and the total number of employees, a manufacturer shall include data from all facilities (both within and outside of the District) which they own, operate, have an ownership interest, or are legally affiliated. If a manufacturer exceeds the criteria specified in subparagraphs (g)(4)(A) or (g)(4)(B) any time after the initial request is filed with the Executive Officer, this exemption shall be immediately terminated, the manufacturer shall forfeit any future eligibility for this exemption, and the manufacturer shall be considered in violation of this rule for each and every day that lacquers or flat coatings which do not comply with the respective VOC limit in the Table of Standards are supplied, sold, or offered for sale within the District. The loss of this exemption due to the manufacturer exceeding the criteria in subparagraphs (g)(1)(A) or (g)(1)(B) shall apply only to the manufacturer.

Review of Future CARB Surveys Provision

(f) Technology Assessment for Flats and Lacquers

The Executive Officer shall conduct:

(1) A technology assessment for the future VOC limits for flat coatings as specified in paragraph (c)(2) by July 1, 2000 and July 1, 2007.

(2) A technology assessment for the future VOC limit for lacquers specified in paragraph (c)(2) by January 1, 2004.

(3) In conducting the above technology assessments, the Executive Officer shall consider any applicable future California Air Resources Board surveys on architectural coatings.

After each technology assessment, the Executive Officer shall report to the Governing Board as to the appropriateness of maintaining the future VOC limit.

ATTACHMENT G

Revised Table 8

Comparison of Alternatives to Proposed Amendments (Millions of 1995 $)

Alternative	Emissions Reduction (tons/day)	Cost-Effectiveness ($/ton)*	Annual Average Cost (1998-2010)	Annual Average Job Impact (1998-2010)
Proposed Amendments	10.3	$8,100**	$14.5	-305
Alternative A	0.0	N/A	0.0	0
Alternative B	6.4	$12,000	$13.3	-278
Alternative C	2.5	$1,400	$1.1	-30
Alternative D	10.5	$18,000	$14.0	-295
Alternative E	1.6	N/A	0.0	0

* The cost-effectiveness values represent only the categories which have cost impacts associated with them.

** Revised from $8,000 from original Table 8 of the Socioeconomic Impact Assessment Report.

RESOLUTION NO. 96-

A Resolution of the Governing Board of the South Coast Air Quality Management District ("AQMD") certifying the Final Subsequent Environmental Assessment prepared for the proposed amendments to Rule 1113.

A Resolution of the AQMD Governing Board Amending Rule 1113 - Architectural Coatings.

WHEREAS, AQMD staff has proposed additional revisions to the October 11, 1996 staff rule proposal, contained in Attachment F of the November 8, 1996 Board Letter, in order to address economic impacts to small paint manufacturers and to incorporate a review of future California Air Resources Board architectural coatings surveys in the proposed technology assessments; and

WHEREAS, the AQMD Governing has determined that the additional revisions are not significant within the meaning of California Environmental Quality Act Guidelines Section 15088.5 and California Health & Safety Code Section 40726; and

WHEREAS, the AQMD Governing Board finds and determines that the proposed amendments to Rule 1113 - Architectural Coatings, which now includes the proposed revisions contained in Attachment F, are considered a "project" pursuant to the California Environmental Quality Act (CEQA); and

WHEREAS, the AQMD has had its regulatory program certified pursuant to Public Resources Code Section 21080.5 and has conducted CEQA review and analysis pursuant to such program (Rule 110); and

WHEREAS, the 1994 AQMP contained a control measure, #94CTS-07, which Proposed Amended Rule 1113 partially implements, for which a program EIR was prepared and certified; and

WHEREAS, new information regarding the use of acetone in place of other traditional solvents became available after the certification of the 1994 AQMP program EIR, such that AQMD staff has prepared a Draft Subsequent Environmental Assessment (SEA) pursuant to AQMD Rule 110 setting forth the potential environmental consequences of adopting Proposed Rule 1113 - Architectural Coatings; and

WHEREAS, the SEA also constitutes a subsequent CEQA document to the February 1990 CEQA document for Rule 1113 in compliance with a Superior Court order relating to lacquers; and

WHEREAS, it is necessary that the adequacy of the environmental document be determined by the AQMD Governing Board prior to its certification; and

WHEREAS, a potentially significant environmental impact was identified for the proposed project due to forgone potential air emission reductions resulting from the immediate increase of VOC limits for certain specialty coatings that consist of japans, magnesite, and fireproofing coatings, which cannot be mitigated to a level of insignificance; and

WHEREAS, such forgone emissions reductions would be more than offset by other proposed amendments which lower VOC limits for lacquers, flats, traffic coatings, and multi-color coatings, with some of these lowered limits taking effect on January 1, 1998; and

WHEREAS, several comment letters were received commenting on the Draft SEA; and

WHEREAS, the Draft SEA has been revised and responses to comments have been prepared such that it is now a Final SEA; and

WHEREAS, no feasible mitigation measures or project alternatives have been identified to mitigate the identified potential temporary significant air quality impact to insignificance for the reasons stated in Attachment 1; and

WHEREAS, a Statement of Overriding Considerations, set forth in Attachment 1, has been prepared stating the specific reasons for this Board's action in finding that the benefits of the proposed project outweigh the unavoidable environmental effects, such that the adverse effects may be considered acceptable; and

WHEREAS, the final SEA and Attachment 1 have been completed in compliance with CEQA and Rule 110; and

WHEREAS, the staff report, which includes the final SEA and the Socioeconomic Impact Analysis, this November 8, 1996 Board letter, Attachment 1, and other supporting documentation was presented to the AQMD Governing Board and that the Board has reviewed and considered the entirety of this information prior to approving the project; and

WHEREAS, the AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Sections 40000, 40001, 40440, 40463, 40702, and 40725 through 40728 of the California Health and Safety Code; and

WHEREAS, the AQMD Governing Board has determined that a need exists to amend Rule 1113 - Architectural Coatings to achieve VOC emission reductions of up to 17.2 % of the VOC emissions inventory for architectural coatings, in accordance with the Air Quality Management Plan ("AQMP") Control Measure CTS-07, which equates to about 10.3 tons per day based upon current emissions inventory and about 11.6

tons per day based upon projected 2010 emissions inventory, to raise VOC limits for certain specialty coatings, to reinstate certain VOC limits to comply with a superior court order, and to clarify rule language; and

WHEREAS, the AQMD Governing Board has determined that the proposed amendments to Rule 1113 - Architectural Coatings, are written and displayed so that the meaning can be easily understood by persons directly affected by them; and

WHEREAS, the AQMD Governing Board has determined that Rule 1113 - Architectural Coatings, as proposed to be amended, is in harmony with, and not in conflict with, or contradictory to, existing statutes, court decisions, or state or federal regulations; and

WHEREAS, the AQMD Governing Board has determined that Rule 1113 - Architectural Coatings, as proposed to be amended, does not impose the same requirement as any existing state or federal regulation, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD; and

WHEREAS, the AQMD Governing Board in amending the regulation, references the following statutes which the AQMD hereby implements, interprets or makes specific: Health and Safety Code Sections 40001 (rules to achieve ambient air quality standards), 40440(a) (rules to carry out the Air Quality Management Plan), 40440(b) (BARCT), and 40440(c) (cost effectiveness), and Federal Clean Air Act Section 171 et seq., 181 et seq. and 116; and

WHEREAS, the AQMD Governing Board determines that there is a problem that Proposed Amended Rule 1113 - Architectural Coatings will alleviate, (i.e., the South Coast Air Basin does not meet state or federal standards for ozone) and the proposed amendment will promote the attainment or maintenance of such air quality standards; and

WHEREAS, the AQMD Governing Board has determined that the socioeconomic impact assessment for proposed Rule 1113 - Architectural Coatings, as updated by this November 8, 1996 Board letter, is consistent with the March 17, 1989 and October 14, 1994 Board Socioeconomic Resolution for rule adoption; and

WHEREAS, the AQMD Governing Board has determined that the socioeconomic impact assessment as updated is consistent with the provisions of Health and Safety Code Sections 40440.8, 40728.5 and 40920.6; and

WHEREAS, the AQMD Governing Board has determined that the proposed amendments to Rule 1113 - Architectural Coatings will result in increased costs to industry, yet are considered cost effective with a cost effectiveness as described in the socioeconomic impact assessment as updated; and

WHEREAS, Proposed Amended Rule 1113 - Architectural Coatings is a control measure in the 1994 AQMP and, thus, has been ranked by cost-effectiveness relative to other AQMP control measures in the 1994 AQMP; and

WHEREAS, the socioeconomic impact assessment further presents incremental cost effectiveness data between CEQA alternatives; and

WHEREAS, the AQMD Governing Board has actively considered the socioeconomic impact assessment as updated and has made a good faith effort to minimize such impacts; and

WHEREAS, the proposed amendments to Rule 1113 - Architectural Coatings helps achieve the maximum feasible emission reduction of VOCs from the coating categories of flats, lacquers, traffic and multi-color coatings, which is estimated to be up to 10.3 tons/day, and that even after considering the socioeconomic impact assessment as updated, the adoption of such amendments is necessary for achieving the federal and state standards for ozone and for implementing the AQMP; and

WHEREAS, a public hearing has been properly noticed in accordance with all provisions of Health and Safety Code, Section 40725; and

WHEREAS, the AQMD Governing Board has held two public hearings in accordance with all provisions of law; and

WHEREAS, the AQMD specifies the Manager of Rule 1113 as the custodian of the documents or other materials which constitute the record of proceedings upon which the adoption of this proposed amendment is based, which are located at the South Coast Air Quality Management District, 21865 E. Copley Drive, Diamond Bar, California.

NOW, THEREFORE BE IT RESOLVED that the AQMD Governing Board does hereby approve the written responses to the comments to the draft SEA, adopt Attachment 1 including the contained Statement of Overriding Considerations, and certify the Final SEA for Proposed Amended Rule 1113 - Architectural Coatings, which was completed in compliance with CEQA and Rule 110 provisions; and find that the Final SEA was presented to the AQMD Governing Board, whose members reviewed, considered, and approved the information therein prior to acting on Proposed Amended Rule 1113 - Architectural Coatings; and

BE IT FURTHER RESOLVED, that the AQMD Governing Board does hereby amend, pursuant to the authority granted by law, Rule 1113 - Architectural Coatings, as set forth in the attached, and incorporated herein by this reference.

BE IT FURTHER RESOLVED that AQMD staff will monitor employment impacts on small manufacturers of flat coatings and lacquers in the South Coast Air Basin and shall include a report of such impacts in the technology assessment reports to the AQMD Governing Board.

BE IT FURTHER RESOLVED that the Board directs AQMD staff to work with CARB and USEPA to expeditiously amend the State Implementation Plan ("SIP") if the technology assessments result in the need to amend the future VOC limits for lacquers or flats, and to work with the USEPA to establish an administrative method of reporting in Title V permits, rules which have been amended but for which amendments have not yet been approved in the SIP without a finding of non-compliance due to following the amended rules.

Attachment

DATE:_____

_____
CLERK OF THE BOARDS

ATTACHMENT 1 TO THE BOARD RESOLUTION

STATEMENT OF FINDINGS AND OVERRIDING CONSIDERATIONS

Introduction
Potential Adverse Impacts Found To Be Significant
Statement of Findings
Statement of Overriding Considerations
Mitigation Monitoring
Conclusions

INTRODUCTION

CEQA requires a public agency's decision makers to consider the information in the CEQA document along with other information which may be presented to the agency when deciding to approve a project. This Attachment, as well as the Final Subsequent Environmental Assessment sets forth the factors considered in the AQMD Governing Board's evaluation of environmental benefits and potential impacts resulting from implementing the proposed amendments to Rule 1113.

POTENTIAL ADVERSE IMPACTS FOUND TO BE SIGNIFICANT

Air Quality Impacts

PAR 1113 would lower the VOC limits for specific coating categories including: lacquers, flat coatings, multi-color, and traffic coatings. The proposed amendments also include increasing allowable VOC limits for certain specialty coatings which are currently under variances because they cannot meet the existing rule limits. These specialty coatings include: exterior fire proofing coatings, magnesite cement coatings, and japans/faux finishing coatings. Implementation of all rule changes will result in a net VOC emission reduction of 10.5 tons per day.

Partially offsetting these anticipated VOC emission reductions is an increase of 0.10 tons per day of VOCs where the higher VOC content limits are being proposed. These coatings however, have been sold at these higher limits under a variance for the past two years, and as a result, there will be no actual increase in VOC emissions. The proposed amendments to increase the VOC limits will take effect upon adoption, while the other amendments to reduce VOC limits will take effect no earlier than 14 months after adoption.

These temporary foregone emission reductions nevertheless exceed the AQMD's significance threshold of 55 pounds of VOC per day contained in the AQMD's CEQA Air Quality Handbook (AQMD, 1993). These foregone emission reductions are therefore considered potentially significant. This adverse air quality impact would last approximately 14 months, until other provision of the proposed amended rule become effective. If adopted, the overall affect of these proposed

amendments would be to reduce potential VOC emissions by 10.5 tons per day by the year 2010. As a result, the October amendments to Rule 1113 would more than offset the 0.10 ton per year of foregone VOC emission reductions. This short-term effect, however, is still considered to be significant.

STATEMENT OF FINDINGS

When approving a project which may have one or more significant adverse environmental effects, CEQA requires a public agency to make one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. Further, the findings must be supported by substantial evidence in the record. Therefore, based upon the substantial evidence presented in the Final EA for proposed amended Rule 1113:

> The AQMD Governing Board finds that proposed amended Rule 1113 has the potential to generate significant adverse air quality impacts for a period of approximately 14 months. The basis for this finding is that the proposed amendments have the potential to result in a loss VOC emission reductions originally anticipated for the rule as a result of increasing the VOC content limits for several specialty coatings, by an amount that exceeds the AQMD's significance threshold.
>
> The AQMD Governing Board finds further that no feasible mitigation measures or project alternatives have been identified which would reduce the potentially significant air quality impact to a level of insignificance. Due to the current and future unavailability of compliant coatings in limited specialty categories of fire proofing coatings, magnesite cement coatings, and japans/faux finish coatings, non-compliant coatings are currently being used under a temporary variance. As a result, there is an urgent need to provide relief from the rule requirements. While other proposed amendments to Rule 1113 could offset these foregone emission reductions, a delay in the effective date of these other amendments is necessary to allow coating manufacturers time to meet the new lowered VOC limits.

STATEMENT OF OVERRIDING CONSIDERATIONS

Despite the fact that no feasible measures or alternatives are available to mitigate potentially significant adverse air quality impacts from the project, the AQMD Governing Board finds that the following benefits of the project outweigh the unmitigated adverse impacts for the following reasons:

- The use of the above-referenced specialty coatings, while limited, is extremely vital to the specific industries that employ the use of these coatings, and therefore their continued use provides a significant economic benefit to them.
- Raising the VOC content limits of the specialty coatings does not increase actual VOC emissions for this source category since non-compliant coatings are currently being used under a variance. The proposed amendments will result in foregone emission reductions, which would not affect existing air quality.
- The potential significant adverse air quality impacts from raising the VOC content of the specialty coatings would last approximately 14 months, until other provisions of the proposed amendments become effective resulting in VOC emission reductions that would more than offset those foregone.
- The net effect on air quality from the entire project is a potential reduction of VOC emissions from architectural coatings of up to 10.5 tons per day by the year 2010.
- The proposed amendments implement in, part, the AQMP control measure CTS-07, which is a necessary part of the AQMD's strategy to attain all state and national ambient air quality standards for ozone, as required by law.

MITIGATION MONITORING

The SEA examined the potential impacts associated with the proposed amendments to Rule 1113. Air quality impacts were found to be significant on a project specific basis. No feasible mitigation measures or project alternatives were identified that would reduce significant adverse air quality impacts to a level of

insignificance, therefore, a Mitigation Monitoring Plan was not prepared for the proposed amendments.

CONCLUSIONS

Based on a worst-case analysis, the potential adverse air quality impacts from the implementation of the amendments to Rule 1113 are considered significant. Significant adverse air quality impacts result from the loss of VOC emission reductions due to increasing the VOC content limit for specialty coatings. The significant adverse impact generated by proposed amended Rule 1113 would last approximately 14 months, until other provisions of the proposed amendments first become effective. Ultimately, overall reductions in VOC emissions of 10.5 tons per day are expected from implementation of the proposed amendments. No feasible mitigation measures or project alternatives have been identified that would minimize the short-term loss of foregone potential emission reductions associated with the proposed amendment while still achieving the overall objectives of the project.

(Adopted Sept. 2, 1977)(Amended Dec. 2, 1977)(Amended Feb. 3, 1978)
(Amended Sept. 5, 1980)(Amended Apr. 3, 1981)(Amended July 3, 1981)
(Amended by California Air Resources Board Oct. 21, 1981)
(Amended Aug. 5, 1983)(Amended Mar. 16, 1984)
(Amended Aug. 2, 1985)(Amended Nov. 1, 1985)
(Amended Feb. 6, 1987)(Amended Jan. 5, 1990)(Amended Feb. 2, 1990)
(Amended Nov. 2, 1990)(Amended Dec. 7, 1990)(Amended Sept. 6, 1991)
(Amended March 8, 1996)(Amended August 9, 1996)

(Amended November 8, 1996)

Draft Proposed Amended RULE 1113. ARCHITECTURAL COATINGS

(a) Applicability

This rule is applicable to any person who supplies, sells, offers for sale, applies, solicits the application of, or manufactures for use in the District any architectural coating intended to be applied to stationary structures or their appurtenances, and to mobile homes, pavements or curbs.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AEROSOL COATING PRODUCT means 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 marking and traffic marking applications.

(2) APPURTENANCES are accessories to ~~an architectural~~ a stationary structure, including, but not limited to: hand railings, cabinets, bathroom and kitchen fixtures, fences, rain-gutters and down-spouts, window screens, lamp-posts, (heating and air conditioning) equipment, other mechanical equipment, large fixed stationary tools, signs, motion picture and television production sets, and concrete forms.

(3) ARCHITECTURAL COATINGS are any coatings applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.

(4) BELOW-GROUND WOOD PRESERVATIVES are ~~coatings~~ wood preservatives formulated to protect below-ground wood ~~from decay or insect attack and which contain a wood preservative chemical registered by the California Department of Food and Agriculture.~~

(5) BITUMINOUS COATINGS MATERIALS are black or brownish coating materials, soluble in carbon disulfide, consisting mainly of hydrocarbons and which are obtained from natural deposits, or as residues from the distillation of crude petroleum oils, or of low grades of coal.

(6) BOND BREAKERS are coatings applied between layers of concrete to prevent the freshly poured top layer of concrete from bonding to the substrate over which it is poured.

(7) CLEAR WOOD FINISHES are clear and semi-transparent coatings, including lacquers and varnishes, applied to wood substrates to provide a transparent or translucent solid film.

(8) COATING is a material which is applied to a surface in order to beautify, protect, or provide a barrier to such surface.

(9)~~(8)~~ COLORANTS are solutions of dyes or suspensions of pigments.

(10)~~(8)~~ CONCRETE-CURING COMPOUNDS are coatings applied to freshly poured concrete to retard the evaporation of water.

(11)~~(9)~~ DRY-FOG COATINGS are coatings which are formulated only for spray application so that when sprayed, overspray droplets dry before falling on floors and other surfaces.

(12) EXEMPT COMPOUNDS (See Rule 102-Definition of Terms.)

(13) FIRE-PROOFING EXTERIOR COATINGS are opaque coatings formulated to protect the structural integrity of outdoor steel and other outdoor construction materials and listed by Underwriter's Laboratories, Inc. for the fire protection of steel.

(14)~~(11)~~ FIRE-RETARDANT COATINGS are coatings ~~which have~~ listed by Underwriter's Laboratories, Inc. as fire-retardant coatings with a flame spread index of less than 25. ~~when tested in accordance with ASTM Designation E 84-87, "Standard Test Method for Surface Burning Characteristics of Building Material," after application to Douglas fir according to the manufacturer's recommendations, or when tested using an equivalent method approved by the Executive Officer~~

(15) FLAT COATINGS are coatings that register a gloss of less than 15 on an 85-degree meter or less than 5 on a 60-degree meter.

~~(12) FORM RELEASE COMPOUNDS are coatings applied 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.~~

(16)~~(13)~~ GRAMS OF VOC PER LITER OF COATING, LESS WATER AND LESS EXEMPT COMPOUNDS, is the weight of VOC per combined volume of VOC and coating solids~~. It and~~and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:
- W_s = weight of volatile compounds in grams
- W_w = weight of water in grams
- W_{es} = weight of exempt compounds in grams
- V_m = volume of material in liters
- V_w = volume of water in liters
- V_{es} = volume of exempt compounds in liters

For coatings that contain reactive diluents, the Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds, shall be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:
- W_s = weight of volatile compounds ~~not consumed~~emitted during curing, in grams
- W_w = weight of water ~~not consumed~~emitted during curing, in grams
- W_{es} = weight of exempt compounds ~~not consumed~~emitted during curing, in grams
- V_m = volume of the material prior to reaction, in liters
- V_w = volume of water ~~not consumed~~emitted during curing, in liters
- V_{es} = volume of exempt compounds ~~not consumed~~emitted during curing, in liters

(17)~~(14)~~ GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where:
- W_s = weight of volatile compounds grams
- W_w = weight of water in grams
- W_{es} = weight of exempt compounds in grams
- V_m = volume of the material in liters

(18)~~(15)~~ GRAPHIC ARTS COATINGS (Sign Paints) are coatings formulated for and hand-applied by artists using brush or roller techniques to indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.

~~(16) HIGH TEMPERATURE INDUSTRIAL MAINTENANCE COATINGS are industrial maintenance coatings formulated for and applied to substrates exposed continuously or intermittently to temperatures above 400 degrees Fahrenheit.~~

~~(18)(17) INDUSTRIAL MAINTENANCE ANTI-GRAFFITI COATINGS are two-component clear industrial maintenance coatings formulated for and applied to exterior walls, and murals to resist repeated scrubbing and exposure to harsh solvents.~~

~~(19)(18) INDUSTRIAL MAINTENANCE COATINGS are high performance coatings formulated for and applied to substrates in industrial, commercial, or institutional situations that are exposed to one or more of the following extreme environmental conditions:~~

~~(A) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation;~~

~~(B) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, chemical mixtures, or solutions;~~

~~(C) repeated exposure to temperatures in excess of 250 degrees Fahrenheit;~~

~~(D) repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial solvents, cleaners, or scouring agents; or~~

~~(E) exterior exposure of metal structures.~~

~~Industrial Maintenance Coatings are not for residential use or for use in areas of industrial, commercial, or institutional facilities, such as office space and meeting rooms.~~

(19) INDUSTRIAL MAINTENANCE PRIMERS AND TOPCOATS are coatings which are intended to be applied to a surface prior to the application of an industrial maintenance topcoat, to provide a firm bond between the substrate and subsequent coats and high performance coatings which are formulated for the purpose of heavy abrasion, water immersion, chemical, corrosion, temperature, electrical or solvent resistance.

(A) Alkyds
Synthetic resins formed by the condensation of polyhydric alcohols with polybasic acids.

(B) Catalyzed Epoxy
Cross-linking resins made by the reaction of epoxides with other materials such as amines, alcohols, phenols, carboxylic acids, and unsaturated compounds.

(C) Bituminous Coatings Materials
Black or brownish coating materials, soluble in carbon disulfide, consisting mainly of hydrocarbons and which are obtained from natural deposits, or any residues from the distillation of crude petroleum oils, or of low grades of coal.

(D) Inorganic Polymers
Substances whose principal structural features are made up on homopolar inter linkages between multivalent elements other than carbon. This does not preclude the presence of carbon containing groups in the side branches, or as inter linkages between principal structural members. Examples of such polymers are ethyl and butyl silicates.

(E) Vinyl Chloride Polymers
Polymers made by the polymerization of vinyl chloride or copolymerization of vinyl chloride with other unsaturated compounds, the vinyl chloride being in greatest amount by weight.

(F) Chlorinated Rubber
Resin formed by the reaction of rubber with chlorine.

(G) Acrylic Polymers
Polymers resulting from the polymerization of derivatives of acrylic acids, including esters of acrylic acid, methacrylic acid, acrylonitrile, and their copolymers. Also known as acrylic resins and acrylate resins.

(H) Urethane Polymers
Coating vehicles containing a polyisocyanate monomer reacted in such a manner as to yield polymers containing any ratio, proportion, or combination of urethane linkages, active isocyanate groups, or polyisocyanate monomer.

(I) Silicones
A resin containing silicon, unlike organic resins which all contain carbon. The basic structure of silicones consists of silicon-oxygen linkages.

(J) Unique Vehicles
Generic polymer components not defined by any of the preceding, e.g., hypalon or phenoxy.

(20) JAPANS/FAUX FINISHING COATINGS are glazes designed for wet-in-wet techniques used as a stain or glaze to create artistic effects, including but not limited to, dirt, old age, smoke damage, and simulated marble and wood grain.

(21)~~(19)~~ LACQUERS are clear or pigmented wood finishes, including clear lacquer sanding sealers.~~coatings~~ formulated with nitrocellulose or synthetic resins to dry by evaporation without chemical reaction~~and to provide a quick drying, solid protective film.~~

(22)~~(20)~~ LOW-SOLIDS ~~STAINS~~COATINGS are ~~stains~~coatings containing ~~1~~one pound or less of solids per gallon of material~~, and containing no Group II exempt compounds listed in (b)(10)(B) as defined in Rule 102.~~

(23)~~(21)~~ MAGNESITE CEMENT COATINGS are coatings formulated for and applied to magnesite cement decking to protect the magnesite cement substrate from erosion by water.

(24)(~~22~~) MASTIC COATINGS are coatings formulated to cover holes and minor cracks and to conceal surface irregularities, and applied in a thickness of at least 10 mils (dry, single coat).

(25)(~~23~~) METALLIC PIGMENTED COATINGS are coatings containing at least 0.4 pound of elemental metallic pigment per gallon (50 grams/liter) of coating as applied.

(26)(~~24~~) MULTI-COLORED COATINGS are coatings which exhibit more than one color when applied and which are packaged in a single container and applied in a single coat.

~~(25) OPAQUE STAINS are all stains that are not classified as semi-transparent stains.~~

~~(26) OPAQUE WOOD PRESERVATIVES are all wood preservatives not classified as clear or semi-transparent wood preservatives, or as below-ground wood preservatives.~~

(27) PRE-TREATMENT WASH PRIMERS are coatings which contain a minimum of 1/2 percent acid, by weight, applied directly to bare metal surfaces to provide necessary surface etching.

(28) PRIMERS are coatings applied to a surface to provide a firm bond between the substrate and subsequent coats.

(29) QUICK-DRY ENAMELS are non-flat coatings which comply with the following:

(i) Shall be capable of being applied directly from the container by brush or roller under normal conditions, normal conditions being ambient temperatures between 60°F and 80°F;

(ii) When tested in accordance with ASTM D 1640 they shall: set-to-touch in two hours or less, dry-hard in eight hours or less, and be tack-free in four hours or less by the mechanical test method; and

(iii) Shall have a 60° dried film gloss of no less than 70.

(30) QUICK-DRY PRIMERS, SEALERS, AND UNDERCOATERS are primers, sealers, and undercoaters which are intended to be applied to a surface to provide a firm bond between the substrate and subsequent coats and which are dry-to-touch in one-half hour and can be recoated in two hours (ASTM D 1640).

(31) REACTIVE DILUENT is a liquid which is a VOC during application and one in which, through chemical and/or physical

reaction, such as polymerization, becomes an integral part of the coating.

~~(29) RESIDENTIAL USE is use in areas where people reside or lodge including, but not limited to, single and multiple family dwellings, condominiums, mobile homes, apartment complexes, motels, and hotels.~~

(32)(~~30~~) ROOF COATINGS are coatings formulated for application to exterior roofs and for the primary purpose of preventing penetration of the substrate by water, or reflecting heat and ~~reflecting~~ ultraviolet radiation. Metallic pigmented roof coatings which qualify as metallic pigmented coatings shall not be considered to be in this category, but shall be considered to be in the metallic pigmented coatings category.

(33)(~~31~~) SANDING SEALERS are clear wood coatings formulated for and applied to bare wood for sanding and to seal the wood for subsequent application of ~~varnish~~ coatings. To be considered a sanding sealer a coating must be clearly labeled~~labelled~~ as such.

(34)(~~32~~) SEALERS are coatings applied to substrates to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate.

~~(33) SEMI-TRANSPARENT STAINS are coatings which are formulated to change the color of a surface but not conceal its texture.~~

~~(34) SEMI-TRANSPARENT WOOD PRESERVATIVES are wood preservative stains formulated to protect exposed wood from decay or insect attack by the addition of a wood preservative chemical registered by the California Department of Food and Agriculture, and which may change the color of a surface but do not conceal the surface, including clear wood preservatives.~~

(35) SHELLACS are clear or pigmented coatings formulated solely with the resinous secretions of the lac beetle (laccifer lacca), thinned with alcohol, and formulated to dry by evaporation without a chemical reaction.

(36) SOLICIT is to require for use, or to specify, by written or oral contract.

(37) STAINS are opaque or semi-transparent coatings which are formulated to change the color but not conceal the grain pattern or texture.

(38~~37~~) SWIMMING POOL COATINGS are coatings specifically formulated to coat the interior of swimming pools and to resist swimming pool chemicals.

(39~~38~~) SWIMMING POOL REPAIR COATINGS are chlorinated, rubber-based coatings used for the repair and maintenance of swimming pools over existing chlorinated, rubber-based coatings.

(40~~39~~) TINT BASE is an architectural coating to which colorants are added.

(41~~40~~) TRAFFIC COATINGS are coatings formulated for and applied to public streets, highways, and other surfaces including, but not limited to, curbs, berms, driveways, and parking lots.

(42)(~~41~~) UNDERCOATERS are coatings formulated and applied to substrates to provide a smooth surface for subsequent coats.

(43)(~~42~~) VARNISHES are clear wood finishes formulated with various resins to dry by chemical reaction on exposure to air.

(44)(~~43~~) VOLATILE ORGANIC COMPOUND (VOC)
See Rule 102.
~~is any volatile compounds which contains the element carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.~~

(45)(~~44~~) WATERPROOFING SEALERS are colorless coatings which are formulated for the sole purpose of preventing penetration of porous substrates by water and which do not alter surface appearance or texture.

(46~~48~~) WOOD PRESERVATIVES are coatings formulated to protect wood from decay or insect attack by the addition of a wood preservative chemical registered by the California Environmental Protection Agency.

(c) Requirements

(1) Except as provided in ~~subsections~~ paragraphs (c)(2), (c)(3), and (c)(4), no person shall supply, sell, offer for sale, apply, or solicit the application of, any architectural coating which, at the time of sale or manufacture, contains more than 250 grams of ~~volatile organic compounds~~ VOC per liter of coating (2.08 pounds per gallon), ~~excluding~~ less water, less exempt compounds, and less any colorant

added to tint bases, or manufacture, blend, or repackage such a coating for use within the District.

(2) Except as provided in ~~subsections~~ paragraphs (c)(3) and (c)(4), no person shall supply, sell, offer for sale, apply, ~~or~~ solicit the application of, manufacture, blend, or repackage, for use within the District, any architectural coating listed in the Table of Standards which contains VOC ~~volatile organic compounds (less water and exempt compounds, and~~ excluding any colorant added to tint bases) in excess of the corresponding VOC limit specified in the table, after the ~~corresponding~~ effective date specified, ~~or manufacture, blend, or repackage such a coating for use within the District.~~

~~TABLE OF STANDARDS~~

~~VOC LIMITS~~

~~Grams of VOC Per Liter of Coating, Less Water And Less Exempt Compounds~~

~~COATING~~	~~Effective at Adoption (2/2/90)~~	~~Effective Dec. 1, 1990~~	~~Effective Dec. 1, 1993~~
~~Clear Wood Finishes~~			
~~Varnish~~	~~350~~	~~350~~	~~350~~
~~Sanding Sealers~~		~~350~~	~~350~~
~~Lacquer~~	~~680~~	~~550~~	~~275 (7-1-94)~~
~~Semi-transparent Stains~~	~~350~~	~~350~~	~~350~~
~~Opaque Stains~~	~~350~~	~~350~~	~~350~~
~~Semi-transparent and Clear Wood Preservatives~~	~~350~~	~~350~~	~~350~~
~~Below-Ground Wood Preservatives~~		~~600~~	~~350~~
~~Opaque Wood Preservatives~~	~~350~~	~~350~~	~~350~~
~~Primers, Sealers, and Undercoaters~~	~~350~~	~~350~~	~~350~~
~~Bond Breakers~~		~~750~~	~~350 (7-1-91)~~
~~Industrial Maintenance Coatings~~	~~420~~	~~420~~	~~340~~
~~Industrial Maintenance Anti-Graffiti Coatings~~		~~600~~	~~340~~
~~Industrial Maintenance High-Temperature Coatings~~		~~650~~	~~550~~
~~Fire Retardant Coatings~~			
~~Clear~~		~~650~~	~~650~~
~~Pigmented~~		~~350~~	~~350~~
~~Form Release Compounds~~		~~250~~	~~250~~
~~Graphic Arts (Sign) Coatings~~		~~500~~	~~500~~
~~Magnesite Cement Coatings~~		~~600~~	~~450~~
~~Metallic Pigmented Coatings~~		~~500~~	~~500~~
~~Dry Fog Coatings~~			
~~Flats~~	~~420~~	~~400~~	~~400~~

~~Non-Flats~~	~~400~~	~~400~~	~~400~~
~~Multi-Color Coatings~~		~~580~~	~~420~~
~~Pretreatment Wash Primers~~		~~780~~	~~780~~
~~Waterproof Sealers~~	~~400~~	~~400~~	~~400~~
~~Concrete-Curing Compounds~~	~~350~~	~~350~~	~~350~~
~~Mastic Coatings~~	~~300~~	~~300~~	~~300~~
~~Traffic Paints for Public Streets and Highways~~	~~250~~	~~250~~	~~250~~
~~For Other Surfaces~~	~~250~~	~~250~~	~~250~~
~~Black Traffic Coatings~~		~~250~~	~~250~~
~~Shellac~~			
~~Clear~~		~~730~~	~~730~~
~~Pigmented~~		~~550~~	~~550~~
~~Swimming Pool Coatings~~		~~650~~	~~340~~
~~Swimming Pool Repair and Maintenance Coatings~~		~~650~~	~~650~~

TABLE OF STANDARDS

VOC LIMITS

Grams of VOC Per Liter of Coating, Less Water And Less Exempt Compounds

COATING	Limit *	Effective Date of Adoption	Effective 1/1/1998	Effective 1/1/1999	Effective 7/1/2001	Effective 1/1/2003	Effective 7/1/2008
Bond Breakers	350						
Clear Wood Finishes							
Varnish	350						
Sanding Sealers	350						
Lacquer	680		550			275	
Concrete-Curing Compounds	350						
Dry-Fog Coatings	400						
Fire-proofing Exterior Coatings	350		450		350		
Fire-Retardant Coatings							
Clear	650						
Pigmented	350						
Flats	250				100		50
Graphic Arts (Sign) Coatings	500						
Industrial Maintenance Primers and Topcoats							
Alkyds	420						
Catalyzed Epoxy	420						
Bituminous Coatings Materials	420						
Inorganic Polymers	420						
Vinyl Chloride Polymers	420						
Chlorinated Rubber	420						
Acrylic Polymers	420						
Urethane Polymers	420						
Silicones	420						
Unique Vehicles	420						
Japans/Faux Finishing Coatings	350		700		350		
Magnesite Cement Coatings	600				450		
Mastic Coatings	300						
Metallic Pigmented Coatings	500						
Multi-Color Coatings	420			250			
Pigmented Lacquer	680			550		275	
Pre-Treatment Wash Primers	780						
Primers, Sealers, and Undercoaters	350						
Quick-Dry Enamels	400						
Roof Coatings	300						
Shellac							
Clear	730						
Pigmented	550						
Stains	350						
Swimming Pool Coatings							
Repair	650						
Other	340						
Traffic Coatings	250			150			
Waterproofing Sealers	400						
Wood Preservatives							
Below-Ground	350						
Other	350						

* The specified limits remain in effect unless revised limits are listed in subsequent columns in the Table of Standards

TABLE OF STANDARDS (cont.)

VOC LIMITS

Grams of VOC Per Liter of Material

COATING	Limit
Low-Solids Coating	120

(3) If anywhere on the container of any coating listed in the Table of Standards, on any sticker or label affixed thereto, or in any sales or advertising literature, any representation is made that the coating may be used as, or is suitable for use as, a coating for which a lower VOC standard is specified in the table or in ~~subsection~~ paragraph (c)(1), then the lowest VOC standard shall apply. This requirement does not apply to the representation of the following coatings in the manner specified:

~~(A) high-temperature industrial maintenance coatings, which may be represented as metallic pigmented coatings for use consistent with the definition of high temperature industrial maintenance coatings;~~

(~~A~~B) lacquer sanding sealers, which may be recommended for use as sanding sealers in conjunction with clear lacquer topcoats;

(~~B~~C) metallic pigmented coatings, which may be recommended for use as primers, sealers, undercoaters, roof coatings, or industrial maintenance coatings;~~and~~

(~~C~~D) shellacs;. and

(D) low-solids coatings.

(4) Except where already required to be in compliance with a the previous version of this rule, sale or application of a coating manufactured prior to the effective date of the corresponding standard in the Table of Standards, and not complying with that standard, shall not constitute a violation of ~~subsection~~ paragraph (c)(2) until three years after the effective date of the standard.

~~(5) The manufacture of a coating subject to a standard listed in the Table of Standards and not complying with that standard shall not constitute a violation of subsection (c)(2) until thirty days after the effective date of the standard.~~

(5) All VOC-containing materials shall be stored in closed containers when not in use. In use includes, but is not limited to: being accessed, filled, emptied, or repaired.

(6) Averaging Provisions

On or after July 1, 2001, manufacturers may comply with the provisions of paragraph (c)(2) for flat coatings by complying with the following averaging provisions:

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

$$\sum_{i=1}^{n} ER_i(U_i) \leq \sum_{i=1}^{n} VOC_i(U_i)$$

Where:

$\sum_{i=1}^{n} VOC_i(U_i)$ = Allowable Emissions

$\sum_{i=1}^{n} ER_i(U_i)$ = Actual Emissions

VOC_i = Pounds of VOC per pound of coating solids (lbs/lb);

U_i = Quantity of coating "i" sold for use within the District (pounds of coating solids); and

ER_i = VOC content of coating "i", as supplied (lbs/lb).

The averaging is limited only to flat coatings selected by the manufacturer. Any flat coating not included in the averaging plan shall comply with the VOC limit in paragraph (c)(2).

(B) Averaging Plan (Plan)

Manufacturers using the averaging approach shall submit a Plan, pursuant to Rule 221 - Plans, to the Executive Officer. The Plan may not be implemented until it is approved in writing by the Executive Officer. Submittal of the Plan does not provide an exemption from the rule requirements. The Plan shall meet the requirements specified in Appendix A.

(d) Administrative Requirements

(1) Containers for all coatings subject to this rule shall display the date of manufacture of the contents or a code indicating the date of manufacture. The manufacturers of such coatings shall file with the Executive Officer of the District and the Executive Officer of the Air Resources Board an explanation of each code.

(2) Containers for all coatings subject to the requirements of this rule shall carry a statement of the manufacturer's recommendation regarding thinning of the coating. This recommendation shall not apply to the thinning of architectural coatings with water. The recommendation shall specify that the coating is to be employed without thinning or diluting under normal environmental and application conditions, unless any thinning recommended on the label for normal environmental and application conditions does not cause a coating to exceed its applicable standard.

(3) Each container of any coating subject to this rule shall display the maximum VOC content of the coating, as supplied~~applied~~, and after any thinning as recommended by the manufacturer. The VOC content of low-solids coatings ~~stains~~ shall ~~also~~ be displayed as grams of VOC per liter of material (excluding any colorant added to the tint bases) and the VOC content of any other coating shall ~~also~~ be displayed as grams of VOC per liter of coating (less water and less exempt compounds, and excluding any colorant added to tint bases). VOC content displayed may be calculated using product formulation data, or may be determined using the test method in sub~~section~~division (e).

~~(4) The labels of all Industrial maintenance coatings shall include the statement "Not for Residential Use," or "Not for Residential Use in California," prominently displayed.~~

(4) After January 1, 1998, the coating container label or container shall include the words "Quick-Dry" or shall list the following:

(A) The recoat time for quick-dry primers, sealers, and undercoaters, or

(B) The dry-hard time for quick-dry enamels.

Containers and container labels shall not contain the words "Quick-Dry" unless the material meets the dry times specified in the

respective definitions or the material complies with the respective general VOC limit for enamels or primers, sealers, and undercoaters.

(e) Test Methods

For the purpose of this rule, the following test methods shall be used. ~~Other test methods determined to be equivalent after review by the staff's of the District, the California Air Resources Board, and the United States Environmental Protection Agency(USEPA), and approved in writing by the District Executive Officer may also be used.~~

(1) VOC Content of Coatings

The VOC content of coatings subject to the provisions of this rule shall be determined by:

(A) The United States Environmental Protection Agency (USEPA) Reference Test Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A), with ~~The~~ exempt compound's' content ~~shall be~~ determined by Method 303 (Determination of Exempt Compounds) in the South Coast Air Quality Management District's (SCAQMD) "Laboratory Methods of Analysis for Enforcement Samples" manual ~~Section III, Methods 19 and 22~~, or

(B) Method 304 (Determination of Volatile Organic Compounds (VOC) in Various Materials) in the SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual~~Section III, Methods 16, 17, 19, 22, and 24~~.

(C) Exempt Perfluorocarbons

The following classes of compounds:

cyclic, branched, or linear, completely fluorinated alkanes

cyclic, branched, or linear, completely fluorinated ethers with no unsaturations

cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations

sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine

will be analyzed as exempt compounds for compliance with subdivision (c), only when manufacturers specify which individual compounds are used in the coating formulations. In addition, the manufacturers must identify the USEPA, ARB, and SCAQMD approved test methods, which can be used to quantify the amount of each exempt compound.

(2) Acid Content of Coatings

The acid content of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1613-85 (Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products).

(3) Metal Content of Coatings

The metallic content of a coating subject to the provisions of this rule shall be determined by Method 311 (Determination of Percent Metal in Metallic Coatings by Spectrographic Method) in the SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual.

(4) Flame Spread Index

The flame spread index of a fire-retardant coating subject to the provisions of this rule shall be determined by ASTM Test Method E 84-91A (Standard Test Method for Surface Burning Characteristics of Building Material) after application to an organic or inorganic substrate, based on the manufacturer's recommendations.

(5) Drying Times

The set-to-touch, dry-hard, dry-to-touch, and dry-to-recoat times of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1640 (Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature). The tack-free time of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1640, according to the Mechanical Test Method.

(6) Gloss Determination

The gloss shall be determined by ASTM Test Method D 523 (Specular Gloss).

(7) Equivalent Test Methods

Other test methods determined to be equivalent after review by the staffs of the District, the California Air Resources Board, and the

USEPA, and approved in writing by the District Executive Officer may also be used.

(8) Multiple Test Methods

When more than one test method or set of test methods are specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.

(9) All test methods referenced in this subdivision shall be the version most recently approved by the appropriate governmental entities.

(f) Technology Assessment for Flats and Lacquers

The Executive Officer shall conduct:

(1) A technology assessment for the future VOC limit for flat coatings as specified in paragraph (c)(2) by July 1, 2000 and July 1, 2007.

(2) A technology assessment for the future VOC limit for lacquers specified in paragraph (c)(2) by January 1, 2004.

(3) In conducting the above technology assessments, the Executive Officer shall consider any applicable future California Air Resources Board surveys on architectural coatings.

After each technology assessment, the Executive Officer shall report to the Governing Board as to the appropriateness of maintaining the future VOC limit.

(~~g~~f) Exemptions

(1) The provisions of this rule shall not apply to:

(A)(~~1~~) architectural coatings in containers having capacities of one quart or less, provided that the manufacturer shall submit an annual report to the Executive Officer within three months of the end of each calendar year. The report shall contain information as required by the Executive Officer to monitor the use of the small container exemption. The loss of this exemption due to the failure of the manufacturer to submit an annual report shall apply only to the manufacturer; or

(B)(~~2~~) architectural coatings sold in this District for shipment outside of this District or for shipment to other manufacturers for repackaging; or

(C)(~~3~~) emulsion type bituminous pavement sealers; or

(D)(~~4~~) aerosol coating products.

(E) Use of stains and lacquers in all areas within the District at an elevation of 4,000 feet or greater above sea level.

(2) For architectural coatings recommended by the manufacturer for use solely as quick-dry primers, sealers and undercoaters, the provisions of subdivision (c) shall not apply to:

(A) the manufacture, blending or repackaging of such coatings, or

(B) the application, sale, offering for sale or soliciting the application of such coatings, provided that the manufacturer submits an annual report to the Executive Officer within three months of the end of each calendar year. The report shall include for each exempt coating gallons sold in California.

(3) Notwithstanding the provisions of paragraph (c)(2), 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 degrees Fahrenheit, at the time of application provided that:

(A) the coating is not applied from April 1 to October 31 of any year;

(B) 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.

(4) The January 1, 2005 VOC limit for lacquers shall not be applicable until January 1, 2007 and the July 1, 2008 VOC limit for flat coatings shall not be applicable to any manufacturer which meets all of the following criteria:

(A) The total gross annual receipts are $2,000,000 or less, and

(B) The total number of employees is 100 or less, and

(C) The manufacturer requesting this exemption files a written request with the Executive Officer annually which includes, but is not limited to,

(i) The total gross annual receipts for each of the last three years,

(ii) The total number of employees for each of the last three years

For the purposes of determining the total gross annual receipts and the total number of employees, a manufacturer shall include data from all facilities (both within and outside of the District) which they own, operate, have an ownership interest, or are legally affiliated. If a manufacturer

exceeds the criteria specified in subparagraphs (g)(4)(A) or (g)(4)(B) any time after the initial request is filed with the Executive Officer, this exemption shall be immediately terminated, the manufacturer shall forfeit any future eligibility for this exemption, and the manufacturer shall be considered in violation of this rule for each and every day that lacquers or flat coatings which do not comply with the respective VOC limit in the Table of Standards are supplied, sold, or offered for sale within the District. The loss of this exemption due to the manufacturer exceeding the criteria in subparagraphs (g)(1)(A) or (g)(1)(B) shall apply only to the manufacturer.

APPENDIX A: Averaging Provision

(A) General Requirements

The Plan shall include, at a minimum:

- An identification of the contact persons, phone numbers, and name of the manufacturer who is submitting the Plan and will be implementing the requirements of the plan.
- A listing of the flat coatings, and available variations, legible copies of the existing labels for each coating, material safety data sheets, and VOC content (pounds of VOC per pound of solids), (grams of VOC per liter of coating), and grams of VOC per liter of material).
- An operational plan covering all the coatings for each compliance period that the Plan will be in effect. The operational plan shall contain all of the following:
  - ⇒ an identification of the compliance periods and dates for the manufacturer to report the information required by the Executive Officer. The length of the compliance period shall not exceed 365 days;
  - ⇒ an identification of specific sales records to be provided to the Executive Officer for approving and enforcing the Plan;
  - ⇒ for each coating listed, all VOC content levels which will be applicable for the coating during each compliance period;
  - ⇒ the projected sales for each coating at each different VOC content for every compliance period that the Plan will be in effect;
  - ⇒ a detailed demonstration showing that the projected actual emissions will not exceed the allowable emissions for each compliance period that the Plan will be in effect. The demonstration shall use the equation specified in subparagraph (c)(6)(A) for projecting the actual emissions and allowable emissions during each compliance period, and shall specify the methodology used for converting VOC content in g/l to lbs/lb for VOC_i and ER_i. The demonstration shall also include all VOC content levels and projected sales within the District for all coatings listed in the Plan during each compliance period;
  - ⇒ For each coating included in the Plan, the total sales volume (in gallons) within the District will be reported for the time period just completed which is equivalent to the requested initial compliance period.

- a statement, signed by a legal representative for the manufacturer, that all information and operational plans submitted with the Plan are true and correct.
- a reconciliation plan which commits the manufacturer to completely reconcile any shortfalls in any and all cases, to the extent permitted by law, even if the manufacturer files for bankruptcy protection. The reconciliation plan shall contain all of the following:
  - ⇒ a clear and convincing demonstration of how shortfalls of up to 5%, 10%, 15%, 25%, 50%, 75%, and 100% of the allowable emissions will be completely reconciled within 90 working days from the date the shortfall is determined;
  - ⇒ a listing of the specific records and other information that will be necessary to verify that the shortfalls were reconciled;
  - ⇒ a commitment to provide any record or information requested by the Executive Officer to verify that the shortfalls have been completely reconciled.

(B) Reporting Requirements

- A final report, demonstrating what the actual emissions and the allowable emissions were during the compliance period, shall be submitted to the Executive Officer within 60 days after the termination of the indicated compliance period.

(C) Renewal of a Plan

- If the Plan has no changes, except the compliance period, the manufacturer shall submit a notice in writing, specifying a new compliance period for the Plan. Otherwise, all of the information specified in Section A of this Appendix shall be submitted.

(D) Modification of a Plan

- If the Executive Officer determines that: (1) the information submitted pursuant to the approval process is no longer valid, or (2) the actual emissions are exceeding the allowable emissions specified in the approved Plan, then the Executive Officer shall notify the manufacturer of his/her findings and the manufacturer shall modify the Plan within 30 days, as necessary to ensure that

the Plan meets all of the applicable requirements and that the actual emissions will not exceed the allowable emissions for the compliance period.

- If the VOC standard specified in the Table of Standards for flat coating is modified in a future rulemaking, the Executive Officer shall notify the manufacturer of the change and the manufacturer shall modify, within 30 days, the allowable emissions specified in the approved Plan to reflect the modified VOC standard as of their effective dates.
- The manufacturer may modify the Plan during the compliance period to ensure that actual emissions are less than or equal to the allowable emissions. All such modifications shall be submitted to and approved by the Executive Officer prior to implementation.

(E) Termination of a Plan

- A Plan shall remain in effect until:
  - ⇒ the Plan reaches the expiration date specified in the Plan by the Executive Officer;
  - ⇒ the Plan is modified by the manufacturer and approved by the Executive Officer;
  - ⇒ the Plan is modified by the Executive Officer;
  - ⇒ the VOC standard for flat coatings is modified in future rulemaking, and the manufacturer informs the Executive Officer in writing that the Plan will terminate on the effective date of the modified standard;
  - ⇒ a manufacturer submits a written request for termination of the plan.
- The Executive Officer shall terminate a Plan if any of the following circumstances occur:
  - ⇒ the manufacturer demonstrates to the satisfaction of the Executive Officer that the continuation of the Plan will result in an extraordinary economic hardship;
  - ⇒ the manufacturer violates the requirements of the approved Plan, and the actual emissions exceed the allowable emissions by 20% or more after reconciliation;
  - ⇒ the manufacturer fails to meet the requirements of the reconciliation plan within the specified time periods;
  - ⇒ the manufacturer demonstrates a recurring pattern of violations and has consistently failed to take the necessary steps to correct those violations.

- Upon termination of a Plan, all flat coatings listed in the Plan must comply with the VOC standard specified in the Table of Standards for flat coatings. In addition, any shortfall for the current compliance period shall be reconciled by the manufacturer.

(F) Plan Approval Timeframes

- The provisions of Rule 210 - Applications and Rule 221 - Plans shall apply.

(G) Violations

- An exceedance of the allowable emissions for any compliance period that the Averaging Plan is in effect shall constitute a single, separate violation of the requirements of this section for each day of the applicable compliance period.

South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

BOARD MEETING DATE: October 11, 1996 AGENDA NO. 25

PROPOSAL: Amend Rule 1113 - Architectural Coatings

SYNOPSIS: The proposed amendment will clarify rule requirements, decrease VOC limits for clear and pigmented lacquers, flat coatings, traffic coatings, and multi-color coatings, and increase VOC limits for fire-proofing exterior coatings, japans/faux finishing coatings, and magnesite cement coatings to reflect current technology. The amendments will also implement a portion of the AQMP Control Measure for architectural coatings.

COMMITTEE: Stationary Source

RECOMMENDED ACTION:

1. Certify the Final Subsequent Environmental Assessment for Proposed Amended Rule 1113 - Architectural Coatings; and
2. Amend Rule 1113 - Architectural Coatings.

James M. Lents, Ph.D.
Executive Officer

PL:JPB:FL:NB

Background

Rule 1113 is applicable to manufacturers, distributors, and end-users of architectural and industrial maintenance (AIM) coatings. It was first adopted in 1977, and has undergone numerous amendments. The purpose of the rule is to reduce VOC emissions from the use of AIM coatings, primarily by placing VOC limits on various coating categories.

On August 21, 1990, the Superior Court of Los Angeles County entered a judgment against AQMD in the case Dunn-Edwards Corporation, et al. vs. SCAQMD, et al. The judgment denied in part, and granted in part, the petition for writ of mandate seeking to overturn certain amendments made in February, 1990. As a result, the AQMD was pre-

vented from enforcing the lower VOC limits for aerosol coatings, industrial maintenance coatings, lacquers, quick-dry enamels, and quick-dry primers, sealers and undercoaters. This judgment impacted approximately 4.5 tons per day (tpd) of VOC emissions. The AQMD has contracted Eastern Michigan University to further study the impacted coating categories, with the exception of lacquers. Other amendments adopted in February 1990 and prior rule provisions remained in effect. The proposed amendments will formally reinstate the limits as existing prior to February 1990, except for lacquers, which is again proposed to be lowered.

The proposed amendments will lower the VOC limits for some coating categories not impacted by the court judgment, with the exception of lacquers. The proposed lower VOC limits are all based on the concept of reformulation of existing coatings, either with water, acetone, or resin technology. The proposed amendments will increase the VOC limit for coating categories that have been under variance for the past three years, and address issues raised since the September 6, 1991 amendments. These include addition of and modification to some definitions, synchronizing final compliance dates for coating categories, and updating the analytical test methods.

As a part of this rulemaking effort, a complete technology and environmental assessment was conducted for all coatings, including lacquers, to comply with the court judgment. In addition, as part of the rulemaking activities for Rule 1136 - Wood Products Coatings, this coating category was extensively studied and received support from industry for the proposed VOC limits in a manufacturing setting. Staff conducted a survey which showed that industry uses the same types of lacquers in the field as in a manufacturing setting.

Proposal

The following VOC limits are proposed to be lowered:

Flat Coatings

Lower the VOC limit for flats from 250 g/l to 100 g/l, effective July 1, 2001 and further reduce from 100 g/l to 50 g/l, effective July 1, 2008. Conduct a technology assessment for feasibility by July 1, 2000 for the 100 g/l limit and by July 1, 2007 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their flat coatings, on a sales weighted basis upon plan submittal and approval. Appendix A of Proposed Amended Rule (PAR) 1113 contains sections on the averaging, operational plan and reconciliation plan content requirements, modification or cancellation of the plan, and plan approval timeframes.

Lacquers

Establish the VOC limit for lacquer at 680 g/l, then lower it to 550 g/l, effective January 1, 1998, and to 275 g/l, effective January 1, 2005. Conduct a technology assessment for

feasibility of the 275 g/l limit by January 1, 2004. Include an exemption for lacquers to add up to 10% retarder during cool, humid days.

Multi-Color Coatings
Lower the VOC limit for multi-color coatings from 420 g/l to 250 g/l, effective January 1, 1998.

Traffic Coatings
Lower the VOC limit for traffic coatings from 250 g/l to 150 g/l, effective January 1, 1998.

Staff recommends deletion, consolidation, and addition of definitions, as well as reinstatement of VOC limits and definitions pursuant to the Superior Court judgment. These include industrial maintenance primers and topcoats at 420 g/l, quick-dry enamels at 400 g/l, and a definition and exemption for quick-dry primers, sealers, and undercoaters. The exemption for quick-dry primers, sealers and undercoaters will continue as a result of the Superior Court judgment, provided the manufacturer continues to submit to the Executive Officer annual reports of those coatings sold in the AQMD.

Staff recommends to increase the VOC limits for certain specialty coating categories that are currently under variance because they cannot comply with the current VOC limits. These include exterior fire-proofing coatings, magnesite cement coatings, and japans/faux finishing coatings.

In addition, staff has reorganized the Table of Standards coating categories into alphabetical order, eliminated coating categories that have been at the default 250 g/l limit of paragraph (c)(1) for at least three years, and consolidated similar categories with the same VOC limit.

Lowering the VOC limits for flats, traffic, multi-color, and lacquers will achieve an emission reduction of 10.5 tpd. Partially offsetting these reductions will be an increase of 0.14 tpd for japans, magnesite, and fire-proofing coatings; however, these coatings have been under variances for the past several years, therefore actual emissions will not increase.

Policy Issues
Industry members, mainly manufacturers and contractors, provided several suggestions and introduced issues that they claimed need additional research. The Environmental Legislative & Regulatory Advocacy Program (EL RAP) has seven main issues, which include: more thickness, more thinning, more priming, more topcoats, more touch-ups and repair work, more frequent recoating, and more reactivity. Due to these seven issues,

some manufacturers claim that coatings with higher VOC content will be substituted for the proposed lower VOC content coatings resulting in an increase in VOC emissions. They also claim a larger amount of low-VOC coatings will be used, resulting in an actual increase in VOC emissions. Additionally, a few manufacturers expressed concern regarding the fire hazards associated with acetone-based nitrocellulose lacquers. Lastly, manufacturers expressed concern regarding the lack of sufficient time necessary for research and development of the reformulated coatings.

The seven issues focus on two main points. The first six issues all state that the new formulations, either solvent-based or waterborne, result in more coating use and an overall increase in VOC emissions over a period of time. The seventh issue involves the reactivity of solvents used in waterborne coatings. EL RAP contends that these result in more ozone formation as compared to solvents in solvent-based formulations.

In response to these concerns, the staff analyzed each of the specific issues raised by EL RAP and either addressed them through analysis in the attached Final Subsequent Environmental Assessment (SEA) or through proposed rule amendments.

With regards to additional thinning, the focus of the proposed amendments is limited to coatings that are strictly waterborne formulations or based on acetone as a substitute solvent, thereby eliminating any concerns of thinning the coating, as supplied, with VOC.

To examine the issues of thickness, priming, topcoats, touch-up and repair, and frequent recoating, staff used coating coverage estimates, typical dry mil thickness, recommended priming, and estimated life of coating, listed on container labels and technical data sheets or provided by manufacturers during personal interviews and phone surveys. A thorough analysis comparing emissions from the proposed lower-VOC content coatings with emissions from potential substitute coatings clearly shows an overall VOC emission reduction as a result of the proposed amendments. An extensive discussion regarding the feasibility of reactivity-based ozone control policy development is included in the attached staff report to address the seventh issue.

To date, manufacturers have not provided data to support the claim that the lower VOC coatings could cause an increase in emissions. As a part of the current rulemaking efforts, staff has requested life-cycle studies that may have been conducted over the past seven years, but none were provided.

The Final SEA also analyzes any additional hazards associated with acetone usage. Staff interviewed fire chiefs from various fire departments, and received follow-up letters, which all indicate that explosion or fire hazards associated with acetone use are no greater than hazards associated with solvents currently used in coating formulations, especially

nitrocellulose lacquers. In contrast, acetone is significantly less toxic than the solvents found in conventional nitrocellulose lacquers.

Staff has proposed several amendments to Rule 1113 to address concerns raised relative to sufficient time to research, develop, and market compliant coatings. The proposed amendments provide a five-year and a twelve-year time period for future compliance limits for flats and up to an eight-year time period for lacquers, as well as an averaging provision for the flat coatings that would allow manufacturers to offset non-compliant flat coatings with super-compliant flat coatings. The AQMD has also committed to a technology assessment one year prior to the future rule limits for both flats and lacquers.

AQMP and Legal Mandates

The 1994 AQMP estimates increased AIM emissions (due to population growth) at 67.1 tpd in 1994, growing to 72.1 tpd by the year 2000 and 83.0 tpd by the year 2010, without additional AIM regulations. If left unchecked, AIM coating emissions alone would account for 26 % of the allowed VOC emissions in 2010, up from 6% of total VOC emissions in 1994. Therefore, the 1994 AQMP has a specific control measure (CTS-07) to reduce AIM VOC emissions by 75 % by the year 2010. This 62 tpd emission reduction is the largest of all short and intermediate term control measures, larger even than the earlier proposed VOC RECLAIM program.

Installation of air pollution control equipment is not feasible for reducing AIM emissions, thereby leaving coating reformulation as the only possible means to achieve the required reductions. The current proposal emphasizes reformulation of existing coatings, primarily by substituting acetone for other, more toxic and reactive solvents, or by using technologically-innovative resins that require a small amount of solvent for coalescence.

These proposed Rule 1113 amendments are a small portion of the 1994 AQMP because they include lowering the VOC limits for only a few of the coating categories discussed in the control measure. The proposed amendments will only reduce AIM emissions by 17.5%, which is only a small part of the 75% emission reduction that will eventually be required from AIM coatings.

An extensive study is currently being conducted to assess the possibility of further emission reductions. This study may lead to a future rule amendment in 1997.

CEQA

Pursuant to the CEQA and AQMD Rule 110 - Rule Adoption Procedures to Assure Protection and Enhancement of the Environment, AQMD prepared a Draft SEA for the proposed amendments to Rule 1113. The Draft SEA was circulated for a 45-day public review and comment period which ended on August 16, 1996. All comments received on

the Draft SEA and responses to comments are incorporated into the Final SEA for the proposed project. No comments required substantive changes to the document.

Socioeconomic Analysis
Staff has thoroughly evaluated the cost of compliance with the proposed amendments, which is included as Appendix H of the final staff report.

Implementation Plan
A notice will be sent to all AIM coating manufacturers.

Resource Impact
Existing AQMD resources will be sufficient to implement the proposed changes to this rule with minimal impact on the budget.

Attachments
- Summary of Proposed Amendment
- Rule Development Flow Chart
- Key Contacts
- Key Issues and Responses
- Staff Report
  - Final Subsequent Environmental Assessment
  - Rule Language

ATTACHMENT A

SUMMARY OF PROPOSED AMENDMENTS

Rule 1113
The following VOC limits are proposed to be lowered: *Flat Coatings* Lower the VOC limit for flats from 250 g/l to 100 g/l, effective July 1, 2001 and further reduce from 100 g/l to 50 g/l, effective July 1, 2008. Conduct a technology assessment for feasibility by July 1, 2000 for the 100 g/l limit and by July 1, 2007 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their flat coatings, on a sales weighted basis upon plan submittal and approval. Appendix A of PAR 1113 - Architectural Coatings contains sections on the averaging, operational and reconciliation content requirements, modification or cancellation of the plan, and plan approval timeframes. *Lacquers* Establish the VOC limit for lacquer at 680 g/l, then lower it to 550 g/l, effective January 1, 1998, and to 275 g/l, effective January 1, 2005. Conduct a technology assessment for feasibility of the 275 g/l limit by January 1, 2004. Include an exemption for lacquers to add up to 10% retarder during cool, humid days. *Multi-Color Coatings* Lower the VOC limit for multi-color coatings from 420 g/l to 250 g/l, effective January 1, 1998. *Traffic Coatings* Lower the VOC limit for traffic coatings from 250 g/l to 150 g/l, effective January 1, 1998

ATTACHMENT A

SUMMARY OF PROPOSED AMENDMENTS

CONTINUED

Rule 1113
Staff recommends deletion, consolidation, and addition of definitions, as well as reinstatement of VOC limits and definitions pursuant to the Superior Court judgment. These include industrial maintenance primers and topcoats at 420 g/l, quick-dry enamels at 400 g/l, and a definition and exemption for quick-dry primers, sealers, and undercoaters. The exemption for quick-dry primers, sealers and undercoaters will continue as a result of the Superior Court judgment, provided the manufacturer continues to submit to the Executive Officer annual reports of those coatings sold in the AQMD. Staff recommends to increase the VOC limits for certain specialty coating categories that are currently under variance because they cannot comply with the current VOC limits. These include exterior fire-proofing coatings, magnesite cement coatings, and japans/faux finishing coatings. In addition, staff has reorganized the Table of Standards coating categories into alphabetical order, eliminated coating categories that have been at the default 250 g/l limit of paragraph (c)(1) for at least three years, and consolidated similar categories with the same VOC limit.

ATTACHMENT B

RULE DEVELOPMENT PROCESS

RULE 1113 - Architectural Coatings

Formation of Current Working Group

January 1996

Seven Working Group Meetings
March 5,. 1996; April 4, 1996; April 25, 1996; May 15, 1996; June 20, 1996; August 20, 1996; September 19, 1996

Public Workshops: *May 24, 1996*
July 17, 1996
Public Consultation Meeting:
September 5, 1996
(2,600 notices mailed for each workshop)

Staff rpt 9/26

Set Public Hearing: September *13, 1996*
Public Hearing: October *11, 1996*

ATTACHMENT C

KEY CONTACTS

Nikole Reaksecker	USEPA - Region IX
Kitty Martin Julie Billington	CARB
Robert Wendoll Ray Robinson	Environmental Legislative & Regulatory Advocacy Program
Heidi MacAullife Bob Nelson	National Paint & Coatings Association
Hal Hargrave Steve Murphy	Painting & Decorating Contractors Association

ATTACHMENT D

KEY ISSUES AND RESPONSES

Rule 1113	
Issue	Response
High-solids lacquers will require thinning in the field	Manufacturers can reformulate existing lacquers using acetone, as accomplished by manufacturers of lacquers for the Wood Products Industry, without increasing the solids in the coating.
Acetone-based lacquers present increased fire hazard	When compared to conventional lacquer solvents such as methyl ethyl ketone, toluene or butyl acetate, based on the 1994 Uniform Fire Code (UFC) hazard classifications, acetone has identical health and physical hazard classifications. According to several fire department sources throughout the AQMD, acetone would not create an increased fire hazard, and as a solvent, handling characteristics would be identical relative to fire department procedures. The UFC treats all of the mentioned solvents as Class I Flammable liquids, and considers them all to present the same relative degree of fire hazard. However, acetone is significantly less toxic than solvents used in traditional solvent-based lacquers.
Acetone-based lacquers were developed for shop-use that has a controlled environment, not an uncontrolled environment typically found in field applications. Therefore, acetone-based lacquers cannot be used in the field.	A recent survey of kitchen and bathroom cabinet makers indicates they use the same coating for wood products in the factory and for finishing cabinets in the field. A few of the respondents that currently finish cabinets both in the factory and the field, indicated that field-finished cabinets do not have an equivalent quality finish as factory-finished cabinets using the conventional lacquers, and they do not expect any differences with the acetone-based lacquers. Most factories used for wood finishing work are also fairly uncontrolled environments that are impacted by the same environmental conditions, such as temperature and humidity changes, as in the field.

ATTACHMENT D

KEY ISSUES AND RESPONSES

CONTINUED

Rule 1113	
Issue	Response
Although some flat coatings can meet the proposed 100 g/l limit, not all can be reformulated to meet the proposed limits. (e.g., elastomeric coatings used for asbestos encapsulation and higher performance coatings)	AQMD staff found, as a part of their data collection and information gathering phase, that over 40% of the flat coatings sold in California complied with the July 2001 proposed limit in 1990. This is based on information submitted by manufacturers regarding sales of both their interior and exterior flat coatings. Staff also found compliant interior and exterior flat coatings with equivalent performance characteristics found in some higher-solvent containing flat coatings. Staff also gathered information regarding availability of elastomeric coatings that comply with the proposed limit. However, during the May 24, 1996 public workshop, several industry representatives indicated the need for additional time for reformulation, more specifically 3 to 5 years for research, development, and market acceptance. Therefore, staff extended the compliance date from January 1, 1998 to July 1, 2001. In addition, staff included a commitment for a detailed technology assessment one year prior to the implementation dates to re-evaluate available coatings. Lastly, staff has included an averaging provision for manufacturers to enable them to average the emissions from the flat coatings. This provision would allow them to continue selling non-compliant coatings, as long as the average sales weighted emissions are equivalent or lower than emissions based on the VOC limits.

ATTACHMENT D

KEY ISSUES AND RESPONSES

CONTINUED

Rule 1113	
Issue	Response
Removing the exclusion of colorant from the calculation of VOC will have significant increases in VOC content of the coatings. Industry needs additional time for compliance, which will be very costly.	Staff received information from a few manufacturers and is awaiting information from additional manufacturers regarding the impact of the colorant on VOC content. Staff recognizes that the proposed change will impact coatings with ultra-low VOC content, and is still evaluating the proposed change. However, the current language causes a concern to the AQMD, since the testing laboratory cannot exclude colorant from the base coating when testing for VOC content, unless the type and quantity of colorant added is known. This makes enforcement more resource intensive. Staff recognizes the large cost impacts related to this change. Therefore, staff has committed to removing the earlier proposed revision to include the colorant in the calculation of the VOC content, and has decided to further study the issue.
Labeling of "quick-dry" coatings as "quick-dry" will result in greater costs and not result in additional air quality benefit. It is also unnecessary since dry times are already listed on the labels.	Staff received actual labels from manufacturers and has reviewed additional labels of "quick-dry" coatings. The intent of the proposed change is to enhance the overall enforceability for the "quick-dry" categories. Staff has modified the language to require the label, can, or MSDS to indicate the recoat time for quick-dry primers, sealers, and undercoaters and the dry-hard time for quick-dry enamels. In addition, staff has extended the compliance date to January 1, 1998 to allow sufficient time for sell through and development of new labels.

ATTACHMENT D

KEY ISSUES AND RESPONSES

CONTINUED

Rule 1113	
Issue	Response
Averaging provision may be a good compliance option for flat coatings, but additional detail is needed in the rule before industry can support it. Questions that need to be answered are the possibility of discounting and the extent of recordkeeping.	Staff added additional language in the averaging provision to clarify the requirements of the averaging plan and the type of records needed for the plan. The USEPA will not require a 10% environmental benefit (discount) as long as the VOC content of flat coatings reach a level significantly beyond federal RACT. Staff believes the proposed July 1, 2001 VOC standard is significantly beyond federal RACT, and therefore will not require additional discounting. Staff has added language to clarify that the averaging provision can be utilized only on or after July 1, 2001, when the lower (100 g/l) VOC standard is implemented for flat coatings.

RESOLUTION NO. 96-

A Resolution of the Governing Board of the South Coast Air Quality Management District (AQMD) certifying the Final Subsequent Environmental Assessment prepared for the proposed amendments to Rule 1113.

A Resolution of the AQMD Governing Board Amending Rule 1113 - Architectural Coatings.

WHEREAS, the AQMD Governing Board finds and determines that the proposed amendments to Rule 1113 - Architectural Coatings, as proposed to be amended, are considered a "project" pursuant to the California Environmental Quality Act (CEQA); and

WHEREAS, the AQMD has had its regulatory program certified pursuant to Public Resources Code Section 21080.5 and has conducted CEQA review and analysis pursuant to such program (Rule 110); and

WHEREAS, the 1994 AQMP contained a control measure, #94CTS-07, which Proposed Amended Rule 1113 partially implements, for which a program EIR was prepared and certified;

WHEREAS, new information regarding the use of acetone in place of other traditional solvents became available after the certification of the program EIR, such that AQMD staff has prepared a Draft Subsequent Environmental Assessment (SEA) pursuant to AQMD Rule 110 setting forth the potential environmental consequences of adopting Proposed Rule 1113 - Architectural Coatings; and

WHEREAS, the SEA also constitutes a subsequent CEQA document to the February 1990 CEQA document for Rule 1113 in compliance with a Superior Court order relating to lacquers; and

WHEREAS, it is necessary that the adequacy of the environmental document be determined by the AQMD Governing Board prior to its certification; and

WHEREAS, a potentially significant environmental impact was identified for the proposed project due to foregone potential air emission reductions resulting from the immediate increase of VOC limits for certain specialty coatings that consist of japans, magnesite, and fireproofing coatings, which cannot be mitigated to a level of insignificance; and

WHEREAS, such foregone emissions reductions would be more than offset by other proposed amendments which lower VOC limits for lacquers, flats, traffic

coatings, and multi-color coatings, with some of these lowered limits taking effect on January 1, 1998; and

WHEREAS, several comment letters were received commenting on the Draft SEA; and

WHEREAS, the Draft SEA has been revised and responses to comments have been prepared such that it is now a Final SEA; and

WHEREAS, no feasible mitigation measures or project alternatives have been identified to mitigate the identified potential temporary significant air quality impact to insignificance for the reasons stated in Attachment 1;

WHEREAS, a Statement of Overriding Considerations, set forth in Attachment 1, has been prepared stating the specific reasons for this Board's action in finding that the benefits of the proposed project outweigh the unavoidable environmental effects, such that the adverse effects may be considered acceptable;

WHEREAS, the final SEA and Attachment 1 has been completed in compliance with CEQA and Rule 110;

WHEREAS, the staff report, which includes the final SEA and the Socioeconomic Impact Analysis, Attachment 1, and other supporting documentation was presented to the AQMD Governing Board and that the Board has reviewed and considered the entirety of this information prior to approving the project;

WHEREAS, the AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Sections 40000, 40001, 40440, 40463, 40702, and 40725 through 40728 of the California Health and Safety Code; and

WHEREAS, the AQMD Governing Board has determined that a need exists to amend Rule 1113 - Architectural Coatings to achieve emission reductions of VOC's by up to 10.5 tons per day in accordance with the Air Quality Management Plan ("AQMP") Control Measure CTS-07, to raise VOC limits for certain specialty coatings, to reinstate certain VOC limits to comply with a superior court order, and to clarify rule language; and

WHEREAS, the AQMD Governing Board has determined that the proposed amendments to Rule 1113 - Architectural Coatings, are written and displayed so that the meaning can be easily understood by persons directly affected by them; and

WHEREAS, the AQMD Governing Board has determined that Rule 1113 - Architectural Coatings, as proposed to be amended, is in harmony with, and not in conflict with, or contradictory to, existing statutes, court decisions, or state or federal regulations; and

WHEREAS, the AQMD Governing Board has determined that Rule 1113 - Architectural Coatings, as proposed to be amended, does not impose the same requirement as any existing state or federal regulation, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD; and

WHEREAS, the AQMD Governing Board in amending the regulation, references the following statutes which the AQMD hereby implements, interprets or makes specific: Health and Safety Code Sections 40001 (rules to achieve ambient air quality standards), 40440(a) (rules to carry out the Air Quality Management Plan), 40440(b) (BARCT), and 40440(c) (cost effectiveness), and Federal Clean Air Act Section 171 et seq., 181 et seq. and 116; and

WHEREAS, the AQMD Governing Board determines that there is a problem that Proposed Amended Rule 1113 - Architectural Coatings will alleviate, (i.e., the Basin does not meet state or federal standards for ozone) and the proposed amendment will promote the attainment or maintenance of such air quality standards; and

WHEREAS, the AQMD Governing Board has determined that the socioeconomic impact assessment of Rule 1113 (Architectural Coatings) as proposed is consistent with the March 17, 1989 and October 14, 1994 Board Socioeconomic Resolution for rule adoption; and

WHEREAS, the AQMD Governing Board has determined that the socioeconomic impact assessment of Rule 1113 as proposed is consistent with the provisions of Health and Safety Code Sections 40440.8, 40728.5 and 40920.6.

WHEREAS, the AQMD Governing Board has determined that the proposed amendments to Rule 1113 - Architectural Coatings will result in increased costs to industry, yet are considered cost effective with a cost effectiveness as described in the socioeconomic impact assessment; and

WHEREAS, Proposed Amended Rule 1113 - Architectural Coatings is a control measure in the 1994 Air Quality Management Plan (AQMP) and thus, has been ranked by cost-effectiveness relative to other AQMP control measures in the 1994 AQMP; and

WHEREAS, the socioeconomic impact assessment further presents incremental cost effectiveness data between CEQA alternatives;

WHEREAS, the AQMD Governing Board has actively considered the socioeconomic impact assessment and has made a good faith effort to minimize such impacts;

WHEREAS, the proposed amendments to Rule 1113 - Architectural Coatings helps achieve the maximum feasible emission reduction of VOC's from the coating categories of flats, lacquers, traffic and multi-color coatings, which is estimated to be up to 10.5 ton/day, and that even after considering the socioeconomic impact assessment, the adoption of such amendments is necessary for achieving the federal and state standards for ozone and for implementing the AQMP; and

WHEREAS, a public hearing has been properly noticed in accordance with all provisions of Health and Safety Code, Section 40725; and

WHEREAS, the AQMD Governing Board has held a public hearing in accordance with all provisions of law; and

WHEREAS, the AQMD specifies the Manager of Rule 1113 as the custodian of the documents or other materials which constitute the record of proceedings upon which the adoption of this proposed amendment is based, which are located at the South Coast Air Quality Management District, 21865 E. Copley Drive, Diamond Bar, California.

NOW, THEREFORE BE IT RESOLVED that the AQMD Governing Board does hereby approve the written responses to the comments to the draft SEA, adopt Attachment 1 including the contained Statement of Overriding Considerations, and certify the Final SEA for Proposed Amended Rule 1113 - Architectural Coatings, which was completed in compliance with CEQA and Rule 110 provisions; and find that the Final SEA was presented to the AQMD Governing Board, whose members reviewed, considered, and approved the information therein prior to acting on Proposed Amended Rule 1113 - Architectural Coatings; and

BE IT FURTHER RESOLVED, that the AQMD Governing Board does hereby amend, pursuant to the authority granted by law, Rule 1113 - Architectural Coatings, as set forth in the attached, and incorporated herein by this reference.

Attachment

DATE:_____ _____

CLERK OF THE BOARD

ATTACHMENT 1
TO THE BOARD RESOLUTION

STATEMENT OF FINDINGS AND OVERRIDING CONSIDERATIONS

Introduction

Potential Adverse Impacts Found To Be Significant

Statement of Findings

Statement of Overriding Considerations

Mitigation Monitoring

Conclusions

INTRODUCTION

CEQA requires a public agency's decision makers to consider the information in the CEQA document along with other information which may be presented to the agency when deciding to approve a project. This Attachment, as well as the Final Subsequent Environmental Assessment sets forth the factors considered in the AQMD Governing Board's evaluation of environmental benefits and potential impacts resulting from implementing the proposed amendments to Rule 1113.

POTENTIAL ADVERSE IMPACTS FOUND TO BE SIGNIFICANT

Air Quality Impacts

PAR 1113 would lower the VOC limits for specific coating categories including: lacquers, flat coatings, multi-color, and traffic coatings. The proposed amendments also include increasing allowable VOC limits for certain specialty coatings which are currently under variances because they cannot meet the existing rule limits. These specialty coatings include: exterior fire proofing coatings, magnesite cement coatings, and japans/faux finishing coatings. Implementation of all rule changes will result in a net VOC emission reduction of 10.5 tons per day.

Partially offsetting these anticipated VOC emission reductions is an increase of 0.10 tons per day of VOCs where the higher VOC content limits are being proposed. These coatings however, have been sold at these higher limits under a variance for the past two years, and as a result, there will be no actual increase in VOC emissions. The proposed amendments to increase the VOC limits will take effect upon adoption, while the other amendments to reduce VOC limits will take effect no earlier than 14 months after adoption.

These temporary foregone emission reductions nevertheless exceed the AQMD's significance threshold of 55 pounds of VOC per day contained in the AQMD's CEQA Air Quality Handbook (AQMD, 1993). These foregone emission reductions are therefore considered potentially significant. This adverse air quality impact would last approximately 14 months, until other provision of the proposed amended rule become effective. If adopted, the overall affect of these proposed

amendments would be to reduce potential VOC emissions by 10.5 tons per day by the year 2010. As a result, the October amendments to Rule 1113 would more than offset the 0.10 ton per year of foregone VOC emission reductions. This short-term effect, however, is still considered to be significant.

STATEMENT OF FINDINGS

When approving a project which may have one or more significant adverse environmental effects, CEQA requires a public agency to make one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. Further, the findings must be supported by substantial evidence in the record. Therefore, based upon the substantial evidence presented in the Final EA for proposed amended Rule 1113:

> The AQMD Governing Board finds that proposed amended Rule 1113 has the potential to generate significant adverse air quality impacts for a period of approximately 14 months. The basis for this finding is that the proposed amendments have the potential to result in a loss VOC emission reductions originally anticipated for the rule as a result of increasing the VOC content limits for several specialty coatings, by an amount that exceeds the AQMD's significance threshold.
>
> The AQMD Governing Board finds further that no feasible mitigation measures or project alternatives have been identified which would reduce the potentially significant air quality impact to a level of insignificance. Due to the current and future unavailability of compliant coatings in limited specialty categories of fire proofing coatings, magnesite cement coatings, and japans/faux finish coatings, non-compliant coatings are currently being used under a temporary variance. As a result, there is an urgent need to provide relief from the rule requirements. While other proposed amendments to Rule 1113 could offset these foregone emission reductions, a delay in the effective date of these other amendments is necessary to allow coating manufacturers time to meet the new lowered VOC limits.

STATEMENT OF OVERRIDING CONSIDERATIONS

Despite the fact that no feasible measures or alternatives are available to mitigate potentially significant adverse air quality impacts from the project, the AQMD Governing Board finds that the following benefits of the project outweigh the unmitigated adverse impacts for the following reasons:

- The use of the above-referenced specialty coatings, while limited, is extremely vital to the specific industries that employ the use of these coatings, and therefore their continued use provides a significant economic benefit to them.

- Raising the VOC content limits of the specialty coatings does not increase actual VOC emissions for this source category since non-compliant coatings are currently being used under a variance. The proposed amendments will result in foregone emission reductions, which would not affect existing air quality.

- The potential significant adverse air quality impacts from raising the VOC content of the specialty coatings would last approximately 14 months, until other provisions of the proposed amendments become effective resulting in VOC emission reductions that would more than offset those foregone.

- The net effect on air quality from the entire project is a potential reduction of VOC emissions from architectural coatings of up to 10.5 tons per day by the year 2010.

- The proposed amendments implement in, part, the AQMP control measure CTS-07, which is a necessary part of the AQMD's strategy to attain all state and national ambient air quality standards for ozone, as required by law.

MITIGATION MONITORING

The SEA examined the potential impacts associated with the proposed amendments to Rule 1113. Air quality impacts were found to be significant on a project specific basis. No feasible mitigation measures or project alternatives were identified that would reduce significant adverse air quality impacts to a level of

insignificance, therefore, a Mitigation Monitoring Plan was not prepared for the proposed amendments.

CONCLUSIONS

Based on a worst-case analysis, the potential adverse air quality impacts from the implementation of the amendments to Rule 1113 are considered significant. Significant adverse air quality impacts result from the loss of VOC emission reductions due to increasing the VOC content limit for specialty coatings. The significant adverse impact generated by proposed amended Rule 1113 would last approximately 14 months, until other provisions of the proposed amendments first become effective. Ultimately, overall reductions in VOC emissions of 10.5 tons per day are expected from implementation of the proposed amendments. No feasible mitigation measures or project alternatives have been identified that would minimize the short-term loss of foregone potential emission reductions associated with the proposed amendment while still achieving the overall objectives of the project.

(Adopted Sept. 2, 1977)(Amended Dec. 2, 1977)(Amended Feb. 3, 1978)
(Amended Sept. 5, 1980)(Amended Apr. 3, 1981)(Amended July 3, 1981)
(Amended by California Air Resources Board Oct. 21, 1981)
(Amended Aug. 5, 1983)(Amended Mar. 16, 1984)
(Amended Aug. 2, 1985)(Amended Nov. 1, 1985)
(Amended Feb. 6, 1987)(Amended Jan. 5, 1990)(Amended Feb. 2, 1990)
(Amended Nov. 2, 1990)(Amended Dec. 7, 1990)(Amended Sept. 6, 1991)
(Amended March 8, 1996)(Amended August 9, 1996)

(Amended October 11, 1996)

Draft Proposed Amended RULE 1113. ARCHITECTURAL COATINGS

(a) Applicability

This rule is applicable to any person who supplies, sells, offers for sale, applies, solicits the application of, or manufactures for use in the District any architectural coating intended to be applied to stationary structures or their appurtenances, and to mobile homes, pavements or curbs.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AEROSOL COATING PRODUCT means 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 marking and traffic marking applications.

(2) APPURTENANCES are accessories to ~~an architectural~~ a stationary structure, including, but not limited to: hand railings, cabinets, bathroom and kitchen fixtures, fences, rain-gutters and down-spouts, window screens, lamp-posts, (heating and air conditioning) equipment, other mechanical equipment, large fixed stationary tools, signs, motion picture and television production sets, and concrete forms.

(3) ARCHITECTURAL COATINGS are any coatings applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.

(4) BELOW-GROUND WOOD PRESERVATIVES are ~~coatings~~ wood preservatives formulated to protect below-ground wood ~~from decay or insect attack and which contain a wood preservative chemical registered by the California Department of Food and Agriculture~~.

(5) BITUMINOUS COATINGS MATERIALS are black or brownish coating materials, soluble in carbon disulfide, consisting mainly of hydrocarbons and which are obtained from natural deposits, or as residues from the distillation of crude petroleum oils, or of low grades of coal.

(6) BOND BREAKERS are coatings applied between layers of concrete to prevent the freshly poured top layer of concrete from bonding to the substrate over which it is poured.

(7) CLEAR WOOD FINISHES are clear and semi-transparent coatings, including lacquers and varnishes, applied to wood substrates to provide a transparent or translucent solid film.

(8) COATING is a material which is applied to a surface in order to beautify, protect, or provide a barrier to such surface.

(9)~~(8)~~ COLORANTS are solutions of dyes or suspensions of pigments.

(10)~~(8)~~ CONCRETE-CURING COMPOUNDS are coatings applied to freshly poured concrete to retard the evaporation of water.

(11)~~(9)~~ DRY-FOG COATINGS are coatings which are formulated only for spray application so that when sprayed, overspray droplets dry before falling on floors and other surfaces.

(12) EXEMPT COMPOUNDS (See Rule 102-Definition of Terms.)

(13) FIRE-PROOFING EXTERIOR COATINGS are opaque coatings formulated to protect the structural integrity of outdoor steel and other outdoor construction materials and listed by Underwriter's Laboratories, Inc. for the fire protection of steel.

(14~~11~~) FIRE-RETARDANT COATINGS are coatings ~~which have~~ listed by Underwriter's Laboratories, Inc. as fire-retardant coatings with a flame spread index of less than 25. ~~when tested in accordance with ASTM Designation E 84-87, "Standard Test Method for Surface Burning Characteristics of Building Material," after application to Douglas fir according to the manufacturer's recommendations, or when tested using an equivalent method approved by the Executive Officer~~

(15) FLAT COATINGS are coatings that register a gloss of less than 15 on an 85-degree meter or less than 5 on a 60-degree meter.

~~(12) FORM RELEASE COMPOUNDS are coatings applied 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.~~

(16)~~(13)~~ GRAMS OF VOC PER LITER OF COATING, LESS WATER AND LESS EXEMPT COMPOUNDS, is the weight of VOC per combined volume of VOC and coating solids, ~~It and~~and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:
- W_s = weight of volatile compounds in grams
- W_w = weight of water in grams
- W_{es} = weight of exempt compounds in grams
- V_m = volume of material in liters
- V_w = volume of water in liters
- V_{es} = volume of exempt compounds in liters

For coatings that contain reactive diluents, the Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds, shall be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:
- W_s = weight of volatile compounds ~~not consumed~~emitted during curing, in grams
- W_w = weight of water ~~not consumed~~emitted during curing, in grams
- W_{es} = weight of exempt compounds ~~not consumed~~emitted during curing, in grams
- V_m = volume of the material prior to reaction, in liters
- V_w = volume of water ~~not consumed~~emitted during curing, in liters
- V_{es} = volume of exempt compounds ~~not consumed~~emitted during curing, in liters

(17)~~(14)~~ GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where: W_s = weight of volatile compounds grams

W_w = weight of water in grams

W_{es} = weight of exempt compounds in grams

V_m = volume of the material in liters

(18)~~(15)~~ GRAPHIC ARTS COATINGS (Sign Paints) are coatings formulated for and hand-applied by artists using brush or roller techniques to indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.

~~(16) HIGH-TEMPERATURE INDUSTRIAL MAINTENANCE COATINGS are industrial maintenance coatings formulated for and applied to substrates exposed continuously or intermittently to temperatures above 400 degrees Fahrenheit.~~

~~(18)(17) INDUSTRIAL MAINTENANCE ANTI-GRAFFITI COATINGS are two-component clear industrial maintenance coatings formulated for and applied to exterior walls, and murals to resist repeated scrubbing and exposure to harsh solvents.~~

~~(19)(18) INDUSTRIAL MAINTENANCE COATINGS are high-performance coatings formulated for and applied to substrates in industrial, commercial, or institutional situations that are exposed to one or more of the following extreme environmental conditions:~~

~~(A) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation;~~

~~(B) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, chemical mixtures, or solutions;~~

~~(C) repeated exposure to temperatures in excess of 250 degrees Fahrenheit;~~

~~(D) repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial solvents, cleaners, or scouring agents; or~~

~~(E) exterior exposure of metal structures.~~

~~Industrial Maintenance Coatings are not for residential use or for use in areas of industrial, commercial, or institutional facilities, such as office space and meeting rooms.~~

(19) INDUSTRIAL MAINTENANCE PRIMERS AND TOPCOATS are coatings which are intended to be applied to a surface prior to the application of an industrial maintenance topcoat, to provide a firm bond between the substrate and subsequent coats and high performance coatings which are formulated for the purpose of heavy abrasion, water immersion, chemical, corrosion, temperature, electrical or solvent resistance.

(A) Alkyds
Synthetic resins formed by the condensation of polyhydric alcohols with polybasic acids.

(B) Catalyzed Epoxy
Cross-linking resins made by the reaction of epoxides with other materials such as amines, alcohols, phenols, carboxylic acids, and unsaturated compounds.

(C) Bituminous Coatings Materials
Black or brownish coating materials, soluble in carbon disulfide, consisting mainly of hydrocarbons and which are obtained from natural deposits, or any residues from the distillation of crude petroleum oils, or of low grades of coal.

(D) Inorganic Polymers
Substances whose principal structural features are made up on homopolar inter linkages between multivalent elements other than carbon. This does not preclude the presence of carbon containing groups in the side branches, or as inter linkages between principal structural members. Examples of such polymers are ethyl and butyl silicates.

(E) Vinyl Chloride Polymers
Polymers made by the polymerization of vinyl chloride or copolymerization of vinyl chloride with other unsaturated

compounds, the vinyl chloride being in greatest amount by weight.

(F) Chlorinated Rubber
Resin formed by the reaction of rubber with chlorine.

(G) Acrylic Polymers
Polymers resulting from the polymerization of derivatives of acrylic acids, including esters of acrylic acid, methacrylic acid, acrylonitrile, and their copolymers. Also known as acrylic resins and acrylate resins.

(H) Urethane Polymers
Coating vehicles containing a polyisocyanate monomer reacted in such a manner as to yield polymers containing any ratio, proportion, or combination of urethane linkages, active isocyanate groups, or polyisocyanate monomer.

(I) Silicones
A resin containing silicon, unlike organic resins which all contain carbon. The basic structure of silicones consists of silicon-oxygen linkages.

(J) Unique Vehicles
Generic polymer components not defined by any of the preceding, e.g., hypalon or phenoxy.

(20) JAPANS/FAUX FINISHING COATINGS are glazes designed for wet-in-wet techniques used as a stain or glaze to create artistic effects, including but not limited to, dirt, old age, smoke damage, and simulated marble and wood grain.

(21)~~(19)~~ LACQUERS are clear or pigmented wood finishes, including clear lacquer sanding sealers,~~coatings~~ formulated with nitrocellulose or synthetic resins to dry by evaporation without chemical reaction~~and to provide a quick-drying, solid protective film~~.

(22)~~(20)~~ LOW-SOLIDS ~~STAINS~~COATINGS are ~~stains~~coatings containing ~~1~~one pound or less of solids per gallon of material~~, and containing no Group II exempt compounds listed in (b)(10)(B) as defined in Rule 102.~~

(23)~~(21)~~ MAGNESITE CEMENT COATINGS are coatings formulated for and applied to magnesite cement decking to protect the magnesite cement substrate from erosion by water.

(24)~~(22)~~ MASTIC COATINGS are coatings formulated to cover holes and minor cracks and to conceal surface irregularities, and applied in a thickness of at least 10 mils (dry, single coat).

(25)~~(23)~~ METALLIC PIGMENTED COATINGS are coatings containing at least 0.4 pound of elemental metallic pigment per gallon (50 grams/liter) of coating as applied.

(26)~~(24)~~ MULTI-COLORED COATINGS are coatings which exhibit more than one color when applied and which are packaged in a single container and applied in a single coat.

~~(25) OPAQUE STAINS are all stains that are not classified as semi-transparent stains.~~

~~(26) OPAQUE WOOD PRESERVATIVES are all wood preservatives not classified as clear or semi-transparent wood preservatives, or as below-ground wood preservatives.~~

(27) PRE-TREATMENT WASH PRIMERS are coatings which contain a minimum of 1/2 percent acid, by weight, applied directly to bare metal surfaces to provide necessary surface etching.

(28) PRIMERS are coatings applied to a surface to provide a firm bond between the substrate and subsequent coats.

(29) QUICK-DRY ENAMELS are non-flat coatings which comply with the following:

(i) Shall be capable of being applied directly from the container by brush or roller under normal conditions, normal conditions being ambient temperatures between 60°F and 80°F;

(ii) When tested in accordance with ASTM D 1640 they shall: set-to-touch in two hours or less, dry-hard in eight hours or less, and be tack-free in four hours or less by the mechanical test method; and

(iii) Shall have a 60° dried film gloss of no less than 70.

(30) QUICK-DRY PRIMERS, SEALERS, AND UNDERCOATERS are primers, sealers, and undercoaters which are intended to be applied to a surface to provide a firm bond between the substrate and subsequent coats and which are dry-to-touch in one-half hour and can be recoated in two hours (ASTM D 1640).

(31) REACTIVE DILUENT is a liquid which is a VOC during application and one in which, through chemical and/or physical

reaction, such as polymerization, becomes an integral part of the coating.

~~(29) RESIDENTIAL USE is use in areas where people reside or lodge including, but not limited to, single and multiple family dwellings, condominiums, mobile homes, apartment complexes, motels, and hotels.~~

(32)~~(30)~~ ROOF COATINGS are coatings formulated for application to exterior roofs and for the primary purpose of preventing penetration of the substrate by water, or reflecting heat and ~~reflecting~~ ultraviolet radiation. Metallic pigmented roof coatings which qualify as metallic pigmented coatings shall not be considered to be in this category, but shall be considered to be in the metallic pigmented coatings category.

(33)~~(31)~~ SANDING SEALERS are clear wood coatings formulated for and applied to bare wood for sanding and to seal the wood for subsequent application of ~~varnish~~ coatings. To be considered a sanding sealer a coating must be clearly labeled~~labelled~~ as such.

(34)~~(32)~~ SEALERS are coatings applied to substrates to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate.

~~(33) SEMI-TRANSPARENT STAINS are coatings which are formulated to change the color of a surface but not conceal its texture.~~

~~(34) SEMI-TRANSPARENT WOOD PRESERVATIVES are wood preservative stains formulated to protect exposed wood from decay or insect attack by the addition of a wood preservative chemical registered by the California Department of Food and Agriculture, and which may change the color of a surface but do not conceal the surface, including clear wood preservatives.~~

(35) SHELLACS are clear or pigmented coatings formulated solely with the resinous secretions of the lac beetle (laccifer lacca), thinned with alcohol, and formulated to dry by evaporation without a chemical reaction.

(36) SOLICIT is to require for use or to specify, by written or oral contract.

(37) STAINS are opaque or semi-transparent coatings which are formulated to change the color but not conceal the grain pattern or texture.

(38~~37~~) SWIMMING POOL COATINGS are coatings specifically formulated to coat the interior of swimming pools and to resist swimming pool chemicals.

(39~~38~~) SWIMMING POOL REPAIR COATINGS are chlorinated, rubber-based coatings used for the repair and maintenance of swimming pools over existing chlorinated, rubber-based coatings.

(40~~39~~) TINT BASE is an architectural coating to which colorants are added.

(41~~40~~) TRAFFIC COATINGS are coatings formulated for and applied to public streets, highways, and other surfaces including, but not limited to, curbs, berms, driveways, and parking lots.

(42)~~(41)~~ UNDERCOATERS are coatings formulated and applied to substrates to provide a smooth surface for subsequent coats.

(43)~~(42)~~ VARNISHES are clear wood finishes formulated with various resins to dry by chemical reaction on exposure to air.

(44)~~(43)~~ VOLATILE ORGANIC COMPOUND (VOC)
See Rule 102.
~~is any volatile compounds which contains the element carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.~~

(45)~~(44)~~ WATERPROOFING SEALERS are colorless coatings which are formulated for the sole purpose of preventing penetration of porous substrates by water and which do not alter surface appearance or texture.

(46~~48~~) WOOD PRESERVATIVES are coatings formulated to protect wood from decay or insect attack by the addition of a wood preservative chemical registered by the California Environmental Protection Agency.

(c) Requirements

(1) Except as provided in ~~subsections~~ paragraphs (c)(2), (c)(3), and (c)(4), no person shall supply, sell, offer for sale, apply, or solicit the application of, any architectural coating which, at the time of sale or manufacture, contains more than 250 grams of ~~volatile organic compounds~~ VOC per liter of coating (2.08 pounds per gallon), ~~excluding~~ less water, less exempt compounds, and less any colorant

added to tint bases, or manufacture, blend, or repackage such a coating for use within the District.

(2) Except as provided in ~~subsections~~ paragraphs (c)(3) and (c)(4), no person shall supply, sell, offer for sale, apply, ~~or~~ solicit the application of, manufacture, blend, or repackage, for use within the District, any architectural coating listed in the Table of Standards which contains VOC ~~volatile organic compounds (less water and exempt compounds, and~~ excluding any colorant added to tint bases) in excess of the corresponding VOC limit specified in the table, after the ~~corresponding~~ effective date specified~~, or manufacture, blend, or repackage such a coating for use within the District.~~

~~TABLE OF STANDARDS~~

~~VOC LIMITS~~

~~Grams of VOC Per Liter of Coating, Less Water And Less Exempt Compounds~~

~~COATING~~	~~Effective at Adoption(2/2/90)~~	~~Effective Dec. 1, 1990~~	~~Effective Dec. 1, 1993~~
~~Clear Wood Finishes~~			
~~Varnish~~	~~350~~	~~350~~	~~350~~
~~Sanding Sealers~~		~~350~~	~~350~~
~~Lacquer~~	~~680~~	~~550~~	~~275(7-1-94)~~
~~Semi-transparent Stains~~	~~350~~	~~350~~	~~350~~
~~Opaque Stains~~	~~350~~	~~350~~	~~350~~
~~Semi-transparent and Clear Wood Preservatives~~	~~350~~	~~350~~	~~350~~
~~Below-Ground Wood Preservatives~~		~~600~~	~~350~~
~~Opaque Wood Preservatives~~	~~350~~	~~350~~	~~350~~
~~Primers, Sealers, and Undercoaters~~	~~350~~	~~350~~	~~350~~
~~Bond Breakers~~		~~750~~	~~350 (7-1-91)~~
~~Industrial Maintenance Coatings~~	~~420~~	~~420~~	~~340~~
~~Industrial Maintenance Anti-Graffiti Coatings~~		~~600~~	~~340~~
~~Industrial Maintenance High-Temperature Coatings~~		~~650~~	~~550~~
~~Fire Retardant Coatings~~			
~~Clear~~		~~650~~	~~650~~
~~Pigmented~~		~~350~~	~~350~~
~~Form Release Compounds~~		~~250~~	~~250~~
~~Graphic Arts (Sign) Coatings~~		~~500~~	~~500~~
~~Magnesite Cement Coatings~~		~~600~~	~~450~~
~~Metallic Pigmented Coatings~~		~~500~~	~~500~~
~~Dry Fog Coatings~~			
~~Flats~~	~~420~~	~~400~~	~~400~~

~~Non-Flats~~	~~400~~	~~400~~	~~400~~
~~Multi-Color Coatings~~		~~580~~	~~420~~
~~Pretreatment Wash Primers~~		~~780~~	~~780~~
~~Waterproof Sealers~~	~~400~~	~~400~~	~~400~~
~~Concrete Curing Compounds~~	~~350~~	~~350~~	~~350~~
~~Mastic Coatings~~	~~300~~	~~300~~	~~300~~
~~Traffic Paints for Public Streets and Highways~~	~~250~~	~~250~~	~~250~~
~~For Other Surfaces~~	~~250~~	~~250~~	~~250~~
~~Black Traffic Coatings~~		~~250~~	~~250~~
~~Shellac~~			
~~Clear~~		~~730~~	~~730~~
~~Pigmented~~		~~550~~	~~550~~
~~Swimming Pool Coatings~~		~~650~~	~~340~~
~~Swimming Pool Repair and Maintenance Coatings~~		~~650~~	~~650~~

TABLE OF STANDARDS

VOC LIMITS

Grams of VOC Per Liter of Coating, Less Water And Less Exempt Compounds

COATING	Limit *	Effective Date of Adoption	Effective 1/1/1998	Effective 1/1/1999	Effective 7/1/2001	Effective 1/1/2005	Effective 7/1/2008
Bond Breakers	350						
Clear Wood Finishes							
Varnish	350						
Sanding Sealers	350						
Lacquer	680		550			275	
Concrete-Curing Compounds	350						
Dry-Fog Coatings	400						
Fire-proofing Exterior Coatings	350	450		350			
Fire-Retardant Coatings							
Clear	650						
Pigmented	350						
Flats	250				100		50
Graphic Arts (Sign) Coatings	500						
Industrial Maintenance Primers and Topcoats							
Alkyds	420						
Catalyzed Epoxy	420						
Bituminous Coatings Materials	420						
Inorganic Polymers	420						
Vinyl Chloride Polymers	420						
Chlorinated Rubber	420						
Acrylic Polymers	420						
Urethane Polymers	420						
Silicones	420						
Unique Vehicles	420						
Japans/Faux Finishing Coatings	350	700		350			
Magnesite Cement Coatings	600			450			
Mastic Coatings	300						
Metallic Pigmented Coatings	500						
Multi-Color Coatings	420		250				
Pigmented Lacquer	680		550			275	
Pre-Treatment Wash Primers	780						
Primers, Sealers, and Undercoaters	350						
Quick-Dry Enamels	400						
Roof Coatings	300						
Shellac							
Clear	730						
Pigmented	550						
Stains	350						
Swimming Pool Coatings							
Repair	650						
Other	340						
Traffic Coatings	250		150				
Waterproofing Sealers	400						
Wood Preservatives							
Below-Ground	350						
Other	350						

* The specified limits remain in effect unless revised limits are listed in subsequent columns in the Table of Standards

TABLE OF STANDARDS (cont.)

VOC LIMITS

Grams of VOC Per Liter of Material

COATING	Limit
Low-Solids Coating	120

(3) If anywhere on the container of any coating listed in the Table of Standards, on any sticker or label affixed thereto, or in any sales or advertising literature, any representation is made that the coating may be used as, or is suitable for use as, a coating for which a lower VOC standard is specified in the table or in ~~subsection~~ paragraph (c)(1), then the lowest VOC standard shall apply. This requirement does not apply to the representation of the following coatings in the manner specified:

~~(A) high-temperature industrial maintenance coatings, which may be represented as metallic pigmented coatings for use consistent with the definition of high-temperature industrial maintenance coatings;~~

(A~~B~~) lacquer sanding sealers, which may be recommended for use as sanding sealers in conjunction with clear lacquer topcoats;

(B~~C~~) metallic pigmented coatings, which may be recommended for use as primers, sealers, undercoaters, roof coatings, or industrial maintenance coatings;~~and~~

(C~~D~~) shellacs;. and

(D) low-solids coatings.

(4) Except where already required to be in compliance with ~~a~~ the previous version of this rule, sale or application of a coating manufactured prior to the effective date of the corresponding standard in the Table of Standards, and not complying with that standard, shall not constitute a violation of ~~subsection~~ paragraph (c)(2) until three years after the effective date of the standard.

~~(5) The manufacture of a coating subject to a standard listed in the Table of Standards and not complying with that standard shall not constitute a violation of subsection (c)(2) until thirty days after the effective date of the standard.~~

(5) All VOC-containing materials shall be stored in closed containers when not in use. In use includes, but is not limited to: being accessed, filled, emptied, or repaired.

(6) Averaging Provisions

On or after July 1, 2001, manufacturers may comply with the provisions of paragraph (c)(2) for flat coatings by complying with the following averaging provisions:

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

$$\sum_{i=1}^{n} ER_i(U_i) \leq \sum_{i=1}^{n} VOC_i(U_i)$$

Where:

$\sum_{i=1}^{n} VOC_i(U_i)$ = Allowable Emissions

$\sum_{i=1}^{n} ER_i(U_i)$ = Actual Emissions

VOC_i = Pounds of VOC per pound of coating solids (lbs/lb);

U_i = Quantity of coating "i" sold for use within the District (pounds of coating solids); and

ER_i = VOC content of coating "i", as supplied (lbs/lb).

The averaging is limited only to flat coatings selected by the manufacturer. Any flat coating not included in the averaging plan shall comply with the VOC limit in paragraph (c)(2).

(B) Averaging Plan (Plan)

Manufacturers using the averaging approach shall submit a Plan, pursuant to Rule 221 - Plans, to the Executive Officer. The Plan may not be implemented until it is approved in writing by the Executive Officer. Submittal of the Plan does not provide an exemption from the rule requirements. The Plan shall meet the requirements specified in Appendix A.

(d) Administrative Requirements

(1) Containers for all coatings subject to this rule shall display the date of manufacture of the contents or a code indicating the date of manufacture. The manufacturers of such coatings shall file with the Executive Officer of the District and the Executive Officer of the Air Resources Board an explanation of each code.

(2) Containers for all coatings subject to the requirements of this rule shall carry a statement of the manufacturer's recommendation regarding thinning of the coating. This recommendation shall not apply to the thinning of architectural coatings with water. The recommendation shall specify that the coating is to be employed without thinning or diluting under normal environmental and application conditions, unless any thinning recommended on the label for normal environmental and application conditions does not cause a coating to exceed its applicable standard.

(3) Each container of any coating subject to this rule shall display the maximum VOC content of the coating, as suppliedapplied, and after any thinning as recommended by the manufacturer. The VOC content of low-solids coatings stains shall also be displayed as grams of VOC per liter of material (excluding any colorant added to the tint bases) and the VOC content of any other coating shall also be displayed as grams of VOC per liter of coating (less water and less exempt compounds, and excluding any colorant added to tint bases). VOC content displayed may be calculated using product formulation data, or may be determined using the test method in subsectiondivision (e).

~~(4) The labels of all industrial maintenance coatings shall include the statement "Not for Residential Use," or "Not for Residential Use in California," prominently displayed.~~

(4) After January 1, 1998, the coating container label or container shall include the words "Quick-Dry" or shall list the following:

(A) The recoat time for quick-dry primers, sealers, and undercoaters, or

(B) The dry-hard time for quick-dry enamels.

Containers and container labels shall not contain the words "Quick-Dry" unless the material meets the dry times specified in the

respective definitions or the material complies with the respective general VOC limit for enamels or primers, sealers, and undercoaters.

(e) Test Methods

For the purpose of this rule, the following test methods shall be used. ~~Other test methods determined to be equivalent after review by the staffs of the District, the California Air Resources Board, and the United States Environmental Protection Agency(USEPA), and approved in writing by the District Executive Officer may also be used.~~

(1) VOC Content of Coatings

The VOC content of coatings subject to the provisions of this rule shall be determined by:

(A) The United States Environmental Protection Agency (USEPA) Reference Test Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A), with ~~T~~the exempt compound's' content ~~shall be~~ determined by Method 303 (Determination of Exempt Compounds) in the South Coast Air Quality Management District's (SCAQMD) "Laboratory Methods of Analysis for Enforcement Samples" manual ~~Section III, Methods 19 and 23~~, or

(B) Method 304 [Determination of Volatile Organic Compounds (VOC) in Various Materials] in the SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual~~Section III, Methods 16, 17, 19, 22, and 24~~.

(C) Exempt Perfluorocarbons

The following classes of compounds:

cyclic, branched, or linear, completely fluorinated alkanes

cyclic, branched, or linear, completely fluorinated ethers with no unsaturations

cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations

sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine

will be analyzed as exempt compounds for compliance with subdivision (c), only when manufacturers specify which individual compounds are used in the coating formulations. In addition, the manufacturers must identify the USEPA, ARB, and SCAQMD approved test methods, which can be used to quantify the amount of each exempt compound.

(2) Acid Content of Coatings

The acid content of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1613-85 (Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products).

(3) Metal Content of Coatings

The metallic content of a coating subject to the provisions of this rule shall be determined by Method 311 (Determination of Percent Metal in Metallic Coatings by Spectrographic Method) in the SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual.

(4) Flame Spread Index

The flame spread index of a fire-retardant coating subject to the provisions of this rule shall be determined by ASTM Test Method E 84-91A (Standard Test Method for Surface Burning Characteristics of Building Material) after application to an organic or inorganic substrate, based on the manufacturer's recommendations.

(5) Drying Times

The set-to-touch, dry-hard, dry-to-touch, and dry-to-recoat times of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1640 (Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature). The tack-free time of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1640, according to the Mechanical Test Method.

(6) Gloss Determination

The gloss shall be determined by ASTM Test Method D 523 (Specular Gloss).

(7) Equivalent Test Methods

Other test methods determined to be equivalent after review by the staffs of the District, the California Air Resources Board, and the

USEPA, and approved in writing by the District Executive Officer may also be used.

(8) Multiple Test Methods

When more than one test method or set of test methods are specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.

(9) All test methods referenced in this subdivision shall be the version most recently approved by the appropriate governmental entities.

(f) Technology Assessment for Flats and Lacquers

The Executive Officer shall conduct:

(1) A technology assessment for the future VOC limit for flat coatings as specified in paragraph (c)(2) by July 1, 2000 and July 1, 2007.

(2) A technology assessment for the future VOC limit for lacquers specified in paragraph (c)(2) by January 1, 2004.

If compliance with any of these limits is determined to be infeasible, the Executive Officer shall propose appropriate amendments.

(~~g~~f) Exemptions

(1) The provisions of this rule shall not apply to:

(A)(~~1~~) architectural coatings in containers having capacities of one quart or less, provided that the manufacturer shall submit an annual report to the Executive Officer within three months of the end of each calendar year. The report shall contain information as required by the Executive Officer to monitor the use of the small container exemption. The loss of this exemption due to the failure of the manufacturer to submit an annual report shall apply only to the manufacturer; or

(B)(~~2~~) architectural coatings sold in this District for shipment outside of this District or for shipment to other manufacturers for repackaging; or

(C)(~~3~~) emulsion type bituminous pavement sealers; or

(D)(~~4~~) aerosol coating products.

(E) Use of stains and lacquers in all areas within the District at an elevation of 4,000 feet or greater above sea level.

(2) For architectural coatings recommended by the manufacturer for use solely as quick-dry primers, sealers and undercoaters, the provisions of subdivision (c) shall not apply to:

(A) the manufacture, blending or repackaging of such coatings, or

(B) the application, sale, offering for sale or soliciting the application of such coatings, provided that the manufacturer submits an annual report to the Executive Officer within three months of the end of each calendar year. The report shall include for each exempt coating gallons sold in California.

(3) Notwithstanding the provisions of paragraph (c)(2), 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 degrees Fahrenheit, at the time of application provided that:

(A) the coating is not applied from April 1 to October 31 of any year;

(B) 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.

APPENDIX A: Averaging Provision

(A) General Requirements

The Plan shall include, at a minimum:

- An identification of the contact persons, phone numbers, and name of the manufacturer who is submitting the Plan and will be implementing the requirements of the plan.
- A listing of the flat coatings, and available variations, legible copies of the existing labels for each coating, material safety data sheets, and VOC content (pounds of VOC per pound of solids), (grams of VOC per liter of coating), and grams of VOC per liter of material).
- An operational plan covering all the coatings for each compliance period that the Plan will be in effect. The operational plan shall contain all of the following:
  - ⇒ an identification of the compliance periods and dates for the manufacturer to report the information required by the Executive Officer. The length of the compliance period shall not exceed 365 days;
  - ⇒ an identification of specific sales records to be provided to the Executive Officer for approving and enforcing the Plan;
  - ⇒ for each coating listed, all VOC content levels which will be applicable for the coating during each compliance period;
  - ⇒ the projected sales for each coating at each different VOC content for every compliance period that the Plan will be in effect;
  - ⇒ a detailed demonstration showing that the projected actual emissions will not exceed the allowable emissions for each compliance period that the Plan will be in effect. The demonstration shall use the equation specified in subparagraph (c)(6)(A) for projecting the actual emissions and allowable emissions during each compliance period, and shall specify the methodology used for converting VOC content in g/l to lbs/lb for VOC_i and ER_i. The demonstration shall also include all VOC content levels and projected sales within the District for all coatings listed in the Plan during each compliance period;
  - ⇒ For each coating included in the Plan, the total sales volume (in gallons) within the District will be reported for the time period just completed which is equivalent to the requested initial compliance period.

- a statement, signed by a legal representative for the manufacturer, that all information and operational plans submitted with the Plan are true and correct.
- a reconciliation plan which commits the manufacturer to completely reconcile any shortfalls in any and all cases, to the extent permitted by law, even if the manufacturer files for bankruptcy protection. The reconciliation plan shall contain all of the following:
  - ⇒ a clear and convincing demonstration of how shortfalls of up to 5%, 10%, 15%, 25%, 50%, 75%, and 100% of the allowable emissions will be completely reconciled within 90 working days from the date the shortfall is determined;
  - ⇒ a listing of the specific records and other information that will be necessary to verify that the shortfalls were reconciled;
  - ⇒ a commitment to provide any record or information requested by the Executive Officer to verify that the shortfalls have been completely reconciled.

(B) Reporting Requirements

- A final report, demonstrating what the actual emissions and the allowable emissions were during the compliance period, shall be submitted to the Executive Officer within 60 days after the termination of the indicated compliance period.

(C) Renewal of a Plan

- If the Plan has no changes, except the compliance period, the manufacturer shall submit a notice in writing, specifying a new compliance period for the Plan. Otherwise, all of the information specified in Section A of this Appendix shall be submitted.

(D) Modification of a Plan

- If the Executive Officer determines that: (1) the information submitted pursuant to the approval process is no longer valid, or (2) the actual emissions are exceeding the allowable emissions specified in the approved Plan, then the Executive Officer shall notify the manufacturer of his/her findings and the manufacturer shall modify the Plan within 30 days, as necessary to ensure that

the Plan meets all of the applicable requirements and that the actual emissions will not exceed the allowable emissions for the compliance period.

- If the VOC standard specified in the Table of Standards for flat coating is modified in a future rulemaking, the Executive Officer shall notify the manufacturer of the change and the manufacturer shall modify, within 30 days, the allowable emissions specified in the approved Plan to reflect the modified VOC standard as of their effective dates.
- The manufacturer may modify the Plan during the compliance period to ensure that actual emissions are less than or equal to the allowable emissions. All such modifications shall be submitted to and approved by the Executive Officer prior to implementation.

(E) Termination of a Plan

- A Plan shall remain in effect until:
  - ⇒ the Plan reaches the expiration date specified in the Plan by the Executive Officer;
  - ⇒ the Plan is modified by the manufacturer and approved by the Executive Officer;
  - ⇒ the Plan is modified by the Executive Officer;
  - ⇒ the VOC standard for flat coatings is modified in future rulemaking, and the manufacturer informs the Executive Officer in writing that the Plan will terminate on the effective date of the modified standard.
  - ⇒ a manufacturer submits a written request for termination of the plan.
- The Executive Officer shall terminate a Plan if any of the following circumstances occur:
  - ⇒ the manufacturer demonstrates to the satisfaction of the Executive Officer that the continuation of the Plan will result in an extraordinary economic hardship;
  - ⇒ the manufacturer violates the requirements of the approved Plan, and the actual emissions exceed the allowable emissions by 20% or more after reconciliation;
  - ⇒ the manufacturer fails to meet the requirements of the reconciliation plan within the specified time periods;
  - ⇒ the manufacturer demonstrates a recurring pattern of violations and has consistently failed to take the necessary steps to correct those violations.

- Upon termination of a Plan, all flat coatings listed in the Plan must comply with the VOC standard specified in the Table of Standards for flat coatings. In addition, any shortfall for the current compliance period shall be reconciled by the manufacturer.

(F) Plan Approval Timeframes

- The provisions of Rule 210 - Applications and Rule 221 - Plans shall apply.

(G) Violations

- An exceedance of the allowable emissions for any compliance period that the Averaging Plan is in effect shall constitute a single, separate violation of the requirements of this section for each day of the applicable compliance period.

South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • http://www.aqmd.gov

BOARD MEETING DATE: May 14, 1999 AGENDA NO. 33

PROPOSAL: Amend Rule 1113 - Architectural Coatings

SYNOPSIS: The proposed amendments will implement the AQMP Control Measure for architectural coatings through decreasing VOC limits for industrial maintenance coatings; nonflat coatings; primers, sealers, and undercoaters (PSU); quick-dry enamels; quick-dry PSU; stains; roof coatings; and waterproofing wood sealers. The proposed amendments will also establish new coating categories and VOC limits for rust-preventative coatings; floor coatings; bituminous roof coatings, recycled flats and nonflats, essential public service coatings, and waterproofing concrete/masonry sealers, as well as provide needed clarifications. Lastly, the proposed amendments will expand and clarify the averaging provision to provide additional flexibility to manufacturers.

COMMITTEE: Stationary Source, April 23, 1999, Reviewed

RECOMMENDED ACTION:
Adopt the attached resolution:
1. Certifying the Final Subsequent Environmental Assessment for Proposed Amended Rule 1113 – Architectural Coatings;
2. Making certain findings; and
3. Amending Rule 1113 - Architectural Coatings.

Barry R. Wallerstein, D.Env.
Executive Officer

JPB:NB

Background

Rule 1113 is applicable to manufacturers, distributors, and end-users of architectural and industrial maintenance (AIM) coatings. It was first adopted in 1977, and has undergone numerous amendments. The purpose of the rule is to reduce VOC emissions from the use of AIM coatings, primarily by placing VOC limits on various coating categories.

On August 21, 1990, the Superior Court of Los Angeles County entered a judgment against AQMD in the case Dunn-Edwards Corporation, et al. vs. SCAQMD, et al. The judgment denied in part, and granted in part, the petition for writ of mandate seeking to overturn certain amendments made in February 1990. As a result, the AQMD was prevented from enforcing the lower VOC limits for aerosol coatings, industrial maintenance coatings, lacquers, quick-dry enamels, and quick-dry primers, sealers and undercoaters. This judgment impacted approximately 4.5 tons per day (tpd) of VOC emissions. Other amendments adopted in February 1990 and prior rule provisions remained in effect.

Rule 1113 - Architectural Coatings was last amended on November 8, 1996, resulting in approximately 10.3 tpd of VOC emission reductions. Subsequently, three separate lawsuits were filed by industry challenging the lower limits for flats and lacquers on both state and federal grounds. The AQMD has prevailed in all three lawsuits on all state grounds, and has succeeded in obtaining dismissal of most of the federal grounds.

The current proposed amendments will lower the VOC limits for all coating categories impacted by the 1990 court judgment, except lacquers, which was addressed in the last rulemaking. The proposed amendments also include lower limits for additional categories. The proposed lower VOC limits are all based on the concept of reformulation of existing coatings, either with water, exempt solvents, and/or currently available, innovative resin technology. The proposed amendments will also add a few additional specialty coating categories, establish current and future effective limits for the new categories, as well as expand, clarify, and streamline the implementation of the averaging provision.

In response to industry concerns, the AQMD contracted Eastern Michigan University (EMU), Coatings Research Institute, to further evaluate six of the seven issues previously raised by Environmental, Legislative & Regulatory Advocacy Program (EL RAP) pertaining to coating categories in the current proposal, and to provide recommendations for future compliance limits for the different coating categories. This study concluded that low- and zero-VOC coatings are currently available for the proposed coating categories, but could not reach conclusions regarding the overall performance of these coatings, as compared to current, compliant solvent-based coating formulations, since performance data was not provided to the researcher.

In order to obtain additional information on application and durability characteristics of the low- and zero-VOC coatings currently available, the AQMD contracted National Technical Systems (NTS) to do a side-by-side comparison of zero-, low-, and high-VOC coatings. The results of the NTS study have supported the staff's assessment that the zero- and low-VOC products available today, when compared to the high-VOC coatings, are equal, and in some cases superior, in some performance characteristics, including but not limited to coverage, and scrub resistance. However, the NTS study has also highlighted application characteristics of the zero-VOC coatings that are somewhat limited when compared to solvent-based, higher-VOC coatings. These include lower rankings for leveling, sagging, and brushing properties. The study does show that some zero-VOC coatings have inferior application characteristics, whereas other zero-VOC coatings have comparable application characteristics, when compared to higher-VOC coatings.

Over the past two and one-half years, and concurrent with the NTS study, staff has performed its own technology assessment of these low- and zero-VOC coatings and has gained even more information pertaining to their performance characteristics. Based on its own assessment, staff is confident that both the proposed compliance limits and deadlines are achievable.

Staff has reassessed the compliance deadlines based on the information provided by the commentators, and supported by the laboratory results. Staff would also like to emphasize that the overall durability evaluation, including accelerated and real time outdoor exposure studies, will continue and be used for future technology assessments in support of the proposed limits.

Proposal

Based on staff's continued technical assessment, as well as additional discussions with the industry, the proposal has been revised since the March 12, 1999 set hearing package. Three new coating categories have been created, interim VOC limits have been raised for a few of the coating categories, and the compliance dates for both the interim and final proposed limits have been extended. The following VOC limits are proposed to be lowered, which will result in an emission reduction of about 21.8 tons per day of VOCs:

Bituminous Roof Coatings

Establish the VOC limit for bituminous roof coatings at 300 g/l, effective date of adoption, and lower the VOC limit from 300 g/l to 250 g/l effective July 1, 2002.

Essential Public Service Coatings

Establish a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

Floor Coatings

Establish the VOC limit for floor coatings of 400 g/l, effective date upon adoption, and lower the VOC limit from 400 g/l to 100 g/l effective July 1, 2002, and further reduce from 100 g/l to 50 g/l effective July 1, 2006. The proposed floor coating category is a subset of the industrial maintenance coating category, which has a VOC limit of 420 g/l. The 400 g/l limit is established in advance of the National Architectural and Industrial Maintenance (AIM) rule's 400 g/l limit for floor coatings, which will become effective September 13, 1999. Conduct a product availability assessment by July 1, 2001 for the 100 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their floor coatings, on a sales-weighted basis.

High Temperature - Industrial Maintenance Coatings

Establish the VOC limit for high temperature - industrial maintenance coatings of 550 g/l, effective July 1, 2002, and lower to 420 g/l effective July 1, 2006.

Industrial Maintenance Coatings

Lower the VOC limit for industrial maintenance coatings from 420 g/l to 250 g/l effective July 1, 2002. Then reduce the VOC limit from 250 g/l to 100 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 250 g/l and by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their industrial maintenance coatings, on a sales-weighted basis.

Nonflats

Lower the VOC limit for nonflats from 250 g/l to 150 g/l, effective July 1, 2002 and further reduce from 150 g/l to 50 g/l, effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 150 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their nonflats, on a sales-weighted basis.

Primers, Sealers, and Undercoaters

Lower the VOC limit for primers, sealers, and undercoaters from 350 g/l to 200 g/l, effective July 1, 2002, and further reduce from 200 g/l to 100 g/l, effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 200 g/l limit and July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales-weighted basis.

Quick-Dry Enamels

Lower the VOC limit for quick-dry enamels from 400 g/l to 250 g/l, effective July 1, 2002, and further reduce the VOC limit from 250 g/l to 50 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of nonflats, on a sales-weighted basis.

Quick-Dry Primers, Sealers, and Undercoaters

Establish the VOC limit for quick-dry primers, sealers, and undercoaters at 350 g/l, effective date of adoption, unless the manufacturer submits an exemption report pursuant to Rule 1113(g)(3). Lower the quick-dry primers, sealers, and undercoaters to 200 g/l, effective July 1, 2002, and further reduce from 200 g/l to 100 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 200 g/l and July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales-weighted basis.

Recycled Flats and Non-Flats

Establish a VOC limit for recycled flats and non-flats at 250 g/l, effective date upon adoption, and then lower from 250 g/l to 100 g/l effective July 1, 2006

Roof Coatings

Lower the VOC limits for roof coatings from 300 g/l to 250 g/l, effective date upon adoption. The proposed limit is the same as the limit established in the National Architectural and Industrial Maintenance (AIM) rule for roof coatings, which will become effective September 13, 1999.

Rust Preventative Coatings

Establish the VOC limit for rust preventative coatings at 400 g/l, effective date upon adoption, and then lower from 400 g/l to 100 g/l, effective July 1, 2006. The proposed rust preventative coating category is currently a subset of the industrial maintenance coating category, which has a VOC limit of 420 g/l, quick-dry enamels which has a VOC limit of 400 g/l, and primers, sealers, and undercoaters, which has a VOC limit of 350 g/l. However, the limit established in the National Architectural and Industrial Maintenance (AIM) rule for rust preventative coatings is 400 g/l, which will become effective September 13, 1999. Conduct a product availability assessment by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their rust preventative coatings, on a sales-weighted basis.

Stains

Lower the VOC limits for stains from 350 g/l to 250 g/l, effective July 1, 2002. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their stains, on a sales-weighted basis.

Waterproofing Wood Sealers

Lower the VOC limit for waterproofing wood sealers from 400 g/l to 250 g/l, effective July 1, 2002. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their waterproofing wood sealers, on a sales-weighted basis.

Policy Issues

Industry members, mainly manufacturers and contractors, provided several suggestions and introduced issues that they believe need additional research. EL RAP and other manufacturers have eight main issues: that low-VOC coatings are thicker, and thus require more thinning, more priming, more topcoats, more touch-ups and repair work, more frequent recoating, substitution, and more reactivity. Due to these eight issues, some manufacturers believe that coatings with higher VOC content will be substituted for the proposed lower VOC content coatings resulting in an increase in VOC emissions. They also believe a larger amount of low-VOC coatings will be used, resulting in an actual increase in VOC emissions. Lastly, manufacturers expressed concern regarding the lack of sufficient time necessary for research and development of the reformulated coatings.

The eight issues focus on two main points. The first seven issues all state that the new formulations, either solvent-based or waterborne, result in more coating use and an overall increase in VOC emissions over a period of time. The eighth issue involves the reactivity of solvents used in waterborne coatings. EL RAP contends that these result in more ozone formation as compared to solvents in solvent-based formulations.

In response to these concerns, the staff has again analyzed each of the specific issues raised by EL RAP. That analysis is included in the draft Subsequent Environmental Assessment (SEA).

In summary, with regards to additional thinning, the focus of the proposed amendments is limited to coatings that are mainly solventless formulations, waterborne formulations or based on using exempt solvents, thereby eliminating any concerns of thinning the coating, as supplied, with VOC. However, the proposed interim limit for rust preventative coatings relies on alkyd technology that may need some additional thinning in the field, especially for spray application. Manufacturers of these coatings, however, have ensured staff that coatings recommended as rust preventative coatings are supplied at optimal formulations, and therefore would not require thinning in the field. Nonetheless, staff has thoroughly analyzed the thinning issue in the staff report and subsequent environmental assessment.

To examine the issues of thickness, priming, topcoats, touch-up and repair, and frequent recoating, staff used coating coverage estimates, typical dry mil thickness, recommended priming, and estimated life of coating, listed on container labels and technical data sheets or provided by manufacturers during personal interviews and phone surveys. Staff's analysis comparing emissions from the proposed lower-VOC content coatings with emissions from potential substitute coatings shows an overall VOC emission reduction as a result of the proposed amendments.

An extensive discussion regarding the feasibility of reactivity-based architectural coatings control policy development is included in the attached staff report to address the eighth issue. The District is supportive of future studies involving alternative ozone control strategies, and plans to work in conjunction with industry to studying this approach.

To date, manufacturers have not provided data to support the claim that the lower VOC coatings could cause an increase in emissions. As a part of the current rulemaking efforts, staff has requested life-cycle studies that may have been conducted over the past seven years, but none were provided.

Staff has proposed several amendments to Rule 1113 to address concerns raised relative to sufficient time to research, develop, and market compliant coatings. The proposed

amendments provide a three year and a seven-year time period for future compliance limits, as well as an averaging provision for the affected categories that would allow manufacturers to offset non-compliant coatings with super-compliant coatings. The AQMD has also committed to a product availability assessment one year prior to the future rule limits for the affected categories. It should be noted, however, that the proposed limits are principally based on currently available and marketed coatings.

AQMP and Legal Mandates

The 1997 AQMP estimates increased AIM emissions for the Summer-day average (due to population growth) at 68.2 tpd in 1997, growing to 74.7 tpd by the year 2005 and 79.4 tpd by the year 2010 without additional AIM regulations. If left unchecked, AIM coating emissions alone would account for more than 26% of the allowed VOC emissions. Therefore, the 1997 AQMP has a specific control measure (CTS-07) to reduce AIM VOC emissions by 50% by the year 2010, as well as a long-term measure requiring an additional 25% reduction in VOCs. This cumulative 62 tpd emission reduction based on the Summer Planning Inventory is the largest of all short- and long-term control measures.

Installation of air pollution control equipment is not feasible for reducing AIM emissions, thereby leaving coating reformulation as the only practical means to achieve the required reductions. The current proposal emphasizes reformulation of existing coatings, primarily by using currently available, technologically innovative resins, as well as utilizing the growing list of exempt solvents.

These proposed Rule 1113 amendments will implement the 1994 and 1997 architectural coatings control measure, and will seek to reduce AIM emissions by approximately 38% or 21.8 tons per day.

CEQA

Pursuant to CEQA (Public Resources Code §§ 21000 et seq.) and AQMD Rule 110 - Rule Adoption Procedures to Assure Protection and Enhancement of the Environment, AQMD prepared a Draft SEA for the proposed amendments to Rule 1113. The Draft SEA was made available for a 30-day public review and comment period. All comments received on the Draft SEA, and responses to those comments, have been incorporated into the CEQA document for the proposed project such that it is now a Final SEA. In summary, the SEA concluded that there were no significant impacts as a result of implementing the proposed amendments. Copies of the Final SEA are available by calling the AQMD's Public Information Center at (909) 396-3600.

Socioeconomic Analysis
Staff has conducted a thorough cost-effectiveness and socioeconomic impact assessment for the proposed amendments, and has concluded that the proposed amendments are within the costs identified in the AQMP.

The overall cost-effectiveness of the proposed amended rule is estimated to be approximately $13,317 per ton of VOC emissions reduced.

The Final Socioeconomic Impact Assessment is attached as Appendix E of the Staff Report.

Implementation Plan
A notice will be sent to all AIM coating manufacturers and professional painting contractors. District staff will also conduct some training of contractors for the use of low-VOC coatings.

Resource Impact
Existing AQMD resources will be sufficient to implement the proposed changes to this rule with minimal impact on the budget.

Attachments
Summary of Proposed Amendment
Rule Development Flow Chart
Key Contacts
Key Issues and Responses
Resolutions
Staff Report
Rule Language
Emission Reduction Calculations
Comparison of the USEPA National AIM Rule with Proposed Amended Rule 1113 - Architectural Coatings

ATTACHMENT A

SUMMARY OF PROPOSED AMENDMENTS

Rule 1113
The following VOC limits are proposed to be lowered: *Bituminous Roof Coatings* Establish the VOC limit for bituminous roof coatings at 300 g/l, effective date of adoption, and lower the VOC limit from 300 g/l to 250 g/l effective July 1, 2002 *Essential Public Service Coatings* Establish a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage. The District plans to include this category as a part of the technology assessments to be conducted at these essential public service agencies. *Floor Coatings* Establish the VOC limit for floor coatings of 400 g/l, effective date upon adoption, and lower the VOC limit from 400 g/l to 100 g/l effective July 1, 2002, and further reduce from 100 g/l to 50 g/l effective July 1, 2006. The proposed floor coating category is a subset of the industrial maintenance coating category, which has a VOC limit of 420 g/l. The 400 g/l limit is established in advance of the National Architectural and Industrial Maintenance (AIM) rule's 400 g/l limit for floor coatings, which will become effective September 13, 1999. Conduct a product availability assessment by July 1, 2001 for the 100 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their floor coatings, on a sales-weighted basis. *High Temperature - Industrial Maintenance Coatings* Establish the VOC limit for high temperature - industrial maintenance coatings of 550 g/l, effective July 1, 2002, and lower to 420 g/l effective July 1, 2006.

ATTACHMENT A

SUMMARY OF PROPOSED AMENDMENTS

CONTINUED

Rule 1113
Industrial Maintenance Coatings Lower the VOC limit for industrial maintenance coatings from 420 g/l to 250 g/l effective July 1, 2002. Then reduce the VOC limit from 250 g/l to 100 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 250 g/l and by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their industrial maintenance coatings, on a sales-weighted basis. *Nonflats* Lower the VOC limit for nonflats from 250 g/l to 150 g/l, effective July 1, 2002 and further reduce from 150 g/l to 50 g/l, effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 150 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their nonflats, on a sales-weighted basis. *Primers, Sealers, and Undercoaters* Lower the VOC limit for primers, sealers, and undercoaters from 350 g/l to 200 g/l, effective July 1, 2002, and further reduce from 200 g/l to 100 g/l, effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 200 g/l limit and July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales-weighted basis.

ATTACHMENT A

SUMMARY OF PROPOSED AMENDMENTS

CONTINUED

Rule 1113
Quick-Dry Enamels Lower the VOC limit for quick-dry enamels from 400 g/l to 250 g/l, effective July 1, 2002, and further reduce the VOC limit from 250 g/l to 50 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of nonflats, on a sales-weighted basis. *Quick-Dry Primers, Sealers, and Undercoaters* Establish the VOC limit for quick-dry primers, sealers, and undercoaters at 350 g/l, effective date of adoption, unless the manufacturer submits an exemption report pursuant to Rule 1113(g)(3). Lower the quick-dry primers, sealers, and undercoaters to 200 g/l, effective July 1, 2002, and further reduce from 200 g/l to 100 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 200 g/l and July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales-weighted basis. *Recycled Flats and Non-Flats* Establish a VOC limit for recycled flats and non-flats at 250 g/l, effective date upon adoption, and then lower from 250 g/l to 100 g/l effective July 1, 2006 *Roof Coatings* Lower the VOC limits for roof coatings from 300 g/l to 250 g/l, effective date upon adoption. The proposed limit is the same as the limit established in the National Architectural and Industrial Maintenance (AIM) rule for roof coatings, which will become effective September 13, 1999.

ATTACHMENT A

SUMMARY OF PROPOSED AMENDMENTS

CONTINUED

Rule 1113
Rust Preventative Coatings Establish the VOC limit for rust preventative coatings at 400 g/l, effective date upon adoption, and then lower from 400 g/l to 100 g/l, effective July 1, 2006. The proposed rust preventative coating category is currently a subset of the industrial maintenance coating category, which has a VOC limit of 420 g/l, quick-dry enamels which has a VOC limit of 400 g/l, and primers, sealers, and undercoaters, which has a VOC limit of 350 g/l. However, the limit established in the National Architectural and Industrial Maintenance (AIM) rule for rust preventative coatings is 400 g/l, which will become effective September 13, 1999. Conduct a product availability assessment by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their rust preventative coatings, on a sales-weighted basis. *Stains* Lower the VOC limits for stains from 350 g/l to 250 g/l, effective July 1, 2002. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their stains, on a sales-weighted basis. *Waterproofing Wood Sealers* Lower the VOC limit for waterproofing wood sealers from 400 g/l to 250 g/l, effective July 1, 2002. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their waterproofing wood sealers, on a sales-weighted basis. The container label requirements will be revised and require the special labeling for rust preventative coatings. The exemption for Quick-Dry Primers, Sealers and Undercoaters will be deleted, effective July 1, 2002.

ATTACHMENT B

RULE DEVELOPMENT PROCESS

Rule - Architectural Coatings

Staff's Technology Assessment

November 1996

Formation of Current Working Group

September 1998

Eight Working Group Meetings
September 3, *1998; October7, 1998; November 4, 1998; December 9,1998; January 21, 1999; February 18, 1999; March 31, 1999; April 28, 1999*

Public Workshop: December 9, 1998

(2,600 notices mailed for workshop)

Set Public Hearing: March 12, 1999
Public Consultation Meetings: March 31, 1999
April 28, 1999
Public Hearing: May 14, 1999

ATTACHMENT C

KEY CONTACTS

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Mr.	Bert	Adams	Glaze N Seal
Ms.	Heidi	Alderman	Air Products & Chemicals
Ms.	Jodi	Allen	Union Carbide
Mr.	Don	Ames	State of CA Air Resources Board
Mr.	Bernie	Appleman	SSPC
Mr.	Allen	Armstrong	Hill Brothers Chemical Co.
Mr.	Yin	Aye	Smiland Paint Co.
Mr.	Marty	Balow	Frazee Paint Co.
Mr.	Jasen	Banta	Matt Construction
Mr.	Barry	Barman	KTA-TATOR, Inc.
Mr.	Paul	Beemer	Henry Co
Mr.	Chuck	Benesch	D'Angelos
Mr.	Howard	Berman	Kessler & Associates, Inc.
Mr.	Jim	Bossardt	Blast/Coat Systems, Inc.
Mr.	Tim	Bosveld	Dunn Edwards
Mr.	Larry	Breeding	Walt Disney Company
Mr.	Mike	Butler	Behr Process Corporation
Mr.	Mike	Callahan	Jacobs
Mr.	David	Clifford	AKZO NOBEL
Mr.	Curtis	Coleman	Law Offices of Curtis L. Coleman
Mr.	Gerrold	Coleman	Paramount Pictures
Mr.	Tim	Conhin	LADWP
Ms.	Margaret	Coon	Ameron Protective Coatings
Mr.	Stan	Cowen	Ventura County APCD
Mr.	Pete	Cutrona	Ellis Paint Co.
Mr.	James	Dabbs	Spectra-Tone Paint Corp.
Mr.	Geoffrey	Dearth	Air Products & Chem. Inc.
Mr.	Mike	De La Vega	Life Paint Company
Ms.	Stacey	Dobrosky	Union Carbide
Mr.	Lee	Doyle	S.G. Pinney & Associates Inc.
Mr.	Richard	Drisko	SSPC
Mr.	Phil	Drooks	Metropolitan Water District of So. California
Mr.	M.	Dyer	Devoe Castings
Mr.	Mehrdad	Emami	McWhorter Tech.
Mr.	Wes	Emerson	Rust-Oleum
Ms.	Daniela	Fernandez	County Government Center

Mr.	Bob	Floriani	ICI-Dulux
Ms.	Yvonne	Fong	U.S. EPA
Mr.	Chris	Foster	Smiland & Khachigian
Mr.	Randy	Francisco	McWhorter Technologies, Inc.
Mr.	David	Fredianc	CSDLAC
Mr.	Harley	Fung	Benjamin Moore & Co.
Ms.	P	Ghuman	LACSD
Mr.	John	Gordon	Pacific Tech. Consultants, Eastern Michigan Univ.
Mr.	Robert	Gross	PPG Industries, Inc.
Mr.	Lloyd	Haanstra	DEFT
Mr.	Jay	Haines	Texture Coatings of America, Inc.
Ms.	Madelyn	Harding	The Sherwin-Williams Co.
Mr.	Hal	Hargrave	Tri-County PDCA
Mr.	Richard	Hart	Hart Polymers
Mr.	Brian	Heath	The Valspar Corp.
Mr.	Robert	Henderson	Coatings Resource Corp.
Mr.	Tony	Hobbs	Tnemec Corporation
Mr.	Scott	Holland	Cal Western Paints
Mr.	Eddy	Huang	AVES
Mr.	Alex	Iaroli	E. P. S.
Mr.	George	Illes	LFR, Levine Fricke
Ms.	Gail	Ito	Chevron
Mr.	Mike	Jacola	California Air Resources Board
Mr.	Barry	Jenkin	Benjamin Moore
Ms.	LaShawn	Johnson	Carboline Coatings
Ms.	Carol Yip	Kaufman	Metropolitan Water District of Southern California
Mr.	Ned	Kisner	Triangle Coatings
Ms.	Terri	Lasso	Sherwin-Williams
Mr.	Jay	Lease	PROCOS
Mr.	Martin	Ledwitz	SCE
Mr.	Gene	Lee	Rohm and Haas Company
Mr.	David	Leehy	Vista Paints
Mr.	Stanton	Lewis	City of Los Angeles
Mr.	Pat	Lofgren	ICI Paints
Mr.	John	Long	Smiland Paint Co.
Ms.	Geraldine	Lucas	Disneyland Resort
Mr.	Dave	Lunzer	Union Carbide
Mr.	Pat	Lutz	Dunn Edwards
Mr.	Todd	Maiden	Seyfarth, Shaw
Mr.	Tom	Marsden	Disneyland Resort

Mr.	Mike	Mason	Southern California Edison
Mr.	John L.	Massingill, Jr.	Eastern Michigan University
Ms.	Judith	McCourt	Union Carbide
Mr.	John	Means	Universal Studios
Mr.	Clayton	Miller	CIAQC
Mr.	Gil	Mislang	Dunn Edwards
Mr.	Norm	Mowrer	Ameron
Mr.	Jerry	Mulnix	Cal-Western Paints, Inc.
Mr.	Stephen	Murphy	Murphy Industrial Coatings
Mr.	Dinkar	Naik	Pacific Polymers
Mr.	Bob	Nelson	National Paint & Coating Association
Mr.	Wayne	Nelson	Spectra-Tone Paint
Mr.	Bob	Newton	NSTS
Mr.	Marcy	Nichol	TruServ Mfg
Mr.	R.	Novielli	Rohm & Haas
Mr.	Jim	Nyarady	CARB
Mr.	Bert	Osen	U.S. Celluluse
Mr.	Parker	Pace	BEHR Process
Mr.	Ijay	Palansky	Dunn Edwards
Mr.	Randy	Pasek	California Air Resources Board
Mr.	Fenando	Pedroza	Frazee Paint
Mr.	Herb	Pigram	Rohm & Haas Co.
Mr.	Hamid	Pourshirazi	Vista Paint
Mr.	Greg	Quinn	Los Angeles PDCA
Mr.	Joe	Ramirez	Ever Guard Coatings
Mr.	Bob	Reeves	Benjamin Moore Paints
Mr.	Benjamin	Remley	DuPont Engineered Services
Ms.	Ellen	Reinhardt	The Better Paint Tray LLC
Mr.	William	Riechers	Genesis Coatings, Inc.
Mr.	Ray	Robinson	ELRAP
Mr.	Mark	Robson	Golden State PDCA
Mr.	Andy	Rogerson	Caltrans
Mr.	Steve	Sanchez	US Can Company
Mr.	Oscar	Sandoval	Frazee Paint
Mr.	Anil	Sayta	Zynolyte/I.C.I Paints
Mr.	Jim	Sell	NPCA
Mr.	Rodney	Sells	Resin Technology Co.
Mr.	Patrick	Shannon	Sierra Performance Coatings
Ms.	Erin	Sheehy	Environmental Compliance Solutions
Mr.	Dean	Simeroth	Air Resources Board
Mr.	Mark	Simon	MWD
Mr.	Al	Singh	Surface Protection Inc.

Mr.	Jim	Sliff	Rust-Oleum
Mr.	Craig	Smith	C-F
Mr.	Harry	Sporidis	Kessler & Associates/Dunn-Edwards
Ms.	Christine	Stanley	Ameron Protective Coatings Systems
Mr.	Bob	Steel	Park Water District / SICC
Mr.	Joe	Stoddard	Mobile Pipe Wrappers & Coaters Inc.
Mr.	Gene	Suconey	Disneyland Resort
Ms.	Sharilen	Talati	
Ms.	Sheri	Thompson	Sherwin Williams
Mr.	Rob	Truitt	Dayton Superior Corp
Mr.	Jay	Umphrey	EPS Inc.
Ms.	Barbara	VanCina	Carboline
Mr.	John	Wallace	MWD
Mr.	John	Waltman	Cal Western Paints
Mr.	Robert	Wendoll	Dunn-Edwards Paints
Mr.	Peter	Whittingham	County of Los Angeles
Mr.	Max	Wills	Cal Poly State University
Mr.	Tek	Woo	Union Carbide
Mr.	Kevin	Worrall	TeraCota
Mr.	Steven	Yagade	Walt Disney Imagineering
Ms.	Carol	Yip Kaufman	MWD
Mr.	Mark	Zielinski	ICI

ATTACHMENT D

KEY ISSUES AND RESPONSES

Rule 1113	
Issue	Response
High-solids coatings will require thinning in the field	Manufacturers can reformulate existing coatings using resins that require less coalescing solvents, without increasing the solids in the coating. However, high solids coatings, with numerous IM coatings available at 100% solids, have been in the market for more than twenty years. These coatings are supplied 'ready to use' without the need for additional thinning in the field, and can be readily applied using airless spray equipment and the appropriate spray tips. Furthermore, the future limits are based on waterborne technology and the use of exempt solvents; therefore, thinning with VOCs will not be an issue, as these coatings are thinned with water, if needed.
Industrial Maintenance Coatings should not be banned for residential and commercial uses, and labeling should not be required	Industrial Maintenance Coatings are to be used in areas where high heat, chemical resistance, impact resistance, and corrosion resistance are an issue. In response to comments regarding problematic metal substrates used in commercial and residential development, staff has created the new 'rust preventative coating' category, specifically for metal substrates. This category's proposed interim limit is higher than the proposed limit for industrial maintenance coatings, due to the relative ease of application of alkyd-based formulations. Staff has removed any duplicative labeling requirement for industrial maintenance coatings.

ATTACHMENT D

KEY ISSUES AND RESPONSES

CONTINUED

Rule 1113	
Issue	Response
Although some nonflat coatings can meet the proposed 150 g/l limit, not all can be reformulated to meet the proposed limits, especially by July 1, 2002. The AQMD should establish higher limits for exterior non-flats.	AQMD staff found, as a part of their data collection and information gathering phase, that over 56% of the total volume of nonflat coatings sold in California in 1996, complied with the July 1, 2002 proposed limit. This is based on information submitted by manufacturers regarding sales of both their interior and exterior nonflat coatings. Staff has also created a new specialty coating category called rust preventative coatings, that will be limited to metal substrates and will have a higher VOC limit. Staff also found compliant interior and exterior nonflat coatings with equivalent performance characteristics found in some higher-solvent containing nonflat coatings. The 1998 CARB survey also shows that over 40% of all nonflat coatings are recommended for both interior and exterior uses, indicating that a high percentage of the products are formulated the same for interior and exterior uses. In addition, staff included a commitment for a detailed product availability assessment one year prior to the implementation of the 150 g/l and 50 g/l limits in order to reevaluate available coatings. Lastly, staff has included an averaging provision for manufacturers to enable them to average the emissions from the nonflat coatings. This provision would allow them to continue selling non-compliant coatings, as long as the average sales-weighted emissions are equivalent or lower than emissions based on the VOC limits.

ATTACHMENT D

KEY ISSUES AND RESPONSES

CONTINUED

Rule 1113	
Issue	Response
Labeling of "rust preventative" coatings will result in greater costs and not result in additional air quality benefit.	Staff believes that the labeling of rust preventative coatings will enhance the enforceability of the rule, and mitigate potential misuse of rust preventative coatings.
Averaging provision is a good compliance option for affected coatings, but industry has proposed an alternative method that they believe will not place a cap on their coating sales.	Staff has adopted a hybrid averaging provision that incorporates Industry's alternative averaging proposal, while maintaining the enforceability of the previously adopted averaging provisions.
The interim limit for rust preventative coatings is higher than the interim limit for industrial maintenance coatings, which typically have a harsher environment.	Staff has proposed a higher interim limit for rust preventative coatings in response to comments made by some members of the industry that untrained homeowners should not use the lower-VOC two-component coatings, which require more training in its use. As a result, staff created a category for rust preventative coatings with a higher interim limit for use by homeowners.
Essential Public Service Agencies need higher limits, since they cannot shut down operations for maintenance related items. Need higher limits for some specific uses.	Staff's technology assessment has identified compliant coatings in each of the categories used by Essential Public Service Agencies. The AQMD will participate in technology assessments conducted by Essential Public Service Agencies. Nonetheless, staff has created a new specialty coating category called essential public service coating that has a higher interim limit of 340 g/l.

ATTACHMENT D

KEY ISSUES AND RESPONSES

CONTINUED

Rule 1113	
Issue	Response
Timing – The public hearing should be delayed to provide industry more time to evaluate the CARB survey and NTS Study results.	The 1998 Draft CARB survey was completed and forwarded to industry members in March 1999. CARB staff finalized the data in February 1999, which has been used by staff to calculate emission reductions. The laboratory testing of the NTS study is also complete. The results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments. The results were initially forwarded and discussed with the Technical Advisory Committee, comprised of members from the Industry, on April 12, 1999. A summary of the study was presented to the AQMD Governing Board's Stationary Source Committee, which is attended by the public, and a summary of the results were passed out to the public. Members of the architectural coatings industry were present at the last meeting, held on April 23, 1999. Subsequent discussions with the Technical Advisory Committee regarding the interim report were conducted on April 26, 1999 and May 3, 1999.
The proposal should be expanded to include more categories found in the National AIM Rule.	The AQMD has incorporated definitions and other elements of the National AIM rule, where appropriate. However, the AQMD does not believe it is necessary to adopt all of the categories in the National AIM rule, since paragraph (c)(1) of Rule 1113 covers all other categories with VOC content limits of 250 g/l. Furthermore, a rule with fewer categories is a lot easier to implement and enforce. Lastly, the VOC limits in the National AIM Rule do not achieve the reductions in VOCs that are possible and necessary.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Staff Report For:

Proposed Amendments to Rule 1113 -- Architectural Coatings

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May 14, 1999

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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BARRY R. WALLERSTEIN, D. Env.

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ACRONYMS USED

ACTF	Architectural Coatings Task Force
AIM	Architectural/Industrial Maintenance Coatings
APCD	Air Pollution Control District
AQMD	South Coast Air Quality Management District
AQMP	Air Quality Management Plan
BACT	Best Available Control Technology as required by AQMD Regulation XIII - New Source Review
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbon
CFMA	California Furniture Manufacturers Association
CTAC	Customer Technology Application Center
CTG	Control Techniques Guideline
DIY	Do-It-Yourself
EL RAP	Environmental Legislative & Regulatory Advocacy Program
FIP	Federal Implementation Plan
G/L	Grams per liter, less water and less exempt solvents
IDLH	Immediate Danger to Life or Health
MEK	Methyl Ethyl Ketone
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NOx	Oxides of Nitrogen
NPCA	National Paint & Coatings Association
PDCA	Painting & Decorating Contractors of America

PM_{10}	Particulate Matter, less than 10 microns
PPM	Parts Per Million
RECLAIM	Regional Clean Air Incentives Market
REG NEG	Regulatory Negotiations
SARA	Superfund Amendments and Reauthorization Act
SCAB	South Coast Air Basin
SCM	Suggested Control Measure
SIC	Standard Industrial Classification
TiO_2	Titanium Dioxide
TRG	Technical Review Group
USEPA	United States Environmental Protection Agency

I. EXECUTIVE SUMMARY

Rule 1113 - Architectural Coatings was originally adopted by the South Coast Air Quality Management District (AQMD) on September 2, 1977, to regulate the volatile organic compound (VOC) emissions from the application of architectural coatings. The VOC emissions from the use of architectural coatings were estimated at 56.3 tons per day (tpd) in 1993 in the AQMD on an Annual Average Inventory, and 66.4 tpd on the Summer Planning Inventory. Based on the 1997 AQMP, a projection of these emissions for 2006 and 2010, are 64.2 tpd and 67.3 tpd, respectively on the Annual Average Inventory, and 75.7 tpd and 79.4 tpd on the Summer Planning Inventory, assuming no additional controls on architectural coatings. The most recent California Air Resources Board's (CARB) architectural coatings usage survey indicates that emissions from this source have decreased by approximately ten percent, mainly due to an increased use of waterborne coatings.

The rule has been amended several times since the date of adoption, mostly to define specialty coating categories and exempt certain coatings from the 250 g/l exterior coating VOC limit and 350 g/l interior coating VOC limit. In contrast to the earlier amendments, the rule was amended on February 2, 1990, to further reduce VOC emissions from certain, previously exempted coating categories. The February 2, 1990, limits were based primarily on CARB's Suggested Control Measure (SCM) for Architectural and Industrial Maintenance (AIM) Coatings. The provisions in the SCM were developed by a consortium of California air pollution control districts, CARB, United States Environmental Protection Agency (USEPA) Region IX, and paint manufacturers.

Upon adoption of the lower VOC limits, coating manufacturers, independent dealers, and painting contractors filed a legal action against the AQMD, and other air districts, over issues that they felt were not adequately addressed in the staff report or in the California Environmental Quality Act (CEQA) document. The suit stayed portions of the February 1990 amendments as specified in the Superior Court judgment. Subsequent rule amendments adopted November 1990, December 1990, September 1991, and March 1996 were not subject to the court judgment.

Additionally, the rule was amended in November 1996 to lower the VOC limits for some coating categories based on the concept of reformulation of existing coatings, increase the VOC limit for other coating categories, reinstate higher VOC limits pursuant to the court order, and address issues raised since the

September 6, 1991 amendme[illegible] These included clarification of the Applicability, addition of the Pur[illegible] of the rule, addition of and modification to some definitions, synchronizing fi[illegible] compliance dates for all coating categories, and updating the analytical test methods. This amendment implemented both Control Measure #94CTS07 and Phase I of Control Measure #97CTS07 – Further Emission Reductions from Architectural Coatings – Rule 1113. Subsequently, three separate lawsuits were filed by industry challenging the lower limits for flats and lacquers on both state and federal grounds. The AQMD has prevailed in all three lawsuits in all state grounds, and has succeeded in obtaining dismissal of most of the federal grounds. An appeal has been filed by one of the three plaintifffs.

The current proposed amendments are to implement Phase II of Control Measure #97CTS07 – Further Reductions from Architectural Coatings – Rule 1113, as well as #94CTS07.

Proposed amendments to the definitions are as follows:

- Add the definition of "Bituminous Roof Coatings"
- Add the definition of "Essential Public Service Coatings"
- Add the definition of "Floor Coatings" as defined in the National AIM Rule
- Add the definition of "High Temperature - Industrial Maintenance Coatings" as originally adopted on February 9, 1990
- Delete the definition of "Industrial Maintenance Primers and Topcoats"
- Add definition of "Industrial Maintenance Coatings" as originally adopted on February 9, 1990. Incorporate "Industrial Maintenance – Anti-Graffiti Coatings" into the industrial maintenance coating category
- Add definition for "Nonflat Coatings" as defined in the National AIM Rule
- Revise definitions of "Quick-Dry Enamels" and "Quick-Dry Primers, Sealers, and Undercoaters", subsuming them into the nonflat and primers, sealers, and undercoaters categories, respectively, effective July 1, 2002
- Add the definition of "Recycled Flats and Nonflats"

- Add definition for "Rust Preventative Coatings"
- Revise the definition for "Waterproofing sealers" to "Waterproofing Wood Sealers"
- Add new definition for "Waterproofing Concrete/Masonry Sealers", as defined by industry

The following VOC limits are proposed to be modified:

- Establish the VOC limit for bituminous roof coatings at 300 g/l, effective date of adoption, and lower the VOC limit from 300 g/l to 250 g/l effective July 1, 2002
- Establish the VOC limit for essential public service at 420 g/l effective date of adoption, and lower the VOC limit from 420 g/l to 340 g/l, effective July 1, 2002 and then further reduce from 340 g/l to 100 g/l effective July 1, 2006.
- Establish the VOC limit for opaque floor coatings of 400 g/l, effective date upon adoption, and lower the VOC limit from 400 g/l to 100 g/l effective July 1, 2002, and further reduce from 100 g/l to 50 g/l effective July 1, 2006. The proposed floor coating category is a subset of the industrial maintenance coating category, which has a VOC limit of 420 g/l. The 400 g/l limit is established in advance of the National Architectural and Industrial Maintenance (AIM) rule's 400 g/l limit for floor coatings, which will become effective September 13, 1999. Conduct a product availability assessment by July 1, 2001 for the 100 g/l limit and July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their floor coatings, on a sales-weighted basis
- Establish the VOC limit for high temperature - industrial maintenance coatings of 550 g/l, effective July 1, 2002, and lower to 420 g/l effective July 1, 2006
- Lower the VOC limit for industrial maintenance coatings from 420 g/l to to 250 g/l effective July 1, 2002. Then reduce the VOC limit from 250 g/l to 100 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit and July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their industrial maintenance coatings, on a sales weighted basis. Appendix A of PAR 1113 - Architectural Coatings

contains sections on the averaging requirements, including modification, renewal, and termination of the program

- Lower the VOC limit for nonflats from 250 g/l to 150 g/l, effective July 1, 2002 and further reduce from 150 g/l to 50 g/l, effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 150 g/l limit and by July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their nonflats, on a sales-weighted basis

- Lower the VOC limit for primers, sealers, and undercoaters from 350 g/l to 200 g/l, effective July 1, 2002, and further reduce from 200 g/l to 100 g/l, effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 200 g/l limit and by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales weighted basis

- Lower the VOC limit for quick-dry enamels from 400 g/l to 250 g/l, effective July 1, 2002, and further reduce the VOC limit from 250 g/l to 50 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 250 g/l limit and by July 1, 2005 for the 50 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales weighted basis.

- Establish a VOC limit for quick-dry primers, sealers, and undercoaters at 350 g/l, effective date upon adoption, unless the manufacturer submits an exemption report pursuant to Rule 1113(g)(3). Lower the quick-dry primers, sealers, and undercoaters to 200 g/l, effective July 1, 2002, and further reduce from 200 g/l to 100 g/l effective July 1, 2006. Conduct a product availability assessment by July 1, 2001 for the 200 g/l limit and by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their primers, sealers, and undercoaters, on a sales weighted basis.

- Establish a VOC limit for recycled flats and non-flats at 250 g/l, effective date upon adoption, and then lower from 250 g/l to 100 g/l effective July 1, 2006

- Lower the VOC limits for roof coatings from 300 g/l to 250 g/l, effective date upon adoption

- Establish the limit for rust preventative coatings at 400 g/l, effective date upon adoption, and then lower from 400 g/l to 100 g/l, effective July 1, 2006. The proposed rust preventative coating category is currently a subset of the industrial maintenance coating category, which has a VOC limit of 420 g/l, quick-dry enamels which has a VOC limit of 400 g/l, and primers, sealers, and undercoaters, which has a VOC limit of 350 g/l. However, the limit established in the National Architectural and Industrial Maintenance (AIM) rule for rust preventative coatings is 400 g/l, which will become effective September 13, 1999. Conduct a product availability assessment by July 1, 2005 for the 100 g/l limit. Include an averaging provision to allow manufacturers to average the VOC content of their rust preventative coatings, on a sales-weighted basis.

- Lower the VOC limits for stains from 350 g/l to 250 g/l, effective July 1, 2002

- Lower the VOC limit for waterproofing wood sealers from 400 g/l to 250 g/l, effective July 1, 2002

The container label requirements will be revised and require the special labeling for rust preventative coatings.

The exemption for Quick-Dry Primers, Sealers and Undercoaters will be deleted, effective July 1, 2002. Three new coating categories for essential public service coatings, recycled non-flat and flat paints, as well as bituminous roof coatings will be added.

The Averaging Provision will be clarified and expanded to include, in addition to the flats, nonflats; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; floor coatings; rust preventative coatings; waterproofing wood sealers; stains; roof, and industrial maintenance coatings.

Technology Assessment provisions will be revised to include nonflats; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; floor coatings; rust preventative coatings; waterproofing wood sealers; stains; and industrial maintenance coatings, as well as an added assessment for reactivity-based ozone control strategy.

Reporting requirements for rust preventative coatings and recycled flats and non-flats will be established.

Lowering the VOC limits for nonflats; industrial maintenance; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; roof coatings; floor coatings, rust preventative coatings, stains; and waterproofing wood sealers will achieve an emission reduction of approximately 21.8 tpd on an Annual Average Basis.

With the above changes, the reduction in VOC emissions is estimated to be 21.8 tpd or approximately a 38 percent emission reduction compared to the current emission inventory, for the Annual Average. The reductions are estimated to be > 26 tpd for the Summer Planning Inventory.

II. LEGISLATIVE AUTHORITY

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

III. BACKGROUND

AIM coatings are one of the largest non-mobile sources of VOC emissions in the AQMD -- larger than petroleum refining, larger than petroleum marketing, larger than degreasing and dry cleaning combined, and larger than the combined VOC emissions from the 950 largest VOC-emitting facilities. It has been estimated that 25 percent of all hydrocarbons used as solvents (293 million gallons in 1992) are used in paints and coatings.[1]

VOC emissions cause the formation of ozone and PM_{10} (particulate matter less than 10 microns in size), two pollutants that exceed the state and national ambient air quality standards. They are the AQMD's most serious air quality problems and the most difficult to reduce to healthful levels.

[1] Stirring Up Innovation: Environmental Improvements in Paints and Adhesives, INFORM, Inc., 1994

VOCs react photochemically with oxides of nitrogen (NOx) to form ozone. Ozone is a strong oxidizer that irritates the human respiratory system and damages plant life and property. VOCs also react in the atmosphere to form PM_{10}, a pollutant which adversely affects human health and limits visibility. Because these small particulates penetrate into the deepest regions of the lung, they affect pulmonary function and have even been linked to increased deaths.

Several health-related studies conducted over the past five years show a significant increase in hospital emergency room visits during warm and smoggy days. The researchers believe this increase is a direct result of higher ozone and PM_{10} concentrations. The "Air Pollution Health Impacts: Recent Findings, Implications, Dieselization, and Policy Initiatives" was a two-day symposium held at the District in November 1997, and included presentation of numerous papers supporting the concept of increased hospital visits during smoggy days.

Emissions

1997 AQMP

The emission inventories for the 1997 AQMP include VOC emissions from AIM coatings from 1987 to 2010. Baseline emissions, assuming no new rules, are reported in terms of average, annual-day emissions, and in terms of average, summer-day emissions. The average summer-day figures, also called seasonal or planning inventories, are the ones used for demonstrating ozone attainment.

Future, controlled AIM VOC emissions, assuming the AQMP measures are adopted and implemented, are only reported in terms of average summer-day emissions.

The 1997 AQMP emission data for AIM coatings are summarized in the following table.

Table 1
1997 AQMP
VOC Emissions from AIM Coatings
(tons per day)

	1987	1990	1993	1997	1999	2000	2002	2005	2008	2010
Baseline										
Annual Avg.	55.3	55.9	56.3	57.8	58.9	59.4	61.1	63.4	65.7	67.3
Summer Avg.	65.2	65.9	66.4	68.2	69.5	70.1	72.0	74.7	77.5	79.4

1998 Draft CARB Survey Data

The 1998 Draft CARB AIM "Survey of Emissions from Solvent Use" report was published in March 1999, and the final report is expected to be published in May 1999. Evaluation of the draft 1996 sales data and estimated clean-up solvent use indicates statewide AIM coating VOC emissions in 1996 of approximately 117 tons per day (tpd). Prorated by population to the SCAB portion of AQMD, this results in 52.65 tpd. This data includes the clean-up and thinning solvents used as a part of the coating operation, and is approximately a 10% reduction in VOC emissions.

Architectural Coating Description

AIM coatings are used to beautify and protect homes, office buildings, factories, and their appurtenances on a variety of surfaces - metal, wood, plastic, concrete, wallboard, etc. For example, AIM coatings are applied to the interior and exterior of homes and offices, factory floors, bridges, stop signs, roofs, swimming pools, driveways, etc. AIM coatings may be applied by brush, roller or spray gun; by do-it-yourselfers (DIY), painting contractors, or maintenance personnel.

AIM and other coatings are composed of: pigments, which give the paint its color and ability to hide the underlying surface, and are generally in the form of finely ground powders; binders (resins), in which the pigment particles are dispersed and which bind the pigment to the painted surface; carriers (solvents), used to keep the paint in a liquid state during application, and to otherwise aid in the application of the paint; and specialty chemicals (additives), necessary for other coating characteristics. The carriers and some specialty chemicals evaporate, leaving behind the film-forming components of the coating. The resins used in AIM coatings include acrylics, vinyls, alkyds, cellulosics, epoxies, urethanes, polyurethanes and several others. The carriers in solvent-based coatings are organic solvents such as alcohols, ketones, esters, glycols, glycol ethers, and aromatic or aliphatic hydrocarbons, and are usually VOCs. The carrier in a waterborne coating is water, although most waterborne coatings contain some VOCs, primarily glycols or texanol.

Due to material availability, price increases, competition, and span of desired product quality, the ratio of pigments such as titanium dioxide (TiO_2) and binders used are frequently adjusted. Between the top and bottom lines of latex paints, it is not unusual for the resin, pigment, and extender contents to vary by three to four times as the water content increases from 50% to over 70%. As seen on labels, vinyl acrylic and TiO_2 content can vary from less than 10% in bottom-of-

the-line grades to over 25% in top-of-the-line grades. Paint films composed of only pigment and binder offer optimal mechanical and chemical performance, but unfavorable economics. The cost of paints is controlled by adding extenders, that cause porosity but negatively impact application, gloss, and overall durability of coatings. Therefore, the highest performing paints consist of a balanced formulation of pigments and binders.

Because AIM coating surfaces cannot be painted within an enclosure vented to an air pollution control device, the only cost-effective method to control VOC emissions from AIM coatings is to reduce the VOC content of the coating.

AIM coatings are usually purchased ready-to-use, although some come in two components that must be mixed prior to application. They are available in a wide range of colors, gloss, and performance characteristics. One important criterion for selecting coatings is durability. Coatings are expected to last from 2 to 10 years with the average expectation of 5 to 7 years. Failure of coatings to stand up to the elements such as sunlight, weather, and cleaning can shorten the life of the coating and require more frequent recoating.

Solvent is sometimes used to thin a coating when it is too thick to spray or brush. Application problems caused by low temperature and high humidity can also be overcome by the addition of solvent to the paint. Waterborne coatings are thinned with water only, whereas solvent-based coatings can only be thinned with organic solvents. Likewise, brushes, rollers, and spray guns used with waterborne coatings are cleaned with water and equipment used with solvent-based coatings use organic solvents for cleanup. Generally, coatings are sold as 'ready-to-use' to eliminate the need for thinning in the field.

Architectural Coating Industry

AIM coatings are the largest segment of the United States' paint market. In 1996, shipments of AIM coatings accounted for just over half of the total industry shipments. At that time, the average price per gallon of an exterior solvent-based coating was $10.50 and exterior waterborne coating was $8.25. The average price per gallon of an interior solvent-based coating was $11.34 and interior waterborne coating was $7.41.

Approximately 10-15% of architectural shipments are for new construction with the balance for maintenance, repair, and remodeling. In 1989, there were about 527 companies producing AIM coatings. Their sizes ranged from large national companies with multiple plant locations, to smaller regional companies, small

local producers, and to specialty product companies (i.e., magnesite coatings, etc.). However, over the past five years, larger national companies have acquired smaller companies, with significant reductions in the overall number of manufacturers. As an illustration of the industry consolidation, in 1990, all companies with sales over $50 million had a 60% market share. In contrast, by 1996, they had a 81% market share in shipments of architectural coatings. These architectural paints are sold to DIY consumers, painting contractors, and commercial and industrial maintenance users through company stores, independent dealers, mass retailers, and home improvement centers. The AIM market is split between waterborne latex and alkyd or oil-based paints, with latex accounting for more than 85% of the volume. Mr. Chris Maby of ICI Paints in North America wrote, "As environmental legislation grows along with waterborne technology, latex paints will probably completely take over the DIY market." This trend has already been noted through the staff's technical assessment and further corroborated by the 1998 Draft CARB survey Data.

Table 2 summarizes the major US producers of architectural coatings in 1997.

Paints are distributed nationally through over 57,000 retail outlets with the 18,500 independent paint dealers being the largest category with over half of retail paint sales. Other leading outlets in order of sales share are: lumber and building material dealers, hardware stores, general merchandise stores, and mass retail chains.

Table 2
List of Top 25 Coating Manufacturers
1997 Revenues

Rank	Company	Sales (MillionS)
1	The Sherwin-Williams Co.	4,880
2	Akzo Nobel*	4,200
3	ICI Americas	4,000
4	PPG Industries Inc.	3,000
5	Dupont Co.	2,200
6	Courtaulds Coatings (Porter)	1,800
7	RPM Inc.	1,300
8	Sigma Coatings	1,000
9	Valspar Corp.	1,000
10	Benjamin Moore & Co.	666
11	Lilly Industries	601
12	Wattyl USA	375
13	Kelly-Moore Paint Co. Inc.	276
14	Duron	255
15	Carboline Co.	200
16	Ameron Int'l.	191
17	Dunn-Edwards Corp.	174
18	Yenkin-Majestic	95
19	Jones-Blair	90
20	Tnemec Co.	72
21	Coronado	65
22	Bruning	60
23	California Products	40
24	US Paint Corp.	36
25	Iowa Paint Mfg.	36
* Majority of sales in Europe		

Source: American Painting Contractor, October 1998. Page 8

The United States Department of Commerce, Bureau of the Census, Manufacturing and Construction Division, recently conducted a national survey of paint manufacturers that have 20 or more employees. These establishments represent approximately 95% of the total value of shipments for Standard Industrial Classification (SIC) 2851 - paint, varnishes, lacquers, enamels, and allied products. An estimated 641,440,000 gallons of architectural coatings and 179,735,000 gallons of specialty coatings were sold in 1997, resulting in a little over one billion pounds of VOC emissions or approximately 1.35 lbs of emissions per gallon of paint. This survey is conducted annually, with quarterly supplements, and is used by the National Paint and Coatings Association (NPCA) to assess market trends and project potential growth opportunities.

Within California, the 1998 Draft CARB survey data, based on quantities reported for sales in 1996, indicates total architectural coating sales of approximately 87 million gallons, resulting in over 72 million pounds of VOC emissions or a little more than 0.8 pounds of VOC emissions per gallon of coating. The CARB emissions inventory for AIM coatings estimate 45% of the total AIM coatings sold in California are sold within the four county SCAB. Therefore, an estimated 39 million gallons of coatings were sold in 1996, resulting in approximately 32 million pounds of VOC emissions. The data submitted for this survey was deemed complete by CARB staff in February 1999. The Draft CARB survey report was circulated to the public in March 1999, and the comment period ended in April 1999. CARB staff is in the process of finalizing the report, and expects to publish it by the end of May 1999.

During the early 1990s, the AIM industry, along with the rest of the nation, experienced very moderate growth, primarily due to the slowdown in the construction industry and very little new home construction. However, with the upturn in the national and California's economy, total construction activity, especially new home construction, has increased, resulting in an overall increase in coating usage. Several large multi-use projects have been developed, and more are currently in the planning stages within the SCAB.

1997 AQMP

As required by federal law, the AQMD adopted the most recent AQMP in November 1996. The AQMP is a comprehensive plan to achieve the national ambient air quality standards (NAAQS) in Southern California, the area with the highest air pollution levels in the United States.

Based on the Urban Airshed Model simulation of the SCAB, the 1997 AQMP found that major reductions in emissions of VOCs and NOx are necessary to attain the air quality standards for ozone and PM_{10}. VOC emissions must be reduced from 1,366[2] tpd in 1993 to 444 tpd by 2010, a 68% reduction. NOx emissions must be reduced by 57%, from 1,321 tpd to 571 tpd. The 1997 AQMP underscores the increasing role of pollution from areawide sources, including consumer products. As emissions from facilities and vehicles are reduced, the widespread areawide sources become a larger part of the inventory, and are included as the biggest area for potential reductions of VOC emissions.

[2] All emission figures in this section are based on the summer planning inventories.

The AQMP estimates increased AIM emissions for the Summer-day average (due to population growth) at 68.2 tpd in 1997, growing to 74.7 tpd by the year 2005 and 79.4 tpd by the year 2010, due to population growth, without additional AIM regulations. If left unchecked, AIM coating emissions alone would account for more than 26% of the allowed VOC emissions. Therefore, the 1997 AQMP has a specific control measure (CTS-07) to reduce AIM VOC emissions by 50% by the year 2010, as well as a long-term measure requiring an additional 25% reduction in VOCs. This cumulative 62 tpd emission reduction based on the Summer Planning Inventory is the largest of all short- and long-term control measures. The 1996 CARB Survey will result in the revision of the emission inventory from this category, as well as revised emission reduction estimates in the next the AQMP.

Installation of air pollution control equipment is not feasible for reducing AIM emissions, thereby leaving coating reformulation as the only practical means to achieve the required reductions. The current proposal emphasizes reformulation of existing coatings, primarily by using currently-available, technologically-innovative resins, as well as utilizing the growing list of exempt solvents.

These proposed Rule 1113 amendments will implement Phase II of the 1997 control measure as well as the 1994 control measure and will seek to reduce AIM emissions by approximately 34%.

In 1996, the AQMD contracted a study to Eastern Michigan University to evaluate the coating categories included in Phase II of the control measure. The study concluded that zero-VOC, as well as low-VOC coatings are available in all the categories, but they were unable to assess performance characteristics of the zero-VOC coatings due to a lack of data made available to them by the industry. In order to address the performance issues, the AQMD has contracted another study to National Technical Systems to assess application and durability characteristics of currently available zero-, low-, and high-VOC coatings. This study will be discussed in greater detail in subsequent sections of this report.

National AIM Rule

In July 1992, USEPA initiated a regulatory negotiation (Reg Neg) process to assist in fulfilling its obligation for a national AIM regulation, as described under Section 183(e) of the Clean Air Act. USEPA hoped that the AIM coating rule would provide the basis for the regulation, which would reduce emissions from AIM coatings sold and used throughout the United States.

After two years of negotiations, USEPA proposed a draft rule that established specific VOC limits starting in 1997. However, that proposed rule was delayed due to litigation filed by the AIM industry. In August 1998, the USEPA entered into a consent agreement with the Sierra Club and committed to finalize the rule by August 15, 1998.

A national AIM coatings rule, including proposed VOC limits and their phased reduction, to meet the obligations of Section 183(e) of the Clean Air Act, was published by EPA in September 1998. The rule establishes a VOC content limit for 61 coating categories, with significantly higher limits for most categories than the current limits in the District's Rule 1113 – Architectural Coatings. The only category with a lower limit is Roof Coatings, which is included in this proposed amended rule to be revised for consistency with the national rule limit. The National AIM Rule clearly does not meet the air quality needs of Southern California or represent the state of available technology.

Appendix C of this staff report includes a comparison of the National AIM rule with Proposed Amended Rule 1113, pursuant to Health & Safety Code 40727.2.

IV. RULE 1113 HISTORY

Recognizing the benefit of reducing VOC emissions from AIM coatings on a statewide basis, CARB adopted a model AIM coating rule in July 1977. All of the air pollution control districts (APCDs) located in metropolitan areas and half of the forty-eight APCDs in California adopted the model rule, including the AQMD in September 1977 as Rule 1113 - Architectural Coatings. That first AIM rule limited interior and exterior AIM coatings to 350 g/l and 250 g/l, respectively, effective September 2, 1979, with the interior limit dropping to 250 g/l on September 2, 1980. Small coating manufacturers were exempted from these limits until September 2, 1980. Thirteen categories of specialty coatings, and small container coatings (one liter or less) were exempted until September 2, 1982. By that date all AIM coatings were to be limited to 250 g/l. Rule 1113 - Architectural Coatings has been amended many times since, but never, until recently, has been as stringent as the original rule.

Between December 1977 and April 1981, the rule was amended four times: allowing the use of photochemically reactive solvent, adding two new specialty coating exemptions, and extending the September 1980 compliance date to September 1981.

In July 1981, the Board adopted a major change by abandoning the exterior/interior distinction and applying a 450 g/l limit for non-flat coatings (semi-gloss and high-gloss), which dropped to 250 g/l by September 1983. The higher limit for small businesses was removed, and the exemptions for small containers and the 15 specialty coatings were extended another year to September 1983.

CARB disagreed with this last amendment, and in October 1981 adopted a more stringent amendment to Rule 1113 - Architectural Coatings for the AQMD that set a 380 g/l limit for non-flat coatings, which would drop to 250 g/l by September 1983. A non-flat limit of 450 g/l was allowed for small businesses until September 1984.

CARB also instituted the Architectural Coatings Task Force (ACTF), composed of coating industry and air pollution agency experts, to investigate future limits for non-flat coatings.

The Technical Review Group (TRG), composed of CARB and California Air Pollution Control Officers Association (CAPCOA) members, also began investigating possible VOC limits for specialty coatings.

Based on work done by the TRG and ACTF, the AQMD amended Rule 1113 in August 1983. The amendments extended the 380 g/l non-flat limit for two more years until September 1985, set new interim and final limits for 21 categories of specialty coatings that went into effect at various times from September 1985 until September 1987, and permanently exempted small containers and 12 specialty coatings.

After a minor AIM labeling requirement was amended in March 1984, an August 1985 amendment extended the non-flat 380 g/l limit another four years until September 1989 and broke up the single category of industrial maintenance coatings into ten subcategories Eight of the subcategories were excused from meeting the interim 500 g/l VOC limit, while the final 420 g/l limit was advanced one year for four subcategories.

Except for a November 1985 amendment that excused opaque stains from any limits until September 1987 and a February 1987 amendment which again revised AIM labeling requirements, there was little change to Rule 1113 for four and one-half years. In July 1989, CARB submitted to all California air pollution control districts a CARB-CAPCOA SCM to further reduce VOC emissions.

After a minor amendment in January 1990, the Governing Board adopted substantial amendments to Rule 1113 based on the CARB-CAPCOA SCM in February 1990. The amendments eliminated exemptions for 11 categories of specialty coatings, leaving only exemptions for quart or smaller containers and emulsion type bituminous pavement sealers; adopted VOC limits for 15 new coating categories; reduced the industrial maintenance coating categories from ten to three; set technology-forcing VOC limits for ten coating categories that went into effect on December 1, 1993, and reorganized the subdivisions of the rule. Other air pollution control agencies adopted similar limits.

Shortly after the adoption of these limits, several coating manufacturers filed a massive legal action against the AQMD, CARB, CAPCOA, TRG, Bay Area AQMD, Santa Barbara County APCD, and three other APCDs, claiming that the February 1990 amendments did not comply with CEQA. On August 21, 1990, the Superior Court of Los Angeles County entered a judgment against AQMD in the case Dunn-Edwards Corporation, et al. vs. SCAQMD, et al. The judgment denied in part, and granted in part, the petition for writ of mandate seeking to overturn certain amendments. As a result, the AQMD was prevented from enforcing the amendments relating to aerosol coatings, industrial maintenance coatings, lacquers, quick-dry enamels, and quick-dry primers, sealers and undercoaters. Other amendments adopted in February 1990 and prior rule provisions remained in effect, including the sunset clause placed on the small container exemption.

In December 1990, the AQMD Governing Board adopted minor amendments to Rule 1113 which, among other things, revised the definition of VOC.

The September 1991 amendments created a new category, low-solids stain, and also incorporated a calculation method for determining VOC content on a materials basis. The amendment also prohibited use of Group II exempt compounds, including ozone-depleting chlorofluorocarbons (CFCs) and several toxic solvents. The March 1996 amendments created a definition for aerosol coatings, revised the definition of exempt compounds by referencing Rule 102 - Definition of Terms, and created an exemption for aerosol coatings.

On December 31, 1993, all final VOC limits went into effect, and the exemption on the sale of non-compliant small containers expired. Several coating manufacturers filed and received variances from the AQMD Hearing Board for their non-compliant coatings sold in small containers. The August 1996 amendment reinstated the small container exemption.

The November 1996 amendments lowered limits for flats, lacquers, traffic, and multi-color coatings, as well as raised limits for fire-proofing, exterior, magnesite, and japans/faux finishing coatings. The amendments also included category consolidation, and the inclusion of an averaging provision as an alternative compliance measure. Three separate lawsuits were filed by industry, mainly questioning the validity of environmental benefits of lowering limits for flats and lacquers. The AQMD has prevailed in all three suits in all state grounds, and has received notice of appeal from one of the plaintiffs. Currently, all amendments remain in effect, as adopted.

Status of Architectural Coating Rules in Other California Districts

As earlier discussed, after the 1989 SCM for AIM coatings was issued, many of the APCDs and AQMDs adopted VOC limits similar to those included in the CAPCOA document into their AIM rule. Subsequently, several coating manufacturers successfully sued the AQMD, CARB, CAPCOA, Bay Area AQMD, Ventura County APCD, and several other districts, and succeeded in overturning certain amendments. However, Santa Barbara APCD was not sued within the prescribed time period and retained the VOC limits of their amended Rule 323 - Architectural Coatings.

Currently, Santa Barbara APCD has the most stringent architectural coatings rule in California for the early 1990s. For example, the current VOC limit of 350 g/l for lacquers is lower than the current 550 g/l VOC limit for this category. Additionally, Santa Barbara APCD has a 340 g/l VOC limit for Industrial Maintenance (IM) and IM anti-graffiti coatings, and their current VOC limit for the IM high-temperature coatings is 420 g/l, which are all lower than the AQMD's current limits. Lastly, the quick-dry enamel category, one of the most controversial, has a VOC limit of 250 g/l, which is significantly lower than the AQMD's current limit for this category. The VOC limits of Rule 323 were adopted in February 1990, and have been in effect since that time.

San Joaquin Valley APCD and Sacramento AQMD both have current VOC limits of 340 g/l for IM coatings. Furthermore, Placer County APCD, as well as the above APCDs and AQMD, all have a VOC limit of 340 g/l for IM anti-graffiti coatings. For IM high-temperature coatings, Placer County APCD, San Joaquin Valley APCD, Sacramento AQMD, and Bay Area AQMD, all have a VOC limit of 420 g/l.

The CARB is currently working on updating the SCM for architectural coatings, and staff has worked closely with the SCM working group on the current

proposal. CARB plans to include the current AQMD proposal as part of the SCM.

V. CURRENT RULEMAKING EFFORTS AND ISSUES

Subsequent to the November 1996 amendments, staff initiated a technical assessment focussing on coating categories included in Phase II of Control Measure CTS07 – Further Emission Reductions from Architectural Coatings. The assessment clearly shows a wide availability of zero- and low-VOC coatings in categories included in Phase II. The manufacturers' data, as listed on their product literature, as well as some technical papers pertaining to performance comparisons, indicate performance of the lower VOC coatings equal to their conventional, high solvent counterparts. For certain coating characteristics, including but not limited to overall durability, some lower VOC coatings were considered superior than the higher solvent coatings. The higher solvent coatings generally exhibited superior application characteristics. Staff's conclusion has been well supported by the results of the Phase II Assessment Study conducted by National Technical Systems.

Public Workshop

On December 9, 1998, AQMD staff conducted a public workshop in order to solicit information and suggestions from the public regarding Proposed Amendment Rule 1113. The workshop was attended by almost 100 persons, representing numerous coating manufacturers, consultants, contractors, and other end-users. Additionally, staff conducted two Public Consultation Meetings on March 31, 1999 and April 28, 1999.

Issues

Industry members, mainly manufacturers and contractors, provided several suggestions and introduced issues that needed additional research. The Environmental Legislative & Regulatory Advocacy Program (EL RAP) presented their issues with Rule 1113, specifying the following eight issues. El RAP claims:

More Thickness

The new complying solvent-based coatings are very viscous and difficult to handle during application, tending to produce a thick film when applied directly from the can. A thicker film indicates that a smaller surface area is

covered with a given amount of material, thereby increasing VOC emissions per unit of area covered.

More Thinning

The more viscous, new compliant solvent-based coatings are typically adjusted by painters to change the properties and make them easier to handle and spread. This adjustment consists of thinning the coating as supplied by the manufacturer by adding solvent to change the viscosity of the coating. The added solvent increases VOC emissions back to, or sometimes above, the level of older formulations.

More Priming

Waterborne topcoats do not adhere as well as the solvent-based topcoats, so the surface requires additional priming, typically with solvent-based primers, to enhance the adherence quality. Additionally, waterborne sealers do not easily penetrate and seal porous substrates like wood, resulting in three or four coats of the sealer being required to do the job. With a high-quality solvent-based sealer, one coat is sufficient to provide protection to the wood.

More Topcoats

Waterborne topcoats may not cover, build, or flow-and-level as well as the solvent-based formulations. Therefore, more coats are necessary to achieve equivalent cover and coating build-up.

More Touch-Ups and Repair Work

The lower-VOC solvent-based formulations dry slowly, and are susceptible to damage such as sagging, wrinkling, alligatoring, or becoming scraped and scratched. The high-solids solvent-based enamels tend to yellow in dark areas. Waterborne coatings tend to blister or peel, and may also result in severe blocking problems. All of these problems require additional coatings for repair and touch-up.

More Frequent Recoating

The durability of the newer solvent-based coatings and waterborne coatings is inferior to the durability of the older solvent-based coatings. Durability problems include cracking, peeling, excessive chalking, and color fading, which all typically result in more frequent recoating.

Substitution

Coating manufacturers and coatings contractors assert that since reformulated compliant water- and low-VOC solvent-based coatings are inferior in durability and are more difficult to apply, consumers and contractors will substitute better performing coatings in other categories for use in categories with low compliance limits. An example of this substitution could be the use of a non-flat coating (currently with a higher compliance limit) in place of a low-VOC flat coating on interior drywall.

More Reactivity

Different types of solvents have different degrees of "reactivity," which is the ability to accelerate the formation of ground-level ozone. The waterborne coatings contain solvents that are more reactive than the solvents used in solvent-based formulations. Furthermore, waterborne coatings perform best under warm, dry weather conditions, and are typically recommended for use between May and October. Since ozone formation is also dependent on the meteorological conditions, use of waterborne coatings during this period increases the formation of ozone.

The above eight issues focus on two main points. The first seven issues all state that the new formulations, either solvent-based or waterborne, result in more coating use and an overall increase in VOC emissions over a period of time. The eighth issue involves the reactivity of solvents used in both waterborne and solvent-based coatings. EL RAP contends that certain solvents are more reactive than others and contribute at a greater rate to ozone formation than others. They also contend that under low-NOx (high VOC:NOx) conditions, some solvents actually have a negative reactivity. However, these low-NOx conditions do not occur in the majority of the area under the AQMD's purview.

The argument that lower-VOC coatings increase emissions is not based on actual studies, but has been a point made by manufacturers for the past eight years without any actual life-cycle studies provided to support the claim. In 1989, as part of the development work for the CARB-CAPCOA SCM, the Architectural Coatings Committee repeatedly asked for supporting documentation. The AQMD, as well as all other air districts that amended their AIM rules in 1990, requested supporting data, but none was provided. During development of the FIP rules, commenters testified on the seven issues, but again failed to provide specific information in support of their claims.

During the November 1996 rulemaking, issues pertaining to substitution of existing coatings with other specific coatings were discussed for flats and lacquers, within the context of the seven issues. Testimony regarding the previous proposal violating the Clean Air Act, Section 183(e), interstate commerce, and antitrust laws was also provided by an attorney. Lastly, testimony was provided on the AQMD's need and reasoning for pursuing the proposed amendments.

Each of the eight EL RAP issues had been analyzed in the Subsequent Environmental Assessment for the 1996 rule amendment. In each case, it was concluded that their claims for an increase in emissions were not founded. The courts have upheld this conclusion to date.

AIM Coating Study

The AQMD had contracted Eastern Michigan University (EMU), Coatings Research Institute, to further evaluate the six of the seven issues raised by EL RAP pertaining to coating categories in the current proposal, and to provide recommendations for future compliance limits for the different coating categories. EL RAP and other coating manufacturers approved the use of EMU for the study. EMU's study concluded that low- and zero-VOC coatings are currently available for the proposed coating categories, but could not reach conclusions regarding the overall performance of these coatings, as compared to current, solvent-based coating formulations, since coating manufacturers refused to provide performance data to EMU, even under a confidentiality agreement.

As a result, in order to obtain performance data, the AQMD contracted with National Technical Systems (NTS) to do a side-by-side comparison of zero-, low-, and high-VOC coatings. The study has been overseen by a Technology Advisory Committee (TAC), comprised of Mr. Robert Wendoll, previously of ELRAP, and now representing Dunn Edwards, Mr. Steve Murphy, representing PDCA, Harley Fung, representing Benjamin Moore Paints, Mr. John Gordon, representing academia, Mr. Jim Nyarady, CARB, and Mr. David Leehy, now representing ELRAP, and Mr. Naveen Berry, representing the AQMD. This study is being conducted to analyze application and durability characteristics in greater detail. Unfortunately, the study was significantly delayed due to delays in obtaining the test coatings. Some results, however have been recently reported, as further discussed in the specific section dealing with each coating category.

In summary, the results show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in

performance characteristics, including, but not limited to, coverage, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of the some zero-VOC coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. However, some zero-VOC coatings had application characteristics similar to their high-VOC counterparts. The lower rankings for some of these low-VOC products are for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments.

Since the initiation of the NTS study, staff has received and reviewed detailed information pertaining to numerous compliant coatings for each category included in this proposal. Staff compared technical data provided for each coating in each category by the manufacturer to assess coverage, dry times, durability (adhesion, abrasion resistance, chemical resistance, impact resistance, scrubbability, etc.), solids content by volume, and other characteristics. Some manufacturers have also forwarded actual laboratory test data, as well as third party testing.

In addition to addressing use of more coatings, staff is also working with CARB on their Reactivity Research Advisory Committee, formed to evaluate reactivities of selected VOCs. Dr. William P. L. Carter, College of Engineering Center for Environmental Research and Technology, has been contracted by CARB to investigate the atmospheric ozone formation potential of selected VOCs emitted from consumer products and industrial sources. Lastly, staff is actively participating in workshops conducted by the North American Research Strategy for Tropospheric Ozone to evaluate research studies conducted at the national level.

The proposed amendments include categories stayed by the superior court judgment, and focus on additional categories to achieve the required emission reductions.

The focus of the proposed amendments is limited to coatings that are strictly waterborne formulations or based on exempt solvent formulations, thereby eliminating any concerns of thinning the coating as supplied with VOC. However, in some cases where solvent-based formulations may be used, thinning with a solvent may be an issue and may require additional analyses for the environmental impacts of thinning.

Site Visits/Field Study

As part of the AQMD's fact finding and data gathering phase of the rule amendment process, staff conducted site visits to various locations where lower-VOC, compliant coatings have been utilized, to observe on a first-hand basis, the challenges and issues related to use of the lower-VOC coatings. In addition, since January 1996, staff has conducted over 100 unannounced site visits to evaluate contractor practices relating to thinning, application, and clean-up. During these site visits, samples were collected for coatings actually being utilized, as applied and as supplied, for laboratory analysis and subsequent study of impacts of thinning.

In addition to the 64 samples collected between January 1996 and November 1996, 47 sites with ongoing painting operations were included as a part of thee on-going compliance program. Of the 59 samples collected during these inspections, 36 were waterborne and 23 were solvent-based. Of the 23, six represented three sets, which were for the same coating as supplied and as applied. All three samples that were thinned with solvent prior to use were analyzed, with none exceeding the current compliance limit. All three sets were Industrial Maintenance Coatings.

Phase II of the field study consisted of purchasing and analyzing paint samples from various retail outlets. Since January 1996, 42 samples, consisting of various coating categories, were purchased and analyzed. All of the coatings analyzed were found to be in compliance with the applicable rule limit. Laboratory tests indicated that the reported VOC content on the container was generally higher than the VOC content as tested. The difference in the actual VOC content versus the reported VOC content ranged from 5% to over 60%. A trend of listing a maximum VOC content at the actual compliance limit was noted to be the practice. Of the samples purchased, seven were found to be in violation of Rule 1113, mostly waterproofing sealers. Staff is currently clarifying the definition of waterproofing sealers to eliminate confusion pertaining to this category.

Industry Contacts

AQMD staff has discussed the current proposal with EL RAP, which represents a group of manufacturers, Painting and Decorating Contractors Association (PDCA), which represents professional contractors, and the National Paint and Coatings Association (NPCA). Additionally, Staff met with Society for Protective Coatings, Metropolitan Water District, Cal Trans, and other public

service agencies to discuss PAR 1113, as well as the impacts of the revisions. Additionally, staff met with numerous other coatings and resin manufacturers.

Furthermore, AQMD staff met with non-EL RAP manufacturers and non-PDCA contractors to discuss issues related to AIM coatings, and has conducted site visits to manufacturers in search of new products. Staff has also conducted site visits to observe actual commercial painting operations to study thinning practices, as well as other environmental influences, such as climatic conditions, on the painting operation.

AQMD staff also worked closely with USEPA - Region IX, CARB, and various air pollution districts' staff to collect information and discuss availability of compliant coatings for the various coating categories.

Meetings with Industry Working Group

In September 1998, staff established a working group comprised of coating manufacturers, painting contractors, representatives of trade organizations, and government representatives. Staff met with the working group eight times to evaluate and consider industry's concerns regarding the proposed amendments. Comments made by industry were incorporated into the proposed rule, resulting in revisions to initial, most stringent proposed rule language included with the Preliminary Staff Report, dated November 10, 1998. After the second working group meeting, which included a detailed discussion of the proposed rule, staff re-evaluated the proposal and extended the definition and compliance dates of quick-dry coating categories. The working group meetings have also served as a forum for experts in the field to discuss the innovative approaches presented by industry at the first working group meeting. To date, the Seasonality, Reactivity, and Low Volatility Compound Exemption have been discussed in detail. Other topics discussed in the working group meetings include the AQMD's emissions inventory, Industry's proposal for a Seasonality Approach and Averaging Provisions, the 1998 CARB Survey, AQMP, and the AQMD's field application study. In summary, the working group meetings, as well as the public workshop and two Public Consultation, have resulted in the addition of more categories, raising proposed interim and final VOC limits for some categories, extending the interim and final compliance dates to provide more time for the existing technology to be further refined, and modifying definitions.

Reactivity-based VOC Control

As indicated earlier in this report, and based on various studies conducted in the field of atmospheric chemistry, many different types of VOCs are emitted into the atmosphere, each reacting at different rates. The Architectural Coatings Industry is funding additional studies to further understand the mechanistic and kinetic reactivities of different VOC species. The industry believes that VOC control strategies which take reactivity into account can potentially achieve ozone reductions in a more cost effective manner than strategies which reduce VOC mass.

The use of reactivity as a regulatory tool has been debated at the local, state, and national level for over 20 years. Reactivity issues were thoroughly assessed during the VOC RECLAIM rule development process over a period of several years. The results were inconclusive.

CARB implemented this reactivity-based control strategy into their California Clean Fuel/Low Emissions Vehicle regulations, where reactivity adjustment factors are employed to place regulations of exhaust emissions from vehicles using alternative fuels on an equal ozone impact basis. CARB is evaluating a similar strategy for consumer products and industrial emissions, and recently contracted with Dr. William Carter, University of California at Riverside, Center for Environmental Research and Technology, College of Engineering, for a two-year study to assess the reactivities of VOC species found in the consumer products emissions inventory. Dr. Carter, one of the principal researchers of reactivities of various VOC species, plans to further study VOC species, more specifically glycol ethers, esters, isopropyl alcohol, methyl ethyl ketone (MEK), and an octanol, since these are typically found in either waterborne coatings, solvent-based coatings, or both. These specific VOCs have been prioritized based on emissions inventory estimates, mechanistic uncertainties, and lack of information in the current reactivity data. Under the current models and ozone chamber studies, however, Dr. Carter has been unable to assess the reactivity of low volatility compounds, and has not succeeded in reducing the uncertainties of key VOC species used in AIM coatings.

Another factor to be considered in the reactivity based approach, and probably the most important, is an accurate speciation profile of waterborne and solvent-based coatings. The CARB, in its effort to get more detailed information about the speciation profiles, required speciation profiles of all coatings included in the 1998 CARB Survey. The results of the speciation data are still under evaluation, and will potentially be used for future, reactivity-based ozone control strategies.

CARB did propose an alternative reactivity-based approach in their recent proposed Aerosol Coatings rule amendment, but have delayed the reactivity-based alternative, until after review of the modeling assumptions and reactivity data included in Dr. Carter's research is completed in mid-1999.

Some of the uncertainties and other factors that need to be addressed for more accurate reactivity numbers include:

- Ozone impacts of VOCs depend on the environment where the VOC is being emitted
- The variability or uncertainty in the chemical composition of the VOC source being considered
- The complexity and uncertainties in the atmospheric processes by which emitted VOCs react to form ozone

The science of VOC reactivity has matured over the past few years, but more comprehensive studies are still being conducted to resolve the uncertainties of reactivity data. The experts in the field, including Dr. Carter, have indicated the need to improve estimates of atmospheric ozone reactivity factors for selected major classes of compounds in the consumer product emissions inventory. They also feel the need to improve the quantification of the uncertainty ranges of atmospheric reactivity factors for the classes of species typically found in coatings. Recently, with funding from USEPA and private sources, a new, state-of-the-art ozone chamber will be developed and used for future studies. The chamber is expected to be built and operational by the end of 1999.

AQMD believes that while it would not be prudent to implement a reactivity-based ozone reduction strategy based on incomplete science and delay VOC emission reductions based on this concern, it may be appropriate to study the issue further if new information not analyzed in previous AQMD study efforts is brought forward. Therefore, AQMD will continue to monitor and participate in all studies related to enhanced reactivity data for VOC species.

In their Report to Congress on a Study of Volatile Organic Compound Emissions from Consumer and Commercial Products (EPA-453/R-94-066-A), USEPA also supported the reactivity-based approach, but also indicated that, "Because of uncertainties, inconsistencies, and lack of reactivity data on individual compounds, ... a rigorous determination of the potential of consumer and commercial products to contribute to ozone nonattainment is not possible at this time ... If, in the future, sufficient information or new methodologies become available, the EPA may reevaluate this finding." As a result, EPA is regulating

AIM coatings based upon VOC content and not reactivity. AQMD is taking the same approach as EPA. Based on the current state of information, there is insufficient evidence to conclude that waterborne coatings actually contain more reactive solvents than solvent-based coatings. In addition, the proposed amendments significantly reduce the amounts of solvents used in waterborne coatings, thus reducing total emissions.

The District, however, does support additional studies needed to further enhance the modeling assumptions, as well as the individual VOC species' MIR values and negative incremental reactivities of some VOC species under low-NOx conditions, for potential future alternative architectural coatings control strategies. The District, as a part of this rulemaking, is proposing to adopt, as a part of the technology assessment, reactivity studies for potential future architectural coating control strategies.

Low Volatility Compounds - Exemption

Several solvents that are currently used in consumer products and architectural coatings are considered low volatility compounds, meaning that they have a vapor pressure of less than 0.1 mm of Hg at 20 degrees Celsius. The CARB has included a low vapor pressure (LVP) exemption in their Consumer Products regulation. CARB staff indicate that the LVP exemption was placed into the proposed rule for some additives found in consumer products, such as surfactants, parafins, and other heavier compounds that do not readily evaporate into the atmosphere and are typically washed away into the sewer. Since the VOCs in paints do and are intended to evaporate into the atmosphere, CARB does not support the LVP exemption for architectural coatings and did not include the LVP exemption into its Aerosol Coatings rule. USEPA staff also does not support a LVP exemption for the architectural coatings rule and did not include such an exemption in the National Architectural Coatings Rule. Based upon its test methodology, USEPA concludes that VOCs from architectural coatings do evaporate into the air and therefore should not be exempted.

Staff concurs with USEPA and CARB to not include a LVP exemption for architectural coatings. Therefore, a LVP exemption will not be included in the current proposed amended Rule 1113. Nonetheless, staff will continue to work with CARB staff in identifying issues, designing future studies, and monitoring results to possibly evaluate this issue in the future.

Delisting of Acetone as a VOC

On June 16, 1995, the USEPA determined that acetone has low photochemical reactivity and should be exempted from consideration as a VOC. The AQMD subsequently amended Rule 102 on November 17, 1995, to add acetone to the definition of Group I exempt compounds, which are non-VOC by definition.

Acetone is a manufactured chemical that is also found naturally in the environment. It is a colorless liquid with a distinctive smell and taste. It evaporates easily, is flammable, and dissolves in water. It is also called dimethyl ketone, 2-propanone, and beta-ketopropanone. Acetone is used to make plastics, fibers, drugs, and other chemicals. It is also used to dissolve other substances, which makes it an ideal cleaning solvent for glassware in laboratories. Chemistry classes at all levels from grade school to universities, as well as industrial laboratories, use acetone for wiping down counter tops and cleaning glassware. Additional uses for acetone include solvent for paints, varnishes, lacquers, inks, adhesives, heatseal coatings, and cosmetic products including nail polish and nail polish remover.

Staff recently surveyed sales of containers of pure acetone. As an example, one quart-container of pure acetone from a local hardware store, recommended as a special-purpose thinner, cleaner, and remover, contained a warning label. The label, as well as the Material Safety Data Sheet (MSDS), caution the user regarding the flammability and advises the user to "**...keep the container away from heat, sparks, flame and all other sources of ignition. The vapors may cause flash fire or ignite explosively ... Use only with adequate ventilation.**" All of the large coating manufacturers currently offer for sale pure acetone in quart or gallon containers with similar warnings.

Not surprisingly, the containers for typical lacquer thinners also had similar warnings since the flashpoint is well below 100 degrees Fahrenheit. A review of MSDSs for lacquer thinners manufactured by numerous manufacturers indicated the presence of acetone ranging from 7% to 25% by volume. These lacquer thinners are recommended and are used widely for reducing coatings, cleaning equipment, and cleaning paint spills.

Standard 79-3, Appendix C of the 1994 Uniform Fire Code, Volume 2, discusses the fire department's method for flammability classification, which is based on a Technical Committee on Classification and Properties of Flammable Liquids of the NFPA Committee on Flammable Liquids. Typically, the flashpoint of a liquid indicates if it is flammable or combustible and indicates the liquid's susceptibility

to ignite. Flashpoint testing is conducted on each liquid, using one of five ASTM methods, and the results indicate the grouping into which the liquid should be placed.

Staff interviewed four local fire departments to discuss the hazards associated with acetone-containing coatings. All four indicated that their department would be equally concerned with any coating or solvent which has a flashpoint below 65 degrees Fahrenheit. Currently available, conventional nitrocellulose lacquers mostly have flashpoints well below 65 degrees Fahrenheit, and are classified as 1B liquids - the same as acetone. Captain Michael R. Lee, County of Los Angeles, Fire Department, provided written comments in a letter dated June 12, 1996, pertaining to acetone as a substitute solvent for other solvents found in coatings. He indicated that acetone, butyl acetate, MEK, and xylene are all flammable, but "Xylene is the least flammable ... but has a higher health hazard. The Uniform Fire Code treats all four of the above solvents as Class I Flammable liquids, considering them all to present the same relative degree of fire hazard. The Fire Code sets the same requirements for the storage, use and handling of all four. In my opinion, acetone presents the highest degree of fire hazard of the four solvents considered, but is not significantly more hazardous than the others. All four should be used with extreme caution, with proper safeguards in place."

The County of Los Angeles, Fire Department, Fire Prevention Guide #9 regulates spray application of flammable or combustible liquids. The guide requires that no open flame, spark-producing equipment or exposed surfaces exceeding the ignition temperature of the material being sprayed is within the area. For open spraying, as would be the case for the field application of the acetone-based lacquer, no spark-producing equipment or open flame shall be within 20 feet horizontally and 10 feet vertically of the spray area. Anyone not complying with the above guidelines would be in violation of current fire codes. The fire department limits residential storage of flammable liquids to five gallons and recommends storage in a cool place. If the flammable coating container is exposed to direct sunlight or heat, storage in cool water is recommended. Finally all metal containers involving the transfer of five gallons or more should be grounded and bonded.

In the current proposed rule, acetone may be used as a replacement solvent for waterproofing sealer formulations. Although acetone is volatile, odorous and flammable, it offers a relatively inexpensive alternative to VOCs at $2.10 a gallon.

The Subsequent Environmental Assessment for the November 1996 amendments for this rule, as well as the staff report for Rule 102, is referenced for a more in-depth analysis of acetone as a substitute solvent.

Waterproofing sealer formulators have used acetone in their coatings, but may increase the acetone content in an effort to comply with the proposed limit.

Oxsol 100 (p-chlorobenzotrifluoride), manufactured by Occidental Chemical Corporation, was also delisted as a VOC in 1994. This solvent can be used to extend or replace many organic solvents, including toluene, xylene, mineral spirits, acetone, methyl ethyl ketone, tricholorethylene, and percholoroethylene. This product is less toxic than toluene, is not considered a Hazardous Air Pollutant or an Ozone-Depleting Substance.

The USEPA is also in the process of delisting t-butyl acetate, which may also help coating formulators in utilizing exempt solvents in their formulations.

In summary, exempt solvents are considered to be a viable alternatives to other, more toxic solvents currently found in various coatings.

Development in Waterborne Coatings

During the 1990s, numerous manufacturers have developed and marketed acrylic-based, waterborne coatings, that exhibit performance characteristics equivalent or superior to the traditional, solvent-based coatings. The first generation of waterborne coatings had stability, rheology, water-immersion, loss of gloss, rusting, lack of corrosion resistance, loss of drying capacity, and bacterial degradation problems. However, subsequent formulations, using a new generation of performance-enhancing additives, as well as innovative resin technologies, have minimized the problems to a practical level, or completely eliminated them. Technology breakthroughs in additives include the following:

- Flow and leveling agents that mitigate the flow problems, even on substrates like plastics, glass, concrete, and resinous wood. These additives even assist in overcoming flow and leveling problems when coating oily or contaminated substrates.

- Pigment-wetting agents have assisted in better dispersion of organic pigments in an aqueous media by altering their hydrophobic nature. This results in better rheology characteristics.

- Defoamers and microfoam agents have mitigated the bubble retention problems, thereby eliminating the loss of drying capacity, and thus improving the film.

- Biocides that are not susceptible to degradation by hydrolysis have provided good stability and eliminated the settling problems.

With the development of these additives, some waterborne coatings now perform better than solvent-based coatings. Their flexibility characteristics and adhesion to properly prepared metal is excellent. The biggest problem with waterborne coatings is the dry time. Water, with its slow evaporation rate and high latent heat of evaporation, just does not have the latitude that solvents do with their wide range of evaporation rates and boiling points. On a warm, dry day, waterborne coatings dry faster than the high-solids, solvent-based coatings, but the dry times can be significantly extended on cold, humid days, which causes problems in some areas. However, with the development of non-volatile, reactive diluents combined with hypersurfactants, performance of these nearly zero-VOC coatings has equalled, and in some characteristics, outperformed traditional, solvent-containing coatings.

Durability of Coatings

The durability of a coating is governed by the nature of the binder used in its formulation, which are also known as film formers or resins. These coatings are exposed to a variety of influences of daily life, including mechanical stresses, chemicals and weathering, against which they serve to protect the substrate. The major impact on the coating film is oxidation by exposure to light, causing the film to first lose color and gloss, and gradually become brittle and incoherent. This is mainly caused by a process known as photochemical degradation. This is especially the case for coatings used for exterior painting.

The coatings industry has developed a variety of additives that act as ultraviolet light (UV) absorbers or free radical scavengers that ultimately slow down the photo-oxidative process, thereby increasing the coating life. Antioxidants and sterically hindered amines are two classes of free radical scavengers, also known as hindered amine light stabilizers (HALS). These can be used with solvent-free or waterborne coatings. Other additives that have positive effect on durability of coatings include adhesion promotors, corrosion inhibitors, curing agents, reactive diluents, optical brightners, and algicides/mildewcides.

Table 3
Performance Comparison of
Acrylic and Alkyd Resin Systems

Acrylic Coatings	Alkyd Coatings
Excellent exterior durability because of high degree of resistance to thermal, photooxidation, and hydrolysis – Pendant groups are ester bonds, but body is C-C bonds, which are much harder to break.	Limited exterior durability because prone to hydrolysis.
Very good color and gloss retention, and resistance to embrittlement	Embrittlement and discoloration issues with age
Require good surface preparation. Since the surface tension is high, the substrate surface needs to be cleaner before application	Minimal surface preparation requirements due to low surface tension. Relatively foolproof applications
Acrylic coatings are generally higher in cost	Lower costs
Polyurethane modified acrylics perform even better, especially in flexibility	Rapid drying, good adhesion, and mar resistance. Silicone modified alkyds have higher performance
Low-VOC and solvent-free formulations available	Higher VOC formulations

As indicated earlier in this report, there are numerous types of binders used in the formulation of coatings. However for architectural uses, acrylics and alkyds are the two most commonly used. Table 3 above, extracted from material provided as part of the Durability and Performance of Coatings seminar held by Eastern Michigan University, describes some typical characteristics of each resin type and highlights strengths and weaknesses of each resin type. But, clearly the table emphasizes the superior durability of acrylic coatings. Utilizing the additives available for improving application and durability characteristics, waterborne acrylic systems have overcome their limitations, and generally outperform solvent-based coatings, when properly formulated.

VI. PROPOSED AMENDMENTS

The following summarizes the major proposed amendments for the rule as a result of staff's technical assessment and discussions with industry. The items are listed in the order in which they appear in the rule.

1. Add the definition of "Bituminous Roof Coatings" [Paragraphs (b)(6)]:

The definition of "Bituminous Roof Coatings," has been added to the existing rule in response to comments provided by the Roof Coatings Manufacturers Association.

2. *Add the definition of "Essential Public Service Coatings" [Paragraphs (b)(13)]:*

The definition of "Essential Public Service Coatings," has been added to the existing rule in response to comments provided by the Essential Public Service Agencies

3. *Add the definition of "Floor Coatings" [Paragraphs (b)(17)]:*

The definition of "Floor Coatings," has been added to the existing rule.

4. *Add the definition of "High-Temperature Industrial Maintenance coatings" [Paragraphs (b)(21)]:*

The definition of "High-Temperature Industrial Maintenance coatings," has been added to the existing rule.

5. *Delete the definition of "Industrial Maintenance Primers and Topcoats" and add the definition of "Industrial Maintenance Coatings" as originally adopted in February 1990 amendments, but deleted in November 1996 amendments to comply with the Superior Court judgement.[Old Paragraph (b)(19), Paragraph (b)(22)]:*

The definition of "Industrial Maintenance Primers and Topcoats" based on the January 1990 rule is deleted and the definition of "Industrial Maintenance coatings" based on the February 1990 rule is added.

6. *Add the definition of "Nonflat Coatings" [Paragraph (b)(30)]:*

A definition of "Nonflat coatings" is added to create a specialty category. The definition is the same as recently adopted by USEPA in the national rule.

7. *Add the definition of "Recycled Flats and Nonflats" [Paragraph (b)(36)]:*

A definition of "Recycled Flats and Nonflats" is added to create a specialty category, based on comments forwarded by Orange County Integrated Waste Management and other public service agencies.

8. *Add the definition of "Rust preventative coatings" [Paragraph (b)(38)]:*

A definition of "*Rust preventative coatings*" is added to create a specialty category.

9. *Revise the definition of "Waterproofing Sealers to Waterproofing Wood Sealers" [Paragraph (b)(51)]:*

The definition of "Waterproofing Sealers" is revised to "Waterproofing Wood Sealers" based on comments received from manufacturers of such products. This definition is specifically for waterproofing sealers used on wood substrates, such as decks and siding.

10. *Add the definition of "Waterproofing Concrete/Masonry Sealers" [Paragraph (b)(52)]:*

The definition of "Waterproofing Concrete/Masonry Sealers" is revised based on comments received from manufacturers of such products. This definition is specifically for waterproofing sealers used on concrete and masonry.

11. *Modify the requirements in paragraph (c)(2) to incorporate coatings manufactured under the Averaging Provisions specified in paragraph (c)(6).*

12. *Categories that have proposed changes to the VOC limits are discussed below:*

VOC Limits

The following VOC limits are proposed to be changed by this amendment. For each coating category proposed for amendment, the latest available usage and emission data, as well as the product description, staff recommendation, and the basis for the amendment is presented. All data below presents usage or emissions within the SCAB. Also presented is a discussion of any pertinent issues that were previously raised by industry for the specific categories.

Floor Coatings

Table 4

Floor Coatings Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	167.6
Estimated 1996 Waterborne Sales (1,000 gallons/year)	295.8
Estimated VOC Emissions (tons/day)	0.61
Current VOC Limit (grams/liter)	400
Proposed VOC Limit (grams/liter) – 7/1/2002	100
Proposed VOC Limit (grams/liter) - 7/1/2006	50
Estimated Emission Reduction (tons/day) – 7/1/2002	0.31
Estimated Emission Reduction (tons/day) - 7/1/2006	0.16

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

Floor coating is a generic term for a variety of high performance opaque coatings used in areas with abrasion as a result of foot traffic or vehicular traffic. Typical users include a variety of commercial and industrial users, with some limited residential applications. Typically, the coating system includes a primer and topcoat or a two-component single coat coating.

Although formulated using the plethora of resin systems, the highest performing floor coatings are based on epoxy and polyurethane systems. The newer technology is based on both 1-part and 2-part coatings, with numerous products being offered as completely solventless systems.

Recommendation

Lower Floor coatings VOC limits from the current 400 g/l level to 100 g/l effective July 1, 2002, and from 100 g/l to 50 g/l effective July 1, 2006.

Basis for Recommendation

1998 Draft CARB Survey Data

The survey for floor coatings was based on information submitted by over 100 manufacturers and over 500 different products. The survey indicated total 1996

sales in the State of California of 657,393 gallons for waterborne formulations, with an SWA VOC content of 164 g/l. This equates to approximately 57% of total floor coating sales during 1996. The SWA VOC content of the 372,414 gallons of solvent-based formulations was 197 g/l, which is greater than the proposed 100 g/l VOC limit. A more detailed analysis of the data shows that 128 of the total 505 products already comply with the proposed July 1, 2002 limit. This equates to approximately 35% of the total volume of floor coatings sold in California during 1996. An estimated 28% of the total products complies with the proposed VOC limit of 50 g/l, which becomes effective July 1, 2006.

AQMD Findings

As a part of the technology assessment, staff has gathered information on numerous floor coating systems that comply with the proposed limits. Over the past five years, the most significant progress in floor coatings has been the development of a zero-VOC two-component, aliphatic polyurethane coatings and two-component epoxy coatings.

Air Products and Chemicals, a raw material supplier of architectural and high performance resins, is currently marketing the ADURA™ Polyols line, which is recommended for a variety of floor uses, including gymnasiums and industrial facilities. The two-component, aliphatic polyurethane formulations are optimally formulated at 40% to 70% solids, and therefore provide excellent coverage. The lower-cost ADURA™ 50 is specifically recommended for concrete coating formulations. The company claims a pot life of 2 to 3 hours, a range of gloss levels, good abrasion and mar resistance, good adhesion to concrete, clear and opaque formulations, and good chemical resistance. The technical data sheet also indicates that these coatings dry hard in less than 30 minutes, and can be applied under a broad range of environmental conditions. The ADURA™ 100 and 200 are recommended for areas with higher performance needs.

The Sherwin Williams Company also has a 100% solids self-leveling epoxy coating called "ArmorSeal 650 SL/RC", which is a two-component, zero-VOC floor coating. The technical data sheet indicates that this coating is chemical,-impact-, and abrasion resistant, and is suitable for USDA facilities. It is also available in a variety of gloss levels, in opaque and clear formulations. The company also has a zero-VOC primer recommended with the topcoat, as well as additional formulations of zero-VOC floor coatings.

Coatings Resources Corporation (CRC), a local Southern California coating manufacturer since 1976, also manufactures several zero-VOC floor coatings.

These include their CR-10, CR-11, CR-12, and CR-13, all 100% solids epoxy or epoxy novolac formulations. All four are recommended for a variety of floor uses that require high abrasion and chemical resistance. Recommended users include petrochemical, mining and milling, food processing, showroom floors, warehouses, water and wasterwater treatment, and other commercial and industrial uses. These floor coatings are available in clear and opaque formulations, with a variety of gloss levels. All of these are approved for USDA inspected facilities. In addition, CRC has single-component acrylic floor coatings with a VOC content of less 50 g/l that are recommended for residential and commercial applications.

Madison Chemical Industries Inc. also has several high performance, zero-VOC, two-component coatings recommended for a variety of industrial and general maintenance uses, including flooring. Their GemThane™ products include a variety of formulations, in both aliphatic and aromatic polyurethane formulations. Their two-component aromatic polyurethane complies with the proposed limits for floor coatings, and can be applied using roller, brush, or conventional spray equipment. However, the fast-set formulations require plural component spray equipment.

Hart Polymers, Inc., a supplier of raw materials and high performance coatings, also has a variety of water-based, zero-VOC, floor coatings. HP-100 is a two-component aliphatic urethane, with a pot life of 90 minutes to 120 minutes. It can be applied using a brush, roller, or conventional spray equipment, with or without a primer. Taking into account the high solids (58% - 64%) and the recommended wet-film thickness of 2 to 3 mils, coverage is excellent. The manufacturer recommends use of the HP-100 between 40 and 90 degrees F, and Relative Humidity levels below 80%. Additionally, Hart Polymers also markets a zero-VOC single component floor coatings in both aliphatic polyurethane and acrylic/aliphatic polyurethane dispersions, labeled HP-140 and HP-130, respectively. These single component floor coatings can also be used in residential environments.

Poly-Carb, Inc., a company based in Cleveland, Ohio, has a variety of high build, 100% solids, two-component floor coatings, with specialty formulations available for a variety of chemical exposures. Specifically, the MARK-64.1 is a heavy duty floor coating recommended for waste water and water treatment plant floors, industrial and manufacturing floors, laboratories, kitchens, food processing areas, high traffic areas, splash zones, and areas subject to corrosive acid and alkali spills. This coating has a tensile strength of 7,500 psi and compressive strength of 13,000 – 15,000 psi.

Other companies offering floor coatings that comply with the proposed 100 g/l limit include Polycoat Products, Ameron, United Coatings, Pacific Polymers, Tnemec, and Pittsburgh Paints.

This discussion highlights just a few of the technologies commercially available, and does not imply that other manufacturers do not have compliant floor coatings. The discussion should also not be considered an endorsement by the AQMD for the specific coatings.

A comprehensive list of coatings compliant with the proposed 100 g/l and 50 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

Issues

In previous workshops and meetings, coating manufacturers and painting contractors have testified that the new coatings are not as durable as the older coatings, and are sub-par in performance when compared to the higher VOC formulations. Another common complaint is the need to thin the coating prior to application. Lastly, they have raised concerns about the need for training for contractors in using two-component coatings.

However, the coatings highlighted in the earlier section are all high-performing products available for a variety of uses, including industrial, commercial, and residential floor applications. The technical data sheets for these coatings all indicate excellent adhesion, abrasion resistance, impact resistance, as well as excellent exterior exposure for the urethane formulations.

Staff has also researched the need to thin floor coatings under the current proposal. Manufacturers of the zero- and low-VOC systems claim that polyurethane and epoxy-based coatings should not be thinned, but contractors will thin by habit. These coatings are developed for optimum application viscosity, either by brush, roller, or spray. Furthermore, majority of these coating systems that would comply with the proposed limits would be waterborne, thus using water as a thinner, when necessary.

Industrial Maintenance Coatings

Table 5

Industrial Maintenance Coatings Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	1,720.35
Estimated 1996 Waterborne Sales (1,000 gallons/year)	173.8
Estimated VOC Emissions (tons/day)	6.48
Current VOC Limit (grams/liter)	420
Proposed VOC Limit (grams/liter) – *7/1/2002*	250
Proposed VOC Limit (grams/liter) - 7/1/2006	100
Estimated Emission Reduction (tons/day) – 7/1/2002	2.90
Estimated Emission Reduction (tons/day) - 7/1/2006	2.63

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

Industrial maintenance (IM) coating is a generic term for a variety of high performance coatings used in areas with harsh environmental conditions such as extreme weather, corrosion, chemical, abrasion, and heat. Typical users include oil and gas production - onshore and offshore, refineries, petrochemical production and processing, marine, pulp and paper mills, bridges, manufacturing facilities, and water and waste treatment facilities. The coating system may include a primer and topcoat or a primer, midcoat, and topcoat or high-build single coat coatings.

In addition to high performance, alkyd-based enamels, inorganic zinc, vinyl, epoxy, polyurethane, and silicone-based resins are used to enhance the protection characteristics of the coatings, while achieving lower VOC content. The newer technology is based on both 1-part and 2-part coatings, with some using reactive diluent technology where part of the solvent becomes a permanent part of the coating.

Recommendation

Lower IM coatings VOC limits from the current 420 g/l level to 250 g/l effective July 1, 2002, and from 250 g/l to 100 g/l effective July 1, 2006.

Basis for Recommendation

1998 Draft CARB Survey Data

The survey for IM coatings was based on information submitted by 68 manufacturers and 2,754 different products, which included basecoats, midcoats, and topcoats. The survey indicated total 1996 sales in the State of California of 379,074 gallons for waterborne formulations, with an SWA VOC content of 170 g/l, lower than the proposed limit for July 1, 2002. This equates to approximately 11% of total IM coating product sales during 1996. The SWA VOC content of the 3,823,118 gallons of solvent-based formulations was 321 g/l, which is greater than the proposed 250 g/l VOC limit. A more detailed analysis of the data shows that 27% of the total volume of sales already comply with the proposed July 1, 2002 limit and 11% of the limit proposed July 1, 2006.

AQMD Findings

As a part of the technology assessment, staff has gathered information on numerous IM coating systems that comply with the proposed limits. Over the past five years, the most significant progress in IM coatings was the development of a zero-VOC two-component, aliphatic polyurethane coating based on novel polyol dispersions that meet or exceed the performance levels of typical solvent-based systems. This system was initially developed by Hart Polymers, a local resin manufacturer, and subsequently licensed to Air Products and Chemicals. The initial line of products were marketed as their HP-100 and HP-200 line of high-performance, two-component, waterborne, aliphatic, polyurethane coatings for a variety of uses. Hart Polymers has also licensed this technology to Deft, Inc. for aerospace use.

Air Products and Chemicals is currently marketing this technology as their ADURA™ Polyols line. Air Products and Chemicals, Inc. recommends these resin systems for general IM usage, general metal, machinery and equipment, storage tank and pipe, transportation and shipping containers, as well as concrete floors and walls. The company's literature indicates "outstanding appearance, exterior durability, chemical resistance, and physical properties." Furthermore, the biggest issue with most two-component coatings is their limited pot life after mixing or the use of plural-component spray equipment. However, Air Products and Chemicals, Inc. claims that the ADURA™ systems have good pot life and can be applied under a broad range of environmental conditions. Considering

these coatings are optimally formulated at 70% solids, they provide excellent coverage.

Several coating companies have already utilized the ADURA™ polyol technology in developing and commercializing IM coatings. Sherwin Williams Industrial and Marine Coatings is marketing this technology as their Centurion® IM coating that contains only 66 g/l of VOCs. In the Spring 1998 issue of Coatings Solutions Journal, an article summarizes the experience of Sherwin Williams' staff in application of this coating. "They're rating this topcoat superior to the solvent-based coatings they had used previously. After 2,000 hours of cyclical corrosion testing, the coating showed no signs of rusting, and achieved a rating of 10 in accordance with ASTM D610, the highest rating achievable." This coating also performed very well in impact and chemical resistance, as well as adhesion tests. The manufacturer indicates that this topcoat can be used on tanks, bridges, rail cars, offshore platforms and other steel structures. Lastly, the coating can be applied using traditional spray equipment, brushed, or rolled. Sherwin Williams also markets a Direct-to-Metal (DTM) Acrylic Coating (B66-100 High Gloss and B66-200 Series Semi Gloss) formulated at a VOC of 208 g/l. The company recommends this single-component, 100% acrylic product for light to moderate industrial uses, including buildings, machinery, storage tanks, water treatment plants, machinery, equipment, power plants, piping, structural steel, and select marine structures. Sherwin Williams claims that this coating is corrosion and chemical resistant, fast dry, flash rust and early rust resistant, and has "outstanding early moisture resistance". Sherwin Williams claims that this coating is suitable for use in USDA inspected facilities. In addition, Sherwin Williams also markets IM primers that comply with the proposed limit. For example, their Zinc Clad VI (B69 Series) is a waterborne organic zinc rich epoxy with a VOC content of only 48 g/l, which is well below the proposed limit of 100 g/l effective July 1, 2006. This primer is a three-component system with a pot life of 8 hours at 77 degrees F and 50% relative humidity (RH). Sherwin Williams also manufactures a two-component Water Based Catalyzed Epoxy (B70-200 Series) coating that is recommended for industrial and commercial environments, due to the coating's corrosion and chemical, impact-, abrasion-, and flash rust-resistance. The technical data sheet indicates that this product is suitable in USDA inspected facilities, is low odor and nonflammable, and has been tested for nuclear irradiation and decontamination, Level II. Pot life is estimated to be 36 hours at 77 degrees F and 50% RH. This coating has a VOC content of 176 g/l, well below the proposed July 1, 2002 limit. Other compliant IM coatings manufactured by Sherwin Williams include Tower-Guard HS (B54AZ600) with a

VOC content of 70 [illegible] and Tank Clad HS Epoxy (B62-80 Series), which is recommended for immersion service for both potable water, fresh water, and salt water. The technical data sheet indicates that this coating was "formulated specifically as an interior lining for pipes and tanks", and is NSF approved to Standard 61 for potable water. It is also recommended for facilities that are USDA inspected. The VOC content is only 177 g/l for the Tank Clad HS Epoxy. There are several other IM coatings manufactured by Sherwin Williams that comply with the proposed limits and are recommended for a wide variety of industrial uses.

Another company which has formulated a wide variety of coatings based on the ADURA™ resin system is Coatings Resources Corporation (CRC), a local Southern California coating manufacturer since 1976. This manufacturer recommends their zero-VOC topcoats for a variety of substrates and environmental conditions, and claim performance equal to solvent-containing polyurethane coatings. They have over 25 products recommended for the gamut of industrial uses, all below the proposed 250 g/l VOC limit for July 1, 2002. These products include coatings based on acrylic, epoxy, and urethane technology. The Waterborne QD Urethane (CR32) and Waterborne Urethane (CR-38) are both zero-VOC systems that can be used without a primer or with a primer for a variety of uses, including steel tanks, piping, marine exposure, and fiberglass. The technical data sheets indicate "outstanding adhesion, low and high humidity cure, and quick-set". The CR-38's technical data sheet claims a 95% gloss retention when tested under ASTM G-53, chemical resistance for a variety of solvents, excellent wet and dry tape adhesion, and salt spray blistering. CRC's acrylic technology includes CR-57 (High-Gloss), CR-58 (Semi-Gloss), and CR-59 (Low-Gloss), which are all recommended for steel tanks, piping, bridges, industrial water and wastewater treatment plants, as well as architectural uses. The VOC content of this technology ranges from 30 g/l to 88 g/l for all three gloss levels, depending on color and substrate requirements. Application temperatures range from 40 degrees F to 110 degrees F, with humidity ranges from 0-90% RH. CRC's epoxy IM coatings are recommended for a variety of uses. For example, the CR-34, Waterborne Surface Tolerant Epoxy, is recommended for non-immersion concrete and steel substrates. Potential users of this technology, formulated at a VOC content of 120 g/l, include petrochemical, water and wastewater, mining and milling, food processing, pulp and paper, and other industries where chemical fumes and splashes are a concern.

Madison Chemical Industries Inc. has developed a 100% solids, VOC free, fast set, aliphatic urethane coating system. A recent paper entitled "One Hundred

Percent Solids Aliphatic Polyurethane Coatings – From Dream to Reality," authored by Shiwei Guan, Research and Development Manager, Madison Chemical Industries (MCI), summarizes results from a comparison of the 100% solids, aliphatic polyurethane system to commercially available, solvent-containing aliphatic and aromatic polyurethane systems. The 100% solids aliphatic urethane outperformed the traditional solvent-containing coatings in adhesion, corrosion-, chemical-, UV-, and abrasion-resistance, as well as color/gloss retention. The major drawback of this formulation is the need for application with plural component spray technology, primarily due to the limited pot life of the mixed components. However, the fast cure time offsets some of the added applications equipment costs. Due to the short cure time, the substrates return to service faster, minimizing shutdown time. MCI is continuing their research research to develop a formulation for use with conventional, single component spray equipment. MCI has a diverse line of IM coatings, with most two-component coatings formulated at zero-VOC. Uses include Pipeline coatings and linings, infrastructural coatings, coatings and linings for storage tanks, including potable water. Some of their zero-VOC technology has been in use for over twenty years. For example their Corropipe II PW™ is a high-performing, zero-VOC, two-component coating that exceeds ANSI/NSF61 standards. The Tufsheen II™ is an aliphatic urethane recommended for storage tank exteriors and other uses. MCI's product line also includes their GemThane™ products that are recommended for a wide variety of maintenance uses in varying industrial environments. The GemThane™ 1:4 Aromatic is an interior use coating with a VOC of 78 g/l, and is recommended for a variety of high performance areass.

Several different manufacturers have other zero- and low-VOC coating systems based on epoxy, acrylic, and specialty blend systems. Other companies have formulated zero- or low-VOC coatings based on siloxane (a silicon/epoxy blend), novolac, and other technologically advanced resin systems. The silicone based resin systems available in the market today exhibit properties of both a high-performance epoxy and a polyurethane in one coat. These coatings are typically self-priming, and possess gloss appearance and retention qualities that exceed the best quality urethanes. Most importantly, these coatings have lower applied costs and significantly lower VOC content.

Ameron has numerous IM coatings, both topcoats and primers, that comply with the proposed limits. Their PSX® 700 is a Epoxy Siloxane based coating with a VOC content of 84 g/l, significantly below the July 1, 2006 proposed level. This technology was presented at the Architectural Coatings Technology Conference in April 1998, and highlighted the relative performance and cost this technology, as

compared to traditional IM coating systems. The performance of this modified epoxy is related to the Si-O units in the backbone, instead of the C-C bonds. The bond strength of the Si-O is approximately 25% greater, making it very stable and resistant to attack by atmospheric oxygen and ultraviolet radiation. Therefore this product has excellent weatherability. In comparison, organic polymers will oxidize and degrade under these conditions. The pot life of this two-component coating is 4 hours and 2 hours at 70 degrees F and 90 degrees F, respectively. It is recommended for a variety of uses, including structural steel, tanks, piping, industrial power plants, concrete walls and floors, as well as marine uses. The technical data sheet indicates "excellent adhesion over compromised surfaces, including intact rust and excellent resistance to acids, corrosion, and chemicals". Their laboratory testing indicates a life of approximately 23 years for a primer and topcoat system, or approximately 20% greater than the typical three coating IM system, consisting of an inorganic zinc primer, epoxy midcoat, and urethane topcoat. The company also claims that overall applied cost of the 2 coat siloxane product is 12% lower than the 3 coat system discussed above. Ameron also has several other IM coatings that comply with the proposed limit of 250 g/l. These include the Amerlock® 400, Amercoat® 151, Amercoat® 220, Amercoat® 300, and Amercoat® 351 coatings recommended for a variety of uses, including tanks interiors and exteriors and other industrial uses. Ameron, Inc. has indicated that they do not have coatings that comply with future limits for all types of industrial uses.

Morton International, Inc. also offers a variety of IM coating formulations based on acrylic technology. Their MorKote™ 1001 Acrylic Emulsion is recommended for general IM coating application, including corrosion-resistant, interior/exterior high gloss coatings. This resin can be formulated into rust prohibitive primers, topcoats, and DTM coatings. A recommended formulation for a high-gloss topcoat, using this resin, estimates the VOC content of 135 g/l. The technical data sheet indicates excellent block resistance, scrub resistance, wet adhesion over glossed alkyd, and good chemical resistance. Their MoreKote™ 1035 and MoreKote™ 1300 acrylic emulsions can be used for IM primers with good stain resistance properties, including tannin. These resins can be used to formulate primers/sealers, as well as clear or pigmented coatings, ranging in VOCs from 9 g/l to 158 g/l.

Vianova Resins, a raw material supplier from Europe, also offers a complete line of IM coating formulations based on a variety of resin systems, including acrylic/alkyds, epoxy, and polyurethane dispersions. They offer formulations for primers, midcoats, and topcoats with VOC content less than 250 g/l. Vianova

representatives claimed that these formulations have comparable properties to solvent-based IM coatings of equivalent chemistry.

Genesis Coatings, Inc. also has a two-component, zero-VOC, aliphatic polyurethane coating called "GCP 1000". This coating is specifically marketed for anti-graffiti uses, as well as general maintenance uses. This coating is recommended for interior and exterior uses, and is available in clear and pigmented formulations. This two-component coating has an estimated pot life of 90 minutes, and can be applied using a brush, roller, or spray gun.

Poly-Carb, Inc. also offers a wide variety of industrial maintenance coatings recommended for a variety of uses, including specialized formulations for different chemical exposures (MARK-46 series, MARK-133.1 and MARK-163). All eight of these are zero-VOC (100% solids) industrial maintenance topcoats and primers, based on epoxy or urethane systems. They are recommended for tank lining and repair of concrete and metal pipes, marine coatings, splash zone coatings, and high abrasion steel and concrete surfaces.

This discussion highlights just a few of the technologies commercially available, and does not imply that other manufacturers do not have compliant IM coatings. The discussion should also not be considered an endorsement by the AQMD for the specific coatings.

A comprehensive list of coatings compliant with the proposed 250 g/l and 100 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

Issues

In previous workshops and meetings, coating manufacturers and painting contractors have testified that the new coatings are not as durable as the older coatings, and are sub-par in performance when compared to the higher VOC formulations. Another common complaint is the need to thin the coating prior to application. Lastly, they have raised concerns about the need for training for contractors in using two-component coatings.

However, performance testing conducted by specialty groups on a variety of IM coatings indicates equal or superior performance for these solventless or low-VOC coating systems. Over the past five years, these studies have been done by the Federal Highway Administration (FHwA), raw material (resin) manufacturers, coating manufacturers, and various private groups.

During the Architectural Coatings Technology Conference, held at the District on April 28, 1998, several IM coating technologies compliant with the proposed limits were highlighted that clearly showed superior performance at equal or lower cost when compared with high solvent formulations.

Lastly, the District has contracted National Technical Systems to evaluate 20 IM coating systems, ranging in VOC content from 0-420 g/l. These systems also range in their resin systems, including self-priming urethane systems, inorganic zinc/epoxy/urethane systems, high-performance alkyd systems, and acrylic systems. The preliminary laboratory results, including prohesion chamber weatheribility studies have shown equal, and in some cases, superior performance from the zero-VOC systems than the high-VOC systems. Results of the accelerated outdoor weathering studies will be available later this year and the actual exposures will be monitored for the next several years. The summary of the NTS study is included as Appendix G of this report.

Staff has also researched the need to thin IM coatings under the current proposal. Manufacturers of the zero- and low-VOC systems claim that polyurethane and epoxy-based coatings should not be thinned, but contractors will thin by habit. These coatings are developed for optimum application viscosity, either by brush, roller, or spray. Furthermore, majority of these coating systems that would comply with the proposed limits are waterborne, and therefore can be only thinned with water, if needed.

During past workshops, a large manufacturer of IM coatings went on record by saying that thinning is not a major problem in California due to the relatively mild weather. Thinning is more of an issue in cold weather.

High Temperature - Industrial Maintenance Coatings

Table 6

High Temperature - Industrial Maintenance Coatings Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	10.3
Estimated 1996 Waterborne Sales (gallons/year)	78.8
Estimated VOC Emissions (tons/day)	0.04
Current VOC Limit (grams/liter)	No Limit
Proposed VOC Limit (grams/liter) – 7/1/2002	550
Proposed VOC Limit (grams/liter) - 7/1/2006	420
Estimated Emission Reduction (tons/day)	0

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

IM - high temperature coatings are used to protect substrates, typically metals, that are exposed continuously or intermittently to temperatures above 400 degrees Fahrenheit. Typical uses include coatings for furnaces, stacks, power plants, refineries, and mufflers, as well as other substrates exposed to high temperatures. These coatings are formulated with a variety of resins such as aluminum rich, inorganic zinc rich, silicone, and epoxy-based formulations. Both solvent-borne and water-borne, polysiloxane based high-temperature coatings are also commercially available.

Recommendation

Establish High Temperature - IM Coatings VOC limits of 550 g/l, July 1, 2002, and then lower the limit to 420 g/l effective July 1, 2006.

Basis for Recommendation

ARB-CAPCOA Suggested Control Measure (SCM), May 1989

Effective 9/1/89, the high temperature - IM coatings VOC limit was actually increased to 650 g/l from 420 g/l due to the lack of available compliant coatings, with the proposed VOC limit dropping to 550 g/l effective 9/1/92, which allowed three years for product development and performance testing. The limit was further reduced to 420 g/l effective 9/1/94.

AQMD Amendments to Rule 1113, February 1990

The amendments set the VOC limit of IM - high temperature coatings at 650 g/l effective 12/1/90, and reduced the VOC limit to 550 g/l effective 12/1/93. The basis for these recommendations were from the ARB-CAPCOA SCM.

Other California Air Districts' Architectural Coatings Rules

Santa Barbara County APCD, BAAQMD, San Joaquin Valley APCD, Sacramento AQMD, and Ventura County APCD all have a VOC limit for IM - high temperature coatings of 420 g/l, which is the same as the as the proposed VOC limit.

1998 Draft CARB Survey Data

A total of 19 manufacturers reported 204 different formulations for High Temperature - IM coatings. Total quantity sold in the State of California during 1996 was estimated at 23,014 gallons, with less than 1% in water-borne formulations. The reported SWA VOC content was 367 g/l, which is well below the proposed 550 g/l and 420 g/l VOC limits. A more detailed analysis of the survey data shows that 181 of the 204 products (89%) included in the survey were below the 550 g/l level, and 81% below the 420 g/l.

1992 Architectural Coating Committee Findings

Eight manufacturers of compliant (550 g/l) High Temperature - IM coatings were found by the committee. The VOC limits of the compliant coatings ranged from a low of 0 g/l to a high of 550 g/l. These coatings have been commercially available in the State of California for over seven years; therefore, the standard is technologically feasible.

1995 FIP

The FIP established a VOC limit of 550 g/l effective 5/15/97, and a VOC limit of 420 g/l effective 1/1/2000. These limits were based on the 1989 SCM and adopted district rules. USEPA, Region IX indicated that compliant coatings are currently available that meet the 420 g/l VOC limit.

AQMD Findings

The District recognizes that High Temperature - IM coatings have limited commercial use and increase in use would be cost-prohibitive. The proposed VOC limit of 550 g/l is a direct result of discussions with manufacturers of coatings and resins. Majority of the silicone and metal-based coatings currently meet the proposed VOC limit. In addition, several resin manufacturers indicate that water-borne resin technology is available, with equivalent performance to their solvent-borne counterparts. Of the 29 compliant coatings found by staff, only three currently use waterborne technology. These 26 coatings had a VOC content ranging from a low of 0 g/l to a high of 549 g/l.

The most promising IM - high temperature technology is the siloxane formulation, patented by Ameron Coatings. This coating has heat resistance to 2000°F, is self-priming, anti-corrosive, cures at room temperature, and has a significantly lower applied cost due to the single coat application. Performance is

superior in almost all criteria as compared to a typical industrial maintenance coating. Lastly, the VOC content is only 84 g/l, as supplied by the manufacturer. Other zero-VOC coatings are also manufactured by Valspar, Ameron, and are currently available.

A comprehensive list of coatings compliant with the proposed 550 g/l and 420 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

The proposed VOC limits result in an emission reduction of 2.7 tons per year, which equates to 0.007 tons per day. Therefore, emission reduction is indicated as 0 tons per day.

Issues

There are no major issues with the proposed VOC limit. Most manufacturers of coatings and resins, as well as end-users, support the proposed limits and compliance dates.

Nonflat Coatings

Table 7

Nonflat Coatings Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	489.5
Estimated 1996 Waterborne Sales (1,000 gallons/year)	9,525.2
Estimated VOC Emissions (tons/day)	8.8
Current VOC Limit (grams/liter)	250
Proposed VOC Limit (grams/liter) – 7/1/2002	150
Proposed VOC Limit (grams/liter) - 7/1/2006	50
Estimated Emission Reduction (tons/day) – 7/1/2002	2.16
Estimated Emission Reduction (tons/day) – 7/1/2006	5.25

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

Nonflat coatings are interior and exterior coatings that have a gloss of greater than or equal to 15 on an 85 degree meter and greater than or equal to 5 on a 60 degree meter. Nonflat coatings represent the second largest category of architectural coatings and make up approximately 15% to 20% of total coatings used for

residential development. This category is usually divided into three distinct subcategories called low-gloss (also known as satin or eggshell), medium-gloss (semi-gloss), and high-gloss. Nonflat coatings are most commonly used for interior and exterior wood trim, bathroom, kitchens, and other high traffic areas where repeated cleaning is necessary. However, some consumers also use the low-gloss nonflats for interior walls (drywall). Approximately 43% of all nonflats sold are for interior use only, 16% for exterior use only, and 41% for both interior or exterior use.

Over the last decade, there has been a significant increase in usage of waterborne acrylic latexes in enamels, mainly attributed to the development of innovative binders and associative thickeners introduced in the early 1980s. However, some users, typically professional painting contractors, still prefer the solvent-based alkyd enamels due to their superior block and print resistance and general application characteristics. In comparison, the acrylic enamels offer superior ease of use, exterior durability, and low odor.

However, over the past five years, several resin manufacturers have introduced newer emulsions to achieve key enamel characteristics without the use of any solvents. These include styrene-acrylic emulsions developed by Eastman Chemical Company and oxidatively crosslinking latexes developed by Rohm and Haas (Emulsion E3131, SF091, and Hydro 30). Rohm and Haas indicates that the E3131 emulsion is completely solvent-free, 100% acrylic, non-yellowing resin, and is currently recommended for interior use only. Rohm and Haas representatives indicated excellent stain resistance and washability characteristics, and indicated that coatings utilizing this chemistry could reduce the overall recoating cycle. They did indicate that they have some freeze thaw concerns, and the resin is approximately 20% higher in cost than currently available technology. They also indicated that additives containing formaldehyde and other aldehydes could cause discoloration. Their HG95 system is currently available at 250 g/l, high-gloss formulations. However, they indicated that formulations can be adjusted down to approximately 150 g/l with some loss in open time. Their SF091 is also a solvent-free vinyl acrylic resin, can be freeze thaw stable with addition of surfactants, and has excellent scrubbability.

BASF introduced a multiphase acrylic latex vehicle called the Acronal LR8958. This resin technology can be used to formulate zero-VOC coatings at varying gloss levels, both for interior and exterior uses. This technology provides excellent block resistance at all gloss levels, provides wet adhesion to aged alkyd, and shows good UV resistance. However, it does show slightly more dirt pick-up than conventional semi-gloss paints. Freeze thaw issues can be overcome using a

surfactant. Another resin system for exterior, semi-gloss architectural coatings is BASF's Acronal Optive™ S100, a 100% acrylic formulation with a starting VOC of 114 g/l. The technical data sheet indicates excellent block resistance, outstanding exterior performance, and excellent adhesion to aged gloss alkyd.

Another zero-VOC technology is a 100% solids reactive resin technology developed by CONLUX Corporation in the early 1990s. This technology is now offered by PPA Technologies. A presentation regarding use of this technology to formulate zero-VOC interior and exterior paints was made at the Architectural Coatings Technology Conference in April 1998. The presenter emphasized the performance of the formulations, ranging from low-gloss to high-gloss. The presenter also emphasized that the recommended formulations are at equivalent cost, as compared with solvent-containing formulations.

Air Products & Chemicals has also introduced a line of interior, zero-VOC, vinyl acetate based resin system marketed as AIRFLEX® 809, claiming higher scrubbability and performance than traditional solvent-containing latex paints. They currently offer low-gloss and semi-gloss formulations.

Over 10 years ago, Vianova Resins of Europe developed RESYDROL® 586, an alkyd oil encapsulated by an acrylic shell, which is now available in the United States. As indicated in the 1998, Volume 1, Issue 2 of "Vianova News", this technology is "a very small, surfactant free, core shell hybrid emulsion. This polymer has made it possible to produce paints with conventional alkyd performance that is infinitely stable in water." Formulations are available for high-gloss interior and exterior enamels that can be developed for VOC contents ranging from 0 to 150 g/l. Application characteristics such as open time, flow, washability, gloss retention, hardness, and lapping are equivalent to solvent-containing alkyd enamels. Yellowing is somewhat controlled by increasing the acrylic content of the hybrid polymer. However, interior nonflat products still suffer from yellowing problems, as is the case with some alkyd-based enamels. However, Vianova staff indicate that exterior use does not result in yellowing, and is considered to be a very good performing product. High gloss nonflats can be formulated at 150 g/l, without sacrificing any performance.

Quick-dry enamels are a subcategory of non-flats, and have historically used alkyd-based resin technology, which is a reaction product of a polybasic acid, a polyhydric alcohol, and a monobasic fatty acid or vegetable oil (triglyceride). This solvent-based technology exhibits versatility in formulating performance properties with economy, and has a wide range of compatibility with other film formers. Gloss and dry time characteristics are realized through compositional

variation. This category is discussed in greater detail in subsequent sections of this report.

Recommendation

Lower nonflat coatings VOC limits from the current 250 g/l level to 150 g/l effective July 1, 2002, and from 150 g/l to 50 g/l effective July 1, 2006.

Basis for Recommendation

1998 Draft CARB Survey Data

A total of 10,014,637 gallons of nonflat coatings were used in the SCAB in 1996, with approximately 5% of the total usage comprised of solvent-based formulations. The SWA VOC content of the waterborne low-gloss, medium-gloss, and high-gloss nonflats was 133 g/l, 151 g/l, and 209 g/l, respectively. For solvent-based low-gloss, medium-gloss, and high-gloss nonflat coatings, the SWA was 341 g/l, 281 g/l, and 366 g/l, respectively. The current limit for nonflat coatings is 250 g/l, therefore, emission reduction estimates have been calculated using 250 g/l as the maximum VOC for nonflats.

Detailed analysis of reported nonflat coating sales indicates a total of 3,744 different products, with over 35% complying with the proposed rule limit to be implemented on July 1, 2002, and almost 3% complying with the proposed rule limit to be implemented on July 1, 2006. Based on total volume sold in 1996, 56% complied with the proposed limit for July 1, 2002.

Overview

This category represents the second largest volume of sales within the AIM coatings. As indicated earlier, nonflats are utilized on a variety of substrates and represent 15% to 20% of total coating usage for residential development.

Staff conducted extensive surveys of smaller, local manufacturers and large, international manufacturers of nonflat coatings regarding availability of low-VOC nonflat coatings. Staff found numerous nonflat coatings, recommended for use for interior only, exterior only, and interior/exterior, that comply with the proposed limit, with numerous manufacturers offering zero-VOC coatings. Table 8 summarizes the current manufacturers of zero-VOC nonflat, interior and exterior coatings.

The first generation of zero-VOC paint was introduced by The Glidden Company in 1992, as the Spred 2000 series, however, they experienced some problems. However in 1996, The Glidden Company introduced a complete line of zero-VOC coatings, including interior and exterior nonflats, under a second generation Lifemaster 2000 and Decashield lines. The Glidden Company, now known in the United States as ICI/Dulux Paints, has also successfully formulated a zero-VOC color base system, known as the Enhance 2000 system, that allows tinting to any color. Sales of the zero-VOC nonflat coatings have steadily increased.

In 1994, Benjamin Moore Paints introduced their zero-VOC paint line, known as Pristine paints. The Pristine line is also based on 100% acrylic resin technology, and is completely solvent-free. Although currently available for only interior uses, the Pristine line has experienced an increase in commercial acceptance and is primarily marketed to areas with indoor air quality issues and/or sensitive individuals, including hospitals, nursing homes, clinics, apartment buildings, hotels, motels, offices, and schools.

Frazee Paints also introduced a zero-VOC coating line of interior paints, marketed as the Envirokote line. This product is also based on an acrylic resin system, which outperforms traditional latex systems. Some of the key features noted by the manufacturer include excellent coverage and hiding, washability, non-yellowing, quick-drying, and excellent touch-up abilities. Staff was unable to obtain any sales data for the Envirokote line, which is primarily marketed to areas where chemical sensitivity and odor may be important considerations.

Sherwin Williams Healthspec Low Odor Interior coatings were developed and marketed over the past two years. This line of zero-VOC coatings include interior flats, eggshell, and semi-gloss coatings. Product Data Sheets for this line of coatings indicate equivalent durability to other solvent-containing coatings for similar uses. These coatings are based on a vinyl/acrylic resin technology and have scrub cycles, pursuant to ASTM D2486.89, of 1,300 for the flat, 1,600 for the eggshell, and 2,000 for the semi-gloss formulations. Application methods recommended include brushing, rolling, and spraying. In addition, Sherwin Williams markets an exterior line of flat, satin, and gloss 100% acrylic paints (A-100 Line) that have a VOC content of 58 g/l, 38 g/l, and 49 g/l, respectively. The 1998 - 1999 Sherwin Williams Painting and Coating Systems Booklet, designed for Specifiers and Applicators, indicates "A-100 Exterior Latex Flat, Satin, and Gloss are our best quality, 100% acrylic latex house paints." Sherwin Williams also has the LowTemp 35 Exterior Satin House Paint (B17) that has a VOC of 40 g/l, and can be applied at temperatures down to 35 degrees F. Furthermore, another interior product line, the ProClassic Waterborne Acrylic Semi-Gloss and

Gloss Series, are marketed to professional painting contractors. The handbook indicates that these are "durable, non-yellowing finishes that are equal to alkyd enamels for flow and leveling characteristics," with dry times that meet the quick-dry definition. These coatings have a VOC Content of 70 g/l for the semi-gloss, and 75 g/l for the high-gloss formulations. Sherwin Williams' ProMar 200 Interior Latex Gloss Enamel has a VOC of 90 g/l, meets the quick-dry definition for dry times, and is marketed as "Our professional best line." Lastly, their SuperPaint Exterior High Gloss Latex Enamel (A85) has a VOC of only 57 g/l, meets the current definition of a quick-dry enamel, and is marketed as having "superior performance in block resistance, moisture resistance, gloss retention, and flow and leveling." Their EverClean Interior Satin (A97) and Semi-Gloss (A98) has a VOC content of 81 g/l and 70 g/l, respectively. The techincal data sheet indicates that these coatings are "specially formulated stain resistant paints providing the washability and durability usually found in glossy enamel finishes. They allow most household stains to be removed without the need for scrubbing." The VOC content information provided above is for white paints only.

NonToxiCA, a small coatings company located in Florida, also offers a complete line of interior and exterior zero-VOC nonflat coatings. The manufacturer claims that their nonflat paints have extremely low odor, high hiding, outstanding touch-up properties, very good adhesion, and has excellent scrub resistance. NonToxiCA's exterior nonflat also has extremely low-odor, excellent resistance excellent resistance to mildew and organic growth, very good adhesion and long term durability, very good color retention, high hiding power, and very good resistance to blistering, cracking, chipping, and peeling. It is recommended for use on all types of substrates, including metals.

Devoe's Wonder-Pure™ interior nonflats have also received commercial acceptance by a variety of users, including the State of Washington. Their head painter, as detailed in the September 1998 issue of "The Paint Dealer", was impressed with the hide, adhesion, dry time, and general workability.

Other manufacturers that have successfully introduced zero-VOC nonflat coatings include Dunn Edwards Paints, Griggs Paint & Silkscreen, Smiland Paints, Spectra-Tone Paint, GalXE-2010, Sampson Paints, Rodda Paints, Bruening Paints, and Selectone Paints.

Currently, five of these manufacturers offer zero-VOC, nonflat coatings for exterior use. Staff also conducted several site visits to locations where zero-VOC flat, eggshell (low-gloss) and semi-gloss coatings were used as interior finishes. One of the major sites was The Gas Company's Energy Resource Center, a

45,000 square foot building, designed to showcase energy-efficient and environmentally sensitive technologies. This facility utilized over 2,000 gallons of the Lifemaster 2000 zero-VOC coating line. Other users include a large amusement park, several aerospace companies, hospitals, movie and television studios, and other specialty uses. David Hertz, a prominent architect of green buildings and a professor at UCLA, developed a 8,000 square foot residence in Bel Air that utilized zero-VOC coatings for all interior painted surfaces. A junior college in San Bernardino County used 30 gallons of Benjamin Moore's Pristine zero-VOC coatings during a weekday. The painting operation, primarily due to its minimal odor, was conducted while students walked around the building and workers were in their offices. Lastly, Park Water District, located in Downey, California, has painted all their interior office areas with the ICI/Dulux's Lifemaster line of zero-VOC coatings. On all exterior surfaces, they have used zero-VOC IM coatings discussed earlier in this report.

In addition to site visits, staff surveyed painting contractors who have used the zero-VOC coatings. The contractors generally felt that the zero-VOC coatings were comparable to conventional interior coatings in leveling, hiding, flow, and spattering characteristics. One of the contractors indicated a slightly longer dry time than conventional latex interior paints, but also emphasized that he would reuse the zero-VOC product due to the benefits of low-odor and short

Table 8

Current Manufacturers of Zero-VOC Architectural Coatings

Manufacturer	Type of Coatings					Interior	Exterior
	Flat	Non-Flat, Satin	Non-Flat, Eggshell	Non-Flat, Semi-Gloss	Primer, Sealer, Undercoate		
American Formulators Manufacturers	X		X	X		YES	
Benjamin Moore & Co.	X	X	X	X	X	YES	
Bruening Paints	X	X	X			YES	
Devoe Paint	X		X	X	X	YES	
Dunn Edwards	X		X	X	X	YES	
Frazee Industries	X	X	X	X	X	YES	
Galaxy-2010	X	X	X			YES	YES
Griggs Paint & Silkscreen	X	X	X	X	X	YES	YES
ICI Paints	X	X	X	X*	X	YES	YES
Miller Paint	X	X	X		X	YES	
NonToxiCA	X	X				YES	YES
Richards Paints	X	X	X			YES	
Rodda Paints	X	X	X		X	YES	
Sampson Coatings	X	X	X	X	X	YES	YES
Sherwin Williams	X		X	X	X	YES	
Spectra-Tone Paint	X		X	X		YES	

* - Not Available for Exterior Use

** Company claims they are not manufacturers any more, but still available at retail outlets.

reoccupancy times of painted areas. Another common issue regarding the zero-VOC nonflats coatings was the inferior wet edge, as compared to current, solvent-containing formulations. All of the contractors surveyed indicated a learning curve of one to three hours to successfully use the zero-VOC products, due to their different characteristics as compared to current latex technology. One of the contractors indicated that the zero-VOC coating had even better coverage than the VOC-containing latex paints. He indicated that better coverage and overall reduced labor costs (having to send workers home, paying painters premium pay for alternate work hours, and no additional ventilation requirements) offset the increased initial cost of the coatings.

A comprehensive list of coatings compliant with the proposed 150 g/l and 50 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

Issues

The primary issues with lower-VOC, nonflat coatings is the rheology, dry times, and durability. As indicated earlier in this report, manufacturers' comparative testing indicates equivalent or superior performance for the low-VOC and zero-VOC flat coatings for all coating characteristics. Furthermore, some manufacturers claim that their low- and zero-VOC coatings perform even better than high solvent coatings. The acrylic resin-based interior paints formed a much harder dry film, dried faster at even lower temperatures, and were equivalent in color- and gloss-retention properties. Scrub tests indicated washability characteristics superior to the conventional latex interior coatings. However, some of the zero-VOC nonflat coatings may have freeze thaw problems, which can generally be overcome with use of surfactants, without sacrificing any other characteristics.

In addition, staff has reviewed several marketing studies regarding painting behavior, which clearly indicate that repainting of interiors is usually done for decorating purposes, mainly color change in single family homes, and compliance with the law for multi-family dwellings under the different subsidized housing programs, such as the Section 8 program implemented by the City of Los Angeles. According to the Apartment Association of Greater Los Angeles, average turnover rate for apartments in the Los Angeles area is approximately one year. Apartments are typically repainted after each period of vacancy.

As stated earlier, Staff has contracted National Technical Systems to assess the durability and application characteristics of various AIM coatings, including 18 zero-VOC, low-VOC, and high-VOC nonflat, interior and exterior coatings. The results show that while not all, most higher VOC nonflats perform better than the tested zero-VOC products for application characteristics, but the zero-VOC surface film properties are comparable to the higher-VOC coatings. Some zero- and low-VOC nonflats actually had superior coverage than high-VOC quick-dry enamels. The summary of the NTS study is included as Appendix G of this report.

Nonetheless, Staff has added a provision in the rule to conduct a technology review of available nonflat coatings to assess the feasibility of the July 1, 2002, and July 1, 2006 limits. The study is to be completed by July 1, 2001, and July 1, 2005, respectively.

Staff has added an averaging provision into the rule to provide an optional method of compliance for manufacturers of nonflat coatings. This provision will allow

manufacturers to average, on a sales weighted basis, the VOC contents of their nonflat coatings, and allow them to manufacture and distribute coatings that have a VOC content higher than the proposed standards. Market-based approaches have been requested by industry as an option to compliance with the standards. An extensive discussion of the averaging concept, as well as its benefits, is included later in this report.

In addition, the District has other programs that could provide for flexibility including the Mobile Source Emission Reduction Credit Program under Regulation XVI. The District is further considering other proposals to provide additional flexibility for complying with VOC emission requirements. These proposals include the Air Quality Investment Program, Inter-Credit Trading Program, and the possible development of a Seasonality Approach.

Quick-Dry Enamel Coatings

Table 9

Quick-Dry Enamel Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	406.6
Estimated 1996 Waterborne Sales (gallons/year)	30
Estimated VOC Emissions (tons/day)	1.86
Current VOC Limit (grams/liter)	400
Proposed VOC Limit (grams/liter) – 7/1/2002	250
Proposed VOC Limit (grams/liter) - 7/1/2006	50
Estimated Emission Reduction (tons/day) – 7/1/2002	1.08
Estimated Emission Reduction (tons/day) - 7/1/2006	0.66

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

Quick-dry enamel is a non-flat coating category typically used where the substrate to be coated needs to dry quickly to minimize dust contamination, such as new home construction, or be returned to service quickly, such as a restaurant. The coated substrate should dry, as measured by ASTM 1640, to touch within two hours, should be tack free within four hours, and dry hard within eight hours for the coating to be listed as quick-dry. In typical residential application, quick-dry enamels are used for interior and exterior wood trim around windows, door jambs, doors, and possibly kitchen cabinetry. For older homes with wood siding, the

quick-dry enamels may be used for the entire exterior surface. This category does not include enamels used in industrial environments.

Quick-dry enamels have historically used alkyd-based resin technology, which is a reaction product of a polybasic acid, a polyhydric alcohol, and a monobasic fatty acid or vegetable oil (triglyceride). This solvent-based technology exhibits versatility in formulating performance properties with economy, and has a wide range of compatibility with other film formers. Gloss and dry time characteristics are realized through compositional variation.

Over the past five years, several coating manufacturers have developed and marketed acrylic formulations that achieve the high gloss and dry times requirements to be classified a quick-dry enamel. Several of these products are zero-VOC formulations and were discussed in the nonflat section of this report.

Recommendation

Lower quick-dry enamel coatings VOC limits from the current 400 g/l level to 250 g/l effective July 1, 2002, and then lower the VOC limit from 250 g/l to 50 g/l, effective July 1, 2006.

Basis for Recommendation

AQMD Findings

District staff has found numerous acrylic and alkyd emulsions that meet the gloss and the dry times requirements of a quick-dry enamel. All of these are waterborne coatings that are currently available, with VOC contents ranging from zero to 250 g/l.

Another reason for reducing the VOC limit for this category is the potential for manufacturers and users to use the quick-dry enamels category to market and use other non-flat coatings that do not necessarily meet all of the requirements. For example, ASTM 1640 is very subjective in actually measuring dry times, and could result in liberal interpretation of the actual dry times. A study conducted by Harlan and Associates for the CARB analyzed a large number of coatings listed as quick-dry enamels and quick-dry primers, sealers, and undercoaters, and concluded that most of the coatings labeled as 'quick-dry' did not meet the definitional requirements and thus should not be classified as such. In contrast, the study concluded that some of the waterborne technology included in the

testing actually met the requirements of a quick-dry coating, but were not necessarily listed as a quick-dry coating.

Issues

There are several, major issues regarding the quick-dry enamel category. The most common manufacturer's and contractor's complaint is the yellowing problem associated with low-VOC, solvent-borne, alkyd enamel formulations.

As indicated earlier, one of the ingredients in an alkyd-based resin is a fatty acid, typically a vegetable oil. The higher VOC, alkyd enamels typically contain a resin made with a short-chain oil, which does not experience yellowing to the degree experienced by low-VOC, alkyd enamel formulations that must use long-chain fatty acids to reduce viscosity with less solvent. Yellowing of the coating occurs in the absence of light, and chemists do not understand the mechanism of the yellowing of longer-chain oils, but hypothesize about the increase in uptake of oxygen and the subsequent decomposition of the peroxides that occurs in the polyunsaturated long oils, primarily due to the increase in cross linking. Conversations with manufacturers and contractors indicate that alkyd-based enamels have always had problems with yellowing, but the lower VOC formulations tend to yellow in a much shorter period of time.

In contrast, water-borne quick-dry enamels do not have yellowing problems.

Another major issue is the longer dry times of the lower-VOC solvent-borne formulations and the water-borne formulations, especially in cold, humid weather conditions.

Research and performance testing has shown that waterborne formulations actually dry faster than typical solvent-borne formulations in average conditions. Since waterborne coatings coalesce as they dry, the resulting film actually leaves very tiny holes that allow the coating to dry much faster. In contrast, the solvent-borne coatings actually cross-link as they dry, creating a tight film that dries fast on the outer end, but causes the inside of the film to stay wet longer. This results in problems such as blistering or fish eyes.

Although water-borne formulations dry faster than solvent-borne formulations in temperate climate, this is not the case in a cool, humid environment, such as the coastal and mountainous communities within the South Coast Air Basin. However, recent advancements in resin technology have resulted in styrene/acrylic based, water-borne formulations that exhibit alkyd-like properties

for gloss, clarity, blocking, hardness and durability, but does not chalk, yellow, or lose gloss like the typical alkyd-based formulations. Union Carbide offers modified acrylic resins that will allow the coating to dry fast, even in cooler, humid environments.

The NTS study compared the dry times of zero-VOC nonflats, low-VOC, and traditional quick-dry enamels, and concluded that the zero-VOC nonflats had the quicker dry times, even under higher humidity conditions. A summary of the NTS results are included as Appendix G of this report.

Other issues associated with low-VOC quick-dry enamels include blocking and durability. Blocking becomes an issue when doors and windows are coated, and need to be closed within a short period of time. The contractors claim the longer dry times and cure times associated with low-VOC solvent-borne and water-borne formulations cause the windows or doors to stick to the door jambs or window panes, which causes the coating to tear when the parts are separated. This problem has been significantly reduced with addition of coating enhancing additives and linseed-oil derived, low-molecular weight copolymers that are used as reactive diluents. BASF has introduced virtually solvent-free high gloss resins that do not have any blocking problems.

Engineered Polymer Solutions, Inc. (EPS), a supplier of emulsions and alkyds to the coatings industry, has introduced a water dispersible 250 g/l alkyd (EPS 2601) that has shown some performance characteristics similar to the traditional medium oil alkyds. This resin system has shown lesser degree of yellowing than a long, long oil alkyd coating. Coverage is similar to conventional 400 g/l quick-dry enamels, and can be formulated for interior and exterior uses.

Eastern Michigan University, Coatings Resources Center, has also developed an alkyd emulsion that can be formulated at a variety of VOC levels.

Extensive performance testing has been conducted over the past five years, mainly testing the durability of water-borne coatings using ASTM D-822, Part 27, which calls for a test panel to be subjected to extreme heat, light, and moisture treatment. This test is commonly referred as the accelerated aging test. Another test of durability is the fence exposure test that is conducted to monitor coating integrity over a long period of time. Both types of tests have shown the refined 100 % acrylic waterborne products, typically with additives and modified polymers, to be far superior to alkyds in durability, color retention, and gloss retention. This result is of no surprise since acrylic coatings form a harder film, after fully curing,

than typical alkyd-based, quick-dry enamels. Most of all, the performance tests show the water-borne formulations for the quick-dry enamels do not yellow.

Other issues for water-borne quick-dry enamels include a 'ropey,' uneven appearance of the film, which is not acceptable to professional contractors. The NTS study did conclude that some, not all, zero-VOC nonflats coatings had bristle marks, when compared to their higher-VOC counterparts. However, this problem can be significantly reduced through proper surface preparation. Furthermore, with commercially available flow and leveling agents added to their formulations, manufacturers have almost completely eliminated the leveling problems found in the first generation water-borne quick dry enamels.

Table 3 on Page 29 of this report summarizes the typical performance advantages and disadvantages of acrylic- and alkyd-based coatings, indicating the trade-off in choosing one over the other.

Primer, Sealer, Undercoater Coatings

Table 10

Primer, Sealer, Undercoater Coatings Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	676.4
Estimated 1996 Waterborne Sales (1,000 gallons/year)	2,000.5
Estimated VOC Emissions (tons/day)	3.60
Current VOC Limit (grams/liter)	350
Proposed VOC Limit (grams/liter) – 7/1/2002	200
Proposed VOC Limit (grams/liter) - 7/1/2006	100
Estimated Emission Reduction (tons/day) – 7/1/2002	1.48
Estimated Emission Reduction (tons/day) - 7/1/2006	0.73

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

The primer, sealer, and undercoater category is a generic term used to describe coatings, typically the initial coat, used to provide a smooth surface for subsequent coats or to provide a shield between the substrate and the subsequent coat or to provide adhesion for the topcoat. This category utilizes the gamut of available coating technologies in its formulations; alkyds, modified alkyds, oleoresin, epoxies, specialty resins, and emulsions are just a few of the formulations used.

Traditionally, there have been specific coatings for a variety of uses, including priming, sealing, stain-blocking, and hiding. Furthermore, specific coatings were formulated for different substrates, including wallboard, plaster, concrete, masonry block, pipe insulation, and painted glossy and non-glossy surfaces. However, the recent trend has been to develop multi-functional primers that can be used for a variety of uses on multiple substrates.

Recommendation

Lower primers, sealers, and undercoaters coatings VOC limits from the current 350 g/l level to 200 g/l effective July 1, 2002, and further reduce the VOC limits to 100 g/l, effective July 1, 2006.

Basis for Recommendation

AQMD Findings

The 1998 Draft CARB survey data, the NPCA Survey, and AQMD staff survey all indicate that compliant, primers, sealers, and undercoaters category coatings are commercially available and are being used by consumers and professional contractors at all levels. The 1998 Draft CARB survey data shows that almost 75% of the volume of primers, sealers, and undercoaters are waterborne, with a SWA VOC of 106 g/l. A more detailed analysis of the data indicates that of the 747 products, over 67% comply with the proposed 200 g/l, and 32% comply with the proposed 100 g/l limit. However, based on the total volume sold in 1996, 74% of the total sales were for products with VOC contents of less than 200 g/l, and over 42% were for products with VOC contents of less than 100 g/l. The survey data results also show that 41% of these products are recommended for interior use only, 31% for exterior use only, and 28% for both interior/exterior uses.

Table 7 provides a list of manufacturers of zero-VOC coatings, including interior and exterior primers. In addition, there are several other manufacturers that have developed and marketed primers that would comply with the proposed limits.

The Sherwin Williams Company, in their 1998-1999 Painting & Coating Systems catalog for Specifiers and Applicators, includes numerous primers, sealers, and undercoaters that comply with both proposed limits. A few of these are discussed in detail. Their Loxon Exterior Acrylic Masonry Primer (A24 Series) is recommended for masonry, cement, and stucco, and has a VOC of only 60 g/l.

The product data sheet indicates that this primer passes moisture resistance, wind-driven rain test, moisture vapor permeability, flexibility, tensile strength, alkali resistance, and mildew resistance tests. Sherwin Williams' PrepRite 200 and 400 Interior Latex Primer are considered their professional best line, and good quality, professional line, respectively. The PrepRite 200 has a VOC content of 26 g/l, and the PrepRite 400 has only 19 g/l, both well below the July 1, 2006 proposed limit of 100 g/l. The product data sheet indicates that these products prime and seal, have excellent holdout, and accepts latex, alkyd, and waterborne epoxy topcoats. Their PrepRite Classic Interior Latex Primer is indicated as "our finest quality primer and sealer, designed for use on interior wood, drywall and masonry/concrete surfaces, providing excellent enamel hold out for any recommended topcoat and excellent sanding characterisitics." It is recommended as a high quality wall primer or enamel undercoater. Most of all, it has a VOC content of only 40 g/l. Lastly, their PrepRite ProBlock Latex Primer/Sealer has a VOC content of 40 g/l, is recommended for both interior and exterior uses, has excellent adhesion to hard, slick, or glossy surfaces, and can be topcoated with a latex or alkyd topcoat. Their catalog includes several, additional primers for both interior and exterior uses. The VOC content information provided above is for white paints only.

Morton International has the Morkote™ 1300 Acrylic Emulsion that can be formulated as a clean tannin block wood sealer that can be topcoated. The recommended formulation has a VOC content of only 8.62 g/l. The indicated dry times meet the requirements of a quick-dry primer, sealer, and undercoater.

In addition, Insl-X, Zinsser, and Zehrung have developed and marketed zero- and low-VOC primers, sealers, and undercoaters recommended for a variety of uses.

A comprehensive list of coatings compliant with the proposed 200 g/l and 100 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

The Phase II Assessment study evaluated the performance characteristics of 18 different primers, sealers, and undercoaters for a variety of characteristics, including dry times, hiding, adhesion (to virgin and previously topcoated wood), and stain blocking. The NTS study results show that the zero- and low-VOC primers actually dry faster than the quick-dry primers, sealers, and undercoaters. However, the study did identify that the higher-VOC primers, sealers, and undercoaters have better leveling, sagging, and brushing properties than the zero-VOC products. However, the results indicated that overall coverage for the three VOC levels was comparable, and in some cases, superior for the zero-VOC

coatings. The results also show that the zero- and low-VOC primers, sealers, and undercoaters had better dry adhesion, as compared to high-VOC, solvent-based primers, sealers, and undercoaters.

Issues

The major issue regarding the low-VOC primer, sealer, undercoater category is the longer dry time in certain conditions, as well as concerns regarding adhesion, mildew resistance, and stain blocking. As indicated earlier, product data sheets of manufacturers of zero- and low-VOC primers, sealers, and topcoats indicate that these products have similar performance to traditional alkyd-based coatings. For example, Zehrung Corporation's Z-Prime II is a zero-VOC interior and exterior use primer that primes, seals, and stain-blocks on a variety of surfaces. The dry-to-touch and recoat times meet the requirements of a quick-dry primer, sealer, and undercoater. The product data sheet indicates that "adhesion to glossy surfaces like enamels, varnish, polyurethane or lacquer, dense chipboard or metal and plastic pipe, galvanized ductwork or plastic laminate are no problem for tough-adhering Z-Prime II."

The NTS Study has identified zero-VOC primers that are quicker in dry times, and have better adhesion than some of the high-VOC primers, sealers, and undercoaters. A summary of the results of the NTS Study are included in Appendix G of this report.

Nonetheless, Staff has added a provision in the rule to conduct a technology review of available primers, sealers, and undercoaters to assess the feasibility of the July 1, 2002, and July 1, 2006, limits. The study is to be completed by July 1, 2001, and July 1, 2005, respectively.

Staff has added an averaging provision into the rule to provide an optional method of compliance for manufacturers of primers, sealers, and undercoaters. This provision will allow manufacturers to average, on a sales weighted basis, the VOC contents of their primers, sealers, and undercoaters, and allow them to manufacture and distribute coatings that have a VOC content higher than the proposed standards. Market-based approaches have been requested by industry as an option to compliance with the standards. An extensive discussion of the averaging concept, as well as its benefits, is included later in this report.

Quick-Dry Primer, Sealer, Undercoater Coatings

Table 11

Quick-Dry Primer, Sealer, and Undercoater Statistics	
Estimated 1996 Solvent-based Sales (1,000 gallons/year)	484.3
Estimated 1996 Waterborne Sales (1,000 gallons/year)	376.5
Estimated VOC Emissions (tons/day)	2.68
Current VOC Limit (grams/liter)	350
Proposed VOC Limit (grams/liter) – 7/1/2002	200
Proposed VOC Limit (grams/liter) - 7/1/2006	100
Estimated Emission Reduction (tons/day) – 7/1/2002	1.53
Estimated Emission Reduction (tons/day) - 7/1/2006	0.34

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

The quick-dry primer, sealer, and undercoater category is a generic term used to describe coatings, typically the initial coat, used to provide a smooth surface for subsequent coats or to provide a shield between the substrate and the subsequent coat or to provide adhesion for the topcoat. This quick-dry category is used for areas that also require a quick turnaround time, as described in the quick-dry enamel category section of this report. By definition, the dry to touch time needs to be less than 30 minutes, and the recoat time needs to be less than two hours, both tested by ASTM 1640.

This category utilizes the gamut of available coating technologies in its formulations; alkyds, modified alkyds, oleoresin, epoxies, specialty resins, and emulsions are just a few of the formulations used.

Recommendation

Lower quick-dry primers, sealers, an undercoaters VOC limits from the current 350 g/l level to 100 g/l effective July 1, 2002, and then further lower from 100 g/l to 50 g/l, effective July 1, 2006.

Basis for Recommendation

AQMD Findings

The 1998 Draft CARB survey data, and AQMD staff survey all indicate that compliant, quick-dry primer, sealer, and undercoater category coatings are commercially available and are being used by consumers and professional contractors at all levels. Almost 44% of the quick-dry primers, sealers, and undercoaters from the survey are waterborne formulations, and have a SWA VOC content of 136 g/l, lower than the proposed July 1, 2002 limit. Of the 145 products, 12% comply with the proposed 100 g/l limit. On a total volume basis, in 1996, 35% of the total volume of quick-dry primers, sealers, and undercoaters was below the 200 g/l VOC content limit. These include products recommended for interior, exterior, and dual interior/exterior uses.

Furthermore, as was the case with the quick-dry enamel category, this category may be exploited by manufacturers to sell their higher VOC coatings under this category. For example, ASTM 1640 is very subjective in actually measuring dry times, and could result in liberal interpretation of the actual dry times. A study conducted by Harlan and Associates for the CARB analyzed a large number of coatings listed as quick-dry enamels and quick-dry primers, sealers, and undercoaters, and concluded that most of the coatings labeled as 'quick-dry' did not meet the definitional requirements and thus should not be classified as such. In contrast, the study concluded that some of the waterborne technology included in the testing actually met the requirements of a quick-dry coating, but were not necessarily listed as a quick-dry coating.

District staff found numerous primers, sealers, and undercoaters that comply with the proposed 200 g/l and 100 g/l limits, and meet the dry time requirements of a quick-dry primer, sealer, and undercoater. Furthermore, the Phase II Assessment Study evaluated 18 primers, sealers, and undercoaters for their dry times, as well as other characteristics to further evaluate the need for this coating, and found that the zero- and low-VOC coatings had faster dry times than higher-VOC, solvent-based quick-dry primers, sealers, and undercoaters.

A comprehensive list of coatings compliant with the proposed 200 g/l and 100 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

Issues

The major issue regarding the low-VOC quick-dry primer, sealer, undercoater category is the longer dry time in certain conditions. Contractors prefer shorter dry times for the basecoat so they can apply a topcoat the same day. However, they claim that the lower VOC, water-borne coatings do not dry fast enough for them to apply the topcoat on the same day. The ambient temperature and humidity have a significant effect on dry times of the coatings. As indicated earlier in this report, under dry, warm conditions, water-borne formulations actually dry faster as compared to the solvent-borne formulations. However, with recent technological advancements in additives for water-borne coatings, the dry times have successfully been shortened, especially under cool temperatures and high humidity.

Rust Preventative Coatings

Table 12

Rust Preventative Coatings – Statistics	
Estimated 1996 Solvent-based Sales *(1,000 gallons/year)*	193.4
Estimated 1996 Waterborne Sales *(1,000 gallons/year)*	142.9
Estimated VOC Emissions *(tons/day)*	0.89
Current VOC Limit *(grams/liter)*	400
Proposed VOC Limit *(grams/liter) -7/1/2006*	100
Estimated Emission Reduction *(tons/day – 7/12006)*	0.93

Source: 1998 Draft CARB Survey Data/Staff Calculations
This is a new coating category. Data from the CARB survey for this category includes 15% of the volume from the primers, sealers, and undercoaters, as well as 15% of the quick-dry primers, sealers, and undercoaters category

Product Description

Rust Preventative Coatings are coatings formulated and recommended for use in preventing the corrosion of ferrous metal surfaces in residential and commercial situations. This category includes the primers and topcoats for metal substrates. A specific category has been created in response to comments from industry, indicating a need for rust prevention and corrosion protection for metal substrates. Typical uses include handrails, fencing, metal doors, and gutters. These coatings rely on mainly the alkyd resin technology, with recent development of acrylic emulsion formulations. This category is necessary due to the ease of application, which is required by the typical do-it-yourself applicator or lesser trained painting contractor.

Recommendation

Establish a VOC limit for rust preventative coatings of 400 g/l effective date upon adoption, and then lower the VOC limit to 100 g/l effective July 1, 2006

Basis for Recommendation

AQMD staff has conducted extensive searches for rust preventative primers and topcoats that meet the proposed VOC limits of 100 g/l. Staff has found numerous manufacturers that have direct-to-metal (DTM) finishes, as well as primers and topcoats.

These technologies are discussed in the Industrial Maintenance Coatings, Nonflats, and Primers, Sealers, and Undercoaters section of this report.

Issues

There are no major issues with rust preventative coatings. The category was created in response to comments made by industry, emphasizing the need for higher VOC limits for problematic substrates, such as ferrous metal. There was a need to establish this category, since use of IM coatings would be not be allowed in residential or commercial areas. Staff did not propose an interim limit (July 1, 2002) for rust preventative coatings, because of the need to prevent corrosion. In contrast to industrial maintenance coatings users who are typically highly trained professional painting contractors, rust preventative coating users include the do-it-yourself users, and lesser-trained painting contractors. A significantly lower limit would require a shift in technology, which is available today for a variety of corrosion protection areas, but in many cases, is comprised of two-component polyurethane or epoxy coatings. These coatings are very sophisticated products that may require special training and equipment to use, which may be too difficult for the typical homeowner to use. The alkyd-based, single component rust preventative coatings available today are typically formulated at 400 g/l, and are more user-friendly for the homeowner to use.

Stains

Table 13

Stains Statistics	
Estimated 1996 Solvent-based Sales *(1,000 gallons/year)*	346.85
Estimated 1996 Waterborne Sales *(1,000 gallons/year)*	755.3
Estimated VOC Emissions *(tons/day)*	2.16
Current VOC Limit *(grams/liter)*	350
Proposed VOC Limit *(grams/liter) - 7/1/2002*	250
Estimated Emission Reduction *(tons/day)*	0.58

Source: 1998 Draft CARB Survey Draft/Staff Calculations

Product Description

Stains can be either semi-transparent or opaque (semi-solid), and are generally used on wood. This type of coating is especially used extensively in cabins and homes with soft wood exterior siding, interior wood substrates, as well as deck coating. They protect the wood from UV exposure, moisture, and minimize tannin bleed through.

Semi-Transparent Stains have traditionally been oil-based formulations that penetrate the wood substrate to protect against cracking, splitting, and warping of wood, and can be both interior and exterior use products. In contrast, opaque stains are for exterior use only, and impart color to the smooth or rough siding, wood shingles/shakes, wood trim, plywood, and aluminum.

Both types of stains are now available in acrylic or oil-based formulations. Vianova Resins has also utilized their alkyd/acrylic hybrid polymer known as RESYDROL® for formulating low-VOC semi-transparent, opaque, and interior wiping stain. Commercially available for over 10 years in Europe, this technology, when coupled with UV absorbers, produces films with excellent exterior durability. Actual exterior exposure studies, done by Vianova Resins, indicate over four years of exterior exposure without any flaking, cracking, or peeling. The relatively small particle size and unique emulsification of the polymer enhances the wood penetration characteristics as well as minimizes grain raising, which is a concern with waterborne, acrylic formulations. Lastly, this polymer will form a film at or near freezing temperatures without using any co-solvents. Several formulations below the proposed 250 g/l limit are available from Vianova Resins.

Recommendation

Lower the VOC limit for stains from 350g/l to 250 g/l, effective July 1, 2002.

Basis for Recommendation

As indicated above, several new, lower-VOC products are currently available as both semi-transparent, both interior and exterior, and opaque exterior stains that comply with the proposed limit.

Sherwin Williams has several products that have a VOC content of less than 100 g/l, as well as Okon, Performance Coatings, FSM Corporation, PPA Technologies, Rhinoguard, and Sierra Performance Coatings.

Okon has developed a product with transoxide pigments, which are 100 to 150 times smaller in size than conventional pigments, and penetrate deeper into wood, providing longer UV protection. Cabot Stains has developed an acrylic, opaque stain that contains Teflon Surface Protector, providing added washability, water repellency, and mildew resistance.

Interior semi-transparent stains that comply with the proposed 250 g/l are available from Deft. , Inc., Sierra Performance Coatings, PPA Technologies, and Führ Research Laboratories. Sierra Performance Coatings, PPA Technologies and Führ Research Laboratories have a zero-VOC interior semi-transparent stain.

The June 1998 Consumer Reports magazine rated nine high-VOC solvent based semi-transparent stains and lower-VOC waterborne stains. They concluded that the three waterborne stains in the good to very good category, with four solvent-based formulations performing in the very good to excellent range. However, the waterborne semi-transparent stains outperformed two solvent-based coatings.

A comprehensive list of coatings compliant with the proposed 250 g/l limits is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

Waterproofing Wo Sealers

Table 14

Waterproofing Wood Sealers – Statistics	
Estimated 1996 Solvent-based Sales *(1,000 gallons/year)*	193.4
Estimated 1996 Waterborne Sales *(1,000 gallons/year)*	142.9
Estimated VOC Emissions *(tons/day)*	0.89
Current VOC Limit *(grams/liter)*	400
Proposed VOC Limit *(grams/liter) - 7/1/2002*	250
Estimated Emission Reduction *(tons/day)*	0.52

Source: 1998 Draft CARB Survey Data/Staff Calculations

Product Description

Waterproofing sealers are used to protect concrete, masonry, wood, and other porous surfaces to seal against moisture damage. Penetration of moisture can cause staining, efflorescence, spalling, dusting, and weathering on concrete. On wood, use of waterproofing sealers can prevent splitting, staining, and warping, as well as maintain the wood's true color and grain. These coatings rely on a variety of resin technologies, with recent development of acrylic emulsion formulations and acetone-based formulations.

Recommendation

Lower the VOC limit for waterproofing wood sealers from 400 g/l to 250 g/l, effective July 1, 2002.

Basis for Recommendation

AQMD staff have conducted extensive searches for waterproofing sealers that meet the proposed VOC limit of 250 g/l. Staff has found numerous manufacturers that have commercialized these acrylic-based products.

Seal Krete, Inc. has a product called Seal Krete® Waterproofing Sealer which is a water-based, acrylic sealer with a VOC content of less than 8 g/l. It is recommended for both concrete and wood. Other manufacturers of waterproofing sealers that comply with the proposed limit include Behr Process, H&C, Flood Company, Gloucester, Okon, Sherwin Williams, and Conspec. The VOC content of these range from 27 g/l to 250 g/l.

Sherwin Williams has the Cuprinol Clear Deck and Wood Seal with a VOC content of only 27 g/l. This alkyd, waterborne sealer is designed for use on wood siding, fences, decks, and outdoor furniture.

However, industry has provided comments pertaining to lack of performance on concrete/masonry surfaces, especially concrete tilt-up buildings. Therefore, staff has limited the reduction to waterproofing wood sealers, and created a new category for waterproofing concrete/masonry sealer.

A comprehensive list of coatings compliant with the proposed 250 g/l limit is included as Table D-1 and Table D-2 of Appendix D of the Subsequent Environmental Assessment, included as Appendix D of this report.

Issues

There are no major issues with waterproofing wood sealers, with the exception of durability of lower-VOC acrylic sealers, as compared to higher-VOC sealers. Product data sheets of the acrylic sealers indicate performance similar to the conventional sealers, with some actually claiming superior performance. Additives such as UV absorbers and HALS have remarkably enhanced the durability of acrylic waterproofing sealers. However, the question of overall durability is a concern, especially in the mountainous regions of the SCAB, where temperature extremes, greater UV exposure, and overall harsher conditions cause recoating every year. The June 1998 issue of Consumer Reports magazine concluded that waterproofing sealers used on wood decks, in general, performed poorly and needed recoating after one year. Initially, the solvent-based products performed better, but over time, they also lost any water penetration or sealing abilities. Lastly, the article concluded that water beading is not a good indicator of water repellancy. This article has caused several of the manufacturers to re-evaluate their formulations and has resulted in reformulated products being available in the marketplace.

Additional Categories

Reducing the VOC content for roof coatings does not achieve any emission reduction, since the average VOC content for most roof coatings is below the proposed 250 g/l limit. However, a need for a specialty coating category was identified by the Roof Coatings Manufacturers Association and manufacturers of roof coatings, as is the case for the National AIM rule. Therefore, the Bituminous Roof Coatings category was created, which is approximately 3% of the total roof coatings market. The compliance date was extended to July 1, 2002 to provide

the manufacturer with adequate time to reformulate. However, there are no emission reductions associated with this category due to the small quantities sold and used.

Another specialty category was created, called "essential public service coating". These coatings are for very specialized uses including back-to-back plates on bridges, equipment designed to provide water and power, as well as some power pumps and underground vaults. Total usage is estimated to be 5,500 gallons per year (15 gallons per day). The proposed limit is 340 g/l, effective July 1, 2002 which will be lowered to 100 g/l effective July 1, 2006. Total emission increases for the interim as compared to the 250 g/l limit for the general IM coating, are estimated to be 27 pounds per day of VOC, which is insignificant as compared to the overall reductions on a daily basis. The Essential Public Service Agencies are required to report usage to track use of these coatings.

Lastly, a specialty category called "Recycled Flats and Nonflats" is created based on comments received from the California Integrated Waste Management, as well as other state agencies that are required to use recycled paints. The proposal includes establishing a limit of 250 g/l effective date upon adoption, and then lowering to 100 g/l effective July 1, 2006. This will allow adequate time for the collection of waste paint to reflect flat and nonflat paints used within the District, and will not deter pollution prevention efforts required by the State of California.

12. Revise the *"Averaging Compliance Option" [Paragraph (c)(6)]:*

An "Averaging Compliance Option" was added into the rule for flat coatings to provide an optional method of compliance for manufacturers of flat coatings in the November 8, 1996 amendments. The proposed amendments will clarify and expand the provision and include floor; primers, sealers, and undercoaters; quick-dry primers, sealers, and undercoaters; quick-dry enamels; rust preventative; roof; stains; waterproofing wood sealers, and industrial maintenance coatings, as well as flats and nonflats (excluding recycled flats and non-flats). Effective January 1, 2001, this provision will allow manufacturers to average, on a sales weighted basis, the VOC contents of their coatings, and allow them to manufacture and distribute coatings that have a VOC content higher than the proposed standards. Market-based approaches have been requested by industry as an option to compliance with the standards. The overall averaging program parallels the CARB's Alternative Control Plan Regulation for Consumer Products.

The Averaging Provision is a voluntary, flexible approach, which will utilize a "bubble" concept. Under this program, manufacturers who voluntarily choose to

comply with the rule under the averaging provision would select the coatings and formulate a detailed program which would demonstrate that the total VOC emissions under the program would not exceed the emissions that would have resulted had the products been formulated to meet the VOC standards. Under the program, once approved, the manufacturers could sell products that exceed the VOC standards specified in the rule for these coatings, provided that the emissions from these high-VOC products will be sufficiently offset by the emissions from the products formulated to achieve VOC limits, below the proposed standards.

The following benefits of averaging have been noted by other similar programs, and are also appropriate under this proposal:

- Higher degree of compliance flexibility
- Equivalent emission reductions by utilizing market forces
- Lower the manufacturers' overall cost of reducing VOC emissions from categories included in the provision

Some of the issues regarding the averaging provision are labeling requirements, enforceable recordkeeping, and program approval guidelines.

Staff has also revised the method of calculating the emissions from the coatings, based on input from industry. This format allows the calculation based on variables extracted from Method 24 testing. Industry supports the simplified method of calculating actual and allowable emissions under the Averaging Provisions. Staff has also revised the language in the provisions to clarify the requirements for submitting, modifying, renewing, and terminating the program.

13. *Add a Technology Assessment requirement for "nonflats", "industrial maintenance coatings", "floor coatings", "waterproofing wood sealers", "roof", "quick-dry primers, sealers, and undercoaters", "quick-dry enamels", "rust preventative coatings", and "primers, sealers, and undercoaters" [subdivision (f)]:*

Staff commits to assessing the product availability of specific future VOC limits for "nonflats," "primers, sealers, and undercoaters," "floor coatings," "rust preventative coatings," and "industrial maintenance coatings," one year prior to revised limit implementation dates. Staff commits to assessing the scientific basis for a reactivity-based architectural coatings control strategy, in conjunction with industry.

VII. EMISSION REDUCTIONS

The proposed amendments will result in emission reductions for the coating categories and achieve an overall emission reduction of 21.8 tpd, which equates to a 38% reduction. To the extent possible, the emission reductions are based on the coating usage and emission reductions reported in the 1998 Draft CARB survey Data, which has the most recent statewide information available. In some cases more recent data was available from the manufacturers. The emission reductions are based on actual VOC contents (based on average VOC content figures reported in the CARB survey) instead of the current rule compliance limits to assess an actual emission reduction instead of a theoretical emission reduction. For example, emission reduction estimates, based on the current rule limit for the categories affected by this proposal, result in reductions of over 35 tons per day, which is considered to be a theoretical emission reduction. However, this does not reflect the current emissions from affected categories, which are based on the SWA VOC content numbers. Therefore, all emission reduction calculations are based on actual emissions. Based on comments received from industry, staff has re-evaluated the method for calculating emission reductions, and has based the reductions on the SWA VOC content and volume of coatings that are at or below the current compliance limit and above the future compliance limit. This revised method was incorporated recently due to the availability of detailed CARB survey data necessary for estimating emission reductions in this method. Staff believes that this is the most accurate method of calculating emission reductions.

Table 15
Overall Emission Reductions

Category	Emission Change (Tons/day)
Floor Coatings	-0.5
Industrial Maintenance Coatings	-5.5
Nonflats	-7.4
Quick-Dry Enamels	-1.8
Primers, Sealers, & Undercoaters	-2.2
Quick-Dry Primers, Sealers, & Undercoaters	-1.9
Rust Preventative Coatings	-0.9
Stains	-1.1
Waterproofing Wood Sealers	-0.5
	-21.8

The detailed calculations are found in Appendix A.

VIII. INDUSTRY COMMENTS AND RESPONSES

Responses to the comments received during the public workshop and public comment period will be attached as Appendix E of this staff report.

IX. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) and AQMD Rule 110, AQMD will prepare a Draft Subsequent Environmental Assessment (SEA) for the proposed amendments to Rule 1113 - Architectural Coatings. The Draft SEA was circulated for a public review and comment period. All comments received on the Draft SEA and responses to comments are incorporated into the SEA for the proposed project.

The SEA is included as Appendix D of this staff report.

X. SOCIOECONOMIC ASSESSMENT

The Draft Socio-Economic Assessment and Cost Effectiveness study was conducted by staff and is included as Appendix F of this staff report.

XI. FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE

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

Necessity - The AQMD Governing Board has determined that a need exists to amend Rule 1113 - Architectural Coatings, to achieve VOC emission reductions, and to clarify rule language.

Authority - The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code Sections 40000, 40001, 40440, 40702, 40725 through 40728.

Clarity - The AQMD Governing Board has determined that the proposed amendments to Rule 1113 - Architectural Coatings, are written and displayed so that the meaning can be easily understood by persons directly affected by them.

Consistency - The AQMD Governing Board has determined that Proposed Amended Rule 1113 - Architectural Coatings, is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

Non-Duplication - The AQMD Governing Board has determined that the proposed amendments to Rule 1113, do not impose the same requirement as any existing state or federal regulation, and the proposed amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference - In adopting these amendments, the AQMD Governing Board references the following statutes which the AQMD hereby implements, interprets or makes specific: Health and Safety Code Sections 40001 (rules to achieve ambient air quality standards), 40440(a) (rules to carry out the Air Quality Management Plan), and 40440(c) (cost effectiveness), and Federal Clean Air Act Sections 171 et sq., 181 et seq., and 116.

Problem - The AQMD Governing Board has determined that there is a problem the proposed rule will alleviate and that Proposed Amended Rule 1113 will promote the attainment and maintenance of state or federal ambient air quality standards for ozone and PM_{10}.

XII. REFERENCES

"ARB-CAPCOA Suggested Control Measure for Architectural Coatings," Technical Support Document, State of California, Air Resources Board, Stationary Source Division, July 1989.

"Survey of Emissions from Solvent Use, Volume II - Architectural Coatings," California Air Resources Board, September 1994.

"Staff Report, Rule 1113 - Architectural Coatings," SCAQMD, December 1989.

"Technical Support Document for Federal Implementation Plan - Architectural Coatings," U.S. Environmental Protection Agency, Region IX, February 1994.

"Supplemental to Technical Support Document for Federal Implementation Plan - Architectural Coatings," U.S. Environmental Protection Agency, Region IX, February 1995.

"Court of Appeals, Respondent's Reply Brief," SCAQMD, August 1992.

"ARB Staff Response to EL RAP Questions on the Architectural Coatings," ARB, October 1989.

"Evaluation of the April 1991 Amendments to APCD Rule 74.2 - Architectural Coatings," Ventura County Air Pollution Control District, April 1992.

"Study of Volatile Organic Compound Emissions from Consumer and Commercial Products, Report to Congress," U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, March 1995.

"Field Investigation on Thinning Practices During the Application of Architectural Coatings in Selected Districts in California," California Air Resources Board, Compliance Division, December 1991.

"VOC Studies for Rules 1113/1129," SCAQMD (prepared by Woodward-Clyde Consultants), March 1993.

"National Paint & Coatings Association VOC Survey," Date Unknown

"The Rauch Guide to the U.S. Paint Industry," Rauch Associates, Inc., 1998.

"Final Environmental Impact Report of the 1994 Air Quality Management Plan," South Coast Air Quality Management District, September 1994.

"Current and Future Average Annual Day Emissions in the South Coast Air Basin, Final Appendix III-A to the 1997 AQMP," South Coast Air Quality Management District, September 1994.

"New Generation of Latex Gloss Enamels: How Good are They?", Godan, Walt, American Painting Contractor (February 1994): 50-52.

"High-Solids Coatings for Steel Close Performance Gap," Salem, Linda S.; Klepser, Robert J.; Modern Paint and Coatings (February 1992): 34-38.

"EVA Maintains Paint Properties, Lowers VOC," Currie, Bill; Modern Paint and Coatings (August 1993): 34-40.

"Formulating Low-Odor, Low-VOC for Interior Paints," Klein, Robert J.; Modern Paint and Coatings (March 1993): 37-38.

"Senergism and Lower VOCs: Waterborne Urethane/Acrylic Latex Blends," Coogan, Dr. Richard G.; Bilancieri, James J.; Pollano, Gail; American Paint & Coatings Journal (May 9, 1994): 49-54.

"Inorganic Chemistry as an Option for Formulating High Solids, Low and Zero-VOC Architectural and Industrial Maintenance Coatings," Stanley, Christine & Foscante, Raymond E.: 273-286.

"Painting the House," Consumer Reports (September 1993): 610-615.

"All Decked Out," Consumer Reports (June 1998): 32-34.

"Innovations in Deck Care Products," The Paint Dealer (August 1997): 58-76

"The Emergence of Latex Gloss Enamels", Stauffer, John, American Painting Contractor (August/September 1997): 24-26.

"Selling the VOC-Free Advantage," The Paint Dealer (May/June 1997): 38-42.

"Blue Skies Ahead? A Perspective on Paint Quality," The Paint Dealer (March 1997): 32.

"Innovations in Exterior Paint," The Paint Dealer (January 1997): 12-17.

"ASTM Course Focuses on Paint VOCs," Paint & Coatings Industry (February 1997): 62-66.

"Foam-Control Agents for Aqueous Architectural Paint and Industrial Coatings," Romano, Andrew A. & Capabianca, Paint & Coatings Industry (February 1997): 62-66.

"Minimizing Exterior Mildew Growth," Stauffer, John, American Painting Contractor, (March 1998): 22

"Hot Stains for Exterior Wood Siding," The Paint Dealer, (February 1998): 16-31.

"Understanding Architectural Coating Failures," Schilling, Mark S., American Painting Contractor, (April 1998): 44-53.

"A Selection Guide to Interior Paints," Kinnen, Andrew, American Painting Contractor, (May 1998): 50-51.

"Paint Manufacturers Ranked by Size," American Painting Contractor, (October 1998): 8.

"VOC Free Paints and Inks at NO EXTRA COST," Sugerman, G., PPA Technologies, (August 1997).

"Zero- and Near-Zero VOC Interior Glossy Architectural Coatings," Mollins, M.J., Taylor, J.W., Martin, R.A., Eastman Chemical Company.

"Formulation of Paints made with Ambient Temperature Crosslinking Acrylic Latexes, Monaghan, Greg, Rohm and Haas.

"Latex Blends as an Approach to Zero VOC Coatings," Feng, J., Winnik, M.A., Department of Chemistry, University of Toronto.

"Superior Performance Coatings – Also "0" VOC," Mersberg, Al, Sampson Coatings.

"One Hundred Percent Solids Aliphatic Polyurethane Coatings – From Dream to Reality," Guan, Shiwei, Madison Chemical Industries, Inc.

"High Solids and 100 Percent Solids Aliphatic Polyurethanes for Exterior Application: A survey of Approaches," Guan, Shiwei, Journal of Protective Coatings & Linings, (July 1997): 44-52.

"Applying Solventless Elastomeric Polyurethanes on Concrete in Wastewater Service," Ramirez, George, Journal of Protective Coatings & Linings, (May 1995)

"Evolution of Waterborne Resins," Kubillus, Uwe, Weger, Walter, Vianova Resins AG, Seventh Asia Pacific Conference, Waterborne Coatings, Ink & Adhesives, Paper 14.

"Waterborne Industrial Paints with Excellent Application and Film Properties Through the Use of Carbohydrate-Based Rheology Modifiers, Chu, S.G., Kraus, W.A., Kroom, Gilbert, Hercules BV, Seventh Asia Pacific Conference, Waterborne Coatings, Ink & Adhesives, Paper 13.

"Cross-Linking High Performance Polymers, with H2O as the only Solvent, for Air Dry or Heat Cure Coatings Application," Hart, Richard E., Hart Polymers.

"Additives for Waterborne Coatings," Athey, Robert, European Coatings Journal, (September 1996), 607-611.

"Coatings Industry Consolidation and Globalization," Stanley, Christine, Dickey, Stephen F., Ameron International Protective Coatings Group.

"Formulating with Multiphase Acrylic Latex in Zero-VOC Paint," Smith, Alan, American Paint & Coatings Journal, (March 25, 1998): 22-29.

"The Right Chemistry," Coatings Solutions, (Spring 1998): 4-6.

"Waterborne Polyurethane Dispersions," American Paint & Coatings Journal, (February 25, 1998): 13-15.

"Common Formulating Challenges in Water-based Coatings," Schwartz, Joel, Warnke, Dave, American Paint & Coatings Journal, (September 10, 1997), February 25, 1998): 16-20.

"Outdoor Weathering Tests for Paints & Coatings," Crewdson, Michael J., Brennan, Patrick, American Paint & Coatings Journal, (August 12, 1998): 23-26.

"Exposure Testing: Its Importance and Acceptance," Collier, Harvest, American Paint & Coatings Journal, (September 24, 1997): 22-23.

"Weatherability Differences Significant Among Universal TIO2 Pigments," Bank, Rick, American Paint & Coatings Journal, (January 14, 1998): 23-27.

"Waterborne Coatings: An Attractive Alternative," Chetcuti, Peter, American Paint & Coatings Journal, (February 11, 1998): 15-17

"ASTM's New Coating Test Method Addresses Interactivity Effects of Weathering and Corrosion," Gardner, Gary, Journal of Protective Coatings & Linings, (September 1998): 50-62.

"Why Surface Preparation is Important," Barnhart, Robert, Mericle, Debbie, Hocking, Tom, Journal of Protective Coatings & Linings, (September 1997): 61-64.

"Gaging the Service Life of Aged Alkyds," Journal of Protective Coatings & Linings, (July 1997): 15-20.

"Metallizing and Zinc-Rich Perform Best in Federal Highway Study," Journal of Protective Coatings & Linings, (July 1997): 29-33.

"Two-Component Waterborne Polyurethanes: The Rheology of Mizing," Bui, H., Dvorchak, M., Hudson, K., Hunter, J., European Coatings Journal, (May 1997): 476-597.

"Evaluating Manufacturers' Claims About Performance and Compliance," Driscoll, James; Journal of Protective Coatings & Linings (August 1993): 52-56.

"Updated Maximum Incremental Reactivity Scale for Regulatory Applications," Carter, William P. L., Preliminary Report to California Air Resources Board, Contract No. 95-308, August 1998.

"Compliance Technology for the Finishing Industry," Daignault, Cindy M.; February 1993.

"Performance-Enhancing Chemical Technology for VOC-Compliant Coatings," Savage, Timothy; Paint & Coatings Industry (April 1995): 54-55.

"Solvent/Resin Compatibility: The Key to Successful Coatings Development," Boyce, Thomas D.; Paint & Coatings Industry (March 1995): 149.

"Proposed Alternative Control Plan Regulation for Consumer Products," California Air Resources Board, September 1994.

"Draft Final Report, Improvement of Speciation Profiles for Architectural and Industrial Coating Operations," California Polytechnic State University, Department of Chemistry, Albert C. Censullo, Ph.D., December 1995.

"The Coatings Agenda America 1995/96," Campden Publishing Limited & National Paint and Coatings Association, 1995.

APPENDIX A

EMISSION CALCULATIONS

VOC Emission Reduction
Current VOC Limits to Future Limits

CATEGORY	EMIS REDUC (tpd)
Industrial Maintenance - Waterborne	0.08
Industrial Maintenance - Solventborne	2.90
Industrial Maintenance	2.55
Rust Preventative Coatings - Waterborne	0.19
Rust Preventative Coatings	0.73
Floor Coatings - Waterborne	0.10
Floor Coatings - Solventbased	0.21
Floor Coatings	0.16
NON-FLATS - W/B - Low Gloss	0.10
NON-FLATS - S/B - Low Gloss	0.03
NON-FLATS - W/B - Low Gloss	1.03
NON-FLATS - W/B - Medium Gloss	0.92
NON-FLATS - S/B - Medium Gloss	0.40
NON-FLATS - W/B - Medium Gloss	3.66
NON-FLATS - W/B - High Gloss	0.28
NON-FLATS - S/B - High Gloss	0.43
NON-FLATS - W/B - High Gloss	0.56
Primers, Sealer, Undercoaters - S/B	1.48
Primers, Sealer, Undercoaters - W/B	0.21
Primers, Sealer, Undercoaters - W/B	0.52
QD -Primers, Sealer, Undercoaters - S/B	1.53
QD-Primers, Sealer, Undercoaters - W/B	0.06
QD-Primers, Sealer, Undercoaters - W/B	0.28
QD-Enamels - S/B	1.08
QD-Enamels	0.66
Stains - Opaque - S/B	0.12
Stains - Semi-Transparent - S/B	1.00
Stains - Semi-Transparent - W/B	0.01
Waterproofing Wood Sealers	0.52
TOTAL	**21.81**

Assumptions:

Constant Solids calculation
@100 g/l and 50 g/l - Waterborne formulations only
Solvent VOC = 880 g/l
Sales Weighted Average VOC of Coatings
Average Solids Content by volume, based on survey or average of compliant coatings
All new coatings assumed at compliance limit - PTE
No reductions from Roof and High-Temperature Coatings are expected

VOC Emission Reduction
Current VOC Limits to Future Limits

	Industrial Maintenance - Waterborne		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	173,833	173,833	
VOC Content, g/l	170	100	
Coating Formulation (Volume fraction)			
Water	0.492	0.537	
VOC	0.098	0.053	
Solids	0.410	0.410	
Tons of VOC Per Year	62.60	33.52	29.08
Tons of VOC Per Day	0.17	0.09	0.08

	Industrial Maintenance - Solventborne		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	1,600,491	1,930,388	
VOC Content, g/l	365	250	
Coating Formulation (Volume fraction)			
Water		0.316	
VOC	0.415	0.194	
Solids	0.591	0.490	
Tons of VOC Per Year	2435.15	1376.90	1058.25
Tons of VOC Per Day	6.67	3.77	2.90

	Industrial Maintenance		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	1,930,388	2,307,049	
VOC Content, g/l	250	100	
Coating Formulation (Volume fraction)			
Water	0.316	0.537	
VOC	0.194	0.053	
Solids	0.490	0.410	
Tons of VOC Per Year	1376.90	444.85	932.06
Tons of VOC Per Day	3.77	1.22	2.55

The following categories were consolidated from the CARB survey for IM Coatings:
Anti-Graffiti, Extreme High Durability, Heat Reactive
Repair & Maintenance Thermoplastic, Thermoplastic Rubber & Plastic

VOC Emission Reduction
Current VOC Limits to Future Limits

	Rust Preventative Coatings - Waterborne		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	726,354	673,206	
VOC Content, g/l	144	100	
Coating Formulation (Volume fraction)			
Water	0.546	0.537	
VOC	0.074	0.053	
Solids	0.380	0.410	
Tons of VOC Per Year	198.10	129.81	68.29
Tons of VOC Per Day	0.54	0.36	0.19

	Rust Preventative Coatings		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	201,130	224,337	
VOC Content, g/l	382	100	
Coating Formulation (Volume fraction)			
Water		0.413	
VOC	0.434	0.067	
Solids	0.580	0.520	
Tons of VOC Per Year	320.27	54.86	265.41
Tons of VOC Per Day	0.88	0.15	0.73

Rust Preventative Primer Category + 15% of Primers, Sealers, and Undercoaters + 15% of Quick-Dry Primers, Sealers, and Undercoaters

VOC Emission Reduction
Current VOC Limits to Future Limits

	Floor Coatings - Waterborne		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	295,827	143,687	
VOC Content, g/l	164	100	
Coating Formulation (Volume fraction)			
Water	0.582	0.210	
VOC	0.078	0.090	
Solids	0.340	0.700	
Tons of VOC Per Year	84.51	47.30	37.21
Tons of VOC Per Day	0.23	0.13	0.10

	Floor Coatings - Solventbased		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	167,586	185,814	
VOC Content, g/l	197	100	
Coating Formulation (Volume fraction)			
Water		0.210	
VOC	0.224	0.090	
Solids	0.776	0.700	
Tons of VOC Per Year	137.62	61.17	76.45
Tons of VOC Per Day	0.38	0.17	0.21

	Floor Coatings		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	329,501	256,279	
VOC Content, g/l	100	50	
Coating Formulation (Volume fraction)			
Water	0.210	0.046	
VOC	0.090	0.054	
Solids	0.700	0.900	
Tons of VOC Per Year	108.47	50.97	57.50
Tons of VOC Per Day	0.30	0.14	0.16

VOC Emission Reduction
Current VOC Limits to Future Limits

	NON-FLATS - W/B - Low Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	390,386	390,386	
VOC Content, g/l	193	150	
Coating Formulation (Volume fraction)			
Water	0.552	0.578	
VOC	0.098	0.072	
Solids	0.350	0.350	
Tons of VOC Per Year	140.81	102.99	37.82
Tons of VOC Per Day	0.39	0.28	0.10

	NON-FLATS - S/B - Low Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	15,468	22,539	
VOC Content, g/l	250	150	
Coating Formulation (Volume fraction)			
Water		0.578	
VOC	0.284	0.072	
Solids	0.510	0.350	
Tons of VOC Per Year	16.12	5.95	10.17
Tons of VOC Per Day	0.04	0.02	0.03

	NON-FLATS - W/B - Low Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	2,020,863	2,020,863	
VOC Content, g/l	150	50	
Coating Formulation (Volume fraction)			
Water	0.578	0.629	
VOC	0.072	0.021	
Solids	0.350	0.350	
Tons of VOC Per Year	533.13	156.30	376.83
Tons of VOC Per Day	1.46	0.43	1.03

VOC Emission Reduction
Current VOC Limits to Future Limits

	NON-FLATS - W/B - Medium Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	2,840,276	2,840,276	
VOC Content, g/l	202	150	
Coating Formulation (Volume fraction)			
Water	0.546	0.578	
VOC	0.104	0.072	
Solids	0.350	0.350	
Tons of VOC Per Year	1086.46	749.31	337.15
Tons of VOC Per Day	2.98	2.05	0.92

	NON-FLATS - S/B - Medium Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	234,984	369,260	
VOC Content, g/l	250	150	
Coating Formulation (Volume fraction)			
Water	0.000	0.578	
VOC	0.284	0.072	
Solids	0.550	0.350	
Tons of VOC Per Year	244.88	97.42	147.47
Tons of VOC Per Day	0.67	0.27	0.40

	NON-FLATS - W/B - Medium Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	7,167,683	7,167,683	
VOC Content, g/l	150	50	
Coating Formulation (Volume fraction)			
Water	0.578	0.629	
VOC	0.072	0.021	
Solids	0.350	0.350	
Tons of VOC Per Year	1890.94	554.37	1336.57
Tons of VOC Per Day	5.18	1.52	3.66

VOC Emission Reduction
Current VOC Limits to Future Limits

	NON-FLATS - W/B - High Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	744,290	744,290	
VOC Content, g/l	209	150	
Coating Formulation (Volume fraction)			
Water	0.541	0.578	
VOC	0.109	0.072	
Solids	0.350	0.350	
Tons of VOC Per Year	297.64	196.35	101.29
Tons of VOC Per Day	0.82	0.54	0.28

	NON-FLATS - S/B - High Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	239,014	348,278	
VOC Content, g/l	250	150	
Coating Formulation (Volume fraction)			
Water		0.578	
VOC	0.284	0.072	
Solids	0.510	0.350	
Tons of VOC Per Year	249.08	91.88	157.20
Tons of VOC Per Day	0.68	0.25	0.43

	NON-FLATS - W/B - High Gloss		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	1,092,568	1,092,568	
VOC Content, g/l	150	50	
Coating Formulation (Volume fraction)			
Water	0.578	0.629	
VOC	0.072	0.021	
Solids	0.350	0.350	
Tons of VOC Per Year	288.24	84.50	203.73
Tons of VOC Per Day	0.79	0.23	0.56

VOC Emission Reduction
Current VOC Limits to Future Limits

	Primers, Sealer, Undercoaters - S/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	600,309	780,401	
VOC Content, g/l	350	200	
Coating Formulation (Volume fraction)			
Water		0.482	
VOC	0.398	0.118	
Solids	0.520	0.400	
Tons of VOC Per Year	875.84	336.79	539.04
Tons of VOC Per Day	2.40	0.92	1.48

	Primers, Sealer, Undercoaters - W/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	869,862	869,862	
VOC Content, g/l	145	100	
Coating Formulation (Volume fraction)			
Water	0.593	0.616	
VOC	0.067	0.044	
Solids	0.340	0.340	
Tons of VOC Per Year	214.03	139.09	74.94
Tons of VOC Per Day	0.59	0.38	0.21

	Primers, Sealer, Undercoaters - W/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	780,401	918,119	
VOC Content, g/l	200	100	
Coating Formulation (Volume fraction)			
Water	0.482	0.616	
VOC	0.118	0.044	
Solids	0.400	0.340	
Tons of VOC Per Year	336.79	146.81	189.99
Tons of VOC Per Day	0.92	0.40	0.52

The following categories were consolidated from the CARB survey for Primers, Sealer, and Undercoaters: Primers, Sealers, and Undercoaters, Sealers

VOC Emission Reduction
Current VOC Limits to Future Limits

	QD -Primers, Sealer, Undercoaters - S/B		
	With Current VOC Lir	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	411,672	421,964	
VOC Content, g/l	432	200	
Coating Formulation (Volume fraction)			
Water		0.482	
VOC	0.491	0.118	
Solids	0.410	0.400	
Tons of VOC Per Year	741.34	182.10	559.23
Tons of VOC Per Day	2.03	0.50	1.53

	QD-Primers, Sealer, Undercoaters - W/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	320,018	329,161	
VOC Content, g/l	136	100	
Coating Formulation (Volume fraction)			
Water	0.574	0.605	
VOC	0.066	0.045	
Solids	0.360	0.350	
Tons of VOC Per Year	77.25	54.18	23.07
Tons of VOC Per Day	0.21	0.15	0.06

	QD-Primers, Sealer, Undercoaters - W/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	421,964	482,244	
VOC Content, g/l	200	100	
Coating Formulation (Volume fraction)			
Water	0.482	0.605	
VOC	0.118	0.045	
Solids	0.400	0.350	
Tons of VOC Per Year	182.10	79.38	102.73
Tons of VOC Per Day	0.50	0.22	0.28

VOC Emission Reduction
Current VOC Limits to Future Limits

	QD-Enamels - S/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	406,644	557,683	
VOC Content, g/l	400	250	
Coating Formulation (Volume fraction)			
Water		0.511	
VOC	0.455	0.139	
Solids	0.480	0.350	
Tons of VOC Per Year	678.04	284.13	393.91
Tons of VOC Per Day	1.86	0.78	1.08

	QD-Enamels		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	557,683	557,683	
VOC Content, g/l	250	50	
Coating Formulation (Volume fraction)			
Water	0.504	0.629	
VOC	0.139	0.021	
Solids	0.350	0.350	
Tons of VOC Per Year	284.13	43.13	241.00
Tons of VOC Per Day	0.78	0.12	0.66

VOC Emission Reduction
Current VOC Limits to Future Limits

	Stains - Opaque - S/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	57,318	67,725	
VOC Content, g/l	350	250	
Coating Formulation (Volume fraction)			
Water		0.421	
VOC	0.398	0.165	
Solids	0.490	0.415	
Tons of VOC Per Year	83.63	40.88	42.74
Tons of VOC Per Day	0.23	0.11	0.12

	Stains - Semi-Transparent - S/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	409,223	429,140	
VOC Content, g/l	350	250	
Coating Formulation (Volume fraction)			
Water		0.481	
VOC	0.398	0.148	
Solids	0.390	0.372	
Tons of VOC Per Year	597.05	232.32	364.73
Tons of VOC Per Day	1.64	0.64	1.00

	Stains - Semi-Transparent - W/B		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	161,681	161,681	
VOC Content, g/l	267	250	
Coating Formulation (Volume fraction)			
Water	0.670	0.679	
VOC	0.100	0.091	
Solids	0.230	0.230	
Tons of VOC Per Year	59.42	54.13	5.28
Tons of VOC Per Day	0.16	0.15	0.01

VOC Emission Reduction
Current VOC Limits to Future Limits

	Waterproofing Wood Sealers		
	With Current VOC Limit	With Future VOC Limit	VOC Emission Decrease
Gallons per Year	193,408	161,217	
VOC Content, g/l	345	250	
Coating Formulation (Volume fraction)			
Water /Exempt	0.298	0.481	
VOC	0.392	0.148	
Solids	0.310	0.372	
Tons of VOC Per Year	278.15	87.28	190.87
Tons of VOC Per Day	0.76	0.24	0.52

APPENDIX B

DRAFT PROPOSED AMENDED RULE 1113 -

ARCHITECTURAL COATINGS

Proposed rule changes that differ from the Set Hearing Board Package (February 25, 1999 version) are indicated in a double strikeout/underlined format.

(Adopted Sept. 2, 1977)(Amended Dec. 2, 1977)(Amended Feb. 3, 1978)
(Amended Sept. 5, 1980)(Amended Apr. 3, 1981)(Amended July 3, 1981)
(Amended by California Air Resources Board Oct. 21, 1981)
(Amended Aug. 5, 1983)(Amended Mar. 16, 1984)(Amended Aug. 2, 1985)
(Amended Nov. 1, 1985)(Amended Feb. 6, 1987)(Amended Jan. 5, 1990)
(Amended Feb. 2, 1990)(Amended Nov. 2, 1990)(Amended Dec. 7, 1990)
(Amended Sept. 6, 1991)(Amended March 8, 1996)(Amended August 9, 1996)
(Amended November 8, 1996)
May 14 ~~February 25~~, 1999

PROPOSED AMENDED RULE 1113 - ARCHITECTURAL COATINGS

(a) Applicability

This rule is applicable to any person who supplies, sells, offers for sale, ~~applies, solicits the application of~~, or manufactures ~~for use in the District~~ any architectural coating for use in the District that is intended to be applied to stationary structures or their appurtenances, and to mobile homes, pavements or curbs; as well as any person who applies or solicits the application of any architectural coating within the District. The purpose of this rule is to limit the VOC content of architectural coatings used in the District or to allow the averaging of such coatings, as specified, so their actual emissions do not exceed the allowable emissions if all the averaged coatings had complied with the specified limits.

(b) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) AEROSOL COATING PRODUCT means 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 marking and traffic marking applications.

(2) APPURTENANCES are accessories to a stationary structure, including, but not limited to: hand railings, cabinets, bathroom and kitchen fixtures, fences, rain-gutters and down-spouts, window screens, lamp-posts, heating and air conditioning equipment, other mechanical equipment, large fixed stationary tools, signs, motion picture and television production sets, and concrete forms.

(3) ARCHITECTURAL COATINGS are any coatings applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.

(4) BELOW-GROUND WOOD PRESERVATIVES are wood preservatives formulated to protect below-ground wood.

(5) BITUMINOUS COATINGS MATERIALS are black or brownish coating materials, soluble in carbon disulfide, consisting mainly of hydrocarbons and which are obtained from natural deposits, or as residues from the distillation of crude petroleum oils, or of low grades of coal.

(6) BITUMINOUS ROOF COATINGS are coatings formulated and recommended for roofing that incorporate bituminous coatings materials.

(7~~6~~) BOND BREAKERS are coatings applied between layers of concrete to prevent the freshly poured top layer of concrete from bonding to the substrate over which it is poured.

(8~~7~~) CLEAR WOOD FINISHES are clear and semi-transparent coatings, including lacquers and varnishes, applied to wood substrates to provide a transparent or translucent solid film.

(9~~8~~) COATING is a material which is applied to a surface in order to beautify, protect, or provide a barrier to such surface.

(10~~9~~) COLORANTS are solutions of dyes or suspensions of pigments.

(11~~10~~) CONCRETE-CURING COMPOUNDS are coatings applied to freshly poured concrete to retard the evaporation of water.

(12~~11~~) DRY-FOG COATINGS are coatings which are formulated only for spray application so that when sprayed, overspray droplets dry before falling on floors and other surfaces.

(13) ESSENTIAL PUBLIC SERVICE COATING is a protective (functional) coating applied to components of power, municipal wastewater, water, bridges and other roadways; transmission or distribution systems during repair and maintenance procedures.

(14~~12~~) EXEMPT COMPOUNDS (See Rule 102-Definition of Terms.)

(15~~13~~) FIRE-PROOFING EXTERIOR COATINGS are opaque coatings formulated to protect the structural integrity of outdoor steel and other outdoor construction materials and listed by Underwriter's Laboratories, Inc. for the fire protection of steel.

(16~~14~~) FIRE-RETARDANT COATINGS are coatings listed by Underwriter's Laboratories, Inc. as fire-retardant coatings with a flame spread index of less than 25.

(17~~5~~) FLAT COATINGS are coatings that register a gloss of less than 15 on an 85-degree meter or less than 5 on a 60-degree meter.

(18~~6~~) FLOOR COATINGS are opaque coatings that are formulated for application to flooring; including but not limited to decks, porches, gymnasiums, bowling alleys; for purposes of abrasion resistance.

(19~~17~~) ~~(16)~~ GRAMS OF VOC PER LITER OF COATING, LESS WATER AND LESS EXEMPT COMPOUNDS, is the weight of VOC per combined volume of VOC and coating solids and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:

W_s = weight of volatile compounds in grams

W_w = weight of water in grams

W_{es} = weight of exempt compounds in grams

V_m = volume of material in liters

V_w = volume of water in liters

V_{es} = volume of exempt compounds in liters

For coatings that contain reactive diluents, the Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds, shall be calculated by the following equation:

$$\text{Grams of VOC per Liter of Coating, Less Water and Less Exempt Compounds} = \frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$$

Where:

W_s = weight of volatile compounds emitted during curing, in grams

W_w = weight of water emitted during curing, in grams

W_{es} = weight of exempt compounds emitted during curing, in grams

V_m = volume of the material prior to reaction, in liters

V_w = volume of water emitted during curing, in liters

V_{es} = volume of exempt compounds emitted during curing, in liters

~~(17)~~(20) GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where: W_s = weight of volatile compounds in grams

W_w = weight of water in grams

W_{es} = weight of exempt compounds in grams

V_m = volume of the material in liters

~~(18)~~(21~~19~~) GRAPHIC ARTS COATINGS (Sign Paints) are coatings formulated for and hand-applied by artists using brush or roller techniques to indoor and outdoor signs (excluding structural components) and murals, including lettering enamels, poster colors, copy blockers, and bulletin enamels.

(22~~0~~) HIGH-TEMPERATURE INDUSTRIAL MAINTENANCE COATINGS are industrial maintenance coatings formulated for and applied to substrates exposed continuously or intermittently to temperatures above 400 degrees Fahrenheit.

~~(19) INDUSTRIAL MAINTENANCE PRIMERS AND TOPCOATS are coatings which are intended to be applied to a surface prior to the application of an industrial maintenance topcoat, to provide a firm bond between the substrate and subsequent coats and high performance coatings which are formulated for the purpose of heavy abrasion, water immersion, chemical, corrosion, temperature, electrical or solvent resistance.~~

~~(A) Alkyds~~

~~Synthetic resins formed by the condensation of polyhydric alcohols with polybasic acids.~~

~~(B) Catalyzed Epoxy~~

~~Cross-linking resins made by the reaction of epoxides with other materials such as amines, alcohols, phenols, carboxylic acids, and unsaturated compounds.~~

~~(C) Bituminous Coatings Materials~~

~~Black or brownish coating materials, soluble in carbon disulfide, consisting mainly of hydrocarbons and which are obtained from natural deposits, or any residues from the distillation of crude petroleum oils, or of low grades of coal.~~

~~(D) Inorganic Polymers~~

~~Substances whose principal structural features are made up on homopolar inter linkages between multivalent elements other than carbon. This does not preclude the presence of carbon containing groups in the side branches, or as inter linkages between principal structural members. Examples of such polymers are ethyl and butyl silicates.~~

~~(E) Vinyl Chloride Polymers~~

~~Polymers made by the polymerization of vinyl chloride or copolymerization of vinyl chloride with other unsaturated compounds, the vinyl chloride being in greatest amount by weight.~~

~~(F) Chlorinated Rubber~~

~~Resin formed by the reaction of rubber with chlorine.~~

~~(G) Acrylic Polymers~~

~~Polymers resulting from the polymerization of derivatives of acrylic acids, including esters of acrylic acid, methacrylic acid, acrylonitrile, and their copolymers. Also known as acrylic resins and acrylate resins.~~

~~(H) Urethane Polymers~~

~~Coating vehicles containing a polyisocyanate monomer reacted in such a manner as to yield polymers containing any ratio, proportion, or combination of urethane linkages, active isocyanate groups, or polyisocyanate monomer.~~

~~(I) Silicones~~

~~A resin containing silicon, unlike organic resins which all contain carbon. The basic structure of silicones consists of silicon oxygen linkages.~~

~~(J) Unique Vehicles~~

~~Generic polymer components not defined by any of the preceding, e.g., hypalon or phenoxy.~~

(~~19~~23~~1~~) INDUSTRIAL MAINTENANCE COATINGS are coatings, including primers, sealers, undercoaters, intermediate coatings and topcoats formulated for and applied to substrates that are exposed to one or more of the following extreme environmental conditions~~ in industrial, commercial, or institutional facilities~~:

(A) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation;

(B) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, chemical mixtures, or solutions;

(C) repeated exposure to temperatures in excess of 250 degrees Fahrenheit;

(D) repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial solvents, cleaners, or scouring agents; or

(E) exterior exposure of metal structures.

Industrial Maintenance Coatings are not for residential use or for use in areas of industrial, commercial, or institutional facilities not exposed to such extreme environmental conditions, such as office space and meeting rooms~~.~~

(~~20~~24~~2~~) JAPANS/FAUX FINISHING COATINGS are glazes designed for wet-in-wet techniques used as a stain or glaze to create artistic effects, including but not limited to, dirt, old age, smoke damage, and simulated marble and wood grain.

(~~21~~25~~3~~) LACQUERS are clear or pigmented wood finishes, including clear lacquer sanding sealers, formulated with nitrocellulose or synthetic resins to dry by evaporation without chemical reaction.

(~~22~~26~~4~~) LOW-SOLIDS COATINGS are coatings containing one pound or less of solids per gallon of material.

(~~23~~27~~5~~) MAGNESITE CEMENT COATINGS are coatings formulated for and applied to magnesite cement decking to protect the magnesite cement substrate from erosion by water.

(~~24~~28~~6~~) MASTIC COATINGS are coatings formulated to cover holes and minor cracks and to conceal surface irregularities, and applied in a thickness of at least 10 mils (dry, single coat).

(~~25~~29~~7~~) METALLIC PIGMENTED COATINGS are coatings containing at least 0.4 pound of elemental metallic pigment per gallon (50 grams/liter) of coating as applied.

(~~26~~30~~8~~) MULTI-COLOR COATINGS are coatings which exhibit more than one color when applied and which are packaged in a single container and applied in a single coat.

(~~27~~31~~29~~) NONFLAT COATINGS are coatings that register a gloss of 5 or greater on a 60-degree meter and a gloss of 15 or greater on an 85-degree meter.~~.~~

(~~28~~32~~0~~) PRE-TREATMENT WASH PRIMERS are coatings which contain a minimum of 1/2 percent acid, by weight, applied directly to bare metal surfaces to provide necessary surface etching.

(~~29~~33~~1~~) PRIMERS are coatings applied to a surface to provide a firm bond between the substrate and subsequent coats.

(~~29~~34~~2~~) QUICK-DRY ENAMELS are non-flat coatings which comply with the following:

(i) Shall be capable of being applied directly from the container by brush or roller under normal conditions, normal conditions being ambient temperatures between 60°F and 80°F;

(ii) When tested in accordance with ASTM D 1640 they shall: set-to-touch in two hours or less, dry-hard in eight hours or less, and be tack-free in four hours or less by the mechanical test method; and

(iii) Shall have a 60° dried film gloss of no less than 70.

~~This category will be subsumed by the nonflat category effective January 1, 2002.~~

(~~30~~35~~3~~) QUICK-DRY PRIMERS, SEALERS, AND UNDERCOATERS are primers, sealers, and undercoaters which are intended to be applied to a surface to provide a firm bond between the substrate and subsequent coats and which are dry-to-touch in one-half hour and can be recoated in two hours (ASTM D 1640). This category will be

subsumed by the primers, sealers, and undercoaters category effective January 1, 2002.

(~~31~~364) REACTIVE DILUENT is a liquid which is a VOC during application and one in which, through chemical and/or physical reaction, such as polymerization, becomes an integral part of the coating.

(37) RECYCLED FLAT AND NON-FLATS are flat and nonflat waste coatings collected through Household Hazardous Waste Collection Programs, and are screened, reprocessed, and repackaged for use by city clean-up projects, facility renovations, graffiti cover-ups, and other similar uses.

(38~~5~~)(~~32~~) ROOF COATINGS are non-bituminous coatings formulated for application to exterior roofs and 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 to be in this category, but shall be considered to be in the metallic pigmented coatings category.

(39~~6~~) RUST PREVENTATIVE COATINGS are ~~primers~~ coatings formulated for use in preventing the corrosion of ~~ferrous~~ metal surfaces in residential and commercial situations.

(~~33407~~) SANDING SEALERS are clear wood coatings formulated for and applied to bare wood for sanding and to seal the wood for subsequent application of coatings. To be considered a sanding sealer a coating must be clearly labeled as such.

(41~~3834~~) SEALERS are coatings applied to substrates to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate.

(42~~3935~~) SHELLACS are clear or pigmented coatings formulated solely with the resinous secretions of the lac beetle (laccifer lacca), thinned with alcohol, and formulated to dry by evaporation without a chemical reaction.

(43~~036~~) SOLICIT is to require for use or to specify, by written or oral contract.

(44~~137~~) STAINS are opaque or semi-transparent coatings which are formulated to change the color but not conceal the grain pattern or texture.

(45~~238~~) SWIMMING POOL COATINGS are coatings specifically formulated to coat the interior of swimming pools and to resist swimming pool chemicals.

(46~~339~~) SWIMMING POOL REPAIR COATINGS are chlorinated, rubber-based coatings used for the repair and maintenance of swimming pools over existing chlorinated, rubber-based coatings.

(47~~440~~) TINT BASE is an architectural coating to which colorants are added.

(48~~541~~) TRAFFIC COATINGS are coatings formulated for and applied to public streets, highways, and other surfaces including, but not limited to, curbs, berms, driveways, and parking lots.

(49~~642~~) UNDERCOATERS are coatings formulated and applied to substrates to provide a smooth surface for subsequent coats.

(50~~743~~) VARNISHES are clear wood finishes formulated with various resins to dry by chemical reaction on exposure to air.

(51~~844~~) VOLATILE ORGANIC COMPOUND (VOC)
See Rule 102.

(52~~945~~) WATERPROOFING WOOD SEALERS are colorless coatings which are formulated for the sole purpose of preventing penetration of porous substrates by water on wood substrates ~~and which do not alter surface appearance or texture~~.

(53~~0~~) WATERPROOFING CONCRETE/MASONRY SEALERS are clear or pigmented film forming compounds that are formulated for sealing concrete and masonry to provide resistance against water, alkalis, acids, ultraviolet light, and staining.

(54~~146~~) WOOD PRESERVATIVES are coatings formulated to protect wood from decay or insect attack by the addition of a wood preservative chemical registered by the California Environmental Protection Agency.

(c) Requirements

(1) Except as provided in paragraphs (c)(2), (c)(3), ~~and~~ (c)(4), and specified coatings averaged under (c)(6), no person shall supply, sell, offer for sale, ~~apply, or solicit the application of,~~ manufacture, blend, or repackage any architectural coating for use in the District which, at the time of sale or manufacture, contains more than 250 grams of VOC per liter of coating (2.08 pounds per gallon), less water, less exempt compounds, and less any colorant added to tint bases, and no

person shall apply or solicit the application of any architectural coating within the District that exceeds 250 grams of VOC per liter of coating as calculated in this paragraph. ~~or manufacture, blend, or repackage such a coating for use within the District~~.

(2) Except as provided in paragraphs (c)(3) ~~and~~ (c)(4), and designated coatings averaged under (c)(6), no person shall supply, sell, offer for sale, ~~apply, solicit the application of~~, manufacture, blend, or repackage, for use within the District, any architectural coating listed in the Table of Standards which contains VOC (excluding any colorant added to tint bases) in excess of the corresponding VOC limit specified in the table, after the effective date specified, and no person shall apply or solicit the application of any architectural coating within the District that exceeds the VOC limit as specified in this paragraph. No person shall apply or solicit the application within the District of any industrial maintenance coatings for residential use; or of any rust-preventative coating for industrial use.

TABLE OF STANDARDS

VOC LIMITS

Grams of VOC Per Liter of Coating, Less Water And Less Exempt Compounds

COATING	Limit *	Effective Date of Adoption	Effective 1/1/1998	Effective 1/1/1999	Effective 7/1/2001	Effective ~~1~~7/1/2002	Effective 1/1/2005	Effective 7/1/2006	Effective 7/1/2008
Bond Breakers	350								
Clear Wood Finishes									
Varnish	350								
Sanding Sealers	350								
Lacquer	680		550				275		
Concrete-Curing Compounds	350								
Dry-Fog Coatings	400								
Essential Public Service Coating	420					340		100	
Fire-proofing Exterior Coatings	450	~~450~~		350					
Fire-Retardant Coatings									
Clear	650								
Pigmented	350								
Flats	250				100				50
Floor Coatings	420					100	~~50~~	50	
Graphic Arts (Sign) Coatings	500								
High Temperature Industrial Maintenance Coatings						550	~~420~~	420	
Industrial Maintenance ~~Primers and Topcoats~~ Coatings	420					250	~~100~~	100	
~~Alkyds~~	~~420~~								
~~Catalyzed Epoxy~~	~~420~~								
~~Bituminous Coatings Materials~~	~~420~~								
~~Inorganic Polymers~~	~~420~~								
~~Vinyl Chloride Polymers~~	~~420~~								
~~Chlorinated Rubber~~	~~420~~								
~~Acrylic Polymers~~	~~420~~								
~~Urethane Polymers~~	~~420~~								
~~Silicones~~	~~420~~								
~~Unique Vehicles~~	~~420~~								
Japans/Faux Finishing Coatings	700	~~700~~		350					
Magnesite Cement Coatings	600			450					
Mastic Coatings	300								
Metallic Pigmented Coatings	500								
Multi-Color Coatings	420		250						
Non-Flat Coatings	250					150	~~50~~	50	
Pigmented Lacquer	680		550				275		
Pre-Treatment Wash Primers	780								
Primers, Sealers, and Undercoaters	350					2~~1~~00	~~50~~	100	
Quick-Dry Enamels	400					2~~1~~50	~~50~~	50	
Quick-Dry Primers, Sealers, and Undercoaters	350**					2~~1~~00	~~50~~	100	
Recycled Flat and Nonflat		250						100	
Roof Coatings	~~300~~	250							
Bituminous Roof Coatings		300				250			
Rust Preventative Coatings	400					~~250~~	~~100~~	100	
Shellac									
Clear	730								
Pigmented	550								
Stains	350					250			
Swimming Pool Coatings									
Repair	650								

Other	340								
Traffic Coatings	250		150						
Waterproofing Sealers	~~400~~								
Wood	400					250			
Concrete/Masonry	400								
Wood Preservatives									
Below-Ground	350								
Other	350								

* The specified limits remain in effect unless revised limits are listed in subsequent columns in the Table of Standards

** The specified limit applies unless the manufacturer submits a report pursuant to Rule 1113(g)(2).

TABLE OF STANDARDS (cont.)

VOC LIMITS

Grams of VOC Per Liter of Material

COATING	Limit
Low-Solids Coating	120

(3) If anywhere on the container of any coating listed in the Table of Standards, on any sticker or label affixed thereto, or in any sales or advertising literature, any representation is made that the coating may be used as, or is suitable for use as, a coating for which a lower VOC standard is specified in the table or in paragraph (c)(1), then the lowest VOC standard shall apply. This requirement does not apply to the representation of the following coatings in the manner specified:

(A) lacquer sanding sealers, which may be recommended for use as sanding sealers in conjunction with clear lacquer topcoats;

(B) metallic pigmented coatings, which may be recommended for use as primers, sealers, undercoaters, roof coatings, or industrial maintenance coatings;

(C) shellacs; and

(D) low-solids coatings.

(4) Except where already required to be in compliance with the previous version of this rule, sale or application of a coating manufactured prior to the effective date of the corresponding standard in the Table of Standards, and not complying with that standard, shall not constitute a violation of paragraph (c)(2) until three years after the effective date of the standard.

(5) All ~~VOC-containing materials~~ architectural coating containers used to apply the contents therein to a surface direct from said container by pouring, siphoning, brushing, rolling, padding, ragging or other means, shall be closed ~~shall be stored in closed containers~~ when not in use~~. In use includes, but is not limited to: being accessed, filled, emptied, or repaired~~. These architectural coating containers include, but should not be limited to: drums, buckets, cans, pails, trays or other application containers.

(6) Averaging ~~Provisions~~ Compliance Option

On or after ~~July~~ January 1, 2001, in lieu of specific compliance with the applicable limits in the Table of Standards ~~manufacturers may comply with the provisions of paragraph (c)(2)~~ for ~~flat,~~ floor, ~~non-flats,~~ primers, sealers, and undercoaters, quick-dry primers, sealers, and undercoaters; quick-dry enamels; rust preventative, roof; stains; waterproofing wood sealers, ~~and~~ industrial maintenance coatings, as well as flats and non-flats (excluding recycled flats and non-flats), manufacturers may ~~by complying with the following averaging~~ average designated coatings~~provisions~~ 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.

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

$$\cancel{\sum_{i=1}^{n} ER_i(U_i) \leq \sum_{i=1}^{n} VOC_i(U_i)}$$

~~Where:~~

$\cancel{\sum_{i=1}^{n} VOC_i(U_i)}$ ~~= Allowable Emissions~~

$\cancel{\sum_{i=1}^{n} ER_i(U_i)}$ ~~= Actual Emissions~~

~~VOC_i = Pounds of VOC per pound of coating solids (lbs/lb);~~

~~U_i = Quantity of coating "i" sold for use within the District (pounds of coating solids); and~~

~~ER_i = VOC content of coating "i", as supplied (lbs/lb).~~

~~The averaging is limited only to flat coatings selected by the manufacturer. Any flat coating not included in the averaging plan shall comply with the VOC limit in paragraph (c)(2).~~

~~(B) Averaging Plan (Plan)~~

~~Manufacturers using the averaging approach shall submit a Plan, pursuant to Rule 221 – Plans, to the Executive Officer. The Plan may not be implemented until it is approved in writing by the Executive Officer. Submittal of the Plan does not provide an exemption from the rule requirements. The Plan shall meet the requirements specified in Appendix A.~~

(d) Administrative Requirements

(1) Containers for all coatings subject to this rule shall display the date of manufacture of the contents or a code indicating the date of manufacture. The manufacturers of such coatings shall file with the Executive Officer of the District and the Executive Officer of the Air Resources Board an explanation of each code.

(2) Containers for all coatings subject to the requirements of this rule shall carry a statement of the manufacturer's recommendation regarding thinning of the coating. This recommendation shall not apply to the thinning of architectural coatings with water. The recommendation shall specify that the coating is to be employed without thinning or diluting under normal environmental and application conditions, unless any thinning recommended on the label for normal environmental and application conditions does not cause a coating to exceed its applicable standard.

(3) Each container of any coating subject to this rule shall display the maximum VOC content of the coating, as supplied, and after any thinning as recommended by the manufacturer. The VOC content of low-solids coatings shall be displayed as grams of VOC per liter of material (excluding any colorant added to the tint bases) and the VOC content of any other coating shall be displayed as grams of VOC per liter of coating (less water and less exempt compounds, and excluding any colorant added to tint bases). VOC content displayed may be calculated using product formulation data,

or may be determined using the test method in subdivision (e).

(4) After January 1, 1998, the coating container label or container shall include the words "Quick-Dry" or shall list the following:

(A) The recoat time for quick-dry primers, sealers, and undercoaters, or

(B) The dry-hard time for quick-dry enamels.

Containers and container labels shall not contain the words "Quick-Dry" unless the material meets the dry times specified in the respective definitions or the material complies with the respective general VOC limit for enamels or primers, sealers, and undercoaters~~.~~

~~(5) The labels of all industrial maintenance coatings shall include the statement "Not for Residential Use" prominently displayed, effective January 1, 2002.~~

(5) The labels of all rust preventative coatings shall include the statement "For ~~Ferrous~~ Metal Substrates Only" prominently displayed, effective ~~January~~ July 1, 2002.

~~(67) Painting Practices~~

~~All architectural coating containers shall be kept closed at all times except when mixing, removing or adding paint. All paint trays shall have lids, which shall be closed at all times except when applying paint to the roller or brush. Brushes and rollers should be cleaned and stored in closed, non-absorbent, non-leaking containers.~~

(e) Test Methods

For the purpose of this rule, the following test methods shall be used

(1) VOC Content of Coatings

The VOC content of coatings subject to the provisions of this rule shall be determined by:

(A) The United States Environmental Protection Agency (USEPA) Reference Test Method 24 (Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings, Code of Federal Regulations Title 40, Part 60, Appendix A) with the

exempt compounds' content determined by Method 303 (Determination of Exempt Compounds) in the South Coast Air Quality Management District's (SCAQMD) "Laboratory Methods of Analysis for Enforcement Samples" manual, or

(B) Method 304 [Determination of Volatile Organic Compounds (VOC) in Various Materials] in the SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual.

(C) Exempt Perfluorocarbons

The following classes of compounds:

cyclic, branched, or linear, completely fluorinated alkanes

cyclic, branched, or linear, completely fluorinated ethers with no unsaturations

cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations

sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine

will be analyzed as exempt compounds for compliance with subdivision (c), only when manufacturers specify which individual compounds are used in the coating formulations. In addition, the manufacturers must identify the USEPA, ARB, and SCAQMD approved test methods, which can be used to quantify the amount of each exempt compound.

(2) Acid Content of Coatings

The acid content of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1613-85 (Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer, and Related Products).

(3) Metal Content of Coatings

The metallic content of a coating subject to the provisions of this rule shall be determined by Method 311 (Determination of Percent Metal in Metallic Coatings by Spectrographic Method) in the SCAQMD's "Laboratory Methods of Analysis for Enforcement Samples" manual.

(4) Flame Spread Index

The flame spread index of a fire-retardant coating subject to the provisions of this rule shall be determined by ASTM Test Method E

84-91A (Standard Test Method for Surface Burning Characteristics of Building Material) after application to an organic or inorganic substrate, based on the manufacturer's recommendations.

(5) Drying Times

The set-to-touch, dry-hard, dry-to-touch, and dry-to-recoat times of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1640 (Standard Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature). The tack-free time of a coating subject to the provisions of this rule shall be determined by ASTM Test Method D 1640, according to the Mechanical Test Method.

(6) Gloss Determination

The gloss shall be determined by ASTM Test Method D 523 (Specular Gloss).

(7) Equivalent Test Methods

Other test methods determined to be equivalent after review by the staffs of the District, the California Air Resources Board, and the USEPA, and approved in writing by the District Executive Officer may also be used.

(8) Multiple Test Methods

When more than one test method or set of test methods are specified for any testing, a violation of any requirement of this rule established by any one of the specified test methods or set of test methods shall constitute a violation of the rule.

(9) All test methods referenced in this subdivision shall be the version most recently approved by the appropriate governmental entities.

(f) Technology Assessment for Flats; Nonflats; Primers, Sealers, and Undercoaters; Quick-dry Primers, Sealers, and Undercoaters; Quick-dry Enamels; Waterproofing Wood Sealers; Stains; Floor; Rust Preventative; Industrial Maintenance Coatings; and Lacquers Coatings

The Executive Officer shall conduct:

(1) A technology assessment for the future VOC limit for flat coatings as specified in paragraph (c)(2) by July 1, 2000 and July 1, 2007.

(2) A technology assessment for the future VOC limit for lacquers specified in paragraph (c)(2) by January 1, 2004.

(3) A technology assessment for the future VOC limit for nonflats; primers, sealers, and undercoaters; quick-dry primers, sealers, and

undercoaters; quick-dry enamels; waterproofing wood sealers; stains floor, rust preventative, and industrial maintenance coatings as specified in paragraph (c)(2) by ~~January~~ July 1, 2001 and ~~January~~ July 1, 2005~~4~~.

-In conducting the above technology assessments, the Executive Officer shall consider any applicable future California Air Resources Board surveys on architectural coatings.

After each technology assessment, the Executive Officer shall report to the Governing Board as to the appropriateness of maintaining the future VOC limit.

The Executive Officer shall conduct a study to further assess reactivity of architectural coatings.

(g) Exemptions

(1) The provisions of this rule shall not apply to:

(A) architectural coatings in containers having capacities of one quart or less, provided that the manufacturer shall submit an annual report to the Executive Officer within three months of the end of each calendar year. The report shall contain information as required by the Executive Officer to monitor the use of the small container exemption. The loss of this exemption due to the failure of the manufacturer to submit an annual report shall apply only to the manufacturer; or

(B) architectural coatings sold in this District for shipment outside of this District or for shipment to other manufacturers for repackaging; or

(C) emulsion type bituminous pavement sealers; or

(D) aerosol coating products.

(E) Use of stains and lacquers in all areas within the District at an elevation of 4,000 feet or greater above sea level.

(2) Until July 1, 2002,~~For~~ architectural coatings recommended by the manufacturer for use solely as quick-dry primers, sealers and undercoaters, ~~the~~ need not comply with the provisions of subdivision (c), so long as~~shall not apply to:~~

~~(A) the manufacture, blending or repackaging of such coatings, or~~

~~(B) the application, sale, offering for sale or soliciting the application of such coatings, provided that~~ the

manufacturer submits an annual report to the Executive Officer within three months of the end of each calendar year~~. The report shall~~ reporting the number of gallons of coatings sold in California under this exemption. ~~include for each exempt coating gallons sold in California.~~

~~This exemption expires effective January 1, 2002.~~

(3) Notwithstanding the provisions of paragraph (c)(2), 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 degrees Fahrenheit, at the time of application provided that:

(A) the coating is not applied from April 1 to October 31 of any year;

(B) 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.

(4) The January 1, 2005 VOC limit for lacquers shall not be applicable until January 1, 2007 and the July 1, 2008 VOC limit for flat coatings shall not be applicable to any manufacturer which meets all of the following criteria:

-(A) The total gross annual receipts are $2,000,000 or less, and

(B) The total number of employees is 100 or less, and

(C) The manufacturer requesting this exemption files a written request with the Executive Officer annually which includes, but is not limited to,

(i) The total gross annual receipts for each of the last three years.

(ii) The total number of employees for each of the last three years

For the purposes of determining the total gross annual receipts and the total number of employees, a manufacturer shall include data from all facilities (both within and outside of the District) which they own, operate, have an ownership interest, or are legally affiliated. If a manufacturer exceeds the criteria specified in subparagraphs

(g)(4)(A) or (g)(4)(B) any time after the initial request is filed with the Executive Officer, this exemption shall be immediately terminated, the manufacturer shall forfeit any future eligibility for this exemption, and the manufacturer shall be considered in violation of this rule for each and every day that lacquers or flat coatings which do not comply with the respective VOC limit in the Table of Standards are supplied, sold, or offered for sale within the District. The loss of this exemption due to the manufacturer exceeding the criteria in subparagraphs (g)(4)(A) or (g)(4)(B) shall apply only to the manufacturer.

(5) Manufacturers of recycled flats and nonflats must submit a letter to the Executive Officer certifying their status as a Recycled Paint Manufacturer. The manufacturer shall submit an annual report to the Executive Officer within three months of the end of the calendar year. The report shall include for each recycled coating, gallons repackaged and distributed in the District.

(6) Manufacturers of rust preventative coatings shall submit an annual report to the Executive Officer within three months of the end of the calendar year. The report shall include for each rust preventative coating, the number of gallons sold in the District.

(7) Essential Public Service Agencies shall submit an annual report to the Executive Officer within three months of the end of the calendary year. The report shall include for each essential public service coating, the number of gallons used in the District.

(8) The provisions of paragraph (c) shall not apply to manufacturing facilities which apply coatings to test specimens for purposes of research and development of those coatings.

APPENDIX A: Averaging Provision

(A) 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:

$$\sum_{i=1}^{n} GiMi \leq \sum_{i=1}^{n} GiViLi$$

Where:

$\sum_{i=1}^{n} GiMi$ = Actual Emissions

$\sum_{i=1}^{n} GiViLi$ = Allowable Emissions

Gi = Total Gallons of Product (i) subject to Averaging:

Mi = Material VOC content of Product (i). as pounds per gallon:

Vi = Percent by Volume Solids and VOC in Product I

$$= \frac{Vm - Vw - Ves}{Vm}$$

(Refer to paragraph (b)(19) for definition of terms)

For Non-Zero VOC Coatings:

$$= \frac{\text{Material VOC}}{\text{Coating VOC}}$$

For Zero VOC coatings:

= % solids by volume

Li = Regulatory VOC Content Limit for Product (i). as pounds per gallon

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 the Table of Standards. The manufacturer shall not include any quantity of coatings that it knows or should have known will not be used in the District.

(B) Averaging Program (Program)

At least six months prior to the start of the compliance period, manufacturers shall submit an Averaging Program, which is subject to all the provisions of Rule 221 – Plans and Rule 306 – Plan Fees, to the Executive Officer. Averaging may not be implemented until the Program is approved in writing by the Executive Officer.

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

(~~A~~C) General Requirements

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

1. An identification of the contact persons, telephone numbers, and name of the manufacturer who is submitting the ~~Plan~~ Program~~, and will be implementing the requirements~~.
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 the Table of Standards, their ~~a listing of the flat coatings, and available variations, legible copies of the existing labels for each coating, material safety data sheets, and~~ VOC content specified in units of both ~~(pounds of VOC per pound of solids), (~~grams of VOC per liter of coating~~)~~, and grams of VOC per liter of material~~)~~ and the designation of the coating category~~.~~.
3. ~~An operational plan covering all the coatings for each compliance period that the Plan will be in effect. The operational plan shall contain all of the following:~~ 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 are below the compliance limit in the Table of Standards. The demonstration shall use the equation specified in paragraph (A) of this Appendix for projecting the

actual emissions and allowable emissions during each compliance period. The demonstration shall also i[illegible]de all VOC content levels and projected volume within the District for [illegible]ch coating listed in the Program during each compliance period. The requested data can be summarized in a matrix form.

4. A ~~an identification~~ specification of the compliance period(s) and applicable reporting dates. ~~for the manufacturer to report the information required by the Executive Officer~~. The length of the compliance period shall not be more than one year or less than six months.~~exceed 365 days;~~

5. An Identification and description of all records to be made available to the Executive Officer upon request, if different then those identified under paragraph (c)(6).

6. A~~a~~n identification and description of specific ~~sales~~ 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. ~~to be provided to the Executive Officer for approving and enforcing the Plan;~~

   ~~⇒ for each coating listed, all VOC content levels which will be applicable for the coating during each compliance period;~~

   ~~⇒ the projected sales for each coating at each different VOC content for every compliance period that the Plan will be in effect;~~

   ~~⇒ a detailed demonstration showing that the projected actual emissions will not exceed the allowable emissions for each compliance period that the Plan will be in effect. The demonstration shall use the equation specified in subparagraph (c)(6)(A) for projecting the actual emissions and allowable emissions during each compliance period, and shall specify the methodology used for converting VOC content in g/l to lbs/lb for VOC, and ER. The demonstration shall also include all VOC content levels and projected sales within the District for all coatings listed in the Plan during each compliance period;~~

   ~~⇒ For each coating included in the Plan, the total sales volume (in gallons) within the District will be reported for the time period just completed which is equivalent to the requested initial compliance period.~~

7. A~~a~~ statement, signed by a ~~legal representative~~ responsible party for the manufacturer, that all information ~~and operational plans~~ submitted ~~with the~~

~~Plan are~~ is true and correct, and that records will be made available to the Executive Officer upon request.

~~7. a reconciliation plan which commits the manufacturer to completely reconcile any shortfalls in any and all cases, to the extent permitted by law, even if the manufacturer files for bankruptcy protection. The reconciliation plan shall contain all of the following:~~

~~⇒ a clear and convincing demonstration of how shortfalls of up to 5%, 10%, 15%, 25%, 50%, 75%, and 100% of the allowable emissions will be completely reconciled within 90 working days from the date the shortfall is determined;~~

~~⇒ a listing of the specific records and other information that will be necessary to verify that the shortfalls were reconciled;~~

~~⇒ a commitment to provide any record or information requested by the Executive Officer to verify that the shortfalls have been completely reconciled.~~

(D~~B~~) Reporting Requirements

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.

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 Executive Officer ~~A~~ a final report, providing a detailed demonstration~~s~~ of the balance between ~~what~~ the actual ~~emissions~~ and ~~the~~ allowable emissions ~~were during~~ for the compliance period, an update of 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 Executive Officer to determine whether the manufacturer complied with t 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 Executive Officer upon request. ~~shall be submitted to the Executive Officer within 60 days after the termination of the indicated compliance period.~~ A manufacturer may request, in writing, an extension of up to 30 days for submittal of the final report.

(E~~C~~) Renewal of a ~~Plan~~ Program

A Program automatically expires at the end of the compliance period. ~~If the Plan has no changes, except the compliance period,~~ T~~t~~he manufacturer ~~shall submit a notice in writing,~~ may request a renewal of the Program by submitting a renewal request that shall include an updated Program, meeting all applicable Program requirements. ~~specifying a new compliance period for the Plan.~~ The renewal request will be considered conditionally approved until the Executive Officer 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 Executive Officer shall base such determination on all available information, including but not limited to, the mid-term and final reports of the preceding compliance period. ~~Otherwise, all of the information specified in Section A of this Appendix shall be submitted~~.

(F~~D~~) Modification of a Program ~~Plan~~

A manufacturer may request a modification of the Program at any time prior to the end of the compliance period. The Executive Officer 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.

~~If the Executive Officer determines that: (1) the information submitted pursuant to the approval process is no longer valid, or (2) the actual emissions are exceeding the allowable emissions specified in the approved Plan, then the Executive Officer shall notify the manufacturer of his/her findings and the manufacturer shall modify the Plan within 30 days, as necessary to ensure that the Plan meets all of the~~

~~applicable requirements and that the actual emissions will not exceed the allowable emissions for the compliance period.~~

- ~~If the VOC standard specified in the Table of Standards for flat the coatings are is modified in a future rulemaking, the Executive Officer shall notify the manufacturer of the change and the manufacturer shall modify, within 30 days, the allowable emissions specified in the approved Plan to reflect the modified VOC standard as of their effective dates.~~
- ~~The manufacturer may modify the Plan during the compliance period to ensure that actual emissions are less than or equal to the allowable emissions. All such modifications shall be submitted to and approved by the Executive Officer prior to implementation.~~

(~~E~~G) Termination of a Program ~~Plan~~

1. A manufacturer may terminate its Program at any time by filing a written notification to the Executive Officer. 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)~~

~~A Plan shall remain in effect until:~~

~~⇒ the Plan reaches the expiration date specified in the Plan by the Executive Officer;~~

~~⇒ the Plan is modified by the manufacturer and approved by the Executive Officer;~~

~~⇒ the Plan is modified by the Executive Officer;~~

~~the VOC standard for flat coatings is modified and the manufacturer informs the Executive Officer in writing that the Plan will terminate on the effective date of the modified standard.~~

~~(b) a manufacturer submits a written request for termination of the plan.~~

2. The Executive Officer may ~~shall~~ terminate a Program ~~Plan~~ if any of the following circumstances occur:

~~⇒ the manufacturer demonstrates to the satisfaction of the Executive Officer that the continuation of the Plan will result in an extraordinary economic hardship;~~

(a) Tthe manufacturer violates the requirements of the approved Program, and at the end of the compliance period, the actual emissions exceed the allowable emissions. ~~by 20% or more after reconciliation;~~

~~⇒ the manufacturer fails to meet the requirements of the reconciliation plan within the specified time periods;~~

(b) the manufacturer demonstrates a recurring pattern of violations and has consistently failed to take the necessary steps to correct those violations.

~~(b) Upon termination of a Plan, all flat coatings listed in the Plan must comply with the VOC standard specified in the Table of Standards for flat the coatings. In addition, any shortfall for the current compliance period shall be reconciled by the manufacturer.~~

~~(F) Plan Approval Timeframes~~

~~The provisions of Rule 210 Applications and Rule 221 Plans shall apply.~~

(H) 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.

(I) Labeling

Each container of any coating that is included in averaging program, and that exceeds the applicable VOC limit in the Table of Standards shall display the following statement: "This product is subject to the averaging provisions of SCAQMD Rule 1113". A symbol specified by the Executive Officer may be used as a substitute.

(J~~G~~) Violations

The e~~E~~xceedance of the allowable emissions for any ~~entire~~ compliance period ~~that the Averaging Plan is in effect~~ shall constitute a ~~single,~~ separate violation ~~of the~~

~~requirements of this section~~ for each day of the ~~applicable~~ compliance period. However, any violation of the requirements of the Averaging Provision of this rule, which the violator can demonstrate, to the executive officer, 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.

APPENDIX C

Comparison of the USEPA National Rule with Proposed Amended Rule 1113

ARCHITECTURAL COATINGS

Originally made available on April 9, 1999. Any changes to the original are shown by double strikeout or double underline.

Written Analysis for California Health & Safety Code 40727.2

Comparison of the U.S. EPA's National Rule with Proposed Amended Rule 1113 (PAR 1113) - Architectural Coatings[1]		
Rule Section	**National Rule**	**PAR 1113**
Applicability	Coatings manufactured or imported for sale or distribution in the United States on or after 9/13/1999 (applies only to manufacturers and importers of coatings).	Any person who supplies, sells, offers for sale, applies, or solicits the application of any architectural coating, or who manufactures an architectural coating within the district.
Compliance	Effective date: 9/13/1999; 3/13/2000 for coatings registered under the Federal Insecticide, Fungicide, and Rodenticide Act.	Effective dates vary - See attached table; three-year "sell through" period.
Exemptions	Aerosol coatings. Coatings sold in containers of 1 liter or less. Coatings collected and redistributed at community-based paint exchanges. Coatings manufactured for export only.	Aerosol coatings. Coatings sold in containers of 1 quart or less. Coatings manufactured for shipment to other manufacturers for repackaging or for sale outside the District. Emulsion-type pavement sealers. Quick-Dry Primers, Sealers, and Undercoaters, provided manufacturers submit sales data. Proposed to expire effective July 1, 2002 Addition of up to 10% thinner to lacquers during certain environmental conditions Exemption for final lacquer limit for small manufacturers - allowing 3 year delay in compliance ~~Manufacturers of Recycled flats and nonflats have an extended compliance period~~ ~~Bituminous Roof Coatings have an extended compliance period~~
Definitions	52 categories defined.	37 categories defined.
VOC Limits	See attached summary table for complete list of categories and	See attached summary table for complete list of categories

1 This matrix provides only a summary comparison of the national rule and PAR 1113. For more detail, the reader is referred to the specific rules. The USEPA National Rule may be found at 63 Fed. Reg. 48848 (1998) (to be codified at 40 C.F.R. Part 59) (promulgated on September 11, 1998)

	applicable limits No future effective dates. Limits based on the coating being thinned to the manufacturer maximum recommendation. If none of the specific category definitions applies to the coating, it falls into flat or nonflat category, depending on the gloss level; by inference, assume that flat or nonflat VOC limit applies.	VOC content limit of 250 grams per liter for all coatings, with the exception of the categories listed in the table of standards. Any thinning must not cause a coating to exceed its applicable standard, and the label must display the maximum VOC content of the coating as applied and after maximum recommended thinning. Varying future effective dates - see table
Container Labeling	Date of manufacture or date code, manufacturer's recommendation regarding thinning, VOC content, and description of appropriate use of or warning that industrial maintenance coatings are not for residential use. Containers of recycled coatings must reveal the percentage of post-consumer coating content. May label either the actual VOC content in the container, or the applicable VOC limit in the table of standards. Special labeling requirement for Industrial Maintenance Coatings	Date of manufacture or date code, manufacturer's recommendation regarding thinning, maximum VOC content. Special labeling requirements for quick-dry categories and ~~,~~ rust preventative coatings~~, and industrial maintenance coatings~~ Special labeling for coatings under the averaging provision Maximum VOC content on container label
Optional Compliance Flexibility Provisions,including Averaging Provisions	Two alternative compliance methods: Exceedance fee provision: allows compliance by paying a fee ($.0028 per gram, $2500 per ton, $1.25 per pound of VOC in excess of the applicable VOC content limit) in lieu of meeting the VOC content limits; fees are to go to the Regional Office of U.S. EPA. Tonnage exemption: allows manufacturers and importers to sell or distribute limited quantities of architectural coatings that do not comply with the VOC content limits based on the total mass of VOC contained in all exempt coatings; the limit of the exemption for all coatings is 25 tons VOC from 9/13/1999 through 12/31/2000; 20 tons VOC in the year 2001; and 10 tons per year in 2002 and each	One additional alternative compliance method: Averaging Provision: allow manufactures to average emissions across several coating categories. Manufacturers can continue to market non-compliant coatings by offsetting emissions with super-compliant coatings. Actual emissions must be equal to or below allowable emissions during the compliance period.

	subsequent year. One labeling flexibility option: Recycled coatings option: allows calculation of an adjusted-VOC content for coatings that contain a percentage of post-consumer (recycled) coating; the VOC content of the volume of recycled coating is subtracted from the actual VOC content of the final coating.	
Recordkeeping	The only recordkeeping requirements apply to the compliance flexibility options; records must be retained three years.	No recordkeeping requirements, except for the optional averaging provision, which requires that records be maintained for three years
Reporting	One-time initial reporting requirement of all manufacturers and importers, due by 9/13/1999 or when becoming subject to the standards, includes: company name and address, street address of each U.S. facility; a list of applicable categories in the table of standards; and an explanation of any date coding system used. The only other reporting requirements are associated with the optional compliance provisions. Required reports are to be sent to the regional U.S. EPA office.	Explanation of any date coding system on the label that must be filed with the district air pollution control officer (APCO). Small Container Exemption – annual sales within District, once a year Quick-Dry Primers, Sealers, and Undercoaters exemption – annual sales in California, once a year Manufacturers of Recycled flats and nonflats must report annual sales data Manufacturers of Rust Preventative Coatings must report annual sales data Essential Public Service Agencies must report, on an annual basis, total usage of the essential public service coating The only other reporting requirements are associated with the optional averaging provisions, twice a year
Test Methods	U.S. EPA Method 24 is the reference method to determine VOC content of the coating, but an alternative method, formulation data, or other means (e.g., quality assurance checks, recordkeeping) of predicting that the coating has been manufactured properly, may be used as long as it can be confirmed with Method 24. Administrator may approve an alternative to Method 24 if the method is demonstrated to provide results acceptable for purposes of determining compliance. A special method for methacrylate	The VOC content of coatings is to be measured using Method 24, or an equivalent method approved by the district APCO. VOC content may also be calculated using product formulation data. Acid Content of Coatings – ASTM Test Method D 1613-85 Metal Content of Coatings – Method 311 Flame Spread Index - ASTM Test Method E 84-91A Dry Times - ASTM Test Method D 1640 Gloss Determination - ASTM Test Method D 523

	multicomponent coatings is provided as an attachment to the rule. No frequency of testing specified	Other equivalent test methods No frequency of testing specified
Work Practices	No rec..rements for end-users	Requirements for work practices, including closed containers for all VOC containing materials ~~No spraying of two-component polyurethanes, effective January 1, 2005~~

Summary of Proposed Amended Rule 1113 & National AIM Rule

Volatile Organic Compound (VOC) Limits (grams per liter)

Coating Rule Name or Number	EPA 63 FR 176: 48848	South Coast PAR1113
Antenna	530	
Anti-Fouling	450	
Anti-Graffiti (Industrial Maintenance)	600	420 [250] [7/1/02] [100] [7/1/06]
Bituminous and Mastics	500	
Bituminous Roof Coatings		300 [250] [7/1/2002]
Bond Breakers	600	350
Calcimine Recoaters	475	
Chalkboard Resurfacers	450	
Concrete Curing Compounds	350	350
Concrete Curing and Sealing Compounds	700	
Concrete Protective	400	
Concrete Surface Retarders	780	
Conversion Varnishes	725	
Dry Fog	400	400
Essential Public Service Coating		420 [340 [7/1/2002] [100] [7/1/2006]
Extreme High Durability	800	
Faux Finishing/Glazing (Japans)	700	350
Fire Proofing, Exterior		350
Fire Retardant, Clear		650
Fire Retardant, Pigmented		350
Fire Retardant/Resistive, Clear	850	
Fire Retardant/Resistive, Opaque	450	
Flats, Exterior	250	250 [100] [7/1/01] [50] [7/1/08]

Flats, Interior	250	250 [100] [7/1/01] [50] [7/1/08]
Floor	400	400 [100] [7/1/02] [50] [7/1/06]
Flow	650	
Form Release Compounds	450	
Graphic Arts (Sign Paints)	500	500
Heat Reactive	420	
High Temperature	650	
High Temperature (Industrial Maintenance)		No Limit [550] [7/1/02] [420] [7/1/06]
Impacted Immersion	780	
Industrial Maintenance Coatings	450	420 [250] [7/1/02] [100] [7/1/06]
Lacquers, Clear		550 [275] [1/1/05]
Lacquers (Including Lacquer Sanding Sealers)	680	
Lacquers, Pigmented		550 [275] [1/1/05]
Low Solids Coatings[1]		120
Low Solids Stains[1]	120	
Low Solids Wood Preservatives	120	
Magnesite Cement	600	450
Mastic Texture	300	300
Metallic Pigmented	500	500
Multi-Color	580	250
Nonferrous Ornamental Metal Lacquers and Surface Protectants	870	
Non Flats, Interior	380	250 [150] [7/1/02] [50] [7/1/06]
Non Flats, Exterior	380	250 [150] [7/1/02] [50] [7/1/06]
Nuclear	450	
Pre-Treatment Wash Primers	780	780
Primers and Undercoaters	350	

Primers, Sealers, and Undercoaters, General		350 [200] [7/1/02] [100] [7/1/06]
Quick Dry Enamels	450	400 [250] [7/1/02] [50] [7/1/06]
Quick Dry Primers, Sealers, and Undercoaters	450	350[2] [200] [7/1/02] [100] [7/1/06]
Repair and Maintenance Thermoplastic	650	
Roof	250	300 [250] [Date of Adoption]
Recycled Flats and Non-flats		250 [100] [7/1/06]
Rust Preventative	400	400 [100] [7/1/06]
Sanding Sealers		350
Sanding Sealers (Non-Lacquer)	550	
Sealers (Including Clear Wood Sealers)	400	
Shellacs, Clear	730	730
Shellacs, Opaque	550	
Shellacs, Pigmented		550
Stains, Clear and Semitransparent	550	350 [250] [7/1/02]
Stains, Opaque	350	350 [250] [7/1/02]
Stain Controllers	720	
Swimming Pool, General	600	340
Swimming Pool Repair & Maintenance		650
Thermoplastic Rubber and Mastics	550	
Traffic	150	150
Varnishes	450	350
Water Proofing Wood Sealers		400 [250] [7/1/02]
Water Proofing Concrete/Masonry Sealers		400
Water Proofing Sealers and Treatments, Clear	600	
Water Proofing Sealers and Treatments, Opaque	600	
Wood Preservatives, Below Ground	550	350
Wood Preservatives, Clear and Semitransparent	550	350
Wood Preservatives, Opaque	350	350
Zone Marking	450	

Adopted	Sep 98	Sep 77
Last Amended		Nov 96

Notes:

1. Low-Solids Coatings - VOC limits in terms of Material VOC
2. Quick-Dry Primers, Sealers, Undercoaters currently exempt if manufacturers reports sales data

Brackets indicate future effective VOC limits.

The EPA rule states that if a coating is not defined in the table above, it falls into the flat or nonflat category based on the gloss level, and the applicable limit applies.

PAR1113 states that if a coating is not defined in the table above, it falls into the default 250 g/l VOC limit requirement, as defined in section c(1).

CHAPTER 2

PROJECT DESCRIPTION

Project Location

Background

Project Objective

Project Description

TABLE 1-3
RANKING OF ALTERNATIVES

Project/ Alts	Air Quality Impacts		Water Demand Impacts		Water Quality Impacts		Public Facility Maintenance Impacts		Fire Department Impacts		Transportation/ Circulation Impacts		Solid/Hazardous Waste Impacts		Hazards Impacts		Human Health	
	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum	Proj.	Cum
PAR 1113	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(2)*	✓
Alt. A	✓ *(4)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(2)*	✓
Alt. B	✓ *(2)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(1)*	✓
Alt. C	✓ *(3)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(1)*	✓	✓ *(2)*	✓

Notes: The ranking scale is such that 1 represents the least impacts and subsequent higher number represent increasingly higher worse impacts.
The same two numbers in brackets for a specific Impact Section means that these proposals would have the same impacts if implemented.
An X denotes either a project-specific significant adverse impact or cumulative significant adverse impact.
A ✓ denotes no significant adverse impact or no cumulative significant adverse impact.

Proj. = Project-Specific Impacts
Cum. = Cumulative Impacts

Summary of Chapter 5 – Project Alternatives

Chapter 5 provides a discussion of alternatives to the proposed project even though such an analysis is not required since this Final SEA finds no new significant impacts. The alternatives analyzed include measures for attaining the objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. Table 1-2 lists the alternatives considered by the SCAQMD and how they compare to PAR 1113.

TABLE 1-2
COMPARISON OF ADVERSE ENVIRONMENTAL IMPACTS OF PAR 1113 TO THE ALTERNATIVES

Environmental Topic	Alternative A (No Project)	Alternative B (Extended Compliance Deadlines)	Alternative C (No Final IM//RP VOC Content Limits)	Mitigation Measures
Air Quality	Not Significant (loss of VOC emission reductions)	Not Significant (loss of VOC emission reductions in interim years)	Not Significant (loss of VOC emission reductions)	None Required
Water Resources				
Water Demand	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Water Quality	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Public Services				
Public Facility Maintenance	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Fire Department	Not Significant, greater than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, greater than PAR 1113	None Required
Transportation/ Circulation	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Solid/Hazardous Waste	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not significant, less than PAR 1113	None Required
Hazards	Not Significant, equivalent to PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, equivalent to PAR 1113	None Required
Human Health	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	None Required

Table 1-3 presents a matrix that lists the significant adverse impacts as well as the cumulative impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The table also ranks each impact section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another.

Human Health	Not Significant	None Required

Environmental Impacts Found Not To Be Significant

The Initial Study for PAR 1113 includes an environmental checklist of approximately 15 environmental topics. As discussed above, review of the proposed project at the NOP/IS stage identified three topics for further review in the Final SEA. Comments received on the NOP/IS and a Public Workshop/CEQA Scoping Meeting held December 9, 1998, and during various Industry Working Group and other industry meetings identified three other environmental areas for further review. For the remaining nine environmental areas where the Initial Study concluded that the project would have no significant direct or indirect adverse effects on the remaining environmental topics, no comments were received on the NOP/IS or at the public meetings that changed this conclusion. Consistent with the 1997 AQMP EIR, SCAQMD staff has reaffirmed that there will be no significant impacts to the following environmental resources in the district as a result of implementing PAR 1113:

- Land Use and Planning
- Population and Housing
- Geophysical
- Biological Resources
- Energy and Mineral Resources
- Noise
- Aesthetics
- Cultural Resources
- Recreation

Other CEQA Topics

CEQA requires SEAs to address the potential for irreversible environmental changes, growth-inducing impacts, and inconsistencies with regional plans. Consistent with the 1997 AQMP EIR, additional analysis of the proposed project confirms that it would not result in irreversible environmental changes or the irretrievable commitment of resources, foster economic or population growth or the construction of additional housing, or be inconsistent with regional plans.

manufacturers', Occupational Safety Health Administration's (OSHA), and American Conference of Governmental Industrial Hygienists' (ACGIH) required and recommended safety procedures. Additionally, the trend by resin manufacturers and coating formulators to phase out the use of more toxic solvents (e.g., monomeric diisocyanates, EGBE, etc.) with less toxic solvents (e.g., polymeric diisocyanates, texanol, ethylene glycol, and propylene glycol) would further eliminate the long-term human health risks from the use of compliant coatings.

In response to comments, staff reevaluated the use of low- or zero-VOC two component IM systems containing diisocyanate compounds. The SCAQMD has refined its definition of industrial maintenance (IM) to prohibit the use of IM coatings in residential, commercial, and institutional settings. Based on actual field monitoring data, and the chemistry of the two component systems, staff has determined their use would not expose the public at large to significant adverse acute human health impacts. Test data shows the concentrations of diisocyante compounds emitted during the application of these IM systems are below the established health protective thresholds. Thus, the previous limitation on spraying has been removed. For acute exposure to applicators, the use of the same safety procedures to reduce long-term health effects will also reduce short-term health effects associated with the use of replacement solvents.

Therefore, the general public as well as coating applicators will not be exposed to long-term or short-term significant adverse human health impacts as a result of the implementation of PAR 1113. Furthermore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Mitigation

Table 1-1 summarizes the impacts and mitigation measures associated with the environmental impact areas that the SCAQMD analyzed for PAR 1113.

TABLE 1-1
ENVIRONMENTAL IMPACTS FROM PAR 1113

Environmental Impact Area	Significance Determination	Mitigation Measures
Air Quality	Not Significant	None Required
Water Resources		
Water Demand	Not Significant	None Required
Water Quality	Not Significant	None Required
Public Services		
Maintenance at Public Facilities	Not Significant	None Required
Fire Departments	Not Significant	None Required
Transportation/Circulation	Not Significant	None Required
Solid/Hazardous Waste	Not Significant	None Required
Hazards	Not Significant	None Required

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Transportation / Circulation

The potential additional trips caused by the disposal of coatings due to shorter shelf lives, pot lives, or lesser freeze-thaw capabilities as compared to conventional coatings are evaluated and presented in Chapter 4. The analysis concludes that transportation/circulation impacts associated with the proposed amendments to Rule 1113 will be insignificant. Therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Solid / Hazardous Waste

The solid waste evaluation examined increased disposal of coatings due to shorter shelf lives, pot lives, or lesser freeze-thaw capabilities as compared to conventional coatings. The analysis included in Chapter 4 concluded that solid/hazardous waste impacts associated with the proposed amendments to Rule 1113 will be insignificant. Therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Hazards/Risk of Upset

The increased usage of exempt solvents or coalescing solvents as a result of implementing PAR 1113 will not result in any significant increased risk of upset. These solvents are not significantly more flammable than the solvents, such as methyl ethyl ketone (MEK), toluene, xylene, ethylene glycol butyl ether (EGBE), that they are replacing. Further, it is anticipated that resin manufacturers and coating formulators will continue the trend of using less hazardous solvents such as Texanol, Oxsol 100, propylene glycol, ethylene glycol, etc., in their compliant water-borne coatings. It is expected that future compliant AIM coatings will contain less or non-hazardous materials compared to conventional coatings, resulting a net benefit. Therefore, hazard impacts as a result of the proposed amendments will be insignificant and no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Human Health

The human health impact evaluation examined the potential increased long-term (carcinogenic and chronic) and short-term (acute) human health exposure associated with the use of various replacement solvents in complaint coating formulations. In the context of long-term exposure, the analysis in Chapter 4 concluded that the general public would not be exposed to long-term health impacts due to the intermittent application of coatings in general. Furthermore, coating applicators' long-term exposure to more toxic replacement solvents (e.g., diisocyanates) are eliminated by following the coating

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant

Water Quality

Based upon the analyses, PAR 1113 is not expected to create significant adverse water quality impacts for the following reasons. Use of exempt solvents is expected to result in equivalent or lesser water quality impacts than currently used solvents since the exempt solvents are less toxic coalescing solvents. Further, because currently available compliant coatings are already based on water-borne technology, no additional water quality impacts from future compliant water-bone coatings are expected because these coatings are also expected to be water based. Finally, PAR 1113 is not expected to promote the use of compliant coatings formulated with hazardous solvents that could create water quality impacts.

No significant impacts are anticipated, therefore, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Public Services

Impacts on public services are divided into two categories – maintenance at public facilities and fire departments. Public Services impacts are considered significant if they will result in the need for new or altered public facilities or services or if fire departments would have to respond more frequently to accidental release incidences and conduct additional inspections.

Maintenance at Public Facilities

Based upon the qualitative and, when available, quantitative durability descriptions in the coating product information sheets, staff concluded that low VOC coatings have durability characteristics comparable to conventional coatings. Therefore, no significant public services (e.g., maintenance at public facilities) impacts are anticipated from the implementation of PAR 1113. As a result, no mitigation measures are necessary. Cumulative impacts are also considered not significant.

Fire Departments

There is not expected to be any significant increase in accidental releases due to the use of compliant coating materials. While potential additional trips may result, as shown in Chapter 4, any such increase would be insignificant. Additionally, as demonstrated in the "Human Health" and "Hazards" sections, future compliant coating materials are not expected to cause significant adverse human health impacts or risk of upset, so accidental release scenarios would not be expected to pose a significant risk to responding firefighters

Air Quality

The adoption and implementation of PAR 1113 is expected to produce substantial long-term VOC emission reductions. The analysis concludes that air quality impacts associated with the proposed amendments to Rule 1113 will be insignificant.

Based on the analysis of potential direct and indirect air quality effects of implementing PAR 1113 in Chapter 4, it is concluded that once the lower VOC content limits are implemented the overall air quality effects of the PAR 1113 will be a VOC emission reduction of approximately 21.8 tons per day by the year 2010.

Eight areas of concern were identified that could result in increased indirect VOC emissions due to a requirement to lower the VOC content of coatings. The eight alleged impacts (raised in the industry's prior litigation) are: increased coating thickness, more thinning, more topcoats, more touch-ups, more priming, more frequent recoating, more substituted coatings, and reactivity. The first seven issues all essentially assert that the new formulations, either solvent-based or water-based, result in more coating use resulting in an overall increase in VOC emissions for a specific area covered or over time. The eighth issue involves the assertion that more reactive solvents will be used in the compliant reformulations than the solvents used in the solvent-based coatings. All eight areas were analyzed in depth in Chapter 4. The result of this analysis reveals that overall PAR 1113 will achieve significant VOC emission reductions.

Water Resources

Impacts on water resources are divided into two categories - water demand and water quality. Water resources impacts are considered significant if they cause changes in the course of water movements or of drainage or surface runoff patterns; substantially degrade water quality; deplete water resources; significantly increase toxic inflow to public waste water treatment facilities; or interfere with groundwater recharge efforts.

Water Demand

Increased water demand from the manufacturing and use of compliant water-borne coatings is evaluated in Chapter 4. The analysis concludes that water demand impacts associated with the proposed amendments to Rule 1113 will be insignificant. The analysis reveals that there is sufficient capacity to meet the water demand associated with the implementation of PAR 1113. Furthermore, the MWD and other water providers are currently exploring various strategies for increasing water supplies and maximizing the use of existing supplies. Options include storage of water from existing sources, use or storage of water unused by other states or agricultural agencies, and advance delivery of water to irrigation districts. These continuing and future water management programs assure that the area's full-service water demands will be met at all times.

Hazards

Potential hazard impacts may be associated with the production, use, storage, and transport of hazardous materials. For the purposes of this Final SEA, the term hazardous materials refers to both hazardous materials and hazardous wastes. Hazardous materials may be found at industrial production and processing facilities. Examples of hazardous materials used on a consumable basis include petroleum, solvents, and coatings. Currently, hazardous materials are transported throughout southern California in great quantities via all modes of transportation including rail, highway, water, air and pipeline.

Hazard concerns are also related to the risks of explosions, the release of hazardous substances, or exposure to air toxics. State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to health or the environment in the event that such materials accidentally released. Federal laws, such as the Emergency Planning and Community-Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act or SARA) impose similar requirements.

This section also describes the reporting system for reporting accidental releases of hazardous materials. Data are provided for the number of hazardous materials releases in 1996, 1997, 1998, statewide and for the four counties within the SCAQMD's jurisdiction. In addition, data are provided for releases of materials that could be used to formulate conventional and future compliant architectural coatings.

Human Health

This section briefly describes the existing setting for human health as it is affected by emissions from existing coating formulations. As noted in this section, the actual effects of exposure to coatings depend on such factors as the exposure duration, potency of the solvents of concern, exposure frequency, and other factors. A table is included that shows the solvents that are currently used to formulate AIM coatings that are considered to be toxic substances. The table also shows the range of adverse human health effects for each toxic substance.

Summary of Chapter 4 – Environmental Impacts and Mitigation Measures

CEQA Guidelines §15126(a) requires the following: "An EIR shall identify and focus on the significant environmental effects of the proposed project. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects."

The following subsections briefly summarize the analysis of potential adverse environmental impacts from the adoption and implementation of PAR 1113.

Public Services

Public services offered and available within the Basin are extensive and numerous although statistical data specific to the Basin are not available. Information concerning public services was obtained from references that outlined data by county or by the Southern California Association of Governments (SCAG) Region. The following public service areas are discussed in this section: schools, law enforcement, and fire protection.

Transportation/Circulation

The agencies that share authority for transportation-related programs in the SCAQMD's area of jurisdiction include the SCAG, the county transportation authorities, local government transportation departments, Caltrans, and the SCAQMD. For the purposes of the AQMP, however, the SCAQMD and SCAG share the responsibility for developing transportation-related control measures in the AQMP. SCAG develops transportation plans for the region, including the Regional Mobility Element (RME) and the Regional Transportation Improvement Program (RTIP), which detail all of the capital and non-capital improvements to the transportation system that will occur between now and 2010. This chapter also includes descriptions of the various transportation and transit systems.

Both federal conformity regulations and state law require transportation plans to show increases in average vehicle ridership, decreases in vehicle trips and vehicle miles traveled, and restrict growth in vehicle emissions. Currently, for home-to-work commute trips in the district, about 75.6 percent of people drive alone, 18.8 percent share a ride and 5.6 percent use public transit.

Solid/Hazardous Waste

Solid wastes consist of residential wastes (trash and garbage produced by households), construction wastes, commercial and industrial wastes, home appliances and abandoned vehicles, and sludge residues (waste remaining at the end of the sewage treatment process). A total of 32 Class III active landfills and two transformation facilities are located within the district with a total disposal capacity of 111,198 tons per day. Los Angeles County has 14 active landfills with a permitted capacity of over 58,000 tons per day. San Bernardino County has nine public and private landfills within the district's boundaries with a combined permitted capacity of 11,783 tons per day. Riverside County has 12 active sanitary landfills with a total capacity of 14,707 tons per day. Each of these landfills is located within the unincorporated area of the county and is classified as Class III. Orange County currently has four active Class III landfills with a permitted capacity of over 25,000 tons per day.

The following subsections briefly highlight the existing settings for those environmental areas that could be adversely affected by implementing PAR 1113.

Air Quality

Over the last decade and a half, there has been significant improvement in air quality within the area of the SCAQMD's jurisdiction. Nevertheless, several air quality standards are still exceeded frequently and by a wide margin. Of the National Ambient Air Quality Standards (NAAQS) established for six criteria pollutants (ozone, lead, sulfur dioxide, nitrogen dioxide, carbon monoxide, and PM10), the area within the SCAQMD's jurisdiction is only in attainment with the sulfur dioxide, nitrogen dioxide, and lead standards. Chapter 3 provides a brief description of the existing air quality setting for each criteria pollutant, as well as the human health effects resulting from each criteria pollutant.

Water

The State Water Resources Control Board (SWRCB) and the nine regional water quality control boards (RWQCB) are responsible for protecting surface and groundwater supplies in California, regulating waste disposal, and requiring cleanup of hazardous conditions (California Water §§13000 - 13999.16). In particular, the SWRCB establishes water-related policies and approves water quality control plans, which are implemented and enforced by the RWQCBs. Five RWQCBs have jurisdiction over areas within the boundaries of the SCAQMD's area of jurisdiction. These agencies also regulate discharges to state waters through federal National Pollution Discharge Elimination System (NPDES) permits. Discharges to publicly owned treatment works (POTW) are regulated through federal pre-treatment requirements enforced by the POTWs.

Total water demand within the district was approximately 4.22 million-acre feet (MAF)[1] or about 1.4 trillion gallons in fiscal year 1995 (July 1994 through June 1995). About two-thirds of that demand occurred in the service area of the Metropolitan Water District of Southern California (MWD). The MWD's service area includes southern Los Angeles County, all of Orange County, the western portion of Riverside County, and the Chino Basin in southwestern San Bernardino County. The MWD supplied 1.57 MAF of water and the Los Angeles Department of Water and Power, the other major water supplier in Southern California, supplied 0.55 MAF in the fiscal year 1995 (Rodrigo, 1996). The remaining 2.1 MAF were drawn from local water sources by local water districts within the MWD service area. About 89 percent of water consumed in the MWD region goes to urban uses with the rest going to agriculture (Rodrigo, 1996).

[1] One acre foot (AF) is equivalent to 325,800 gallons.

EXECUTIVE SUMMARY

The organization of this Final SEA is as follows: Chapter 1 – Legislative Authority and Executive Summary; Chapter 2 – Project Description; Chapter 3 – Existing Setting; Chapter 4 – Environmental Impacts and Mitigation Measures; and, Chapter 5 – Project Alternatives. The following subsections briefly summarize the contents of each chapter.

Summary of Chapter 1 – Legislative Authority and Executive Summary

This Chapter contains a discussion of the legislative authority of the SCAQMD to adopt rules and regulations to implement the current AQMP. It also provides the basis for preparing a subsequent CEQA document to the 1997 AQMP Final Program EIR. This chapter also provides a summary of the content of each chapter.

Summary of Chapter 2 – Project Description

In addition to including a description of the project location, Chapter 2 also includes a brief description of PAR 1113. Briefly, the proposed amendments to Rule 1113 would:

- ✓ Reduce the VOC content limit for industrial maintenance (IM) coatings; high temperature IM coatings; non-flats; primers, sealers, and undercoaters (PSU); quick-dry enamels; rust preventive coatings; roof coatings; waterproofing wood sealers and floor coatings;
- ✓ Delete the current exemption for quick-dry primers, sealers, and undercoaters;
- ✓ Clarify definitions for some categories to be consistent with the National Architectural/Industrial Maintenance (AIM) Rule;
- ✓ Expand and simplify the existing Rule 1113 averaging provision to include additional coating categories; and
- ✓ Clarify labeling requirements.

For a complete description of the proposed amendments the reader is referred to Appendix A.

Summary of Chapter 3 - Existing Setting

Pursuant to the CEQA Guidelines §15125, Chapter 3 – Existing Setting, includes descriptions of those environmental areas that could be adversely affected by PAR 1113.

VOC content limits. The SCAQMD prevailed in six of the seven alleged impact areas, but the lower court requested the SCAQMD to further study whether or not illegal thinning of coatings in the field resulted in a negative air quality impact before readopting the February 1990 amendments.

While the SCAQMD agreed to study the illegal thinning issue, the plaintiff appealed the court's decision to dismiss their claims regarding the six other potential air quality impacts. In 1993, the Court of Appeals in a published decision (Dunn-Edwards Corporation, et. al. v. SCAQMD) rejected the plaintiffs' appeal. Plaintiffs then appealed the appellate decision to the California Supreme Court that denied review on December 2, 1993.

The CEQA analysis in this Final SEA includes an analysis of illegal thinning in the field and, therefore, complies with the courts request.

Other Rule 1113 Amendments

Rule 1113 has been amended a number of times since January 1, 1990, as summarized in the following bullet points. For each amendment described below a Notice of Exemption was prepared.

- **March 8, 1996** - These amendments established a definition for aerosol coatings consistent with the CARB, revised the definition of exempt compounds by referencing Rule 102 - Definition of Terms, and created an exemption for aerosol coatings.

- **September 6, 1991**- These amendments created a new coating category, low-solids stain, and also incorporated a calculation method for determining VOC content on a materials basis. The amendment also prohibited use of Group II exempt compounds, including ozone-depleting chlorofluorocarbons (CFCs) and several toxic solvents.

- **December 7, 1990** - These amendments incorporated new definitions for specialty coatings and established a specific VOC content limit in the table of standards.

- **November 2, 1990** - These amendments incorporated new definitions for specialty coatings and established a specific VOC content limit in the table of standards.

- **February 2, 1990** These amendments incorporated new definitions for specialty coatings and established a specific VOC content limit in the table of standards.

categories. Other components of the proposed amendments included addition of and modification to some definitions, updating the analytical test methods, and establishing an averaging methodology for flats to provide flexibility for complying with future VOC content limits.

Subsequently, industry filed three separate lawsuits, questioning the validity of the proposed future limits for the lacquer and flat coating categories. The SCAQMD has prevailed at the Superior Court level in all three cases.

August 1996 – Final Environmental Assessment - Proposed Amendments to Rule 1113 - Architectural Coatings

These amendments incorporated an exemption from the VOC limits for coatings sold in containers one quart size or less. The analysis in the Final Environmental Analysis concluded that adopting a small container exemption would result in significant adverse air quality impacts.

February 1990 - Determination of No Significant Impacts - Proposed Amendments to Rule 1113 - Architectural Coatings.

In February 1990, the SCAQMD Governing Board adopted amendments to Rule 1113 - Architectural Coatings that were based on the California Air Resources Board (CARB) and California and Air Pollution Control Officers Association (CAPCOA) Suggested Control Measure (SCM). The 1990 amendments included the following provisions: exemptions for 11 categories of specialty coatings were eliminated, leaving only exemptions for quart or smaller containers and emulsion type bituminous pavement sealers; lower VOC content limits for 15 new coating categories; technology-forcing low VOC limits for ten existing coating categories effective December 1, 1993; consolidation of the industrial maintenance coating categories from ten to three; and reorganization of the subdivisions of the rule.

The Court Order

In 1990, the Dunn-Edwards Corporation challenged the 1990 amendments to Rule 1113 in court (Dunn-Edwards Corporation, et. al. v. SCAQMD). That case challenged, in part, the CEQA document prepared for the amendments to Rule 1113 adopted in February 1990, specifically the amendments that lowered the VOC limits for six coating categories: industrial maintenance high temperature coatings; industrial maintenance anti-graffiti coatings; industrial maintenance primers and topcoats; lacquers; quick-dry primers and sealers; and quick-dry enamels. The lawsuit alleged that the CEQA document was inadequate because it did not fully analyze potential significant adverse air quality impacts in seven areas that were alleged to arise from implementing the lower

PREPARATION OF A SUBSEQUENT ENVIRONMENTAL ASSESSMENT

As previously noted, the SCAQMD is required to prepare and adopt an AQMP containing strategies, i.e., control measures for attaining and maintaining all of the state and national ambient air quality standards. The last AQMP was adopted in 1997. As part of that effort, a program EIR for the 1997 AQMP was prepared pursuant to CEQA Guidelines Section 15168(a)(3) because the AQMP is related to the issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program. The 1997 AQMP EIR evaluated all control measures contained in the plan, including control measure (CM) CTS-07, which this project implements. As permitted under §15168, the 1997 AQMP Program EIR dealt with the cumulative impacts of CM CTS-07. In addition, that document found no project-specific significant environmental impacts associated with the implementation of CM CTS-07 at that time. The 1997 AQMP EIR is incorporated herein by reference. The 1997 AQMP EIR was challenged by the paint industry as to its evaluation of CTS-07. That challenge was rejected by the Superior Court in February of 1999.

Pursuant to §15168, an Initial Study was prepared to examine the proposed project subsequent to certification of the 1997 AQMP final program EIR. In response to the initial study, many comments were received mostly from representatives of the paint industry. Based on those comments and the Initial Study, the SCAQMD has decided to prepare this Final SEA, which is a subsequent CEQA document to the 1997 AQMP Program EIR. As explained in the following section, this Final SEA complies with the 1990 Dunn-Edwards Corporation, et. al. v. SCAQMD court order.

CEQA DOCUMENTATION FOR RULE 1113 - ARCHITECTURAL COATINGS

In addition to this Final SEA, a number of CEQA documents have been prepared for previous amendments to Rule 1113. The following subsections briefly summarize the previously prepared CEQA documents for Rule 1113.

November 1996 – Final Subsequent Environmental Assessment - Proposed Amendments to Rule 1113 - Architectural Coatings

In November 1996, the SCAQMD Board adopted amendments to Rule 1113. These amendments reduced the VOC content limits of four coating categories: lacquers, flats (interior and exterior), traffic coatings, and multi-color coatings, resulting in an overall net reduction of 10.3 tons per day VOC emissions from this source category. In addition, the amendments temporarily increased the VOC content limits for four coating

[Cal. Health and Safety Code, §40440(a)]. Rule 1113 was originally prepared pursuant to these mandates.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

PAR 1113 is a "project" as defined by the CEQA (Cal. Public Resources Code §§21000 et seq.). The SCAQMD is the lead agency for this project and is preparing the appropriate environmental analysis pursuant to its certified regulatory program (SCAQMD Rule 110). California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The Secretary of the Resources Agency certified the SCAQMD's regulatory program on March 1, 1989.

Rule 110 requires an assessment of anticipated environmental impacts as well as an analysis of feasible methods to substantially reduce any significant adverse environmental impacts. To fulfill the purpose and intent of Rule 110, the SCAQMD has prepared this Final SEA to address the potential environmental impacts associated with implementing PAR 1113. This Final SEA is intended to: (a) provide the lead agency, responsible agencies, decision makers and the general public with information on the environmental effects of the proposed project; and, (b) be used as a tool by decision makers to facilitate decision making on the proposed project.

A NOP/IS for this Final SEA (included herein as Appendix B) were distributed to responsible agencies and interested parties for a 30-day review and comment period ending December 1, 1998. The NOP/IS identified potential adverse impacts for the following environmental topics: air quality, water resources (e.g., water demand and water quality), and public services. The SCAQMD received 10 comment letters during the public comment period. Additionally, CEQA-related comments were received during oral testimony given at a Public Workshop/CEQA Scoping Meeting held December 9, 1998, and during various Industry Working Group and other industry meetings. SCAQMD staff's responses to the CEQA- related comments submitted on the NOP/IS as well as the comments provided at the CEQA Scoping Meeting, and during various Working Group and industry meetings are presented in Appendix C of this Final SEA. It should be noted that as result of the written and oral comments received after the release of the NOP/IS, the SCAQMD has also analyzed the potential adverse impacts for the following environmental areas: transportation/circulation, solid/hazardous waste, hazards, and human health.

INTRODUCTION

Rule 1113 – Architectural Coatings, was originally adopted by the South Coast Air Quality Management District (SCAQMD) on September 2, 1977, to control volatile organic compound (VOC) emissions from architectural coatings. The proposed amendments to Rule 1113 would implement, in part, both the 1994 and the 1997 Air Quality Management Plan (AQMP) control measure CTS-07 – Further Emission Reductions from Architectural Coatings, which calls for a reduction of the allowable VOC content limit per liter of coating from coatings: industrial maintenance; non-flats; quick-dry enamels; primers, sealers, and undercoaters; quick-dry primers, sealers, and undercoaters; roof coatings; and waterproofing wood sealers. PAR 1113 would also add several new coating categories, high temperature industrial maintenance coatings, rust preventative coatings, bituminious roof coatings, recycled flats and nonflats, essential public service coatings, and floor coatings, and delete the current exemption for quick-dry primers, sealers, and undercoaters.

Pursuant to the California Environmental Quality Act (CEQA) (California Public Resources code §§21000 et seq.), this Final Subsequent Environmental Assessment (SEA) includes an analysis of potential environmental impacts from implementing PAR 1113. Based upon an initial evaluation in the Notice of Preparation and Initial Study (NOP/IS) prepared for the proposed amendments and released to the public on October 28, 1998, the following environmental topics were identified as having the potential to be adversely affected by the proposed amendments and are analyzed in this document: air quality, water resources, and public services. Additionally, based on comments received on the NOP/IS and at various Industry Working Group meetings and industry meetings, this Final SEA also includes an analysis of the following environmental topics: transportation/circulation, solid/hazardous waste, hazards, and human health. Results of the analysis indicate that the proposed amendments will not generate any significant adverse environmental impacts.

LEGISLATIVE AUTHORITY

The California Legislature created the SCAQMD in 1977 (Lewis-Presley Air Quality Management Act, Health and Safety Code §§40400 et seq.), as the agency responsible for developing and enforcing air pollution control rules and regulations within the SCAQMD's area of jurisdiction. By statute, the SCAQMD is required to adopt an AQMP demonstrating compliance with all state and national ambient air quality standards for the SCAQMD's area of jurisdiction [Health and Safety Code §40460(a)]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP

CHAPTER 1

LEGISLATIVE AUTHORITY AND EXECUTIVE SUMMARY

Introduction

Legislative Authority

California Environmental Quality Act

Preparation of a Subsequent Environmental Assessment

CEQA Documentation for Proposed Amended Rule 1113 – Architectural Coatings

Executive Summary

PREFACE

This document constitutes the Final Subsequent Environmental Assessment (SEA) for the amendments to Rule 1113 – Architectural Coatings. The Draft EA was released for a 30-day public review and comment period from March 23, 1999 to April 21, 1999. Seven comment letters were received from the public. Minor modifications have been made to the Draft such that it is now a Final EA. These modifications do not constitute substantial new information and therefore, does not require recirculation of the document pursuant to CEQA Guidelines §15088.5. Deletions and additions to the text of the SEA are denoted using ~~strikethrough~~ and <u>underlined</u>, respectively.

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Subsequent Environmental Assessment for:

Proposed Amended Rule 1113 - Architectural Coatings

SCAQMD No. 990319DWS
SCAG No. I9900112

May 4, 1999

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APPENDIX D

SUBSEQUENT ENVIRONMENTAL ASSESSMENT

PROJECT LOCATION

The SCAQMD has jurisdiction over approximately 10,743 square miles (referred to hereafter as the district), consisting of the four-county South Coast Air Basin (Basin), the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the district, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portions of the SSAB and MDAB are bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Planning Area) is a subregion of Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 2-1).

BACKGROUND

Architectural and industrial maintenance (AIM) coatings are used to beautify and protect homes, office buildings, factories, and their appurtenances on a variety of surfaces - metal, wood, plastic, concrete, wallboard, etc. For example, AIM coatings are applied to the interior and exterior of homes and offices, factory floors, bridges, stop signs, roofs, swimming pools, driveways, etc. AIM coatings may be applied by brush, roller or spray gun; by do-it-yourselfers (DIY), painting contractors, or maintenance personnel.

AIM and other coatings are composed of: pigments, which give the paint its color and ability to hide the underlying surface, and are generally in the form of finely ground powders; binders (resins), in which the pigment particles are dispersed and that bind the pigment to the painted surface; carriers (solvents), used to keep the paint in a liquid state during application, and to otherwise aid in the application of the paint; and specialty chemicals (additives), necessary for other coating characteristics. The carriers and some specialty chemicals evaporate, leaving behind the film-forming components of the coating. The resins used in AIM coatings include acrylics, vinyls, alkyds, cellulosics, epoxies, urethanes, polyurethanes and several others. The carriers in solvent-based coatings are organic solvents such as alcohols, ketones, esters, glycols, glycol ethers, and aromatic or aliphatic hydrocarbons, and are usually VOCs. The carrier in a waterborne coating is water, although most waterborne coatings contain some VOCs, primarily glycols or texanol.

AIM coatings are usually purchased ready-to-use, although some come in two components that must be mixed prior to application. They are available in a wide range of colors, gloss, and performance characteristics. One important criterion for selecting coatings is durability. Coatings are expected to last from two to 10 years with the average expectation of five to

seven years. Failure of coatings to stand up to the elements such as sunlight, weather, and cleaning can shorten the life of the coating and require more frequent recoating.

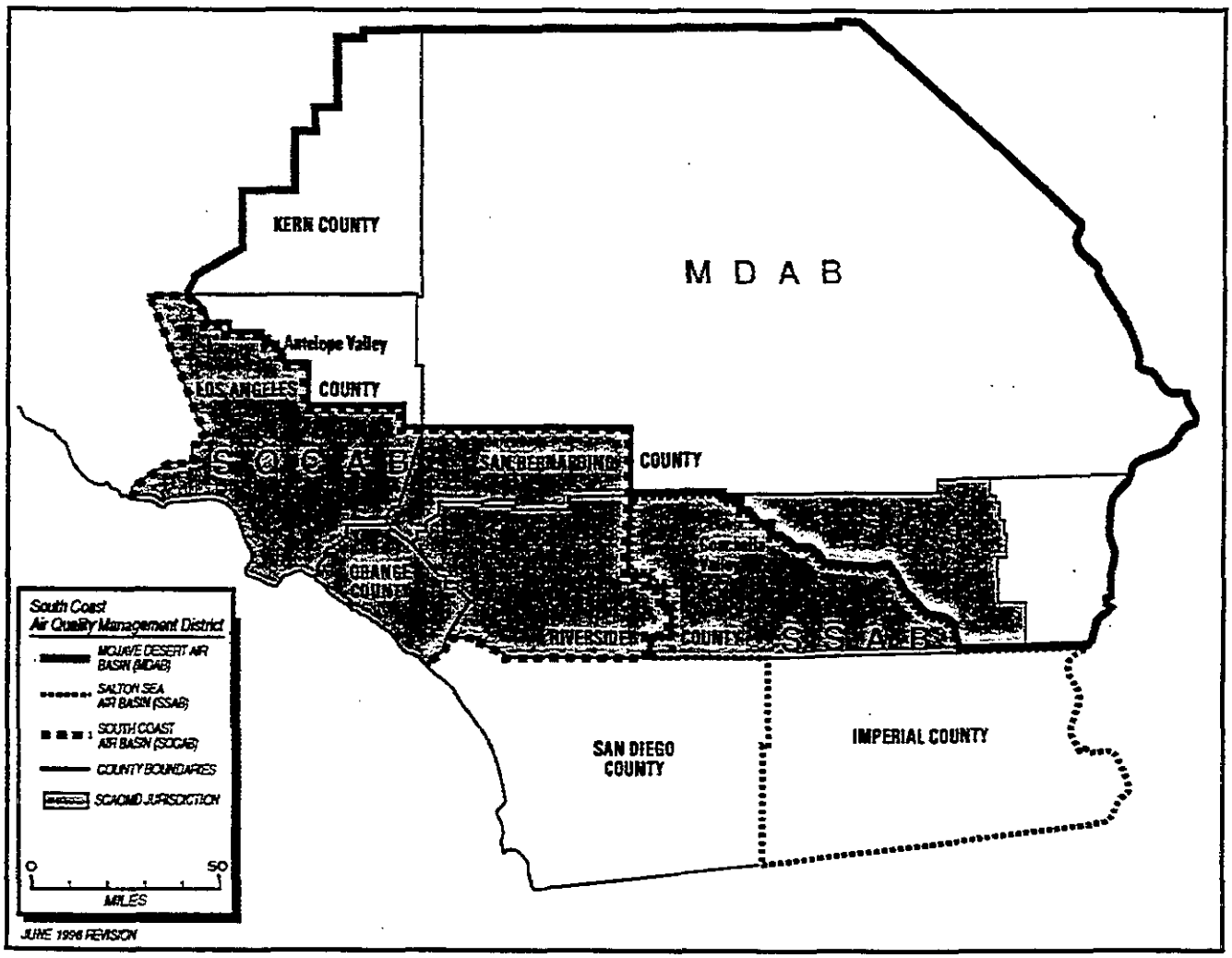


FIGURE 2-1
South Coast Air Quality Management District

A solvent may sometimes be used to thin a coating if it is too thick to spray or brush. Application problems caused by low temperature and high humidity can also be overcome by the addition of solvent to the coating. Waterborne coatings are thinned with water only, whereas solvent-based coatings can only be thinned with organic solvents. Similarly, brushes, rollers, and spray guns used with waterborne coatings are cleaned with water, while such equipment used with solvent-based coatings use organic solvents for cleanup. Generally, coatings are sold as 'ready-to-use' to eliminate the need for thinning in the field.

VOC emissions from architectural coating operations are regulated by SCAQMD Rule 1113. Under this rule, emissions are controlled by limiting the VOC content, measured in grams per liter, of the architectural coatings sold and applied in the district. Architectural coatings are

defined by their application and use and include coatings which are applied to stationary structures including residential and commercial buildings; billboards; curbs and roads; and mobile homes. VOCs are emitted to the atmosphere from the evaporation of organic solvents used in industrial maintenance coatings, nonflats, flats, primers/sealers/undercoaters, waterproofing wood sealers, varnishes, wood preservatives, lacquers, fire retardant coatings, etc. The existing rule and PAR 1113 apply to those persons who supply, sell, apply, solicit the application of, and manufacture such coatings.

Rule 1113 was originally adopted September 2, 1977, to regulate VOC emissions from the application of architectural coatings and has been amended several times since the date of adoption. Most rule amendments subsequent to the original rule adoption have been to exempt certain coating categories from the 250 grams per liter (g/l) exterior coating VOC limit or the 350 g/l interior coating VOC limit. In contrast to the earlier amendments, the rule was amended on February 2, 1990, to further reduce VOC emissions from certain, previously exempted coating categories. The February 2, 1990 limits were based primarily on the CARB CAPCOA SCM for architectural and industrial maintenance coatings. A consortium of California air pollution control districts, the CARB, U. S. Environmental Protection Agency (EPA) Region IX, and paint manufacturers developed the provisions in the SCM. Upon adoption of the lower VOC limits, coating manufacturers sued the SCAQMD, along with other air districts, over issues that they felt were not adequately addressed in the staff report or in the CEQA document. The suit stayed portions of the February 1990 amendments, as specified in the Superior Court judgment. Subsequent rule amendments adopted November 1990, December 1990, and September 1991 were not subject to the court judgment. The most recent amendments to Rule 1113 were adopted on November 8, 1996, and resulted in a net emission reduction of 10.3 tons per day of VOC. Subsequently, industry filed three separate lawsuits, questioning the validity of the proposed future limits for the lacquer and flat coating categories. The SCAQMD has prevailed in all three cases at the state court level.

In an effort to better understand the state of coating technology for industrial maintenance coatings, non-flats, and other coatings, in Spring 1996, the SCAQMD contracted with Eastern Michigan University (EMU) to conduct an informational study. The EMU study generally found that high-VOC, low-VOC, and zero-VOC coatings were commercially available for industrial maintenance; non-flat coatings; primers, sealers, undercoaters; water-proofing sealers; and stains. The EMU study also encountered difficulty with obtaining durability information for the low- and zero-VOC coatings in these coating categories from the coating manufacturers. As a result, the EMU study suggested that side-by-side comparisons be made for various coating characteristics between low- and zero-VOC coatings compared with high-VOC coatings.

Due to the lack of durability information contained in the EMU study, the SCAQMD contracted with National Technical Systems (NTS) to conduct a comparison study that will evaluate the durability and application characteristics of the following coating categories:

industrial maintenance; non-flat coatings; quick dry enamels, primers, sealers and undercoaters (PSU); quick dry PSUs; water proofing wood sealers; and stains. The final report will provide side-by-side comparisons for the aforementioned coatings and discuss results pertaining to overall performance. A total of 114 coatings will be included in the study.

Since the NTS study was initiated, staff continued to conduct it's technology assessment of low- and zero-VOC coatings affected by the proposed amendments and has gained additional information pertaining to their performance characteristics (See Appendix D and the discussion in Chapter 4 on compliant low- and zero-VOC coatings characteristics). Based on this assessment, staff believes that both the proposed compliance limits and deadlines are achievable. Staff will nevertheless reassess the deadlines based upon the laboratory results of the NTS study. These results are expected to be completed sometime in the March/April 1999 timeframe.

In addition to the NTS study and staff's technology assessment, CARB is currently in the process of refining their architectural coatings inventory for the state of California. The current inventory is based on 1990 industry sales data. The current inventory update would be based on 1996 industry sales data. CARB has requested not only the 1996 sales information for various coating categories, but also speciation profiles for each coating category. This updated inventory will assist staff in evaluating the current emissions inventory from use of architectural coatings, as well as providing a more accurate estimate of the emission reductions that can be achieved from each of the coating categories affected by the proposed amendments. The CARB 1996 architectural emissions inventory is expected to be finalized by the end of May 1999. The Draft 1998 CARB Archtiectural Coating Survey was released for public comment in early March 1999. CARB staff has indicated that the survey is complete and envision making only minor changes to the final report.

Meetings with Industry Working Group

In September 1998, SCAQMD staff established a working group comprised of coating manufacturers, painting contractors, representatives of trade organizations, and government representatives. Staff has already met with the working group seven times to evaluate and consider industry's concerns regarding the proposed amendments. A number of recommendations made by members of the Industry Working Group were incorporated into the proposed amendments, resulting in a modified version of PAR 1113. After the second working group meeting, which included a detailed discussion of PAR 1113, staff re-evaluated the proposal and extended the definition and compliance dates of quick-dry coating categories. The working group meetings have also served as a forum to discuss the innovative approaches presented by industry at the first working group meeting. To date, concepts for project alternatives including seasonality, reactivity, and an exemption for low volatility compounds have been discussed in detail. Other topics discussed in the working group meetings include the AQMD's emissions inventory, industry's proposal for a

seasonality approach and averaging provisions, AQMP, and the AQMD's field application study. In summary, the working group meetings, as well as the public workshop and individual meetings with resin manufacturers and coating formulators, have resulted in the addition of more categories, raising proposed VOC limits for some categories, extending compliance dates, and modifying definitions.

PROJECT OBJECTIVES

The primary objective of PAR 1113 is to readopt portions of the definitions and lower VOC limits that were originally adopted on February 2, 1990, and overturned by the Superior Court on August 21, 1990. Additionally, PAR 1113 seeks to implement, in part, the 1997 AQMP control measure CTS-07, which calls for a 50 percent reduction in VOC emissions from architectural coatings by 2010 and the federally enforceable 1994 AQMP, which calls for a 75 percent reduction.

DESCRIPTION OF AFFECTED ARCHITECTURAL COATING CATEGORIES

Floor Coatings

Floor coating is a generic term for a variety of high performance coatings used in areas with abrasion as a result of foot traffic or vehicular traffic. Typical users include a variety of commercial and industrial users, with some limited residential applications. Typically, the coating system includes a primer and topcoat or a two-component single coat coating.

Although formulated using a number of resin systems, the highest performing floor coatings are based on epoxy and polyurethane systems. The newer polyurethane technology is based on both 1-part and 2-part coatings, with numerous products being offered as completely solventless systems.

Industrial Maintenance (IM) Coatings

The IM coating category is a generic term for a variety of high performance coatings, including primers, undercoats, and topcoats, used in areas with harsh environmental conditions such as extreme weather, corrosion, chemical, abrasion, and heat. Typical users include oil and gas production - onshore and offshore, refineries, petrochemical production and processing, marine, pulp and paper mills, bridges, manufacturing facilities, and water and waste treatment facilities. The coating system may include a primer and topcoat or a primer, midcoat, and topcoat or high-build single coat coatings.

In addition to high performance, alkyd-based enamels, inorganic zinc, vinyl, epoxy, polyurethane, and silicone-based resins are used to enhance the protection characteristics of these coatings, while achieving lower VOC content. The newer polyurethane technology is based on both 1-part and 2-part coatings, with some using reactive diluent technology where

part of the solvent becomes a permanent part of the coating.

High Temperature IM

High temperature IM coatings are used to protect substrates, typically metals, that are exposed continuously or intermittently to temperatures above 400 degrees Fahrenheit. Typical uses include coatings for furnaces, stacks, power plants, refineries, and mufflers, as well as other substrates exposed to high temperatures. These coatings are formulated with a variety of resins such as aluminum rich, inorganic zinc rich, silicone, and epoxy-based formulations. Both solvent-borne and water-borne, polysiloxane-based high-temperature coatings are also commercially available.

Non-Flats

Nonflat coatings are interior and exterior coatings that have a gloss of greater than or equal to 15 on an 85 degree meter and greater than or equal to 5 on a 60 degree meter. Nonflat coatings represent the second largest category of architectural coatings and make up approximately 15 percent to 20 percent of total coatings used for residential development. This category is usually divided into three distinct subcategories called low-gloss (also known as satin or eggshell), medium-gloss (semi-gloss), and high-gloss. Nonflat coatings are most commonly used for interior and exterior wood trim, bathroom, kitchens, and other high traffic areas where repeated cleaning is necessary. However, some consumers also use the low-gloss nonflats for interior walls (drywall). Approximately 43 percent of all nonflats sold are for interior use only, 16 percent for exterior use only, and 41 percent for both interior or exterior use.

Quick-Dry Enamels

Quick-dry enamel is a non-flat coating category typically used where the substrate to be coated needs to dry quickly to minimize dust contamination, such as new home construction, or be returned to service quickly, such as a restaurant. The coated substrate should dry, as measured by ASTM 1640, to touch within two hours, should be tack free within four hours, and dry hard within eight hours for the coating to be listed as quick-dry. In typical residential application, quick-dry enamels are used for interior and exterior wood trim around windows, door jambs, doors, and possibly kitchen cabinetry. For older homes with wood siding, the quick-dry enamels may be used for the entire exterior surface. This category does not include enamels used in industrial environments.

Primer, Sealer and Undercoater (PSU)

The primer, sealer, and undercoater category is a generic term used to describe coatings, typically the initial coat, used to provide a smooth surface for subsequent coats or to provide a shield between the substrate and the subsequent coat or to provide adhesion for the topcoat. This category utilizes the gamut of available coating technologies in its formulations; alkyds,

modified alkyds, oleoresin, epoxies, specialty resins, and emulsions are just a few of the formulations used.

Quick-Dry PSU

The quick-dry primer, sealer, and undercoater category is a generic term used to describe coatings, typically the initial coat, used to provide a smooth surface for subsequent coats or to provide a shield between the substrate and the subsequent coat or to provide adhesion for the topcoat. This quick-dry category is used for areas that also require a quick turnaround time, as described in the quick-dry enamel category section of this report. By definition, the dry to touch time needs to be less than 30 minutes, and the recoat time needs to be less than two hours, both tested by ASTM 1640.

This category utilizes the gamut of available coating technologies in its formulations; alkyds, modified alkyds, oleoresin, epoxies, specialty resins, and emulsions are just a few of the formulations used.

Rust Preventive Coatings

Rust Preventative Coatings are coatings formulated and recommended for use in preventing the corrosion of metal surfaces in residential and commercial situations. This category includes the primers and topcoats for metal substrates. A specific category has been created in response to comments from industry, indicating a need for rust prevention and corrosion protection for metal substrates. Typical uses include handrails, fencing, metal doors, and gutters. These coatings rely on a variety of resin technologies, with recent development of acrylic emulsion formulations.

Stains

Stains can be either semi-transparent (interior and exterior) or opaque (semi-solid), and are generally used on wood. These type of coatings are especially used extensively in cabins and homes with soft wood exterior siding, as well as deck coating. They protect the wood from UV exposure, moisture, and minimize tannin bleed through.

Water Proofing Wood Sealers

Waterproofing wood sealers are used to protect wood, and other porous surfaces to seal against moisture damage. On wood, use of waterproofing sealers can prevent splitting, staining, and warping, as well as maintain the wood's true color and grain. These coatings rely on a variety of resin technologies, with recent development of acrylic emulsion formulations and acetone-based formulations.

PROJECT DESCRIPTION

The current proposed amendments would implement Phase II of Control Measure #97CTS07 – Further Reductions from Architectural Coatings – Rule 1113, as well as #94CTS07. The proposed amendments to Rule 1113 include the following components, listed in the order they appear in the rule:

1. Add a definition of "Bituminous Roof Coatings" [Paragraph (b)(6)]

   The definition of "Bituminous Roof Coatings" has been added in response to comments provided by the Roof Coatings Manufacturers Association.

2. Add a definition of "Essential Public Service Coating" [Paragraph (b)(13)]

   The definition of "Essential Public Service Coating" has been added in response to comments provided by the Metropolitan Water District.

3. Add a definition for "Floor Coatings" [Paragraphs (b)(17)]:

   The definition of "Floor Coatings" has been added to the existing rule.

4. Add a definition for "High-Temperature Industrial Maintenance coatings" [Paragraphs (b)(21)]:

   The definition of "High-Temperature Industrial Maintenance coatings" has been added to the existing rule.

5. Delete the definition of "Industrial Maintenance Primers and Topcoats" and add a definition for "Industrial Maintenance Coatings" as originally adopted in February 1990 amendments, but deleted in November 1996 amendments to comply with the Superior Court judgement [Old Paragraph (b)(19), Paragraph (b)(22)]:

   The definition of "Industrial Maintenance Primers and Topcoats" based on the January 1990 rule is deleted and the definition of "Industrial Maintenance coatings" based on the February 1990 rule is added.

6. Add a definition for "Nonflat Coatings" [Paragraph (b)(30)]:

   A definition of "Nonflat coatings" is added to create a specialty category. The definition is the same as recently adopted by USEPA in the national AIM rule.

7. Add a definition for "Recycled Flats and Nonflats" [Paragraph (b)(36)]:

A definition of " Recycled Flats and Nonflats" is added to create a specialty category, based on comments forwarded by Orange County Integrated Waste Management and other public service agencies.

8 Add the definition of "Rust preventative coatings" [Paragraph (b)(38)]:

A definition of "Rust preventative coatings" is added to create a specialty category.

9. Revise the definition of "Waterproofing Sealers to Waterproofing Wood Sealers" [Paragraph (b)(51)]:

The definition of "Waterproofing Sealers" is revised to "Waterproofing Wood Sealers" based on comments received from manufacturers of such products. This definition is specifically for waterproofing sealers used on wood substrates, such as decks and siding.

10. Add a definition for "Waterproofing Concrete/Masonry Sealers" [Paragraph (b)(52)]:

The definition of "Waterproofing Concrete/Masonry Sealers" is revised based on comments received from manufacturers of such products. This definition is specifically for waterproofing sealers used on concrete and masonry.

11. Reduce the VOC content limit for IM coatings; non-flats; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; bituminous roof coatings, roof coatings; essential public service coatings, floor coatings; recycled flats and nonflats, rust preventative coatings; stains; and waterproofing wood sealers (see Table 2-1);

12. Revise the "Averaging Provision" methodology [Paragraph (c)(6)]:

The November 8, 1996 amendments included an "Averaging Provision" for flat coatings to provide an optional method of compliance for manufacturers of this coating product. The currently proposed amendments will expand the averaging provision to include nonflat coatings; floor coatings; rust preventative; primers, sealers, and undercoaters; quick-dry PSUs, quick-dry enamels, and IM coatings. Effective January 1, 2001, this provision will allow manufacturers to average, on a sales-weighted basis, the VOC contents of their coatings and allow them to manufacture and distribute coatings that have a VOC content higher than the proposed standards. Market-based approaches have been requested by industry as an option to compliance with the standards. The overall averaging program parallels the CARB's "Alternative Control Plan Regulation for Consumer Products."

The Averaging Provision is a voluntary, flexible approach that will utilize a "bubble" concept. Under this program, manufacturers who voluntarily choose to comply with the rule under the averaging provision would select the coatings and develop a

detailed plan that would demonstrate that the total VOC emissions under the plan would not exceed the emissions that would have resulted had the products beer formulated to meet the proposed VOC standards. Under the plan, once approved, the manufacturers could sell products that exceed the VOC standards specified in the rule for these coatings, provided that the emissions from these high-VOC products will be sufficiently offset by the emissions from the products formulated to achieve VOC limits below the proposed standards.

13Modify the requirements in paragraph (c)(2) to incorporate coatings manufactured under the Averaging Provisions specified in paragraph (c)(6).

14. Add a Technology Assessment requirement for "nonflats", "industrial maintenance coatings," "floor coatings," "waterproofing wood sealers", "roof", "quick-dry primers, sealers, and undercoaters", "quick-dry enamels", "rust preventative coatings," and "primers, sealers, and undercoaters" [subdivision (f)]:

    Staff commits to assessing the product availability of specific future VOC limits for "nonflats," "primers, sealers, and undercoaters," "floor coatings," "rust preventative coatings," and "industrial maintenance coatings," one year prior to revised limit implementation dates. Staff commits to assessing the scientific basis for a reactivity-based ozone control strategy, in conjunction with industry.

For a complete description of PAR 1113, the reader is referred to Appendix A of this Final SEA.

PROJECTED EMISSIONS REDUCTIONS

The November 1996 amendments to Rule 1113, which lowered the VOC content limits from lacquers, flats (interior and exterior), traffic coatings, and multi-color coatings, are projected to reduce VOC emissions by 10.3 tons per day by 2010. Implementation of PAR 1113 is currently estimated to result in approximately 21.8 tons per day of VOC emission reductions or approximately a 36 percent emission reduction compared to current emission levels for the Annual Average Inventory for this emission source category. The table below summarizes the current proposed changes in VOC limits and the associated projected emission reductions.

TABLE 2-1

PAR 1113 PROPOSED EMISSION LIMITS AND PROJECTED EMISSION REDUCTIONS FOR AFFECTED COATING CATEGORIES

Coating Category	Current Limit[1] (g/l)	Proposed Limit[1] and Compliance Dates	Emission Reductions by 2010 (tons/day)

		g/l	Date	
Bituminous Roof Coatings	300	250	07/01/02	n/a
Floor Coatings[3]	420	100	07/01/02	0.31
		50	07/01/06	0.16
Industrial Maintenance (IM) Coatings	420	250	07/01/02	2.90
		100	7/01/06	2.63
Essential Public Service Coating	420	340	07/01/02	n/a
		100	07/01/06	n/a
High Temperature IM Coatings	No Limit	550	07/01/02	0.00
		420	07/01/06	not quantified
Non-Flats	250	150	07/01/02	0.86
		50	07/01/06	6.55
Quick-Dry Enamel	400	250	07/01/02	1.08
		50	07/01/06	0.66
Primers, Sealers, Undercoaters	350	200	07/01/02	1.48
		100	07/01/06	0.73

[1] Grams of VOC per liter of coating, less water and less exempt compounds.

TABLE 2-1 (CONCLUDED)
PAR 1113 PROPOSED EMISSION LIMITS AND PROJECTED EMISSION REDUCTIONS FOR AFFECTED COATING CATEGORIES

Coating Category	Current Limit[1] (g/l)	Proposed Limit[1] and Compliance Dates		Emission Reductions by 2010 (tons/day)
		g/l	Date	
Quick-Dry Primers, Sealers, & Undercoaters	350[2]	200	07/01/02	1.53
		100	07/01/06	0.34
Recycled Flat and Nonflat	250	100	07/01/06	n/a
Rust Preventative Coatings[3]	400			
		100	07/01/06	0.92
Stains	350	250	07/01/02	1.13
Water-proofing Wood Sealers	400	250	07/01/02	0.52
			Total	**21.8**

[1] Grams of VOC per liter of coating, less water and less exempt compounds.
[2] Currently exempt if manufacturers reports sales data.
[3] New category.
[4] Estimated emission reductions based on preliminary 1996 sales information (1998 Draft CARB Survey).

CHAPTER 3

EXISTING SETTING

Existing Setting
Air Quality
Water Resources
Public Services
Transportation / Circulation
Solid / Hazardous Waste
Hazards
Human Health

EXISTING SETTING

In order to determine the significance of the impacts associated with a proposed project, it is necessary to evaluate the project's impacts against the backdrop of the environment as it exists at the time the notice of preparation is published. The CEQA Guidelines defines "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance" (CEQA Guidelines §15360; see also Public Resources Code §21060.5). Furthermore, a CEQA document must include a description of the physical environment in the vicinity of the project, as it exists at the time the notice of preparation is published, from both a local and regional perspective (CEQA Guidelines §15125). Therefore, the "environment" or "existing setting" against which a project's impacts are compared consists of the immediate, contemporaneous physical conditions at and around the project site (Remy, et al; 1996).

A brief discussion for each existing environmental topic setting, e.g., air quality, water resources, public services, transportation/circulation, solid/hazardous waste, hazards, and human health, that could be adversely affected by PAR 1113 is presented in the following sections. For a more detailed discussion of current and projected future environmental settings in the district for air quality, water resources, public services, solid/hazardous waste, hazards, and human health, with and without additional control measures, please refer to th Final 1997 AQMP, including its Appendices, and the 1997 AQMP Final Environmenta Impact Report (EIR). These existing setting topics are still considered to be relevant with regard to implementing AQMP control measures. Copies of the above-referenced documents are available from the SCAQMD's Public Information Center by calling (909) 396-3600.

ARCHITECTURAL COATING INDUSTRY

AIM coatings are the largest segment of the United States' total paint market. In 1996, shipments of AIM coatings accounted for just over half of the total industry shipments. Architectural coatings are sold to do-it-yourself (DYI) consumers, painting contractors, and commercial and industrial maintenance users through company stores, independent dealers, mass retailers, and home improvement centers.

The architectural coatings market is split between waterborne latex and alkyd or oil-based paints, with latex accounting for more than 85 percent of the volume. Mr. Chris Maby of ICI Paints in North America wrote, "As environmental legislation grows along with waterborne technology, latex paints will probably completely take over the DIY market." This trend has already been noted through the staff's technical assessment and further corroborated by the 1998 Draft CARB Survey Data.

Ongoing Analysis and Technology Assessment

Subsequent to the November 1996 amendments, staff initiated a technical assessment focussing on coating categories included in Phase II of Control Measure CTS07 – Further Emission Reductions from Architectural Coatings. The assessment clearly shows a wide availability of zero- and low-VOC coatings in categories included in Phase II. The manufacturers' data, as listed on their product literature, as well as some technical papers pertaining to performance comparisons, indicate performance of the lower VOC coatings equal to their conventional, high solvent counterparts. For certain coating characteristics, including but not limited to overall durability, the lower VOC coatings were considered superior than the higher solvent coatings. The higher solvent coatings generally exhibited superior application characteristics.

The SCAQMD also contracted with Eastern Michigan University (EMU) Coatings Research Institute to further evaluate the six of the eight issues raised by coating manufacturers (see the "Analysis of Industry Issues" section in Chapter 4) and contractors pertaining to coating categories in the current proposal and to provide recommendations for future compliance limits for the different coating categories. This study concluded that low- and zero-VOC coatings are currently available for the proposed coating categories, but did not reach conclusions regarding the overall performance of these coatings, as compared to current, solvent-based coating formulations.

SCAQMD staff is also working with CARB's Reactivity Research Advisory Committee, formed to evaluate reactivities of selected VOCs. Dr. William P. L. Carter, College of Engineering Center for Environmental Research and Technology, has been contracted by CARB to investigate the atmospheric ozone formation potential of selected VOCs emitted from consumer products and industrial sources. Staff is also actively participating in workshops conducted by the North American Research Strategy for Tropospheric Ozone to evaluate research studies conducted at the national level.

To obtain performance data regarding application and durability characteristics of currently available low- and zero-VOC coatings, the SCAQMD contracted National Technical Systems to do a side-by-side comparison of zero-, low-, and high-VOC coatings. Since this study was initiated, staff has performed its own technology assessment of these low- and zero-VOC coatings and has gained even more information pertaining to their performance characteristics. Based on this assessment, staff is confident that both the proposed compliance limits and deadlines are achievable.

1998 CARB Survey

The 1998 Draft CARB survey data, based on quantities reported for sales in 1996, indicate total architectural coating sales of approximately 87 million gallons, resulting in over 72 million pounds of VOC emissions or a little more than 0.8 pounds of VOC emissions per gallon of coating. The CARB emissions inventory for AIM coatings estimate 45 percent of the total AIM coatings sold in California are sold within the four county Basin. Therefore, an estimated 39 million gallons of coatings were sold in the Basin in 1996, resulting in approximately 32 million pounds of VOC emissions.

According to the CARB survey, there are AIM coatings currently available that comply with the January 1, 2002 compliance date for most coating categories affected by PAR 1113 (Table 3-1). The CARB survey also shows that for some AIM coating categories, there are coatings currently available that comply with the January 1, 2005 compliance date (Table 3-1). These data indicate that low VOC AIM coatings are already available and being used for some applications.

TABLE 3-1
SUMMARY OF CARB SURVEY RESULTS ON CURRENTLY AVAILABLE COMPLIANT COATINGS

Coating Category	Number of Products in CARB Survey	SWA[a] VOC Content (g/l)	SWA[b] VOC Content (g/l)	Complies With 07/01/02 Limit		Complies With 07/01/2006 Limit	
				# of Coatings	% of Total Coatings*	# of Coatings	% of Total Coatings*
Floor Coatings	505	149	164	128	39%	65	28%
IM Coatings	2,754	435	124	743	27%	302	11%
High Temp. IM Coatings	204	367	222[c]	181	89%	165	81%
Nonflat Coatings	3,744	331	164	1,310	35%	112	3%
Quick-dry Enamels	118	403	n/a	0[d]	0[d]	0[d]	0[d]
Primer, Sealer & Undercoater (PSU)	647	384	101	431	67%	212	33%

TABLE 3-1 (CONTINUED)
SUMMARY OF CARB SURVEY RESULTS ON
CURRENTLY AVAILABLE COMPLIANT COATINGS

Coating Category	Number of Products in CARB Survey	SWA[a] VOC Content (g/l)	SWA[b] VOC Content (g/l)	Complies With 07/01/02 Limit		Complies With 07/01/2006 Limit	
				# of Coatings	% of Total Coatings*	# of Coatings	% of Total Coatings*
Quick-dry PSU Coatings	145	432	136	18	12%	11[c]	8%
Rust Preventative Coatings[f]	16	382	144	10**	63%**	0	0
Stains	1,319	412	203	345	26%	n/a	n/a

[a] Sales weighted average for solvent-based coatings
[b] Sales weighted average for water-based coatings.
[c] Less than one percent of the coatings are water-based coatings.
[d] Numerous nonflat coatings not included in this category also meet the definition of quick-dry enamel.
[e] Numerous PSU coatings not included in this category also meet the definition of quick-dry PSU coating.
[f] These include products specifically listed as rust preventative in the CARB study. Other coatings not included in this category were identified in the following coating categories: IM, nonflats, PSU, quick-dry PSU.
* Percent of total coatings are based on individual products listed in the Draft 1998 Architectural Coating Survey.
** Interim limit has been removed from proposal.

AIR QUALITY

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter less than 10 microns (PM10), sulfur dioxide (SO_2) and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO_2, far more stringent. California has also established standards for sulfate, visibility, hydrogen sulfide and vinyl chloride. The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3-2.

The SCAQMD monitors levels of various criteria pollutants at 28 monitoring stations. In 1997, the Basin or district exceeded the federal standards for ozone, carbon monoxide, or

TABLE 3-2
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS

AIR POLLUTANT	STATE STANDARD CONCENTRATION/ AVERAGING TIME	FEDERAL PRIMARY STANDARD CONCENTRATION/ AVERAGING TIME	MOST RELEVANT EFFECTS
Ozone	0.09 ppm, 1-hr. avg. >	0.12 ppm, 1-hr avg.>	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals. (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide	9.0 ppm, 8-hr avg. > 20 ppm, 1-hr avg. >	9 ppm, 8-hr avg.> 35 ppm, 1-hr avg.>	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide	0.25 ppm, 1-hr avg. >	0.053 ppm, ann. avg.>	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide	0.04 ppm, 24-hr avg.> 0.25 ppm, 1-hr. avg. >	0.03 ppm, ann. avg.> 0.14 ppm, 24-hr avg.>	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
Suspended Particulate Matter (PM10)	30 $\mu g/m^3$, ann. geometric mean > 50 $\mu g/m^3$, 24-hr average>	50 $\mu g/m^3$, annual arithmetic mean > 150 $\mu g/m^3$, 24-hr avg.>	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) Excess seasonal declines in pulmonary function, especially in children
Sulfates	25 $\mu g/m^3$, 24-hr avg. >=		(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	1.5 $\mu g/m^3$, 30-day avg. >=	1.5 $\mu g/m^3$, calendar quarter>	(a) Increased body burden; (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hour average (10am - 6pm)		Visibility impairment on days when relative humidity is less than 70 percent

TABLE 3-3
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

		Carbon Monoxide						
						No. Days Standard Exceeded[a]		
						Federal	State	
Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	2nd High Conc. ppm 8-hour	≤9.5 ppm 8-hr.	>9.0 ppm 8-hr.	> 20 ppm 1-hr
LOS ANGELES COUNTY								
1	Central LA	363	9	7.9	6.0	0	0	0
2	NW Coast LA Co	365	7	4.4	4.1	0	0	0
3	SW Coast LA Co	358	12	10.3	8.1	1	1	0
4	S Coast LA Co	365	9	6.7	6.4	0	0	0
6	W Sn Fernan V	362	12	9.8	9.3	1	2	0
7	E Sn Fernan V	353	9	7.4	7.0	0	0	0
8	W Sn Gabrl V	361	8	6.0	5.3	0	0	0
9	E Sn Gabrl V1	356	8	4.3	4.1	0	0	0
9	E Sn Gabrl V2	--	--	--	--	--	--	--
10	Pomona/Wln V1	364	8	5.0	4.9	0	0	0
10	Pomona/Wln V2	--	--	--	--	--	--	--
11	S Sn Gabrl V	346	9	6.2	6.0	0	0	0
12	S Cent LA Co	364	19	17.0	15.0	14	18	0
13	Sta Clarita V	363	7	6.8	6.3	0	0	0
ORANGE COUNTY								
16	N Orange Co	361	12	6.0	5.6	0	0	0
17	Cent Orange Co	364	8	5.8	5.6	0	0	0
18	N Coast Orange	364	7	5.8	5.0	0	0	0
19	Saddleback V	365	5	3.6	2.8	0	0	0
RIVERSIDE COUNTY								
22	Norco/Corona	--	--	--	--	--	--	--
23	Metro Riv Co 1	310*	7*	5.8	5.0*	0*	0*	0*
23	Metro Riv Co 2	364	11	5.0	4.7	0	0	0
24	Perris Valley	--	--	--	--	--	--	--
25	Lake Elsinore	--	--	--	--	--	--	--
26	Temecula V	--	--	--	--	--	--	--
29	San Gorgonio P	--	--	--	--	--	--	--
30	Coachella V1**	359	3	1.4	1.4	0	0	0
30	Coachella V2**	--	--	--	--	--	--	--
SAN BERNARDINO COUNTY								
32	NW SB V	--	--	--	--	--	--	--
33	SW SB V	--	--	--	--	--	--	--
34	Cent SB V 1	--	--	--	--	--	--	--
34	Cent SB V 2	323*	8*	6.0*	5.4*	0*	0*	0*
35	E SB V	--	--	--	--	--	--	--
37	Cent SB Mtns	--	--	--	--	--	--	--

ABBREVIATIONS USED IN THE ARSEA NAMES: LA = Los Angeles, SB = San Bernardino, N = North, S = South, W = West, E = East, V = Valley, P = Pass, Cent = Central

ppm - Parts per million parts of air, by volume.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
** - Salton Sea or Mojave Desert Air Basin
a) - The federal 1-hour standard (1-hour average CO > 35 ppm) was not exceeded.

TABLE 3-3 (CONTINUED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Ozone							
					No. Days Standard Exceeded[a)]		
					Federal		State
Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hour	Max. Conc. in ppm 8-hour	≤9.5 ppm 8-hr.	>9.0 ppm 8-hr.	> 20 ppm 1-hr
LOS ANGELES COUNTY							
1	Central LA	365	0.12	0.09	0	3	6
2	NW Coast LA Co	365	0.11	0.09	0	2	6
3	SW Coast LA Co	364	0.11	0.09	0	3	6
4	S Coast LA Co	365	0.10	0.07	0	0	1
6	W Sn Fernan V	365	0.12	0.10	0	3	12
7	E Sn Fernan V	355	0.13	0.11	2	6	15
8	W Sn Gabrl V	365	0.14	0.11	5	16	24
9	E Sn Gabrl V1	357	0.16	0.12	11	18	42
9	E Sn Gabrl V2	365	0.17	0.13	18	26	67
10	Pomona/Wln V1	364	0.16	0.12	7	10	30
10	Pomona/Wln V2	–	–	–	–	–	–
11	S Sn Gabrl V	355	0.13	0.10	6	7	18
12	S Cent LA Co	359	0.08	0.07	0	0	0
13	Sta Clarita V	365	0.16	0.13	13	27	54
ORANGE COUNTY							
16	N Orange Co	365	0.13	0.10	1	3	9
17	Cent Orange Co	363	0.10	0.09	0	1	1
18	N Coast Orange	365	0.10	0.08	0	0	1
19	Saddleback V	365	0.13	0.10	2	2	8
RIVERSIDE COUNTY							
22	Norco/Corona	–	–	–	–	–	–
23	Metro Riv Co 1	326*	0.19*	0.13*	13*	55*	89*
23	Metro Riv Co 2	332	–	–	–	–	–
24	Perris Valley	360	0.14	0.11	6	41	64
25	Lake Elsinore	356	0.16	0.12	4	38	49
26	Temecula V	118*	0.10*	0.09*	0*	1*	3*
29	San Gorgonio P	365	0.13	0.10	2	9	34
30	Coachella V 1**	339*	0.16*	0.12*	4*	31*	45*
30	Coachella V 2**	365	0.11	0.09	0	2	3
SAN BERNARDINO COUNTY							
32	NW SB V	361	0.19	0.13	12	30	69
33	SW SB V	–	–	–	–	–	–
34	Cent SB V 1	365	0.17	0.13	10	33	65
34	Cent SB V 2	365	0.20	0.14	32	65	102
35	E SB V	363	0.20	0.14	35	79	108
37	Cent SB Mtns	351	0.21	0.14	29	74	92

ABBREVIATIONS USED IN THE ARSEA NAMES: LA = Los Angeles, SB = San Bernardino, N = North, S = South, W = West, E = East, V = Valley, P = Pass, Cent = Central

ppm - Parts per million parts of air, by volume.

– - Pollutant not monitored.

* - Less than 12 full months of data. May not be representative.

** - Salton Sea or Majave Desert Air Basin.

TABLE 3-3 (CONTINUED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Nitrogen Dioxide					
Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hour	Average Compared to Federal Standard[b)] AAM in ppm	No. Days Std. Exc'd State > .25 ppm 1-hour
LOS ANGELES COUNTY					
1	Central LA	342	0.20	0.0430	0
2	NW Coast LA Co	365	0.14	0.0285	0
3	SW Coast LA Co	355	0.17	0.0280	0
4	S Coast LA Co	364	0.20	0.0333	0
6	W Sn Fernan V	365	0.20	0.0260	0
7	E Sn Fernan V	343	0.20	0.0424	0
8	W Sn Gabrl V	360	0.17	0.0341	0
9	E Sn Gabrl V 1	356	0.16	0.0338	0
9	E Sn Gabrl V 2	365	0.13	0.0300	0
10	Pomona/Wln V 1	364	0.15	0.0433	0
10	Pomona/Wln V 2	--	--	--	--
11	S Sn Gabrl V	351	0.15	0.0363	0
12	S Cent LA Co	344	0.20	0.0428	0
13	Sta Clarita V	--	--	--	--
ORANGE COUNTY					
16	N Orange Co	361	0.15	0.0329	0
17	Cent Orange Co	363	0.13	0.0332	0
18	N Coast Orange	362	0.12	0.0199	0
19	Saddleback V	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metro Riv Co 1	322*	0.12*	0.0262*	0*
23	Metro Riv Co 2	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	308*	0.11*	0.0165*	0*
26	Temecula V	--	--	--	--
29	San Gorgonio P	--	--	--	--
30	Coachella V 1**	312*	0.07*	0.0158*	0*
30	Coachella V 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW SB V	327*	0.15*	0.0341*	0*
33	SW SB V	--	--	--	--
34	Cent SB V 1	347	0.14	0.0365	0
34	Cent SB V 2	347	0.14	0.0353	0
35	E SB V	--	--	--	--
37	Cent SB Mtns	--	--	--	--

ABBREVIATIONS USED IN THE ARSEA NAMES: LA = Los Angeles, SB = San Bernardino, N = North, S = South, W = West, E = East, V = Valley, P = Pass, Cent = Central

ppm - Parts per million parts of air, by volume.
AAM - Annual arithmetic mean.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
** - Salton Sea or Majave Desert Air Basin.
b) - The federal standard is annual arithmetic mean NO^2 greater than 0.0534 ppm. No location exceeded this standard.

TABLE 3-3 (CONTINUED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Sulfur Dioxide					
Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hour[c)]	Max. Conc. in ppm 24-hour[c)]	Average Compared to Federal Standard[d)] AAM in ppm
LOS ANGELES COUNTY					
1	Central LA	365	0.02	0.011	0.0007
2	NW Coast LA Co	--	--	--	--
3	SW Coast LA Co	364	0.10	0.015	0.0014
4	S Coast LA Co	365	0.04	0.011	0.0024
6	W Sn Fernan V	--	--	--	--
7	E Sn Fernan V	323*	0.04*	0.008*	0.0003*
8	W Sn Gabrl V	--	--	--	--
9	E Sn Gabrl V 1	--	--	--	--
9	E Sn Gabrl V 2	--	--	--	--
10	Pomona/Wln V 1	--	--	--	--
10	Pomona/Wln V 2	--	--	--	--
11	S Sn Gabrl V	--	--	--	--
12	S Cent LA Co	--	--	--	--
13	Sta Clarita V	--	--	--	--
ORANGE COUNTY					
16	N Orange Co	--	--	--	--
17	Cent Orange Co	--	--	--	--
18	N Coast Orange	365	0.03	0.010	0.0003
19	Saddleback V	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metro Riv Co 1	333*	0.04*	0.007*	0.0003*
23	Metro Riv Co 2	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
26	Temecula V	--	--	--	--
29	San Gorgonio P	--	--	--	--
30	Coachella V 1**	--	--	--	--
30	Coachella V 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW SB V	--	--	--	--
33	SW SB V	--	--	--	--
34	Cent SB V 1	365	0.01	0.001	0.0000
34	Cent SB V 2	--	--	--	--
35	E SB V	--	--	--	--
37	Cent SB Mtns	--	--	--	--

ABBREVIATIONS USED IN THE ARSEA NAMES: LA = Los Angeles, SB = San Bernardino, N = North, S = South, W = West, E = East, V = Valley, P = Pass, Cent = Central

ppm - Parts per million parts of air, by volume.
* - Less than 12 full months of data. May not be representative.
AAM - Annual arithmetic mean.
-- - Pollutant not monitored.
** - Salton Sea or Majave Desert Air Basin.

c) - The federal standard is annual arithmetic mean SO^2 greater than 80 µg/m3 (0.03 ppm). No location exceeded this standard. The other federal standards (3-hour average > 0.50 ppm, and 24-hour average > 0.14 ppm) were not exceeded either.

d) - The other state standard (24-hour average > 0.04 ppm) was not exceeded either.

TABLE 3-3 (CONTINUED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Suspended Particulates PM10[e)]							
				No. (%) Samples Exceeding Standard		Annual Averages[g)]	
Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in µg/m³ 24-hour	Federal >150 µg/m³ 24-hour	State >50 µg/m³ 24-hour	AAM Conc. µg/m³	AGM Conc. µg/m³
LOS ANGELES COUNTY							
1	Central LA	60	102	0	15(25.0)	42.5	39.2
2	NW Coast LA Co	--	--	--	--	--	--
3	SW Coast LA Co	55*	79*	0*	4(7.3)*	35.5*	33.8*
4	S Coast LA Co	57	87	0	10(17.5)*	40.5	38.2
6	W Sn Fernan V	--	--	--	--	--	--
7	E Sn Fernan V	56*	92*	0*	17(30.4)*	44.8*	41.9*
8	W Sn Gabrl V	--	--	--	--	--	--
9	E Sn Gabrl V 1	60	116	0	24(40.0)	45.9	40.8
9	E Sn Gabrl V 2	--	--	--	--	--	--
10	Pomona/Wln V 1	--	--	--	--	--	--
10	Pomona/Wln V 2	34*	67*	0*	6(17.6)*	39.6*	38.0*
11	S Sn Gabrl V	--	--	--	--	--	--
12	S Cent LA Co	--	--	--	--	--	--
13	Sta Clarita V	59	67	0	5(8.5)	32.9	30.5
ORANGE COUNTY							
16	N Orange Co	--	--	--	--	--	--
17	Cent Orange Co	60	91	0	11(18.3)	38.9	36.3
18	N Coast Orange	--	--	--	--	--	--
19	Saddleback V	56*	86*	0*	4(7.1)*	34.5*	32.5*
RIVERSIDE COUNTY							
22	Norco/Corona	60	158	1(1.7)	25(41.7)	49.6	44.2
23	Metro Riv Co 1	59	163	1(1.7)	41(69.5)	64.9	56.3
23	Metro Riv Co 2	--	--	--	--	--	--
24	Perris Valley	60	139	0	19(31.7)	44.5	38.5
25	Lake Elsinore	--	--	--	--	--	--
26	Temecula V	--	--	--	--	--	--
29	San Gorgonio P	57	227	1(1.8)	14(24.6)	38.2	30.1
30	Coachella V 1**	59	63	0	1(1.8)	26.4	23.6
30	Coachella V 2**	54*	144*[i)]	0*[i)]	23(42.6)*[i)]	49.1*[i)]	44.2*[i)]
SAN BERNARDINO COUNTY							
32	NW SB V	--	--	--	--	--	--
33	SW SB V	59	208	1(1.7)	21(35.6)	51.3	44.8
34	Cent SB V 1	61	122	0	29(47.5)	53.7	47.6
34	Cent SB V 2	60	108	0	27(45.0)	51.4	45.6
35	E SB V	60	103	0	23(38.3)	43.2	35.4
37	Cent SB Mtns	58	47	0	0	23.8	20.8

ABBREVIATIONS USED IN THE ARSEA NAMES: LA = Los Angeles, SB = San Bernardino, N = North, S = South, W = West, E = East, V = Valley, P = Pass, Cent = Central

µg/m³ - Micrograms per cubic meter of air.
AAM - Annual arithmetic mean. AGM - Annual geometric mean.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
** - Salton Sea or Majave Desert Air Basin.
e) - PM10 samples were collected every 6 days using the size-selective inlet high volume sampler with quartz filter media
g) - Federal PM10 standard is AAM > 50 µg/m³; state standard is AGM > 30 µg/m³
i) - The data for the two samples collected on high-wind-days (157 µg/m³ on 3/17/97 and 182 µg/m³ on 4/28/97) were excluded according to the EPA's Natural Events Policy.

TABLE 3-3 (CONTINUED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

		Particulates TSP[f]		
			Annual Averages	
Source/ Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in $\mu g/m^3$ 24-hour	AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY				
1	Central LA	61	154	70.0
2	NW Coast LA Co	56*	98*	50.2*
3	SW Coast LA Co	52*	122*	56.7*
4	S Coast LA Co	60	117	60.3
6	W Sn Fernan V	–	–	–
7	E Sn Fernan V	–	–	–
8	W Sn Gabrl V	60	106	51.6
9	E Sn Gabrl V 1	57	195	90.7
9	E Sn Gabrl V 2	–	–	–
10	Pomona/Wln V 1	–	–	–
10	Pomona/Wln V 2	–	–	–
11	S Sn Gabrl V	56*	124*	79.0*
12	S Cent LA Co	55*	163*	86.4*
13	Sta Clarita V	–	–	–
ORANGE COUNTY				
16	N Orange Co	–	–	–
17	Cent Orange Co	–	–	–
18	N Coast Orange	–	–	–
19	Saddleback V	–	–	–
RIVERSIDE COUNTY				
22	Norco/Corona	–	–	–
23	Metro Riv Co 1	59	495	122.4
23	Metro Riv Co 2	62	155	80.1
24	Perris Valley	–	–	–
25	Lake Elsinore	–	–	–
26	Temecula V	–	–	–
29	San Gorgonio P	–	–	–
30	Coachella V 1**	–	–	–
30	Coachella V 2**	–	–	–
SAN BERNARDINO COUNTY				
32	NW SB V	61	159	69.3
33	SW SB V	–	–	–
34	Cent SB V 1	60	212	99.8
34	Cent SB V 2	60	182	96.1
35	E SB V	–	–	–
37	Cent SB Mtns	–	–	–

$\mu g/m^3$ - Micrograms per cubic meter of air.
AAM - Annual arithmetic mean. AGM - Annual geometric mean.
– - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
** - Salton Sea or Majave Desert Air Basin.
f) - Total supended particulates, lead, and sulfate were determined from samples collected every 6 days by the high volume sampler method, on glass fiber filter media. Federal TSP standard superseded by PM10 standard, July 1, 1987.

TABLE 3-3 (CONTINUED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

		Lead[f]			
				Quarters/Months Exceeding Standard[h]	
Source/ Receptor Area No.	Location of Air Monitoring Station	Max. Mo. Conc. µg/m³	Max. Qtrly. Conc. µg/m³	Federal >1.5 µg/m³ Qtrly. Avg.	State >=1.5 µg/m³ Mo. Avg.
LOS ANGELES COUNTY					
1	Central LA	.0.07	0.07	0	0
2	NW Coast LA Co	--	--	--	--
3	SW Coast LA Co	0.06*	0.05*	0*	0*
4	S Coast LA Co	0.05	0.03	0	0
6	W SN Fernan V	--	--	--	--
7	E Sn Fernan V	--	--	--	--
8	W Sn Gabrl V	--	--	--	--
9	E Sn Gabrl V 1	--	--	--	--
9	E Sn Gabrl V 2	--	--	--	--
10	Pomona/Wln V 1	--	--	--	--
10	Pomona/Wln V 2	--	--	--	--
11	S Sn Gabrl V	0.08*	0.06*	0*	0*
12	S Cent LA Co	0.07*	0.07*	0*	0*
13	Sta Clarita V	--	--	--	--
ORANGE COUNTY					
16	N Orange Co	--	--	--	--
17	Cent Orange Co	--	--	--	--
18	N Coast Orange	--	--	--	--
19	Saddleback V	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metro Riv Co 1	0.07	0.04	0	0
23	Metro Riv Co 2	0.07	0.04	0	0
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
26	Temecula V	--	--	--	--
29	San Gorgonio P	--	--	--	--
30	Coachella V 1**	--	--	--	--
30	Coachella V 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	NW SB V	0.04	0.04	0	0
33	SW SB V	--	--	--	--
34	Cent SB V 1	--	--	--	--
34	Cent SB V 2	0.04*	0.04*	0*	0*
35	E SB V	--	--	--	--
37	Cent SB Mtns	--	--	--	--

µg/m³ - Micrograms per cubic meter of air.
-- - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
** - Salton Sea or Majave Desert Air Basin.
f) - Total supended particulates, lead, and sulfate were determined from samples collected every 6 days by the high lume sampler method, on glass fiber filter media. Federal TSP standard superseded by M10 standard, July 1, 1987.
h) - Special monitoring immediately downwind of stationary sources of lead was carried out at several locations in 1996. The maximum monthly average concentration was 1.82 µg/m³ and the maximum quarterly average concentration was 0.71 µg/m³, both recorded in Area 5, Southeast Los Angeles County.

TABLE 3-3 (CONCLUDED)
1997 AIR QUALITY DATA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

		Sulfate[f]	
			No. (%) Samples Exceeding Standard
Source/ Receptor Area No.	Location of Air Monitoring Station	Max. Conc. in $\mu g/m^3$ 24-hour	State >=25 $\mu g/m^3$ 24-hour
LOS ANGELES COUNTY			
1	Central LA	14.3	0
2	NW Coast LA Co	14.0*	0*
3	SW Coast LA Co	14.4*	0*
4	S Coast LA Co	11.4	0
6	W Sn Fernan V	–	–
7	E Sn Fernan V	–	–
8	W Sn Gabrl V	11.6*	0
9	E Sn Gabrl V 1	12.7*	0*
9	E Sn Gabrl V 2	–	–
10	Pomona/Wln V 1	–	–
10	Pomona/Wln V 2	–	–
11	S Sn Gabrl V	13.1*	0*
12	S Cent LA Co	11.4*	0*
13	Sta Clarita V	–	–
ORANGE COUNTY			
16	N Orange Co	–	–
17	Cent Orange Co	–	–
18	N Coast Orange	–	–
19	Saddleback V	–	–
RIVERSIDE COUNTY			
22	Norco/Corona	–	–
23	Metro Riv Co 1	13.1	0
23	Metro Riv Co 2	10.4	0
24	Perris Valley	–	–
25	Lake Elsinore	–	–
26	Temecula V	–	–
29	San Gorgonio P	–	–
30	Coachella V 1**	–	–
30	Coachella V 2**	–	–
SAN BERNARDINO COUNTY			
32	NW SB V	9.7	0
33	SW SB V	–	–
34	Cent SB V 1	10.2	0
34	Cent SB V 2	9.1	0
35	E SB V	–	–
37	Cent SB Mtns	–	–

$\mu g/m^3$ - Micrograms per cubic meter of air.
– - Pollutant not monitored.
* - Less than 12 full months of data. May not be representative.
** - Salton Sea or Majave Desert Air Basin.
f) - Total supended particulates, lead, and sulfate were determined from samples collected every 6 days by the high volume sampler method, on glass fiber filter media. Federal TSP standard superseded by PM10 standard, July 1, 1987.

PM10 on a total of 86 days. In 1997, the annual maximum concentrations of ozone, CO and PM10 in the district exceeded both federal and state standards in some or all areas. In the desert areas of Riverside County downwind of the Basin, the standards were exceeded for ozone and PM10. In 1997, no areas of the Basin exceeded standards for NO_2, SO_2, lead or sulfate. Currently, the district is in attainment with the ambient air quality standards for lead, SO_2, and NO_2. The air quality data collected from the SCAQMD monitoring network is presented in Table 3-3.

Ozone

Unlike primary criteria pollutants that are emitted directly from an emissions source, ozone is a secondary pollutant. It is formed in the atmosphere through a photochemical reaction of VOC, NOx, oxygen, and other hydrocarbon materials with sunlight.

Ozone is a deep lung irritant, causing the passages to become inflamed and swollen. Exposure to ozone produces alterations in respiration, the most characteristic of which is shallow, rapid breathing and a decrease in pulmonary performance. Ozone reduces the respiratory system's ability to fight infection and to remove foreign particles. People who suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis are more sensitive to ozone's effects. In severe cases, ozone is capable of causing death from pulmonary edema. Early studies suggested that long-term exposure to ozone results in adverse effects on morphology and function of the lung and acceleration of lung-tumor formation and aging. Ozone exposure also increases the sensitivity of the lung to bronchoconstrictive agents such as histamine, acetylcholine, and allergens.

The national ozone ambient air quality standard is exceeded far more frequently in the district than any other area in the United States. In the past few years, ozone air quality has been the cleanest on record in terms of maximum concentration and number of days exceeding the standards and episode levels. The weather phenomenon, El Nino, contributed to some of the improvement of the ozone air quality in 1997 by causing unstable weather and increased cloudiness through the summer. Maximum 1-hour average and 8-hour average ozone concentrations in 1997 (0.21 ppm and 0.14 ppm) were 168 percent and 169 percent of the federal 1-hour and 8-hour standards, lower than the previous three years. Ozone concentrations exceeded the 1-hour state standard at all but one monitored locations in 1997. There was only one stage I episode in 1997, compared to the record low of seven days recorded in 1996.

The 1-hour federal ozone standard was exceeded a number of days in different areas of the Basin in 1997. The number of days exceeding the federal standard varies widely between different areas of the Basin. The standard was exceeded most frequently in the Basin's inland valleys in an area extending from the East San Gabriel Valley eastward to the

Riverside-San Bernardino area and into the adjacent mountains. The East San Bernardino Valley recorded the greatest number of exceedances of the national ozone standard (35 days).

In 1997, the USEPA promulgated a new national ambient air quality standard for ozone. The ARB and local air districts will be developing State Implementation Plans (SIP) to reduce unhealthful levels of ozone in areas violating the new federal standard. California has previously developed a SIP for the current ozone standard. The new federal air quality standard for ozone will be analyzed in the 2000 AQMP. A SIP for the new national ambient air quality standard for ozone will be prepared by 2003.

Carbon Monoxide

CO is a colorless, odorless gas formed by the incomplete combustion of fuels. CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs in the body. The ambient air quality standard for carbon monoxide is intended to protect persons whose medical condition already compromises their circulatory systems' ability to deliver oxygen. These medical conditions include certain heart ailments, chronic lung diseases, and anemia. Persons with these conditions have reduced exercise capacity even when exposed to relatively low levels of CO. Fetuses are at risk because their blood has an even greater affinity to bind with CO. Smokers are also at risk from ambient CO levels because smoking increases the background level of CO in their blood.

CO was monitored at 20 locations in the district in 1997. The national and state 8-hour CO standards were each exceeded at three locations. The highest 8-hour average CO concentration of the year (17.0 ppm) was 179 percent of the federal standard. Source/Receptor Area No. 12, South Central Los Angeles County, reported by far the greatest number of the exceedances of the federal and state CO standards (14 and 18 days, respectively) in 1997.

Nitrogen Dioxide

NO_2 is a brownish gas that is formed in the atmosphere through a rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. NO and NO2 are collectively referred to as NO_x. NO_2 can cause health effects in sensitive population groups such as children and people with chronic lung diseases. It can cause respiratory irritation and constriction of the airways, making breathing more difficult. Asthmatics are especially sensitive to these effects. People with asthma and chronic bronchitis may also experience headaches, wheezing and chest tightness at high ambient levels of NO_2. NO_2 is suspected to reduce resistance to infection, especially in young children.

By 1991, exceedances of the federal standard were limited to one location in Los Angeles County. The Basin was the only area in the United States classified as nonattainment for the federal NO_2 standard under the 1990 Clean Air Act Amendments. No location in the area of

SCAQMD's jurisdiction has exceeded the federal standard since 1992 and the South Coast Air Basin was designated attainment for the national standard in 1998. The state NO_2 standard has been met each year since 1994. In 1997, the maximum concentration (0.0433 ppm) was 81 percent of the federal standard. The more stringent state standard was not exceeded for the fourth consecutive year, with a maximum 1-hour average NO_2concentration (0.20 ppm) which was 77 percent of the state standard. In 1998, the South Coast Air Basin was redesignated to attainment of the federal NO_2 ambient air quaility standard. Despite declining NO_x emissions over the last decade, further NO_x emissions reductions are necessary because NO_x emissions are PM10 and ozone precursors.

Particulate Matter

PM10 is defined as suspended particulate matter 10 microns or less in diameter and includes a complex mixture of man-made and natural substances including sulfates, nitrates, metals, elemental carbon, sea salt, soil, organics and other materials. PM10 may have adverse health impacts because these microscopic particles are able to penetrate deeply into the respiratory system. In some cases, the particulates themselves may cause actual damage to the alveoli of the lungs or they may contain adsorbed substances that are injurious. Children can experience a decline in lung function and an increase in respiratory symptoms from PM10 exposure. People with influenza, chronic respiratory disease and cardiovascular disease can be at risk of aggravated illness from exposure to fine particles. Increases in death rates have been statistically linked to corresponding increases in PM10 levels.

In 1997, PM10 was monitored at 20 locations in the district. The national 24-hour standard was exceeded at four locations, and the state 24-hour standard was exceeded at 19 locations.

In 1997, the USEPA promulgated a new national ambient air quality standard for PM2.5, particulate matter 2.5 microns or less in diameter. The PM2.5 standard complements existing national and state ambient air quality standards that target the full range of inhalable PM10. Efforts to characterize PM2.5 and comply with the federal standards will provide further progress towards attaining California's own PM10 standards. The ARB and local air districts will be developing SIPs to reduce unhealthful levels of PM2.5 in areas violating the new federal standards. These standards will be analyzed in the 2000 AQMP. A new SIP for PM2.5 will be prepared by 2006.

Sulfur Dioxide

SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Health effects include acute respiratory symptoms and difficulty in breathing for children. Though SO_2 concentrations have been reduced to levels well below state and federal standards, further reductions in emissions of SO_2 are needed to comply with standards for other pollutants (sulfate and PM10).

Sulfates

Sulfates are a group of chemical compounds containing the sulfate group, which is a sulfur atom with four oxygen atoms attached. Though not exceeded in 1993, 1996, and 1997, the state sulfate standard was exceeded at three locations in 1994 and one location in 1995. There are no federal air quality standards for sulfate.

Lead

Lead concentrations once exceeded the state and national ambient air quality standards by a wide margin, but have not exceeded state or federal standards at any regular monitoring station since 1982. Though special monitoring sites immediately downwind of lead sources recorded very localized violations of the state standard in 1994, no violations were recorded at these stations since that time.

Visibility

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the state of California has adopted a standard for visibility or visual range. Until 1989, the standard was based on visibility estimates made by human observers. The standard was changed to require measurement of visual range using instruments that measure light scattering and absorption by suspended particles.

It has been determined that the calibration of the instruments used to measure visibility was faulty, and no reliable data are available for 1997.

Volatile Organic Compounds

It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because reduction in VOC emissions reduces the rate of photochemical reactions that contribute to the formation of ozone. They are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

Architectural Coating Existing Emissions Inventory

Architectural and industrial maintenance (AIM) coatings represent one of the largest non-mobile sources of VOC emissions in the district -- larger than petroleum refining, larger than petroleum marketing, larger than degreasing and dry cleaning combined, and larger than the combined VOC emissions from the 950 largest VOC-emitting facilities. It has been estimated that 25 percent of all hydrocarbons used as solvents (293 million gallons in 1992) are used in paints and coatings.[2]

The emission inventories from the 1997 AQMP include VOC emissions from AIM coatings from 1987 to 2010. Baseline emissions, assuming no new rules, are reported in terms of average, annual-day emissions, and in terms of average, summer-day emissions. The average summer-day figures, also called seasonal or planning inventories, are the ones used for demonstrating ozone attainment. Future, controlled AIM VOC emissions, assuming the AQMP measures are adopted and implemented, are only reported in terms of average summer-day emissions. The 1997 AQMP emission data for AIM coatings are summarized in Table 3-4. Table 3-5 provides a breakdown of the emission inventories associated with these coatings.

TABLE 3-4

1997 AQMP VOC EMISSIONS INVENTORY (tons per day)

AIM Coating VOC Baseline	1987	1990	1993	1997	1999	2000	2002	2005	2008	2010
Annual Avg.	55.3	55.9	56.3	57.8	58.9	59.4	61.1	63.4	65.7	67.3
Summer Avg.	65.2	65.9	66.4	68.2	69.5	70.1	72.0	74.7	77.5	79.4
Total VOC Emissions All Sources	1818.5	1648.3	1240.2	996.6	916.0	891.4	858.9	810.4	785.5	770.1

Table 3-5 is based on the 1998 Draft CARB AIM "Survey of Emissions from Solvent Use". Evaluation of the 1996 sales data indicates statewide AIM coating VOC emissions in 1996 of approximately 99 tons per day. Prorated by population to the Basin portion of AQMD, this results in 45 tons per day. This data does not include the clean-up and thinning solvents used as a part of the coating operation. The usage and emission values found in this report are subject to changes based on the final 1998 CARB Survey Report. See page 3-3 of this Final SEA for updated usage and emission data.

[2] Stirring Up Innovation: Environmental Improvements in Paints and Adhesives, INFORM, Inc., 1994.

TABLE 3-5

VOC EMISSIONS INVENTORY FOR AFFECTED COATING CATEGORIES

Categories	1997 Inventory (tons/day)	2010 Inventory (tons/day)
Floor Coatings	0.61	0.71
IM Coatings	6.48	7.52
High Temperature IM Coatings	0.04	0.05
Non-Flats	8.80	10.22
Quick-Dry Enamels	1.86	2.16
PSU	3.60	4.18
Quick-Dry PSU	2.68	3.11
Rust Preventive Coatings	0.89	1.03
Stains	2.16	2.51
Water-Proofing Wood Sealers	0.89	1.03
Total	**28.01**	**32.52**

Strategy for Attaining the National and State Ozone Standards

As required by federal law, the AQMD adopted the 1997 AQMP in November 1996. The AQMP is a comprehensive plan to achieve the national and state ambient air quality standards in the district, the area with the highest air pollution levels in the United States.

Based on the Urban Airshed Model simulation of the Basin, it was concluded in the 1997 AQMP that major reductions in emissions of VOCs and NOx are necessary to attain the air quality standards for ozone and PM_{10}. Earlier AQMPs contained the same conclusion. To attain the ozone standards, VOC emissions must be reduced from 1,366[3] tons per day in 1993 (the baseline inventory year for the 1997 AQMP) to 444 tons per day by 2010, a 68 percent reduction. NOx emissions must be reduced by 57 percent, from 1,321 tons per day to 571 tons per day.

The 1997 AQMP underscores the increasing role of pollution from areawide sources, including consumer products. As emissions from facilities and vehicles are reduced, the widespread areawide sources become a larger part of the inventory, and are included as the biggest area for potential reductions of VOC emissions.

It is estimated in the 1997 AQMP that without additional AIM regulations the summer-day average inventory for AIM coating emissions will increase due to population growth by the following: 68.2 tons per day in 1997; 74.7 tons per day by the year 2005; and 79.4 tons per day by the year 2010. If left unregulated, AIM coating emissions alone would account for more than 26 percent of the VOC emissions inventory targeted for 2010. To assist with

[3] All emission figures in this section are based on the summer planning inventories.

attaining and maintaining the state and national ozone standards, the 1997 AQMP has a specific control measure (CTS-07) to reduce AIM VOC emissions by 50 percent by the year 2010, as well as a long-term measure requiring an additional 25 percent reduction in VOC emissions. The projected 62 tons per day emission reduction from control measure CTS-07, based on the Summer Planning Inventory, produces the largest VOC emissions reduction of all short- and long-term AQMP control measures. The proposed Rule 1113 amendments will implement Phase II of the control measure and will seek to reduce AIM emissions by approximately 36 percent.

Installation of air pollution control equipment is not feasible for reducing AIM coatings emissions, thereby leaving coating reformulation as the only possible means to achieve the required reductions. The current proposal emphasizes reformulation of existing coatings, primarily by using currently available, technologically-innovative resins, as well as utilizing the growing list of solvents from the definition of Exempt Compounds.

WATER RESOURCES

California has an extensive regulatory program to control water pollution. The most important statute affecting water quality issues is the Porter-Cologne Act, which gives the State Water Resources Control Board (SWRCB) and the nine regional water quality control boards (RWQCB) broad powers to protect surface and groundwater supplies in California, regulate waste disposal, and require cleanup of hazardous conditions (California Water Code §§13000 - 13999.16). In particular, the SWRCB establishes water-related policies and approves water quality control plans, which are implemented and enforced by the RWQCBs. Five RWQCBs have jurisdiction over areas within the boundaries of the district. These Regional Boards include: Los Angeles, Lahontan, Colorado River Basin, Santa Ana, and San Diego.

It is the responsibility of each regional board to prepare water quality control plans to protect surface and groundwater supplies within its region. These plans must: identify important regional water resources and their beneficial uses, such as domestic, navigational, agricultural, industrial, and recreational; establish water quality objectives, limits or levels of water constituents or characteristics established for beneficial uses and to prevent nuisances; and present an implementation program necessary to achieve those water quality objectives. These plans also contain technical information for determining waste discharge requirements and taking enforcement actions. The plans are typically reviewed and updated every three years (California Water Code §13241).

California dischargers of waste, which "could affect the quality of the waters of the state" are required to file a report of, waste discharge with the appropriate regional water board (California Water Code §13260). The report is essentially a permit application and must contain information required by the regional board. After receipt of a discharge report, the regional board will issue "waste discharge requirements" analogous to a permit with

conditions prescribing the allowable nature of the proposed discharge (California Water Code §§13263, 13377, and 13378).

National Pollution Discharge Elimination System Requirements

Most discharges into state waters are regulated by the National Pollution Discharge Elimination System (NPDES), a regulatory program under the federal Clean Water Act. The NPDES is supervised by USEPA, but administered by the SWRCB. NPDES requirements apply to discharges of pollutants into navigable waters from a point source, discharges of dredged or fill material into navigable waters, and the disposal of sewage sludge that could result in pollutants entering navigable waters. California has received USEPA approval of its NPDES program.

Pursuant to California's NPDES program, any waste discharger subject to the NPDES program must obtain an NPDES permit from the appropriate RWQCB. The permits typically include criteria and water quality objectives for a wide range of constituents. The NPDES program is self-monitoring, requiring periodic effluent sampling. Permit compliance is assessed monthly by the local RWQCB and any NPDES violations are then categorized and reported to USEPA on a quarterly basis.

USEPA has also published regulations that require certain industries, cities and counties to obtain NPDES permits for stormwater discharges [(55 Fed. Reg. (1990)]. The nev regulations set forth permit application requirements for classes of stormwater discharges specifically identified in the federal Clean Water Act. The regulated stormwater discharges include those associated with industrial activity and from municipal storm sewer systems serving a population of 100,000 or more.

Discharges to Publicly Owned Treatment Works (POTWs)

Water discharges to a public sewage system (referred to generically as a POTW), rather than directly to the environment, are not subject to the NPDES discharge requirements. Instead, such discharges are subject to federal pretreatment requirements under §§307(b) and (c) of the Clean Water Act [(33 U.S.C., §1317(b)-(c))]. Though these pretreatment standards are enforced directly by USEPA, they are implemented by local sanitation districts (Monahan et al., 1993). The discharger, however, has the responsibility to ensure that the waste stream complies with the pretreatment requirements of the local system. Any facility using air pollution control equipment affecting water quality must receive a permit to operate from the local sanitation district. In cases where facilities modify their equipment or install air pollution controls that generate or alter existing wastewater streams, owner/operators must notify the local sanitation district and request that their existing permit be reviewed and modified.

To ensure compliance with wastewater pretreatment regulations, local sanitation districts, such as the County Sanitation Districts of Los Angeles County, sample and analyze the wastewater streams from facilities approximately two to four times per year (Lum, 1989). Persons who violate the state's water quality laws are subject to a wide array of enforcement provisions.

In 1990, USEPA revised and extended existing regulations to further regulate hazardous waste dischargers and require effluent testing by POTWs. To comply with revised permit limits, POTWs may alter their operations or impose more stringent local limits on industrial user discharges of hazardous wastes (Monahan, et al., 1993). Sanitation districts that adopt ordinances establishing a permit system and fee structure operate POTWs in California. There are 47 agencies providing wastewater treatment in the district, the largest three being the County Sanitation Districts of Los Angeles County, Los Angeles City Sanitation District, and the Orange County Sanitation District. These three agencies account for 71 percent of influent wastewater in the district (SCAG, 1993).

There are a variety of advanced chemical and physical treatment techniques and equipment that remove chemical contaminants from waste streams. Depending upon the characteristics of the contaminants in the wastewater stream, it may be necessary for the wastewater to undergo a series of treatment processes. Table 3-6 identifies some examples of wastewater treatment methodologies and the appropriate sequence in the wastewater treatment process in which they would occur.

TABLE 3-6

EXAMPLES OF WASTEWATER TREATMENT METHODS

INITIAL TREATMENT	INTERMEDIATE TREATMENT	ADVANCED TREATMENT
Sedimentation	Trickling Filters	Carbon Adsorption
Neutralization	Activated Sludge	Ion Exchange
Chemical Coagulation	(aerobic bacteria)	Air Stripping
Precipitation	Chemical Oxidation	Reverse Osmosis
	(chlorination & ozonation)	Electrodialysis

Source: Lippmann and Schlesinger, 1979; Vembu, 1994.

Existing Water Sources and Uses

Local water districts are the primary water purveyors. These water districts receive some of their water supply from surface and groundwater resources within their respective jurisdictions, with any shortfall made up from supplemental water purveyors. In some cases, 100 percent of a local water district's water supply may come from supplemental sources. The main sources of surface water used by local water districts within the district are the

Colorado, Santa Ana, and Santa Clara Rivers. The primary groundwater sources used by local water districts are as follows:

- Los Angeles County: Raymond, San Fernando, and San Gabriel Water Basins.
- San Bernardino and Riverside counties: Upper Santa Ana Valley Water Basin.
- Riverside County: Coachella Valley Water Basin.
- Orange County: Coastal Plain Water Basin.

The major supplemental water importer in the district is the Southern California Metropolitan Water District (MWD), which is made up of 12 member agencies, 14 member cities, and one County Water Authority.

Water Consumption

Estimating total water use in the district is difficult because the boundaries of supplemental water purveyors' service areas bear little relation to the boundaries of the district and there are dozens of individual water retailers within the district.

Total water demand within the district was approximately 4.22 million acre-feet[4] (MAF) or about 1.4 trillion gallons in fiscal year 1995 (July 1994 through June 1995). About two-thirds of that demand occurred in the service area of the Metropolitan Water District of Southern California (MWD). The MWD's service area includes southern Los Angeles county, including the San Gabriel and San Fernando Valleys, all of Orange County, the western portion of Riverside County, and the Chino Basin in southwestern San Bernardino County. The MWD supplied 1.54 MAF and the LADWP supplied 0.36 MAF in the fiscal year 1995. Local water districts within the MWD service area drew the remaining water from local water sources. About 89 percent of water consumed in the MWD region goes to urban uses with the rest going to agriculture (Rodrigo, 1996). Sixty-six percent of urban water use occurs in the residential sector, with another 17 percent in the commercial and six percent in the industrial sectors. Remaining water uses include public entities, fire fighting, industrial and manufacturing processes. Smaller water purveyors supplied water to northern and eastern areas of the district. Table 3-7 shows water demand by water district.

Most of the outlying regions of the district are heavily dependent on local surface and groundwater resources as major sources of supply for both domestic and agricultural uses. Supplemental supplies are also available in some areas through California State Water Project (SWP) contractors. The largest water supply source in this sub-region is the Colorado River.

[4]One acre foot (AF) is equivalent to 325,800 gallons.

Past population growth and agricultural development in the outlying regions have resulted in groundwater pumping beyond safe yield levels. The Antelope Valley Basin (north Los Angeles County), Mojave Basin (San Bernardino County), and the Coachella Valley Basin (Riverside County) are all in overdraft condition.

TABLE 3-7

1994/1995 WATER DEMAND

WATER DISTRICT	1994/1995 WATER DEMAND (MAF)
Metropolitan Water District Service Area:	
MWD	1.54
Los Angeles Aqueducts	0.36
Local Supplies	1.83
Local Supplies:	
Coachella Valley Water District	0.73
Palo Verde Irrigation District	0.90
San Bernardino Valley Municipal	0.30
Antelope Valley/East Kern Water Agency	0.10
Desert Water Agency	0.037
Castaic Lake Water Agency	0.016
Palmdale Water Agency	0.018
San Gorgonio Pass Water Agency	0.018
Crestline/Lake Arrowhead Water Agency	0.002
Little Rock Creek Irrigation District	0.002

Source:MWD, 1996

Local Water Supplies

Local surface water sources and groundwater basins provide about one-third of the water supply in the district (calculated from data in SCAG, 1993d). The largest surface water sources in the region are the Colorado, the Santa Ana, and the Santa Clara River systems. Major groundwater basins in the region include the Central, Raymond, San Fernando, and San Gabriel basins (Los Angeles county); the Upper Santa Ana Valley Basin system (San Bernardino and Riverside counties); the Coastal Plain Basin (Orange county); and the Coachella Valley Basin (Riverside county).

Local water resources are fully developed and are expected to remain relatively stable in the future on a region-wide basis. However, local water supplies may decline in certain localize areas and increase in others. Several groundwater basins in the region are threatened by overdraft conditions, increasing levels of salinity, and contamination by toxics or other pollutants. Local supplies may also be reduced by conversion of agricultural land to urban development, thereby reducing the land surface available for groundwater recharge. Increasing demand for groundwater may also be limited by water quality, since levels of salinity in sources currently used for irrigation could be unacceptably high for domestic use without treatment.

Imported Water Supplies

Several major conveyance systems bring water to the urbanized portion of the region from: northern California via the SWP; the Sierra Nevada via the Los Angeles Aqueduct; and the Colorado River via the Colorado River Aqueduct. The All-American/Coachella Canals deliver agricultural irrigation water from the Colorado River to the Coachella Valley. The continued availability of water from these sources is uncertain at current levels. The yield of the SWP system is expected to decrease in the future as water use in areas of origin increases, Central Valley Project (CVP) contractual obligations increase, and users with prior rights to northern California water supplies begin to exercise those rights (SCAG, 1987). The following subsections detail some of the major sources of water supplied to the area withir the jurisdiction of the SCAQMD.

State Water Project

The SWP supplied 0.57 MAF to the MWD in 1995 (Muir, 1996). Contractors in the MWD service area hold contracts for 1.86 MAF. California's total apportionment of SWP water is 4.23 MAF per year, with a dependable supply of about 2.1 MAF. If additional water supplies are not secured, SWP contractors in the region will face increasing risks of water supply deficiencies during dry years. Efforts to increase dependable yields through the SWP have included a Coordinated Operation Agreement between the State and the U.S. Bureau of Reclamation, completion of additional pumping capacity in the San Francisco Bay Delta, and development of additional off-stream storage facilities. If these efforts are successful, annual net use of SWP may increase by 0.8 MAF by 2010.

Los Angeles Aqueduct

The Los Angeles Aqueduct provided about 0.17 MAF of water in 1992 (RWQCB, 1993). Recent court decisions (September, 1994) have required that minimum stream flows be established in four of the streams feeding Mono Lake so that fish and water fowl habitats can be restored and protected (Frink, 1996). In addition, California courts have ruled that the average lake surface elevation of Mono Lake be restored to 6,392 feet above mean sea level

To comply with these rulings, the City of Los Angeles anticipates it will have to ultimately reduce diversion of Mono Lake water by as much as 60,000 AF per year.

Colorado River Aqueduct

Currently, California's basic apportionment of Colorado River water is 4.4 MAF. However, due to above-normal runoff in the Colorado River Basin, and the states of Arizona and Nevada not taking their full apportionment, California has received an average of 4.8 MAF per year in recent years (SCAG, 1993).

With the Central Arizona Project operational, and therefore diverting Colorado River water, the supply of Colorado River water available to MWD can be reduced from 1.212 MAF to 0.62 MAF per year, even with completion of a cooperative water conservation program with the Imperial Irrigation District. MWD staff has conservatively projected future supply at 0.62 MAF per year from existing programs and facilities and is considering programs to increase its dependable Colorado River supplies (Schempp, 1996).

Subregional Water Quality

The following subsections consider the quality of surface and groundwater sources that lie within the coastal sub-region and the outlying sub-region. Water quality of the major water basins in each sub-region is discussed for both surface and groundwater sources.

Coastal Sub-region Water Quality

The Los Angeles River Basin area is located in southern Los Angeles County and is drained by the Los Angeles River, San Gabriel River, and Malibu Creek (RWQCB, 1993).

- Surface water quality of the Los Angeles River system has minor problems that are attributable to high pH, nitrate/nitrite, chlorine levels, and low dissolved oxygen. The Los Angeles River drainage basin includes large recreation and wildlife habitat areas in the San Fernando Valley. Urban runoff and illegal dumping are the major sources of water quality problems in this river system.

- Minor water quality problems caused by urban runoff and point source discharges have occurred in urbanized portions of the San Gabriel River drainage system, but water quality is good in the source areas of the San Gabriel Mountains.

- Malibu Creek and its tributaries are an intermittent stream system that drains a portion of the western Santa Monica Mountains. This drainage area has high total dissolved solids (TDS) levels and, in general, water quality has declined as a result of wastewater discharge into the creek. Non-point source pollutants of concern include excess nutrients, sediment and bacteria.

Groundwater sources of the Los Angeles River Basin include the Los Angeles Coastal Plain. San Fernando Valley, and San Gabriel Valley Basins (RWQCB, 1993).

- Water quality in the Los Angeles Coastal Plain Basin is generally good, although saltwater intrusion has been a problem along the coast. The Los Angeles County Flood Control District through the Dominguez Gap Barrier project is currently addressing this problem. The purpose of the project is to create a fresh water pressure ridge to prevent further landward movement of seawater.

- Hydrocarbons from industry, and nitrates from subsurface sewage disposal and past agricultural activities are the primary pollutants in much of the groundwater throughout the San Gabriel and San Fernando Valley Groundwater Basins. Pollution has shut down at least 20 percent of municipal groundwater production capacity in both basins. The California Department of Toxic Substances Control has designated large areas of these basins as high priority Hazardous Substances Cleanup sites. The USEPA has designated both areas as Superfund sites. Both the RWQCB and USEPA are overseeing investigations to further define the extent of pollution, identify the responsible parties and begin remediation.

Santa Ana River Basin

The Santa Ana River Basin area is located in Orange County and the western (non-desert) portion of San Bernardino and Riverside counties. Improper operation of individual sewage storage or treatment systems in the upper Santa Ana River area has degraded surface water quality. High Total Dissolved Solids (TDS) and nutrient levels have affected lower portions of the river due to low quality rising groundwater, urban runoff, and nonpoint agricultural pollution. Lakes in the area receive water from the State Water Project and Colorado River and have fair to good water quality.

Primary groundwater basins in the Santa Ana River Basin include Orange County Coastal Plain, Upper Santa Ana River Valley, San Jacinto, Elsinore, and San Juan Creek. Groundwater quality is generally good in this area. Some deterioration has occurred due to recharge by Colorado River water, percolation of irrigation wastewater, overdraft, seawater intrusion, and mineralization. Water quality has been compromised further by municipal, industrial, and agricultural waste disposal. Saltwater intrusion problems have been somewhat alleviated by injection of water into wells of the Talbert Gap Barrier Project and increased use of Colorado River water by southern Orange County.

Outlying Sub-region Water Quality

Santa Clara River Basin

The Santa Clara River Basin area is located in Ventura County and northern Los Angeles County and is drained by the Santa Clara River, which empties into the Pacific Ocean near the City of Oxnard. Surface water sources are provided mainly by reservoirs in the area, which are in turn supplied by water from the SWP and the Los Angeles Aqueduct. These water sources provide water that is generally of high quality. Tributary creeks typically possess good water quality except during low flows. Water quality in the Santa Clara River is relatively poor and further degrades downstream when groundwaters rise, resulting in high TDS levels, irrigation return flows, and other contaminants. Threats to water quality include increasing urban development in floodplain areas, which requires flood control measures. These measures result in increased flows and erosion and loss of habitat (RWQCB, 1993).

Nine groundwater basins are located in the Santa Clara River Basin. Groundwater quality is generally good in the upper Santa Clara River Basin (Los Angeles County) but worsens near the Los Angeles County-Ventura County line. High TDS concentrations are common in the Santa Clara River Valley area.

Desert Basins

The desert sub-region includes most of San Bernardino County, eastern Riverside County, and Imperial County. Few water quality problems exist in this area with the exception of the Salton Sea vicinity, which has high and increasing salinity as a result of irrigation return flows, increasing salinity of Colorado River water, and inadequately treated municipal discharges (particularly from sources in Mexico) (Coachella Valley Water District, 1993).

Groundwater quality problems in the South Lahontan Basin, located in desert sub-region portions of Los Angeles and San Bernardino counties, include overdraft and pollution from mining and sewage wastes. West Colorado River Basin has increasingly high salinity near the Colorado River. Local groundwater supplies along the Colorado River are also poor where they are affected by saline river water, failing septic tanks and leachfield systems, and irrigation return flows.

PUBLIC SERVICES

Public services offered and available within the Basin are extensive and numerous although statistical data specific to the Basin are not available. Information concerning public services was obtained from references that outlined data by county or by the Southern California Association of Governments (SCAG) Region. The SCAG region comprises Ventura and Imperial counties, and the desert portions of Los Angeles, San Bernardino and Riverside

counties in addition to the four-county area comprising the Basin. Statistical information will therefore be provided for the four-county area or by SCAG region. The following public service areas are discussed in this section.

- Schools;
- Law Enforcement; and
- Fire Protection;

Schools

In 1994, there were more than 2,700 schools in Los Angeles, Orange, Riverside, and San Bernardino counties serving over 3.6 million students (SCAQMD, 1994). Schools include private and public schools from kindergarten through junior colleges, vocational education and continuing education programs, and major universities. For the 1992 to 1993 school year, Los Angeles County had the largest number of schools, (kindergarten through twelfth grade schools), with a student population of approximately 1,667,014, Orange County with 442,510, Riverside County with 261,886 and San Bernardino County with 334,741. Nearly 44 percent of the public school districts in the Basin are within Los Angeles County including the Los Angeles Unified School District (LAUSD) and the Long Beach Unified School District (LBUSD). Combined with Santa Ana Unified School District (SAUSD) in Orange County, these three school districts represent almost 30 percent of the Basin's public school enrollment (SCAG, 1993).

The greatest growth in both public and private secondary and elementary school enrollments has been in San Bernardino and Riverside counties. Riverside County alone has experienced an 80 percent increase in its public school enrollment, while San Bernardino County's public school enrollment population grew by 64 percent, between 1981 and 1991 (SCAG, 1993). It is anticipated these growth trends will continue into the future.

The capacity of school facilities to accommodate the student population is directly affected by increases in school enrollment. The greatest percent of new school construction is in Riverside (45 percent) and San Bernardino (38 percent) counties. The greatest percentage of reconstruction/remodeling 87 percent, however, is in Los Angeles County. This high percentage of facility expansion projects is a strong indication of the current school congestion problem in Los Angeles County. Further evidence of the current overcrowding is the fact that, both LAUSD and LBUSD have had to institute busing programs (SCAG, 1993).

Post secondary schools include public and private colleges and universities, and adult schools. Nearly 43 percent of the state's 1991 community college enrollment was concentrated in the four-county region (SCAG, 1993). The four-county region contains dozens of institutions of higher learning (post 12th grade), including 13 community colleges, seven California State Universities (CSU), three University of California (UC) campuses,

and many private colleges such as the University of Southern California (USC), Pepperdine University, and Loyola-Maymount University.

Law Enforcement

As of 1990, there were approximately 55,471 law enforcement officers employed within the SCAG Region, yielding a ratio of one police officer and/or sheriff per 263 civilians (SCAG, 1993). Most cities in the district maintain their own police departments, although some cities may contract with county sheriffs departments or nearby larger cities for police services. Unincorporated areas receive police protection from county sheriff departments. The California Highway Patrol (CHP) provides law enforcement services on state and interstate highways. The CHP also provides back-up services, along with county sheriff departments, on federal lands such as national forests and Bureau of Land Management land. State rangers protect state park and recreation areas.

Many of the police and sheriff departments have begun programs to improve efficiencies in delivering protection services and increase involvement in policing. These programs have included drug and crime prevention programs and education, job training and community activities for youth and adults. Police departments have also begun to place a greater reliance upon communities to provide needed support services, such as neighborhood watch programs. Some law enforcement agencies have established a goal of increasing their efficiency in delivering protection services and utilization of existing facilities through consolidation of services, better use of underutilized facilities, and redefinition of service district boundaries and use of new technologies.

In an effort to increase law enforcement officers available to provide protection services, some law enforcement agencies are replacing officers in administrative functions with civilian personnel. In addition, Congress has passed the new crime bill which is expected to provide among other things, additional funding for more law enforcement officers.

Fire Protection

Fire protection consists of fire fighting, paramedical care, fire detection and building and fire code inspection. In addition, they are usually the first agency to respond to an emergency release of hazardous materials. City and county fire departments generally provide these services with some cities contracting with the county for services. The U.S. Forest Service provides fire protection on all national forest lands while the California Department of Forestry has jurisdiction over wildland fire protection in various unincorporated areas of Riverside and San Bernardino counties. The Los Angeles County Department of Forestry serves the northeastern area of Los Angeles County. Approximately 17,924 personnel (one employee per 765 civilians) were employed in fire protection within the four county area, as of June 1993 (SCAG, 1993).

Average response times vary from 4.35 to 15 minutes for emergency medical service and from 2.52 to 15 minutes for structure incidence fires (SCAG, 1993). Times vary according t a variety of factors, such as size of area covered, distance from station, time of day, and road congestion. Within the district, response times are often longer in rural areas than in suburban and urban areas.

TRANSPORTATION / CIRCULATION

Many agencies share authority for transportation planning and operations in the district. These agencies include SCAG, the county transportation authorities, local government transportation departments, and Caltrans, as well as the SCAQMD. For the purposes of the AQMP, however, the SCAQMD and SCAG share the responsibility for developing transportation measures to achieve air quality objectives.

SCAG, as the federally designated Metropolitan Planning Organization (MPO) for a major portion of Southern California, SCAG is required to adopt and periodically update a long-range transportation plan for the area of its jurisdiction [(Title 23 United States Code §134(g)(1)]. SCAG also is required, under §65080 of the Government Code, to prepare a regional transportation plan (RTP) for the area. These subsections also specify that actions by transportation agencies must be consistent with an adopted RTP that conforms with air quality requirements in order to obtain federal and state funding.

By law, the 1998 Regional Transportation Plan must meet federal and state air quality (conformity) requirements. Failure to comply with conformity requirements will result in a loss of transportation funding from these sources. Currently there are seven federally designated non-attainment areas in the SCAG region--South Coast Air Basin, Ventura County, San Bernardino County, Searles Valley, Coachella Valley, North Los Angeles County (Antelope Valley) and Imperial County. In the South Coast Air Basin, the RTP is required to reduce VOC emissions by approximately 15 tons per day and NOx emissions by approximately 16 tons a day.

The transportation system utilized in the district is a multi-faceted and multi-modal system for moving people and goods. It includes an extensive network of freeways, highways and roads; public transit; air and sea routes; and non-motorized modes of travel (walking and biking). The routes of travel to move people and goods are briefly summarized below. Please consult SCAG's 1998 Regional Transportation Plan for further detail.

Freeways, Highways and Arterials

There are almost 8,000 miles of freeway and high-occupancy vehicle (HOV) lanes linking the region. Additionally, there are 27,500 lane miles of arterials and highways. These roadways are an integral part of the transportation system, often acting as alternative routes to freeway driving.

On an annual basis, transit ridership peaked in the mid-eighties at somewhat less than 600 million passenger trips annually and since then slowly has declined to slightly less than 500 million passenger trips per year. Despite this downward trend, ridership has increased on the recently introduced rail services and for several smaller bus operators. However, in the critical home-to-work trips category, according to census data, transit's share declined almost 12 percent between 1980 and 1990. By comparison, drive-alone, home-to-work trips increased from 70.2 to 72.4 percent for an increase of 3.1 percent.

Transit service is provided by approximately 17 separate public agencies, with nine of these providing 98 percent of the existing public bus transit service. Local service is supplemented by municipal lines and shuttle services and private bus companies provide additional regional service.

Rail

The Southern California Regional Rail Authority operates commuter rail systems. Additionally, Amtrak provides inter-city service, principally between San Diego and San Luis Obispo.

The SCAG region is served by two main line freight railroads--the Burlington Northern Santa Fe (BNSF) and the Union Pacific Railroad (UP). These freight railroads connect Southern California with other U.S. regions, Mexico and Canada via their connections with other railroads. They also provide freight rail service within Southern California. In 1995, these railroads moved more than 91 million tons of cargo in and out of Southern California.

The SCAG region is also served by three short line or switching railroads: Harbor Belt Railroad, owned by BNSF and UP; Los Angeles Junction Railway Company, owned by BNSF; and Ventura County Railway, owned by Greenbrier. These freight railroads perform specific local functions, and serve as feeder lines to the trunk line railroads for moving goods to and from Southern California.

The two main line freight railroads maintain major facilities in the SCAG region: Intermodal facilities in Commerce (BNSF), San Bernardino (BNSF), City of Industry (UP), Los Angeles (UP) and Long Beach (UP). Major classification yards include Barstow (BNSF), East Los Angeles (UP) and West Colton (UP), and Rail-truck transload and warehousing facilities in Bakersfield, Glendale, Fontana, Pomona, Los Angeles, Long Beach, Wilmington and Commerce.

Maritime

Three major seaports serve southern California. These ports--Hueneme, Long Beach and Los Angeles--serve over 80 ocean carriers, the two major railroads and almost every trucking company in southern California. Port of Hueneme with its recent port expansion ranks as

one of the premier automobile and agricultural product handling facilities in California. The ports of Long Beach and Los Angeles are full-service ports with facilities for containers, autos and various bulk cargoes. With an extensive ndside transportation network, the three ports moved more than 120 million tons of cargo .995. In particular, the San Pedro Bay Ports (Long Beach and Los Angeles) dominate the container trade in the Americas by shipping and receiving more than 5 million containers. Together, these two ports rank third, behind Rotterdam and Hong Kong, in world sea trade.

SOLID / HAZARDOUS WASTE

Solid Waste

California Code of Regulations (CCR) Title 14, Division 7 provides the state standards for the management of facilities that handle and/or dispose of solid waste. CCR Title 14, Division 7 is administered by the California Integrated Waste Management Board (CIWMB) and the designated Local Enforcement Agency (LEA). The designated LEA for each county is the County Department of Environmental Health. CCR Title 14, Division 7 establishes general standards to provide required levels of performance for facilities that handle and/or dispose of solid waste. Other requirements included in CCR Title 14, include operational plans, closure plans, and post-closure monitoring and maintenance plans. This regulation covers various solid waste facilities including, but not limited to: landfills, materials recovery facilities (MRFs) and transfer stations and composting facilities.

The district's four-county region is permitted to accept over 111,198 tons of municipal solid waste (MSW) each day. Solid wastes consist of residential wastes (trash and garbage produced by households), construction wastes, commercial and industrial wastes, home appliances and abandoned vehicles, and sludge residues (waste remaining at the end of the sewage treatment process).

A total of 39 Class III active landfills and two transformation facilities are located within the district with a total capacity of 111,198 tons per day. Los Angeles County has 14 active landfills with a permitted capacity of over 58,000 tons per day. San Bernardino County has nine public and private landfills within the district's boundaries with a combined permitted capacity of 11,783 tons per day. Riverside County has 12 active sanitary landfills with a total capacity of 14,707 tons per day. Each of these landfills is located within the unincorporated area of the county and is classified as Class III. Orange County currently has four active Class III landfills with a permitted capacity of over 25,000 tons per day.

Hazardous Waste

Hazardous materials as defined in 40 CFR 261.20 and California Title 22 Article 9 (including listed substances, 40 CFR 261.30) are disposed of in Class I landfills. California has enacted

strict legislation for regulating Class I landfills (California Health and Safety Code, §§ 25209 - 25209.7). For example, the treatment zone of a Class I landfill must not extend more than five feet below the initial surface and the base of the zone must be a minimum of five feet above the highest anticipated elevation of underlying groundwater [H&S Code, §25209.1(h)]. The Health and Safety Codes also require Class I landfills to be equipped with liners, a leachate collection and removal system, and a groundwater monitoring system (H&S Code, §25209.2(a). Such systems must meet the requirements of the California Department of Toxic Substances Control (DTSC) and the California Water Resources Control Board (H&S Code, §25209.5).

Currently, the area within the district does not have any approved Class I landfills that accept hazardous wastes. There are currently two Class I landfills located in California. Chemical Waste Management Corporation in Kettleman City is a treatment, storage and disposal facility that has a capacity of 13 million cubic yards. At current disposal rates, this capacity would last for approximately 26 years (Turek, 1996). Laidlaw Environmental has a Class I facility in Buttonwillow with a permitted capacity of 13 million cubic yards. The current capacity is 800 thousand cubic yards. At current disposal rates, this capacity would last for approximately three years. In addition, treatment services and landfill disposal are available from the Laidlaw facility located in Westmoreland (Buoni, 1996).

In addition, hazardous waste can also be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; USPCI, Inc., in Murray, Utah; and Envirosafe Services of Idaho, Inc.; in Mountain Home, Idaho. Incineration is provided at the following out-of-state facilities: Aptus, located in Aragonite, Utah and Coffeyville, Kansas; Rollins Environmental Services, Inc., located in Deer Park, Texas and Baton Rouge, Louisiana; Chemical Waste Management, Inc., in Port Arthur, Texas; and Waste Research & Reclamation Co., Eau Claire, Wisconsin (Kirby, 1996).

HAZARDS

Hazardous Materials Management Planning

State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to health or the environment in the event that such materials are accidentally released. The California Office of Emergency Services (OES) enforces these requirements. Federal laws, such as the Emergency Planning and Community-Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act or SARA) impose similar requirements.

Hazardous Materials Transportation

The U.S. Department of Transportation (U.S.DOT) has the regulatory responsibility for the safe transport of hazardous materials between states and to foreign countries. U.S.DOT regulations govern all means of transportation, except for those packages shipped by mail. Hazardous materials sent by U.S. mail are covered by the U.S. Postal Service (USPS) regulations. U.S.DOT regulations are contained in the Code of Federal Regulations, Title 49 (49 CFR); USPS regulations are in 39 CFR.

Common carriers are licensed by the California Highway Patrol (CHP), pursuant to the California Vehicle Code, §32000. This section requires licensing of every motor (common) carrier who transports, for a fee, in excess of 500 pounds of hazardous materials at one time and every carrier, if not for hire, who carries more than 1,000 pounds of hazardous material of the type requiring placards. Common carriers conduct a large portion of their business in the delivery of hazardous materials.

Under the Resource Conservation and Recovery Act (RCRA) of 1976, the U.S.EPA sets standards for transporters of hazardous waste. In addition, the State of California regulates the transport of hazardous waste originating or passing through the state. State regulations are contained in CCR, Title 13. Hazardous waste must be regularly removed from generating sites by licensed hazardous waste transporters. Transported materials must be accompanied by hazardous waste manifests.

Two state agencies have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies: the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans).

The CHP enforces hazardous materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. The CHP conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill identification teams at 72 locations throughout the state.

Hazardous Material Worker Safety Requirements

The California Occupational Safety and Health Administration (Cal/OSHA) and the Federal Occupational Safety and Health Administration (OSHA) are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. In California, Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations.

Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (contained in 29 CFR - Labor). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. Because California has a federally-approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace (which are detailed in CCR, Title 8) include requirements for employee safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances. The hazard communication program also requires that Material Safety Data Sheets (MSDS) be available to employees and that employee information and training programs be documented. These regulations also require preparation of emergency action plans (escape and evacuation procedures, rescue and medical duties, alarm systems, and emergency evacuation training).

Both federal and state laws include special provisions for hazard communication to employees in research laboratories, including training in chemical work practices. The training must include instruction in methods for the safe handling of hazardous materials, an explanation of MSDS, use of emergency response equipment and supplies, and an explanation of the building emergency response plan and procedures.

Chemical safety information must also be available at the workplace. More detailed training and monitoring is required for the use of carcinogens, ethylene oxide, lead, asbestos, and certain other chemicals listed in 29 CFR. Emergency equipment and supplies, such as fire extinguishers, safety showers, and eye washes, must also be kept in accessible places. Compliance with these regulations reduces the risk of accidents, worker health effects, and emissions.

The National Fire Code (NFC), Standard 45 (published by the National Fire Protection Association) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards.

While NFC Standard 45 is regarded as a nationally recognized standard, the California Fire Code (24 CCR) contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require

emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

Hazardous Waste Handling Requirements

Under RCRA, a major new federal hazardous waste regulatory program was created that is administered by the U.S. EPA. Pursuant to RCRA, U.S. EPA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste.

RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the concept of regulating hazardous wastes from generation through disposal. HSWA specifically prohibits the use of certain techniques for the disposal of some types of hazardous wastes.

Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as the federal RCRA requirements. U.S. EPA approved California's program to implement federal regulations as of August 1, 1992.

The California Environmental Protection Agency Department of Toxic Substance Control (DTSC) administers the Hazardous Waste Control Law (HWCL). Under HWCL, DTSC has adopted extensive regulations governing the generation, transportation, and disposal of hazardous wastes. HWCL differs little from RCRA; both laws impose "cradle to grave" regulatory systems for handling hazardous wastes in a manner that protects human health and the environment. Regulations implementing HWCL are generally more stringent than regulations implementing RCRA.

Regulations implementing HWCL list over 780 hazardous chemicals as well as nearly 30 more common materials that may be hazardous. HWCL regulations establish criteria for identifying, packaging and labeling hazardous wastes. They prescribe management practices for hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

Under both RCRA and HWCL, hazardous waste manifests must be retained by the generator for a minimum of three years. Hazardous waste manifests list a description of the waste, its intended destination and regulatory information about the waste. A copy of each manifest must be filed with DTSC. The generator must match copies of hazardous waste manifests with certification notices from the treatment, disposal, or recycling facility.

Emergency Response to Hazardous Materials and Wastes Incidents

Pursuant to the Emergency Services Act, California has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government agencies and private persons. Response to hazardous materials incidents is one part of this plan. The Plan is administered by OES, which coordinates the responses of other agencies including U.S. EPA, CHP, Department of Fish and Game, the applicable RWQCB, and local fire departments (see California Government Code, §8550).

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985 (the Business Plan Law), local agencies are required to develop "area plans" for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the business plans submitted by persons who handle hazardous materials. An area plan must include pre-emergency planning of procedures for emergency response, notification and coordination of affected government agencies and responsible parties, training, and follow-up.

Hazardous Materials Incidents

Hazard concerns are related to the risks of fire, explosions, or releases of hazardous substances in the event of accident or upset conditions. Hazard is thus related to the production, use, storage, and transport of hazardous materials. Industrial production and processing facilities are potential sites for hazardous materials. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production processes. Examples of hazardous materials used on a consumable basis include fuels, paints, paint thinner, nail polish, and solvents. Hazardous materials may be stored at facilities producing such materials and at facilities where hazardous materials are part of the production processes. Storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district in great quantities via all modes of transportation including rail, highway, water, air and pipeline.

Hazardous materials incidents are reported to the Governor's Office of Emergency Services (OES), which compiles and archives the information. The data on accidental hazardous materials releases presented below are based on a database search of the OES Warning Center's Hazardous Material Spills Reports conducted by OES staff. Even though the record search disclosed these spills, it should be noted that there could have been other spills not reported to OES.

During 1998, the counties of Orange, Riverside, San Bernardino and Los Angeles reported a total of 1,726 hazardous material releases, while the statewide total was 5,811 (Table 3-8). The breakdown is as follows: 940 releases in Los Angeles County, 222 releases in Orange

County, 306 releases in Riverside County, and 258 in San Bernardino County. Tables 3-9 through 3-12 provide information regarding releases of materials that could be used t formulate conventional and future compliant coatings. Table 3-13 provides information specifically regarding releases of paints and coatings.

TABLE 3-8

REPORTED HAZARDOUS MATERIALS INCIDENTS – 1998 ALL MATERIALS

Location	Reported Incidents	% of Reported Four-County Incidents
Los Angeles	940	54
Orange	222	13
Riverside	306	18
San Bernardino	258	15
Total	**1,726**	**100**
California Total	5,811	

Source: Office of Emergency Services

TABLE 3-9

1998 HAZARDOUS MATERIALS RELEASE INFORMATION: LOS ANGELES COUNTY

Conventional Solvent	Number of Releases	Amount Released (gallons)
Toluene	NR[a]	--
Xylene	1[b]	42
Mineral Spirits	3	241
MEK[c]	2	20
Replacement Solvent		
Acetone	5	133
Texanol	1	546
PCBTF[d]	NR	--
EGBE[e]	NR	--

Source: Office of Emergency Services

[a] NR = none reported
[b] may have been toluene
[c] MEK = methyl ethyl ketone
[d] PCBTF = parachlorobenzotriflouride
[e] EGBE = ethylene glycol butyl ether

TABLE 3-10

1998 HAZARDOUS MATERIALS RELEASE INFORMATION: ORANGE COUNTY

Compound	Number of Releases	Amount Released
Toluene	NR[a]	–
Xylene	1	4 liters
Mineral Spirits	NR	–
MEK[b]	NR	–
Replacement Solvent		
Acetone	NR	–
Texanol	NR	–
PCBTF[c]	NR	–
EGBE[d]	NR	–

Source: Office of Emergency Services

[a] NR = none reported
[b] MEK = methyl ethyl ketone
[c] PCBTF = parachlorobenzotriflouride
[d] EGBE = ethylene glycol butyl ether

TABLE 3-11

1998 HAZARDOUS MATERIALS RELEASE INFORMATION: RIVERSIDE COUNTY

Conventional Solvent	Number of Releases	Amount Released (gallons)
Toluene	1	30
Xylene	NR[a]	–
Mineral Spirits	NR	–
MEK[b]	NR	–
Replacement Solvent		
Acetone	NR	–
Texanol	NR	–
PCBTF[c]	NR	–
EGBE[d]	NR	–

Source: Office of Emergency Services

[a] NR = none reported
[b] MEK = methyl ethyl ketone
[c] PCBTF = parachlorobenzotriflouride
[d] EGBE = ethylene glycol butyl ether

TABLE 3-12

1998 HAZARDOUS MATERIALS RELEASE INFORMATION: SAN BERNARDINO COUNTY

Conventional Solvent	Number of Releases	Amount Released (gallons)
Toluene	NR[a]	--
Xylene	NR	--
Mineral Spirits	NR	--
MEK[b]	NR	--
Replacement Solvent		
Acetone	NR	--
Texanol	NR	--
PCBTF[c]	NR	--
EGBE[d]	NR	--

Source: Office of Emergency Services

[a] NR = none reported
[b] MEK = methyl ethyl ketone
[c] PCBTF = parachlorobenzotriflouride
[d] EGBE = ethylene glycol butyl ether

TABLE 3-13

REPORTED PAINT/COATING INCIDENTS – 1998

Location	Reported Incidents	Amount (gallons)
Los Angeles	17	428
Orange	6	21
Riverside	8	698
San Bernardino	2	8
Total	**33**	**1,155**

Source: Office of Emergency Services

Human Health

This section briefly describes the existing setting for human health as it is affected by emissions from existing coating formulations. The actual effects of exposure to coatings, however, depend on such factors as the exposure duration, potency of the solvents of concern, exposure frequency, and other factors. As noted in Table 3-14, AIM coatings are currently formulated with toxic substances with a range of adverse human health effects.

TABLE 3-14

TOXICITY OF CURRENTLY AVAILABLE COATING SOLVENTS

Traditional/Conventional Solvents				
Solvents	**TLV (ACGIH) (ppm)**	**PEL (OSHA) (ppm)**	**IDLH (ppm)**	**Health Hazard**
Toluene	100	200	2,000	Moderate irritation - eye, nose, throat; narcosis: skin; suspect teratogen; mutagen
Xylene	100	100	1,000	Mild irritation - eye, nose, throat; narcosis; skin
MEK	200	200	3,000	Mild irritation - eye, nose, throat; narcosis
Isopropanol	400	400	12,000	Mild irritation - eye, nose, throat; narcosis
Butyl Acetate	150	150	10,000	Moderate irritation - eye, nose, throat; narcosis
Isobutyl Alcohol	50	100	8,000	Mild irritation - eye, nose, throat; suspect carcinogen
Stoddard Solvent	100	500	5,000	Narcosis; mild irritant
Petroleum Distillates (Naptha)	100	400	10,000	Mild irritation; narcosis
EGBE	25	50	700	Mild irritation - eye, nose, throat; anemia; skin
EGME	5	25	Not Available	Cumulative CNS; skin; suspect reproductive effects; blood disorders
EGEE	5	200	Not Available	Cumulative blood damage; moderate irritation of eyes, throat, skin

[a] Source: American Conference of Government Industrial Hygienists

[b] Source: OSHA

[c] IDLH = immediately dangerous to life and health

CHAPTER 4

ENVIRONMENTAL IMPACTS AND MITIGATION

Introduction

Air Quality

Water Resources

Public Services

Transportation / Circulation

Solid / Hazardous Waste

Hazards

Human Health

Environmental Impacts Found Not To Be Significant

Other CEQA Topics

INTRODUCTION

CEQA requires environmental documents to identify significant environmental effects that may result from a proposed project [CEQA Guidelines §15126(a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited, to, the resources involved; physical changes; alterations of ecological systems; health and safety problems caused by physical changes; and other aspects of the resource base, including water, scenic quality, and public services. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126(c)].

The CEQA Guidelines state that the degree of specificity required in a CEQA document depends on the type of project being proposed (CEQA Guidelines §15146). The detail of the environmental analysis for certain types of projects cannot be as great as for others. For example, the environmental document for projects, such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan, should focus on the secondary effects that can be expected to follow from the adoption or amendment, but the analysis need not be as detailed as the analysis of the specific construction projects that might follow. As a result, this Final SEA analyzes impacts on a regional level and impacts on the level of individual industries or individual facilities where feasible.

The categories of environmental impacts recommended for evaluation in a CEQA document are established by CEQA (Public Resources Code, §21000 et seq.) and the CEQA Guidelines as promulgated by the State of California Secretary of Resources. Under the CEQA Guidelines, there are approximately 15 environmental categories in which potential adverse impacts from a project are evaluated. Projects are evaluated against the environmental categories in an environmental checklist and those environmental categories that may be adversely affected by the project are further analyzed in the appropriate CEQA document.

Pursuant to CEQA, a Notice of Preparation and an Initial Study (NOP/IS), including an environmental checklist, were prepared for this project (see Appendix B). Of the 15 potential environmental impact categories, it was determined that a Draft SEA should be prepared to address potential new effects on air quality, water resources, and public services. As a result of comments received on the NOP/IS, it was further determined that potential transportation/circulation, solid/hazardous waste, hazards, and human health impacts should also be further addressed in this Final SEA. The following sections analyze the potential environmental impacts of the proposed amendments.

AIR QUALITY

The proposed amendments will implement, in part, the 1994 and the 1997 AQMP Control Measure CTS-07 for architectural coatings. While there are many types of architectural coatings currently in use, the currently proposed amendments would reduce the allowable VOC content of eleven coating categories: industrial maintenance (IM) coatings, high temperature IM coatings, non-flats, quick-dry enamels, primers/sealers/undercoaters (PSU), rust preventive coatings, floor coatings, quick-dry PSU, water-proofing wood sealers, roof coatings, and stains[5]. As noted in Table 2-1 in Chapter 2, PAR 1113 is expected to reduce VOC emissions from architectural coatings approximately 21.8 tons per day upon final compliance.

Significance Criteria

The project will be considered to have significant adverse air quality impacts if any one of the thresholds in Table 4-1 are equaled or exceeded.

TABLE 4-1
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
TAC, AHM, and Odor Thresholds		
Toxic Air Contaminants (TACs)	MICR ≥ 10 in 1 million HI ≥ 1.0 (project increment) HI ≥ 5.0 (facility-wide)	
Accidental Release of Acutely Hazardous Materials (AHMs)	CAA §112(r) threshold quantities (see Table 5-2)	
Odor	Project creates or is subjected to an objectionable odor > 10 D/T	

[5] From this point forward, in many instances, these coatings, which are the target of these rule amendments, may be generically referred to as "affected coatings".

TABLE 4-1 (CONTINUED)
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Change in Concentration Thresholds	
NO_2 1-hour average annual average	20 ug/m^3 (= 1.0 pphm) 1 ug/m^3 (= 0.05 pphm)
PM10 24-hour annual geometric mean	2.5 ug/m^3 1.0 ug/m^3
Sulfate 24-hour average	1 ug/m^3
CO 1-hour average 8-hour average	1.1 mg/m^3 (= 1.0 ppm) 0.50 mg/m^3 (= 0.45 ppm)

MICR = maximum individual cancer risk; HI = Hazard Index; D/T = dilution to threshold factor; ug/m^3 = microgram per cubic meter; pphm = parts per hundred million; mg/m^3 = milligram per cubic meter; ppm = parts per million; TAC = toxic air contaminant;

AHM = acutely hazardous material

Air Quality Impacts

The objective of PAR 1113 is to reduce VOC emissions from affected coating categories. Analysis of PAR 1113 indicates that the proposed project is expected to generate direct air quality benefits. The direct effect of the proposed amendments to Rule 1113 is a reduction of VOC emissions from affected sources.

Analysis of Industry Issues

The following subsections describe each of eight issues that may create significant adverse air quality impacts from amending Rule 1113. These issues were raised by industry representatives in the Industry Working Group meetings and identified in comments on the NOP/IS. These eight issues focus on two main points. The first seven issues are all contentions that the new formulations, either solvent-borne or waterborne, result in more coating use, or use of noncompliant coatings, and an overall increase in VOC emissions over a period of time. The eighth issue is the contention that low-VOC waterborne and solvent-borne coatings are formulations and, therefore, contribute at a greater rate to ozone formation. They also contend that under low-NOx conditions, some solvents actually have a negative reactivity.

As previously mentioned in the Executive Summary, the appellate court has already determined that six of the eight issues asserted by industry and contractors had been adequately addressed in the previously prepared CEQA document (a Determination of

No Significant Impacts - DONSI) certified in February 1990[6]. However, the lower court set aside the VOC limits for IM and PSU coatings because the court felt that the issue o thinning had not been adequately addressed in that document. The SCAQMD did not appeal this finding.

As mandated by the court judgment the thinning issue associated with the amended coating categories adopted in February 1990, as well as the other affected coating categories, has been evaluated. Staff has also reanalyzed the other six potential issues and also the substitution issue. As demonstrated in the preceding subsections, staff continues to believe those six other alleged issues as well as the substitution issue do not result in significant adverse air quality impacts

It should be noted that during the November 1996 rulemaking process, the eight issues as mentioned above were discussed in detail for flats and lacquers. Each of the aforementioned eight issues were analyzed in the Draft and Final Subsequent Environmental Assessment for the November 1996 rule amendments. In each case, it was concluded that the coating manufacturers' and contractors' claims for an increase in emissions as a result of the reformulation of low-VOC coatings were not supported by any credible or empirical evidence. The Los Angeles County Superior Court has upheld this conclusion to date.

More Thickness

PROJECT SPECIFIC IMPACT: Industry representatives contend that reformulated compliant water- and solvent-borne coatings are very viscous (e.g., are formulated using a high-solids content) and, therefore, are difficult to handle during application, tending to produce a thick film when applied directly from the can. A thicker film indicates that a smaller surface area is covered with a given amount of material, thereby increasing VOC emissions per unit of area covered.

ANALYSIS: SCAQMD staff evaluated product data sheets for approximately 340 conventional and low-VOC coatings to compare solids content by volume, coverage area, drying time, pot life, shelf life and durability. Table 4-2 is a summary of these coating characteristics grouped by coating categories as defined by Rule 1113. Staff has asserted in the past and continues to maintain that a coating with more solids will actually cover a greater surface area. This contention is generally supported for the PAR 1113 affected coating categories. Low-VOC quick-dry enamels, PSU, quick-dry PSU, rust preventative coatings and stains, on the average, generally have a lower solids content and a lower area of coverage than conventional coatings. Low-VOC nonflats have a solids content and area of coverage comparable to conventional coatings. Low-VOC floor coatings and IM coatings, on the average, have a higher solids content with a comparable to slightly

[6] The seventh issue, substitution, was not specifically identified as an issue in the litigation. It was incorporated into the other six issues.

less area of coverage than conventional coatings.

These results demonstrate that currently available low-VOC coatings are not necessarily formulated with a higher solids content. Further, a higher solids content does not result in a significant reduction in the coverage area. The information from the coating product data sheets tends to corroborate a positive correlation between solids content and the coverage area.

TABLE 4-2
SUMMARY OF COATING CHARACTERISTICS

Coating Category	# of samples	Range of VOC Content (gm/l)	Average VOC Content (gm/l)	Average % Solids by Volume	Average Coverage (sq ft/gal) @ ~3 mil	Average Drying Time (hrs) Between Coats	Average Pot Life* @70 deg. (hrs)	Average Shelf Life (yrs)
Floor Coatings (420-100 g/l)	9	114-420	338	47.5	356	n/a	8.5	2.3
Floor Coatings (100-50 g/l)	5	76-100	86	75.1	440	n/a	2.4	1.8
Floor Coatings (< 50 g/l)	13	0	0	80.4	331	n/a	1.9	1.4
Industrial Maintenance Coatings (420-250 g/l)	47	257-420	354	58.1	352	n/a	6.3	1.6
Industrial Maintenance Coatings (250-100 g/l)	26	114-250	194	52.5	273	n/a	8	2.4
Industrial Maintenance Coatings (<100 g/l)	61	0-108	39.7	74.4	306	n/a	2.5	1.2
Nonflats (250-150 g/l)	10	215-250	239	39	400	8.5	n/a	2.6
Nonflats (150-50 g/l)	29	59-135	94.5	35	359	6.7	n/a	2.9
Nonflats (<50 g/l)	16	0-50	11.1	39.7	407	11.3	n/a	1
Quick Dry Enamels (400-150 g/l)	6	164-400	290	54.1	432	6.0	n/a	1
Quick Dry Enamels (<150 g/l)	4	88-154	120	35.8	407	3.2	n/a	1

** For two-component coatings only*

TABLE 4-2 (CONTINUED)
SUMMARY OF COATING CHARACTERISTICS

Coating Category	# of samples	Range of VOC Content (gm/l)	Average VOC Content (gm/l)	Average % Solids by Volume	Average Coverage (sq ft/gal) @ ~3 mil	Average Drying Time (hrs) Between Coats	Average Pot Life* @70 deg (hrs)	Average Shelf Life (yrs)
Primer, Sealer, Undercoater (350-200 g/l)	28	220-350	314	51.4	393	13	6.5	1.7
Primer, Sealer, Undercoater (200-100 g/l)	10	113-206	160.4	44.2	350	5	16	2.6
Primer, Sealer, Undercoater (<100 g/l)	29	0-109	53.7	42.9	372	7.9	2.4	2.3
Quick Dry Primer, Sealer, Undercoater (exempt – 200 g/l)	9	340-560	464	40.4	401	2	7	1.9
Quick Dry Primer, Sealer, Undercoater (200-100 g/l)	6	115-141	124	45.1	353	2.1	n/a	2.7
Quick Dry Primer, Sealer, Undercoater (<100 g/l)	17	0-108	67.7	39.3	370	1.8	n/a	1.0
Water Proofing Wood Sealer (400-250 g/l)	5	400	400	14.7	160	n/a	n/a	1.0
Water Proofing Wood Sealer (<250 g/l)	10	0-241	73.9	46.3	224	n/a	4.7	1.4
Stains (350-250 g/l)	3	350	350	55.6	367	24	n/a	5.3
Stains (<250 g/l)	10	0-250	148.9	25.7	299	6.2	n/a	5.0
Rust Preventative Coatings (350-100 g/l)	6	198-350	313	61.1	435	n/a	4	2.7
Rust Preventative Coatings (<100 g/l)	4	0-94	23.5	50	306	n/a	2.5	2.0

** For two-component coatings only*

As a comparison, Table 4-3 shows that the Draft 1998 CARB Survey yielded similar results for average VOC content as the random sampling of low-VOC coatings to their conventional counterparts. The survey showed a consistent trend of a sales weighted average lower percent solids by volume in coatings with lower-VOC content.

Based upon the results of the SCAQMD and CARB surveys, staff concludes that the data do not support the industry's assertion that compliant low-VOC coatings are necessarily formulated with a higher solids content than conventional coatings. Further, the data do not support their assertion that there is an inverse correlation between solids content and coverage area.

TABLE 4-3
1998 DRAFT CARB SURVEY

Coating Types	CARB SURVEY RESULTS	
	Average VOC Content (gm/l)	**Average Solids by Volume (%)**
Floor Coatings (>250 g/l)	149	83
Floor Coatings (<250 g/l)	164	34
IM Coatings (>250 g/l)	436	56
IM Coatings (<250 g/l)	124	36.6
Nonflats (>250 g/l)	331	58
Nonflats (<250 g/l)	164	36
Quick Dry Enamels (>250 g/l)	403	50
Quick Dry Enamels (<250 g/l)	n/a	n/a
PSU (>250 g/l)	384	46
PSU (<250 g/l)	101	31
Quick Dry PSU (>250 g/l)	432	45
Quick Dry PSU (>250 g/l)	136	41
Water Proofing Sealer (>250 g/l)	339	50
Water Proofing Sealer (<250 g/l)	227	30
Rust Preventive Coatings (>250 g/l)	382	48
Rust Preventive Coatings (<250 g/l)	144	39
Stains(>250 g/l)	412	47
Stains(>250 g/l)	203	30

Illegal Thinning

PROJECT SPECIFIC IMPACT: As directed by the court, the SCAQMD has extensively analyzed the alleged air quality impacts due to more thinning. In oral testimony received by the SCAQMD from a few industry representatives, it has been asserted that thinning occurs in the field in excess of what is allowed by the SCAQMD

rule limits. It is asserted that, because reformulated compliant water- and solvent-borne coatings are more viscous (e.g., high-solids content), painters have to adjust th properties of the coatings to make them easier to handle and apply. In particular for solvent-borne coatings this adjustment consists of thinning the coating as supplied by the manufacturer by adding solvent reduce its viscosity. The added solvent increases VOC emissions back to or sometimes above the level of older formulations.

ANALYSIS: It has been further asserted that manufacturers will formulate current noncompliant coatings by merely increasing the solids content, which would produce a thicker film. Industry claims that a thicker film means less coverage. Therefore, thinning will occur to get the same coverage area as current noncompliant coatings resulting in more VOC emissions per area covered. As shown in Table 4-2 (see also the "More Thickness" discussion), based upon manufacturer's claims regarding coverage, low-VOC coatings have comparable coverage area compared to conventional coatings. As a result, the data indicate that it is not true that a painter will have to thin low-VOC solvent-borne coatings to obtain the same coverage.

Many of the reformulated compliant coatings are water-borne formulations or will utilize exempt solvents, thereby eliminating any concerns of thinning the coating as supplied and increasing the VOC content as applied beyond the compliance limit. Since exempted solvents are no longer considered a reactive VOC, thinning with them would, therefore, not increase VOC emissions. Water based coatings are thinned with water and would also not result in increased VOC emissions.

Extensive research has been conducted during the last six years to determine whether or not thinning of materials beyond the allowable levels occurs in the field. As part of the AQMD's fact finding and data gathering phase of the rule amendment process, staff conducted site visits to various locations where lower-VOC, compliant coatings have been utilized, to observe on a first-hand basis, the challenges and issues related to use of the lower-VOC coatings. In addition, since January 1996, staff has conducted over 100 unannounced site visits to evaluate contractor practices relating to thinning, application, and clean up. During these site visits, samples were collected for coatings actually being utilized, as applied and as supplied, for laboratory analysis and subsequent study of impacts of thinning.

Subsequent to the most recent amendments to Rule 1113 in November 1996, actual samples were taken at 47 sites with ongoing painting operations. Of the 59 samples collected, 36 were waterborne and 23 were solvent-borne. Of the 23, six represented three sets, which were for the same coating as supplied and as applied. All three samples that were thinned with solvent prior to use were analyzed, with none exceeding the compliance limit. All three sets were Industrial Maintenance Coatings.

Phase II of the field study consisted of purchasing and analyzing paint samples fror various retail outlets. Since January 1996, 42 samples, consisting of various coating

categories, were purchased and analyzed. All of the coatings analyzed were found to be in compliance with the applicable rule limit. Laboratory tests indicated that the reported VOC content on the container was generally higher than the VOC content as tested. The difference in the actual VOC content versus the reported VOC content ranged from five percent to over 60 percent. A trend of listing a maximum VOC content at the actual compliance limit was noted to be the practice. Of the samples purchased, seven were found to be in violation of Rule 1113, mostly waterproofing sealers. Staff believes that part of the reason for these violations is confusion over the definition of waterproofing sealers, which is currently being clarified.

A number of additional studies have addressed the thinning issue. The results are detailed below:

- In mid-1991, the California Air Resources Board (CARB) conducted a field study of thinning in regions of California that have established VOC limits for architectural coatings (CARB, 1991). A total of 85 sites where painting was in progress were investigated. A total of 121 coatings were in use at these sites, of which 52 were specialty coatings. The overall result of this study was that only six percent of the coatings were thinned in excess of the required VOC limit indicating a 94 percent compliance rate.

- The SCAQMD contracted with an environmental consulting firm, to study thinning practices in the district (SCAQMD 1993a). In Phase I of the study, consumers who had just purchased paints were interviewed as they left one of a number of stores located in different areas of the district. Seventy solvent-borne paint users responded to the survey. One-third of consumers purchased solvent-borne coatings. Of those surveyed, three (four percent of all solvent-borne paint purchasers) indicated that they planned to thin their coatings before use. In Phase II of the study, the consultant contacted 36 paint contractors. The majority stated that they were using water-borne coatings. Four contractors using solvent-borne paints allowed the consultant to collect paint samples at their painting sites. None of the samples collected were thinned.

- During the 1996 rule amendments, SCAQMD staff conducted over 60 unannounced site visits to industrial parks and new residential construction sites to survey contractors regarding their thinning practices, coating application techniques, and clean-up practices. Samples were also collected during these site visits for coatings as supplied and as applied, for laboratory analysis and subsequent study of thinning practices. The results of the study indicate that out of the 91 samples taken only nine were thinned with solvents. Out of the nine thinned samples, only two were thinned to the extent that the VOC content limit of the coating, as applied, would have exceeded the applicable rule limit. During pre-arranged visits, however, excessive thinning was observed at only one site at a 1:2 ratio. At this level, the coating was thinned to the point where, according to

the professional contractor using it, it did not provide adequate hiding and he had to apply several coats. The practice of over-thinning is expected to inhibit hiding power, application properties, and drying time of a coating.

The SCAQMD solicited empirical data from the paint industry on a number of occasions to support their claims of increased thinning. In contrast to the empirical data acquired from the field studies detailed above, the SCAQMD has received no countervailing empirical data from other sources to indicate that thinning is occurring to a greater extent than the above data would indicate.

In summary, field investigations of actual painting sites in the district and other areas of California that have VOC limits for coatings indicate that thinning of specialty coatings exists but rarely beyond the actual compliance limits. Even in cases where thinning does occur, it is rarer still for paints to be thinned to levels that would exceed applicable VOC content limits. The conclusion is that widespread thinning does not occur often; when it does occur, it is unlikely to occur at a level that would lead to a substantial emissions increase when compared with emissions from higher VOC coatings. Professional contractors can receive Notices of Violation (NOVs) for the practice of over-thinning, as it is illegal under the current version of the rule to exceed the specified compliance limits. It is, therefore, not likely that the proposed rule amendments would increase this practice. During the numerous surprise site visits conducted by district staff over many years, inspectors did not observe excess thinning to the degree cited by the industry representatives.

CONCLUSION: Thinning should not be a problem because a majority of the coatings that would comply with future limits will be waterborne formulations. Other compliant coatings are available may be applied without thinning. Even if some thinning occurs, thinning would likely be done with water or exempt solvents. Finally, current practice indicates that coating applicators do not engage in widespread thinning, and even when thinning occurs, the coatings VOC content limits are not exceeded. As a result, claims of thinning resulting in significant adverse air quality impacts are unfounded.

More Priming

PROJECT SPECIFIC IMPACT: Conventional coatings are currently used as part of a three, four, or five part coating system, consisting of one or more of the following components; primer, midcoat, and topcoat. Coating manufacturers and coating contractors have asserted that reformulated compliant low-VOC water- and solvent-borne topcoats do not adhere as well as higher-VOC solvent-borne topcoats to unprimed substrates. Therefore, the substrates must be primed with typical solvent-borne primers to enhance the adherence quality. Industry representatives have testified that the use of water-borne compliant topcoats, could require more priming to promote adhesion. Additionally, it is has been asserted that water-borne sealers do not penetrate and seal porous substrates like wood, as well as traditional solvent-borne sealers. This allegedly

results in three or four coats of the sealer per application compared to one coat for a solvent-borne sealer would be necessary, resulting in an overall increase in VOC emissions for the coating system.

ANALYSIS: Regarding surface preparation, staff evaluated this characteristic as part of the evaluation of coating product data sheets mentioned above (see the detailed tables in Appendix D). Information from the coating product data sheets indicated that low-VOC coatings do not require substantially different surface preparation than conventional coatings. According to the product data sheets, conventional and low-VOC coatings require similar measures for preparation of the surface (i.e. apply to clean, dry surfaces), and application of the coatings (i.e. brush, roller or spray). Both low-VOC coatings and conventional coatings for both architectural and industrial maintenance applications have demonstrated the ability to adhere to a variety of surfaces. As a part of the technology assessment, staff analyzed the product data sheets for a variety of low-VOC primers, including stain-blocking primers, primers that adhere to alkyds, and primers that have equal coverage to conventional solvent-borne primers, sealers, and undercoaters.

CONCLUSION: As a result, the material needed and time necessary to prepare a surface for coating is approximately equivalent for conventional and low-VOC coatings. More primers are not needed because low-VOC coatings possess comparable coverage to conventional coatings, similar adhesion qualities and consistent resistance to stains, chemicals and corrosion. Low-VOC coatings tend not to require any special surface preparation different from what is required before applying conventional coatings to a substrate. As part of good painting practices for any coating, water-borne or solvent-borne, the surface traditionally needs to be clean and dry for effective adhesion. Consequently, claims of significant adverse air quality impacts resulting from more priming are unfounded.

More Topcoats

PROJECT-SPECIFIC IMPACTS: Coating manufacturers and coating contractors assert that reformulated compliant water- and low-VOC solvent-borne topcoats may not cover, build, or flow-and-level as well as the solvent-borne formulations. Therefore, more coats are necessary to achieve equivalent cover and coating build-up.

ANALYSIS: Technology breakthroughs with additives used in recent formulations of low-VOC coatings have minimized or completely eliminated flow and leveling problems. These flow and leveling agents mitigate flow problems on a variety of substrates, including plastic, glass, concrete and resinous wood. These additives even assist in overcoming flow and leveling problems when coating oily or contaminated substrates. According to the product data sheets for the sampled coatings, water-borne coatings have proven durability qualities. Comparable to conventional coatings, water-borne coatings

for architectural applications are resistant to scrubbing, stains, blocking and UV exposure. Coating manufacturers, such as Dunn-Edwards, ICI, Pittsburgh Paints an Sherwin Williams, formulate lc -VOC nonflat coatings (<150 g/l) with high build and excellent scrubbability. Most of the coatings are mildew resistant and demonstrate excellent washability characteristics. The coverage of the coatings average around 400 square foot per gallon, which is equivalent to the coverage of the conventional nonflat coatings. Con-Lux, Griggs Paint and Spectra-Tone also formulate even lower VOC (<50 g/l) coatings that also demonstrate excellent durability, washability, scrubability and excellent hide. The coverage is again equivalent to the conventional coatings around 400 square foot per gallon.

Water-borne coatings for IM applications are resistant to chemicals, corrosion, chalk and abrasion. Both IM coating formulations have passed abrasion and impact resistance tests, such as ASTM test methods D4060 and G14, respectively. Similar to their conventional counterparts, water-borne IM coatings also tend to retain gloss and color, as well as have good adhesion to a variety of substrates. A majority of the low-VOC (<250 g/l) IM coatings passed adhesion tests, such as ASTM test methods D4541, D3359-78, D2197 or D412. Low-VOC IM coatings tend to have comparable coverage (~300 square foot per gallon) to conventional IM coatings.

CONCLUSION: Both low-VOC and conventional coatings have comparable coverage and superior performance. These low-VOC coatings possess scrub and stain resistan' qualities, blocking and resistance to UV exposure for the exterior coatings. Both low-VOC and conventional IM coatings tend to have chemical and abrasion resistant qualities, gloss and color retention, and comparable adhesion qualities. With comparable coverage and equivalent durability qualities, additional topcoats for low-VOC coatings should not be required.

More Touch-Ups and Repair Work

PROJECT-SPECIFIC IMPACTS: Coating manufacturers and coating contractors assert that reformulated compliant water- and low-VOC solvent-borne formulations dry slowly, and are susceptible to damage such as sagging, wrinkling, alligatoring, or becoming scraped and scratched. They also claim that the high-solids solvent-borne alkyd enamels tend to yellow in dark areas, and that water-borne coatings tend to blister or peel, and also result in severe blocking problems. All of these problems they claim require additional coatings for repair and touch-up.

ANALYSIS: Extra touch-up and repair and more frequent coating applications are related to durability characteristics of coatings. Staff met with numerous resin and coatings manufacturers to discuss this issue, and also reviewed coating product data sheets (see the detailed tables in Appendix D) to obtain durability information for low-VOC coatings and conventional coatings. Comparable to conventional coatings, wate borne coatings for architectural applications are resistant to scrubbing, staining, blocking

and UV exposure. They were noted for excellent scrubability and resistant to mildew. The average drying time between coats for the low-VOC coatings (<150 g/l) was less than the average drying time for the conventional coatings (250 g/l). The average drying time for the lower-VOC coatings (<50 g/l) did increase more than the conventional coatings. However, with the development of non-volatile, reactive diluents combined with hypersurfactants, performance of these nearly zero-VOC coatings has equalled, and in some characteristics, outperformed traditional, solvent containing coatings.

Water-borne coatings for IM applications are resistant to chemicals, corrosion, chalk, impact and abrasion. Similar to their conventional counterparts, water-borne IM coatings also tend to retain gloss and color, as well as have good adhesion to a variety of substrates. Further, both low-VOC coatings and conventional coatings tend to be comparable with regards to passing abrasion and impact resistance tests, and are considered to have proven durability qualities. Some IM low-VOC epoxy and urethane systems perform significantly better than their alkyd-based counterparts. Examples of these coatings can be found in Appendix D.

CONCLUSION: Therefore, based on the durability characteristics information contained in the coating product data sheets, low-VOC coatings and conventional coatings have comparable durability characteristics. As a result, it is not anticipated that more touch up and repair work will need to be conducted with usage of low-VOC coatings. Consequently, claims of significant adverse air quality impacts resulting from touch-up and repair for low-VOC coatings are unfounded.

More Frequent Recoating

PROJECT-SPECIFIC IMPACT: Coating manufacturers and coating contractors assert that the durability of the reformulated compliant water- and low-VOC solvent-borne coatings is inferior to the durability of the traditional solvent-borne coatings. Durability problems include cracking, peeling, excessive chalking, and color fading, which all typically result in more frequent recoating. As a result, they claim more frequent recoating would be necessary resulting in greater total emissions than would be the case for conventional coatings.

ANALYSIS: The durability of a coating is dependent on many factors, including surface preparation, application technique, substrate coated, and exposure conditions. Again, as mentioned above, key durability characteristics, as discussed in product data sheets, include resistance to scrub or abrasion, corrosion-, chemicals-, impact-, stain-, and UV-resistance, are similar between conventional and low-VOC coatings. Both coating types pass abrasion and impact resistance tests, and have similar durability qualities. According to the product data sheets, low-VOC coatings repeatedly would not need

additional surface preparation than what needs to be done to prime the surface for conventional coatings. The technique to applying the coatings did not significantly diffe: either. It is expected that if applied using manufacturers' recommendations, compliant low-VOC coatings should be as durable as conventional coatings, and therefore, no additional recoating is required from the usage of low-VOC coatings. Furthermore, overall durability is dependent on the resin used in the formulation as well as the quality of pigment, instead of just the VOC content of the coating.

The durability of a coating is governed by the nature of the binder used in its formulation, which are also known as film formers or resins. These coatings are exposed to a variety of influences of daily life, including mechanical stresses, chemicals and weathering, against which they serve to protect the substrate. The major impact on the coating film is oxidation by exposure to light, causing the film to first lose color and gloss, and gradually become brittle and incoherent. This is mainly caused by a process known as photochemical degradation. This is especially the case for coatings used for exterior painting.

The coatings industry has developed a variety of additives that act as ultraviolet light (UV) absorbers or free radical scavengers that ultimately slow down the photo-oxidative process, thereby increasing the coating life. Antioxidants and sterically hindered amines are two classes of free radical scavengers, also known as hindered amine light stabilizers (HALS). These can be used with solvent-free or waterborne coatings. Other additives that have positive effect on durability of coatings include adhesion promoters, corrosion inhibitors, curing agents, reactive diluents, optical brightners, and algicides/mildewcides.

TABLE 4-4
PERFORMANCE COMPARISON OF ACRYLIC AND ALKYD RESIN SYSTEMS

Acrylic Coatings	Alkyd Coatings
Excellent exterior durability because of high degree of resistance to thermal, photooxidation, and hydrolysis – Pendant groups are ester bonds, but body is C-C bonds, which are much harder to break.	Limited exterior durability because prone to hydrolysis.
Very good color and gloss retention, and resistance to embrittlement	Embrittlement and discoloration issues with age
Require good surface preparation. Since the surface tension is high, the substrate surface needs to be cleaner before application	Minimal surface preparation requirements due to low surface tension. Relatively foolproof applications
Acrylic coatings are generally higher in cost	Lower costs
Polyurethane modified acrylics perform even better, especially in flexibility	Rapid drying, good adhesion, and mar resistance. Silicone modified alkyds have higher performance
Low-VOC and solvent-free formulations available	Higher VOC formulations

As indicated earlier in this report, there are numerous types of binders used in the formulation of coatings. However for architectural uses, acrylics and alkyds are the two most commonly used. Table 4-4 above, extracted from material provided as part of the Durability and Performance of Coatings seminar held by Eastern Michigan University, describes some typical characteristics of each resin type and highlights strengths and weaknesses of each resin type. But, clearly the table emphasizes the superior durability of acrylic coatings. Utilizing the additives available for improving application and durability characteristics, waterborne acrylic systems have overcome their limitations, and generally outperform solvent-borne coatings, when properly formulated.

CONCLUSION: Coatings manufacturers' own data sheets indicate that the low-VOC coatings for both architectural and industrial maintenance applications are durable and long lasting. Any durability problems experienced by the low-VOC coatings are not different than those seen with conventional coatings. Recent coating technology has improved the durability of new coatings. Because the durability qualities of the low-VOC coatings are comparable to the conventional coatings, more frequent recoatings would not be necessary.

Substitution

PROJECT-SPECIFIC IMPACT: Coating manufacturers and coatings contractors assert that since reformulated compliant water- and low-VOC solvent-borne coatings are inferior in durability and are more difficult to apply, consumers and contractors will substitute better performing coatings in other categories for use in categories with low compliance limits. An example of this substitution could be the use of a rust preventative coating, which has a higher interim VOC content limit requirement, in place of an IM coating or a nonflat coating.

ANALYSIS: There are several reasons why widespread substitution will not occur as a result of the implementation of PAR 1113. First and foremost, based on staff research of resin manufacturers' and coating formulators' product data sheets, there are, generally, a substantial number of low-VOC coatings that are currently available, that have performance characteristics comparable to conventional coatings (see the tables in Appendix D and Table 4-2). Second, PAR 1113 prohibits the application of certain coatings in specific settings. For example, industrial maintenance coatings cannot by used in residential, commercial, or institutional setting. Also, rust preventive coatings cannot be used in industrial settings. Third, the type of performance (e.g., durability) desired in some settings would prohibit the use of certain coatings. For example, in an IM setting a coating with a life of 10 years or more is typically desired due to the harshness of the environment. Therefore, it is unlikely that an alkyd-based rust preventive coating with a typical life of five years would be used in place of an IM coating. Fourth, PAR 1113 requires that when a coating can be used in more than one coating category the lower limit of the two categories is applicable. For example, a rust preventive coating substituted for an IM coating in the interim year would have to meet

the lower IM interim limit. Lastly, SCAQMD enforcement records reveal that there is greater than 99 percent compliance rate with Rule 1113. Thus, it highly unlikely the coating applicators will violate PAR 1113 by substituting higher-VOC coatings for lower-VOC coatings.

CONCLUSION: As discussed above, the SCAQMD does not expect that low-VOC coatings will substituted for by higher-VOC coatings. Currently, there are a substantial number of low-VOC coatings that have performance characteristics comparable to conventional coatings. Furthermore, PAR 1113 prohibits the application of certain coatings in specific settings. Moreover, the type of performance desired in some settings would prohibit the use of certain coatings in those settings. PAR 1113 also requires that when a coating can be used in more than one coating category the lower limit of the two categories is applicable. Lastly, SCAQMD enforcement records reveal that there is greater than 99 percent compliance rate with Rule 1113.

If in the rare event that substitution does occur, PAR 1113 would still achieve overall VOC emission reductions. Consequently, PAR 1113 will not result in significant adverse air quality impacts from the substitution of low-VOC coatings with higher-VOC coatings.

More Reactivity

Different types of solvents have different degrees of "reactivity", which is the ability to accelerate the formation of ground-level ozone. Coating manufacturers and coating contractors assert that the reformulated compliant low-VOC water- and solvent-borne coatings contain solvents that are more reactive than the solvents used in conventional coating formulations. Furthermore, water-borne coatings perform best under warm, dry weather conditions, and are typically recommended for use between May and October. Since ozone formation is also dependent on the meteorological conditions, use of waterborne coatings during this period increases the formation of ozone.

ANALYSIS: The use of reactivity as a regulatory tool has been debated at the local, state, and national level for over 20 years. For example, CARB incorporated a reactivity-based control strategy into their California Clean Fuel/Low Emissions Vehicle regulations, where reactivity adjustment factors are employed to place regulations of exhaust emissions from vehicles using alternative fuels on an equal ozone impact basis. CARB is evaluating a similar strategy for consumer products and industrial emissions, and recently contracted with Dr. William Carter, University of California at Riverside, Center for Environmental Research and Technology, College of Engineering, for a two-year study to assess the reactivities of VOC species found in the consumer products emissions inventory. Dr. Carter, one of the principal researchers of reactivities of various VOC species, plans to further study VOC species, more specifically glycol ethers, esters, isopropyl alcohol, methyl ethyl ketone (MEK), and an octanol, since these are typically found in either waterborne coatings, solvent-borne coatings, or both. These specific VOCs have been prioritized based on emissions inventory estimates, mechanistic

uncertainties, and lack of information in the current reactivity data. Under the current models and ozone chamber studies, however, Dr. Carter has been unable to assess the reactivity of low volatility compounds, and has not succeeded in reducing the uncertainties of key VOC species used in AIM coatings.

Another factor to be considered in the reactivity based approach, and probably the most important, is an accurate speciation profile of waterborne and solvent-borne coatings. CARB, in its effort to get more detailed information about the speciation profiles, required speciation profiles of all coatings included in the 1998 CARB Survey. The results of the speciation data are still under evaluation, and could potentially be used for future reactivity-based architectural coatings control.

CARB did propose an alternative reactivity-based approach in their recent proposed Aerosol Coatings rule amendment, but have delayed the reactivity-based alternative, until after a complete peer review of the modeling assumptions and reactivity data included in Dr. Carter's research is completed in mid-1999.

The contention that more reactive solvents will be used in lieu of traditional less reactive solvents is somewhat misleading because the coating categories affected by these rule amendments currently contain reactive and highly toxic solvents such as toluene, xylene, MEK, etc. Furthermore, Harley, et al., (1992) noted, "The speciated organic gas emissions from use of solvent-borne architectural coatings are 24 percent more reactive than the official [VOC] inventory would suggest." This observation illustrates the uncertainties associated with the reactivities of traditional allegedly less reactive solvents. Therefore, there is a need for further study of the chemical composition of industrial surface coatings and the detailed composition of petroleum distillate solvents incorporated in surface coatings.

To date, Dr. Carter has compiled some information regarding the reactivity of VOCs and has established several different reactivity scales. However, he cautions the use of these scales due to the uncertainties involved; for example, "Deriving such numbers is not a straightforward matter and there are a number of uncertainties involved. One source of uncertainty in reactivity scales comes from the fact that ozone impacts of VOCs depend on the environment where the VOC is emitted. A second source of uncertainty is variability in the chemical composition of the VOC source being considered. Complex mixtures such as "mineral spirits" may be more difficult to characterize and may vary from manufacturer to manufacturer though in principal the composition of a given lot can be determined and reasonably assumed to be constant regardless of how the product is used. A third source of uncertainty comes from the complexity and uncertainties in the atmospheric processes by which emitted VOCs react to form ozone (Carter, 1995).

According to Dr. Carter, reliable reactivity numbers do not currently exist from which accurate air quality policy can be derived based on reactivity and not total VOC emissions. Further, Dr. Carter, asserts that ketones are the most important class of

consumer emissions for which there are no environmental chamber reactivity data suitable for evaluating reactivity predictions. He also finds no experimental reactivity data for glycols or alcohols suitable for mechanism evaluation. (Carter, 1995, page 6).

Another factor to be considered in the reactivity based approach, and probably the most important, is an accurate speciation profile of water-borne and solvent-borne coatings. Dr. Albert C. Censullo, Professor of Chemistry, California Polytechnic State University, San Luis Obispo, conducted a comprehensive assessment of species profiles for a number of sources within the general categories of industrial and architectural coating operations. The study was intended to upgrade the existing species profiles, which were last analyzed in 1991. The compositions of industrial and architectural coatings have changed significantly in the last few years due to regulatory changes at the national, state, and local levels.

As a part of the Censullo study, 52 water-borne coating samples were analyzed and species profiles were determined by using an average of at least two analyses. The four most common solvents in water-borne coatings were identified as texanol, propylene glycol, diethylene glycol butyl ether, and ethylene glycol, all of which were identified by Dr. Carter as needing further reactivity assessment.

Additionally, the Censullo study obtained emission profiles for 54 solvent-borne coating samples. The results were significantly more complex compared to the species profiles for the water-borne samples, due primarily to the various petroleum fractions used in solvent-borne coatings. Some of the species profiles resulted in several hundred components from one sample. Dr. Carter has compiled reactivity data on several of the specifies identified, but has also indicated the need to further assess the reactivity of MEK, isopropyl alcohol, other alcohols, and esters found in solvent-borne coatings. Subsequently, the 1998 CARB survey included a section to obtain specification profiles from coating manufacturers. This updated species profile is an important first step in focusing the attention of researchers in assessing overall reactivity and its contribution to ozone formation. The information in the original survey questionnaire will be used to study whether or not additional flexibility can be built into regulations based on the reactivity of the ingredients. The draft report on the speciation data will be available in June, 1999.

In spite of the studies identified above, reactivity data for VOCs, especially those compounds used to formulate consumer and commercial products, are extremely limited. "Better data, which can be obtained only at great expense, is needed if the EPA is to consider relative photochemical reactivity in any VOC control strategy." (USEPA, 1995). Current studies are underway with more work being planned for the future with respect to assigning reactivity numbers for various key chemical compounds found in coatings.

The reactivity issue is also currently under study by the EPA. Section 183(e) of the 1990 amendments to the Clean Air Act (CAA) requires the EPA to develop a control strategy

for VOC emissions from consumer and commercial products taking into account the photochemical reactivities of such emissions. "The EPA must...consider those products which emit 'highly reactive' species of VOCs and list those consumer and commercial products that account for at least 80 percent of the VOC emissions on a 'reactivity adjusted' basis in ozone nonattainment areas." (USEPA, 1995, page 4-1).

With respect to water-borne reformulated coatings, the architectural coating industry also concurs with the SCAQMD's technical assessment that reactivity will not significantly affect the reaction of total VOC reductions on reducing ozone formation in the Basin. At a 1991 joint SCAQMD/CARB Conference on Reactivity-Based Hydrocarbon Controls: Scientific Issues and Potential Regulatory Applications, a paper was presented by coating industry representatives entitled, *"Application of Reactivity Criteria to Architectural Coatings."* This paper asserts that "...approximately 68% of the volume of architectural coatings made and used in California are waterborne flat coatings and waterborne primers, sealers, and undercoaters, with a weighted average VOC content of 80 g/L. This is so much lower than the VOC content of the solvent-borne flat coatings replaced...that reactivity is probably not a significant issue with regard to these coatings."

To address the issue of reactivity of VOCs, staff is currently participating in CARB's Reactivity Research Advisory Committee, which is monitoring the progress of the North American Research Strategy for Tropospheric Ozone with regard to evaluating research studies on reactivity conducted at the national level. In addition to the SCAQMD's participation in the aforementioned studies, Dr. Carter has been retained by CARB to carry out an experimental and computer modeling study to investigate the atmospheric ozone formation potential of selected VOCs emitted from consumer products and industrial sources.

Although the science of VOC reactivity has matured over the past few years, more comprehensive studies are still being conducted to resolve the uncertainties of reactivity data. The experts in the field, including Dr. Carter, have indicated the need to improve estimates of atmospheric ozone reactivity factors for selected major classes of compounds in the consumer product emissions inventory. They also feel the need to improve the quantification of the uncertainty ranges of atmospheric reactivity factors for the classes of species typically found in coatings. In the near future, with funding from USEPA and private sources, a new, state-of-the-art ozone chamber will be developed and used for future studies. The chamber is expected to be built and operational by the end of 1999 or early 2000. Furthermore, the architectural coatings industry is funding additional studies to further understand the mechanistic and kinetic reactivities of different VOC species. The results of all the aforementioned research and studies will be invaluable in determining the extent to which a reactivity based approach can be relied on for regulating VOC emissions from the application of coatings and the use of solvents.

Until the results of this research and studies are completed and peer reviewed, the SCAQMD believes that it would not be prudent to implement a reactivity-based ozone

reduction strategy based on incomplete science. Therefore, the SCAQMD will continue to monitor and participate in all studies related to enhanced reactivity data for VOC species, including directly participating in studies pertaining to reactivity of solvents in architectural coatings.

CONCLUSION: In the absence of actual reactivity numbers for the compounds contained in "traditional" solvent formulations and compliant, low-VOC coatings, emissions must be calculated in the standard manner of total VOC per unit of coating applied manner. Based upon the current state of knowledge regarding VOC reactivity, it is speculative to conclude that the proposed amendments will generate significant adverse air quality impacts due to increased reactivity.

On June 16, 1995, the USEPA determined that acetone. PCBTF, VMS as well as other solvents have low photochemical reactivity and should be exempted from consideration as a VOC. The AQMD subsequently amended Rule 102 on November 17, 1995, to add acetone and other solvents to the definition of Group I exempt compounds, which are non-VOC by definition.

Oxsol 100 (p-chlorobenzotriflouride, PBTCF), manufactured by Occidental Chemical Corporation, was also delisted as a VOC in 1994. This solvent can be used to extend or replace many organic solvents, including toluene, xylene, mineral spirits, acetone, methyl ethyl ketone, trichloroethylene, and perchloroethylene. This product is less toxic than toluene, is not considered a Hazardous Air Pollutant or an Ozone-Depleting Substance. The USEPA is also in the process of delisting t-butyl acetate, which may also help coating formulators in utilizing exempt solvents in their formulations.

Synergistic Effects of the Eight Issues

Coatings manufacturers have also alleged that not only should each of the eight issues (e.g., more thickness, illegal thinning, more priming, more topcoats, more touch-up and repair, more frequent recoating, more substitution, and more reactivity) be analyzed separately but that the synergetic effect of all issues be analyzed. As discussed above, the SCAQMD' research and analysis of resin manufacturers' and coating formulators' product information sheets concludes that on each separate issue that the low-VOC compliant coatings have comparable performance as current coatings or industry's assertion is unfounded. Therefore, since individually each issue does not result in a significant adverse air quality impact, the synergistic effect of all eight issues will result in significant adverse air quality impacts.

Low Vapor Pressure

While not argued as one of the alleged eight issues discussed previously, coatings manufacturers have asserted that coating solvents should not be regulated as a VOC at all. These solvents currently used in consumer products and architectural coatings are

considered low volatility compounds, meaning that they have a vapor pressure of less than 0.1 mm of Hg at 20 degrees Celsius. While CARB has included a low vapor pressure (LVP) exemption in their Consumer Products regulation, their staff indicate that the LVP exemption was placed into the proposed rule for some additives found in consumer products, such as surfactants, paraffin, and other heavier compounds that do not readily evaporate into the atmosphere and are typically washed away into the sewer. Since the VOCs in paints do and are intended to evaporate into the atmosphere, CARB does not support the LVP exemption for architectural coatings and did not include the LVP exemption into its Aerosol Coatings rule. USEPA staff also does not support an LVP exemption for the architectural coatings rule and did not include such an exemption in the National Architectural Coatings Rule. Based upon its test methodology, USEPA concludes that VOCs from architectural coatings do evaporate into the air and therefore should not be exempted. SCAQMD staff concurs with USEPA and CARB to not include a LVP exemption for architectural coatings. Nevertheless, staff will continue to work with CARB staff in identifying issues, participating in future studies, and monitoring the result of any studies.

NTS Study

A study by the National Technical System (NTS) was initiated to assess application and durability characteristics of zero-VOC, low-VOC, and high-VOC coatings in order to supplement information collected by District staff, as part of our technology assessment. The laboratory testing of the NTS study is complete, and the Preliminary Test Data/Project Status Report #3 was released April 5, 1999.

The results from the NTS study are consistent with staff's own technology assessment. The results of the study show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of some zero-VOC nonflat and PSU coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging and brushing properties. However, for IM coatings, zero and low-VOC coatings performed better than high-VOC coatings. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual field application characteristics. In sum, the results of the NTS study indicates that for the final VOC content limits, some, but not all of the zero-VOC coatings may have some application characteristics. As a result, the SCAQMD has given coating formulators seven years to reformulate their coatings to correct coating application problems. This time period is consistent with input received from resin manufacturers and coating formulators that it takes five to seven years to reformulate coatings to make it commercially available based on emerging resin technology.

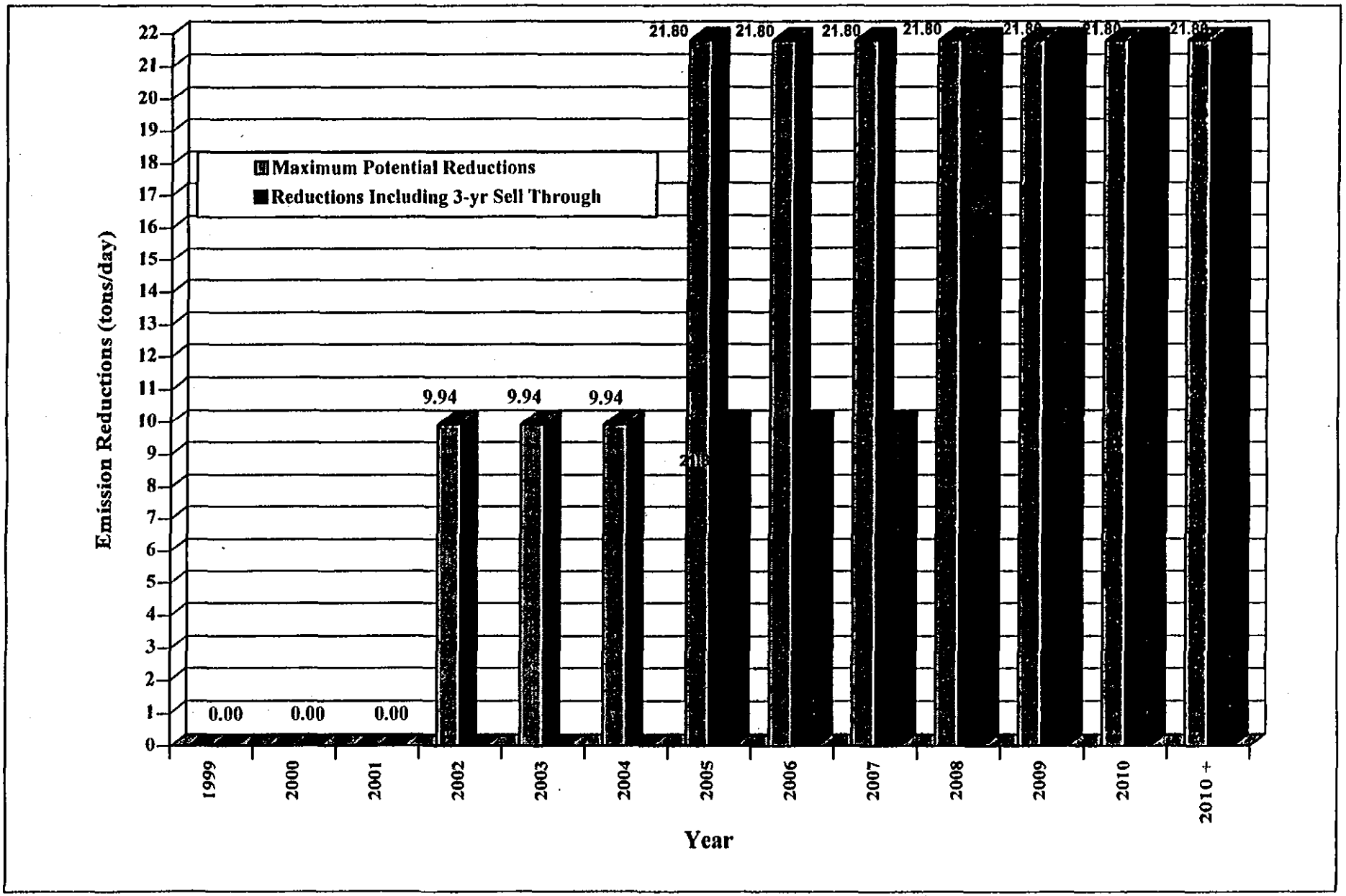
PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessmei of the availability of compliant coatings. If compliant coatings are unavailable by the completion of the technology assessment to meet the final limit, the SCAQMD will report back to the Governing Board as to the appropriateness of maintaining the existing VOC content limits. The SCAQMD plans to utilize the on-going testing results from the NTS study for future technology assessments.**Overall Conclusion**

Based on the preceding analysis of potential air quality impacts from implementing PAR 1113, it is concluded that the overall air quality effects of the PAR 1113 will be a VOC emission reduction of approximately 21.8 tons per day by the year 2010. Figure 4-1 illustrates the overall VOC emission reductions with and without the sell through provision associated with the implementation of PAR 1113.

To aid coating manufacturers in complying with the interim and final VOC continent limits, the SCAQMD has expanded the averaging provision of the current rule to cover PAR 1113 affected coating categories. In the 1996 amendments, SCAQMD staff included an "Averaging Provision" for flat coatings to provide an optional method of compliance for manufacturers of flat coatings. PAR 1113 will expand the provision and allow averaging for flats, nonflats; quick-dry enamels: IM coatings; PSU; quick-dry PSU; rust preventative coatings; and floor coatings. Effective January 1, 2001, this provision will allow manufacturers to average, on a sales-weighted basis, the VOC contents of al these coatings, and allow them to manufacture and distribute coatings that have a VOC content higher than the proposed standards. Market-based approaches have been requested by industry as an option to compliance with the standards. The overall averaging program parallels the CARB's Alternative Control Plan Regulation for Consumer Products.

The Averaging Provision is a voluntary, flexible approach that will utilize a "bubble" concept. Under this program, manufacturers who voluntarily choose to comply with the rule under the averaging provision would select the coatings and formulate a detailed program which would demonstrate that the total actual VOC emissions under the program would not exceed the allowable emissions that would have resulted had the products been formulated to meet the VOC content limits. Once the program is approved, the manufacturers could sell products that exceed the VOC content limits specified in the rule for specific coating categories, provided that the emissions from these high-VOC products will be sufficiently offset by emissions from other coating products formulated to achieve VOC limits, below the proposed VOC content limits.

FIGURE 4-1
OVERALL VOC EMISSION REDUCTIONS FROM PAR 1113



The following benefits of averaging have been noted by other similar programs, and are also appropriate under this proposal:

- Higher degree of compliance flexibility
- Equivalent emission reductions by utilizing market forces
- Lower the manufacturers' overall cost of reducing VOC emissions from categories included in the provision

PROJECT SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since PAR 1113 will result in an overall long-term air quality benefit (e.g., VOC reductions), no adverse impacts remain.

CUMULATIVE IMPACTS: The cumulative impacts of PAR 1113 have been fully evaluated in the Final 1997 AQMP Program EIR, which is incorporated by reference. In addition, on further analysis of potential cumulative impacts, the SCAQMD has determined that implementing PAR 1113, existing rules and regulations, and adopting and implementing 1997 AQMP control measures are anticipated to produce substantial net air quality benefits. Based on regional modeling analyses performed for both the 1994 and 1997 AQMPs, implementing control measures contained in the 1994 and 1997 AQMPs, in addition to the air quality benefits of the existing rules, is anticipated to bring the district into attainment with all national and most state ambient air quality standards by the year 2010. Therefore, there will be no cumulative adverse air quality impacts from implementing PAR 1113.

CUMULATIVE IMPACT MITIGATION: No cumulative impact mitigation measures are required

WATER RESOURCES

In the NOP/IS, staff identified as a possible issue water demand impacts that could occur as a result of implementing PAR 1113. Specifically, PAR 1113 may result in additional water demand from the manufacturing and clean up of complaint water-borne coatings as well as the potential additional generation of wastewater that could be disposed of into storm drains and sanitary sewers.

Significance Criteria

The project will be considered to have significant adverse water demand impacts if any one of the following criteria is met by the project:

- The project increases demand for water by more than 5,000,000 gallons per day.
- The project requires construction of new water conveyance infrastructure.

The project will be considered to have significant adverse water quality impacts if any one of the following criteria is met by the project:

- The project creates a substantial increase in mass inflow of effluents to public wastewater treatment facilities.
- The project results in a substantial degradation of surface water or groundwater quality.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

Water Demand Impacts

PROJECT SPECIFIC IMPACTS: In the NOP/IS for PAR 1113, staff identified potential water demand impacts that could occur if compliant coatings are reformulated with water.

ANALYSIS: To analyze these impacts, staff has projected what the water demand impacts would be as a result of using water to manufacture and to clean-up water-borne coatings. As a "worst-case", staff assumed that all affected coating categories associated with PAR 1113 would eventually be reformulated with water-borne technology. Staff also assumed for this "worst-case" analysis that all coatings that were and will be sold for use in the SCAQMD's jurisdiction were manufactured here. Additionally, staff assumed that water instead of solvent-borne clean-up material would be used to clean-up coating equipment. Thus, more water will be used in conjunction with the clean-up practices associated with the use of compliant coating categories than is presently the practice. As shown in Table 4-5, water demand impacts associated with the manufacture and clean-up of water-borne formulations (included as a "worst-case"), currently and in the future, are anticipated to create a negligible incremental water demand impact and do not exceed the SCAQMD's significant threshold of 5,000,000 gallons per day.

CONCLUSION: As shown in Table 4-5, it is within the capacity of the local water suppliers to supply the small incremental increase in water demand associated with the implementation of PAR 1113. Therefore, no significant water demand impacts are expected as the result of implementing PAR 1113.

It should be noted, however, that the MWD and other water providers are currently exploring various strategies for increasing water supplies and maximizing the use of existing supplies.

Options include storage of water from existing sources, use or storage of water unused by other states or agricultural agencies, and advance delivery of water to irrigation district These continuing and future water management programs help to assure that the area's full-service water demands will be met at all times.

The SCAQMD staff will conduct a technical assessment one year prior to each of the rule limit requirements to determine where the technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products.

TABLE 4-5
PROJECTED WATER DEMAND FOR REFORMULATED COATINGS

Year	Projected Population[a] (millions of people)	Projected Water Demand[b] (bgy)	Projected Water Supply[c] (bgy)	Projected Coating Sales[d] (mgy)	Projected Mfgr Demand[e] (mgy)	Projected Cleanup Demand[f] (mgy)	PAR 1113 Total Demand[g] (mgy)	Total Impacts[h] (% Increase)	Total Impacts[i] (mgd))
1996	14.42	1,108.40	1,266.97	17.56	0.00	0.00	0.00	0.000000	0.00
1997	14.71	1,129.36	1,266.97	18.96	0.00	0.00	0.00	0.000000	0.00
1998	15.00	1,150.32	1,266.97	20.48	0.00	0.00	0.00	0.000000	0.00
1999	15.29	1,171.28	1,266.97	22.12	0.00	0.00	0.00	0.000000	0.00
2000	15.58	1,192.24	1,266.97	23.89	0.00	0.00	0.00	0.000000	0.00
2001	15.88	1,213.20	1,266.97	25.80	0.00	0.00	0.00	0.000000	0.00
2002	16.17	1,234.16	1,266.97	27.87	27.87	27.87	55.73	0.004399	0.15
2003	16.46	1,255.12	1,266.97	30.09	30.09	30.09	60.19	0.004751	0.16
2004	16.75	1,276.08	1,266.97	32.50	32.50	32.50	65.00	0.005131	0.18
2005	17.04	1,297.04	1,526.97	35.10	35.10	35.10	70.21	0.004598	0.19
2006	17.34	1,318.00	1,526.97	37.91	37.91	37.91	75.82	0.004965	0.21
2007	17.63	1,338.96	1,526.97	40.94	40.94	40.94	81.89	0.005363	0.22
2008	17.92	1,359.92	1,526.97	44.22	44.22	44.22	88.44	0.005792	0.24
2009	18.21	1,380.88	1,526.97	47.76	47.76	47.76	95.51	0.006255	0.26
2010	18.50	1,401.80	1,526.97	51.58	51.58	51.58	103.15	0.006755	0.28

[a] Population projections obtained from SCAG's 1998 RTP.

[b] Water demand and supply projections obtained from MWD Web Page. MWD Fact Sheet, http://www.mwd.dst.ca.us/docs/fctsheet.htm. As a "worst-case" all of MWD's service area water demand is included.

[c] Assumes MWD provides 60% of water supply in the SCAQMD's jurisdiction. The remaining 40% is provided by other water districts or municipalities. MWD 1996 baseline figure obtained from MWD's Fact Sheet. Includes 1.3 million acre-feet per year (AF/yr) from the Colorado River, 784,000 AF/yr from State Water Project, 244,412 AF/yr for Reservoirs, 178,000 AF from recycling programs, 30,000 from water reclamation, and the construction of a 797,546 AF reservoir by 2005. AF (acre- feet) equals approximately 326,000 gallons

[d] The Draft 1998 CARB Survey sales data is used as the baseline for 1996. It is assumed that 45% of the total 1996 sales occurred in the district. It is projected that coating sales will increase by 8% (1% from individuals and 7% from contractors) per year. Reference The Coatings Agenda America 1995/1996 articles entitled "Demand Led by Do-It-Yourselfers" and "Holding on in the Face of a Blizzard."

[e] Assumes that one gallon of water will be used to manufacture one gallon of coating applied. Also assumes as a "worst-case" scenario, that all coatings used in the SCAQMD's jurisdiction were manufactured here.

[f] Assumes that one gallon of water will be used to clean-up equipment for every gallon of coating applied. Also assumes as a "worst-case" scenario, that full conversion of affected coating categories to water-borne formulations occurs in 2002.

[g] Total amount of manufacturer and clean-up water demand.

[h] The percentage increase in water demand as a result of the incremental increase due to water clean-up of water-borne coating material.
[i] The incremental increase in daily water usage associated with the implementation PAR 1113.

Acronyms: bgy = billion gallons per year; mgy = millions of gallons per year; mgd = milllion gallons per day

PROJECT-SPECIFIC MITIGATION: None required.

REMAINING IMPACTS: None.

CUMULATIVE IMPACTS: The cumulative impacts of PAR 1113 have been fully evaluated in the Final 1997 AQMP Program EIR, which is incorporated by reference. The 1997 AQMP Final Program EIR concluded that the implementation of all control measures, including CM #97CTS-07, would not create cumulatively significant adverse water demand impacts. Additionally, the 1997 AQMP Final Program EIR found that the implementation of certain mitigation measures would further reduce the incremental impacts associated with the adoption of control measures, which are incorporated herein by reference.

CUMULATIVE IMPACT MITIGATION: None required.

Water Quality Impacts

Groundwater and Surface Water Impacts

PROJECT-SPECIFIC IMPACT: Based upon staff research of currently available compliant coatings, to comply with PAR 1113 VOC content limits, it is likely that resin manufacturers and coating formulators will replace conventional coating formulations, which may contain toluene, xylene, mineral spirits, acetone, methyl ethyl ketone (MEK), tricholorethylene, and percholoroethylene, with either exempt solvents (e.g., acetone, Oxsol 100, t-butyl acetate) or water-borne formulations. In addition to the above-mentioned solvents, coalescing solvents such as texanol, propylene glycol, and ethylene glycol may be used more widely in low-VOC water-borne formulations as alternatives to more toxic coalescing solvents such as ethylene glycol monobutyl ether (EGBE), ethylene glycol monoethyl ether (EGEE), ethylene glycol monomethyl ether (EGME), and their acetates. Furthermore, diisocyanates (e.g., hexamethylene diisocyanate (HDI), methylene bisphenyl diisocyanate (MDI), and toluene diisocyanate (TDI)) may be used more widely in low-VOC two component, water-borne IM systems as activators to their higher-VOC solvent-borne counterparts.

Some commentators contend that with the increased use of water-borne technologies to meet the interim and final VOC content limits, there will be a greater trend of coating applicators to improperly dispose of the waste generated from these coatings into the ground, storm drains, or sewer systems. However, there is no data to support this contention. In any event, there are several reasons why there should be no significant increase over current practices for improper disposal due to greater use of water-borne coatings.

ANALYSIS: As part of the 1996 Rule 1113 amendments, SCAQMD staff conducted over 60 unannounced site visits at industrial parks and new housing construction sites in an effor to evaluate coating and cleanup practices. During these site visits, SCAQMD staff surveyed contractors regarding their thinning practices, coating application techniques, and clean-up practices. Out of 32 responses received from the contractors on their clean-up practices, seven (22 percent) indicated that they dumped their waste material into the ground, 18 (56 percent) indicated that they used a disposal company to handle waste material, and seven (22 percent) indicated that they recycled their waste material as thinner. This survey demonstrates that a majority of the contractors either dispose of the waste material properly as required by the coating manufacturer's MSDS or recycle the waste material regardless of type of coating. Based upon these results, there is no reason to expect that paint contractors will change their disposal practices, especially those that dispose of wastes properly, with the implementation of PAR 1113.

Furthermore, based on discussions with resin manufacturers and coating formulators, the trend in coating technologies is to replace toxic/hazardous solvents (e.g., EGBEs) with less toxic/hazardous solvents (e.g., texanol, ethylene glycol, and propylene glycol). Staff has verified this trend by reviewing product data sheets and MSDSs for currently available compliant low-VOC coatings. Additionally, a draft December 1995 report entitled "Improvement of Speciation Profiles for Architectural and Industrial Coating Operations" prepared by Dr. Albert C. Censullo for CARB indicates that a majority of current water based formulations (flats and non-flats) contain hazardous solvents.

The Censullo report, which is intended to upgrade the species profiles for a number of sources within the general categories of industrial and architectural coating operations, reported that the four most common solvents in the 52 randomly chosen water-borne coatings (flats and non-flats) were: texanol (found in 37/52); propylene glycol (31/52); diethylene glycol butyl ether (23/52); and ethylene glycol (14/52). It appears from this information that the use of solvents such as texanol and propylene glycol in water-borne coating formulations, is prevalent today and should continue into the future with the eventual replacement of more toxic and hazardous coalescing solvents such as EGBEs with less or nontoxic coalescing solvents.

Even if some of the nonflat complaint coatings were disposed of into the ground, storm drains, or sewer system, EPA would not consider it a hazardous waste. A research report released in March of 1997 demonstrated that latex (nonflat technology) paint is, in fact, not a hazardous waste product. The study, conducted by DynCorp Environmental Health and Safety Services of Reston, Virginia, included an independent laboratory analysis of 16 representative consumer latex paint samples. The results of this analysis demonstrate that these latex paint products would not be considered a "hazardous waste," according to procedures and protocols listed in Environmental Protection Agency (EPA) documentation, specifically 40 CFR, Subpart 261 20-24.

In the context of IM coatings, staff research reveals that compliant low-VOC, two-component IM coating systems containing diisocyanate compounds (toluene diisocyanate (TDI), hexamethylene diisocyanate (HDI), or methylene bisphenyl diisocyanate (MDI)) will be used to meet the interim and final VOC content limits. Exposure to diisocyanates can cause allergic reactions (primarily asthmatic) in sensitive individuals. It is likely that the compliant water-borne two component systems may replace higher-VOC solvent-borne one component IM systems. These water-borne compliant formulations are intended as direct replacements for their higher-VOC solvent-borne two component counterparts currently being applied. However, users of these compliant coating systems are business (e.g., painting contractors) that are more sophisticated and experienced than the average consumer in the proper disposal methods and applicable disposal requirements. Furthermore, after these coatings are mixed and exceed their pot life, they become a solid mass and are disposable as solid waste rather than wastewater. Thus, it is unlikely that these users will improperly dispose of these compliant coating systems resulting in an adverse water quality impacts

It should be noted that the National Paints and Coatings Association's "Protocol for Management of Post Consumer Paint," and the SCAQMD's "Painter's Guide to Clean Air" provide the public and painting contractors with information as to the environmentally sound coating disposal practices. These public outreach programs are expected to reduce the amount of coating waste material entering the sewer systems, storm drainage systems, and being dumped on the ground. Therefore, further reducing any water quality impacts associated with the improper disposal of complaint coatings.

CONCLUSION: Thus, significant ground water and surface water quality impacts are not expected from the use of texanol, propylene glycol, and ethylene glycol as coalescing solvents in compliant water-borne coatings. Furthermore, the potential for significant adverse groundwater and surface water quality impacts from compliant IM coatings containing diisocyanates is considered unlikely since users will properly dispose of any waste generated from application of these coatings.

Water Quality Impacts to Publicly Owned Treatment Works (POTWs)

PROJECT-SPECIFIC IMPACT: As already noted, it is anticipated that future compliant AIM coatings will be formulated with water-borne technologies. As a result, more water will be used for clean-up and the resultant wastewater material could be disposed of into the public sewer system. Thus, the increased usage of water-borne compliant coatings could adversely affect local POTWs' ability to handle the projected incremental increase in waste material.

ANALYSIS: To evaluate the amount of wastewater projected to be generated, it is anticipated that current coating equipment (i.e., spray guns, rollers, and brushes) clean-up practices of using water will continue into the future. Table 4-6 illustrates the "worst-case" potential increase of waste material likely to be received by POTWs in the district as a result of implementing PAR 1113.

The results of the analysis illustrated in Table 4-6 are considered to be a "worst-case" analysis that considerably overestimates potential wastewater impacts from implementing PAR 1113. For example, the EPA in its Report to Congress entitled "Study of Volatile Organic Compound Emissions from Consumer and Commercial Products" evaluated consumer products to determine which categories were likely to be disposed of to POTWs. The study found that the likelihood of paints, primers, and varnishes being disposed of to POTWs was low. Therefore, this category was not even evaluated for its VOC emission impacts on POTWs. This suggests that the presence of solvents from this category of consumer products in wastewater streams is very low compared to the total volume of solvents being disposed of from other consumer product categories.

In addition, as discussed earlier, water-borne coatings are increasingly becoming less toxics than current coatings. To that extent, it is likely that adverse impacts to water quality will actually decrease as compared to the existing situation.

TABLE 4-6
PROJECTED POTW IMPACT FROM REFORMULATED COATINGS

Year	POTW Average Daily Flow[a] (mgd)[e]	POTW Capacity[b] (mgd)	Coatings Disposal Daily Flow[c] (mgd)	Total Impacts[d] (% Increase)
1996	1671.00	2005.20	0.0000	0.000000000
1997	1671.00	2005.20	0.0000	0.000000000
1998	1671.00	2005.20	0.0000	0.000000000
1999	1671.00	2005.20	0.0000	0.000000000
2000	1691.00	2029.20	0.0000	0.000000000
2001	1691.00	2029.20	0.0000	0.000000000
2002	1691.00	2029.20	0.0763	0.000003762
2003	1691.00	2029.20	0.0825	0.000004063
2004	1691.00	2029.20	0.0890	0.000004388
2005	1691.00	2029.20	0.0962	0.000004739
2006	1691.00	2029.20	0.1039	0.000005119
2007	1691.00	2029.20	0.1122	0.000005528
2008	1691.00	2029.20	0.1211	0.000005970
2009	1691.00	2029.20	0.1308	0.000006448
2010	1691.00	2029.20	0.1413	0.000006964

[a] 1990 total average daily wastewater flows handled by all POTWs in the district. Includes Eastern Municipal Water District tripling their capacity in 2000.

[b] Based on average daily flows of 80% of total POTW capacity. Does not include wet weather peak capacity.

[c] Assumes that one gallon of water will be used to clean-up equipment for every gallon of coating applied. Also assumes as a "worst-case" scenario, that full conversion of affected coating categories to water-borne formulations occurs in 2002. The figures for Coatings Disposal Flow expressed in mgy are converted to mgd by dividing by 365.

mgd = millions of gallons per day

CONCLUSION: The potential increase is considered to be well within the existing and

projected capacity of POTWs in the district. Hence, wastewater impacts associated with the disposal of water-borne clean-up waste material generated from PAR 1113 affected coating categories are not considered significant. With the increasing trend toward less toxic water-borne, it is likely that there will be less adverse impacts to water quality.

Potential water quality impacts are expected to be further minimized through using the optional averaging provision. The averaging provision should help coating manufacturers comply with the proposed lower VOC limits by allowing them to manufacture and sell coatings at various VOC levels for a specific coating category assuming the category, as a whole, complies with a sales-weighted average VOC content equal to that in the rule. Since current solvents could continue to be used in the higher VOC coatings, the disposal practices associated with them would continue so no additional water quality impacts would be expected.

Overall Conclusion

Based upon the preceding analyses, PAR 1113 is not expected to create significant adverse water resource impacts for the following reasons. First, the current trend in coating technologies is to move away from using hazardous materials to using less or non-hazardous coating technologies. This trend may be the result of increasingly stringent state and federal regulations relative to hazardous materials, as well as the potential for increased liability associated with promoting or using hazardous materials. Second, experienced users are expected to properly dispose of waste generated from the use of compliant coatings. Third, public outreach programs are anticipated to further inform the public and painting contractors as to the proper disposal methods for compliant coatings. Lastly, based upon future projections, district POTWs are expected to be able to handle any incremental increase water-borne coating wastewater disposed of as part of clean-up practices associated with the use of compliant water-base coatings. As a result, water quality impacts will likely decrease over the current disposal practices.

PROJECT-SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since water quality impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACTS: The cumulative impacts were thoroughly analyzed in the 1997 AQMP Final Program EIR, which is herein incorporated by reference along with its adopted mitigation measures. In addition, due to the trend toward using less hazardous compounds in water-borne coatings, PAR 1113's contribution to the cumulative significant adverse water quality impacts (due primarily to Rules 1171 and 1122) found in the 1997 AQMP Final Program EIR will not be found to be cumulatively considerable and thus is not significant.

CUMULATIVE IMPACT MITIGATION: None required.

PUBLIC SERVICES IMPACTS

In the NOP/IS, staff identified potential significant public services impacts that could occur as a result of implementing PAR 1113. Specifically, whether reformulated compliant coatings could lead to more demand for maintenance at public facilities because these coatings allegedly do not perform or hold-up as well as traditional solvent-borne coatings. Additionally, based on comments received on the NOP/IS and at various public meetings the SCAQMD will also analyze other public services (e.g., fire department) impacts associated with the application of coatings reformulated with low-VOC solvents and exempt solvents (e.g., acetone).

Significance Criteria:

The project will be considered to have significant adverse public services impacts if any one of the following criteria is met by the project:

- The proposed project will result in the need for new or altered public facilities or services.

Additional Maintenance of Public Facilities

PROJECT-SPECIFIC IMPACTS: In the NOP/IS and in subsequent public forums, some commentators have asserted that because reformulated compliant coatings will not perform as well as current coatings public facility impacts will result from more frequent maintenance activities. In other words, because public facilities have limited budgets for painting activities, they will not be able to do more frequent touchups to maintain facility appearance, equipment, and in some instances safety.

ANALYSIS: As part of the analysis of PAR 1113, staff evaluated coating product information sheets for a large number of conventional coatings and currently available low-VOC coatings (see the tables in Appendix D and Table 4-2). Extra touch-up and repair and more frequent coating applications are related to durability qualities of coatings. Generally, durability information is provided qualitative in the product information sheets rather than quantitatively, e.g., descriptions such as resistant or not resistant to high heat, chemicals, abrasion, etc.

CONCLUSION: Based upon the qualitative durability descriptions in the coating product information sheets, staff concluded that low-VOC coatings have durability characteristics comparable to conventional coatings.

PROJECT-SPECIFIC MITIGATION MEASURES: No mitigation measures are required.

REMAINING IMPACTS: Since public service impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACTS: The cumulative impacts of PAR 1113 have been fully evaluated in the Final 1997 AQMP Program EIR, which is incorporated by reference. The 1997 AQMP Final Program EIR concluded that the implementation of all control measures, including CM #97CTS-07, would not create cumulatively significant adverse cumulative public service impacts.

CUMULATIVE IMPACT MITIGATION: None required.

Fire Departments

PROJECT-SPECIFIC IMPACTS: Potential adverse impacts to fire departments could occur in two ways: 1) if there is an increase in accidental release of hazardous materials used in compliant coatings, fire departments would have to respond more frequently to accidental release incidences and 2) if there is an increase in the amount of hazardous materials stored at affected facilities, fire departments would have to conduct additional inspections. Table 4-7 highlights the flammability characteristics of currently used solvents to replacement solvents that may be used to reformulate affected coatings to meet the PAR 1113 interim and final VOC content limits.

ANALYSIS: As illustrated in Table 4-7, the flammability classifications by the National Fire Protection Association (NFPA) are the same for acetone, t-butyl acetate, toluene, xylene, MEK, isopropanol, butyl acetate, and isobutyl alcohol. Recognizing that as a "worst-case" acetone has the lowest flashpoint, it still has the highest Lower Explosive Limit, which means that acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm.

In contrast, toluene vapors can cause an explosion at 13,000 ppm, which poses a much greater risk of explosion. The concentration of xylene vapors that could cause an explosion is even lower at 10,000 ppm. Under operating guidelines of working with flammable coatings under well-ventilated areas, as prescribed by the fire department codes, it would be difficult to achieve concentrated streams of such vapors.

Assuming as a "worst-case", although not likely, staff assumed that most affected PAR 1113 coating categories would be reformulated with acetone to meet the interim and final VOC content limits, it is anticipated that impacts to fire department would still be insignificant.

TABLE 4-7
CHEMICAL CHARACTERISTICS FOR COMMON COATING SOLVENTS

Traditional/Conventional Solvents						
Chemical Compounds	**M.W.**	**Boiling Point (°F)**	**Flashpoint[a] (°F)**	**Vapor Pressure (mmHg @ 68 °F)**	**Lower Explosive Limit (% by Vol.)**	**Flammability Classification (NFPA)**
Toluene	92	231	40	22	1.3	3
Xylene	106	292	90	7	1.1	3
MEK	72	175	21	70	2.0	3
Isopropanol	60	180	53	33	2.0	3
Butyl Acetate	116	260	72	10	1.7	3
Isobutyl Alcohol	74	226	82	9	1.2	3
Stoddard Solvent	144	302 - 324	140	2	0.8	2
Petroleum Distillates (Naptha)	100	314 - 387	105	40	1.0	4
EGBE	118	340	141	0.6	1.1	2
EGME	76	256	107	6	2.5	2
EGEE	90	275	120	4	1.8	2
Replacement Solvents						
Chemical Compounds	**M.W.**	**Boiling Point (°F)**	**Flashpoint[a] (°F)**	**Vapor Pressure (mmHg @ 68 °F)**	**Lower Explosive Limit (% by Vol.)**	**Flammability Classification (NFPA)**
Acetone	58	133	1.4	180	2.6	3
Di-Propylene Glycol	134	451	279	30	1	1
Propylene Glycol	76	370	210	0.1	2.6	1
Ethylene Glycol	227	388	232	0.06	3.2	1
texanol	216	471	248	0.1	0.62	1
Oxsol 100	181	282	109	5	0.90	1
t-Butyl Acetate	113	208	59		1.5	3
Hexamethylene Diisocyanate (HDI)	168	415	284	0.5	1	1
Methylene Bisphenyl Diisocyanate (MDI)	250	314	385	0.5	1	1
Toluene Diisocyanate (TDI)	174	200	270	0.04	1	1

Chemistry classes at all levels from grade school to universities, as well as industrial laboratories, use acetone for wiping down counter tops and cleaning glassware. Additional uses for acetone include solvent for paint, varnish, lacquers, inks, adhesives, floor coatings, and cosmetic products including nail polish and nail polish remover.

Labels and MSDSs accompanying acetone-based products caution the user regarding acetone's flammability and advises the user to "keep the container away from heat, sparks, flame and all other sources of ignition. The vapors may cause flash fire or ignite explosively. Use only with adequate ventilation." All of the large coating manufacturers currently offer pure acetone for sale in quart or gallon containers with similar warnings.

Interviews with four local fire departments during the 1996 amendments to Rule 1113 revealed that all four departments would be equally concerned with any coating or solvent, which has a flashpoint below 65 degrees Fahrenheit. Currently, several conventional coatings generally have flashpoints below 65 degrees Fahrenheit. Based on inquiries from the SCAQMD, Captain Michael R. Lee, of the Petroleum-Chemical Unit for the County of Los Angeles Fire Department, submitted a letter to the SCAQMD stating that the Uniform Fire Code (UFC) treats solvents such as acetone, butyl acetate, MEK, and xylene as Class I Flammable Liquids. Further, the UFC considers all of these solvents to present the same relative degree of fire hazard. The UFC also sets the same requirements for the storage, use and handling of all four solvents. Captain Lee goes on to state, "In my opinion, acetone presents the highest degree of fire hazard of the four solvents considered, but not significantly more hazardous than the others. All four should be used with extreme caution, with proper safeguards in place."

The County of Los Angeles, Fire Department, Fire Prevention Guide #9 regulates spray application of flammable or combustible liquids. The guide requires no open flame, spark-producing equipment or exposed surfaces exceeding the ignition temperature of the material being sprayed within the area. For open spraying, as would be the case for the field application of the acetone-based coatings, no spark-producing equipment or open flame shall be within 20 feet horizontally and 10 feet vertically of the spray area. Anyone not complying with the above guidelines would be in violation of current fire codes. The fire department limits residential storage of flammable liquids to five gallons and recommends storage in a cool place. If the flammable coating container will be exposed to direct sunlight or heat, storage in cool water is recommended. Finally all metal containers involving the transfer of five gallons or more should be grounded and bonded.

CONCLUSION: Based upon the above considerations, it is not expected that PAR 1113 will generate significant adverse impacts to local fire departments requiring new or additional fire fighting resources. Similarly, as noted in the "Hazards" section, any increase in accidental releases of compliant coating materials would be expected to result in a concurrent reduction in the number of accidental releases of existing coating materials. As a result, the net number of accidental releases would be expected to remain constant, allowing for population growth in the district. Additionally, as demonstrated in the "Human Health" section, future compliant coating materials are not expected to cause significant adverse human health impacts, so accidental release scenarios would be expected to pose a lower risk to responding firefighters. Furthermore, if manufactures continue to use solvents such as Texanol, propylene glycol, ethylene glycol, etc., in their compliant water-borne coatings, fire departments would not be expected to experience adverse impacts because in general these solvents are less flammable solvents as rated by the NFPA.

PROJECT-SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since public service impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACTS: The cumulative impacts of PAR 1113 have been fully evaluated in the Final 1997 AQMP Program EIR, which is incorporated by reference. The 1997 AQMP Final Program EIR concluded that the implementation of all control measures, including CM #97CTS-07, would not create cumulatively significant adverse cumulative public service impacts.

CUMULATIVE IMPACT MITIGATION: None required.

TRANSPORTATION/CIRCULATION

The NOP/IS prepared for PAR 1113 did not identify any potential significant adverse transportation/circulation impacts associated with the proposed project. Subsequent to making the NOP/IS available to the public, comments were received indicating that PAR 1113 could generate transportation/circulation impacts as described below.

Significance Criteria

The project will be considered to have significant adverse transportation/circulation impacts if any one of the following criteria are met by the project:

- The project results in the need for 350 or more new employees.
- The project will increase heavy-duty transport truck traffic to and/or from any one facility by more than 350 truck trips per day.
- The project will increase customer traffic by more than 700 trips per day.

Transportation / Circulation Effects

PROJECT-SPECIFIC IMPACTS: In the NOP/IS and in subsequent public forums, some commentators have asserted that transportation/circulation impacts will occur as a result of implementing PAR 1113 in part because the drying times of low-VOC coatings are longer than the drying times for conventional coatings. Commentators also asserted that low-VOC coatings require more surface preparation than conventional coatings. As a result, jobs will take more than one day to complete. Other transportation/circulation issues raised in response to the NOP/IS include the assertion that low-VOC coatings contain a higher solids content, with a lower average coverage area. As a result, more transport trips would be necessary to supply the additional volumes of coatings for a given job. Finally, comments received on the NOP/IS claimed that low-VOC coatings require more touch-up and repair, which means more trips to each job site.

ANALYSIS: It is assumed here that the biggest concern regarding drying time would be for primers, sealers, and undercoaters since, by definition, these require additional topcoats. As

part of the analysis of PAR 1113, staff evaluated coating product data sheets (which typically include drying times) for a large number of conventional and low-VOC coatings (see the tables in Appendix D and Table 4-2). The available information from product data sheets indicates that low-VOC primers, sealers, and undercoaters have a slightly shorter drying time, on average, than conventional coatings. On average, the drying time for low-VOC quick-dry primers, sealers, and undercoaters is comparable to the drying time for the same categories of conventional coatings. Finally, the drying time for low-VOC stains is substantially shorter than the drying time for conventional stains. Consequently, the assertion that low-VOC coatings have longer drying times that will require more trips over more days is not supported by coating product information sheets.

Regarding surface preparation, staff evaluated this characteristic as part of the evaluation of coating product data sheets mentioned above (see the tables in Appendix D and Table 4-2). Where information or data are provided, the information indicated that low-VOC coatings do not require substantially different surface preparation than conventional coatings. As a result, the time necessary to prepare a surface for coating is approximately equivalent for conventional and low-VOC coatings.

The issue of topcoats is related to solids content and the amount of area a coating will cover. The review of coating product data sheets indicated that for industrial maintenance floor coatings, low-VOC coatings tended to have a higher solids content, with a comparable average coverage area than conventional coatings. For most other coating categories affected by PAR 1113, the solids content and area of coverage for low-VOC coatings was, on average, comparable to conventional coatings although some categories, e.g., quick-dry primers, sealers, and undercoaters and stains, had slightly less coverage than conventional coatings in these categories. As a result, since solids content and coverage area for low-VOC coatings are comparable to conventional coatings, it is not likely that additional trips will be necessary.

Extra touch-up and repair and more frequent coating applications are related to durability qualities of coatings. Staff reviewed coating product data sheets (see the tables in Appendix D and Table 4-2) to obtain durability information for low-VOC coatings and conventional coatings. Generally, durability information is provided qualitative rather than quantitatively, e.g., descriptions such as resistant or not resistant to high heat, chemicals, abrasion, etc. Based upon the qualitative durability descriptions in the coating product information sheets, staff concluded that low-VOC coatings have durability characteristics comparable to conventional coatings.

Industry has also alleged that PAR 1113 will generate solid/hazardous waste impacts which in turn, will lead to increased traffic impacts due to compliant coatings having a shorter pot life, shorter shelf life, or lesser freeze-thaw capabilities compared to existing coatings.

Staff's evaluation of resin manufacturers' and coating formulators' product data sheets (see the tables in Appendix D and Table 4-2) tend to confirm the assertion that low-VOC coatings

have a shorter pot life and a shorter shelf life. Information on freeze-thaw characteristics was generally not available. However, significant adverse traffic impacts are not expected from the disposal of coatings "going bad" due to pot life, shelf life, or freeze-thaw problems. First, it is improbable that any one location (e.g., selling, distributing, or applying coatings) would generate an additional 350 heavy-duty truck trips per day as a result of pot life, shelf life, or freeze-thaw problems. Second, manufacturers of low-VOC resin technology indicate that the inclusion of surfactants will help eliminate freeze-thaw and shelf-life problems. Finally, when coating applicators become familiar with appropriate low-VOC application techniques, pot life problems will decrease significantly or be eliminated since the contractors will be able to more accurately estimate the correct amount of coating to be.

CONCLUSION: Based upon staff research of coating product information sheets described in the preceding paragraphs, no significant adverse transportation impacts are anticipated from implementing PAR 1113.

PROJECT-SPECIFIC MITIGATION MEASURES: No mitigation measures are required.

CUMULATIVE IMPACTS: Analysis of project-specific transportation impacts indicated that PAR 1113 is not expected to generate any significant adverse cumulative transportation/circulation impacts. Further, implementing all 1997 AQMP control measures, rules and regulations is not anticipated to have any direct or indirect significant adverse cumulative transportation impacts. This conclusion is further validated by the fact that the initial study for the 1997 AQMP did not identify any transportation/circulation impacts associated with the 1997 AQMP.

CUMULATIVE IMPACT MITIGATION: No cumulative impact mitigation measures are required.

SOLID/HAZARDOUS WASTE IMPACTS

The NOP/IS prepared for PAR 1113 did not identify any potential significant adverse hazards impacts associated with the proposed project. Subsequent to making the NOP/IS available to the public, comments were received indicating that PAR 1113 could generate solid/hazardous waste impacts as described below.

Significance Criteria

The project will be considered to have significant adverse solid/hazardous waste impacts if the following criteria are met by the project:

- The generation and disposal of nonhazardous or hazardous wastes that exceed the

capacity of designated landfills.

Solid/Hazardous Waste Impacts

PROJECT-SPECIFIC IMPACTS: Industry has alleged that the implementation of PAR 1113 will generate solid/hazardous waste impacts due to the following assertions:

- Compliant lower-VOC coatings targeted by PAR 1113 will not have the same freeze-thaw capabilities as existing coatings, and therefore may go bad during transport from mild climates to extreme climates resulting in that load being discarded into a landfill.
- Compliant lower-VOC coatings targeted by PAR 1113 will have shorter shelf lives, and therefore a percentage of the manufacturer's inventory will have to be landfilled because the coatings have gone bad in the can overtime.
- As a result of the lower-VOC content limits for IM and floor coatings, manufacturers will formulate more two components systems that may have, on the average, a shorter pot life compared to conventional coatings. As a result low-VOC coatings could solidify in the can during the application process, resulting in an unusable portion of coating that would need to be discarded into a landfill.

ANALYSIS: Staff evaluation of coatings product data sheets (see the tables in Appendix D and Table 4-2) tend to confirm the assertion that low-VOC coatings have a shorter pot life and a shorter shelf life. Information on freeze-thaw characteristics was generally not available. To estimate solid waste impacts associated with implementing PAR 1113, staff assumed as a "worst-case" that, starting in the year 2002 when the interim VOC content limits become effective, solid wastes would increase as follows: five percent of all coatings affected by PAR 1113 would be landfilled due to freeze–thaw; one percent of all affected coatings would be landfilled due to a shorter shelf-life; and 10 percent of all IM and floor coatings would be landfilled as a result of having a shorter pot life. According to the resin manufacturers, solidified coatings would not be considered a hazardous waste. Therefore, for this solid waste analysis, the SCAQMD also assumed that all the landfilled material would be considered non-hazardous waste.

Table 4-8 highlights the estimated nonhazardous material that may be landfilled if industry's assertions are accurate. Table 4-8 also shows whether the landfilling of nonhazardous material associated with the implementation of PAR 1113 will be considered significant.

TABLE 4-8
ANTICIPATED SOLID WASTE IMPACTS ASSOCIATED WITH IMPLEMENTING PAR 1113[A]

Year	Land fill Capacity tons/day	Freeze-Thaw Disposal[b] tons/day	Shelf-Life Disposal[c] tons/day	Pot life Disposal[d] tons/day	Total Disposal tons/day	Total Impact % Capacity	Significant Yes/No
1996	111,198	0	0	0	0	0	N/A
1997	111,198	0	0	0	0	0	N/A
1998	111,198	0	0	0	0	0	N/A
1999	111,198	0	0	0	0	0	N/A
2000	111,198	0	0	0	0	0	N/A
2001	111,198	0	0	0	0	0	N/A
2002	111,198	21	4	3	28	0.03	No
2003	111,198	22	4	4	31	0.03	No
2004	111,198	24	5	4	33	0.03	No
2005	111,198	26	5	4	36	0.03	No
2006	111,198	28	6	5	38	0.03	No
2007	111,198	30	6	5	42	0.04	No
2008	111,198	33	7	5	45	0.04	No
2009	111,198	36	7	6	48	0.04	No
2010	111,198	38	8	6	52	0.05	No

[a] The Draft 1998 CARB Survey sales data is used as the baseline for 1996. It is assumed that 45 percent of the total 1996 sales occurred in the district. It is projected that coating sales will increase by 8 percent per year. To convert gallons to tons, the SCAQMD assumed that the coatings had an average density of 10.5 pounds per gallon.
[b] Assumed that five percent of all coatings affected by PAR 1113 coatings would be landfilled.
[c] Assumed that one percent of all coatings affected by PAR 1113 coatings would be landfilled.
[d] Assumed that 10 percent of IM and floor coatings affected by PAR 1113 coatings would be landfilled.

CONCLUSION: As shown in Table 4-8, even if some compliant coatings are landfilled due to freeze-thaw, shelf life, or pot life problems, the total amount of solid waste material deposited in district landfills will not create a significant solid waste impact. It should be noted that the above analysis overestimates the actual solid waste impacts associated with the implementation of PAR 1113 for several reasons. First it is not likely that coatings manufacturers will simply dispose of all coatings damaged due to the alleged freeze-thaw, shelf-life, and pot life problems. It may be possible that some of these coatings can be reused for various other purposes, such as painting over graffiti, etc. Second, discussions with manufacturers of low-VOC resin technology have indicated that the inclusion of surfactants will help eliminate freeze-thaw and shelf-life problems. Finally, when painting contractors become familiar with appropriate application techniques required for applying low-VOC two component IM systems, pot life problems will decrease significantly or be eliminated altogether since the contractors will be able to more accurately estimate the correct amount of coating to be mixed to minimize waste. It is expected that by the time the interim limits become effective, painting contractors will have learned the proper application techniques for

the low-VOC two component IM systems. Therefore, the amount of pot-life disposal shown in Table 4-8 above should drop to negligible levels starting within a year after the interim limits become effective.

PROJECT-SPECIFIC MITIGATION MSEASURES: No mitigation measures are required.

CUMULATIVE IMPACTS: The cumulative impacts of PAR 1113 have been fully evaluated in the Final 1997 AQMP Program EIR, which is incorporated by reference. The 1997 AQMP Final Program EIR concluded that the implementation of all control measures, including CM #97CTS-07, would not create cumulatively significant adverse cumulative solid/hazardous waste impacts.

CUMULATIVE IMPACT MITIGATION: No cumulative impact mitigation measures are required.

HAZARD IMPACTS

The NOP/IS prepared for PAR 1113 did not identify any potential significant adverse hazards impacts associated with the proposed project. Subsequent to making the NOP/IS available to the public, comments were received indicating that PAR 1113 could generate hazards impacts as described below.

Significance Criteria

The project will be considered to have significant adverse hazards impacts if any one of the following criteria is met by the project:

- The project results in a substantial number of people being exposed to a substance causing irritation.
- The project results in one or more people being exposed to a substance causing serious injury or death.
- The project creates substantial human exposure to a hazardous chemical.

Hazard Impacts

PROJECT-SPECIFIC IMPACTS: Hazard impact concerns are related to the risk of fire, explosions, or the release of hazardous substances in the event of an accident or upset conditions. It is expected that the interim and final VOC content limits required by PAR 1113 may be achieved, in part, through the use of replacement solvents and predominantly

water-borne technologies. For example, acetone, which is a flammable substance, may be used as a replacement solvent in some waterproofing sealer formulations. Overall, exemp solvents are considered to be viable alternatives to other, more toxic solvents currently found in various coatings.

Additionally, coalescing solvents such as texanol, propylene glycol, and ethylene glycol may be used more widely in low-VOC water-borne formulations as alternatives to more toxic coalescing solvents such as EGBE, EGEE, EGME, and their acetates. Furthermore, diisocyanates (e.g., hexamethylene diisocyanate (HDI), methylene bisphenyl diisocyanate (MDI), and toluene diisocyanate (TDI)) may be used more widely in low-VOC two component IM systems as an activators.

To the extent that future compliant AIM coatings would be formulated with exempt solvents or other potentially hazardous materials, and to the extent that these materials could be accidentally released into the environment, PAR 1113 could create significant adverse hazard impacts.

ANALYSIS: As shown in Table 4-7 of the "Public Services" section, acetone is flammable and may result in increased risk of flammability/explosion or accidental releases of hazardous materials. Therefore, in the context of hazards impacts associated with the implementation of PAR 1113, the reformulation of coatings with acetone would constitute the "worst-case" hazards scenario.

As a result of being delisted as a VOC by the SCAQMD, acetone usage has been steadily increasing irrespective of amendments to Rule 1113. In any event, it is likely that for some AIM coating categories where acetone is already being used, e.g., waterproofing sealers, acetone usage is expected to increase. Any anticipated increase in acetone usage may increase the number of trucks or rail cars that transport acetone within the district. The safety characteristics of individual trucks or rail cars that transport acetone will not be affected by PAR 1113. The consequences (exposure effects) of an accidental release of acetone are directly proportional to the size of the individual transport trucks or rail cars and the release rate. Although the probability of an accidental release of acetone could increase, the severity of an incident involving acetone transport will not change as a result of the proposed amendments to Rule 1113. Similarly, the severity of an accident involving the storage of acetone is not expected to change from existing conditions.

As already noted in Table 4-7, the flammability classifications by the NFPA are the same for acetone, t-butyl acetate, toluene, xylene, MEK, isopropanol, butyl acetate, and isobutyl alcohol. Recognizing that as a "worst-case" acetone has the lowest flashpoint, it still has the highest Lower Explosive Limit, which means that acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm.

In contrast, toluene vapors can cause an explosion at 13,000 ppm, which poses a muct greater risk of explosion. The concentration of xylene vapors that could cause an explosion

is even lower at 10,000 ppm. Under operating guidelines of working with flammable coatings under well-ventilated areas, as prescribed by the fire department codes, it would be difficult to achieve concentrated streams of such vapors.

Furthermore, any increase in accidental releases of compliant acetone-based coatings would be expected to result in a concurrent reduction in the number of accidental releases of existing coating materials. As shown in Table 4-7 many of the solvents used in conventional solvents are as flammable as acetone, so there would be no net change or possibly a reduction in the hazard consequences from replacing some conventional solvents with acetone.

Although acetone is expected to be used to formulate some future compliant AIM coatings, current information from coating product information sheets (see the tables in Appendix D) indicates that acetone is only expected to be used in a limited amount of compliant coatings (e.g., floor coatings). The majority of the future compliant coatings are expected to be reformulated with water-borne technologies. Therefore, it is unlikely that PAR 1113 by itself will substantially increase the future usage of acetone in the district.

With regard to other possible replacement solvents, based on discussion with resin manufacturers and coating formulators, the trend in coating technologies is to replace EGBEs (e.g., glycol ethers) with less toxic/hazardous coalescing solvents such as texanol, ethylene glycol, and propylene glycol. Staff has verified this trend by reviewing product data sheets and MSDSs for currently available compliant low-VOC coatings. Additionally, a draft December 1995 report entitled "Improvement of Speciation Profiles for Architectural and Industrial Coating Operations" prepared by Dr. Albert C. Censullo for CARB indicates that a majority of current water based formulations (flats and non-flats) contain non-HAP solvents. Further, it appears from this information that the use of solvents, such as texanol and propylene glycol in water-borne coating formulations, is prevalent today and should continue into the future with the eventual replacement of more toxic and hazardous coalescing solvents such as EGBEs with less or nontoxic coalescing solvents.

As noted in the "Water Resources" section of this chapter, some future compliant two-component IM coating systems may contain diisocyanate compounds. While the trend of using less hazardous compounds is not reflected by the use of diisocyanate compounds, there should be no significant increase in the risk of upset due to the increasing use of these compounds. Like texanol, oxsol 100, propylene glycol, and ethylene glycol, diisocyanates are significantly less flammable as compared to currently used highly flammable conventional solvents. Therefore, the increased use of compliant coatings containing diisocyanates will be offset by the decrease use of more flammable solvents.

CONCLUSION: Potential hazard impacts resulting from adopting and implementing PAR 1113 are not expected to be significant for the following reasons. The increased usage of acetone as a result of implementing PAR 1113 will generally be balanced by reduced usage of other equally or more hazardous materials such as MEK, toluene, xylene, etc, which are

equally or more hazardous. Further, emergency contingency plans that are already in place are expected to minimize potential hazard impacts posed by any increased use of acetone in future compliant coatings. In addition, businesses are required to report increases in the storage of flammable and otherwise hazardous materials to local fire departments to ensure that adequate conditions are in place to protect against hazard impacts.

Another reason hazard impacts from implementing PAR 1113 are not expected to be significant is that it is anticipated that resin manufacturers and coating formulators will continue the trend of using less toxic or hazardous solvents such as texanol, oxsol 100, propylene glycol, ethylene glycol, etc., in their compliant water-borne coatings. As a result, it is expected that future compliant AIM coatings will contain less or non-hazardous materials compared to conventional coatings, a net benefit.

While diisocyanates are more toxic, their flammability is significantly less than current solvents. Thus, the overall risk of upset is not significantly increased as a result of using complaint coatings containing diisocyanates.

PROJECT SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since hazards impacts are not significant and in some respects speculative, no adverse impacts remain.

CUMULATIVE IMPACT: During past promulgation of amendments to various SCAQMD coating and solvent rules (e.g., 102, 1107, 1113, 1136, etc.) the SCAQMD received comments that acetone could result in a significant adverse hazards impact (e.g., risk of fire or explosion) because of its flammability. The SCAQMD has extensively analyzed the hazards impacts associated with the reformulation of coatings with acetone in EAs for 102, 1107, the November amendments to 1113, and 1136 and concluded that the reformulation of acetone will not create significant cumulative hazards. Furthermore, the cumulative impacts of PAR 1113 have been fully evaluated in the Final 1997 AQMP Program EIR, which is incorporated herein by reference.

CUMULATIVE IMPACT MITIGATION: None required.

HUMAN HEALTH IMPACTS

The NOP/IS prepared for PAR 1113 did not identify any potential significant adverse human health impacts associated with the proposed project. Subsequent to making the NOP/IS available to the public, comments were received indicating that PAR 1113 could generate significant adverse human health impacts as described below.

Significance Criteria:

The project will be considered to have a significant adverse human health impact if any of the following occur:

- The project equals or exceeds the SCAQMD's maximum individual cancer risk (MICR) thresholds for toxic air contaminants (TACs) as identified in the SCAQMD's CEQA Air Quality Handbook (SCAQMD 1993b). The MICR significance threshold for project specific and cumulative impacts is 10 in one million (10×10^{-6}).
- The project creates an excess cancer case of 0.5 or greater in a population subject to a cancer risk of greater than one in one million (1×10^{-6}).
- The project results in hazardous air pollutant emissions from the project which result in a hazard index greater than or equal to 1.0.
- The project results in hazardous air pollutant emissions that result in a facility-wide hazard index greater than or equal to 5.0.

PROJECT SPECIFIC IMPACT: Comments submitted to the SCAQMD by coating manufacturers and coating contractors on the NOP/IS and at various public meetings assert that low-VOC compliant coatings will contain compounds that are more toxic than current formulations. Based on discussions with manufacturers, exempt solvents are considered to be viable alternatives to aid coatings manufacturers in reformulating existing coatings to meet the interim and final VOC content limits proposed in PAR 1113. In the currently proposed amended rule, for example, acetone may be used as a replacement solvent for waterproofing sealer formulations. Waterproofing sealer formulators have used acetone in their coatings, but may increase the acetone content in an effort to comply with the proposed limit. The Final SEA for the 1996 amendments to Rule 1113, as well as the Final SEA for Rule 102, is referenced for an additional in-depth analysis of acetone as a substitute solvent.

Coalescing solvents such as texanol, propylene glycol, and ethylene glycol may be used more widely in low-VOC water-borne formulations as alternatives to their more toxic counterparts such as EGBE, EGEE, EGME and their acetates. Coalescing solvents act as plasticizers in certain coating formulations (e.g., nonflats) to allow the otherwise solid resin to flow together to form a film.

Diisocyanates (e.g., HDI, MDI, and TDI) may be used more widely in low-VOC two component IM systems. Comments received on the NOP/IS suggest that for some IM applications two component low-VOC systems containing isocyanates will replace existing higher-VOC two-component and one-component systems.

METHODOLOGY: Using available toxicological information to evaluate potential human health impacts associated with PAR 1113, staff has compared the toxicity of the mo. common currently used coating solvents to solvents expected to be used in reformulated, compliant coatings. As a measure of toxicity, staff compared: the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygiene (ACGIH), OSHA's Permissible Exposure Limits (PELs), the Immediately Dangerous to Life and Health (IDLH) levels recommended by the National Institute for Occupational Safety and Health (NIOSH), and health hazards developed by the National Safety Council.

As illustrated in Table 4-9, some of the replacement solvents have lower or less severe TLVs, PELs, IDLHs than traditional solvents. For example, acetone would be considered less toxic than all the listed traditional solvents. However, there are some replacement solvents that could have higher or more severe toxicological effects. In particular the diisocyanate group of solvents appear to have more severe toxicological effects than the listed traditional solvents. To analyze in more detail the toxic effects associated with the use of compliant low-VOC coatings, the SCAQMD conducted a health risk assessment (HRA) for the compounds listed in Table 4-16 consistent with the HRA procedures listed in the SCAQMD's Risk Assessment Procedures for Rules 1401 and 212 document. An HRA is used to estimate the likelihood of an individual contracting cancer or experience other adverse health effects as a result of exposure to toxic air contaminants (TACs). Risk assessment is a methodology for estimating the probability or likelihood of an adverse health effect occurrence.

TABLE 4-9
TOXICITY OF COATING SOLVENTS

Traditional/Conventional Solvents			
Solvents	**TLV (ACGIH) (ppm)**	**PEL (OSHA) (ppm)**	**IDLH (ppm)**
Toluene	100	200	2,000
Xylene	100	100	1,000
MEK	200	200	3,000
Isopropanol	400	400	12,000
Butyl Acetate	150	150	10,000
Isobutyl Alcohol	50	100	8,000
Stoddard Solvent	100	500	5,000
Petroleum Distillates (Naptha)	100	400	10,000
EGBE	25	50	700
EGME	5	25	Not Available
EGEE	5	200	Not Available

TABLE 4-9 (CONTINUED)
TOXICITY OF COATING SOLVENTS

Traditional/Conventional Solvents			
Solvents	**TLV (ACGIH) (ppm)**	**PEL (OSHA) (ppm)**	**IDLH (ppm)**
Acetone	750	750	20,000
Di-Propylene Glycol	Not Established	Not Established	Not Established
Propylene Glycol	Not Established	Not Established	Not Established
Ethylene Glycol	50	50	80
Texanol	Not Established	Not Established	Not Established
Oxsol 100	Not Established	Not Established	Not Established
t-Butyl Acetate	200	200	Not Available
Hexamethylene Diisocyanate (HDI)	0.005	Not Established	Not Available
Methylene Bisphenyl Diisocyanate (MDI)	0.005	Not Established	Not Available
Toluene Diisocyanate (TDI)	0.005 (0.02–STEL)	0.005	Not Available

Risks from carcinogens are expressed as an added lifetime risk of contracting cancer as a result of a given exposure. For example, if the emissions from a facility are estimated to produce a risk of one in one million (1×10^{-6}) to the most exposed individual, this means that the individual's chance of contracting cancer has been increased by one chance in one million over and above his or her chance of contracting cancer from all other factors (for example, diet, smoking, heredity and other factors). This added risk to a maximally exposed individual is referred to as a "maximum individual cancer risk" or MICR. For CEQA purposes, the SCAQMD's significance threshold for carcinogenic impacts is a MICR greater than or equal to 10 in one million (10×10^{-6}).

To evaluate noncancer health effects from a TAC, exposure levels are estimated (just as with carcinogens), so that they can be compared to a corresponding Reference Exposure Level (REL). As for carcinogens, exposure is evaluated for the most exposed individual. Chronic exposures are evaluated using the same exposure assumptions described for carcinogens -- continuously for a 70-year residential lifetime or 8 to 9 hours per day and 50 weeks a year for a 46-year working (commercial or industrial) lifetime. For acute exposures, the maximum hourly airborne concentration of a TAC is estimated.

The health risk from exposure to a noncarcinogenic TAC is evaluated by comparing the estimated level of an sensitive receptor's exposure to the TAC to the TAC's REL. The ratio is expressed as a hazard index (HI), which is the ratio of the estimated exposure level to the REL:

$$\text{Hazard Index (HI)} = \frac{\text{Estimated Exposure Level}}{\text{Reference Exposure Level}}$$

A HI of one or less indicates that the estimated exposure level does not exceed the Reference Exposure Level, and that no adverse health effects are expected. For CEQA purposes, the SCAQMD's significance threshold for noncarcinogenic impacts is a hazard index greater than or equal to one.

The ratio of the estimated acute level of sensitive receptor's exposure to a TAC to the acute REL is called an acute HI. The ratio of the estimated chronic level of exposure to a TAC to its chronic REL is called a chronic hazard index.

Based on the foregoing HRA methodologies, the SCAQMD estimated the long-term carcinogenic, long-term chronic, and short-term acute risks associated with the use of the above listed compounds where toxicity data were available. Tables 4-10 – 4-12 highlight the results of this risk analysis. These tables present the amount of each compound that can be emitted and coating usage before the SCAQMD significance thresholds are exceeded. For a more detailed discussion of how the table values where derived and the unit risk factors, chronic RELs, and acute RELs used to conduct the HRAs, the reader is referred to Appendix E of this Final SEA.

Carcinogenic Effects

PROJECT-SPECIFIC IMPACT: Discussions with coatings manufactures and review of coating product sheets indicate that TDI may be used in some low- or zero-VOC, water-borne compliant two-component IM coating systems. TDI is the only compound listed on Table 4-11 that has a carcinogenic unit risk factor according to the SCAQMD's Rule 1401. TDI is part of a group of compounds known as diisocyanates, which are low-molecular-weight aromatic and aliphatic compounds. Also included in this group, but not considered to be carcinogenic, are HDI and MDI. These water-borne compliant formulations are intended as direct replacements for their higher-VOC solvent-borne two component counterparts currently being applied. Comments received on the NOP/IS have suggested that the compliant water-borne two-component systems may also replace higher-VOC solvent-borne one-component IM systems. Thus, there could be an incremental increase in use of coatings containing TDI.

ANALYSIS: To analyze the potential cancer risks associated with the use of compliant coatings containing TDI to downwind receptors and applicators of these coatings, the SCAQMD conducted a HRA. As "worst-case", the SCAQMD assumed that approximately one percent (by weight) of the TDI in the two component system would be emitted, although in theory these low- to zero-VOC systems should not result in any volatilization of any VOC compounds, including TDI. The results of the carcinogenic HRA for the use of coatings containing TDI are shown in Table 4-10.

TABLE 4-10
MAXIMUM INDIVIDUAL CANCER RISK FROM POTENTIAL EXPOSURES TO TDI COATINGS
(Gallons Per Day That Would Exceed A MICR Of 10 x 10^{-6})

	Downwind Receptor Distances, (in meters)					
	25		50		100	
Compound	Emissions lbs/day	Usage gals/day	Emissions lbs/day	Usage gals/day	Emissions lbs/day	Usage gals/day
TDI	0.14	1.30	0.41	3.95	1.55	14.77

As shown in Table 4-10, approximately 15 gallons per day of coatings containing TDI can be used before the significance threshold of a MICR >10 x 10^{-6} is exceeded at a downwind receptor distance of 100 meters. At closer source receptor distances the amount of daily coatings that can be used before the SCAQMD's significance threshold is exceeded are 1.3 gallons at 25 meters and 4 gallons at 50 meters.

CONCLUSION: Although the daily usage levels in Table 4-10 are low in some cases, significant adverse carcinogenic human health impacts are not expected for downwind residential or sensitive receptors for the following reasons. As explained above, the resultant MICR from a HRA estimates the probability of a potential maximally exposed individual contracting cancer as a result of continuous exposure to toxic air contaminants over a period of 70 years for residential and 46 years for worker receptor locations. Most, if not all, applications of low- or zero-VOC two component IM systems containing TDI will occur primarily in industrial settings where residential or sensitive receptors are not proximately located. Furthermore, the application of these coating systems will be for maintenance (e.g., touch-up and repair) or repaint purposes, lasting only a couple days to weeks, and occurring on an intermittent basis (e.g., once every couple of years to every ten years, or more). Therefore, downwind residential or sensitive receptors will not be exposed on a long-term basis to TDI that would result in significant adverse carcinogenic human health impacts.

In the context of worker exposure (e.g., applicators of the coatings), significant adverse impacts are not expected. Discussions with resin manufacturers and coating formulators reveal that significant carcinogenic risks are eliminated by following the coating manufacturers', OSHA's, and ACGIH's required and recommended, respectively, safety practices for handling materials containing TDI. See the "Acute Effects" section for a description of the recommended safety practices for handling materials containing TDI, as well as HDI and MDI. According to resin manufacturers and coating formulators the safety practices and application techniques associated with higher-VOC solvent-borne two component systems will be the same for the compliant water-borne two component systems, in part because some existing two-component systems also contain diisocyanates. Thus, applicators will not require additional training beyond what is currently required regarding the proper handling or proper application of these compliant coatings.

Furthermore, it appears that TDI in compliant water-borne two component systems are being phased out with HDI and MDI. Since HDI and MDI are noncarcinogenic, the replacement of TDI with HDI and MDI would eliminate all carcinogenic risk associated with the use of these compliant coatings.

Chronic Effects

PROJECT-SPECIFIC IMPACT: Comments received on the NOP/IS for PAR 1113 and during Industry Working Group meetings suggest that some of the replacement solvents that could be used to formulate future compliant low-VOC coatings could cause significant adverse chronic human health impacts.

ANALYSIS: To analyze the existing chronic health risks associated with solvents used in conventional coatings to downwind receptors and applicators of these coatings, the SCAQMD prepared a HRA for solvents used in conventional coatings (Table 4-11). Table 4-11 shows the number of gallons it would take on a daily basis to equal or exceed a chronic hazard index of 1.0. Since for most AIM coating applications no more than 25 – 30 gallons can be applied per day, solvents that take less than approximately 25 gallons per day to contribute to a chronic hazard index of 1.0 or more could create significant human health impacts As shown in Table 4-11, the lists of both conventional solvents and replacement solvents contain compounds where typical rates of usage could contribute to a chronic hazard index greater than or equal to 1.0.

TABLE 4-11
LONG-TERM CHRONIC EXPOSURE RISK ASSESSMENT
(Gallons Per Day That Would Exceed A Chronic Hazard Index Of 1.0)

	Downwind Receptor Distances					
	25m		50m		100m	
Conventional Solvents	Emissions lbs/day	Usage gals/day	Emissions lbs/day	Usage gals/day	Emissions lbs/day	Usage gals/day
Toluene	30.060	28.628	91.141	86.801	341.122	324.878
Xylene	45.090	42.943	136.712	130.202	511.683	487.318
MEK	150.299	143.142	455.705	434.005	1705.611	1624.392
Isopropol Alcohol	300.598	286.284	911.411	868.010	3411.223	3248.784
Glycol Ethers/Acetates	3.006	2.863	9.114	8.680	34.112	32.488
EGBE	3.006	2.863	9.114	8.680	34.112	32.488
EGEE	30.060	28.628	91.141	86.801	341.122	324.878
EGME	3.006	2.863	9.114	8.680	34.112	32.488
Replacement Solvents						
Ethylene Glycol	60.120	57.257	182.282	173.602	682.245	649.757
Propylene	450.897	429.426	1367.116	1302.016	5116.834	4873.176
TDI	0.014	0.136	0.043	0.412	0.162	1.543
HDI	0.002	0.014	0.005	0.043	0.017	0.162

Like risks associated with carcinogens, risks associated with compounds that pose chronic hazard risk are based on long-term continuous exposure. AIM coatings are applied on an infrequent and intermittent basis. For first time painting or repainting situations, application of AIM coatings occurs all at one time over the course of hours or several weeks depending on the specific nature of the job. For touch-up and maintenance applications, actual application of AIM coatings takes several hours to several weeks to complete depending on the specific nature of the job and occurs periodically through-out the year or over the course of several years. Therefore, because of the intermittent and infrequent application of AIM coatings, long-term exposure of downwind residential or sensitive receptors to chronic health effects is not anticipated from the implementation of PAR 1113.

CONCLUSION: Chronic exposure of coating applicators to compliant coatings containing replacement solvents, in particular the diisocyanate compounds, is not expected to produce significant chronic risks since coating applicators will be following the coating manufacturers' and ACGIH's recommended safety practices and OSHA's required safety practices for handling materials containing both conventional and replacement solvents. The recommended safety practices for handling these materials are discussed in the "Acute Effects" section. Additionally, the safety practices and application techniques associated with higher-VOC solvent-borne coatings will be the same for the compliant water-borne coatings. Thus, applicators will not need additional training regarding the proper handling or application of compliant coatings containing TDI.

In the context of IM coatings, it appears that TDI and HDI in compliant water-borne two-component systems is being replaced in some coating formulations with MDI. This compound is currently not listed in SCAQMD's Rule 1401 as a chronic TAC. Therefore, the replacement of TDI and HDI with MDI would further eliminate the chronic risk associated with the use of these compliant coatings containing TDI and HDI.

With regard to EGBE, the SCAQMD analyzed potential adverse chronic human health impacts associated with the use of water-borne wood coatings and flats containing EGBE in the September 1995 EA for the Rule 1136 - Wood Products Coatings, and the November 1996 SEA for Rule 1113 – Architectural Coatings. These analyses concluded that reformulated water-borne wood coatings and flats containing EGBE would not result in significant adverse chronic human health impacts. These documents can be obtained by contacting the SCAQMD Public Information Center at (909) 396-3600.

Relative to AIM coatings, EGBE is a coalescing solvent currently in use for some water-borne formulations. Based on discussions with resin manufacturers and coating formulators, the current trend in AIM coating technologies is to replace EGBEs (e.g., glycol ethers) with less toxic or hazardous coalescing solvents such as texanol, ethylene glycol, and propylene glycol. Staff has verified this trend by reviewing product data sheets and material safety data sheets (MSDSs) for currently available compliant low-VOC coatings. Additionally, a draft December 1995 report entitled "Improvement of Speciation Profiles for Architectural and Industrial Coating Operations" prepared by Dr. Albert C. Censullo for CARB indicates that a

majority of current water based formulations (flats and non-flats) contain non-HAP solvents. The report, which is intended to upgrade the species profiles for a number of sources within the general categories of industrial and architectural coating operations, identified that the four most common solvents in the 52 randomly chosen water-borne coatings (flats and non-flats) as: texanol (found in 37 of 52); propylene glycol (31 of 52); diethylene glycol butyl ether (23 of 52); and ethylene glycol (14 of 52). It appears from this information that the use of non-HAP solvents such as texanol and propylene glycol in water-borne coating formulations, is already becoming more prevalent and this trend should continue in the future with the eventual replacement of more toxic and hazardous coalescing solvents such as EGBEs with less toxic or hazardous materials.

Staff research on PAR 1113 identified an article entitled "Clean Air Act Amendments" which appeared in the October 1995 edition of the Painting and Coatings Industry Magazine. This article indicates that current coatings containing hazardous air pollutants (HAP) such as ethylene glycol ethers or ethylene glycol ether acetates can be replaced with non-HAP solvents such as propylene glycol ethers or propylene glycol ether acetates in order to comply with the 1990 CAAA. The article further states, "Coatings that meet or surpass end-user standards can be produced using low-VOC and non-HAPs-formulating technology, which enable compliance with legislation driven by the 1990 CAAA." This implies that non-HAP solvent containing coatings can be manufactured now to meet the 1990 CAAA requirements.

Staff research on PAR 1113 identified another relevant article by the Chemical Manufacturers Association, entitled "A Review of the Uses and Health Effects of Ethylene Glycol Monobutyl Ether" (CMA, 1995). This article indicates that based on recent studies there is little possibility of significant adverse health effects in humans at exposure levels encountered in the typical workplace. Further, the article points out that exposures to EGBE in consumer use would be considerably lower than the ACGIH exposure limit of 25 ppm. The article provided information that workers exposed to EGBE levels twice the ACGIH exposure limit did not experience adverse health effects. To the extent that PAR 1113 accelerates the current trend away from EGBEs, human health benefits would be expected.

Acute Effects

PROJECT-SPECIFIC IMPACT: Comments received on the NOP/IS for PAR 1113 and during Industry Working Group meetings suggest that some of the replacement solvents that could be used to formulate future compliant low-VOC coatings could cause significant adverse acute human health impacts.

Acute Worker Health Analysis

ANALYSIS: Several of the solvents used in conventional coatings that were analyzed for chronic affects have also been analyzed for short-term acute worker health effects through short-term, high-level or "acute" exposure. Table 4-12 presents the results of the SCAQMD's acute HRA for the solvents used in conventional coatings.

As shown in Table 4-12, low usage conventional coatings formulated with EGBE, EGEE, or EGME could trigger acute human health impacts. As noted in earlier in this chapter, there is currently a trend by resin manufacturers and coating formulators of replacing currently applied coatings containing EGBE, EGEE, and EGME with less toxic coalescing solvents such as texanol, ethylene glycol, and propylene glycol. It is anticipated these less toxic coalescing solvents will be used to formulate future compliant low-VOC coatings. To a certain extent, PAR 1113 may have the beneficial effect of encouraging or accelerating the trend of formulating AIM coatings with less toxic or nontoxic solvents. Therefore, the implementation of PAR 1113 may ultimately provide human health benefits.

Discussions with coatings manufactures and coating applicators and review of coating product sheets indicates that for some IM coating applications diisocyanates (e.g. TDI, HDI, and MDI) may be used to formulate low or zero-VOC, water-borne compliant two component IM systems. These water-borne compliant formulations are intended as direct replacements for their higher-VOC solvent-borne two-component counterparts currently being used, which also contain diisocyanates. However, some commentators have asserted that the compliant water-borne two component systems may also replace higher-VOC solvent-borne one component IM systems, which predominately do not contain diisocyanates. Thus, there could be an incremental increase in the use of coatings containing TDI, HDI, and MDI.

TABLE 4-12
SHORT-TERM ACUTE EXPOSURE RISK ASSESSMENT FOR CONVENTIONAL SOLVENTS
(Gallons Per Day That Would Exceed An Acute Hazard Index Of 1.0)

	Downwind Receptor Distances					
	25m		50m		100m	
Compound	Emissions lbs/hr	Usage gals/day	Emissions lbs/hr	Usage gals/day	Emissions lbs/hr	Usage gals/day
Toluene	20.00	152.38	39.98	304.58	107.10	815.96
Xylene	2.20	16.76	4.40	33.50	11.78	89.76
MEK	15.00	114.29	29.98	228.43	80.32	611.97
Isopropol Alcohol	1.50	11.43	3.00	22.84	8.03	61.20
Glycol Ethers & Acetates	0.77	5.84	1.53	11.67	4.10	31.27
EGBE	0.75	5.71	1.50	11.42	4.02	30.60
EGEE	0.19	1.41	0.37	2.82	0.99	7.55
EGME	0.17	1.26	0.33	2.51	0.88	6.73

Diisocyanates, including TDI, HDI, and MDI, are low-molecular-weight aromatic and aliphatic compounds. These compounds are widely used to manufacture flexible and rigid

foams, fibers, coatings, and elastomers. These compounds are increasingly used in the automobile industry, autobody repair, and building insulation materials. The major route o occupational exposure to diisocyanates is inhalation of the vapor or aerosol; exposure may also occur through skin contact during the handling of liquid diisocyanates. Occupational exposure could potentially occur during the mixing and application of two-component IM coatings containing diisocyanates.

Diisocyanates are powerful irritants to the mucous membranes of the eyes and gastrointestinal and respiratory tracts. Direct skin contact with diisocyanates can also cause marked inflammation. Respiratory irritation may progress to a chemical bronchitis with severe bronchospasm.

After one or more exposures, diisocyanates can also sensitize workers, making them subject to severe asthma attacks if they are exposed again--even at concentrations below the NIOSH REL. Death from severe asthma in sensitized subjects has been reported. Additionally, sporadic cases of hypersensitivity pneumonitis (HP) have also been reported in workers exposed to diisocyanates. Individuals with acute HP typically develop symptoms four to six hours after exposure.

The main concern is when the coating is sprayed onto the substrate. During the application process it may be possible that the diisocyanates could volatilize and come into contact with the worker. Staff contacted resin manufacturers and coating formulators to obtain additional information about TDI, HDI, and MDI. Resin manufacturers indicated that there is currently a trend to replace TDI, which is also a carcinogen, with the less hazardous diisocyanate compounds, HDI and MDI. Furthermore, a resin manufacturer indicated that use of a plural spraying system would minimize the amount of diisocyanate exposure because the diisocyanate compounds bind to the coating constituents during this type of spraying application.

Although adverse human health effects from acute exposures to TDI, HDI, and MDI may occur, the California State Office of Environmental Health Hazard Assessment (OEHHA) has not finalized acute RELs for TDI, HDI, and MDI. As a result, there is currently no SCAQMD approved method for analyzing acute health impacts from these compounds. Further, even conservatively using the short-term exposure limit (STEL) of 0.02 for TDI as a surrogate REL for TDI, HDI, and MDI, coating applicators would have to apply complicated two-component IM systems at a rate of four gallons or more per hour (assuming a sensitive receptor is located at a distance of 100 meters) to exceed an acute HI of 1.0. Investigation reveals that it is not likely that painters could apply two-component systems at this rate. Further, the formulation of compliant IM coating systems not containing diisocyanate compounds and the development of spraying technology that minimizes diisocyanate emissions should be available when the interim and final compliance VOC content limits go into effect. Consequently, PAR 1113 is not expected to result in significant adverse impacts to coating applicators.

In addition, significant adverse acute health impacts are not expected to occur as a result of implementing PAR 1113 if workers applying two-component coating systems containing diisocyanates follow OSHA's required, and the coating manufacturers' and ACGIH's recommended safety practices for handling materials containing diisocyanates. The following paragraphs summarize some of the safety measure required or recommended by NIOSH and OSHA to reduce acute human health impacts associated with the use of compliant coatings containing diisocyanates.

As noted previously, there is already a trend in the coatings industry to move away from reformulating coatings with hazardous materials to less or non-hazardous materials. Therefore, when feasible, coating applicators should use coatings that contain less hazardous materials. For two component IM systems that contain diisocyanates, coating applicators can use compliant one component low-VOC or zero-VOC IM systems. Other safety measures to protect individuals against exposure to diisocyanates are described in the following paragraphs.

Worker Isolation – Areas containing diisocyanates should be restricted to essential workers. If feasible, these workers should avoid direct contact with diisocyanates by using automated equipment operated from a control booth or room with separate ventilation.

Protective Clothing and Equipment – When there is potential for diisocyanate exposure, workers should be provided with and required to use appropriate personal protective clothing and equipment such as coveralls, footwear, chemical-resistant gloves and goggles, full faceshields, and suitable respiratory equipment.

Respiratory Protection – Only the most protective respirators should be used for situations involving exposures to diisocyanates because they have poor warning properties, are potent sensitizers, or may be carcinogenic. These respirators include:

- Any self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode, and

- Any supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

  Any respiratory protection program must, at a minimum, meet the requirements of the OSHA respiratory protection standard [29 CFR 1910.134]. Respirators must be certified by NIOSH and MSHA according to 30 CFR or by NIOSH (effective July 19, 1995) according to 42 CFR 84. A complete respiratory protection program should include: (1) regular training and medical evaluation of personnel, (2) fit testing, (3) periodic environmental monitoring, (4) periodic maintenance, inspection, and cleaning of equipment, (5) proper storage of equipment, and (6) written standard operating procedures governing the selection and use of respirators. The program should be

evaluated regularly. The following publications contain additional information about selection, fit testing, use, storage, and cleaning of respiratory equipment: NIOSH Guic to Industrial Respiratory Protection [NIOSH 1987a] and NIOSH Respiratory Design Logic [NIOSH 1987b].

Worker and Employer Education – Worker education is vital to a good occupational safety and health program. OSHA requires that workers be informed about:

- Materials that may contain or be contaminated with diisocyanates;
- The nature of the potential hazard [29 CFR 1910.1200]. Employers must transmit this information through container labeling, MSDSs, and worker training;
- The serious health effects that may result from diisocyanate exposures; and
- Any materials that may contain or be contaminated with diisocyanates.

Additionally, workers should take the following steps to protect themselves from diisocyanate exposure:

- Be aware that the highest diisocyanate concentrations may occur inside containment structures.
- Use appropriate respiratory protection when working with diisocyanates.
- Wash hands and face before eating, drinking, or smoking outside the work area.
- Shower and change into clean clothes before leaving the worksite.
- Participate in medical monitoring and examination programs, air monitoring programs, or training programs, offered by your employer.

According to resin manufacturers and coating formulators, the above safety practices and application techniques recommended for future compliant low-VOC coatings are currently used for conventional solvent-borne two-component systems. Thus, applicators will not require additional training regarding the proper handling or application of compliant coatings containing diisocyanates. This will further reduce the applicator's exposure to diisocyanates.

Acute Sensitive Receptor Health Analysis

In the context of downwind residential or sensitive receptors, most, if not all, applications of low- or zero-VOC two-component IM systems containing diisocyanates will occur primarily in industrial settings where residential or sensitive receptors or not proximately located (e.g., greater than 100 meters). However, some commentators have asserted that there are some applications of these coatings where the public could be exposed (e.g., bridge coatin applications).

The SCAQMD investigated the potential for acute exposures of sensitive receptors to low or zero-VOC two-component IM systems containing diisocyanates in settings that are not strictly considered industrial settings. This investigation, which includes discussions with resin manufacturers, coating formulators, and coating applicators, as well as the review of various health-related studies, reveals that the primary route of diisocyanate exposure to the public would be through the spraying of low- or zero-VOC two component IM systems. Controlled laboratory monitoring by Mobay[7] while mixing a two component system containing HDI showed nondetectable air concentrations of HDI. Furthermore, field monitoring of hand brushing and rolling application of a single component system containing HDI conducted by CalTrans showed that HDI concentrations were not detectable. Additionally, field monitoring studies conducted by Mobay during the brushing and rolling of one component IM topcoats (one system containing HDI and the other containing MDI), as well as the spraying of a two-component IM system containing HDI, revealed that HDI and MDI concentrations were well below HDI and MDI thresholds recommended by ACGIH and OSHA. Therefore, mixing and hand brushing or rolling of the compliant one or two component systems appears not to release diisocyanates such that the general public would suffer acute significant adverse human health impacts.

It should be again noted that other water-borne technologies are in development that could be viable replacements for some applications of two component low-VOC IM systems containing diisocyanates. For example some resin manufactures and coating formulators are offering compliant low-VOC single component, water-borne acrylic, acrylic/epoxy, acrylic urethane dispersed, etc., IM coating technologies, instead of the two-component polyurethane systems that contain diisocyanates. Consequently, PAR 1113 is not expected to result in significant adverse impacts to sensitive receptors.

Rule 1113 also contains an optional averaging provision which might enable affected facilities to using IM coatings with a higher VOC content that do not contain diisocyanates by allowing them to manufacture and sell coatings at various VOC levels for a specific coating category assuming the category, as a whole, complies with a sales-weighted average VOC content equal to that in the rule. This provision would allow another mechanism to avoid potential acute human health impacts from PAR 1113.

CONCLUSION: Based upon the above considerations, significant adverse acute human health impacts are not expected as a result of implementing PAR 1113. Further, the SCAQMD will conduct a technical assessment one year prior to each VOC content limit going into effect for the affected coatings to determine what the state of coating technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such compliant coatings.

[7] Mobay is now Bayer.

Overall Conclusion

Based upon the preceding analyses, PAR 1113 is not expected to create significant adverse human health impacts for the following reasons. First, although TDI, which is classified as a carcinogen, could be use in future compliant two-component IM coatings, it is not expected to create significant adverse carcinogenic impacts because application of IM coatings occurs primarily in industrial settings where sufficient safety equipment and procedures are in place to prevent significant exposures. Furthermore, the application of these coating systems will be for maintenance (e.g., touch-up and repair) or repaint purposes, lasting only a couple days to weeks, and occurring on an intermittent basis (e.g., once every couple of years to every ten years, or more). No increased cancer risks are anticipated since carcinogenic effects typically require long-term exposures. Finally, coating technologies are moving away from using TDI to formulate low-VOC coatings to using non-carcinogens, such as HDI or MDI.

Second, significant adverse chronic human health impacts are not anticipated for the following reasons. Some solvents used in conventional coatings that have the potential to create chronic human health impacts (e.g., EGBE), may be replaced by compliant low-VOC coatings that do not create significant adverse human health impacts (e.g., glycol ethers). In addition, as mentioned for carcinogens, for IM coatings in particular, long-term exposures that could generate significant adverse chronic human health impacts, are not anticipated.

No significant acute human health exposures are anticipated from implementing PAR 1113 for the following reasons. It is anticipated that for some coating applications, less toxic coalescing solvents will be used to formulate future compliant low-VOC coatings than is currently the case. Also, the development of spraying technology will further reduce diisocyanate emissions. Further, to exceed an acute hazard index of 1.0, painters would have to apply complicated two-component coatings at a rate of four gallons or more per hour. Investigation reveals that it is not likely that painters could apply two-component systems at this rate. Finally, based on actual field monitoring data, the brushing, rolling, or spraying of one or two component low-VOC IM systems containing diisocyante compounds should not expose the public at large to significant adverse human health impacts. The concentrations of diisocyante compounds emitted during the application of these IM systems are below the established health protective thresholds. In the context of worker (e.g., applicator) exposure, the use of personal protective equipment should provide adequate protection to applicators during coating application.

PROJECT SPECIFIC MITIGATION MEASURES: None required.

REMAINING IMPACTS: Since human health impacts are not significant, no adverse impacts remain.

CUMULATIVE IMPACT: The cumulative impacts were thoroughly analyzed in the 1997 AQMP Final Program EIR, which is herein incorporated by reference along with its adopted mitigation measures. The 1997 AQMP Program EIR concluded that human health impacts

would be cumulatively significant based upon the increased usage of acetone and glycol ether (e.g., EGBE) formulations, which was seen to be at that time the replacement solvent of choice. As noted earlier current information demonstrates an ever-increasing trend away from the use of glycol ethers and towards the use of less toxic coalescing solvents such as texanol, propylene glycol, and ethylene glycol. In regards to the potential increase use of diisocyanate compounds in compliant IM two component formulations, carcinogenic, chronic, and acute significant adverse exposures are not expected as explained above. Consequently, PAR 1113's contribution to the cumulatively significant impacts to human health found in the 1997 AQMP Final Program EIR is less than cumulatively considerable and is thus not significant.

CUMULATIVE IMPACT MITIGATION: None required.

ENVIRONMENTAL IMPACTS FOUND NOT TO BE SIGNIFICANT

An Initial Study (see Appendix B) was prepared for the proposed rule amendment, describing anticipated environmental impacts resulting from implementing PAR 1113. It was concluded in the Initial Study that the environmental areas identified in the following subsections would not be significantly adversely affected by PAR 1113. These environmental areas, therefore were not further analyzed in this Final SEA. A brief discussion of why PAR 1113 will not significantly adversely affect each of these environmental areas is provided in the following sections.

Land Use and Planning

Implementation of the proposed amendments will not cause significant adverse impacts to land uses or land use planning in the district. It is anticipated that any increased activities will occur at existing facilities. Thus, no new resources or facilities are expected to be constructed which would result in any land use impacts.

No new development or alterations to existing land use designations will occur as a result of the implementation of the proposed amendments. It is not anticipated that existing land uses located in the district would require additional land to continue current operations or require rezoning. Therefore, no significant adverse impacts affecting existing or future land uses are expected.

Population and Housing

Human population in the district is anticipated to grow regardless of implementing PAR 1113. The proposed amendments will primarily affect the formulation of architectural coatings and are not anticipated to generate any significant effects, either direct or indirect on the district's population as no additional workers are anticipated to be required to comply with the proposed amendments. Further, PAR 1113 is not expected to cause a relocation of population within the district. As a result, housing in the district is expected to be unaffected by the proposed amendments. New housing construction is not expected to be affected by the use of lower-VOC coatings.

Additionally, adoption of PAR 1113 is not expected to contribute to any significant housing cost increases because reformulated coatings are currently being sold at prices comparable to conventional coatings. Direct economic impacts are not required to be analyzed pursuant to CEQA unless they also have a significant, direct effect on physical environmental parameters. Cost impacts associated with implementation of PAR 1113 will be discussed in the SCAQMD's Socioeconomic Impact Assessment (see the Staff Report for PAR 1113).

Geophysical

Architectural coatings are applied to buildings, stationary structures, roads, etc. The proposed amendments affect coating formulators and have no effects on geophysical formations in the district. Therefore, PAR 1113 is not expected to result in additional exposure of people to potential impacts involving seismicity, landslides, mudslides or erosion as no new development is anticipated to be generated by PAR 1113.

Biological Resources

Implementation of the proposed amendments will not cause impacts to sensitive habitats of plants or animals because all activities will typically occur at construction, industrial or commercial sites already in operation. No new development that could potentially adversely affect plant and animal life is anticipated. Potential impacts to aquatic life from releases of excess paint and associated wastewater disposed of in sewer and storm drains is discussed in the "Water Quality Impacts" section of Chapter 4. The analysis of water quality impacts to both groundwater and surface water concluded that PAR 1113 would not generate significant adverse water quality impacts.

Energy and Mineral Resources

Electricity

Because add-on control equipment is not expected to be used to comply with the provisions of PAR 1113, no additional energy use is expected to be required. Additionally, PAR 1113 will not substantially increase the number of businesses or amount of equipment in the district. Furthermore, energy usage associated with providing power for special spray equipment used to apply reformulated coatings, is expected to be negligible. Currently, almost 75 percent of the electricity used in the district is imported from out-of-state power plants. Thus, there is a substantial amount of unused generating capacity in the basin. Any additional electricity needed to power special spray equipment would most likely be provided by out-of-state power plants. Any incremental power generation necessary to power special spray-equipment operation would be negligible compared to overall in-district generation and could be easily met by existing in-district capacity. Therefore, no increases in energy consumption or mineral resources are expected from the implementation of PAR 1113. Consequently, energy impacts are not considered to be significant.

The SCAQMD received one comment on the NOP/IS for PAR 1113 asserting that PAR 1113 would increase the demand for electrical power to manufacture more compliant low-VOC coatings in the future than is currently necessary to manufacture. This comment is based on the assumption that low-VOC coatings have a high solids content and, therefore, lower coverage than conventional coatings and the assumption that low-VOC are less durable and need to be recoated more frequently. Both of these issues, i.e., more thickness and more frequent recoating have been analyzed in the "Air Quality Impacts" section of this chapter. In general, staff evaluation of coating product data sheets for a substantial number of conventional and low-VOC coatings (see the tables in Appendix D and Table 4-2) produced the following results. First, low-VOC coatings have comparable solids content and coverage area compared to conventional coatings. The analysis also concluded that low-VOC coatings had comparable durability characteristics compared to conventional coating. Therefore, there is no evidence that manufacturing low-VOC coatings will increase electric energy demand.

Even if energy demand increased substantially, manufacturing additional volumes of AIM coatings would not be considered and inefficient or wasteful use of energy.

Natural Gas

The consumption of natural gas in the district is not expected to increase as a result of the implementation of PAR 1113. Electricity will be the primary source of energy used to power the spraying equipment operated at various sites. Consequently, natural gas energy impacts from implementing PAR 1113 are not considered to be significant.

Fossil Fuels

PAR 1113 is also expected not to substantial increase energy consumption from non-renewable resources (e.g., diesel and gasoline) above current district usage levels. Any incremental fuel usage from trips associated with more frequent application of compliant coatings are expected to be negligible. There are sufficient supplies of gasoline and diesel to meet the small fuel demands from transport trips associated with more frequent application of compliant coatings. Therefore, fossil fuel energy impacts from implementing PAR 1113 are not considered to be significant.

Mineral Resources

A comment was received on the NOP/IS for PAR 1113 asserting that PAR 1113 would require the production of more compliant low-VOC coatings in the future than is currently necessary to manufacture. This would ultimately result in the disposal of more paint cans, resulting a wasteful use of a natural resource, i.e., metal for the cans. As discussed in the "Electricity" subsection above, available information on low-VOC coatings contradict the assertion that more low-VOC coatings would need to be manufactured than would otherwise be necessary with conventional coatings. Consequently, PAR 1113 is not expected to result in a wasteful use of natural resources.

Noise

No significant noise impacts are associated with the use of architectural coatings. Coating formulators within the district potentially affected by the proposed amendments are located in existing construction industrial, or commercial areas. It is assumed that these facilities are subject to and in compliance with existing community noise standards. In addition to noise generated by current operations, noise sources in each area include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses.

In general, the primary noise source at existing facilities is generated by vehicular traffic, such as trucks transporting raw materials to the facility, trucks hauling wastes away from the facility, trucks to recycle waste or other materials, and miscellaneous noise such as spray

equipment (i.e. compressors, spray nozzles) and heavy equipment use (forklifts, trucks, etc.). Noise is generated during operating hours, which generally range from 6 a.m. to 5 p.m. Monday through Friday. PAR 1113 is not expected to alter noise from existing noise generating sources. It is likely that affected companies are operating in compliance with any local noise regulations that may exist in their respective communities. Therefore, no significant noise impacts are expected from the proposed amendments.

Additionally, the implementation of PAR 1113 is not expected to result in significant noise impacts in residential areas. As with industrial or commercial areas, it is assumed that these areas are subject to local community noise standards. Contractors or do-it-yourselfers applying compliant PAR 1113 coatings in residential areas are expected to comply with local community noise standards.

One comment was received on the NOP/IS asserting that noise impacts would increase because low-VOC coatings have a lower coverage area than conventional coatings so noisy spray equipment would be used for longer periods of time. As already discussed, low-VOC coatings have a coverage area comparable to conventional coatings (see the "More Thickness" discussion in the "Air Quality Impacts" section of this chapter. Further, coating application systems that rely on pressure and a power source are available that have very low noise levels associated with them. Consequently, no significant adverse noise impacts are anticipated.

Utilities and Service Systems

The proposed amendments will not substantially increase the amount of businesses or equipment in the district. Reformulation of coatings is not expected to require additional utility or service systems. In fact, PAR 1113 may actually result in fewer impacts to utilities and/or public service agencies because compliant coatings are expected to be formulated with less hazardous materials compared to current coatings. Demands on utilities or utility systems are not expected to increase and impacts to utilities are therefore, not considered to be significant.

Aesthetics

The proposed amendments do not require any changes in the physical environment that would obstruct any scenic vistas or views of interest to the public. In addition, no major changes to existing facilities or stockpiling of additional materials or products outside of existing facilities are expected to result. The reason for this determination is that any physical changes would occur at existing industrial or commercial sites. Therefore, no significant impacts adversely affecting existing visual resources such as scenic views or vistas, etc. are anticipated to occur.

One comment was received on the NOP/IS for PAR 1113 asserting that significant aesthetic impacts will result from the use of low-VOC coatings due to defects in appearance after application because the rule contains a compliance schedule sufficient for coating formulators to produce acceptable quality low-VOC products. The current compliance proposal is a modification of an earlier version of PAR 1113 and is the result of input received during the Industry Working Group meetings. The current compliance schedule should ensure that formulators have sufficient time to reformulate products that exhibit the desired performance characteristics.

Cultural Resources

There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Should archaeological resources be found during the application of Rule 1113 coatings to newly constructed structures or existing structures, the application of such coating would cease until a thorough archaeological assessment is conducted. Furthermore, the application of architectural coatings, in the vast majority of situations, would occur after construction where archaeological resources would have already been disturbed. The proposed revisions to Rule 1113 are, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the district.

One comment was received on the NOP/IS for PAR 1113 asserting that significant cultural resource impacts will occur due to potential negative impacts on the maintenance of "historic and ethnically significant architectural structures in Southern California." First, industrial maintenance coatings are not typically used for residential use or for use in painting the outside of buildings, although some nonflat coatings may be used for a structure's exterior trim. In spite of this, based upon information on currently available compliant products, performance characteristics of existing and reformulated products should be sufficient to meet the weathering impacts on outdoor structures. Consequently, significant adverse impacts to cultural resources are not anticipated as a result of implementing PAR 1113.

Recreation

The proposed amendments will not generate additional demand for, or otherwise affect land used for recreational purposes. Further, as already explained, the proposed amendments are not expected to have adverse affects on land uses in general. No significant adverse effects on recreational facilities were identified. One comment received on the NOP indicated that recreation may be affected because demand for parks would increase due to increased job losses and unemployed workers. Implementation of PAR 1113 is not expected to result in significant job losses and, therefore, this is not a realistic adverse impact. The SCAQMD staff prepared a Socioeconomic Assessment, which addresses cost and associated

employment impacts associated with adoption and implementation of PAR 1113 (see the Staff Report for PAR 1113).

Economic Impacts

Detailed analyses of economic or social effects are necessary only when they have significant impacts on physical environmental parameters. The proposed amendments to Rule 1113 would lower the VOC content limits for some coating categories, etc. As a result of implementing PAR 1113, no significant adverse direct or indirect (secondary) environmental impacts resulting from economic impacts have been identified. There are no environmental impacts that can be traced from socioeconomic effects. A socioeconomic analysis has , nevertheless, been prepared. The socioeconomic impact report for PAR 1113 is included in the Final Staff Report. Persons interested in obtaining copies of the Final Staff Report should contact the district Public Information Center at (909) 396-3600.

OTHER CEQA TOPICS

The following sections address various topics and issues required by CEQA such as growth inducement, short-term versus long-term effects, and irreversible changes.

Irreversible Environmental Changes

CEQA Guidelines §15126(e) requires an environmental analysis to consider "any significant irreversible environmental changes which would be involved if the proposed action should be implemented." The Initial Study identified air quality, water resources, and public resources, as potential impact areas. Additional information suggested that potential transportation/circulation, solid/hazardous waste, hazards, and human health impacts be evaluated.

The analysis concluded that no significant adverse project-specific or cumulative impacts would occur to any of these environmental areas. For example, the "Air Quality Impacts" analysis included an evaluation of eight issues identified by industry that might produce significant adverse air quality impacts. The results of this analysis indicated that there was no evidence supporting significant adverse air quality impacts as a result of any of the eight issues. The analysis of the substitution issued did indicate that the potential air quality benefits of the rule could be less than anticipated, although substitution is not anticipated for a variety of reasons as explained in the "Air Quality Impacts" section. The analysis of water resource impacts indicated that an incremental increase in the amount of wastewater from cleaning coating equipment could occur, but this increase did not exceed the SCAQMD's threshold of significance. The analysis of public facilities and transportation circulation

concluded that PAR 1113 would not create any significant adverse impacts to these areas. The solid/hazardous waste analysis included an evaluation of the potential for an incrementa increase in solid waste impacts resulting from some types of IM coatings have a shorter pot life, a shorter shelf life, and are less able to withstand freeze-thaw conditions than conventional coatings. A "worst-case" analysis was performed and determined that there could be an incremental increase in solid waste impacts, but this increase did not exceed the SCAQMD's threshold of significance. The analysis of hazard and human health impacts indicated that future compliant low-VOC coatings could be formulated with hazardous materials. Generally, solvents used in low-VOC coatings are typically less hazardous than solvents used in conventional coatings. Therefore, hazard impacts are considered to be insignificant. Further, because AIM coatings are typically applied in industrial settings where safety equipment, training, and procedures are in place, workplace exposures to potentially hazardous coatings would be minimal. In addition, because AIM coatings are applied on an as-needed basis, continuous exposures would not occur. As a result, no significant carcinogenic or non-carcinogenic hazard impacts are anticipated.

As can be seen by the information presented in this SEA, the proposed project would not result in irreversible environmental changes or the irretrievable commitment of resources.

Potential Growth-Inducing Impacts

CEQA Guidelines §15126(f) requires an environmental analysis to consider the "growth-inducing impact of the proposed action." Implementing PAR 1113 will not, by itself, have any direct or indirect growth-inducing impacts on businesses in the SCAQMD's jurisdiction because it is not expected to foster economic or population growth or the construction of additional housing and primarily affects existing coating formulation companies.

CONSISTENCY

The Southern California Association of Governments (SCAG) and the SCAQMD have developed, with input from representatives of local government, the industry community, public health agencies, the USEPA - Region IX and the California ARB, guidance on how to assess consistency within the existing general development planning process in the Basin. Pursuant to the development and adoption of its Regional Comprehensive Plan Guide (RCPG), SCAG has developed an Intergovernmental Review Procedures Handbook (June 1, 1995). The SCAQMD also adopted criteria for assessing consistency with regional plans and the AQMP in its CEQA Air Quality Handbook. The following sections address consistency between PAR 1113 and relevant regional plans pursuant to the SCAG Handbook and SCAQMD Handbook.

Consistency with the Air Quality Management Plan

PAR 1113 is consistent with the AQMP since it is specifically identified as a control measure that is necessary to attain and maintain the state and national ambient air quality standards.

Consistency with Regional Comprehensive Plan and Guide (RCPG) Policies

The RCPG provides the primary reference for SCAG's project review activity. The RCPG serves as a regional framework for decision making for the growth and change that is anticipated during the next 20 years and beyond. The Growth Management Chapter (GMC) of the RCPG contains population, housing, and jobs forecasts, which are adopted by SCAG's Regional Council and that reflect local plans and policies, shall be used by SCAG in all phases of implementation and review. The subsections summarize the main policies and goals contained in the GMC and whether or not PAR 1113 is consistent with these polices and goals

Improve the Regional Standard of Living

The Growth Management goals are to develop urban forms that enable individuals to spend less income on housing cost, that minimize public and private development costs, and that enable firms to be more competitive, which would strengthen the regional strategic goal to stimulate the regional economy. Proposed amended Rule 1113 in relation to the GMC would not interfere with the achievement of these goals, nor would it interfere with any powers exercised by local land use agencies to achieve these goals. PAR 1113 will not interfere with efforts to minimize red tape and expedite the permitting process to maintain economic vitality and competitiveness.

Provide Social, Political and Cultural Equity

The Growth Management goals are to develop urban forms that avoid economic and social polarization; promote the regional strategic goals of minimizing social and geographic disparities; and reach equity among all segments of society. Consistent with the Growth Management goals, local jurisdictions, employers and service agencies should provide adequate training and retraining of workers, and prepare the labor force to meet the challenges of the regional economy. Growth Management goals also includes encouraging employment development in job-poor localities through support of labor force retraining programs and other economic development measures. Local jurisdictions and other service providers are responsible to develop sustainable communities and provide, equally to all members of society, accessible and effective services such as: public education, housing, health care, social services, recreational facilities, law enforcement, and fire protection. Implementing PAR 1113 is not expected to interfere with the goals of providing social, political and cultural equity.

Improve the Regional Quality of Life

The Growth Management goals also include attaining mobility and clean air goals and developing urban forms that enhance quality of life, accommodate a diversity of life styles, preserve open space and natural resources, are aesthetically pleasing, preserve the character of communities, and enhance the regional strategic goal of maintaining the regional quality of life. The RCPG encourages planned development in locations least likely to cause environmental impacts, as well as supports the protection of vital resources such as wetlands, groundwater recharge areas, woodlands, production lands, and land containing unique and endangered plants and animals. While encouraging the implementation of measures aimed at the preservation and protection of recorded and unrecorded cultural resources and archaeological sites, the plan discourages development in areas with steep slopes, high fire, flood and seismic hazards, unless complying with special design requirements. Finally, the plan encourages mitigation measures that reduce noise in certain locations, measures aimed at preservation of biological and ecological resources, measures that would reduce exposure to seismic hazards, minimize earthquake damage, and develop emergency response and recovery plans. Proposed amended Rule 1113 in relation to the GMC is not expected to interfere with attaining these goals and, in fact, promotes improving air quality in the region.

Consistency with Regional Mobility Plan (RMP) and Congestion Management Plan (CMP)

Proposed amended Rule 1113 is consistent with the RMP and CMP since no significant adverse impact to transportation/circulation will result from the additional regulation of coke, coal, and sulfur facilities within the district. While traffic and congestion is generated from the transport offsite of wastes for disposal or recycling, the construction and operation activities at affected facilities will not require a substantial increase number of employees. Furthermore, because affected facilities will not increase their handling capacities, there will not be an increase in material transport trips associated with the implementation of APR 1113. Therefore, material transport trips are not expected to significantly adversely affect circulation patterns.

CHAPTER 5

PROJECT ALTERNATIVES

Introduction

Alternatives Rejected as Infeasible

Description of Alternatives

Comparison of the Alternatives

Conclusion

INTRODUCTION

This Final SEA provides a discussion of alternatives to the proposed project although not required under CEQA since no significant impacts have been found. Alternatives include measures for attaining the objectives of the proposed project and provide a means for evaluating the comparative merits of each alternative. A "No Project" alternative must also be evaluated. The range of alternatives must be sufficient to permit a reasoned choice, but need not include every conceivable project alternative. CEQA Guidelines §15126(d)(5) specifically notes that the range of alternatives required in a CEQA document is governed by a 'rule of reason' and only necessitates that the CEQA document set forth those alternatives necessary to permit a reasoned choice. The key issue is whether the selection and discussion of alternatives fosters informed decision-making and meaningful public participation. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative. SCAQMD Rule 110 does not impose any greater requirements for a discussion of project alternatives in an environmental assessment than is required for an EIR under CEQA.

ALTERNATIVES REJECTED AS INFEASIBLE

A CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and explain the reasons underlying the lead agency's determination (CEQA Guidelines §15126(d)(2)). The NOP/IS prepared for PAR 1113 included seven concepts that could possibly be further developed into project alternatives. Members of the Industry Working Group (see "Industry Working Group Meetings" discussion in Chapter 2 originally recommended most of these concepts. One of the concepts identified in the NOP/IS, product line averaging, has been incorporated as a component of PAR 1113, although the specifics of the proposal are still under evaluation by staff. An alternative VOC content limit alternative has been further developed as Alternative B.

Upon further consideration and evaluation, some of the alternatives concepts originally identified by the Industry Working Group and included in the NOP/IS have been determined to be infeasible as the basis for a specific project alternative. These concepts and the rationale for rejecting them as infeasible are discussed in the following subsections.

Low Vapor Pressure (Low Volatility) Exemption

Under this alternative, VOC emission limits would be based on the volatility of affected coatings' VOC compounds rather than the VOC content of the coating. Thus, under this alternative, VOC compounds with low vapor pressures may be exempted as a VOC from the overall VOC content of the coating. This alternative has been rejected as infeasible as described in the following paragraphs.

Currently several solvents are used in consumer products and architectural coatings that are considered low volatility compounds, meaning that they have a vapor pressure of less than 0.1 mm of Hg at 20 degrees Celsius. Although CARB has included a low vapor pressure (LVP) exemption in their Consumer Products regulation, CARB staff indicates that the LVP exemption was placed into the proposed regulation because of specific additives found in consumer products, such as surfactants, paraffins, and other heavier compounds that are typically washed away before they evaporate into the air. Furthermore, CARB has indicated that the LVP exemption was not intended to apply to solvents used in AIM coatings, since these solvents are intended to evaporate into the air. For that resin, CARB has not provided an LVP exemption in their aerosol paints rule.

USEPA also did not include an LVP exemption in the National AIM Rule and USEPA staff has communicated to the SCAQMD that they do not support an LVP exemption for the architectural coatings rule. USEPA staff concludes that any VOCs (non-exempt solvent species) that are included in the approved test method are considered to be part of the overall VOC content of the coating, and should not be exempted. Using the currently approved test method, testing of coatings containing some of the LVP solvents includes identifying some LVP solvents as VOCs. As a result, because a LVP exemption is not appropriate for paints, a low vapor pressure alternative is considered to be infeasible and, therefore, has not been included as a project alternative in this Final SEA.

Performance-Based Standards

Members of the Industry Working Group also originally raised the concept for a performance-based rule provision or project alternative. Rather than establish lower VOC content requirements for specified categories of coatings, this alternative would establish emission standards based on performance standards such as emissions per area covered or coating durability.

This alternative was rejected as infeasible because no consensus could be reached on how to create a standard to cover the multitude of coating formulations with varying performance characteristics. For example, alkyd-based coating formulations for some applications currently have a life cycle of five to seven years, while urethane-based coating formulations for similar applications may have a life cycle of approximately 20

years. In this situation, the performance standard could be seven years, 20 years, or some time frame in-between these numbers. Agreement could not be reached concerning the appropriate standard for each type of coating technology. As a result, this alternative has been dropped from further consideration.

Reactivity-Based Alternative

This alternative would regulate coatings based upon the reactivity of the solvent used rather than establish VOC content requirements. A number of studies have been conducted in the field of atmospheric chemistry that conclude that many different types of VOCs are emitted into the atmosphere, each reacting at different rates. The architectural coatings industry has suggested that VOC control strategies taking reactivity into account can potentially achieve ozone reductions in a more cost-effective manner than strategies that reduce VOC mass emissions.

The use of reactivity as a regulatory tool has been debated at the local, state, and national level for over 20 years. Reactivity issues were thoroughly assessed during the VOC RECLAIM rule development process over a period of several years. The results were inconclusive.

CARB implemented a reactivity-based control strategy into its California Clean Fuel/Low Emissions Vehicle regulations, where reactivity adjustment factors were employed to place regulations of exhaust emissions from vehicles using alternative fuels on an equal ozone impact basis. CARB is evaluating a similar strategy for consumer products and industrial emissions, and recently contracted with Dr. William Carter, University of California at Riverside, Center for Environmental Research and Technology, College of Engineering, for a two-year study to assess the reactivities of VOC species found in the consumer products emissions inventory. Dr. Carter, one of the principal researchers of reactivities of various VOC species, plans to further study VOC species, more specifically glycol ethers, esters, isopropyl alcohol, methyl ethyl ketone (MEK), and an octanol, since these are typically found in either waterborne coatings, solvent-based coatings, or both. These specific VOCs have been prioritized based on emissions inventory estimates, mechanistic uncertainties, and lack of information in the current reactivity data. Under the current models and ozone chamber studies, however, Dr. Carter has been unable to assess the reactivity of low volatility compounds, and has not succeeded in reducing the uncertainties of key VOC species used in AIM coatings.

Another factor to be considered in the reactivity-based approach, and probably the most important, is an accurate speciation profile of waterborne and solvent-based coatings. CARB, in its effort to get more detailed information about the speciation profiles, required speciation profiles of all coatings included in the 1998 CARB Survey. The results of the speciation data are still under evaluation, and could potentially be used for future, reactivity-based ozone control strategies.

In addition to the uncertainties associated with speciation profiles for all coatings, the following uncertainty factors that must be addressed prior to any rule making based on reactivity:

- Ozone impacts of VOCs depend on the environment where the VOC is being emitted;
- The variability or uncertainty in the chemical composition of the VOC source being considered; and
- The complexity and uncertainties in the atmospheric processes by which emitted VOCs react to form ozone

Although the science of VOC reactivity has matured over the past few years, more comprehensive studies are still being conducted to resolve the uncertainties of reactivity data. The experts in the field, including Dr. Carter, have indicated the need to improve estimates of atmospheric ozone reactivity factors for selected major classes of compounds in the consumer product emissions inventory. They also feel the need to improve the quantification of the uncertainty ranges of atmospheric reactivity factors for the classes of species typically found in coatings. Recently, with funding from USEPA and private sources, a new, state-of-the-art ozone chamber will be developed and used for future studies. The chamber is expected to be built and operational by the end of 1999.

In its Report to Congress on a Study of Volatile Organic Compound Emissions from Consumer and Commercial Products (EPA-453/R-94-066-A), USEPA also supported the reactivity-based approach, but also stated, "Because of uncertainties, inconsistencies, and lack of reactivity data on individual compounds, ... a rigorous determination of the potential of consumer and commercial products to contribute to ozone nonattainment is not possible at this time ... If, in the future, sufficient information or new methodologies become available, the EPA may reevaluate this finding." As a result, EPA is regulating AIM coatings based upon VOC content and not reactivity.

Based on the current state of information, there is insufficient evidence to conclude that waterborne coatings actually contain more reactive solvents than solvent-based coatings. As a result, the SCAQMD believes that a reactivity-based alternative is not a feasible alternative at this time because there is not enough data or other information available to support such an alternative because atmospheric science data available are incomplete. However, the SCAQMD does support continued research that would enhance the state of science in this field.

Regional Deregulation

Areas in the district that do not have an ozone problem or contribute to the SCAQMD's ozone problem would be exempted from the VOC content requirements of the proposed

amendments. This alternative was rejected as infeasible for the reasons specified in the following paragraphs.

A similar concept to regional deregulation (geographic shift control strategy) was considered as a project alternative to the 1997 AQMP. For this AQMP alternative, air quality modeling was performed to determine its viability. The results of the analysis indicated that the geographical shift alternative was difficult to model because the model is dependent on meteorological conditions. For example, depending on the meteorological conditions used, it was difficult to determine whether or not an exceedance in one source receptor area (SRA) was due to the emissions sources in that SRA or the result of wind conditions in which emissions from an upwind SRA were transported to a second SRA, causing a violation in the second SRA.

As indicated in the preceding paragraph, ozone is a regional problem, not a localized problem, and is affected by high ambient NOx concentrations. Although the district currently is in attainment with both the national and California ambient air quality standards, ambient NOx concentrations are sufficiently high that this alternative would not contribute appreciably towards attaining the national or California ambient air quality standards for ozone. For this reason and the reason cited in the preceding paragraph, the regional deregulation alternative is not considered to be a feasible alternative.

Seasonal Regulation

The low-VOC content limits proposed for various coatings in PAR 1113 would only be in effect during the "high ozone season" (i.e., typically the summer months). During the "low ozone season" (i.e., typically the winter months), coatings subject to the currently proposed amendments with higher VOC content limits could be used. A comment was made in one of the comment letters received on the NOP/IS that this alternative might not be feasible for coatings used "on large-scale, long-term new construction and maintenance projects – where the work of many trades is coordinated through a "critical path" schedule –" and coatings used for low-volume touch-up and repair work.

Based on discussions with industry, staff has determined that this alternative is infeasible because it may be difficult for coatings distributors to manage architectural coating stocks to ensure that only compliant coatings are sold during the high ozone season. As a result, this alternative is rejected as infeasible due to this lack of enforceability.

DESCRIPTION OF ALTERNATIVES

The rationale for selecting and modifying specific components of the proposed amendments to generate feasible alternatives for analysis is based on CEQA's

requirement to present "realistic" alternatives; that is, alternatives that can actually be implemented. The following alternatives were developed by identifying and modifying major components of PAR 1113. Specifically, the primary components of the proposed alternatives that have been modified are the interim compliance dates, the final compliance dates, and the range of exemptions. In general, the range of alternatives to PAR 1113 is relatively limited because the technology and data regarding alternative approaches is limited or not well understood as explained the above "Alternatives Rejected as Infeasible" section. Further, the final VOC content limit requirements are driven by the VOC emission reductions identified in the 1997 AQMP control measure CTS-07, which are necessary if the district is to attain and maintain the state and national ambient air quality standards for ozone.

Table 5-1 identifies the major components of PAR 1113 and each of the project alternatives. All other components of PAR 1113 not identified in the following subsections or in Table 5-1 would also be included in the proposed project alternatives.

Alternative A - No Project

This alternative assumes that the proposed amendments to Rule 1113 will not be adopted. Existing Rule 1113 would remain in effect with no modifications. As a result, VOC emissions from architectural coatings would not be further reduced to meet 1997 AQMP goals.

Alternative B – Extended Compliance Alternative

Alternative B would extend the interim compliance VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. The interim and final VOC content limits for affected coatings would be identical to those proposed for PAR 1113.

Alternative C – No Final VOC Limit for IM or Rust Preventive Coatings

Alternative C would not further reduce the interim VOC content limit of 250 g/l or 400 g/l for IM and rust preventative (RP) coatings, respectively. This means that IM and RP coatings would only have to comply with the 2002 VOC content limits. The other proposed changes in PAR 1113 would be maintained.

TABLE 5-1
PAR 1113 AND PROJECT ALTERNATIVES[1]

Coa..ng Category	Alternative A – No Project Alternative	Proposed Amended Rule 1113[3]		Alternative B - Extended Compliance Alternative		Alternative C - No Final IM/RP VOC Content Limit Alternative	
	Current Limit (G/L)	Proposed Limit (G/L)	Compliance Dates	Proposed Limit (G/L)	Compliance Dates	Proposed Limit (G/L)	Compliance Dates
Floor Coatings	420	100	07/01/02	100	01/01/03	100	07/01/02
		50	07/01/2006	50	01/01/08	50	07/01/2006
Industrial Maintenance (IM) Coatings	420	250	07/01//02	250	01/01//03	250	07/01//02
		100	07/01/2006	100	01/01/08	250	07/01/2006
High Temp. IM Coatings	No Limit	550	07/01/02	550	01/01/03	550	07/01/02
		420	07/01/2006	420	01/01/08	420	07/01/2006
Non-Flat	250	150	07/01/02	150	01/01/03	150	07/01/02
		50	07/01/2006	50	01/01/08	50	07/01/2006
Quick-Dry Enamel	400	250	07/01/02	250	01/01/03	250	07
		50	07/01/2006	50	01/01/08	50	07/01/2006
PSU	350	200	07/01/02	200	01/01/03	200	07/01/02
		100	07/01/2006	100	01/01/08	100	07/01/2006
Quick-Dry PSU	350[2]	200	07/01/02	200	01/01/03	200	07/01/02
		100	07/01/2006	100	01/01/08	100	07/01/2006
Rust Preventative Coatings	400						
		100	07/01/2006	100	01/01/08		
Stains	350	250	07/01/02	250	01/01/03	250	07/01/02
Water-Proofing Wood Sealers	400	250	07/01/02	250	01/01/08	250	07/01/02

1) grams of VOC per liter of coating, less water and less exempt compounds
2) Currently exempt if manufacturers report sales data
3) The proposed project has three additional coating categories and VOC content limits:
Bituminoous Roof Coatings, currently at 300 g/l, are required to reduce to 250 g/l by 07/01/02;
Essential Public Services Coatings, currently at 420 g/l, are required to reduce to 340 g/l by 07/01/02 and 100 g/l by 07/01/06; and
Recylced Flat and Nonflat Coatings, currently at 250 g/l, are required to reduce to 100 g/l by 07/01/06.

COMPARISON OF THE ALTERNATIVES

The Initial Study (see Appendix B) identified those environmental topics where the PAR 1113 could cause adverse environmental impacts. Further evaluation of these topics and other identified topics in Chapter 4 of this Final SEA reveals that there are no significant impacts from the implementation of PAR 1113.

The following subsections briefly describe potential environmental impacts that may be generated by each project alternative. Each environmental topic summary contains a brief description of the environmental impacts for each project alternative compared to impacts resulting from implementing the proposed amendments. Potential impacts for the environmental topics are quantified, where sufficient data are available. A comparison of the impacts for each of the environmental topics is summarized in Table 5-3 and the alternatives are ranked in Table 5-4.

Air Quality

Alternative A - No Project

This alternative assumes that the proposed amendments to Rule 1113 will not be adopted. Existing Rule 1113 would remain in effect with no modifications. As a result, approximately 20 tons per day of VOC emissions from architectural coatings would not be further reduced to meet 1997 AQMP goals. Thus, jeopardizing the district's ability to meet and maintain federal and state ozone standards by the year 2010.

Alternative B – Extended Compliance

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. The interim and final VOC content limits for affected coatings would be identical to those proposed for PAR 1113. As shown in Table 5-2, assuming no sell through, this alternative would result in estimated daily VOC emission reductions by the year 2010 of 21.8 tons per day. This alternative would ultimately achieve the same VOC emission reductions as PAR 1113. However, the VOC emission reductions would be achieved a year later for the interim year and three years later for the final year. Thus, missing some of the 1997 AQMP targets for VOC emission reductions.

Alternative C – No Final IM or RP VOC Content Limit

This alternative would omit the proposed final VOC content limits for IM and RP coatings. Alternative C would allow the interim VOC content for IM and RP coatings to remain at 250 g/l and 400 g/l, respectively. The other proposed VOC content limit changes in PAR 1113 would be maintained. As shown in Table 5-2, assuming no sell

through, this alternative would result in estimated daily VOC emission reductions by the year 2010 of 18.25 tons per day. This alternative would achieve 3.55 tons per day less VOC emission reductions than the proposed project. However, this loss of 3.55 tons per day less VOC emission reductions would have to be made up in other VOC categories, which may not be feasible for some VOC categories.

Emission Reductions from PAR 1113 and Alternatives

It should noted that all of the alternatives, except Alternative A, will reduce VOC emissions from affected AIM coating categories. Table 5-2 highlights the estimated emission reductions from PAR 1113 and each project alternative.

TABLE 5-2
COMPARISON VOC EMISSION REDUCTIONS
FROM PAR 1113 AND THE PROJECT ALTERNATIVES (pounds per day)

Year Reductions Achieved	PAR 1113	Alternative A (No Project)	Alternative B (Extended Compliance)	Alternative C (No Final IM//RP VOC Content Limit)
2002	19,620	0	0	19,620
2003	↓	0	19,620	↓
2006	23,980+ 19,620	0	↓	16,880 + 19,620
2008	↓	0	23,980+ 19,620	↓
2010+	↓	0	↓	↓
TOTAL*	43,600	0	43,600	36,500
Tons/Day	21.8	0	21.8	18.25

* Assumed 365 operational days per year
↓ = Same amount of VOC emission reduction obtained as previous years.

Water Resources

Water Demand

Alternative A assumes that PAR 1113 will not be adopted. The water demand impacts associated with the use of current coatings would remain constant under the No Project Alternative. As a result of not implementing the proposed VOC content limits, which are anticipated to be met predominately through water-borne technology, this alternative would have less water demand impacts compared to the proposed project. Thus, Alternative A would not create any new or additional water demand impacts.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. Therefore, the water demand impacts will be slightly greater than PAR 1113, but not significant. Since the affected coating categories will be reformulated with the same water-borne technology to meet the interim and final VOC content limits, this alternative would result in similar insignificant water demand impacts as the proposed project.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. This alternative would allow the interim VOC content for IM and RP coatings to remain at 250 g/l and 400 g/l, respectively. As a result of not implementing the proposed final VOC content limit for IM and RP coatings of 100 g/l, which is anticipated to be met through water-borne technology, Alternative C would have less but still slight insignificant water demand impacts compared to PAR 1113.

Water Quality

Alternative A assumes that PAR 1113 will not be adopted. No change in the current quantities of coatings entering the sewer systems, storm drainage systems, or groundwater within the district should occur under the No Project Alternative because current practices are expected to be maintained. Thus, Alternative A would not create any new or additional water quality impacts.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. However, the same low-VOC technology used to meet the PAR 1113 interim and final VOC content limits will be used to meet the later Alternative B interim and final VOC content limits. Therefore, Alternative B would result in similar insignificant water quality impacts (e.g., wastewater, storm water, and groundwater) as the proposed project.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l, which can be met by both solvent-borne and water-borne technology, would remain in place after the year 2002. Thus, the further use of water-borne technology to meet the lower VOC content limits of PAR 1113 for these coating categories is not required. Since there will be no incremental increase in the use of water-borne technology for these coatings at the final compliance deadline, the generation of wastewater from the clean up of water-borne technology will not occur. Therefore, water quality impacts associated with Alternative C are less than those associated with implementation of PAR 1113.

Public Services

Public Facility Maintenance

The No Project Alternative would not require any changes to coating application practices done for maintenance purposes at public facilities. Thus, Alternative A would not create any new or additional public service impacts.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. However, the same low-VOC technology used to meet the PAR 1113 interim and VOC content limits will be used to meet the later

Alternative B interim and final VOC content limits. Therefore, Alternative B would result in similar insignificant public services impacts (e.g., maintenance at public facilities) as the proposed project.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l, which can be met by both solvent-borne and water-borne technology, would remain in place after the year 2002. As a result, end-users will be allowed to use RP coatings with a higher VOC content based on alkyd or acrylic technology, which currently perform satisfactorily at a VOC content of 400 g/l[8]. Therefore, the public services impacts associated with Alternative C are less than those associated with implementation of PAR 1113.

Fire Departments

The No Project Alternative will not change the current impacts on fire departments. The current Rule 1113 VOC content limits would allow the continued use of coatings that contain flammable solvents such as toluene, xylene, MEK, mineral spirits, and others. To comply with the interim and final VOC content limits in PAR 1113, it is expected that coating formulators will use predominantly water-borne technology containing less flammable solvents. Therefore, the continued use of flammable solvents such as toluene, xylene, MEK, and mineral spirits would result in more fire department impacts than would be expected from the implementation of the proposed project.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. However, the same replacement and coalescing solvents used to meet the PAR 1113 interim and final VOC content limits would be used to meet the Alternative B interim and final VOC content limits. Therefore, Alternative B would result in similar insignificant public services impacts (e.g., fire departments) as PAR 1113.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l, which can be met by both solvent-borne and water-borne technology, would remain in place after the year 2002. Since under Alternative C IM and RP coatings will not be required to meet the final VOC content limits of PAR 1113, formulators will not be required to reformulate solvent-borne technology containing more flammable solvents with water-borne technology containing less flammable solvents (e.g., diisocyanates, texanol, propylene glycol, and ethylene glycol). Therefore, Alternative C would result in slightly more fire department impacts than would be expected from the implementation of PAR 1113.

[8] Since this alternative maintains all of the other rule requirements of PAR 1113, IM coatings would be prohibited for use at public facilities.

[9] It should be noted that SCAQMD research of various resin manufacturers' and coating formulators' product data sheets reveals that there are compliant water-borne technology that has comparable performance to higher VOC solvent-borne formulations.

Transportation / Circulation

The No Project Alternative would not require any changes to existing coating manufacturing processes or coating application practices. The volume of traffic or traffic circulation patterns associated with the manufacturing, distribution, and use of AIM coatings would not change under Alternative A. Thus, Alternative A would not create any new or additional transportation/circulation impacts.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. However, the same replacement and coalescing solvents used to meet the PAR 1113 interim and final VOC content limits would be used to meet the Alternative B interim and final VOC content limits. Therefore, Alternative B would result in similar insignificant transportation/circulation impacts as the proposed project.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l would remain in place after the year 2002. Since under Alternative C IM and RP coatings will not be required to meet the final VOC content limits of PAR 1113, formulators will not be required to further reformulate these coatings with water-borne technology. Thus, any potential additional trips associated with the disposal of reformulated low-VOC water-borne IM and RP coatings due to freeze–thaw, shelf-life, or pot life problems will be less than PAR 1113. Therefore, Alternative C would result in slightly less transportation/circulation impacts than would be expected from the implementation of PAR 1113

Solid / Hazardous Waste

The No Project Alternative would not require any changes to existing coating manufacturing processes or coating application practices. The volume of solid/hazardous waste generated from the manufacturing, distribution, and use of AIM coatings would not change under Alternative A. Thus, Alternative A would not create any new or additional solid/hazardous waste impacts.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. However, the same replacement and coalescing solvents used to meet the PAR 1113 interim and final VOC content limits would be used to meet the Alternative B interim and final VOC content limits. Therefore, Alternative B would result in similar insignificant solid/hazardous waste impacts as PAR 1113.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l would remain in place after the year 2002. Since under Alternative C IM and RP coatings will not be required

to meet the final VOC content limits of PAR 1113, formulators will not be required to further reformulate these coatings with water-borne technology. Thus, any potentia additional coatings landfilled as a result freeze–thaw, shelf life, or pot life problems associated with the use of reformulated low-VOC water-borne IM and RP coatings will be less than PAR 1113. Therefore, Alternative C would result in slightly less solid/hazardous waste impacts than would be expected from the implementation of PAR 1113

Hazards

The No Project Alternative will not change the current hazards impacts. The current Rule 1113 VOC content limits would allow the continued use of coatings that contain toxics such as toluene, xylene, MEK, EGBE, and others. The use of these toxic and flammable solvents when balanced against the use of toxic solvents such as TDI, MDI, HDI, which are less flammable, to meet the interim and final VOC content limits of PAR 1113 would result in similar insignificant hazards impacts as the proposed project.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. However, the same replacement and coalescing solvents used to meet the PAR 1113 interim and final VOC content limits would be used to meet the Alternative B interim and final VOC content limits. Therefore, Alternative B would result in similar insignificant hazards impacts as the proposed project.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l, which can be met by both solvent-borne and water-borne technology, would remain in place after the year 2002. Coating formulators would not be required under this alternative to further reformulate with water-borne technology to meet the final VOC content limits in PAR 1113. In the context of RP coatings, coating formulators would not be replacing current coalescing solvents such as EGBE with less toxic and less flammable solvents such as texanol, propylene glycol, and ethylene glycol in their water-borne formulations. Conversely, in the context of IM coatings, coating formulators would not be incrementally increasing the use of two component polyurethane water-borne systems containing toxic solvents such as TDI, HDI, and MDI. Therefore, when balancing the loss of replacement solvents that are less toxic and less flammable against the incremental increase in the use of coatings containing more toxic solvents, Alternative C would result in similar insignificant hazards impacts as the proposed project.

Human Health

The No Project Alternative will not change the current hazards impacts. The currer Rule 1113 VOC content limits would allow the continued use of coatings that contain

toxics such as toluene, xylene, MEK, EGBE, and others. The use of these toxic solvents when balanced against the use of toxic solvents such as TDI, MDI, HDI to meet the interim and final VOC content limits of PAR 1113 would result in similar insignificant human health impacts as the proposed project.

Alternative B would extend the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. It is anticipated that the same replacement and coalescing solvents used to meet the PAR 1113 interim and final VOC content limits would be used to meet the Alternative B interim and final VOC content limits. However, in the context of compliant two component water-borne IM systems containing TDI, HDI, MDI, since formulators have an additional three years to develop coatings they may be able to formulate systems containing less toxic compounds or develop better application techniques to further reduce exposure to these compounds. Therefore, Alternative B would result in slightly less insignificant human health impacts as compared to PAR 1113.

Alternative C would omit the proposed final VOC content limits for IM and RP coatings. The interim VOC content limit for IM of 250 g/l and RP of 400 g/l, which can be met by both solvent-borne and water-borne technology, would remain in place after the year 2002. Coating formulators would not be required under this alternative to further reformulate with water-borne technology to meet the final VOC content limits in PAR 1113. In the context of RP coatings, coating formulators would not be replacing current coalescing solvents such as EGBE with less toxic solvents such as texanol, propylene glycol, and ethylene glycol in their water-borne formulations. Conversely, in the context of IM coatings, coating formulators would not be incrementally increasing the use of two component polyurethane water-borne systems containing toxic solvents such as TDI, HDI, and MDI. Therefore, when balancing the loss of replacement solvents that are less toxic against the incremental increase in the use of coatings containing more toxic solvents, Alternative C would result in similar insignificant hazards impacts as the proposed project.

CONCLUSION

Pursuant to CEQA Guidelines §15126.6 (d), a matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. Table 5-3 lists the alternatives considered by the SCAQMD and how they compare to PAR 1113. Table 5-4 presents a matrix that lists the significant adverse impacts as well as the cumulative impacts associated with the proposed project and the project alternatives for all environmental topics analyzed. The table also ranks each impact section as to whether the proposed project or a project alternative would result in greater or lesser impacts relative to one another.

Pursuant to CEQA Guidelines §15126.6 (e)(2), if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superio alternative among the other alternatives. Since the No Project alternative (Alternative A) would not ultimately achieve the long-term air quality benefits (e.g., VOC reductions) of PAR 1113, it is not the environmentally superior alternative.

TABLE 5-3
COMPARISON OF ADVERSE ENVIRONMENTAL IMPACTS OF PAR 1113 TO THE ALTERNATIVES

Environmental Topic	Alternative A (No Project)	Alternative B (Extended Compliance Deadlines)	Alternative C (No Final IM//RP VOC Content Limits)	Mitigation Measures
Air Quality	Not Significant (loss of VOC emission reductions)	Not Significant (loss of VOC emission reductions in interim years)	Not Significant (loss of VOC emission reductions)	None Required
Water Resources				
Water Demand	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Water Quality	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Public Services				
Public Facility Maintenance	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Fire Department	Not Significant, greater than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, greater than PAR 1113	None Require
Transportation/ Circulation	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	None Required
Solid/Hazardous Waste	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	Not significant, less than PAR 1113	None Required
Hazards	Not Significant, equivalent to PAR 1113	Not Significant, equivalent to PAR 1113	Not Significant, equivalent to PAR 1113	None Required
Human Health	Not Significant, equivalent to PAR 1113	Not Significant, less than PAR 1113	Not Significant, equivalent to PAR 1113	None Required

TABLE 5-4
RANKING OF ALTERNATIVES

Project/ Alts	Air Quality Impacts		Water Demand Impacts		Water Quality Impacts		Public Facility Maintenance Impacts		Fire Department Impacts		Transportation/ Circulation Impacts		Solid/Hazardous Waste Impacts		Hazards Impacts		Human Health	
	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.	Proj.	Cum.
PAR 1113	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(2)*	✓
Alt. A	✓ *(4)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(1)*	✓	✓ *(2)*	✓
Alt. B	✓ *(2)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(3)*	✓	✓ *(3)*	✓	✓ *(1)*	✓	✓ *(1)*	✓
Alt. C	✓ *(3)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(2)*	✓	✓ *(1)*	✓	✓ *(2)*	✓

Notes: The ranking scale is such that 1 represents the least impacts and subsequent higher number represent increasingly higher worse impacts.
The same two numbers in brackets for a specific Impact Section means that these proposals would have the same impacts if implemented.
An X denotes either a project-specific significant adverse impact or cumulative significant adverse impact.
A ✓ denotes no significant adverse impact or no cumulative significant adverse impact.

Proj. = Project-Specific Impacts
Cum. = Cumulative Impacts

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REFERENCES

REFERENCES

Buoni, 1996. Laidlaw Environmental. Personal communication with K. Carretti, Harding Lawson Associates. June 4, 1996.

California Gas and Electric, 1994. California Gas Report.

CARB, 1998. Draft 1998 Architectural Coatings Survey.

Carter, William P.L. 1995. "Investigation of Atmospheric Reactivities of Selective Stationary Source Volatile Organic Compounds," Report to California Air Resources Board. October 3, 1995.

Carter, William P. L. 1998. "Updated Maximum Incremental Reactivity Scale for Regulatory Applications," Preliminary Report to California Air Resources Board, Contract No. 95-308. August 1998.

CMA, 1995. "A Review of the Uses and Health Effects of Ethylene Glycol Monobutyl Ether." Chemical Manufacturers Association, 1995.

Frink, Dan. 1996. State Water Resources Control Board. Personal communication with T. Harder, Harding Lawson Associates. May 31,1996.

Harley, et al., 1992, "Respeciation of Organic Gas Emissions and the Detection of Excess Unburned Gasoline in the Atmosphere." Environmental Science Technology., Volume 26. California Institute of Technology. November 1992.

Kirby, Lorna. 1996. Department of Toxic Substances Control. Personal communication with K. Carretti, Harding Lawson Associates, May, 1996.

Monahan, Michael A. et al., 1993. California Environmental Law Handbook, 7th ed., Government Institutes, Inc. 1993.

Mobay's Occupational and Product Safety Department, 1988. "Field Monitoring Studies of Two-Component IM System Containing HDI Poly-Isocyanate from the Painting of a Bridge and a Chemical Manufacturing Plant."

Muir, Bob. 1996. Metropolitan Water District. Personal Communication with T. Harder, Harding Lawson Associates. June 3, 1996.

NIOSH, 1987a. NIOSH Guide to Industrial Respiratory Protection. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 87-116.

NIOSH, 1987b. NIOSH Respirator Decision Logic. U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 87-108.

Remy, et al., 1996. Guide to the California Environmental Quality Act, 9th ed. July 1996.

Rodrigo, Dan. 1996. Metropolitan Water District. Personal Communication with T. Harder, Harding Lawson Associates. June 6, 1996.

RWQCB,1993. Regional Water Quality Control Board, Los Angeles Region. Draft Update: Water Quality Control Plan, Los Angeles Region. December 23, 1993.

SCAG, 1987. Draft Baseline Projection. February 1987.

SCAG, 1993. Draft State of the Region Report. December 1993.

SCAQMD, 1993a. "VOC Studies for Rules 1113/1129," SCAQMD (prepared by Woodward-Clyde Consultants). March 1993.

SCAQMD, 1993b. CEQA AIR Quality Handbook. SCAQMD. November 1993.

SCAQMD, 1996. 1997 Air Quality Management Plan. SCAQMD. November 1996.

Schempp, Bob. 1996. Metropolitan Water District. Personal Communication with T. Harder, Harding Lawson Associates. June 6, 1996.

Turek, Paul. 1996. Chemical Waste Management. Personal communication with K. Carretti, Harding Lawson Associates. May 31, 1996.

USEPA, 1995. "Study of Organic Compound Emissions from Gas and Commercial Products, Report to Congress." United States Environmental Protection Agency. March 1995

APPENDIX A

PROPOSED AMENDED RULE 1113

In order to save space and avoid repetition, please refer to the latest version of the proposed amended rule located elsewhere in the rule package.

Original hard copies of this Final Subsequent Environmental Assessment, which includes the proposed rule, can be obtained through the SCAQMD Public Information Center at the Diamond Bar headquarters or by calling (909) 396-3600.

APPENDIX B

NOTICE OF PREPARATION AND INITIAL STUDY

South Coast
Air Quality Management District
21865 E. Copley Drive, Diamond Bar, CA 91765-[illegible]82
(909) 396-2000 · http://www.aqmd.gov

October 27, 1998

SUBJECT: **NOTICE OF PREPARATION OF A DRAFT SUBSEQUENT ENVIRONMENTAL ASSESSMENT**

PROJECT TITLE: **PROPOSED AMENDMENTS TO RULE 1113: ARCHITECTURAL COATINGS**

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and will prepare a subsequent environmental assessment (SEA) for the project identified above pursuant to its certified regulatory program (SCAQMD Rule 110). This project was previously considered in the SCAQMD's 1997 AQMP and associated Program Environmental Impact Report (EIR) as well as the 1990 Environmental Assessment (EA) for amended Rule 1113. The proposed amended rule will reduce VOC emissions from certain architectural coatings. The purpose of this Notice of Preparation (NOP) is to inform appropriate government agencies that a Draft SEA is being prepared, and to solicit comments on the environmental areas within each agency's jurisdiction.

In conjunction with the development of the proposed amended rule, it is necessary to address the affects of the proposed amended rule on the environment. The SCAQMD is preparing appropriate environmental analyses consistent with CEQA. This NOP serves two purposes: to solicit information on the scope of the environmental analysis for the proposed project and notify the public that the SCAQMD will prepare a Draft SEA to the 1997 AQMP EIR and 1990 EA to assess potential environmental impacts that may result from implementing the proposed amended rule. If potential adverse impacts are identified, the Draft SEA will also discuss feasible mitigation measures to reduce potential significant adverse environmental impacts. The Draft SEA will also include a discussion of all other topics required by CEQA.

The attached materials are not SCAQMD applications or forms requiring a response from you. Their purpose is simply to provide information to you on the above project. If the proposed project has no bearing on you or your organization, no action on your part is necessary.

The project's description, location, and potential environmental impacts are described in the Initial Study for the proposed project that is attached to this NOP. This NOP and Initial Study are available for a 30-day review and comment period. Comments focusing on your area of expertise, your agency's area of jurisdiction, or scope of the project alternatives should be addressed to Mr. Darren W. Stroud (c/o Office of Planning, Transportation and Information Management) at the address shown above, or sent by FAX to (909) 396-3324. Comments must be received no later than 5:00 PM on December 1, 1998. Please include the name and phone number of the contact person for your agency.

Project Applicant: N/A

Date: October 27, 1998 **Signature:** Steve Smith

Steve Smith
Title: Program Supervisor

Telephone: (909) 396-3054

Reference: California Code of Regulations, Title 14, Sections 15082(a), 15103, and 15375

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

INITIAL STUDY FOR THE DRAFT SUBSEQUENT ENVIRONMENTAL ASSESSMENT FOR:

PROPOSED AMENDED RULE (PAR) 1113 - ARCHITECTURAL COATINGS

October 27, 1998

Director
Planning and Policy
Elaine Chang, Dr.PH.

Planning Manager
Planning and Policy
Henry Hogo

Author: Darren W. Stroud - Air Quality Specialist

Reviewed by: Steve Smith, Ph.D. - Program Supervisor
Bill Wong – Senior Deputy District Counsel

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD

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Cities Representative, Los Angeles County, Western Region

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Supervisor, Fifth District
Los Angeles County Representative

MEE HAE LEE
Senate Rules Committee Appointee

RONALD O. LOVERIDGE
Mayor, City of Riverside
Cities Representative, Riverside County

JON D. MIKELS
Supervisor, Second District
San Bernardino County Representative

LEONARD PAULITZ
Councilmember, City of Montclair
Cities Representative, San Bernardino County

JAMES SILVA
Supervisor, Second District
Orange County Representative

NELL SOTO
Councilmember, City of Pomona
Cities Representative, Los Angeles County, Eastern Region

S. ROY WILSON
Supervisor, Fourth District
Riverside County Representative

PAUL A. WOODRUFF
Governor's Appointee

ACTING EXECUTIVE OFFICER:

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CHAPTER 1

PROJECT DESCRIPTION

Introduction
Project Location
Background
Project Description
Projected Emission Reductions
Alternatives
Initial Environmental Impacts

INTRODUCTION

The proposed amended Rule (PAR) 1113 – Architectural Coatings, is a "project" as defined by the California Environmental Quality Act (CEQA). California Public Resources Code §21080.5 allows public agencies with regulatory programs to prepare a plan or other written document in lieu of an environmental impact report once the Secretary of the Resources Agency has certified the regulatory program. The South Coast Air Quality Management District's (SCAQMD) regulatory program was certified by the Secretary of the Resources Agency on March 1, 1989, and is codified as SCAQMD Rule 110. Pursuant to Rule 110 (the rule which implements the SCAQMD's certified regulatory program), SCAQMD is preparing a Draft Subsequent Environmental Assessment (SEA) to evaluate potential adverse impacts from amending Rule 1113.

CEQA requires that the potential adverse environmental impacts of proposed projects be evaluated and that methods to reduce or avoid identified significant adverse environmental impacts of these projects be implemented if feasible. The purpose of the Draft SEA is to inform the SCAQMD's Governing Board, public agencies, and interested parties of potentially significant adverse environmental impacts that could result from implementing the proposed project.

This Initial Study is intended to provide information about the proposed project to other public agencies and interested parties prior to the release of the Draft SEA. The Initial Study is being released for a 30-day review period. Written comments on the scope of the environmental analysis and possible project alternatives received by the SCAQMD during the 30-day review period will be considered when preparing the Draft EA.

The SCAQMD was created by the California legislature in 1977[1] as the public agency responsible for developing and enforcing air pollution control regulations in the areas within its jurisdiction. By statute, the SCAQMD is required to adopt or amend and enforce rules that will reduce air pollutant emissions in order to attain and maintain federal and state ambient air quality standards. If the area within SCAQMD's jurisdiction is to comply with the state and federal ambient air quality standards for ozone, further reductions from sources that generate volatile organic compounds (VOCs) are required.

Unlike primary criteria pollutants that are emitted directly from an emission source, ozone is a secondary pollutant. It is formed in the atmosphere through photochemical reactions of VOC, NO_x, and other hydrocarbon materials with sunlight. Ozone is a deep lung irritant, causing air passages to become inflamed and swollen. Exposure to ozone

[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. Stat. ch. 324 (codified at H & S Code, Sections 40400 - 40540).

produces alterations in respiration, the most characteristic of which is shallow, rapid breathing and a decrease in pulmonary performance. Ozone reduces the respiratory system's ability to fight infection and to remove foreign particles. People who suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis are more sensitive to ozone's effects. In severe cases, ozone is capable of causing death from pulmonary edema. Early studies suggested that long-term exposure to ozone results in adverse effects on morphology and function of the lung and acceleration of lung-tumor formation and aging. Ozone exposure also increases the sensitivity of the lung to bronchoconstrictive agents such as histamine, acetylcholine, and allergens.

It should be noted that there are no state or federal ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because a reduction in VOC emissions reduces certain chemical reactions that contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

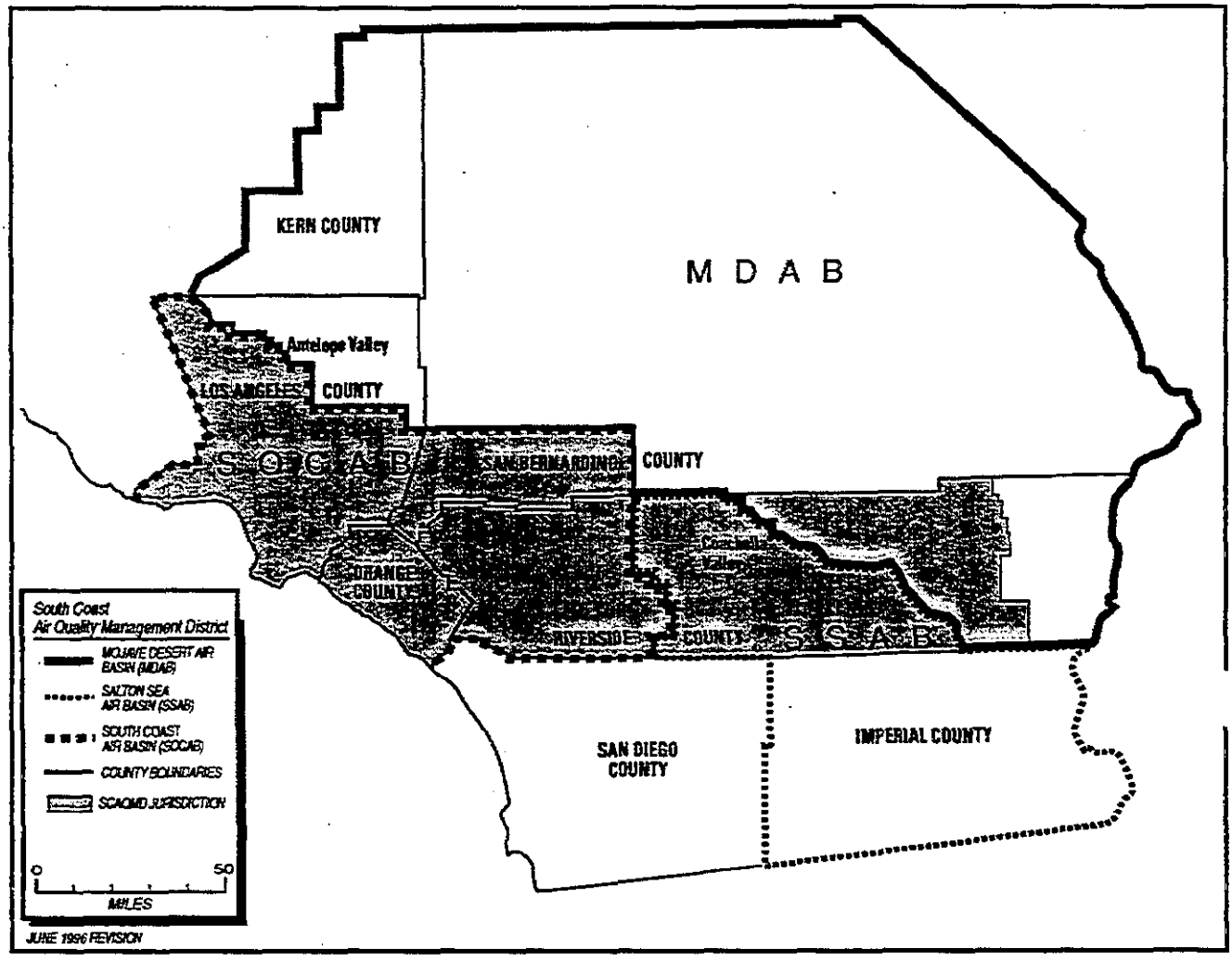
Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOC because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

PROJECT LOCATION

The district has one of the worst air quality problems in the nation. Though there have been significant improvements in air quality in the district over the last decade and a half, some air quality standards are still exceeded frequently and by a wide margin.

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles (referred to hereafter as the district), consisting of the four-county South Coast Air Basin (Basin), the Riverside County portions of the Salton Sea Air Basin (SSAB), and the Mojave Desert Air Basin (MDAB) (both formerly part of the Southeastern Desert Air Basin). The Basin, which is a subarea of the district, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside county portion of the SSAB and MDAB are bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Planning Area) is a subregion of Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 1-1).

Figure 1-1
South Coast Air Quality Management District



BACKGROUND

VOC emissions from architectural coating operations are regulated by SCAQMD Rule 1113. Under this Rule, emissions are controlled by limiting the VOC content, measured in grams per liter, of the architectural coatings sold and applied in the district. Architectural coatings are defined by their application and use and include coatings which are applied to stationary structures including residential and commercial buildings; billboards; curbs and roads; and mobile homes. VOCs are emitted to the atmosphere from the evaporation of organic solvents used in industrial maintenance coatings, nonflats, flats, primers/sealers/undercoaters, waterproofing sealers, varnishes, wood preservatives, lacquers, fire retardant coatings, etc. The current Rule and PAR 1113 apply to those persons who supply, sell, apply, solicit the application of, and manufacture such coatings.

Rule 1113 was originally adopted September 2, 1977 to regulate the VOC emissions from the application of architectural coatings, and has been amended several times since the date of adoption, mostly to exempt certain coating categories from the 250 grams per liter (g/l) exterior coating VOC limit and 350 g/l interior coating VOC limit. In contrast to the earlier amendments, the rule was amended on February 2, 1990 to further reduce VOC emissions from certain, previously exempted coating categories. The February 2, 1990 limits were based primarily on the California Air Resources Board (CARB) Suggested Control Measure (SCM) for architectural and industrial maintenance coatings. A consortium of California air pollution control districts, the CARB, U. S. Environmental Protection Agency Region IX, and paint manufacturers developed the provisions in the SCM. Upon adoption of the lower VOC limits, coating manufacturers sued the District, along with other air districts, over issues that they felt were not adequately addressed in the staff report or in the CEQA document. The suit stayed portions of the February 1990 amendments, as specified in the Superior Court judgment. Subsequent rule amendments adopted November 1990, December 1990, and September 1991 were not subject to the court judgment. The most recent amendments to Rule 1113 were adopted on November 8, 1996, and resulted in a net emission reduction of 10.3 tons per day of VOC. Subsequently, industry filed three separate lawsuits, questioning the validity of the proposed future limits for the lacquer and flat coating categories. The District has prevailed in all three cases.

In an effort to better understand the state of coating technology for industrial maintenance coatings, non-flats, and other coatings, the SCAQMD in Spring 1996 contracted with Eastern Michigan University (EMU) to conduct an informational study. The EMU study generally found that high-VOC, low-VOC, and zero-VOC coatings were commercially available for industrial maintenance; non-flats; primers, sealers, and undercoaters; water-proofing sealers; and stains coatings. Unfortunately, the EMU study found that durability information for the low- and zero-VOC coatings in these coating categories was not widely available. This finding was to a certain extent based on the fact that coatings manufacturers did not supply durability information on their low- and zero-VOC coatings. As a result, the EMU study recommended that side-by-side comparisons be made between low- and zero-VOC coatings with high-VOC coatings.

Due to the lack of durability information contained in the EMU study, the District has contracted with National Technical Systems (NTS) to conduct a comparative study that will evaluate the durability and application characteristics of the following coating categories: industrial maintenance; non-flats; primers, sealers, and undercoaters; water-proofing sealers; and stains. The final report will provide side-by-side comparisons for the aforementioned coatings and discuss results pertaining to overall performance. A total of 114 coatings will be included in the study. Preliminary laboratory data is expected by late November 1998.

In addition to the NTS study, CARB is currently in the process of refining their architectural coatings inventory for the state of California. The current inventory is based on 1990 industry sales data. The current inventory update would be based on 1996 industry sales data. CARB has requested not only the 1996 sales information for various coating categories, but also speciation profiles for each coating category. This updated inventory will assist staff in evaluating the current emissions inventory from use of architectural coatings, as well as providing a more accurate estimate of the emission reductions that can be achieved from each of the coating categories affected by the proposed amendments. The CARB 1998 architectural emissions inventory is expected to be completed by late November 1998.

PROJECT DESCRIPTION

The primary objective of PAR 1113 is to readopt portions of the definitions and lower VOC limits that were originally adopted on February 2, 1990, and overturned by the Superior Court on August 21, 1990. Additionally, PAR 1113 seeks to implement, in part, the 1997 AQMP control measure CTS-07, which calls for a 50 percent reduction in VOC emissions from architectural coatings by 2010 and the federally enforceable 1994 AQMP, which calls for a 75 percent reduction. This represents a 30 tons per day VOC reduction by 2010 from this area source category and is one of the largest emission reduction control measures in the 1997 AQMP. The November 1996 amendments to Rule 1113, which lowered the VOC content limits from lacquers, flats (interior and exterior), traffic coatings, and multi-color coatings, are projected to reduce VOC emissions by 10.3 tons per day by 2010. Based on the current inventory, PAR 1113 is projected to reduced VOC emissions by an additional 19.7 tons per day by 2010.

To achieve the additional 19.7 tons per day of VOC emission reductions called for in control measure CTS-07, PAR 1113 would lower the allowable VOC content per liter of coating from industrial maintenance (IM) coatings, non-flats, primers, sealers, and undercoaters, quick-dry enamels, and waterproof sealers. PAR 1113 would also delete the current exemption for quick-dry primers, sealers, and undercoaters. Although not included in the proposed amendments, staff is currently evaluating the feasibility of expanding the existing Rule 1113 averaging provision to include additional coating categories.

Additionally, PAR 1113 will expand the "Averaging Provision" to include the coating categories that will be impacted. However, this proposed change has not yet been included in the proposed rule language because staff would like to discuss if averaging is feasible. For a complete description of PAR 1113, the reader is referred to Appendix A of this Initial Study.

PROJECTED EMISSIONS REDUCTIONS

The implementation of PAR 1113 is currently estimated to result in 19.7 tons per day of VOC emission reductions on an annual average inventory basis and 23.3 tons per day on the summer planning inventory basis by the year 2010. The table below summarizes the current proposed changes in VOC limits and the associated projected emission reductions. However, the results and information provided by the NTS study and the CARB 1998 architectural emissions inventory could change the emission limits and reduction estimates listed in Table 1-1.

Table 1-1
PAR 1113 Proposed Emission Limits and Projected Emission Reductions for Affected Coating Categories

Coating Category	Current Limit[1] (g/l)	Proposed Limit[1] (g/l)	Annual Average Emission Reductions (tons/day)	Summer Planning Emission Reductions (tons/day)
Industrial Maintenance Coatings	420	100 (effective 07/01/2001) 50 (effective 07/01/2005)	5.3	6.3
Non-Flats	250	100 (effective 07/01/2001) 50 (effective 07/01/2005)	8.9	10.5
Quick-Dry Enamel	400	100 (effective 07/01/2001) 50 (effective 07/01/2005)	TBD	TBD
Primers, Sealers, Undercoaters (PSU)	350	100 (effective 07/01/2001) 50 (effective 07/01/2005)	4.0	4.7
Quick-Dry PSU	Exempt[2]	100 (effective 07/01/2001) 50 (effective 07/01/2005)	1.5	1.8
Stains	350	250 (effective 07/01/2001)	TBD[3]	TBD
Water-Proofing Sealers	400	250 (effective 7/1/2001)	TBD	TBD
		Total	**19.7[4]**	**23.3**

[1] Grams of VOC per liter of coating, less water and less exempt compounds
[2] Currently exempt if manufacturers reports sales data
[3] TBD – To be determined upon completion of the NTS study and CARB 1998 architectural emissions inventory survey.

[4] Estimated emission reductions based on 1990 sales info. (1994 CARB Survey).

ALTERNATIVES

The Draft SEA will discuss and compare alternatives to the proposed project pursuant to SCAQMD Rule 110 and CEQA Guidelines §15252, which require discussion of reasonable alternatives to avoid or reduce potentially significant effects and that feasibly attain the basic objectives of the proposed project. The purpose of the discussion of alternatives is to foster informed decision making and public participation. A CEQA document need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.

Some alternatives that are currently under consideration for inclusion in the Draft SEA are summarized below.

- Low Vapor Pressure Exemption - VOC emission limits would be based on the volatility of affected coatings' VOC compounds rather than the VOC content of the coating. Thus, under this alternative, VOC compounds with low vapor pressures may be exempted as a VOC from the overall VOC content of the coating.

- Performance-based standards – Emission standards would be based on VOC emissions per area covered per year rather than VOC content of the coatings.

- Reactivity – VOC emission limits would be based on the ozone reactivity of affected coatings' VOC compounds rather than the VOC content of the coating.

- Product Line Averaging – Rather than a coating manufacturer having to meet a specific VOC content limit for each specific product line, this alternative would allow averaging for all product lines.

- Regional Deregulation – Areas in the district that do not have an ozone problem or contribute to the SCAQMD's ozone problem would be exempted from the VOC content requirements of the proposed amendments. Since the district has high NOx levels that contribute to the district's ozone problems, this alternative is not currently applicable. However, as NOx levels decrease in the future and the district reaches attainment for ozone, this alternative may be feasible. Thus, this alternative will be analyzed for its future applicability.

- Seasonal Approach – Low-VOC content limits for various coatings would only be in effect during the "high ozone season" (i.e., typically the summer months). During the "low ozone season" (i.e., typically the winter months), affected coatings with higher VOC content limits could be used.

- VOC Content Limits / Final Compliance Deadlines – As a result of information obtained from industry or through various studies and surveys, the proposed VOC content limits and/or final compliance deadlines as shown above in Table 1-1 may be modified.

SCAQMD Rule 110 (the rule that implements the SCAQMD's certified regulatory program) does not impose any greater requirements for a discussion of project alternatives in an environmental assessment than is required for an EIR under CEQA.

Written suggestions on project alternatives received during the comment period for the NOP will be considered when preparing the Draft SEA.

INITIAL ENVIRONMENTAL EVALUATION

Chapter 2 of this Initial Study contains an environmental checklist that was prepared to identify potentially significant adverse environmental impacts, and will determine the scope of the analysis in the Draft EA. Items checked as having a "Potentially Significant Impact" will be analyzed further in the Draft EA.

CHAPTER 2

ENVIRONMENTAL CHECKLIST

Introduction

General Information

Environmental Factors Potentially Affected

Determination

Evaluation of Environmental Impacts

INTRODUCTION

The environmental checklist provides a standard evaluation tool to identify a project's adverse environmental impacts. A sample checklist form is provided in the State CEQA Guidelines, Appendix I. The SCAQMD has slightly modified the Appendix I checklist, but it still addresses all areas identified in the Appendix I checklist. This checklist identifies and evaluates potential adverse environmental impacts that may be created by the proposed project.

GENERAL INFORMATION

Name of Project Proponent:	South Coast Air Quality Management District
Address of Proponent:	21865 E. Copley Drive
	Diamond Bar, CA 91765
Lead Agency:	South Coast Air Quality Management District
Name of Project:	Proposed Amended Rule 1113

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental areas marked with an "✓" (checkmark) have the potential to be adversely affected by the proposed project. A checkmark of potentially significant impact does not mean the proposed project will have a significant impact but requires further evaluation, which may lead to an ultimate determination of no significant impact. An explanation relative to the determination of each of the areas can be found in the expanded checklist that follows.

☐	Land Use and Planning	☐	Population and Housing	☐	Geophysical
☑	Water	☑	Air Quality	☐	Transportation/ Circulation
☐	Biological Resources	☐	Energy and Mineral Resources	☐	Hazards
☐	Noise	☑	Public Services	☐	Solid/Hazardous Waste
☐	Aesthetics	☐	Cultural Resources	☐	Recreation
☑	Mandatory Findings of Significance				

DETERMINATION

On the basis of this initial evaluation:

☐ I find the proposed project, in accordance with those findings made pursuant to CEQA Guideline § 15252, could NOT have a significant effect on the environment, and that an ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will NOT be significant effects in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED ENVIRONMENTAL ASSESSMENT with no significant impacts will be prepared.

☑ I find that the project MAY have a significant effect(s) on the environment, and an ENVIRONMENTAL ASSESSMENT will be prepared.

Date: August 21, 1998

Signature: Steve Smith

Steve Smith, Ph.D.
Program Supervisor

EVALUATION OF ENVIRONMENTAL IMPACTS

	Potentially Significant Impact	No Impact
I. LAND USE AND PLANNING. *Would the proposal:*		
a) Conflict with general plan designation or zoning?	☐	☑
b) Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project?	☐	☑
c) Affect agricultural resources or operations (e.g. impacts to soils or farmlands, or impacts from incompatible land uses)?	☐	☑
d) Disrupt or divide the physical arrangements of an established community (including a low-income or minority community)?	☐	☑

Discussion:

Implementation of the proposed amendments to Rule 1113 will not cause significant adverse impacts to land uses or land use planning in the district. It is anticipated that any increased activities will occur at existing facilities or sites. Thus, no new resources or facilities are expected to be constructed which would result in any land use impacts.

No new development or alterations to existing land use designations will occur as a result of the implementation of the proposed amended Rule (PAR) 1113. It is not anticipated that the use of compliant Rule 1113 coatings in the district would require additional land to continue current operations or require rezoning. Therefore, no significant adverse impacts affecting existing or future land uses are expected.

	Potentially Significant Impact	No Impact
II. POPULATION AND HOUSING. *Would the proposal:*		
a) Cumulatively exceed official regional or local population projections?	☐	☑
b) Induce substantial growth in an area either directly or indirectly (e.g. through projects in an undeveloped area or extension of major infrastructure)?	☐	☑
c) Displace existing housing, especially affordable housing?	☐	☑

Discussion:

Human population in the district is anticipated to grow regardless of implementing PAR 1113. The proposed amendments will primarily affect the formulation of architectural coatings and are not

anticipated to generate any significant effects, either direct or indirect on the district's population as no additional workers are anticipated to be required to comply with the proposed amendments. Further, PAR 1113 is not expected to cause a relocation of population within the district. As a result, housing in the district is expected to be unaffected by the proposed amendments. New housing construction is not expected to be affected by the use of lower-VOC coatings.

Additionally, adoption of PAR 1113 is not expected to contribute to any significant housing cost increases because reformulated coatings are currently being sold at comparable prices as "traditional" higher-VOC coatings. Direct economic impacts are not required to be analyzed pursuant to CEQA unless they also have a significant, direct effect on physical environmental parameters. Cost impacts associated with implementation of PAR 1113 will be discussed in the District's Socioeconomic Impact Assessment (under separate cover).

	Potentially Significant Impact	No Impact
III. GEOPHYSICAL. *Would the proposal result in or expose people to potential impacts involving:*		
a) Seismicity: fault rupture, ground shaking, seiche or tsunami?	☐	☑
b) Landslides or mudslides?	☐	☑
c) Erosion, changes in topography or unstable soil conditions from excavation, grading or fill?	☐	☑
d) Subsidence of land?	☐	☑

Discussion:

Architectural coatings are applied to buildings, stationary structures, roads, etc. The proposed amendments affect coating formulators and have no effects on geophysical formations in the district. Additionally, since add-on control equipment will not be used to reduce VOC emissions from architectural coatings, PAR 1113 is not expected to result in additional exposure of people to potential impacts involving seismicity, landslides, mudslides or erosion as no new development is anticipated.

	Potentially Significant Impact	No Impact
IV. WATER. *Would the proposal result in:*		
a) Changes in adsorption rates, drainage patterns, or the rate and amount of surface runoff?	☐	☑
b) Exposure of people or property to water related hazards such as flooding?	☐	☑
c) Discharge into surface waters or other alteration of surface water quality (e.g. temperature, dissolved oxygen or turbidity)?	☑	☐

d) Changes in the amount of surface water in any water body?	☐	☑
e) Changes in currents, or the course or direction of water movements?	☐	☑
f) Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?	☐	☐
g) Altered direction or rate of flow of groundwater	☐	☐
h) Impacts to groundwater quality?	☑	☐
i) A need for new water treatment, distribution, sewer or storm water drainage systems?	☑	☐

Discussion:

Many architectural coatings manufacturers are expected to meet the lower VOC limits in PAR 1113 by reformulating or substituting VOC-containing materials with other substances (e.g., water-based, non-toxic, and/or VOC-free materials). The expanded use of reformulated materials to replace VOC-containing materials has the potential to adversely affect both water demand and water quality (e.g., surface water and groundwater). As the production of water-based materials increases, for example, there could be a greater demand for water from those industries that manufacture the water-based materials. In addition, use of water based coatings may generate increased amounts of wastewat[illegible] coating applications. Water used for equipment cleanup and unused product may contain haz[illegible]s materials in excess of levels permitted in wastewater discharges. This wastewater may be discharged into storm drains and sanitary sewers and may, therefore, alter surface water quality. Additionally, wastewater from clean-up activities could be dumped on the ground, which may infiltrate into the water table, thus, affecting groundwater quality. These water impacts will be evaluated in more detail in the Draft SEA.

	Potentially Significant Impact	No Impact
V. AIR QUALITY. *Would the proposal:*		
a) Violate any air quality standard or contribute to an existing or projected air quality violation?	☑	☐
b) Expose sensitive receptors to pollutants?	☐	☑
c) Alter air movement, moisture, or temperature, or cause any change in climate?	☐	☑
d) Create Objectionable odors?	☑	☐
e) Diminish an existing air quality rule or future compliance requirement resulting in a significant increase in air pollutant(s).	☑	☐

Discussion:

During promulgation of past amendments to Rule 1113 in which the VOC content limits of various coating categories were lowered, the SCAQMD received comments that estimated emission reductions would not be as great as originally anticipated for eight reasons, which are summarized.

More Thickness

Coating manufacturers and coating contractors assert that reformulated compliant water- and solvent-based coatings are very viscous (e.g., high-solids content) and difficult to handle during application, tending to produce a thick film when applied directly from the can. A thicker film indicates that a smaller surface area is covered with a given amount of material, thereby increasing VOC emissions per unit of area covered.

More Thinning

Because reformulated compliant water- and solvent-based coatings are more viscous (e.g., high-solids content), coating manufacturers and coating contractors assert that painters have to adjust the properties of the coatings to make them easier to handle and spread. Especially, for solvent-based coatings this adjustment consists of thinning the coating as supplied by the manufacturer by adding solvent to change the viscosity of the coating. The added solvent increases VOC emissions back to or sometimes above the level of older formulations. With water-based coatings, thinning is not an issue because water is the solvent used to thin these coatings.

More Priming

Coating manufacturers and coating contractors assert that reformulated compliant water- and low-VOC solvent-based topcoats do not adhere as well as higher-VOC solvent-based topcoats to unprimed substrates. Therefore, the substrates must be primed with typical solvent-based primers to enhance the adherence quality. Additionally, water-based sealers do not penetrate and seal porous substrates like wood, as well as traditional solvent-based sealers. This results in three or four coats of the sealer per application compared to one coat for a high-quality solvent-based sealer.

More Topcoats

Coating manufacturers and coating contractors assert that reformulated compliant water- and low-VOC solvent-based topcoats may not cover, build, or flow-and-level as well as the solvent-based formulations. Therefore, more coats are necessary to achieve equivalent cover and coating build-up.

More Touch-Ups and Repair Work

Coating manufacturers and coating contractors assert that reformulated compliant water- and low-VOC solvent-based formulations dry slowly, and are susceptible to damage such as sagging, wrinkling, alligatoring, or becoming scraped and scratched. The high-solids solvent-based enamels tend to yellow in dark areas. Water-based coatings tend to blister or peel, and also result in severe blocking problems. All of these problems require additional coatings for repair and touch-up.

More Frequent Recoating

Coating manufacturers and coating contractors assert that the durability of the reformulated compliant water- and low-VOC solvent-based coatings is inferior to the durability of the traditional solvent-based coatings. Durability problems include cracking, peeling, excessive chalking, and color fading, which all typically result in more frequent recoating.

More Reactivity

Different types of solvents have different degrees of "reactivity", which is the ability to accele[illegible] the formation of ground-level ozone. Coating manufacturers and coating contractors assert that the reformulated compliant water- and low-VOC solvent-based coatings contain solvents that are more reactive than the solvents used in higher-VOC solvent-based formulations. Furthermore, water-based coatings perform best under warm, dry weather conditions, and are typically recommended for use between May and October. Since ozone formation is also dependent on the meteorological conditions, use of waterborne coatings during this period increases the formation of ozone.

Substitution

Coating manufacturers and coating contractors assert that since reformulated compliant water- and low-VOC solvent-based coatings are inferior in durability and are more difficult to apply, consumers and contractors will substitute better performing coatings in other categories for use in categories with low compliance limits. An example of this substitution could be the use of a non-flat coating (currently with a higher compliance limit) in place of a low-VOC, flat coating on interior drywall.

All of these issues will be analyzed in more detail in the Draft SEA.

Regarding secondary emissions from power plants providing power to special spray equipment used to apply reformulated coatings, it is expected that current district baseline emissions will not increase. Currently, almost 75 percent of the electricity used in the district is imported from out-of-state power plants. Any additional electricity needed to power special spray equipment would most likely be provided by out-of-state power plants. Furthermore, any in-district power generation would be provided by facilities subject to the requirements of SCAQMD Regulation XX - Regional Clean Air M[illegible]s (RECLAIM) or Rule 1135 - Emission of Oxides of Nitrogen From Electric Power Generating S[illegible]. These rules cap emissions from power generating facilities and require the emissions to be reduced over time. Therefore, secondary emissions from power plants are not expected to be significant and will not be evaluated further.

Toxics

The SCAQMD has also received comments in the past that compliant low-VOC coatings are often formulated with toxic compounds. As a result, material replacement or reformulation to reduce the use of high-VOC solvent-based coatings has the potential to result in health risks associated with exposure to both carcinogenic and noncarcinogenic toxic air contaminants. Material reformulation or substitution may result in increased use of acetone, a compound that has been delisted as a VOC by EPA, and will not be regulated by the AQMD. Increased application of acetone-based coatings has the potential to increase objectionable odors. The toxic air impacts and potential odor impacts will be evaluated in more detail in the Draft SEA.

	Potentially Significant Impact	No Impact
VI. TRANSPORTATION/CIRCULATION. *Would the proposal result in:*		
a) Increased vehicle trips or traffic congestion?	☐	☑
b) Hazards to safety from design features (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?	☐	☑
c) Inadequate emergency access or access to nearby uses?	☐	☑
d) Insufficient parking capacity on-site or off-site?	☐	☑
e) Hazards or barriers for pedestrians or bicyclists?	☐	☑
f) Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☑
g) Rail, waterborne or air traffic impacts?	☐	☑

Discussion:

The proposed amendments will not substantially increase the amount of businesses or equipment in the district. The main effect of the proposed amendments will be to alter the way certain architectural coatings are manufactured. PAR 1113 will not result in a substantial increase in vehicle trips throughout the entire district from the transportation of compliant water-based or low-VOC solvent-based coatings. Even if more frequent application of complaint coatings may occur as a result of the implementation of PAR 1113, the frequency and concentration of daily trips to and from any one location in the district (e.g., manufacturer to distribution center, manufacturer to retail painting store, contractor to retail painting store, or do-it-yourselfer to retail painting store) is not expected to cause significant traffic impacts. Therefore, potential increases in traffic or alterations of traffic patterns are not anticipated from the manufacture, delivery, and use of compliant PAR 1113 coatings.

Coating performance and durability issues will be discussed relative to potential indirect air quality impacts in the Air Quality Impacts section of the Draft SEA.

	Potentially Significant Impact	No Im
VII. BIOLOGICAL RESOURCES. *Would the proposal result in impacts to:*		
a) Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)?	☐	☑
b) Wildlife dispersal or migration corridors?	☐	☑

Discussion:

PAR 1113 is not expected to adversely affect existing plant or animal species or communities, unique or endangered plant or animal species, or agricultural crops. Improvements in air quality from PAR 1113 are expected to provide health benefits to plant, animal species as well as the human residents in the district. No significant adverse impacts to biological resources are expected to result from the proposed rule amendments because PAR 1113 is expected to affect facilities in residential, industrial or commercial areas where biological resources are already severely disturbed.

	Potentially Significant Impact	No Impact
VIII. ENERGY AND MINERAL RESOURCES. *Would the proposal:*		
a) Conflict with adopted energy conservation plans?	☐	☑
b) Use non-renewable resources in a wasteful and inefficient manner?	☐	☑

Discussion:

Electricity

Because add-on control equipment is not expected to be used to comply with the provisions of PAR 1113, no additional energy use is expected to be required. Additionally, PAR 1113 will not substantially increase the number of businesses or amount of equipment in the district. Furthermore, energy usage associated with providing power for special spray equipment used to apply reformulated coatings, is expected to be negligible. Currently, almost 75 percent of the electricity used in the district is imported from out-of-state power plants. Thus, there is a substantial amount of unused generating capacity in the basin. Any additional electricity needed to power special spray equipment would most likely be provided by out-of-state power plants. Any incremental power generation necessary to power special spray-equipment operation would be negligible compared to overall in-district generation and could be easily met by existing in-district capacity. Therefore, no increases in energy consumption or mineral resources are expected from the implementation of PAR 1113. Consequently, energy impacts are not considered to be significant.

Natural Gas

The consumption of natural gas in the district is not expected to increase as a result of the implementation of PAR 1113. Electricity will be the primary source of energy used to power the spraying equipment operated at various sites. Consequently, natural gas energy impacts from implementing PAR 1113 are not considered to be significant.

Fossil Fuels

PAR 1113 is also expected not to substantial increase energy consumption from non-renewable resources (e.g., diesel and gasoline) above current district usage levels. Any incremental fuel usage from trips associated with more frequent application of complaint coatings are expected to be negligible. There are sufficient supplies of gasoline and diesel to meet the small fuel demands from transport trips associated with more frequent application of complaint coatings. Therefore, fossil fuel energy impacts from implementing PAR 1113 are not considered to be significant.

	Potentially Significant Impact	No Impact
IX. HAZARDS. *Would the proposal involve:*		
a) A risk of accidental explosion or release of hazardous substances (including, but not limited to: oil, pesticides, chemicals or radiation)?	☐	☑
b) Possible interference with an emergency response plan or emergency evacuation plan	☐	☑
c) The creation of any health hazards or potential health hazard?	☐	☑
d) Exposure of people to existing sources of potential health hazards?	☐	☑
e) Increased fire hazard in areas with flammable brush, grass, or trees?	☐	☑

Discussion:

Risk of Upsets

Some coating manufacturers may elect to comply with the VOC content limits of PAR 1113 by reformulating their coatings with the acetone (exempt solvent). During past promulgation of amendments to various SCAQMD coating and solvent rules (e.g., 102, 1107, 1113, 1136, etc.) the SCAQMD received comments that acetone could result in hazards impacts (e.g., risk of fire or explosion) because of its flammability. The SCAQMD has extensively analyzed the alleged hazards impacts associated with the reformulation of coatings with acetone in EAs for 102, 1107, 1113, and 1136 as well as the 1997 AQMP and has concluded that the reformulation of acetone will not create significant hazards impacts on a project-specific basis. Thus, the project-specific hazards impacts associated with the implementation of PAR 1113 are also considered insignificant. Furthermore, any increase in accidental releases of compliant acetone-based coatings would be expected to result in a concurrent reduction in the number of accidental releases of existing coating materials. In addition,

cumulative hazards impacts associated with the reformulation of acetone are not considered significant because in the incremental increase from the reformulation of acetone associated w e implementation of PAR 1113 are negligible.

Human Health

The SCAQMD has also received comments in the past that to meet some proposed VOC content limits, manufacturers would have to use hazardous coalescing solvents (i.e., glycol ethers -EGBE) in their water-based reformulations. This, as the argument goes, would lead to human health impacts to workers and the public from their exposure to these compounds. However, various articles and studies, indicate that this is not the case and that solvents such as ethylene glycol ethers or ethylene glycol ether acetates will be replaced with non-hazardous solvents such as propylene glycol ethers or propylene glycol ether acetates in order to comply with the 1990 CAAA. Other reports suggest that non-hazardous solvents such as texanol and propylene glycol are prevalent today in water-based reformulations and should continue to be used in the future. Furthermore, the reformulation of coatings with hazards solvents such as propylene glycol ethers or propylene glycol ether acetates will result in a concurrent reduction in use of coatings containing hazardous solvents such as benzene, toluene, xylene, etc. Thus, the project-specific human health impacts associated with the implementation of PAR 1113 are considered insignificant. In addition, cumulative hazards impacts associated with the reformulation of hazardous solvents are not considered significant because the incremental increase from the reformulation of hazardous solvents associated with the implementation of PAR 1113 are negligible.

	Potentially Significant Impact	No Impact
X. NOISE. *Would the proposal result in:*		
a) Increases in existing noise levels?	☐	☑
b) Exposure of people to severe noise levels?	☐	☑

Discussion:

No significant noise impacts are anticipated by the implementation of PAR 1113. Coating manufacturers within the district potentially affected by the proposed amendments are located in existing industrial or commercial areas. It is assumed that operations in these areas are subject to and in compliance with existing community noise standards. In addition to noise generated by current operations, noise sources in each area may include nearby freeways, truck traffic to adjacent businesses, and operational noise from adjacent businesses.

In general, the primary noise source at existing facilities is generated by vehicular traffic, such as trucks transporting raw materials to the facility, trucks hauling wastes away from the facility, trucks to recycle waste or other materials, and miscellaneous noise such as spray equipment (i.e. compressors, spray nozzles) and heavy equipment use (forklifts, trucks, etc.). Noise is generated during operating hours, which generally range from 6 a.m. to 5 p.m., Monday through Friday. PAR 1113 is not expected to alter noise from existing noise generating sources.

Additionally, the implementation of PAR 1113 is not expected to result in significant noise impacts in residential areas. As with industrial or commercial areas, it is assumed that these areas are subject to local community noise standards. Contractors or do-it-yourselfers applying compliant PAR 1113 coatings in residential areas are expected to comply with local community noise standards.

	Potentially Significant Impact	No Impact
XI. PUBLIC SERVICES. *Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas?*		
a) Fire protection?	☐	☑
b) Police protection?	☐	☑
c) Schools?	☐	☑
d) Maintenance of public facilities, including roads?	☑	☐
e) Other governmental service?	☐	☑

Discussion:

PAR 1113 may result in the use of acetone to reformulate lower-VOC coatings. Acetone is a volatile, flammable liquid at room temperature. Feedback received from these authorities indicates that, based upon their extensive professional experience as a result of years of regulating the use and storage of flammable materials, the use of acetone will pose no greater risks than the use of existing solvents such as MEK, toluene, butyl acetate, etc., even though acetone is slightly more flammable. Furthermore, the handling characteristics for acetone is identical to traditional solvents found existing coatings, relative to fire department procedures. Therefore, no significant public services impacts are expected as a result of reformulating current solvent-based coatings with acetone.

However, the Draft SEA will analyze whether reformulated compliant coatings could lead to more demand for maintenance at public facilities because these coatings do not perform or hold-up as well as traditional solvent-based coatings.

	Potentially Significant Impact	No Impact
XII. UTILITIES AND SERVICE SYSTEMS. *Would the proposal result in a need for new systems, or substantial alterations to the following utilities:*		
a) Power or natural gas?	☐	☑
b) Communications systems?	☐	☑
c) Landfills?	☐	☑

Discussion:

PAR 1113 will not substantially increase the amount of businesses or equipment in the District. Since add-on control equipment is not expected to be used to comply with the provisions of PAR 1113, no additional increase on the demand for utilities (e.g., electrical, gas, and communication systems) is expected. Also, with the use of water-based coatings to comply with the proposed lower-VOC content limits, it is expected that less solid waste will be deposited into landfills because some of the excess

water-based material can be recycled and reused. Impacts to utilities or service systems are, therefore, not considered to be significant.

XIII. AESTHETICS. *Would the proposal:*	Potentially Significant Impact	No Impact
a) Affect a scenic vista or scenic highway?	☐	☑
b) Have a demonstrable negative aesthetic effect?	☐	☑
c) Create light or glare?	☐	☑

Discussion:

The proposed amendments do not require any changes in the physical environment that would obstruct any scenic vistas or views of interest to the public. In addition, no major changes to existing facilities or stockpiling of additional materials or products outside of existing facilities are expected to result. The reason for this determination is that any physical changes would occur at existing industrial or commercial sites. Therefore, no significant impacts adversely affecting existing visual resources such as scenic views or vistas, etc. are anticipated to occur.

Coating performance and durability issues will be discussed relative to potential indirect air quality impacts in the Air Quality Impacts section of the Draft SEA.

XIV. CULTURAL RESOURCES. *Would the proposal:*	Potentially Significant Impact	No Impact
a) Disturb paleontological resources?	☐	☑
b) Disturb archaeological resources?	☐	☑
c) Have the potential to cause a physical change that would affect unique ethnic cultural values?	☐	☑

Discussion:

There are existing laws in place that are designed to protect and mitigate potential impacts to cultural resources. Should archaeological resources be found during the application of Rule 1113 coatings to newly constructed structures or existing structures, the application of such coating would cease until a thorough archaeological assessment is conducted. Furthermore, the application of architectural coatings, in the vast majority of situations, would occur after construction where archaeological resources would have already been disturbed. The proposed revisions to Rule 1113 are, therefore, not anticipated to result in any activities or promote any programs that could have a significant adverse impact on cultural resources in the District.

	Potentially Significant Impact	No Impact
XV. RECREATION. *Would the proposal:*		
a) Increase the demand for neighborhood or regional parks or other recreational facilities?	☐	☑
b) Affect existing recreational opportunities?	☐	☑

Discussion:

No recreational resources in the district are expected to be adversely affected by the implementation of PAR 1113. The proposed amendments will not generate additional demand for, or otherwise affect land used for recreational purposes. Further, as already discussed in the Land Use section above, the proposed amendments are not expected to have adverse affects on land uses in general. Therefore, no significant adverse effects on recreational facilities are expected from the implementation of PAR 1113.

	Potentially Significant Impact	No Impact
XVI. MANDATORY FINDINGS OF SIGNIFICANCE.		
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☑
b) Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	☐	☑
c) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)	☑	☐
d) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☑	☐

Discussion:

As a result of the possible adverse effects on air quality, water demand, water quality and public services, the proposed project has the potential to degrade the quality of the environment. Many of the impacts are individually limited, but could be cumulatively significant. There may be adverse human health impacts associated with exposure to both carcinogenic and noncarcinogenic toxic air contaminants. These potential human health impacts may occur individually, such as elevated exposure to toxic air contaminants, or cumulatively, if different environmental impacts reinforce each other. These impacts will be evaluated in detail in the Draft SEA.

APPENDIX C

RESPONSES TO COMMENTS ON THE NOP/IS

Comment Letter #1:	**ELRAP**
Comment Letter #2:	**Law Offices of Smiland & Khachigian**
Comment Letter #3:	**Sherwin Williams**
Comment Letter #4:	**National Paint & Coatings Association**
Comment Letter #5:	**PPG Industries, Inc.**
Comment Letter #6:	**Benjamin Moore & Co.**
Comment Letter #7:	**Bona**
Comment Letter #8:	**Du Pont**
Comment Letter #9:	**Carboline Company**
Comment Letter #10:	**Southern California Association of Governments**

COMMENT LETTER #1

ELRAP

COMMENT LETTER #1
ELRAP
December 1, 1998

1-1 Comment letter #1 consists of a series of letters and reference materials. To distinguish between different documents in this comment letter, the following protocol will be followed: the first document following the initial comment letter will be comment letter #1a, the second document following the initial comment letter will be comment letter #1b, etc.

Since release of the Notice of Preparation/Initial Study (NOP/IS), proposed amended Rule (PAR) 1113 has been modified. Responses to comments received on the NOP/IS and the project description in Draft Subsequent Environmental Assessment (SEA) for PAR 1113 reflect the most current version of PAR 1113.

1-2 The statement identified by the commentator does not pre-judge the conclusions of the analysis of potential environmental impacts from PAR 1113. It is a statement of the goals of the project. This is consistent with CEQA Guidelines §15124(b) which states that the project description should include, " A statement of the Objectives sought by the proposed project. Although CEQA Guidelines §15124(b) refers specifically to the project description in an environmental impact report (EIR), this does not preclude stating the project objectives in other types of CEQA documents.

1-3 The commentator's assertion that the passage cited from the NOP/IS is speculation that is "... grossly over-simplified, inaccurate, and misleading," demonstrates a fundamental misunderstanding. Air quality modeling performed for the 1997 AQMP demonstrates not only the contribution VOC emissions make toward ambient ozone concentrations but also the need for further reducing VOC emissions to comply with the national and California ambient air quality standards. Further, ground level ozone formation is a result of complex chemical reactions involving both VOCs and NOx. VOCs react with hydroxyl radicals to form organic peroxyl radicals which subsequently react with nitric oxide (NO) to form nitrogen dioxide (NO_2). Nitrogen dioxide photo-disassociates to form NO and oxygen atoms. The oxygen atoms rapidly associate with molecular oxygen to form ozone. The amount of ozone formed is a function of the number of conversions of NO to NO_2 due to the organic "chain reactions." When VOC emissions are lowered, the number of NO-to-NO_2 conversions decrease. Discussions on the atmospheric chemistry of ozone formation can be found in the 1991 National Research Council report, "Rethinking the Ozone Problem in Urban and Regional Air Pollution." Specifically, page 116 states... "the presence of VOCs causes enhanced NO-to-NO_2 conversion and hence the production of concentrations of ozone that exceed those encountered in the clean background troposphere." Additionally, the SCAQMD's preliminary analysis indicates that additional reductions of VOC and NOx emissions beyond those included in the AQMP will likely be necessary to meet the recently promulgated National Ambient Air Quality Standards for ozone and PM2.5.

Because of the extreme ozone nonattainment status of the South Coast Air Basin, the SCAQMD must control both NOx and VOC emissions if the area is to achieve ambient air quality standards. The AQMP for this district targets all feasible, cost-effective VOC emission reduction strategies from sources under its jurisdiction.

1-4 The Commentator is referred to response to comment #1-1.

1-5 The emission reduction estimates contained in the NOP/IS were preliminary estimates of potential emission reductions from reducing the VOC content of the specified architectural coating categories. The SCAQMD has acknowledged the eight issues cited by the commentator and included them in the NOP/IS indicating that each issue will be further

addressed in the Draft SEA. For a complete discussion of the eight issues and their effects on potential VOC emissions reductions, the commentator is referred to Chapter 4.

1-6 The project alternatives concepts included in the NOP/IS have been further discussed during Industry Working Group meetings and evaluated by staff. Some of these alternatives have been determined to be infeasible, some have been incorporated into PAR 1113 and some form the basis of one or more project alternatives. The commentator is referred to Chapter 5 for a discussion of project alternatives considered and rejected as infeasible or evaluated and compared to PAR 1113.

1-7 Adoption of PAR 1113 is not expected to contribute to any significant housing cost increases because reformulated coatings are currently being sold at comparable prices as "traditional" higher-VOC coatings. Direct economic impacts are not required to be analyzed pursuant to CEQA unless they also have a significant, direct effect on physical environmental parameters. Cost impacts associated with implementation of PAR 1113 are discussed in the District's Socioeconomic Impact Assessment (under separate cover).

1-8 The issues referred to by the commentator from the NOP/IS have been evaluated in Chapter 4 of the Draft SEA. The commentator, therefore, is referred to Chapter 4. With regard to the July 26 ELRAP document mentioned by the commentator, this document and specific responses to this document can be found in the Final SEA for PAR 1113 (AQMD No. 960626DWS).

1-9 In this comment the commentator asserts that transportation/circulation impacts will occur as a result of implementing PAR 1113 in part because the drying times of low VOC coatings are longer than the drying times for conventional coatings. As a result, jobs will take more than one day to complete. It is assumed here that the biggest concern regarding drying time would be for primers, sealers, and undercoaters since, by definition, these require additional topcoats. As part of the analysis of PAR 1113, staff evaluated coating product data sheets (which typically include drying times) for a large number of conventional and low VOC coatings (see the tables in Appendix D and the related summary tables in Chapter 4). The available information from product data sheets indicates that low VOC primers, sealers, and undercoaters have a slightly shorter drying time, on average, than conventional coatings. On average, the drying time for low VOC quick-dry primers, sealers, and undercoaters is comparable to the drying time for the same categories of conventional coatings. Finally, the drying time for low VOC stains is substantially shorter than the drying time for conventional stains. Consequently, the assertion that low VOC coatings have longer drying times that will require more trips over more days is not supported by coating product information sheets.

Regarding surface preparation, staff evaluated this characteristic as part of the evaluation of coating product data sheets mentioned above (see the tables in Appendix D and the summary tables in Chapter 4 of the Draft SEA). Where information or data are provided, the information indicated that low VOC coatings do not require substantially different surface preparation than conventional coatings. As a result, the time necessary to prepare a surface for coating is approximately equivalent for conventional and low VOC coatings.

The issue of topcoats is related to solids content and the amount of area a coating will cover. The review of coating product data sheets indicated that for industrial maintenance floor coatings, low VOC coatings tended to have a higher solids content, with a slightly, but not substantially lower average coverage area than conventional coatings. For most other coating categories affected by PAR 1113, the solids content and area of coverage for low

VOC coatings was, on average, comparable to conventional coatings although some categories, e.g., quick-dry primers, sealers, and undercoaters and stains, had slightly less coverage than conventional coatings in these categories. As a result, since solids content and coverage area for low VOC coatings are comparable to conventional coatings, some additional trips may occur district-wide, but not enough to create significant adverse transportation impacts.

Extra touch-up and repair and more frequent coating applications are related to durability qualities of coatings. Staff reviewed coating product data sheets (see the tables in Appendix D and the relevant summary tables in Chapter 4) to obtain durability information for low VOC coatings and conventional coatings. Based upon the a comparison of the coating product information sheets, staff concluded that low VOC coatings have durability characteristics comparable to conventional coatings. Based upon staff research of coating product information sheets, no significant adverse transportation impacts are anticipated from implementing PAR 1113.

The commentator also asserts that the proposed amendments will result in increased shipping of coatings formulated with acetone. First, many coatings are already formulated with acetone and, therefore, are already being transported in the district. Second, many conventional coatings are formulated with other solvents that are considered as flammable as acetone, e.g., t-butyl acetate, toluene, xylene, MEK, isopropanol, butyl acetate, and isobutyl alcohol. Based upon staff review of coating product information sheets, future compliant low VOC coatings are expected to be formulated with less or non-flammable materials such as texanol, propylene glycol, etc. Consequently, it is anticipated that future compliant coatings will follow the existing trend of moving away from hazardous coating formulations to less or non-hazardous formulations. For a more complete analysis of this issue, the commentator is referred to the "Hazard Impacts" section of Chapter 4.

1-10 It should be noted that the 1992 article cited by the commentator refers to past and possibly current problems concerning homeowners who illegally dispose of currently available coatings into storm drains. The issues raised in this comment relate to potential water quality impacts resulting from the illegal dumping of wastewater with paint residue into storm drains. Although this impact appears to be an existing problem, it has been addressed in the "Water Impacts" section of Chapter 4 in the Draft SEA

1-11 The SCAQMD disagrees with the commentator's assertion that significantly greater quantities of future compliant coatings would need to be used compared to existing coatings. Future compliant coatings are not expected to be used in greater quantities than currently available coatings and, even it this were the case, use of materials in future compliant coatings would not constitute wasteful or inefficient use. Therefore, no significant adverse impacts to nonrenewable resources are anticipated

1-12 As a result of comments received on the Draft SEA for PAR 1113, Chapter 4 includes an analysis of hazards associated with increased usage of future compliant coatings formulated with acetone. The analysis looked at two factors: (1) the probability of increased incidents as a result of the increased usage of acetone-based coatings; and (2) the consequences associated with the incidents. With regard to the probability of more incidents as a result of PAR 1113, it is expected that this will not occur because the number of shipments of architectural coatings will not increase as a result of implementing PAR 1113. While the total amount of acetone shipped may increase, the statistical probability of a truck accident from transporting AIM coatings remains unchanged. In other words, the number of vehicle trips associated with the transporting of AIM coatings to and from various manufacturers,

distributors, stores, contractors, and do-it-yourselfers is expected to remain constant after implementing PAR 1113. Based upon the preceding information, hazard impacts are not expected to change appreciably as a result of adopting PAR 1113.

In the context of the consequences associated with incidents, this was analyzed from two perspectives: (1) toxicity of release; and (2) flammability. It is expected that an incident (i.e., spill or explosion), involving the transporting of acetone-based coatings will produce less toxic impacts than other conventional coatings containing solvents such as toluene, xylene, MEK, etc. Acetone has a higher TLV (750 ppm), PEL (750 ppm) and IDLH (20,000 ppm) compared to other conventional solvents. These high exposure limits coupled with acetone's higher vapor pressure indicate that acetone would evaporate quickly in a spill such that extended human exposure to significant levels that could cause harm are unlikely. Further, acetone is also considered to have the same or less toxic effects as other conventional solvents. As a result, even if exposure were to occur, which is highly unlikely, the human health effects would be the same or less compared with existing architectural coatings.

Information received from various fire authorities indicates that even though acetone is slightly more flammable than other conventional solvents it would be treated the same in the event of a fire or explosion because conventional solvents are also flammable. Since PAR 1113 does not increase the probability that a transport accident will occur and the fire authorities would handle this type of incident the same compared with coatings formulated with conventional solvents as with acetone-based coatings, the hazard impacts are not considered to be significant.

1-13 The SCAQMD disagrees with the commentator's assertion that noise impacts will increase with the use of future compliant low VOC coatings, especially those applications were coatings are applied by brush or roller. Coating application systems that rely on pressure and a power source are available that have very low noise levels associated with them. In any event, as with any new technology, a "learning curve" may be involved, whereby, once trained, workers should be able to apply future compliant coatings in approximately the same amount of time as currently available coatings. As a side note, staff has investigated whether or not gasoline-powered spray equipment are available. No spray equipment manufacturers were found that manufactured such equipment. Consequently, no significant adverse noise impacts are anticipated from implementing PAR 1113.

1-14 Potential adverse impacts to local fire protection services relative to greater use of acetone from implementing PAR 1113 has been evaluated in Chapter 4. The commentator is, therefore, referred to Chapter 4 of the Draft SEA. With respect to schools and other public services identified by the commentator, no significant adverse effects are anticipated. Regarding future job losses resulting from implementing PAR 1113, the commentator is referred to the Socioeconomic Economic Impact Assessment in the PAR 1113 Staff Report.

1-15 SCAQMD staff does not concur with the commentator's assumption that significantly more coatings will be used as a result of this rule, which would then result in increased electrical power needed to manufacture the low-VOC coatings or that more coatings will cause the generation of more solid waste from the disposal of empty paint cans. Manufacturers are required to supply lower-VOC products, not supply more coatings. In many areas, metal paint cans are recycled. Further, even if it were true that greater volumes future compliant coatings per unit area would be necessary, the additional power demand necessary to produce

these additional volumes would not be considered an inefficient or wasteful use of energy or a significant impact.

1-16 SCAQMD staff does not concur with the commentator's assertion that significant aesthetic impacts will result from the use of low-VOC coatings due to defects in appearance after application because the rule contains a compliance schedule sufficient for coating formulators to produce acceptable quality low-VOC products. The current compliance proposal is a modification of an earlier version of PAR 1113 and is the result of input received during the Industry Working Group meetings. The current compliance schedule should ensure that formulators have sufficient time to reformulate products which exhibit the desired performance characteristics.

1-17 SCAQMD staff does not concur with the commentator's assertion that significant cultural resource impacts will occur due to potential negative impacts on the maintenance of "historic and ethnically significant architectural structures in Southern California." First, industrial maintenance coatings are not typically used for residential use or for use in painting the outside of buildings, although some nonflat coatings may be used for a structure's exterior trim. In spite of this, based upon information on currently available compliant products, performance characteristics of existing and reformulated products should be sufficient to meet the weathering impacts on outdoor structures. That is particularly true in light of the fact that the rule contains a compliance extension requested in this comment letter to ensure that newly developed products exhibit these characteristics.

The commentator cites a 1997 *Los Angeles Times* article and a letter to the editor from the commentator implying that the Craftsman- and Victorian-style bungalows are being stuccoed because of the high cost and greater frequency of painting these houses. This assertion demonstrates a fundamental misunderstanding of the issue involved. The high costs are due to restoration of houses that have been poorly maintained for years, if not decades. Restoration of these houses require substantial repair, as well as surface reconstruction and preparation before the house is even painted. As a result it is much simpler and cheaper to stucco a house than perform the needed repairs to restore the historical architectural integrity. Further, stucco is applied to the exterior walls, which are typically painted with flat coatings. The currently proposed amendments do not modify the VOC content of flat coatings In any event, painting these houses is a relatively small part of the cost of restoring these old houses.

1-18 SCAQMD staff does not concur with the commentator's assertion that additional recreational resources will be required as a result of workers allegedly made jobless by the proposed amendments. SCAQMD staff has conducted socioeconomic analysis which showed minimal job impacts (the commentator is referred to the Socioeconomic Impacts Assessment contained in the Staff Report for PAR 1113).

1-19 Extensive discussion of air quality, water quality, hazard, and public service impacts were included in the Draft SEA prepared for this rule amendment. As noted in the response to comments #1-11 and #1-17, significant adverse impacts to energy and cultural resources, respectively, are not anticipated as a result of implementing PAR 1113.

1-20 As noted in the commentator's comment, the document cited and enclosed in a March 2, 1994 letter to the SCAQMD was previously submitted to the SCAQMD during the rule promulgation process for the 1996 amendments to Rule 1113. The document cited by the commentator was included in the Final SEA for PAR 1113 (SCAQMD No. 960626DWS) and responses to comments were prepared which are incorporated by reference. The commentator is, therefore, referred to the Final SEA for PAR 1113 (SCAQMD No.

960626DWS) with regard to specific responses to comments from the cited document. The Final SEA for PAR 1113 (SCAQMD No. 960626DWS) is available upon request from the SCAQMD's Public Information Center by calling (909)396-3600.

The recommended by the commentator presumes, incorrectly, that currently compliant products will be banned. Further, staff evaluated the coating product information sheets for a substantial number of both low VOC and currently compliant conventional coatings comprising a number of AIM coating categories. This evaluation identified coating characteristics such as VOC content, drying time, pot life, shelf life, durability characteristics, etc. The products evaluated are listed in the Tables in Appendix D, which are summarized in Table 4-2 in Chapter 4 of the Draft SEA.

1-21 This comment summarizes a number of the issues already identified in this comment letter. The following is a list of topics mentioned by the commentator and where to find the SCAQMD's response: adverse impacts to housing, #1-17; comparison of conventional coatings to future compliant coatings, #1-20 and Chapter 4; hazards associated with acetone, #1-20 and Chapter 4; greater use of coatings ,#1-15 and Chapter 4; energy and mineral resources, #1-11.

1-22 The analysis of potential adverse impacts that could be generated by implementing PAR 1113 is contained in Chapter 4 of this EA. The analysis of potential adverse impacts includes a project-specific analysis of impacts as well as an analysis of cumulative impacts when they are significant as required by the CEQA Guidelines.

COMMENT LETTER #1a

ELRAP - MILFORD, ET AL.

COMMENT LETTER #1a
ELRAP – Milford, et al.
December 1, 1998

1a This is a 1989 journal article that presents results of a modeling study of the responses of photochemical pollutant concentrations to VOC and NOx emissions reductions. This study is cited by the commentator to support his assertion that, "...VOC reductions can promote rather than inhibit ozone formation..." To the contrary, one of the conclusions of this document is, "ROG [VOC] controls are predicted to be most effective in those areas where high NOx levels are maintained and radical concentrations suppressed through midday." The document also states, however, "Moreover, the analysis indicates a strategy of controlling NOx emissions in combination with ROG [VOC] emissions would help reduce ozone, PAN, and inorganic nitrate simultaneously." As shown in Table 1c-1, this strategy of controlling both NOx and VOC emissions is consistent with SCAQMD's rule adoption strategy over the last decade as well as the 1997 AQMP ozone attainment strategy, which includes control measures expected to reduce NOx emissions 103 tons per day and VOC emissions 178 tons per day by 2006. The currently proposed amendments to Rule 1113 implement Phase II of the 1997 AQMP control measure #97CTS07 – Further Reductions from Architectural Coatings – Rule 1113, as well as 1994 AQMP control measure #94CTS07.

See also the responses to comments #1-3 and #1b-1.

COMMENT LETTER #1b

DUNN EDWARDS- KESSLER & ASSOCIATES, INC.

COMMENT LETTER #1b
Dunn Edwards – Kessler & Associates, Inc.
December 1, 1998

1b-1 The three statements attributed to the NOP/IS are accurate. With regard to reactivity, the SCAQMD does not dispute the fact that different VOCs have different reactivities. VOC control based on reactivity, however, is not currently a viable regulatory approach because of the limited amount of specific information available regarding actual or relative reactivities of the many VOCs used in coatings products.

AQMD staff disagrees with the commentator's implication that the SCAQMD's mass VOC emission control strategy may be counterproductive to ozone reduction. As discussed in Chapter 4 of the Draft SEA, the science of VOC reactivity is still in its early stages, with more comprehensive studies being conducted to refine VOC reactivity data. Until these studies are completed, the SCAQMD agrees with the EPA that it would not be prudent to implement a control strategy for VOC emissions based principally on VOC reactivity at this time. In its 1995 Report to Congress entitled "*Study of Volatile Organic Compound Emissions From Consumer and Commercial Products*," the EPA concluded, "To be most effective, ozone control strategies ideally should be based not only on mass VOC and NOx emissions but should consider the relative photochemical reactivity of individual species, the VOC-to-NOx ratios prevalent in specific airsheds, and other factors which could work together to minimize the formation of ozone with adverse impacts. Reactivity data on VOC, especially those compounds used to formulate consumer products and commercial products, is extremely limited. Better data, which can be obtained only at great expense, is needed if the EPA is to consider relative photochemical reactivity in any VOC control strategy. In the meantime, a practical approach is to act on the basis of mass VOC emissions." Thus, until more comprehensive VOC reactivity studies are completed that yield more refined speciation profiles for architectural coatings, the SCAQMD will continue to use a mass VOC control strategy. The SCAQMD welcomes any new scientific data that industry can provide to aid the SCAQMD in moving from a mass VOC emissions reduction strategy to a control strategy based on VOC reactivity.

In general, the relative contribution of a specific VOC under different atmospheric conditions needs to be better understood before data can be used for policy-making. Dr. William Carter recently received funding for a three million dollar ozone chamber, which will include studying VOC reactivity. The SCAQMD is also contributing funding to this ozone chamber. A working group will be established to guide reactivity research. It is expected that it will take 18 to 24 months to have the chamber running. The results of future studies may result in sufficient information to include reactivity-based control provisions in Rule 1113 and other coatings rules.

Reactivity-based regulations have also been discussed at Industry Working Group meetings (meeting #2, 10/7/98; meeting #3, 11/4/98; and meeting #4, 12/9/98). At Industry Working Group meeting #3, Dr. Carter explained that EPA does consider whether a VOC is reactive or non-reactive. EPA staff feels the high uncertainties of the MIR values would not make it a sound strategy until values are refined. EPA and private groups have established NARSTO to coordinate research related to reactivity policy.

While vehicle exhaust has been extensively studied for reactivity, it was only three years ago that glycols, esters, ketones, etc. were being studied. Uncertainty values vary for the best understood species by 30 percent for absolute reactivity and 20 percent for relative reactivity. For species that have not been studied extensively, uncertainty can be much greater. The value of the uncertainties is very difficult to isolate, but attempts to numerically identify uncertainties have been made.

Some specific problems (scientific issues) associated with reactivity-based regulations include:

- Assumptions in the current airshed models are too simplified, and do not represent airshed conditions in Basin.
- Studying the reactivity of halogenated compounds is frustrating because currently there is no way to simulate reactivity under current models and chamber conditions.
- Information on the reactivity of alcohol amines indicates that there is a high degree of uncertainty associated with the reactivity of these compounds and additional study is necessary.
- The reactivity of aromatics is still not well understood and current mechanism may not correlate well.
- Quantifying reactivity uncertainties is difficult – particularly for most compounds found in architectural coatings.
- The existing atmospheric chamber is not for studying reactivity in low-NOx environments.

NOx levels also effect the reactivity, absolute concentrations. Temperature and light intensity can also affect reactivity, but this relationship has not yet been studied. In urban areas, time and place of VOC and NOx emissions can also have effect; Absolute reactivity is scenario dependent and is more variable, whereas relative reactivity is less scenario dependent, and therefore less variable, and is the more important scale. The current scenarios represent the center of urban areas' NOx levels. The maximum incremental reactivity varies for each VOC species. Generally, under current scenarios, the VOC:NOx ratio is approximately 6.0, which is consistent with NOx levels in the downtown area of Los Angeles.

1b-2 The commentator is referred to the responses to comments #1b-1 and #1-3.

1b-3 SCAQMD staff has evaluated a seasonal regulation alternative that would allow architectural coatings with VOC content limits higher than those contained in PAR 1113 and rejected it as an infeasible alternative for the following reason. Based on discussions with industry, it has been suggested that this alternative may be infeasible because it may be difficult for coatings distributors to manage architectural coating stocks to ensure that only compliant coatings are sold during the high ozone season. As a result, this alternative is rejected as infeasible. See also the discussion in Chapter 5 of "Alternatives rejected as infeasible."

In addition to the issues identified by staff, one commentator (see comment letter #3) expressed concerns with a seasonal alternative because of the additional costs to coatings retailers of changing their stocks up to four times per year. Another concern raised by this commentator was the SCAQMD's ability to enforce a seasonal alternative.

COMMENT LETTER #1c

ELRAP

COMMENT LETTER #1c
ELRAP (6/24/98)
December 1, 1998

1c-1 As noted by this comment, VOCs contribute to ozone formation. Refer to response to comment #1-3 for a discussion of the need to control VOC emissions.

1c-2 In this comment, the commentator provides general information about atmospheric concentrations of NOx and VOC. Although it is correct that most of the NOx in the atmosphere is from anthropogenic sources, the assertion that 60 percent of atmospheric VOCs comes from natural sources is not correct. According to the 1997 AQMP, man-made sources produce a substantial portion of the VOC emission inventory in the district (see also Table 1c-1). The commentator also states that in the relative absence of NOx controls, VOC emission controls "have proven effectively marginally at reducing peak ozone levels. In the last decade, the SCAQMD has implemented a number of NOx control rules, in addition to VOC control rules, that has produced declining actual and future projected emission inventories (see Table 1c-1). Although the district still has the worst ozone problem in the nation, ambient ozone concentrations have declined as a result of implementing vigorous NOx and VOC control strategies. For example, in the past few years, ozone air quality has been the cleanest on record in terms of maximum concentration and number of days exceeding the standards and episode levels. Maximum 1-hour average and 8-hour average ozone concentrations in 1997 (0.21 ppm and 0.14 ppm) were 168 percent and 169 percent of the federal 1-hour and 8-hour standards, but lower than the previous three years. Ozone concentrations exceeded the 1-hour state standard at all but one monitored locations in 1997. There was only one stage I episode in 1997, compared to the record low of seven days recorded in 1996.

1c-3 It is not clear what evidence the commentator bases his assertion that architectural coating emissions inventory data are inconsistent with monitoring data. Based on the air quality modeling and the emissions inventory contained in the AQMP, architectural coatings contribute a substantial amount of VOC emissions to the atmosphere, which, in turn, contribute to ozone formation. The 1997 AQMP emissions inventory data for architectural coatings are summarized in the following table.

Table 1c-1
1997 AQMP Baseline and Future Baseline Emissions Inventories
(tons per day)

AIM Coating VOC Baseline	1987	1990	1993	1997	1999	2000	2002	2005	2008	2010
Annual Avg.	55.3	55.9	56.3	57.8	58.9	59.4	61.1	63.4	65.7	67.3
Summer Avg.	65.2	65.9	66.4	68.2	69.5	70.1	72.0	74.7	77.5	79.4
Total VOC Emissions All Sources	1818.5	1648.3	1240.2	996.6	916.0	891.4	858.9	810.4	785.5	770.1
Total NOx Emissions	1302.6	1413	1194.3	1002.7	915.7	881.9	815.5	750.3	712.1	696.8

Source: 1997 AQMP, Appendix II

CARB's 1998 "Survey of Emissions from Solvent Use" is expected to be published in early 1999. Preliminary evaluation of the 1996 sales data indicates statewide AIM coating VOC emissions in 1996 of approximately 99 tons per day. Prorated by population to the Basin portion of SCAQMD, this results in 45 tons per day. These data do not include the clean-up and thinning solvents used as a part of the coating operation. The usage and emission values found in the preliminary CARB report are subject to changes based on the final 1998 CARB Survey Report.

1c-4 In this comment, the commentator implies that changes in coatings technologies are driven by market forces. The behavior of manufacturers in developing lower-VOC coatings and the public's acceptance of those products have occurred in conjunction with regulatory limits being placed on the products. There is no indication that the market would have moved at the same speed or to the same extent absent environmental regulations. The fact that EPA published a national AIM coatings rule in September 1998 to meet the obligations of Section 183(e) of the Clean Air Act, also indicates their position that regulations are necessary to drive the market forces. In addition, a study prepared for Inform Inc., a non-profit environmental research organization, entitled *Stirring Up Innovation: Environmental Improvements in Paints and Adhesives*, found that environmental regulation have been a strong driving force promoting innovation in the paint industry.

The commentator also indicates that coatings regulations are ineffective because they are based on two flawed assumptions. The first assumption is that reducing the VOC content of architectural coatings reduces total VOC emissions. The second assumption is that reducing VOC emissions from architectural coatings reduces peak ozone levels. With regard to each of these issues, the commentator is referred to the responses to comments #1-3 and #1b-1.

1c-5 The commentator is referred to the responses to comments #1-3 and #1b-1.

1c-6 The commentator is referred to the responses to comments #1-3 and #1b-1.

1c-7 This comment recommends that the SCAQMD consider innovative approaches to regulating architectural coatings. More detailed recommendations are given in comments 1c-8 through 1c-16. Please refer to the responses to these comments.

1c-8 The commentator is referred to the responses to comments #1-3 and #1b-1.

1c-9 The concept for a performance-based rule provision or project alternative was originally raised by members of the Industry Working Group (see "Industry Working Group Meetings' discussion in Chapter 2). Rather than establish lower VOC content requirements for specified categories of coatings, this alternative would establish emission standards based on emissions per area covered or coating durability.

This alternative was rejected as infeasible because the Industry Working Group could not reach consensus on how to establish performance standards as this depends on the type of application or coating technology. For example, alkyd-based coating formulations currently have a life cycle of five to seven years, while urethane-based coating formulations may have a life cycle of approximately 20 years. Agreement could not be reached concerning the appropriate standard for each type of coating technology. As a result, this alternative has been dropped from further consideration.

1c-10 The commentator is referred to the responses to comments #1c-9.

1c-11 With regard to architectural coatings inventories, the commentator is referred to the response to comment #1c-3. With regard to a reactivity based architectural coating regulation, the commentator is referred to the response to comment #1b-1.

1c-12 A low vapor pressure exemption was discussed during Industry Working Group meetings #2 (10/7/98) and #3 (11/4/98). One of the issues identified was the fact that for some VOCs, e.g., Texanol, current methods of measuring low vapor pressure are not readily usable because they are not very precise or reliable. Before a low vapor pressure exemption provision can be considered, other measuring or test methods need to be developed.

In addition, according to CARB, regulations are under consideration to include a low vapor pressure exemption, which was initially meant for high molecular weight resins, surfactants, detergents, and parafins/waxes commonly found in consumer products. For CARB's Consumer Products Rule, however, staff is proposing to delay implementation of the low vapor pressure exemption. Prior to implementation, CARB will evaluate how much of these new solvent mixtures that meet the LVP definition are found in consumer products and design a study to assess the fate of LVP solvents. The study is expected to occur no earlier than the end of 1999.

The low vapor pressure exemption under consideration by CARB is for consumer products where the organic compounds are washed away. These typically do not evaporate into the air. For architectural coatings, the intent of solvents is to evaporate and go into the air. The approved test method for measuring VOC (Method 24) yields low vapor pressure compounds as VOCs, therefore, they should not be considered exempt in architectural coatings regulations. For this reason, a low vapor pressure exemption is not considered to be a feasible alternative.

1c-13 This comment is a recommendation to include a product line averaging provision to regulate architectural coatings. A product line averaging provision is included in PAR 1113.

1c-14 The seasonal deregulation alternative was discussed during Industry Working Group meeting #1 (9/3/98). At this meeting, members indicated that contractors are often involved in long-term projects and as a result, coatings must be available year round. Further, industrial maintenance coating contractors are often involved with very specialized projects, where changes to coatings specifications are not possible. For these types of projects, specific coatings must also be available year round.

Based on discussions with industry, it may be difficult for coatings distributors to manage architectural coating stocks to ensure that only compliant coatings are sold during the high ozone season. As a result, this alternative is rejected as infeasible. See also the discussion in Chapter 5 of "Alternatives Rejected as Infeasible."

In addition to the above issues, one commentator (see comment letter #3) expressed concerns with a seasonal alternative because of the additional costs to coatings retailers of changing their stocks up to four times per year. Another concern raised by this commentator was the SCAQMD's ability to enforce a seasonal alternative.

Based upon all of the above reasons, a seasonal deregulation alternative is currently considered to be infeasible.

1c-15 A similar concept to regional deregulation (geographic shift control strategy) was considered as a project alternative to the 1997 AQMP. For this AQMP alternative, air quality modeling was performed to determine its viability. The results of the analysis indicated that the geographical shift alternative was difficult to model because the model is dependent on meteorological conditions. For example, depending on the meteorological conditions used, it was difficult to determine whether or not an exceedance in one source receptor area (SRA) was due to the emissions sources in that SRA or the result of wind conditions in which emissions from an upwind SRA were transported to a second SRA, causing a violation in the second SRA. For this reason a regional deregulation alternative was rejected as infeasible. See also the discussion "Alternatives Rejected as Infeasible" in Chapter 5.

1c-16 The SCAQMD already has a public outreach program through the SCAQMD's Public Advisor's Office. The Public Advisor's Office prepares brochures that include information on additional steps the public can take to reduce air pollution, see for example "25 Ways You Can Clean the Air" or "What You Need to Know About Water-based Cleaners." With regard to coatings, the SCAQMD currently has available a brochure called "The Painter's Guide." In addition to written material, staff in the Public Advisor's Office is available to give presentations to local community groups and organizations on air pollution and reducing emissions. Staff also attends special events such as ride share fairs – setting up booths, for example – to distribute information about air pollution and reducing emissions. In spite of these activities, the SCAQMD must continue adopting and implementing NOx and VOC control rules because the SCAQMD cannot take any credit for potential emissions from educational or voluntary programs.

1c-17 In this comment, the commentator recommends that serious consideration be given to some of the alternative regulatory approaches previously described in this comment letter. The alternatives recommend for consideration include the following: exemption for low volatile compounds (see response to comment #1c-12); seasonal deregulation (see response to comment #1c-14); regional deregulation (see response to comment #1c-15); reactivity based regulation (see response to comment #1b-1); performance based standards (see response to comment #1c-9); product line averaging (see response to comment #1c-13); and public advisories/voluntary action (see response to comment #1c-16).

With the exception of the proposal for public advisories/voluntary action, all of these alternatives have been discussed in one or more Industry Working Group meetings. As noted in some of the above responses, a number of issues were identified in the Industry Working Group meetings for several of the alternatives, e.g., the low vapor pressure exemption alternative, seasonal deregulation, regional deregulation, and reactivity. These issues and other issues identified by staff renders most of the recommended alternatives as infeasible.

COMMENT LETTER #1d

ELRAP

COMMENT LETTER #1d
ELRAP (7/26/96)
December 1, 1998

1d It is unclear why comment letter #1d was included in the packet of comments on the currently proposed amendments to Rule 1113 as it was previously submitted to the SCAQMD in response to a June 14, 1996, Notice of Preparation of a Draft EA for PAR 1113 (SCAQMD No. 960613DWS). The amendments under consideration at that time reinstated a small container exemption into Rule 1113.

In this comment letter, the commentator summarizes a timeline of events associated with the process of reinstating the small container exemption into Rule 1113. The bulk of the letter, however, explains why the commentator disagrees with the conclusion in the Draft SEA that reinstating the small container exemption will result in a significant adverse air quality impact.

As explained in the response to comments, incorporated herein by reference, staff disagreed with the commentator's assertion that reinstating the small container exemption would result in a net air quality benefit. Based upon the analysis contained in the 1996 Final EA (SCAQMD No. 960613DWS), it was concluded that reinstating the small container exemption would result in a VOC emission increase of 0.55 tons per day (1,100 pounds per day), which exceeds the SCAQMD's VOC significance threshold of 55 pounds per day. For additional information, the commentator is referred to the 1996 Final EA for PAR 1113 (SCAQMD No. 960613DWS).

COMMENT LETTER #1e

ELRAP

COMMENT LETTER #1e
ELRAP (10/6/97)
December 1, 1998

1e With regard to the letter to the editor and the associated *Los Angeles Times* article, the commentator is referred to the response to comment #1-17.

COMMENT LETTER #2

LAW OFFICES OF SMILAND & KHACHIGIAN

COMMENT LETTER #2
Law Offices of Smiland & Khachigian
December 1, 1998

2-1 It is unclear what the commentator is referring to when he states that, "...the NOP admits (at 1-8) that the 'project' for which the South Coast AQMP (sic) proposes to prepare a Draft SEA has not been defined,..." The NOP includes a summary of PAR 1113 beginning on page 1-5 of the Initial Study. Further, a copy of PAR 1113 is included in the NOP/IS as Appendix A.

The SCAQMD is aware of its responsibilities pursuant to CEQA to analyze project-specific impacts and cumulative impacts when they are significant (CEQA Guidelines §§15126 and 15130, respectively). The topics identified on pages 2-6 and 2-7 are analyzed in detail in Chapter 4 of the Draft SEA. See also responses to comments #1-8, #1-12, #1-21, #1c-5, and #1c-6.

2-2 The commentator is referred to the responses to comment #2-1.

2-3 The statement in the NOP that the project was previously considered in the 1997 AQMP and in a 1990 EA is for background information. The SCAQMD is not relying on either of these two documents to serve as the CEQA document for the currently proposed amendments to Rule 1113. The Draft SEA prepared for PAR 1113 analyzes potential adverse impacts specifically from the current PAR 1113. The analysis is based upon the most currently available data and information.

2-4 The commentator is referred to responses to comments #1-3 and #1b-1.

2-5 According to the 1997 AQMP, Appendix III, mobile sources, both on-road and off-road, generate over 60 percent of the total 1993 VOC emissions inventory. The mobile source inventory is provided by CARB and the SCAQMD is required by law to use this inventory.

2-6 The commentator is referred to the responses to comments #1-3, 1a, and #1b-1.

2-7 The commentator is referred to the responses to comments #1-3and #1b-1.

2-8 An additional opportunity to comment on the environmental analysis for PAR 1113 is afforded the commentator during the comment period for the Draft SEA.

COMMENT LETTER #3

SHERWIN WILLIAMS

COMMENT LETTER #3
Sherwin Williams
November 25, 1998

3-1 It is assumed that by regulatory options the commentator is referring to potential project alternatives. Potential alternatives recommended by the Industry Working Group for consideration include the following: exemption for low volatile compounds (see response to comment #1c-12); seasonal deregulation (see response to comment #1c-14); regional deregulation (see response to comment #1c-15); reactivity based regulation (see response to comment #1b-1); performance based standards (see response to comment #1c-9); product line averaging (see response to comment #1c-13); and public advisories/voluntary action (see response to comment #1c-16). The commentator is also referred to Chapter 5 of the Draft SEA for a description and analysis of the currently proposed project alternatives. If this comment refers to alternative regulatory coating categories, the commentator is referred to the response to comment #3-6.

3-2 Although it is true that the SCAQMD has contracted a study with NTS, the proposed amendments do not rely on this study for the development of PAR. Staff has conducted an exhaustive and comprehensive analysis of currently available low VOC coatings that forms the primary basis for PAR 1113. This analysis evaluated hundreds of coatings from approximately 12 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time. These issues are discussed in Chapter 4 of the Draft SEA. To the extent information is available from the NTS study, it will be incorporated into the analysis.

3-3 CARB has been collecting sales data which is expected to provide more precise information on the architectural coating emission inventory in the district. Though the CARB study is important, it does not provide information relevant to establishing specific VOC content limits.

3-4 The SCAQMD disagrees with the commentator's assertion that, "...developing the NOP and draft SEA prior to such a decision on the final proposal...is contrary to sound governmental policy." Under CEQA, the CEQA process must be completed prior to a final decision on a project.

3-5 The NOP/IS for PAR 1113 was circulated for a 30-day public review and comment period.

3-6 Compliant interior and exterior coatings are currently available for clear and semi-transparent stains. Opaque (semi-solid) stains are typically manufactured for exterior use only. However, compliant stains are available for all three types of stains. For clear and semi-transparent stains, 9 percent and 15 percent respectively, are recommended for both interior and exterior (dual) usage. Different interior and exterior VOC limits for the same category substantially impact the enforceability of the rule, especially in cases where the same formulation is recommended for dual uses.

Staff has found compliant coatings for each use (a-g). . Staff has analyzed the use of the lower-VOC technologies for a variety of uses. The low- and zero-VOC industrial maintenance coatings are recommended for a variety of industrial uses, including but not limited to refineries, chemical facilities, food processing, pulp and paper manufacturing, bridge, pipeline, and wastewater treatment facilities.

Staff has found both single-component and two-component low- and zero-VOC coatings for a variety of uses. Therefore, staff believes that creating separate categories for single- and multi-component coatings is unnecessary. Rule 1107 – Metal Coatings, also has several

other requirements, such as recordkeeping. Facilities under Rule 1107 also fall under New Source Review requirements and, therefore, have a daily facility cap of emissions and coating usage. Rule 1113 has neither requirement.

Staff has found compliant individual coatings, as well as complete systems that comply with the proposed limits. Please review the draft staff report for an extensive discussion of industrial maintenance coatings and systems.

Staff has found compliant primers, sealers, and undercoaters for a variety of uses, including interior and exterior uses. The CARB survey indicates that almost 1/3 of all primers, sealers, and undercoaters are for dual (both interior and exterior) uses. Different interior and exterior VOC limits for the same category substantially impact the enforceability of the rule, especially in cases where the same formulation is recommended for dual uses.

Nonflat coatings, as defined in the proposed amended rule are not floor or rust preventative coatings. The proposed amended rule has two new categories for floor and rust preventative coatings. Staff has found compliant nonflats for a variety of uses, including interior and exterior uses. The CARB survey indicates that over 40 percent of all nonflats are recommended for dual (both interior and exterior) uses. Different interior and exterior VOC limits for the same category substantially impact the enforceability of the rule, especially in cases where the same formulation is recommended for dual uses.

The PAR 1113 includes an averaging provision which can be used by the coating manufacturers to continue marketing non-compliant coatings, and allow an end-user to take a similar approach on a systems basis.

3-7 The District has proposed an additional category called Rust Preventative Coatings in PAR1113.

3-8 The commentator is referred to the responses to comments #1-3 and #1b-1.

3-9 This comment is a recommendation to include a product line averaging provision to regulate architectural coatings. A product line averaging provision is included in PAR 1113.

3-10 SCAQMD staff has evaluated a seasonal regulation alternative that would allow architectural coatings with VOC content limits higher than those contained in PAR 1113 and rejected it as an infeasible alternative for the following reason. Based on discussions with industry, it has been suggested that this alternative may be infeasible because it may be difficult for coatings distributors to manage architectural coating stocks to ensure that only compliant coatings are sold during the high ozone season. As a result, this alternative is rejected as infeasible. See also the discussion in Chapter 5 of "Alternatives rejected as infeasible."

In addition to the issues identified by staff, this commentator expressed concerns with a seasonal alternative because of the additional costs to coatings retailers of changing their stocks up to four times per year. Another concern raised by the commentator was the SCAQMD's ability to enforce a seasonal alternative.

3-11 The primary focus of the proposed project alternatives is VOC content limits and alternative compliance dates. The commentator is referred to Chapter 5 of the Draft SEA for descriptions and analyses of the proposed project alternatives. With regard to the commentator's recommendation to units of grams of VOC per liter rather than the current "less water" VOC calculation method, please refer to the response to comment #4-14.

3-12 The SCAQMD disagrees with the commentator's assertion that noise impacts will increase with the use of future compliant low VOC coatings, especially those applications where coatings are applied by brush or roller. Coating application systems that rely on pressure and a power source have very low noise levels associated with them. In any event, as with any new technology, a "learning curve" may be involved, whereby, once trained, workers should be able to apply future compliant coatings in approximately the same amount of time as currently available coatings.

Regarding surface preparation, staff evaluated hundreds of conventional and low VOC coatings (see Tables in Appendix D and the summary tables in Chapter 4 of the Draft SEA). Where information or data are provided, the information indicated that low VOC coatings do not require substantially different surface preparation, including sandblasting, than conventional coatings. As a result, the time necessary to prepare a surface for coating is approximately equivalent for conventional and low VOC coatings. For these reasons, no significant adverse noise impacts are anticipated from implementing PAR 1113.

3-13 It should be noted that sandblasting is a surface preparation technique that is and has been widely used as a means of surface preparation. Specifically with regard to surface preparation, staff evaluated this characteristic as part of the evaluation of coating product data sheets mentioned in preceding responses (see also the tables in Appendix D and the summary table in Chapter 4 of the Draft SEA). Where information or data are provided, the information indicated that low VOC coatings do not require substantially different surface preparation than conventional coatings. As a result, it is not anticipated that the use of sandblasting as a method of surface preparation will increase substantially as a result of implementing PAR 1113. Consequently, no significant adverse hazard impacts from sandblasting are expected.

3-14 Wastes from sandblasting are not anticipated to increase substantially for the same reason identified in the response to comment #3-13. Consequently, no significant adverse solid/hazardous waste impacts are expected as a result of implementing PAR 1113.

3-15 As mentioned in response to comment #3-2, one of the characteristics that staff evaluated regarding currently available low VOC coatings is pot life. The analysis of potential environmental impacts in Chapter 4 includes an analysis of potential impacts related to pot life of multi-component low VOC coatings.

3-16 Contractors building new housing will be required to use compliant coatings on and after the proposed compliance dates listed in the Table of Standards in Rule 1113. Based upon information on currently available compliant products (see the discussion in Chapter 4), performance characteristics of existing and reformulated products should be sufficient to meet the weathering impacts and other performance characteristics on new construction. In addition, PAR 1113 has been modified, such that the first compliance date milestone has been moved from July 1, 2001, to January 1, 2002. This delay will allow coatings manufacturers additional time to formulate their products. The commentator is also referred to response to comment #1-7.

3-17 The commentator is correct that there is no regulatory requirement to eliminate from AIM coatings the specific solvents mentioned. In surveying conventional and low VOC AIM coatings (see the tables in Appendix D), however, staff noted a trend of coating formulators to move away from formulating low VOC coatings with hazardous materials when possible. Further, although mineral spirits are not carcinogenic or teratogenic, they are highly flammable. Generally, replacement solvents would be less flammable. Regarding potential hazard impacts associated with architectural coatings formulated with acetone, the commentator is referred to the response to comment #1-12. See also Chapter 4 of the Draft

EA for a more complete discussion of hazard impacts associated with both conventional and replacement solvents.

COMMENT LETTER #4

NATIONAL PAINT & COATINGS ASSOCIATION

COMMENT LETTER #4
National Paint & Coatings Association
December 1, 19[illegible]

4-1 Although it is true that the SCAQMD has contracted a study with NTS, the proposed amendments do not rely on this study for the development of PAR. Staff has conducted an exhaustive and comprehensive analysis of currently available low VOC coatings that forms the primary basis for PAR 1113. This analysis evaluated hundreds of coatings from approximately 12 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time. To the extent information is available from the NTS study, it will be incorporated into the analysis.

4-2 PAR 1113 has been rescheduled to be considered by the SCAQMD Governing Board at the May 14, 1999 Public Hearing.

4-3 The NTS study does include actual exposure tests that will be conducted in three locations within the Basin, including El Segundo, Saugus, and Fullerton. Staff will analyze the results of the actual exposure studies and utilize these as a part of technical assessments for future limits.

4-4 The proposed amendments do rely on low VOC coatings technology. This is typically the way the SCAQMD's rule promulgation process works, i.e., develop new rules or amend existing rules based upon on low emission technologies that are currently available. SCAQMD staff's exhaustive and comprehensive analysis of currently available low VOC coatings forms the basis for PAR 1113. This analysis evaluated hundreds of coatings from approximately 12 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time. These issues are discussed in Chapter 4 of the Draft SEA. Further, PAR 1113 has been modified, such that the first compliance date milestone has been moved from July 1, 2001, to January 1, 2002. This delay will allow coatings manufacturers additional time to formulate their products.

In addition to staff research, the SCAQMD established an Industry Working Group (see the discussion in Chapter 2) that has met five times since September 3, 1998. These Industry Working Group meetings have addressed many of the issues raised in the comments on the NOP/IS and has resulted in modifications to PAR as identified in the response to comment #4-5. Consequently, the Rule 1113 amendment process can be characterized as, "...a thorough, open minded, and objective evaluation of existing and reasonably foreseeable coatings technologies in setting future VOC limits."

4-5 Staff has analyzed the national AIM rule's categories and definitions, as well as the VOC limits. Staff believes that adding additional categories into the Table of Standards with the default 250 g/l limit will add to confusion, instead of simplifying the rule. For example, the national AIM rule has separate categories for interior and exterior nonflats, but has the same VOC limit. This does not add any simplicity to the rule, just redundancy. The current Rule 1113 – Architectural Coatings currently contains an exemption for coatings sold in containers having a capacity of one quart or less (Rule 1113(g)(1)(A)). Staff has created two new coating categories: floor coatings and rust preventative coatings. However, the current and future proposed VOC limits are different than those found in the national AIM rule. Staff has adopted the national AIM rule definitions and provisions for some categories, where appropriate.

4-6 Regarding a low vapor pressure exemption, the commentator is referred to the response to comment #1c-12.

4-7 Regarding performance based standards, the commentator is referred to the response to comment #1c-9.

4-8 Regarding a reactivity based alternative, the commentator is referred to the responses to comments #1-3 and #1b-1.

4-9 This comment is a recommendation to include a product line averaging provision to regulate architectural coatings. A product line averaging provision is included in PAR 1113.

4-10 Regarding regional deregulation, the commentator is referred to the response to comment #1c-15.

4-11 Regarding a seasonal regulatory approach, the commentator is referred to the response to comment #1c-14.

4-12 With regard to the comments that there is no reasonably foreseeable technology that would achieve the limit and the limit might be appropriate for some applications and not others, the commentator is referred to the response to comment #4-5. With regard to costs, the commentator is referred to the Socioeconomic Impact Assessment in the Staff Report for PAR 1113. Finally, with regard to holding off further drafting of the proposed revisions to Rule 1113, the Public Hearing for PAR 1113 has been delayed from February 12, 1999, to May 14, 1999. This delay has provided additional time for consideration of PAR 1113 by the Industry Working Group and staff.

4-13 The commentator is referred to the response to comment #4-5.

4-14 The SCAQMD utilizes the USEPA approved test method for VOC content of architectural coatings. An alternative test method for testing VOC content of architectural coatings (especially low- VOC coatings) has been developed, and is currently undergoing validation testing. This alternative test method, also known as the direct injection method, relies on a GC/MS analysis, and reports the results in percent VOC. The SCAQMD supports the work on the direct injection method, and looks forward to adoption by the USEPA.

4-15 A non-compliant coating fee is essentially a pay-to-pollute proposal. The SCAQMD has resisted such proposals in the past because they do nothing to bring the district into compliance with state and federal standards, and may actually hinder attainment efforts. Further, The US EPA has indicated in the past that it will not approve pay to pollute proposals unless there is a specified emission reduction proposal associated with the proposal. As a result, a pay-to-pollute will not be considered further.

4-16 The commentator is referred to the response to comment #1-12 regarding potential hazard impacts associated with architectural coatings formulated with acetone. With regard to plural coating systems, the commentator is referred to the response to comment #5-5. See also Chapter 4 of the Draft EA.

4-17 The analysis of environmental impacts in Chapter 4 of the Draft SEA includes an analysis of potential impacts to landfills from the use of two-coating systems The commentator is, therefore, referred to Chapter 4.

COMMENT LETTER #5

PPG INDUSTRIES, INC.

COMMENT LETTER #5
PPG Industries, Inc.
December 1, 1998

5-1 The commentator is referred to responses to comments #4-1 through #4-17.

5-2 Regarding the rule amendment schedule, the commentator is referred to the responses to comments #3-2, #4-1 and #4-2.

5-3 The proposed VOC limit of 250 g/l for stains is based on a variety of 100 percent acrylic technologies that have been available in the marketplace for over five years. Numerous local, national, and international manufacturers of stains have this compliant technology available. Some of the manufacturers claim excellent performance for their 100 percent acrylic products. The commentator is referring to the Resydrol 586 resin technology, which is a hybrid resin based on an alkyd core and acrylic exterior. Staff has submitted a requests for PPGAF's analysis and laboratory studies on numerous occasions pertaining to their evaluation of the Vianova Resin's Resydrol technology. To date, PPGAF's staff, specifically Robert Gross, has not forwarded their testing information. In contrast, Vianova Resin has forwarded information showing performance of their stains based on the Resydrol 586 resin. Basically, this technology has been used in Europe for over ten years, and Vianova has over four years of actual exposure data from the US, showing good performance, without any flaking, cracking, or peeling. Therefore, if PPGAF has actual studies that show different performance, the SCAQMD again requests these studies. In summary, numerous types of technologies are currently available, and commercially available stains that comply with the proposed 250 g/l VOC limit, seem to perform just as well or even better than some of the alkyd technology. Therefore, staff has not received any empirical studies that show the need for more frequent recoating using the new, lower-VOC technologies.

5-4 Staff has shared the technologies for other coating categories in the working group meetings, as well as in the Draft Staff Report. If the commentator wishes to obtain additional information, or would like staff to facilitate meetings with suppliers of compliant technology, the commentator is encouraged to contact staff to set up a meeting.

5-5 The proposed definition for industrial maintenance coatings is the definition originally adopted in 1990, but invalidated in a court decision. The existing definition lists each resin type individually, with the same VOC limit for each resin type listed. The proposed definition clarifies the definition for this coating category by adding specific performance requirements necessary for industrial maintenance coatings, and removes the individual resins utilized for formulating coatings. For this category, compliant waterborne and high-solids coatings are available for all uses. Staff recognizes that a portion of compliant coatings rely on two-component formulations that have limited pot lives. The use of plural spray equipment mitigates issues relating to two-component coatings, whereas use of airless spray technology mitigates application issues relating to high-solids coatings. All of the safety issues have been extensively analyzed in the Draft SEA. In summary, staff has conducted a technology assessment and found commercially available technologies for a variety of industrial uses. However, if a manufacturer does have a specialty industrial maintenance coatings that cannot be formulated below the proposed compliance limits, that manufacturer can use the Averaging Provision option to continue selling the non-compliant coating.

5-6 The definition of stains has not been modified as part of PAR 1113. Based upon staff's research on available low VOC coatings, including stains, the 250 gram per liter limit is a viable limit. The commentator is also referred to the response to comment #5-4.

5-7 Staff would like to thank the commentator for the comments provided. In response, staff has re-addressed the proposed VOC limits and compliance dates, where appropriate.

COMMENT LETTER #6

BENJAMIN MOORE & CO.

COMMENT LETTER #6
Benjamin Moore & Co.
November 25, 1998

6-1 The commentator is referred to the response to comment #4-5.

6-2 The commentator is referred to the response to comment #4-14.

6-3 With regard to a reactivity-based alternative, the commentator is referred to the responses to comments #1b-1 and #1-3. With regard to an exemption for low volatile compounds, the commentator is referred to the response to comment #1c-12.

6-4 A product line averaging provision is included in PAR 1113. The commentator is referred to Chapter 2 – Project Description and PAR 1113 (Appendix A).

6-5 Staff assumes this comment refers to requiring a non-compliant coating fee. The commentator is referred to the response to comment #4-15.

6-6 With regard to the various studies, the rule amendment schedule and VOC content limits, the commentator is referred to the responses to comments #3-2, 4-1, and 4-2.

6-7 The SCAQMD would like to thank the commentator for proposing alternative future limits. However, staff has found compliant coatings for all affected categories, with performance claims equivalent to their high-solvent counterparts. Furthermore, the proposed alternative limits do not achieve the emission reductions necessary to implement the applicable AQMP control measure.

6-8 First and foremost, the proposed amended rule does not require completely solvent-free coatings. However, staff has gathered information on numerous zero-VOC and low-VOC resin technologies that do not have blocking or stain-blocking problems. Staff has also found numerous coatings for all affected categories, with performance claims equal to their higher-solvent counterparts. The lower VOC products do require more stringent surface preparation for proper application. Waterborne coatings typically dry much faster than their solvent-based counterparts, except during high humidity and low temperature conditions. However, such high humidity and low temperature conditions do not appear in most of the Basin during majority of the year.

6-9 The analysis of environmental impacts in Chapter 4 of the Draft SEA includes an analysis of potential impacts to landfills from the use of two-coating systems The commentator is referred to the response to comment #1-12 regarding potential hazard impacts associated with architectural coatings. See also Chapter 4 of the Draft EA.

COMMENT LETTER #7

BONA

COMMENT LETTER #7
Bona
December 1, 1998

7-1 It is likely that the issues identified on pages 2-6 and 2-7 of the IS do not apply to hardwood floors. These issues have been raised as part of past rule making efforts on Rule 1113 and, in fact, have been raised in response to the currently proposed amendments to Rule 1113 (see, for example, comment letter #1). These issues are addressed in Chapter 4 of the Draft SEA.

It is acknowledged, however, that commercially available water-based floor finishes have durability characteristics equal to or surpassing that of traditional solvent-based products.

7-2 Wood varnishes are not included in the NTS study because their VOC content limit is not affected by the currently proposed amendments. The results of the NTS study will be available to the public when it is completed.

7-3 As noted in response to comment #7-2, the VOC content limit of wood varnishes is not affected by the currently proposed amendments. As a result, prices for wood varnishes are not expected to be affected by PAR 1113.

7-4 As noted in response to comment #7-2, the VOC content limit of wood varnishes is not affected by the currently proposed amendments.

7-5 PAR 1113 has been modified to delay the compliance date for stains from July 1, 2001, to January 1, 2002 to allow additional time to develop compliant formulations. The commentator is referred to the responses to comments #7-6 and #7-7.

7-6 Waterborne coatings typically dry much faster than their solvent-based counterparts, except during high humidity conditions and low temperatures. However, such high humidity and low temperature conditions do not appear in most of the basin during majority of the year.

7-7 Viscosity of a coating is affected by temperature and humidity, recognizing that viscosity of a coating can increase with decreasing temperatures and increasing humidity levels. Staff has found compliant stains that have a similar viscosity to the higher VOC stains. However, such high humidity and low temperature conditions do not appear in most of the Basin during the majority of the year.

7-8 Staff agrees that some manufacturers may be circumventing the more stringent VOC limits by categorizing their coatings under the quick-dry categories. The quick-dry primers, sealers, and undercoaters, however, will be subsumed into the general primer, sealer, and undercoater category.

7-9 Potential alternatives recommended by the Industry Working Group for consideration include the following: exemption for low volatile compounds (see response to comment #1c-12); seasonal deregulation (see response to comment #1c-14); regional deregulation (see response to comment #1c-15); reactivity based regulation (see response to comment #1b-1); performance based standards (see response to comment #1c-9); product line averaging (see response to comment #1c-13); and public advisories/voluntary action (see response to comment #1c-16). The commentator is also referred to Chapter 5 of the Draft SEA for a description and analysis of the currently proposed project alternatives.

COMMENT LETTER #8

DU PONT

COMMENT LETTER #8
Du Pont
December 11, 1998

8-1 The proposed amendments do rely on low VOC coatings technology. This is typically the way the SCAQMD's rule promulgation process works, i.e., develop new rules or amend existing rules based upon on low emission technologies that are currently available. For PAR 1113 staff conducted an exhaustive and comprehensive analysis of currently available low VOC coatings that forms the primary basis for PAR 1113. This analysis evaluated hundreds of coatings from approximately 12 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time. These issues are discussed in Chapter 4 of the Draft SEA. Further, PAR 1113 has been modified, such that the first compliance date milestone has been moved from July 1, 2001, to January 1, 2002. This delay will allow coatings manufacturers additional time to formulate 50 gram per liter products.

8-2 Regarding performance issues, the commentator is referred to the response to comment #8-1. These issues are discussed in Chapter 4 of the Draft SEA. Finally, even if it were true that lowering the VOC content level of coatings from 420 grams per liter to 50 grams per liter required more frequent applications, an individual could apply the 50 gram per liter coating an additional seven times and still obtain a slight air quality benefit. Based on staff research of available compliant coatings, no coatings were identified with such poor performance characteristics.

8-3 Staff has found commercially available coatings that comply with the VOC content limits for all affected coating categories, especially the January 1, 2002 VOC content limits. Most of these have been available and used for more than five years by a variety of local users However, the SCAQMD appreciates the need for end-users to evaluate the performance of these coatings. Therefore, the proposed limits for industrial maintenance coatings have been raised for the industrial maintenance and nonflat coatings, and the compliance dates have been extended. Regarding use of these coatings, end-users can use non-compliant coatings for an additional three years after the future effective dates are implemented. Please refer to subsection 1113(c)(4) for the specific language of the sell-through provision. The compliance dates listed in the Table of Standards are specifically for manufacture, and not use.

8-4 With regard to analysis of currently available coatings see response to comment #8-1.

8-5 Staff has found numerous single-component and two-component, zero-VOC industrial maintenance coatings, with pot lives of up to three hours (see the tables in Appendix D). These can be brushed, rolled or sprayed using conventional coating gun technologies. However, staff recognizes that some fast-cure zero-VOC technologies require using plural spray technology. However, the increased cost of the application equipment is more than offset by the faster dry time and quicker turnaround time associated with the fast cure coatings. The final compliance date for the 100 g/l VOC limit for industrial maintenance coatings has been extended from July 1, 2001, to January 1, 2005, to provide adequate time for contractor training with the increased use of two-component coatings.

8-6 It is assumed that this comment's reference to new application methods refers to the potential increased usage of two-component coating systems, which require plural spray gun equipment. It should be noted that two-component coating systems are already used in certain applications, e.g., industrial maintenance applications. Although such equipment requires training to achieve desired coating characteristics, staff has not identified any

hazards associated with plural spray gun equipment that are greater or more severe than currently used coating spray equipment.

8-7 The commentator is referred to the response to comment #8-1. Although the commentator doesn't mention in this comment any specific issues that may arise, Chapter 4 of the Draft SEA includes analysis of a wide range of potential impacts that may occur as a result of the proposed amendments. See also response to comment #4-2.

8-8 Based upon input from the Industry Working Group, the interim compliance date has been moved from July 1, 2001, to January 1, 2002. The final compliance date remains January 1, 2005, based on input from the coatings industry regarding how long it takes to formulate new coatings. The 100 gram per liter interim limit for applicable has not been modified due to the delayed interim compliance date and the available of compliant coatings currently on the market.

8-9 With regard to the NTS study, the commentator is referred to the response to comment #3-2. With regard to real world testing the commentator is referred to the response to comment #4-3. Finally, the NTS study will be made available to coatings manufacturers, as well as the public in general.

8-10 Rule 1113 already contains a provision, (c)(4), that allows the sale of coatings manufactured before the final compliance date for three years after the final compliance date.

8-11 CARB has been collecting sales data which is expected to provide more precise information on the architectural coating emission inventory in the district. Though the CARB study is important, it does not provide information relevant to establishing specific VOC content limits.

8-12 Staff has analyzed the use of the lower-VOC coating technologies for a variety of uses. The low- and zero-VOC industrial maintenance coatings are recommended for a variety of industrial uses, including but not limited to refineries, chemical facilities, food processing, pulp and paper manufacturing, bridge, pipeline, and wastewater treatment facilities.

8-13 The commentator is referred to the response to comment #8-8.

8-14 Staff is cognizant of the issues involved with use of low- and zero-VOC coatings. Extensive evaluation of hundreds of low VOC and conventional coatings indicates that low VOC coatings have comparable durability characteristics, such as corrosion resistance for example, compared to conventional coatings (see the tables in Appendix D and applicable summary table in Chapter 4). Consequently, the chances of corrosion failures are not significantly greater than with conventional coatings. With regard to economic impacts associated with PAR 1113, the commentator is referred to Socioeconomic and Cost Effectiveness Assessment.

8-15 Staff has conducted an extensive technology assessment for the PAR 1113, as well as analyzed the cost-effectiveness of proposal. The current version of PAR, in particular modifications to the Table of Standards, reflects this technology assessment.

8-16 The SCAQMD cannot provide any guidance to industry pertaining to documentation on pursuit of other avenues.

COMMENT LETTER #9

CARBOLINE COMPANY

COMMENT LETTER #9
Carboline Company
November 30, 1998

9-1 PAR 1113 contains a specific category for high temperature coatings, with a proposed limit of 550 g/l, effective January 1, 2002. Staff has found several compliant industrial maintenance coatings that have substantial service lives. These include, but are not limited to, Ameron's Polysiloxane coatings and Madison Chemical's two-component polyurethane coatings. Therefore, staff believes that a category for extreme performance is not required. For a more extensive discussion of industrial maintenance coatings, please review the industrial maintenance section in the draft staff report. Finally, staff is not aware of any nuclear facilities within the district, needing this specialty coating category.

9-2 The compliance date for the 100 g/l VOC content limit for industrial maintenance coatings has been extended from July 1, 2001, to January 1, 2005, to provide adequate time for contractor training with the increased use of two-component coatings. The interim compliance date for the VOC content limit of 250 g/l is proposed for January 1, 2002. Staff has analyzed the use of the lower-VOC technologies for a variety of uses. The low- and zero-VOC industrial maintenance coatings are recommended for a variety of industrial uses, including but not limited to refineries, chemical facilities, food processing, pulp and paper manufacturing, bridge, pipeline, and wastewater treatment facilities

9-3 Staff has found numerous single-component and two-component, zero-VOC industrial maintenance coatings, with pot lives of up to three hours. These can be brushed, rolled or sprayed using conventional gun technologies. However, staff recognizes that some fast-cure zero-VOC technology require the use of plural spray technology. However, the increased cost of the application equipment is more than offset by the faster dry time and quicker turnaround time associated with the fast cure coating.

9-4 The commentator is referred to the responses to comments #9-2 and #9-3.

COMMENT LETTER #10

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

COMMENT LETTER #10
Southern California Association of Governments
November 17, 1998

10-1 The SCAQMD agrees that the proposed project is not regionally significant per the Areawide Clearinghouse criteria. The Draft SEA will be sent to SCAG for further review and comment.

12/9/98 SCOPING MEETING ORAL COMMENTS

RESPONSES

The following summarizes the environmental-related comments received by the AQMD at the Public Workshop for PAR 1113. The comments have been grouped by environmental topic. Responses to each comment are also included.

Safety

Comment #1: Lane restrictions are often required when Caltrans paints bridges. Potential safety problems may occur if passerby's are exposed to hazardous materials.

Response #1: When Caltrans performs most types of work near roadways, lane restrictions already occur. With regard to safety problems, it is assumed the comment refers to greater use of two-component polyurethane IM coating systems to comply with the final compliance date of 2005 that may contain one of three forms of diisocyante, TDI, HDI, and MDI. TDI is considered to be a carcinogen, while all three can generate allergic reactions in sensitive individuals. The main concern is when the coating is sprayed onto the substrate. During the application process it may be possible that the diisocyante could volatilize and come into contact with motorists or pedestrians in the immediate area. Subsequent to release of the NOP/IS, PAR 1113 was modified to address this concern. New section (d)(8) in PAR 1113 prohibits spray application of two-component polyurethane resin coatings effective January 1, 2008. As a result of this modification to PAR 1113, safety problems are not anticipated to occur as a result of adopting PAR 1113.

Comment #2: New coatings may not have the appropriate brittleness and would not crack along with the infrastructure. The crack may be missed during infrastructure inspections and thus result in adverse safety impacts.

Response #2: Low-VOC coatings are available in a variety of formulations, depending on their recommended uses. For example, low- and zero-VOC coatings are available for industrial maintenance uses that have either a rigid film or an elastomeric film that provides flexibility. The use of each is dependant on the type of substrate to be coated, the exposure conditions for the substrate, and the desired service life of the coating.

Comment #3: There is the potential for public endangerment if coatings have short life-cycles or are less corrosive resistant, which may lead to destruction of infrastructure (e.g., water tanks, bridges, pipelines).

Response#3: Staff reviewed coating product data sheets (see the tables in Appendix D and the relevant summary tables in Chapter 4) to obtain durability information for low VOC coatings and conventional coatings. Based upon a comparison of the coating product information sheets, staff concluded that low VOC coatings have durability characteristics comparable to conventional coatings. Based upon staff research of coating product information sheets, no significant adverse infrastructure impacts are anticipated from implementing PAR 1113. Also, refer to the response to comment #1-9 regarding durability and other characteristics of low VOC coatings and the air quality analysis of issues identified by the architectural coatings industry.

Comment #4: High temperature indicating paints are used for safety reasons at refineries and other industrial sites. No compliant coatings are currently available for this safety-related use.

Response #4: To address this issue, PAR 1113 has been modified to include a high temperature industrial maintenance category with the following VOC content limits and compliance dates: 550 grams per liter by January 1, 2002, and 420 grams per liter by January 1, 2005.

Comment #5: Coatings for certain uses require government approval for safety-related purposes. For example, the interior of potable water systems require chemical evaluation by the National

Sanitation Foundation. FIFRA must approve products for use below the water line of piers. Military specifications require very specific products.

Response #5: Low- and zero-VOC coatings are available and approved for storage of potable water by the National Sanitation Foundation and ANSI. United Coatings and Madison Chemical are just two of the manufacturers that have NSF/ANSI approved zero-VOC coatings for interior of potable water storage tanks.

Human Health

Comment #6: Worker safety is a concern. Special handling and expertise may be required for reformulated coatings.

Response #6: It is assumed that this comment's reference to special handling and expertise refers to the potential increased usage of two-component coating systems, which require plural spray gun equipment. It should be noted that two-component coating systems are already used in certain applications, e.g., industrial maintenance applications. Although such equipment requires training to achieve desired coating characteristics, staff has not identified any hazards associated with plural spray gun equipment that are greater or more severe than currently used coating spray equipment.

In addition to consideration of coating equipment, worker safety concerns have been raised regarding the potential for increased usage of low VOC, two-component polyurethane IM coatings. These coatings are currently contain diisocyanates, which are hazardous materials. The primary concern is while spraying the coating onto the substrate when there is a small possibility that the diisocyanate could volatilize and be inhaled or otherwise come into contact with the worker. Since release of the NOP/IS, PAR 1113 has been modified to prohibit using spray equipment for two-component polyurethane IM coatings. Please see new rule section (d)(8).

Comment #7: Some reformulations are more toxic than conventional products, especially two-component, epoxy, and catalyzed systems. While workers may have appropriate safety equipment, the general population will be exposed to greater risks.

Response #7: The issue of hazardous solvents in two components systems has been addressed in the "Hazards" and "Human Health" sections in Chapter 4. In addition, since the release of the NOP/IS, PAR 1113 has been modified to include section (d)(8) which prohibits spraying two component polyurethane systems which are the coatings of most concern after January 1, 2005. By prohibiting the use of spray equipment is expected to eliminate potential human health impacts.

Comment #8: Special certifications for health and safety requirements are needed by certain industries. The nuclear power industry has special requirements to ensure the coated surfaces remain free from contamination or are readily cleaned. Reformulations may not be appropriate for this industry. Also, coatings for interiors of potable water systems must be approved by appropriate regulatory agencies to certify no harmful leaching would occur.

Response #8: There are no nuclear power industry facilities located within the South Coast Air Basin. Low- and zero-VOC coatings are available and approved for storage of potable water by the National Sanitation Foundation and ANSI. United Coatings and Madison Chemical are just two of the manufacturers that have NSF/ANSI approved zero-VOC coatings for interior of potable water storage tanks.

Air Quality

Comment #9: There is no direct relationship between VOC content and ozone formation. Reducing VOCs may or may not reduce VOC emissions depending on performance characteristics. Reducing total VOC emissions from coatings may or may not reduce ozone levels in the Basin depending on changes in the character, location, and timing of emission. Reducing emissions under certain conditions could increase ozone formation.

Response #9: Please refer to responses comments #1-3 and #1b-1 from comment letters #1 and #1b, respectively.

Comment #10: Failure of reformulated coatings lead to a greater number of applications and greater VOC emissions.

Response #10: Please refer to response to comment #3 above.

Waste

Comment #11: Reformulations with reduced pot lives will lead to additional disposal of additional hazardous wastes.

Response #11: Reduced pot life is an issue related to two-component coating systems. Staff contacted resin manufactures about this issue. Resin manufactures indicated that wastes from two-component coating systems are not hazardous wastes, but are disposed of simply as a solid waste. With regard to potential adverse impacts to landfills as a result of implementing PAR 1113, specifically the issue related to solid waste impacts resulting from shortened pot life, please refer to the solid waste analysis in Chapter 4.

Comment #12: PAR 1113 may require more equipment cleaning, which results in increased wastewater.

Response #12: The analysis of water resources impacts in Chapter 4 takes into account the increased generation of wastewater to clean equipment used to apply compliant coatings. The analysis indicated that this impact would not be significant. Please refer to the analysis in Chapter 4 for more detailed information.

General

Comment #14: If costs of materials increase, users may use cheaper products with adverse environmental impacts.

Response #14: Although specific environmental impacts were not identified, it is assumed that this comment refers to potential impacts resulting from the failure of low VOC coating systems for specific applications. Please refer to the response to comment #3 above.

Comment #15: Coating substitutions such as brick, siding, tiles, etc., may not perform as well or as efficiently in terms utilizing raw materials and energy. Coatings are typically the most efficient use of resources and energy to accomplish the intended aim. Thus, substitution of these alternative surface finishing methods would result in an increased burden on the total ecology.

Response #15: It is assumed that the commentator is implying that the performance characteristics of compliant low VOC coatings will be inferior to conventional coatings, so substitutions such as those identified by the commentator will need to be used. As noted in the response to comment #3,

based on staff research of the product data sheets, there are, generally, a substantial number of low VOC coatings that are currently available, that have performance characteristics comparable tc conventional coatings. In addition, there is no indication that brick, siding, and tiles would be substitutes for either interior or exterior flat coatings. See also the air quality analysis in Chapter 4.

Comment #16: The SCAQMD should consider innovative alternative approaches identified in the NOP. Exemption for low volatility compounds and a simplified averaging provision alternative should be explored. The existing averaging provision is not viable for use by coating manufacturers.

Response #16: Potential alternatives identified in the NOP/IS and discussed by the Industry Working Group for consideration include the following: exemption for low volatile compounds (see response to comment #1c-12); seasonal deregulation (see response to comment #1c-14); regional deregulation (see response to comment #1c-15); reactivity based regulation (see response to comment #1b-1); performance based standards (see response to comment #1c-9); product line averaging (see response to comment #1c-13); and public advisories/voluntary action (see response to comment #1c-16). The commentator is also referred to Chapter 5 of the Draft SEA for a description and analysis of the currently proposed project alternatives. If this comment refers to alternative regulatory coating categories, the commentator is referred to the response to comment #3-6.

Comment #17: Contractors will have a greater liability problem with unproven replacement coatings that are applied in environmentally sensitive or production areas, or where coating failure can cause structural, equipment and/or environmental damage that exhaust a contractor's financial resources to correct.

Response #17: Please refer to response to comment #3 and the air quality analysis in Chapter 4.

APPENDIX D

SUMMARY OF COATING CHARACTERISTICS

Due to the voluminous nature of the coating product sheets (~1000 sheets) from which the following data were derived, they are available upon request by contacting Lori Inga at (909) 396-3109.

***NOTE:** Morton International, Vianova and Air Products are raw material manufacturers.*

TABLE D-1

Floor Coatings - from 420 g/l to 100 g/l (9 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Ameron Amercoat® 335 (2 comp epoxy acrylic)	288	43+/-3	229	600* psi	Abrasion resistance 130 mg loss	1 year retention	8 hrs / 1 yr.
Dunn Edwards ULTRASHIELD® Aliphatic Polyurethane Enamel Pigmented IP 630	420	54	425-550	Good; clean, dry surfaces	Chemical, impact resistance	90 + @60 deg; gloss retention	6-8 hrs / 1 yr
Dunn Edwards ULTRASHIELD® Aliphatic Polyurethane Enamel Pigmented IP 631	420	53	550	Good; clean, dry surfaces	Chemical, impact resistance	95 + @60 deg; gloss retention	6-8 hrs / 1 yr
Morton International MorKote™ 3000 (Acrylic concrete wall and floor)	114	36	193	n/a	4,000 scrubbing cycles	10 @60 deg	n/a / 1 yr
Pittsburgh Paints 3-110 Urethane Fortified Alkyd Floor and Deck Enamel Interior/Exterior	373	51.3 +/ 2	400-500	Coat w/paint thinner	Not resistant to high heat/ corrosion chemicals	75 @60 deg	n/a / 3 yrs
Pittsburgh Paints 3-814 Series – Exterior/Interior Floor and Deck Gloss-Oil Enamel	378	51.6 +/- 2	400-450	Back roll if sprayed	Not resistant to high heat chemicals	80 @60 deg	n/a / 3 yrs
Pittsburgh Paints Aquapon 97-53,54,97 Polyamide-Epoxy Tinting Bases	420	53.8 +/- 2	287-431	Apply to dry clean surface	Abrasion, impact, chemical resistant	70+ @60 deg ; loss due to prolonged exterior exposure	3.5-4 hrs / 3 yrs
Pittsburgh Paints Aquapon 97-51 Polyamide-Epoxy Tinting Base	399	47.2 +/- 2	246-369	Outstand-ing	Excellent abrasion, impact, chemical resistance	70 @60 deg; loss due to prolonged exterior exposure	12-24 hrs / 3 yrs
Pittsburgh Paints Aquapon WB 98-Line Waterborne Epoxy High Performance	230	38 +/- 2	203	Apply to clean dry primed surface	Impact, abrasion, stain resistant	70+@60 deg	6 hrs / 5 yrs

* Test method ASTM D2197

Average Summary of Samples	**338**	**47.5**	**356**

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2.

TABLE D-2

Floor Coatings - from 100 g/l to 50 g/l (5 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg. Shelf Lif
Advanced Polymer Sciences Guardline Concrete Corrosion Resistant	100	91	490	500 psi	15,000 psi hydroblast	UV resistance 40+ yrs	30 mins / 1 yr
Ameron PSX® 700 (2 comp epoxy polyurethane)	84	90 +/- 3	481	1000*psi	Abrasion resistance 53 mg loss	Retains 50% @ 26 wks	4 hrs / 1 yr.
Benjamin Moore M58 Safety and Marking Latex	76	62	330	Apply to clean, dry surfaces	Vehicle/ foot traffic resistant	20% Gloss	4 hrs / 1 y
Madison Chemical GemThane™ 1:4 Aromatic	78	94	500	800 psi	Chemical, abrasion resistant	Chalk & discolor due to UV exposure	1 + / 1 yr
Pittsburgh Paints 3-410 Series – Latex Floor and Deck Enamel	90	38.3 +/- 2	400	No special surface preparation	Tough, durable film	5-40 @60 deg	n/a / 5 yr

* Test method ASTM D2197

Average Summary of Samples	**86**	**75.1**	**440**	**2.4 hrs. 1.8 yrs**

TABLE D-3

Floor Coatings - 50 g/l or less (13 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Characte r-istics	Pot Life @70 deg./ Shelf Life
Advanced Polymer Sciences Underguard High Performance Concrete Sealer	0	100	290	Concrete	15,000 psi hydroblast	Semi-clear.	15-30 mins / 1 yr
Air Products ADURA™ 50	0	40	200-400	>400** psi	Abrasion resistance 123 mg loss	78-97 @60 deg	2-3 hrs / 1 yr
Air Products ADURA™ 100	0	70	377	Good	Abrasion resistance 46.4 mg loss	95 @60 deg	3-5 hrs / 1 yr
Air Products ADURA™ 200	0	70	150-400	Excellent	Abrasion resistance 100 mg loss	95 @60 deg	5.5 hrs/ 1 yr
Coatings Resources Corp. CR-10	0	100	150-400	1710 psi*	13,500 psi	95 @60 deg	1 hr / 2yrs
Coatings Resources Corp. CR-11	0	100	150-400	Good	Abrasion resistant	90 @60 deg	1 hr / 2 yrs
Coatings Resources Corp. CR-13	0	100	150-400	1500 psi*	12,500 psi	High	1 [illegible]
Glass Shield Floor Guard 100 (2 comp polyurethane)	0	100	535	Excellent	Excellent	High gloss	30 mins / 2 yrs
Hart Polymers HP-100 (2-comp aliphatic polyurethane)	0	60	333	Pass*	Abrasion resistance <40 mg loss	>90 @60 deg	1.5-2 hrs / 1 yr
Hart Polymers HP-120 (2-comp epoxy/acrylic high gloss)	0	50	400-500	Pass*	Abrasion resistance <25 mg loss	Discolor from direct sunlight	2.5-3 hrs / 1 yr
Hart Polymers HP-320 (2-comp acrylic/epoxy)	0	55	300	Pass*	Abrasion resistance <25 mg loss	Discolor from direct sunlight	2.5-3 hrs / 1 yr
Hart Polymers HP-330 (2-comp epoxy)	0	100	500	Excellent	Abrasion resistance <25 mg loss	High	45 mins / 1 yr
Sherwin Williams ArmorSeal 650 SL/RC	0	100	50-160	Excellent	Abrasion, chemical, impact resistant	Full	40 min./ 1 yr
Average Summary of Samples	**0**	**80.4**	**331**				**1.9 hrs / [illegible]**

* Test method ASTM D2197
** Test method ASTM D4541-85

TABLE D-4

Industrial Maintenance Coatings - from 420 g/l to 250 g/l (47 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Ameron Amershield® (2 comp aliphatic polyurethane)	264	73 +/-3	234	Excellent	Abrasion resistance, 60.2 mg loss	Retains gloss - 100 cleaning cycles	2.5 hrs / 1 yr
Ameron Amercoat® 450HS (2 comp aliphatic polyurethane)	287.5	66 +/- 3	530	Prime steel, concrete	Excellent abrasion resistance	Excellent	4 hrs / 1 yr
Ameron Amercoat® 892HS (single comp)	323	64 +/- 3	514	Prepare steel	Good abrasion resistance,	Semigloss	n/a / 1 yr
Ameron Amercoat® 90HS (2 comp epoxy-phenolic)	323	64+/-3	257	Prepare steel, concrete, aluminum	Excellent abrasion resistance,	Flat	4 hrs / 1 y
Ameron Amerthane ® 487 (2 comp elastomeric polyurethane)	276	68 +/- 3	136	3500 psi (tensile strength)	Outstand-ing impact, abrasion/ good chemical, corrosion resistance	Semigloss	1 ¼ hrs / (months
Ameron Amercoat® 385 (2 comp multi-purpose epoxy primer)	276	66 +/- 3	265	>1000* psi	Excellent resistance - 1 yr after chemicals	Flat	3 hrs/ 1 y
Ameron Amercoat® 185HS (single comp universal primer)	383	59 +/- 3	379	Prepare steel, aluminum	Protects against weatherin g	Flat	n/a / 1 yr
Ameron Amercoat® 5105 (single comp alkyd primer)	335	62 +/- 3	331	Bare steel	Corrosion resistant	Flat	n/a / 1 yr
Ameron Dimetcote® 21-9 (2 comp inorganic zinc silicate primer – steel)	293	79.9	427	500* psi	Corrosion resistant	Flat	4 hrs / 1(months
Ameron Amercoat® 68HS (3 comp zinc rich epoxy primer)	288	70 +/- 3	374	Excellent	Chemical resistant	Flat	16 hrs / yr
Ameron Amercoat® 370 (2 comp epoxy primer)	300	63 +/- 3	202	>1000* psi	Corrosion resistant	Flat	4 hrs / 1
Dunn Edwards BLOC-RUST® Red Oxide Alkyd Corrosion Inhibitive Primer 43-4	300	64	500-550	Prime surface	Corrosion resistant	Flat	n/a/ 1 yr

TABLE D-4 (CONTINUED)

Industrial Maintenance Coatings - from 420 g/l to 250 g/l (47 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Dunn Edwards Corrobar White Alkyd Corrosion Inhibitive Primer 43-5	345	56	500-550	Good; clean dry surfaces	Corrosion resistant	Flat	n/a / 1 yr
Dunn Edwards Paints Enduragloss 42-53 (single comp)	420	47	400-475	Clean, dull surfaces	Abrasive; corrosion resistant	85 –90 @ 60 deg.	n/a / 1 yr
Dunn Edwards High Build Industrial Epoxy Primer – IP714	340	59	250-300	Good; prime surface	Abrasive; corrosion resistant	High gloss	6-8 hrs / 1 yr
Dunn Edwards Low Sheen Pigmented Z 6243 (2 comp)	340	64.7	500-600	Clean, dull surfaces	Very good chemical; excellent stain resistance	20-25 @ 60 deg	8-10 hrs / 1 yr
Dunn Edwards SYN-LUSTRO® High Performance Alkyd Gloss Enamel – 10 Series	395	51	400-425	Apply to clean, dry surfaces	Abrasion resistant	85-90 @ 60 deg	n/a / 1 yr
Dunn Edwards Paints Ultrashield IP630 (2 comp)	420	54	425-550	Clean, dull surfaces	Abrasion resistance, 100 mg loss	90 @ 60 deg	6-8 hrs / 1
ICI Devoe Speed Enamel #4110	420	45 +/- 1	300-400	Excellent ⅄	Excellent corrosion resistance	Flat	n/a / 1 yr
ICI Devoe Speed Enamel #4318	383	49+/-1	300-400	Excellent ⅄	Good ✪	85 @ 60 deg	n/a / 1 yr
Madison Chemical Gemthane Precatalyzed Aliphatic Exterior Coating	320	68	350	Self-priming	Abrasion resistance, 82 mg loss	Resist weatherin g	12 hrs / 1 yr
Madison Chemical Gemthane S (single comp)	282	72	383	Apply to clean surfaces	Abrasion resistance, 60 mg loss	Suitable to chemical exposure	1-2 hrs / 1 yr
Madison Chemical Gemthane 1:4 Aliphatic Urethane	340	75-78	333	800 psi	UV, impact resistant	Excellent gloss retention	1-5 hrs / 1 yr
Pittsburgh Paints Aquapon 97-53,54,97 Polyamide-Epoxy Tinting Bases (2 comp)	420	53.8 +/- 2	287-431	Apply to dry clean surface	Abrasion, impact, chemical resistant	70+ ; loss due to prolonged exterior exposure	3.5-4 hrs 5 yrs
Pittsburgh Paints 97-480 Silicone-Alkyd Finish Coatings	420	46.9 +/- 2	346	Prime surface	Heat/chalk resistant	85 @ 60 deg excellent gloss retention	n/a / 3 yr

TABLE D-4 (CONTINUED)

Industrial Maintenance Coatings - from 420 g/l to 250 g/l (47 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg. Shelf Life
Pittsburgh Paints 7-814 Industrial Gloss-Oil Interior/Exterior Enamel	420	51.3 +/- 2	350-500	Paint only in dry weather	Long lasting durability	75 @ 60 deg gloss will decrease with time	n/a / 3 yrs
Pittsburgh Paints 7-824 Industrial Interior Alkyd Low-Lustre Enamel	420	45.1 +/- 2	300-400	Easy applicatio n/excellen t flow and leveling	Excellent blocking resistance	25-35 @ 60 deg	n/a / 3 yr
Pittsburgh Paints 7-844 Industrial Interior Alkyd Semi-Gloss Enamel	420	45.6 +/- 2	300-400	Easy applicatio n/excellen t flow and leveling	Excellent blocking resistance	50-75 @ 60 deg	n/a / 3 yr
Pittsburgh Paints 7-852, 858 Industrial Rust Inhibitive Steel Primers	420	52.4 +/- 2	390-535	No special surface preparatio n	Rust inhibitive properties	Flat	n/a / 3 yr
Pittsburgh Paints Lavax 23-Line Machinery Enamel	402	51.6 +/- 2	350-400	Can withstand effects from temp. changes	Durable, wear resistant	Eggshell	n/a / 3 yr
Pittsburgh Paints Pitt-Glaze 16-Line High Solids Polyester-Epoxy Finish Coatings-Solvent (2 comp gloss)	313	65.6 +/- 2	175-265	Prime the surface	Chemical/ abrasion resistant	85 @ 60 deg	10 hrs / 3 yrs
Pittsburgh Paints Pitt-Glaze 16-Line High Solids Polyester-Epoxy Finish Coatings-Solvent (2 comp semi-gloss)	338	63.1 +.- 2	175-265	Prime the surface	Chemical/ abrasion resistant	45-60 @ 60 deg	10 hrs / 3 yrs
Pittsburgh Paints Pitthane 97-840 High Build Acrylic Aliphatic Urethane	420	59.9 +/- 2	160-240	Apply to dry, clean, primed surfaces	Not hydrostati c pressure resistant	Exception -al gloss/ color retention	4 hrs / 3 yrs
Pittsburgh Paints Speedhide 6-205 Quick-Drying Machinery and Equipment Primer	417	46.1 +/- 2	300-350	No special surface prep.	Great durability	Outstand-ing color retention	n/a / 3 yr
Pittsburgh Paints Speedhide 6-252 Gloss Oil Interior/Exterior Enamel	377	53.2 +/- 2	450	No special surface prep.	Great durability	Outstand-ing color retention	n/a / 3 yr

TABLE D-4 (CONTINUED)

Industrial Maintenance Coatings - from 420 g/l to 250 g/l (47 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Pittsburgh Paints Tankhide 97-630 Alkyd Paint Finish Coatings	420	46.6 +/- 2	186-212	Apply to dry, clean, primed surfaces	Used for exterior metal surfaces	Gloss initially; chalks w/ weatherin g	n/a / 3 yrs
Sure Coat Epoxigard	257	50	88	--	--	--	6 hrs / 1 y
Tnemec Hi-Build Gloss Series 2H	384-422	49+/-2	524	Clean, dry surfaces	Good flow & hiding	Gloss	n/a / 1 yr
Tnemec Hi-Build Epoxoline Series 66 (2 component)	362-395	56+/-2	150-299	Clean, dry surfaces	Bench-mark perf-ormance	Chalks w/ extended UV exposure	10 hrs / 1 yr
Tnemec Hi-Build Epoxoline II #69 (2 component)	269-275	69+/-2	184-369	Clean, dry surfaces	Excellent abrasion resistance	Chalks w/ extended UV exposure	4-6 hrs / 1 yr
Tnemec Endura-Shield #71	387-442	54+/-2	557	Clean, dry surfaces	Abrasion, corrosion, chemical resistant	Excellent gloss/ color retention	4 hrs / 1 y
Tnemec Endura-Shield #74	257-297	70+/-2	281-449	Clean, dry surfaces	Abrasion, corrosion, chemical resistant	Highly resistant to exterior weatherin g	2 hrs / 1 y
Tnemec Versare Primers Series 4	342-383	54+/-2	346	Clean, dry surfaces	Rust inhibitive	Resistant to exterior exposure	n/a / 2 yr
Tnemec Tneme-Zinc 90-97 (2 component)	320	63+/-2	337	Dry surface	Chemical; corrosion resistant	Possible multi-coats for desired hide/look	24 hr / 9 months
United Coatings Uniseal Water-based Epoxy Sealer (single comp)	330	14+/-1	250-400	Clean surfaces	Enhanced clean-ability	Black surface absorbs sun's heat	n/a / 1 y
United Coatings Alumiseal Rust Inhibitive Metal Primer	420	55+/-2	250-300	Superior	Corrosion resistant	2000 hrs weather exposure	n/a / 1 y

TABLE D-4 (CONCLUDED)

Industrial Maintenance Coatings - from 420 g/l to 250 g/l (47 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg. Shelf Lif
Vista Paint 910 Red Oxide Metal Primer	340	43.8	250-350	Outstand-ing	Outstand-ing corrosion resistance	Flat	n/a / 1 yr
Average Summary of Samples	**354**	**58.1**	**352**				**6.3 hrs 1.6 yr**

*ASTM D4541 Test Method
⊥ASTM D3359-78 Test Method
✪ ASTM D4060 Test Method

TABLE D-5

Industrial Maintenance Coatings - from 250 g/l to 100 g/l (26 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg. Shelf Lif
Ameron Amercoat® 220 (single component acrylic)	180	35+/-3	280	500 psi*	Abrasion resistance, 110 mg loss	Retains gloss - 1 year	n/a / 1 yr
Ameron Amercoat® 78HB (2 comp coal-tar epoxy)	228	78 +/- 3	417	Prepare steel	Good abrasion resistance	Flat	4 hrs / 1 y
Ameron Amerlock® 400 (2 comp epoxy)	168	83 +/- 3	266	900* psi	Abrasion resistance, 102 mg loss	Semigloss ; retains gloss - 750 hrs of humidity	2.5 hrs / yr
Ameron Amercoat® 151 (acrylic epoxy primer)	228	39+/-3	313	Good	Abrasion resistance 17 mg loss	Flat	12 hrs / yr
AquaSurTech D45	250	33	177-258	Excellent	Excellent abrasion resistance	No peeling cracking, blistering	6 hrs / 1 yrs
Benjamin Moore Epoxy Coating M45/M46	213	75	300	Good	Good abrasion resistance	40% Gloss	16 hrs / yr

TABLE D-5 (CONTINUED)

Industrial Maintenance Coatings - from 250 g/l to 100 g/l (26 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Benjamin Moore Epoxy Coating M47/M48	134	77	155	Good	Exception al chemical resistance	40% Gloss	16 hrs / 1 yr
Coatings Resources Corp. CR-24 High Build Epoxy Tank Lining	196	75	150-400	Excellent	Excellent	Medium gloss	2 hrs / 2 yrs
Morton International MorKote™ 1001 (High gloss topcoat)	135	44	235	Excellent	1,000 scrubbing cycles	82 @ 60 deg	1 hr / 1 yr
Morton International MorKote ™ 1400 (High gloss topcoat)	205	42	400	Good/ excellent	No effect	91 @ 60 deg	n/a / 1 yr
Morton International MorKote ™ 1725 (general industrial topcoat)	114	41.5	400-500	Excellent	No effect (dull from acid)	84 @ 60 deg	n/a / 1 yr
Morton International MorKote ™ 1043 (Satin stain resistant coating)	129.4	35.8	400	1,000 cycles	1,000 scrubbing cycles	16 @ 60 deg	n/a / 1 yr
Morton International MorKote ™ 3000 (Acrylic concrete wall and floor)	114	36.9	400	n/a	4,000 scrubbing cycles	10 @ 60 deg	[illegible]
Pittsburgh Paints Aquapon WB 98-Line Waterborne Epoxy High Performance (2 comp)	230	38 +/- 2	203	Apply to clean dry primed surface	Impact, abrasion, stain resistant	70+ @ 60 deg	6 hrs / 3 yrs
Pittsburgh Paints Pitt-Glaze 16-Line High Solids Acrylic-Epoxy-Water (2 comp)	197	44.9 +/- 2	275-325	Prime the surface	Stain chemical resistant	85+ @ 60 deg	6 hrs / 5yrs
Pittsburgh Paints Pitt-Guard 97-144 Direct-to-Rust Coating (2 comp)	198	84.9 +/- 2	195-274	Prime the surface	Immersion service	25-45 @ 60 deg-not controlled	4 hrs / 5 yrs
Pittsburgh Paints Pitt-Tech 90-374 Interior/Exterior High Performance, High Gloss Industrial Enamel	250	36.7 +/- 2	200	Apply to clean dry surfaces	Durable; chalk/ humidity resistance	70-90 @ 60 deg	n/a / 5 yrs
Pittsburgh Paints Pitt-Tech 90-474 Interior/Exterior High Performance, Satin Industrial Enamel	250	38.4 +/- 2	200	Apply to clean dry surfaces	Excellent abrasion resistance; not heat resistant	20-25 @ 60 deg	n/a / 5 yrs
PRI Asphalt Technologies Epoxyguard	221	50	88	Good	Good abrasion resistance	Good chemical resistance	6 hrs/ 1 h

TABLE D-5 (CONCLUDED)

Industrial Maintenance Coatings - from 250 g/l to 100 g/l (26 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Sherwin Williams B66-100 High Gloss	208	38 +/- 2	155-250	500 psi*	Abrasion resistance, 107 mg loss	Water reducible	n/a / 3 yrs
Sherwin Williams B66-200 Series Semi Gloss	208	38 +/- 2	155-250	500 psi*	Abrasion resistance, 107 mg loss	Water reducible	n/a / 3 yrs
Sherwin Williams Tank Clad HS Epoxy (B62-80 Series)	177	80+/-2	160-255	1000 psi*	Abrasion resistance, 120 mg loss; impact resistance 20 in./ lbs	Semigloss	2 hrs / 1 y
Sherwin Williams Water Based Catalyzed Epoxy (B70-200)	176	39 +/- 2	200-250	350 psi*	Abrasion resistance, 126 mg loss; impact resistance 15 in lbs.	Water reducible	36 hrs / 1 yr
Tnemec H.S. Epoxy #104	158-177	82+/-2	131-329	Clean, dry surfaces	Superior abrasion, stain resistance	Semi-gloss	1 hr / 1 yr
Tnemec Cryl SG Series 6 &7	169-258	43+/-2	276	Clean, dry surfaces	Excellent color retention	Matte (6) Gloss (7)	n/a / 1 yr
Vista Paint 4900 Duraprime	250	39	350-450	Clean surfaces	Corrosion resistant	Flat	n/a / 1 yr

*ASTM D4541 Test Method
ASTM D2246 Test Method
ASTM D3359-78 Test Method

Average Summary of Samples	**194**	**52.5**	**273**	**8 hrs/ 2.4 yrs**

TABLE D-6

Industrial Maintenance Coatings - 100 g/l or less (*61* ~~55~~ samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Advanced Polymer Sciences Siloxiraine 2031	108	88.6	364	Good	Good impact resistance, 140 in.lbs	UV = 40+ years	2 hrs / 1 yr
Advanced Polymer Sciences Siloxirane 2032	108	89.6	384	2,850 psi*	Good impact resistance, 120 in.lbs	UV = 40+ years	2 hrs / 1+ yr
Advanced Polymer Sciences Siloxirane 2431	102	91	467	Excellent	Abrasion resistance: 2 mg loss/1000 cycles	High Build	8 hrs / 1 yr
Advanced Polymer Sciences Siloxirane 2432	102	91	513	Excellent	Abrasion resistance: 3.8 mg loss/1,000 cycles	High Build	2 hrs / 1 yr
Advanced Polymer Sciences Powerline Protective Lining	108	90	364	5,200 psi*	Resists hydro-blasting	Sunlight resistant	2 [illegible]
Advanced Polymer Sciences Underguard High Performance Concrete Sealer	0	100	290	Concrete surfaces	15,000 psi hydroblast	Good	15-30 mins / 1 yr
Air Products ADURA™ 50	0	40	214	>400 psi	Abrasion resistance, 123 mg loss	78-97 @ 60 deg	2-3 hrs / 1yr
Air Products ADURA™ 100	0	70	377	Good	Abrasion resistance, 46.4 mg loss	95 @ 60 deg	3-5 hrs / 1 yr
Air Products ADURA™ 200	0	70	377	Pass *	Abrasion resistance, 100 mg loss	95 @ 60 deg	5.5 hrs / 1 yr
Ameron Amercoat® 300 (2 comp epoxy)	0	44+/-3	253	Good	Good abrasion resistance	Gloss varies	45 mins / 6 months
Ameron Amercoat® 351 (2 comp 100% solids epoxy)	0	100	201	1200* psi	Abrasion resistance, 41 mg loss	Semigloss	1 hr / 1 yr
Ameron Amercoat® 395 (2 comp high solids epoxy – tank lining)	108	91 +/- 3	486	Prepare steel	—	Matte	10 hrs / 1

TABLE D-6 (CONTINUED)

Industrial Maintenance Coatings - 100 g/l or less (*61* ~~55~~ samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Ameron Amercoat® 428PC (2 comp 100% solids epoxy)	0	100	267	Prepare steel, concrete, aluminum	Good abrasion resistance	High gloss	½ hr / 1 yr
Ameron Dimetcote® 21-5 (2 comp inorganic zinc silicate primer)	0	62.8	336	1000* psi	Abrasion resistance, 40 mg loss	Retains gloss after 4 years	8 hrs / 1 yr
Ameron Nu-Klad 105A (2 comp epoxy primer and sealer)	0	100	250-400	Prepare concrete	Good	Subject to color change	n/a / 6 months
Ameron PSX® 700 (2 comp epoxy polyurethane)	84	90 +/- 3	481	1000* psi	Abrasion resistance, 53 mg loss	Retains 50% gloss @ 26 wks	4 hrs / 1 yr
Ameron PSX® 738 (2 comp comp)	96	84 +/- 3	270	Excellent	Resists acid & chemical	Flat	5 hrs / 8 months
Benjamin Moore M58 Safety and Marking Latex	76	62	330	Apply to clean, dry surfaces	Vehicle/ foot traffic resistant	20% Gloss	4 hrs / 1 yr
Coatings Resources Corp. CR-26 Solvent Resistant Epoxy Tank Lining	0	100	150-400	Excellent	Excellent	High gloss	30 mins / 1 yr
Coatings Resources Corp. CR-27 High Build Flexible Tank Lining	0	100	150-400	Excellent	Abrasion resistant	High gloss	1 hr / 1 yr
Coatings Resources Corp. CR-28 Food Grade Novolac Lining	0	100	150-400	Excellent	Corrosion resistant	No gloss	45 mins / 1 yr
Coatings Resources Corp. CR-32 High Solids Waterborne Quick Cure Urethane	0	80	427	Outstand-ing adhesion	Very chemical resistant	High, low medium	2 hrs / 1 yr
Coatings Resources Corp. CR-35 Solventless High Build Surface Tolerant Epoxy	0	100	150-400	Excellent	Corrosion resistant	70 @ 60 deg	45 mins / 1 yr
Coatings Resources Corp. CR-36 Solventless Gloss Epoxy Finish	0	100	150-400	Excellent	Corrosion resistant	90 @ 60 deg	1 hr / 1 yr
Coatings Resources Corp. CR-42 Epoxy Primer/Sealer	0	100	535	Carbon steel or concrete/ masonry	Water, chemical resistant	Gloss varies	45 mins / 1 yr
Coatings Resources Corp. CR-57 (High-Gloss Acrylic)	88	42	150-400	Excellent	UV resistant	80 @ 60 deg	n/a / 1 yr
Coatings Resources Corp. CR-58 (Semi-Gloss Acrylic)	88	42	150-400	Excellent	Excellent	50 @ 60 deg	n/a / 1 yr

TABLE D-6 (CONTINUED)

Industrial Maintenance Coatings - 100 g/l or less (*61* ~~55~~ samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Coatings Resources Corp. CR-59 (Low-Gloss Acrylic)	88	42	150-400	Excellent	UV resistant	30 @ 60 deg	n/a / 1 yr
Coatings Resources Corp. Waterborne QD Urethane (CR32)	0	80	150-400	Excellent	Good	High, low medium	2 hrs / 1 yr
Coatings Resources Corp. Waterborne Urethane (CR-38)	0	80	150-400	Pass▽	Abrasion resistance, 175 mg loss	93 @ 60 deg	2 hrs / 1 yr
Genesis Coatings GCP 1000	0	58	275	Pass*	Pass*	90 @ 60 deg	2-5 hrs /1 yr
Glass Shield EP-Guard WB 1590 (2 comp)	93	44 +- 2%	235	Excellent	Excellent	High gloss	6 hrs / 1 yr
Glass Shield Floor Guard 100 (2 comp polyurethane)	0	100	535	Excellent	Excellent	High gloss	30 mins / 2 yrs
Gro-Mast 766-1005	60	61.19+-2%	248	Excellent	Excellent abrasion resistance	Excellent UV resistance	n/a / 1 yr
Gro-Mast 766-1018	60	61.19+-2%	248	Excellent	Excellent abrasion resistance	Excellent UV resistance	1.
Harris Specialty Thorolastic	80	56 +-2%	100	Good	Good abrasion resistance	8 hrs, rain; no cracking	n/a / 1 yr
Harris Specialty Thorosheen	96	38 +-2%	200	Good	Good abrasion resistance	8 hrs, rain; no cracking	n/a / 1 yr
Harris Specialty Thoro Block Filler	66	54.08	100	Good	Good abrasion resistance	8 hrs, rain; no cracking	n/a / 1 yr
Hart Polymers HP-100 (2-comp aliphatic polyurethane)	0	60	333	Pass*	Abrasion resistance <40 mg loss	>90 @60 deg	1.5-2 hrs / 1 yr
Hart Polymers HP-200 (2-comp acrylic epoxy)	0	50	400	Pass*	Abrasion resistance 50 mg loss	3-5 hrs	2.5-3 hrs / 1 yr
Hart Polymers HP 210 (single comp acrylic urethane)	0	50	400-500	Pass*	Abrasion resistance, <25 mg loss	Good chemical resistance	n/a / 1 yr
Hart Polymers HP 220 (single comp polyurethane epoxy)	0	50	400-500	Pass*	Abrasion resistance, <25 mg	Good chemical resistance	n/a / 1 yr

TABLE D-6 (CONTINUED)

Industrial Maintenance Coatings - 100 g/l or less (*61* ~~55~~ samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg. Shelf Life
MAB Ply Mastic Epoxy Coating	90	90+/-2	250	450-500 psi	Abrasion resistance, 75-87 mg* loss	Semi-gloss	n/a / 1 yr
Morton International MorKote™ 1035	94	38.7	400-500	Good	Excellent	Good	n/a / 1 yr
Morton International MorKote ™ 1043 (topcoat)	103	45	400	Excellent	No effect	85 @ 60 deg	n/a / 2 yr
Morton International MorKote ™ 1725 (Topcoat airless spray)	84	39.3	400-500	Excellent	No effect (dull from acid)	90 @ 60 deg	n/a / 1 yr
Morton International MorKote ™ 1725 (High gloss interior finish)	102	32.9	400	1,000 cycles	700 scrubbing cycles	90 @ 60 deg	n/a / 2 yr
Morton International MorKote ™ 1725 (High gloss clear tint base)	107	34.9	400	Excellent	n/a	95 @ 60 deg	n/a / 2 yr
POLY-CARB MARK-46 Highly Chemical Resistant Epoxy Coating	0	100	100-250	5,000-7,000 psi	Excellent chemical resistance	High build	2-3 hrs / 2 yrs
POLY-CARB MARK-46.1 Epoxy Coating for Tank Lining, Secondary Containment and Flooring	0	100	100-150	5,000-7,000 psi	Excellent chemical, hydro-carbon resistance	High build	90 mins / 2 yrs
POLY-CARB MARK-46.1.1 Highly Chemical Resistant Epoxy Coating	0	100	80-100	5,000-7,000 psi	Excellent chemical/ corrosion resistance	High build	12-15 mins / 2 yrs
POLY-CARB MARK-46.1.3 Highly Chemical Resistant Epoxy Coating	0	100	100-250	5,000-7,000 psi	Excellent chemical resistance	High build	21-24 mins / 2 yrs
POLY-CARB MARK-46.2.1 Highly Chemical Resistant Coating and Grout	0	100	60-100	5,000-7,000 psi	Excellent chemical resistance	High build	28-35 mins / 2 yrs
POLY-CARB MARK-46.8 100% Solids Sprayable Aromatic Urethane Coating	0	100	175-200	3,500-4,000 psi	Excellent chemical resistance	High build	20-30 mins / 2 yrs
PolyQuik	0	100	533	3,229 psi	Abrasion resistance, 180 mg loss	Corrosion, chemical resistant	n/a / 1 yr

TABLE D-6 (CONCLUDED)

Industrial Maintenance Coatings - 100 g/l or less (*61* ~~55~~ samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Gloss Character-istics	Pot Life @70 deg./ Shelf Life
Sherwin Williams Centurion B65W700	66	58 +-2%	282	800 psi*	Abrasion resistance, 45 mg loss	Gloss	4 hrs / 1 yr
Sherwin Williams Armorseal 650 SL/RC (2 component)	0	100	50-160	Provides nonslip texture	Abrasion, impact, chemical resistant	Full gloss	40 mins / 18 months
Sherwin Williams Tower-Guard HS (B54AZ600)	70	89+/-2	145-240	100 psi*	Abrasion resistance, 180 mg loss	Full gloss	n/a / 3 yrs
Sherwin Williams UHS Primer	40	98 +-2%	400	800 psi	Abrasion resistance, 20.8 mg loss	Gloss varies	45 min / 3 yrs
Sherwin Williams Zinc Clad VI (B69)	48	45 +/- 2	241-361	480 psi	Impact resistance, 120 in. lbs.	Gloss varies	8 hrs / 1 yr
United Coatings Elastuff 504 Abrasion Resistant Polyurethane Rubber Coating (two comp)	2.4	43+/-2	100	4,400 psi	Abrasion resistance 35-40 mg loss ✪	Color will dissipate with UV exposure	1 hr / 1 yr

⌘ ASTM D2197 Test Method
*ASTM D4541 Test Method
∇ ASTM D4145-90 Test Method.
⅄ ASTM D3359-78 Test Method

Average Summary of Samples	***39.7*** **44**	***74.4*** **~~71.6~~**	***306*** **~~324~~**	***2.5*** **~~2.8~~ hrs/** ***1.2*** **~~1.1~~ yr**

TABLE D-7

Nonflats - from 250 g/l to 150 g/l (10 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Scrubability (# of cycles)	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Benjamin Moore Impervex Latex High Gloss Metal and Wood Enamel #309	250	34	400-500	Excellent color retention; weather resistant	12 hrs	n/a / 5 yrs
Benjamin Moore Regal Semi-Gloss Aquaglo #333	250	34	400-450	Tough durable film	12 hrs	n/a / 5 yrs
Benajmin Moore Iron Clad Metal & Wood Enamel #363	250	34	350	Durable; washable	6-8 hrs	n/a / 5 yrs
Dunn Edwards Perma Sheen Acrylic Semi-Gloss Enamel W 901	215	34	350-375	Superior washable finish	2-4 hrs	n/a /1 yr
Dunn Edwards DECOGLO ® Acrylic Semi-Gloss W 450	235	37	300-400	Lasting durability	4-6 hrs	n/a /1 yr
Dunn Edwards DECOSHEEN® Acrylic Eggshell Enamel W 440	215	40	350-400	Extra tough; washability	8 hrs	n/a /1 yr
Dunn Edwards Permagloss Acrylic Gloss Enamel W 960	220	33	350-375	Stain resistant; washable finish	2-4 hrs	n/a /1 yr
Frazee Paint Production Gloss Enamel II #347	250	49.9	400	Excellent hide & build	12 hrs	n/a /1 yr
Frazee Paint Velglo II Interior Satin Gloss Enamel #328	250	56.1	450-550	Superb durability	18 hrs	n/a /1 yr
Pittsburgh Paints Brilliant Reflections 51-line Interior/Exterior Latex Gloss Enamel	250	38.4 +/- 2	400-450	Washable with soap and water	4 hrs	n/a / 5 yrs
Average Summary of Samples	**239**	**39**	**400**		**8.5 hrs**	**n/a / 2.6 yrs**

TABLE D-8

Nonflats - from 150 g/l to 50 g/l (29 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Scrubability (# of cycles)	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Dunn Edwards Enduracryl Low Sheen Finish W 705	135	40	350-400	Superior durability; mildew resistance	2-4 hrs	n/a /1 yr
ICI Dulux Ultra-Hide Build-Dur Spray Latex Eggshell Interior 1472	77	35 +/- 1	200	High build	4-8 hrs	n/a / 1 yr
ICI/Dulux Paints Enhance 2000 (Wall and Trim Enamel)	84	29	400 – 450	Excellent	2-4 hrs	n/a / 1 yr
ICI/Dulux Latex Satin Finish 2403	105	36	300-400	Excellent	2-4 hrs	n/a / 1 yr
ICI/Dulux Ultra Hide Durus Exterior Acrylic Semi-Gloss Finish 2416	79	41	300-400	Excellent	4 hrs	n/a / 1 yr
ICI/Dulux Vinyl Acrylic 3010-1200	69	51	100	Excellent	Overnight	n/a / 1 yr
ICI/Dulux Ultra-Hide Buildtex Interior/Exterior Acrylic Latex 3230	88	54	120-240	Excellent	Overnight	n/
ICI/Devoe BLOXFIL® 4000 Heavy-duty acrylic	67	45 +/- 1	241	Moisture, alkali resistant	Overnight	n/a / 1 yr
Morton International MorKote ™ 3000 (Acrylic concrete wall and floor)	114	36.9	197	4,000 cycles (scrub)	2 hrs	n/a / 1 yr
Pittsburgh Paints 19-510 Kitchen, Bath & Trim Semi-Gloss Enamel Acrylic Latex	107	29.8 +/- 2	400-500	Wash repeatedly	2 hrs	n/a / 5yrs
Pittsburgh Paints Pitt-Cryl 10-110 Exterior Water Base Paint	114	38.8 +/- 2	400	Mildew resistant	4 hrs	n/a / 5 yrs
Pittsburgh Paints Speedcraft 5-411 Interior Eggshell Latex Enamel	86	26.7 +/- 2	450	Not resistant to abrasion	4 hrs	n/a / 5yrs
Pittsburgh Paints Speedcraft 5-510 Interior Semi-Gloss Latex	85	26.2 +/- 2	400-450	Not resistant to high heat/strong chemicals	4 hrs	n/a / 5yrs
Pittsburgh Paints Speedhide 6-507 Hi-Build Latex Semi-gloss Prime, Fill and Finish	96	38.5 +/- 2	60-200	Not resistant to mildew	24 hrs	n/a / 5 yrs

TABLE D-8 (CONTINUED)

Nonflats - from 150 g/l to 50 g/l (29 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Scrubability (# of cycles)	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Pittsburgh Paints Speedhide 6-510 Acrylic Latex Semi-gloss Enamel	119	29.2 +/- 2	400	Excellent washability	4 hrs	n/a / 5 yrs
Pittsburgh Paints Speedhide 6-900 Exterior Semi-gloss Latex House and Trim Paint	126	33.5 +/- 2	400	Good fade/ mildew/chal k resistance	4 hrs	n/a / 5 yrs
Pittsburgh Paints Speedhide 6-8510 Interior High-Lustre Semi-gloss Latex	107	29.8 +/- 2	400-500	Can be washed repeatedly	2 hrs	n/a / 5 yrs
Pittsburgh Paints Speedpro 14-510 Interior Semi-gloss Acrylic Latex	80	25.1 +/- 2	400-450	Not resistant to high heat/strong chemicals	4 hrs	n/a / 5 yrs
Pittsburgh Paints SunCare 2-810 Series – Exterior House and Trim Semi-Gloss Latex	134	32.7 +/- 2	400	No special surface preparation	4 hrs	n/a / 5 yrs
Pittsburgh Paints Sun-Proof 76-110 Ext House & Trim Acrylic Satin Latex	124	31.1 +/- 2	400	Contains mildewcide	4 hrs	n/a / 5yrs
Pittsburgh Paints Sun-Proof 78-45 Semi-gloss Acrylic Latex House & Trim Paint	79	33.7 +/- 2	400	Not resistant to high heat/strong chemicals	4 hrs	n/a / 5 yrs
Pittsburgh Paints WallCare 2-410 Series – Latex Semi-Gloss Enamel	119	30 +/- 2	400	Not for heavy traffic areas	4 hrs	n/a / 5 yrs
Pittsburgh Paints Wallfresh 32-45 Series – Interior Semi-Gloss Latex	59	26 +/- 2	400-500	Good washability	4 hrs	n/a / 5 yrs
Sherwin Williams ProClassic Waterborne Acrylic Semi-Gloss	70	35+/-2	400	Washable	4 hrs	n/a / 1yr
Sherwin Williams ProClassic Waterborne Acrylic Gloss (B-21)	70	35+/-2	400	Washable	4 hrs	n/a / 1yr
Sherwin Williams ProMar 200 Interior Latex Gloss Enamel	90	38+/-2	400	Professional best line	4 hrs	n/a / 1yr
Sherwin Williams SuperPaint Exterior High Gloss Latex Enamel (A85)	57	43+/-2	400	Moisture, gloss resistance	24 hrs	n/a / 1yr
Sherwin Williams EverClean Interior Satin (A97)	81	40+/-2	400	>80% at 100 cycles of abrasive cleaners	4 hrs	n/a / 1yr

TABLE D-8 (CONCLUDED)

Nonflats - from 150 g/l to 50 g/l (29 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Scrubability (# of cycles)	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Sherwin Williams ProMar 400 Interior Latex Egg-Shel Enamel B20W400	121	29+/-2	400	Good quality	24 hrs	n/a / 1yr
Average Summary of Samples	**94.5**	**35**	**359**		**6.7 hrs**	**n/a / 2.9 yrs**

TABLE D-9

Nonflats - 50 g/l and less (16 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Scrubability (# of cycles)	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Con-Lux Enviro-Plex Acrylic Latex Eggshell Enamel-12000	0	48-50	395-525	10,000 cycles	18 hrs	n/a / 1 yr
Con-Lux Enviro-Plex Acrylic Latex Semi-Gloss Enamel – 11000	0	46-48	375-500	10,000 cycles	18 hrs	n/a / 1 yr
Con-Lux Enviro-Plex 100% Acrylic Gloss Enamel-13000	0	50-52	410-545	10,000 cycles	18 hrs	n/a / 1 yr
Dunn Edwards Sierra Interior Acrylic Eggshell Enamel W 540	0	38	350-400	Excellent hide	2-4 hrs	n/a /1 yr
Dunn Edwards Sierra Interior Acrylic Semi-gloss W 550	0	38	350-400	Excellent hide	2-4 hrs	n/a / 1 yr
Griggs Paint, Acrylic Emulsion (single comp Satin, Semi-gloss and gloss)	0	36-40	435	Extremely abrasion resistant and washable	2-4 hrs	n/a / 1 yr
ICI Dulux Lifemaster 2000 (Semi-gloss)	0	39	400	Excellent	6–8 hrs	n/a / 1 yr
ICI/Dulux 2000 (Interior eggshell)	0	40	400	Excellent	4 hrs	n/a / 1 yr
ICI/Dulux Exterior Acrylic Low Sheen 2403-0500	50	35	400	Excellent	12-16 hrs	n/a / 1 yr
ICI/Dulux Decra Shield DS88XX Satin Finish	0	37	300-400	Excellent	2-3 hrs	n/a / 1 yr
Sherwin Williams LowTemp 35 Exterior Satin House Paint (B17)	40	35+/-2	400	Water, oil resistant	48 hrs	n/a / 1yr
Sherwin Williams Healthspec Low Odor Interior	0	41+/-2	400	1300	4 hrs	n/a / 1yr
Sherwin Williams A-100 Line – Satin (A82 – White)	38	33 +/- 2	400	Water, oil resistance	4 hrs	n/a / 1yr
Sherwin Williams A-100 Line – Gloss (A8 - White)	49	33 +/- 2	400	Water, oil resistance	24 hrs	n/a / 1yr
Spectra-Tone Paint Enviro Interior Semi-gloss (9900)	0	33.2	400	Washable /excellent durability	4 hrs	n/a / 1yr
Vianova RESYDROL® 586	0	45	400	Good	8 hrs	n/a / 1yr
Average Summary of Samples	**11.1**	**39.7**	**407**		**11.3 hrs**	**n/a / 1 yr**

TABLE D-10

Quick-Dry Enamels - from 400 g/l to 150 g/l (6 samples)

(Numerous coatings listed in Nonflats meet the dry time and gloss requirements of a Quick-Dry Enamel)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Gloss Character-istics	Drying time to touch	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Benjamin Moore Super Spec Quick Dry Enamel #289	400	49.7	525	Outstand-ing semi-gloss	2 hrs	8 hrs	n/a / 1 yr
Dunn Edwards Rancho Quick Dry Alkyd Gloss Enamel QD60	400	50	400-425	85-90 @ 60 deg	1-2 hrs	6-8 hrs	n/a / 1 yr
Frazee Paint Classic II Quick Dry Exterior Gloss House and Trim Paint #352	400	75	400-500	Superior lasting quality/ color retention	1-2 hrs	12 hrs	n/a / 1 yr
ICI Dulux Acrylic Semi-gloss Interior Wall and Trim Enamel 1407	191	39 +/- 1	400	Durable semi-gloss	30–60 min	2-4 hrs	n/a / 1 yr
ICI Dulux Latex Eggshell Interior Wall and Trim Enamel 1412	184	32 +/- 1	400	Durable low-lustre	30–60 min	2-4 hrs	n/a / 1 yr
ICI Dulux Latex Low Lustre Interior Wall and Trim Enamel 1414	164	40 +/- 1	400	Durable low-lustre	30–60 min	2-4 hrs	1
Average Summary of Samples	**290**	**54.1**	**432**			**6.0 hrs**	**n/a / 1 yr**

TABLE D-11

Quick-Dry Enamels - from 150 g/l to 50 g/l (4 samples)

(Numerous coatings listed in Nonflats meet the dry time and gloss requirements of a Quick-Dry Enamel)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Gloss Character-istics	Drying time to touch	Drying time to recoat	Pot Life @70 deg. Shelf Lif
ICI Dulux Acrylic Eggshell Interior Wall and Trim Paint 1402	125	36 +/- 1	400	Durable eggshell	30-60 min	2-4 hrs	n/a / 1 yr
ICI Dulux Acrylic Eggshell Interior Wall and Trim Enamel 1403	112	41 +/- 1	400	Durable eggshell	30–60 min	2-4 hrs	n/a / 1 yr
ICI Dulux Acrylic Semi-gloss Interior Wall and Trim Enamel 1406	154	38 +/- 1	400	Durable semi-gloss	30–60 min	2-4 hrs	n/a / 1 y
ICI Dulux Speed-Wall Latex Semi-gloss Wall and Trim Enamel 1456	88	28	400-450	34-45 @ 60 deg	30-60 min	2-5 hrs	n/a / 1 y
Average Summary of Samples	**120**	**35.8**	**407**			**3.2 hrs**	**n/a / 1 yr**

TABLE D-12

Primer, Sealer, Undercoater - from 350 g/l to 200 g/l (28 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Aquarius Coatings Armabrite 4241	309	67	500	Excellent	Resistant to solvent, chemicals, abrasion, graffiti, etc	4 hrs.	n/a / 1 yr
Aquarius Coatings Armaglaze 9000	268	61-69	500	Excellent	Resistant to solvent, chemicals, abrasion, graffiti, etc	8 hrs	6 hrs / 1 yr
Benjamin Moore Super Spec Alkyd Exterior Primer 176	350	56	500	Excellent	Stain resistant	Overnight	n/a / 1 yr
Dunn Edwards ALKYLSEAL® Interior Alkyd Pigmented Sealer E 28-1	350	56	400-450	Good; clean, dry surfaces	Good enamel holdout	24 hrs	n/a / 1 yr
Dunn Edwards COMPO Exterior Alkyd Primer/Undercoater 42-1	350	56	400-450	Apply to clean, dry surface	Excellent enamel holdout	> 24 hrs	r
Dunn Edwards SUPER-LOC® Two Component Waterborne Epoxy Masonry Primer W 718	310	42	150-350	Superior	Alkali/efflorescence resistant	6-8 hrs	6-8 hrs / 1 yr
Dunn Edwards SUPER U-365 Interior Alkyd Enamel Undercoater E 22-1	350	55	400-450	Excellent	Excellent enamel holdout	24 hrs	n/a / 1 yr
Dunn Edwards SURFACO® Masonry Surface Conditioner 42-52	310	61	200-400	Apply to clean, dry surfaces	Firm, adherent base	>16 hrs	n/a /1 yr
Dunn Edwards Ultra-Hide Oil/Alkyd Interior Wood Undercoater 1120-1200	347	56 +/- 1	400-450	Apply to clean, dry surface	Moisture resistant	Overnight	n/a / 1 yr
Frazee Paint Acry-Prime Interior Acrylic Undercoater	250	65.5	350-400	Excellent; clean surface	Blocking resistant	4 hrs	n/a / 1 yr
Frazee Paint Block-N-Prime Interior/ Exterior Acrylic Primer	250	46.8	250-400	Good; clean, dry surfaces	Corrosion resistant	4 hrs	n/a / 1 yr
Frazee Paint FRAFLO II Interior Enamel Undercoater	350	84.2	450	Prime clean, dry surfaces	Provides perfect foundation	Overnight	n/a 1 yr
Glass Shield PreShield MC 46828	320	65 +- 2%	347	Excellent	Excellent	5 hrs	n

TABLE D-12 (CONTINUED)

Primer, Sealer, Undercoater - from 350 g/l to 200 g/l (28 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg. Shelf Life
ICI Dulux Ultra-Hide Alkyd Prime-N-Finish 1310	347	55	400	Prime the surface	Durable finish	16 hrs	n/a / 1 yr
ICI Ultra-Hide Durus Exterior Acrylic Primecoat 2110-1200	313	60 +/- 1	400-500	Good	Stain, moisture resistant	24 hrs	n/a / 1 yr
Morton International MorKote™ 1043 Primer (Formula 924-41D)	267	23.2	124	Excellent	Excellent stain resistance	90 min	n/a / 1 yr
Pittsburgh Paints 17-255 Quick Drying Enamel Undercoater	349	57.9 +/- 2	450-500	No special surface preparatio n	Not for exterior use	24 hrs	n/a / 3 yr
Pittsburgh Paints Aquapon WB 98-46 Waterborne Epoxy Primer	220	39.4 +/- 2	210	Prime surface	Impact, abrasion, stain resistant	16 hrs	n/a / 5 yr
Pittsburgh Paints Seal Grip 17-21 Interior/Exterior Acrylic Latex Stain Blocking Primer	264	38.2 +/- 2	400	Sand surfaces	Stain resistant	1-4 hrs	n/a / 5 yr
Pittsburgh Paints Speedhide 6-6 Quick-Drying Enamel Undercoater	349	56 +/- 2	450-500	No special surface prep	Not rust inhibitive	24 hrs	n/a / 3 yr
Pittsburgh Paints Speedhide 6-9 Exterior Wood Primer	334	57.6 +/- 2	400	Avoid direct sunlight	Not for use as topcoat	24 hrs	n/a / 3 yr
Pittsburgh Paints Speedhide 6-208 Rust Inhibitive Steel Primer	349	52.2 +/- 2	390-535	No special surface prep.	Rust inhibitive properties	5-8 hrs	n/a / 3 yr
Pittsburgh Paints Speedhide 6-212 Rust Inhibitive Steel Primer	338	52.2 +/- 2	390-535	No special surface preparatio n	Rust inhibitive properties	5-8 hrs	n/a / 3 yr
Pittsburgh Paints Speedhide 6-209, Galvanized Steel Primer	346	55.6 +/- 2	420-460	No special surface preparatio n	Good resistance to corrosion	24 hrs	n/a / 3 yr
Vista Paint 088 Enamel Undercoat	350	57.5	300-400	Clean surfaces	Excellent sanding qualities	12 hrs	n/a / 1 yr
Vista Paint 1100 Hi Build Sealer	250	29	250-350	Apply to clean, dry surfaces	Excellent enamel holdout	2-3 hrs	n/a / 1 yr

TABLE D-12 (CONCLUDED)

Primer, Sealer, Undercoater - from 350 g/l to 200 g/l (28 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Vista Paint 4100 Prime Kote	340	53	350-450	Excellent; clean surfaces	Uniform enamel holdout	24 hrs	n/a / 1 yr
Vista Paint 4900 Duraprime	250	39	350-450	Apply to clean surfaces	Superior corrosion resistance	2-4 hrs	n/a / 1 yr
Average Summary of Samples	**314**	**51.4**	**393**			**13 hrs**	**6.5 hrs / 1.7 yrs**

TABLE D-13

Primer, Sealer, Undercoater - from 200 g/l to 100 g/l (10 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Glass Shield PrimeTar MC 46750	206	76 +- 2%	408	Excellent	Excellent	4 hrs	6 hr / 1 yr
Glass Shield Floor Guard WB 590	193	46 +- 2%	251	Excellent	Excellent	3 hrs	6 hrs / 1 yr
ICI Ultra-Hide Durus Exterior Acrylic Primecoat 2010-1200	143	32 +/- 1	400	Excellent	Moisture resistance	3-6 hrs	n/a / 1 yr
Kilz X-siding	160	75	400-450	Clean surface	2 coats for maximum durability	4 hrs	n/a / 1 yr
Morton International MorKote™ 1300 primer (Formula 997-68)	158	34.8	186	Good flow & leveling	Excellent blocking resistance	2 hrs.	n/a / 1 yr
Pittsburgh Paints 17-10 Quick-Drying Interior Latex Primer-Sealer	127	28.4 +/- 2	350-450	No special surface preparatio n	Not for use as topcoat	4 hrs	n/a / 5 yrs
Pittsburgh Paints Speedhide 6-603 Alkali Resistent Primer	113	37.1 +/- 2	400	No special surface preparatio n	Stain blocking properties	1 hr	n/a / 5 yrs
Pittsburgh Paints Speedhide 6-755 Waterbase Interior/ Exterior Undercoater	204	34.2 +/- 2	400	Apply on bare wood	Not for exterior use	2 hrs	n/a / 5 yrs
Pittsburgh Paints SunCare 2-510 – Exterior Latex Wood Primer	124	39 +/- 2	400	Dampen surface in hot dry weather	Mildew resistant	4-6 hrs	n/a / 5 yrs
Sherwin Williams Water Based Catalyzed Epoxy (B70-200)	176	39 +/- 2	200-250	350 psi	Abrasion resistance, 126 mg; impact resistance 15 in lbs.	18-24 hrs	36 hrs / 1 yr
Average Summary of Samples	**160.4**	**44.2**	**350**			**5 hrs**	**16 hrs / 2.6 yrs**

TABLE D-14

Primer, Sealer, Undercoater - 100 g/l and less (29 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Aquarius Coatings Armaglaze 6000	30	40-46	400	Excellent	Resistant to solvent, chemicals, abrasion, graffiti, etc	4 hrs.	3hrs / 1yr
Con-Lux Enviro-Plex Latex Primer/Sealer-10495	0	44-46	360-480	Good	Abrasive resistant; tough, scrubbable	2-18 hrs	n/a / 1yr
Coatings Resources Corp. CR-32 High Solids Waterborne Quick Cure Urethane	0	80	427	Outstand-ing adhesion	Very chemical resistant	2–48 hrs	2 hrs / 1 yr
Coatings Resources Corp. CR-42 Epoxy Primer/Sealer	0	100	535	Carbon steel or concrete/ masonry	Water, chemical resistant	2-72 hrs	45 mins / 1 yr
Coatings Resources Corp. CR-47 Waterborne Acrylic Primer	78	37	150	Steel, wood , fiberglass	Corrosion resistant	1 hr	n/a / 1 yr
Dunn Edwards M-P PRIME Acrylic Multi-purpose Primer W 713	85	38	400	Excellent	Adheres well	4 hrs	n/a / 1 yr
Dunn Edwards VINYLASTIC® Interior Pigmented Sealer W101	60	37	300-400	Excellent	Excellent enamel holdout	2-4 hrs	n/a / 1yr
Evans/ Gibson-Homans Primer 01018	90	43	600	Apply to clean, dry surface	Excellent water resistance	2 hrs	2 hrs / 1 yr
Evans/ Gibson-Homans 00233 HD Vinyl	1.08	49	240	Apply to clean, dry surface	Mildew resistance	2 hrs	n/a / 1yr
Evans/ Gibson-Homans 00234 HD Clear Wall Covering	10	39	240	Apply to clean, dry surface	Mildew resistance	2 hrs	n/a / 1yr
Flexbon Exterior 100% Acrylic Latex Primer	70	40.8	400	Good	Alkali resistant	18 hrs	n/a / 1 yr
Hart Polymers HP-200 (2-comp acrylic epoxy)	0	50	400	Pass*	Abrasion resistance 50 mg loss	3-5 hrs	2.5-3 hrs / 1 yr
ICI Dulux Interior Primer Finish 1472	77	35	200	Prime the surface	High build	4-8 hrs	n/a / 1 yr
ICI Dulux Pigmented Bonding Primer 3030-1200	108	36	350-450	Excellent adhesion	Alkali resistant	4 hrs	[illegible]

TABLE D-14 (CONTINUED)

Primer, Sealer, Undercoater - 100 g/l and less (29 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg Shelf Lif
Morton International MorKote™ 1300 sealer (Formula924-143A)	8.62	36	400-500	Good flow & leveling	Excellent block resistance	30 min	n/a / 6 months
Pittsburgh Paints 17-13 Exterior Hardboard Primer/Sealer	109	38.7 +/- 2	350-400	No special surface preparatio n	Blocking resistance	24 hrs	n/a / 5 yr
Pittsburgh Paints Speedcraft 5-2 Interior Latex Primer-Sealer, White	83	24.6 +/- 2	350-450	Apply on primed surfaces	Not intended for high heat/ strong chemicals	4 hrs	n/a / 5 yr
Pittsburgh Paints Speedhide 6-2 Quick-Drying Interior Latex Primer-Sealer	96	28.4 +/- 2	350-450	No special surface prep	Not resistant to high alkalinity	4 hrs	n/a / 5 yr
Pittsburgh Paints Speedhide 6-609 Exterior Latex Wood Primer	89	39 +/- 2	400	No special surface preparatio n	Blister and mildew resistant	4-6 hrs	n/a / 5 yr
Pittsburgh Paints Speedhide 6-712 Waterbase Inhibitive Metal Primer	94	41.9 +/- 2	300-350	Excellent; apply on clean, dry metal	Corrosion inhibitive properties	6-8 hrs	n/a / 5 y
Pittsburgh Paints WallCare 2-2 Interior Latex Primer-Sealer	83	24.6 +/- 2	350-450	Good	Need thinner to prevent corrosion	4 hrs	n/a / 5 y
Pittsburgh Paints Wallfresh 68-2 Interior Latex Primer-Sealer White	83	24.8 +/- 2	350-400	No special surface preparatio n	Not resistant to high heat/ strong chemicals	4 hrs	n/a / 5 y
Pittsburgh Paints Weatherfresh 73-1 Latex Wood Primer	89	39 +/- 2	400	Brush wood	Blister and mildew resistant	4-6 hrs	n/a / 5 y
Sherwin Williams Loxon Exterior Acrylic Masonry Primer (A24)	60	40	200	154 psi	Pass*	24 hrs	n/a / 1 y
Sherwin Williams Zinc Clad VI (B69)	48	45 +/- 2	241-361	480 psi	Impact resistance, 120 in. lbs.	3 hrs	8 hrs / 1

TABLE D-14 (CONCLUDED)

Primer, Sealer, Undercoater - 100 g/l and less (29 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Sherwin Williams UHS Primer	40	98 +-2%	400	800 psi	Abrasion resistance, 20.8 mg loss	8 hrs	45 min / 3 yrs
Sherwin Williams PrepRite 200	26	28 +/- 2	400	Professional best line	Professional best line	4 hrs	n/a / 1 yr
Sherwin Williams PrepRite 400	19	29 +/- 2	400	Good quality	Good quality	4 hrs	n/a / 1 yr
Sherwin Williams PrepRite ProBlock Interior Latex Primer/Sealer	40	36 +/- 2	400	Excellent	Fill surface irregularities	4 hrs	n/a / 1 yr

* Test method ASTM D2197

Average Summary of Samples	**53.7**	**42.9**	**372**	**7.9 hrs**	**2.4 hrs / 2.3 yrs**

TABLE D-15

Quick-Dry Primer, Sealer, Undercoater - from Exempt to 200 g/l (9 samples)

(Numerous coatings listed in Primer, Sealer, Undercoater meet the dry time and gloss requirements of a Quick-Dry PSU)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Drying time to touch	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Dunn Edwards High Build Industrial Epoxy Primer – IP714	340	59	250-300	Good; prime surface	30 mins	2-4 hrs	6-8 hrs / 1 yr
Dunn Edwards Corrosion Inhibitive Primer – IP507	420	50	350-400	Good; prime surface	30 mins	2-4 hrs	n/a / 1 yr
Dunn Edwards Block-it Quick Dry Primer/Sealer QD 42-56	450	42	400-425	Good; prime surface	15-30 mins	1 hr	n/a / 1 yr
Dunn Edwards Galv-Alum Quick Dry Primer QD 43-7	440	44	350-400	Prime the surface	30 mins	2 hrs	n/a / 1 yr
Pittsburgh Paints 97-608 Fast Dry Alkyd Inhibitive Industrial Primer	536	31.4 +/- 2	273-365	Apply to dry clean surface	15-30 mins	1 hr	n/a / 3 yrs
Pittsburgh Paints Rez 77-30 Interior Quick-Drying Sealer and Finish	560	26.6 +/- 2	500-700	No special surface prep.	30 mins	2-3 hrs	n/a / 3 yrs
Pittsburgh Paints Speedhide 6-10 Quick-Drying Interior Sanding Wood Sealer/Finish	560	27.3 +/- 2	500-700	Sand lightly	30 mins	2-3 hrs	n/a / 3 yrs
Pittsburgh Paints Speedhide 6-205 Quick-Drying Machinery and Equipment Primer	417	46.1 +/- 2	300-350	No special surface prep.	1 hr	2 hrs	n/a / 3 yrs
Zehrung Z-Prime	450	37.4	200-450	Excellent adhesion	30 mins	1 hr	n/a / 1 yr
Average Summary of Samples	**464**	**40.4**	**401**			**2 hrs**	**7 hrs / 1.9 yrs**

TABLE D-16

Quick-Dry Primer, Sealer, Undercoater - from 200 g/l to 100 g/l (6 samples)

(Numerous coatings listed in Primer, Sealer, Undercoater meet the dry time and gloss requirements of a Quick-Dry PSU)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Drying time to touch	Drying time to recoat	Pot Life @70 deg. Shelf Life
Dunn Edwards E-Z PRIME Exterior Acrylic Wood Primer W708	115	39	200-450	Good; prime surface	15 mins	2-3 hrs	n/a / 1 yr
Dunn Edwards UNIKOTE Interior Acrylic Enamel Undercoater W 707	130	43	400-450	Good: clean, dry surfaces	30 mins	2 hrs	n/a / 1 yr
Insl-X Aqualock Waterbase primer, sealer, stain killer (AQ 0500)	118	43	345	Excellent[V]	20-30 mins	1 hr	n/a / 1 yr
Insl-X Prep-a-Wall (WP3000)	115	42	225	Superior	15 mins	2 hr	n/a / 1 yr
Pittsburgh Paints 17-10 Quick-Drying Interior Latex Primer-Sealer	127	28.4 +/- 2	350-450	No special surface prepara-tion	Not for use as topcoat	4 hrs	n/a / 5 yrs
Zinsser Bull's Eye 1-2-3	141	75	400	No special surface prep.	30 mins	1 hr	yrs
Average Summary of Samples	**124**	**45.1**	**353**			**2.1 hrs**	**n/a / 2.7 yr**

V Test method ASTM D3359

TABLE D-17

Quick-Dry Primer, Sealer, Undercoater - 100 g/l and less (17 samples)

(Numerous coatings listed in Primer, Sealer, Undercoater meet the dry time and gloss requirements of a Quick-Dry PSU)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Drying time to touch	Drying time to recoat	Pot Life @70 deg. Shelf Lif
Dunn Edwards Sierra Interior Sealer/Undercoater W500	0	38	300-400	Good; prime surface	30 mins	2 hrs	n/a / 1 yr
Dunn Edwards EFF-STOP® Acrylic Masonry Primer/Sealer W 709	105	34	200-400	Apply to clean, dry surfaces	30 mins	2-4 hrs	na / 1 yr
ICI Dulux Ultra-Hide Acrylic Primer 1020-1200	108	31 +/- 1	450	Excellent	30 mins	2 hrs	n/a / 1 yr
ICI Dulux Latex Wall Primer 1000-1200	103	29	300-400	Excellent	30 mins	2 hrs	n/a / 1 yr
ICI Dulux Acrylic Primer, Interior Wood Undercoater	108	31	450	Excellent	30 mins	2 hrs	n/a / 1 yr
ICI Dulux Ultrahide Primer, Sealer	96	41	400	Excellent	30 mins	2 hrs	n/a / 1 y
ICI Dulux Ultrahide Vapor Barrier Latex Primer/Sealer	85	34	400	Excellent	30-60 mins	2 hrs	n/a / 1 y
ICI Dulux Exterior Latex Primer	95	50	300-500	Excellent	30 mins	1 hr	n/a / 1 y
ICI Dulux Ultrahide Stain Killer Primer/Sealer	95	50	300-450	Excellent	30 mins	1 hr	n/a / 1 y
ICI Dulux Lifemaster 2000 Interior Primer/Sealer	0	32	400	Excellent	30-60 mins	2-3 hrs	n/a / 1 y
ICI Dulux Dryfall Flat Primer and Finish	27	36	288-385	Excellent	15 mins	2 hrs	n/a / 1 y
ICI Dulux Primer and finish 1482-1200	26	34	272-361	Excellent	15 mins	2 hrs	n/a / 1 y
ICI Dulux Primer and finish 1486-1200	39	40	350-450	Excellent	15 mins	2 hrs	n/a / 1 y
Morton International MorKote™ 1035 Primer (Formula 997-79)	94	38.7	207	Good	15 mins	2 hrs	n/a / 1 y
Shieldz Universal Pre-wall covering primer	75	75	400	Good	15 mins	2 hrs	n/a / 1 y
X-out Water-based primer/sealer stain killer	95	29	400	Clean surface	30 mins	1 hr	n/a / 1 y
Zehrung Z-Prime II	0	45	250-450	Glossy surfaces	30 mins	1 hr	n/a / 1 y
Average Summary of Samples	**67.7**	**39.3**	**370**			**1.8 hrs**	**n/a / 1 yr**

TABLE D-18

Water Proofing Sealers (Wood and Concrete) - from 400 g/l to 250 g/l (5 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion / penetration into substrate	Durability Qualities	Resistance to H_2O /UV exposure	Pot Life @70 deg./ Shelf Life
Okon Water-based water proofing concrete sealers	400	10	100-350	Apply with brush, roller or spray.	Excellent resistance to abrasion	Excellent resistance to UV	n/a / 1 yr
Tex-Cote Rainstopper Series 100	400	8	50-125	Apply to clean surface	Water resistant 2500 hrs exposure.	Excellent after 250 hrs of UV	n/a / 1 yr
Tex-Cote Rainstopper Series 200	400	20	100-125	Apply to clean surface	Water resistant 2500 hrs exposure.	Excellent after 250 hrs of UV	n/a / 1 yr
Tex-Cote Rainstopper Series 400, 500	400	25	100-200	Apply to clean surface	Water resistant 2500 hrs exposure.	Excellent after 250 hrs of UV	n/a / 1 yr
Thompson's Water Seal Waterproofing Formula#171	400	10.3	50-400	Dry, clean surface	Excellent resistant to abrasion	Excellent water repellency	n/a / 1 yr
Average Summary of Samples	**400**	**14.7**	**160**				**n/a / 1 yr**

TABLE D-19

Water Proofing Sealers (Wood and Concrete) - 250 g/l and less (10 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion / penetration into substrate	Durability Qualities	Resistance to H_2O /UV exposure	Pot Life @70 deg. Shelf Life
Hart Polymers HP-110 (2-comp aliphatic epoxy)	0	45	250-350	Excellent adhesion	Tensile strength 1100 psi	Excellent UV resistance	4 hrs / 1 y
Hart Polymers HP-110 (2-comp aliphatic epoxy)	0	45	250-350	Excellent adhesion	Tensile strength 1100 psi	Excellent UV resistance	4 hrs / 1 y
Hart Polymers HP-150 (2 comp aliphatic epoxy elastomeric)	0	52	250-350	Excellent adhesion	Tensile strength 2000 psi	Excellent UV resistance	1.5-2 hrs 1 yr
Hart Polymers HP-340 (single comp aliphatic polyurethane elastomeric – heavy applications - roofs)	0	58-61	33	Excellent adhesion	Tensile strength 1500 psi	20 in./lbs. impact resistance	n/a / 1 yr
Hart Polymers HP-350 (2-comp acrylic epoxy)	0	61	250-350	Pass *	Tensile strength 5000 psi	50 in./lbs impact resistance	1.5-2 hrs 1 yr
Pittsburgh Paints Aquapon WB 98-Line Waterborne Epoxy High Performance	230	38 +/- 2	203	Apply to dry, clean primed surface	Impact, abrasion resistant	Stain resistance	6 hrs / 5 yrs
Pittsburgh Paints Coal Cat 97-640, 641 Coal Tar Epoxy Coating	233	72.3 +/- 2	165-192	Apply to dry, clean primed surface	Very good / excellent chemical resistance	Fresh and salt water resistant	8-10 hrs 8 months
Pittsburgh Paints Coal Cat 97-641 Coal Tar Epoxy Coating	241	72.3 +/- 2	165-192	Apply to dry, clean primed surface	Very good / excellent chemical resistance	Fresh and salt water resistant	8-10 hrs 8 months
Seal Krete® Waterproofing Sealer	<8	10	80-300	Excellent	High	--	1-2 hrs / years
Sherwin Williams Cuprinol Clear Deck	27	6.4 +/- 2	200-300	Pressure treated	Water repellent	Water repellant	n/a / 1 yr

* Test method ASTM D2197

Average Summary of Samples	**73.9**	**46.3**	**224**	**4.7 hrs 1.4 yrs**

TABLE D-20

Stains - from 350 g/l to 250 g/l (3 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion / penetration into substrate	Resistance to UV exposure	Drying time to recoat	Pot Life @70 deg./ Shelf Life
Cabot Stains Problem-Solver Primer	350	55.1	150-250	Good	Superior durability	24 hrs	n/a 10 yrs
Pittsburgh Paints 77-315,77-317 Exterior Solid Color Stains	350	55.9 +/- 2	300-600	Excellent water repellant	Good for long term exposures	24 hrs	n/a / 3 yrs
Pittsburgh Paints 77-360 Exterior Semi-Transparent Stain-Oil	350	55.2 +/- 2	300-600	Excellent water repellant	Good for long term exposures	24 hrs	n/a / 3 yrs
Average Summary of Samples	**350**	**55.6**	**367**			**24**	**n/a / 5.3 yrs**

TABLE D-21

Stains - 250 g/l and less (10 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion / penetration into substrate	Resistance to UV exposure	Drying time to recoat	Pot Life @70 deg. Shelf Life
Benjamin Moore Acrylic Exterior Stain 179	250	30	300-450	Excellent hiding, adhesion	Mildew, fading, blistering resistant	1 hr	n/a / 5 yr
Cabot Decking Stains with Teflon Surface Protector #1700 Series	250	32.9	250-450	Excellent	Mildew, oil, dirt resistant	6 hrs	n/a / 5 yr
Okon Deck Stain	171	15	100-250	Varies w/ substrate	1000 hrs	8-24 hrs	Indefinite
Okon Natural Choice	220	15	50-200	Varies w/ substrate	1000 hrs	8-24 hrs	Indefinite
Pittsburgh Paints Rez 77-410 Solid Color Acrylic Latex Stains Exterior/Interior	132	24 +/- 2	150-300	Must back-roll for max penetra-tion	Effects vary with different wood	2-4 hrs	n/a / 5 yr
Pittsburgh Paints Rez 77-460 Exterior Semi-Transparent Latex Stain	174	18.3 +/- 2	200-500	Must back-roll for max penetra-tion	Excellent color retention; mildew/ crack resist.	2-4 hrs	n/a / 5 yr
Pittsburgh Paints Speedhide 6-7415 Professional Exterior Solid Color Latex Stains	138	23.3 +/- 2	200-400	Must back-roll for max penetra-tion	Different wood affects color	2-4 hrs	n/a / 5 yr
Pittsburgh Paints Speedhide 6-7417 Professional Exterior Solid Color Latex Stains	154	23.3 +/- 2	200-400	Must back-roll for max penetra-tion	Different wood affects color	2-4 hrs	n/a / 5 yr
Rhinoguard Deck and Siding Finish	0	30	550	Excellent	Excellent UV resistance	2-4 hrs	n/a / 5 yr
Vianova RESYDROL® (AY586)	0	45	241	Good	Will not crack, peel or chip	8 hrs	n/a / 5 yr
Average Summary of Samples	**148.9**	**25.7**	**299**			**6.2 hrs**	**n/a / 5 yrs**

TABLE D-22

Rust Preventative Coatings - from 350 g/l to 100 g/l (6 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Pot Life @70 deg./ Shelf Life
Dunn Edwards BLOC-RUST® Red Oxide Alkyd Corrosion Inhibitive Primer 43-4	300	64	500-550	Prime surface	Corrosion resistant	n/a/ 1 yr
Dunn Edwards Corrobar White Alkyd Corrosion Inhibitive Primer 43-5	345	56	500-550	Good; clean dry surfaces	Corrosion resistant	n/a / 1 yr
Pittsburgh Paints Pitt-Guard 97-144 Direct-to-Rust Coating (2 comp)	198	84.9 +/- 2	195-274	Prime the surface	Immersion service	4 hrs / 5 yrs
Pittsburgh Paints Speedhide 6-20 Exterior Wood Finish	350	57.1 +/- 2	400	Apply in dry weather	Not resistant to high heat/ chemical	n/a / 3 yrs
Pittsburgh Paints Speedhide 6-208 Rust Inhibitive Steel Primer	349	52.2 +/- 2	390-535	No special surface preparation	Rust inhibitive properties	n/a / 3 yrs
Pittsburgh Paints Speedhide 6-212 Rust Inhibitive Steel Primer	338	52.2 +/- 2	390-535	No special surface preparation	Rust inhibitive properties	n/a / 3 yrs
Average Summary of Samples	**313**	**61.1**	**435**			**4 hrs / 2.7 yrs**

TABLE D-23

Rust Preventative Coatings - 100 g/l and less (4 samples)

Coating Company and Product Name	VOC content (gm/l)	Solids (% by volume)	Coverage (sq ft/gal) @ ~3 mil	Adhesion Qualities	Durability Qualities	Pot Life @70 deg./ Shelf Life
Hart Polymers HP-110 (2-comp aliphatic epoxy)	0	45	250-350	Excellent	Excellent UV resistance	4 hrs / 1 yr
Hart Polymers HP-150 (2 comp aliphatic epoxy elastomeric)	0	52	250-350	Excellent	Excellent UV resistance	1.5-2 hrs / 1 yr
Hart Polymers HP-350 (2-comp acrylic epoxy)	0	61	250-350	Pass*	50 in./lbs. impact resistance	1.5-2 hrs /1 yr
Pittsburgh Paints Speedhide 6-712 Waterbase Inhibitive Metal Primer	94	41.9 +/- 2	300-350	Excellent; apply on clean, dry metal	Corrosion inhibitive properties	n/a / 5 yrs
Average Summary of Samples	**23.5**	**50.0**	**306**			**2.5 hrs / 2 yr**

* ASTM D2197 test method

APPENDIX E

RISK ASSESSMENT METHODOLOGIES

METHODOLOGIES FOR RISK ASSESSMENT

The following presents the methodologies the SCAQMD used to estimate the toxic risks associated with the implementation of PAR 1113. The reader referred to the attached spreadsheets for the variables and assumptions used in these methodologies. The reader is also referred to the SCAQMD's Risk Assessment Procedures for Rules 1401 and 212 (November 1998) for a more detailed discussion of risk assessment procedures.

Health risk assessment is used to estimate the likelihood that an individual would contract cancer or experience other adverse health effects as a result of exposure to toxic air contaminants. Risk assessment is a methodology for estimating the probability or likelihood that an adverse health effect will occur. The risk assessment procedures for PAR 1401 are consistent with current recommendations by Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA). OEHHA is the state agency with primary responsibility for developing and recommending risk assessment methods

Carcinogenic Analysis

The equation for calculating MICR is:

$$MICR = Qyr \times U \times \left(\frac{X}{Q}\right) \times MET \times MP \times LEA$$

$$Qyr = \text{Amount of Toxic Emissions}, \frac{tons}{yr}$$

$$U = \text{Toxic Unit Risk Factor}, \left(\frac{\mu g}{m^3}\right)^{-1}$$

$$\left(\frac{X}{Q}\right) = \text{Dispersion Factor}, \left(\frac{\mu g}{m^3} \Big/ \frac{tons}{yr}\right)$$

$$MET = \text{Metrological Correction Factor}$$

$$MP = \text{Multi - Pathway Adjustment Factor}$$

$$LEA = \text{Life Time Exposure Adjustment Factor}$$

Knowing that the SCAQMD significance threshold for toxics is MICR $>10 \times 10^{-6}$, the following equation is used to estimate the yearly toxic emissions that would have to be emitted to exceed this threshold.

$$Qyr = \frac{MICR}{U \times \left(\frac{X}{Q}\right) \times MET \times MP \times LEA}$$

To calculate the amount of daily toxic emissions that would have to be emitted to exceed a MICR $>10x10^{-6}$, the following equation is used.

$$Qday, \frac{lbs}{day} = \frac{Qyr}{Days} \times \frac{2000\,lbs}{ton}$$

$$Qyr = \text{Amount of Toxic Emissions}, \frac{tons}{yr}$$

$$Days = \text{Coating Application}, \frac{days}{yr}$$

Knowing the daily toxic emissions, the daily coating usage necessary to exceed a MICR $>10x10^{-6}$ can be estimated using the following equation.

$$Usage, \frac{gal}{day} = \frac{Qday}{Density \times \left(\frac{\%Tox}{100}\right)}$$

$$Qday = \text{Amount of Toxic Emissions}, \frac{lbs}{day}$$

$$Density = \text{Density of Coating}, \frac{lbs}{gal}$$

$$\%Tox = \text{Percentage of Toxic Compound in Coating}, \%$$

Chronic Analysis

The equation for calculating HIC is:

$$HIC = \frac{Qyr \times \left(\frac{X}{Q}\right) \times MET \times MP}{REL}$$

$$Qyr = \text{Amount of Toxic Emissions}, \frac{tons}{yr}$$

$$\left(\frac{X}{Q}\right) = \text{Dispersion Factor}, \left(\frac{\mu g}{m^3} \Big/ \frac{tons}{yr}\right)$$

$$MET = \text{Metrological Correction Factor}$$

$$MP = \text{Multi - Pathway Adjustment Factor}$$

$$REL = \text{Re ference Expsoure Level}$$

Knowing that the SCAQMD significance threshold for toxics is HI >1, the following equation is used to estimate the yearly toxic emissions that would have to be emitted to exceed this threshold.

$$Qyr = \frac{HIC \times REL}{\left(\frac{X}{Q}\right) \times MET \times MP}$$

To calculate the amount of daily toxic emissions that would have to be emitted to exceed a HI >1, the following equation is used.

$$Qday, \frac{lbs}{day} = \frac{Qyr}{Days} \times \frac{2000\,lbs}{ton}$$

$$Qyr = \text{Amount of Toxic Emitted}, \frac{tons}{yr}$$

$$Days = \text{Coating Application}, \frac{days}{yr}$$

Knowing the daily toxic emissions, the daily coating usage necessary to exceed a HI >1 can be estimated using the following equation.

$$Usage, \frac{gal}{day} = \frac{Qday}{Density \times \left(\frac{\%Tox}{100}\right)}$$

$$Qday = \text{Amount of Toxics Emitted}, \frac{lbs}{day}$$

$$Density = \text{Density of Coating}, \frac{lbs}{gal}$$

$$\%Tox = \text{Percentage of Toxic Compound in Coating}, \%$$

Acute Analysis

The equation for calculating HIA is:

$$HIC = \frac{Qhr \times \left(\frac{X}{Q}\right)_{max}}{REL}$$

$$Qhr = \text{Amount of Toxic Emitted}, \frac{lbs}{hr}$$

$$\left(\frac{X}{Q}\right)_{max} = \text{Dispersion Factor}, \left(\frac{\frac{\mu g}{m^3}}{\frac{tons}{yr}}\right)$$

$$REL = \text{Re ference Expsoure Level}$$

Knowing that the SCAQMD significance threshold for toxics is HI > 1, the following equation is used to estimate the hourly toxic emissions that would have to be emitted to exceed this threshold.

$$Qhr = \frac{HI \times REL}{\left(\frac{X}{Q}\right)_{max}}$$

Knowing the hourly toxic emissions, the daily coating usage necessary to exceed a HIA > 1 can be estimated using the following equation.

$$\text{Usage}, \frac{gal}{day} = \frac{Qhr \times Hours}{Density \times \left(\frac{\%Tox}{100}\right)}$$

$$Qhr = \text{Amount of Toxic}, \frac{lbs}{hrs}$$

$$Hours = \text{Coating Application}, \frac{hrs}{day}$$

$$Density = \text{Density of Coating}, \frac{lbs}{gal}$$

$$\%Tox = \text{Percentage of Toxic Compound in Coating}, \%$$

"Real-Case" Analysis

Compound	% by wt.	Unit Risk Factor 1/(ug/m3)	Chronic REL ug/m3	Acute REL ug/m3	MICR MP	Chronic MP	Target Organs
Toluene	10		2.00E+02	4.00E+04		1	CNS/PNS, Repr
Xylene	10		3.00E+02	4.40E+03		1	Repr, Resp
Methyl Ethyl Ketone*	10		1.00E+03	3.00E+04		1	Repr
Isopropol Alchol*	10		2.00E+03	3.00E+03		1	CV/BL, CNS/PNS, Immun
Ethylene Glycol*	10		4.00E+02			1	Resp, Skin, Kidn, Repr
Propylene*	10		3.00E+03			1	Resp
Glycol Ethers & Acetates	10		2.00E+01	1.53E+03		1	Resp
EGBE	10		2.00E+01	1.50E+03		1	CV/BL
EGEE	10		2.00E+02	3.70E+02		1	Repr, CV/BL
EGME	10		2.00E+01	3.30E+02		1	Repr
Toulene Diisocyante	1	1.10E-05	9.50E-02		1	1	Resp
Hexmethylene Diisocyanate*	1		1.00E-02			1	Resp
Isocyanate	1		9.50E-02			1	Resp

Assumptions

Coating Density	10.5	lbs/gal
hrs/day	8	
days/yr	260	
Stack Ht	Ground Level	
Receptor	Residential	
Location	West LA	
Signficance Threshold for	MICR	1.00E-05
Signficance Threshold for	HIC	1
Signficance Threshold for	HIA	1

Input Variables

Distance to Receptor m	X/Q ug/m3 / tons/yr	X/Qmax ug/m3 / lb/hr	MET	LEA
25	51.18	2000	1.00	1
50	16.88	1000.6	1.00	1
100	4.51	373.5	1.00	1

Carcinogenic Analysis (MICR)

Compound	25m QYR tons/yr	25m QDAY lbs/day	25m Usage gals/day	50m QYR tons/yr	50m QDAY lbs/day	50m Usage gals/day	100m QYR tons/yr	100m QDAY lbs/day	100m Usage gals/day
Toulene Diisocyante	0.02	0.14	1.30	0.05	0.41	3.95	0.20	1.55	14.77

441

Chonic Exposure Analysis (HIC)

Compound	25m QYR tons/yr	25m QDAY lbs/day	25m Usage gals/day	50m QYR tons/yr	50m QDAY lbs/day	50m Usage gals/day	100m QYR tons/yr	100m QDAY lbs/day	100m Usage gals/day
Toluene	3.9078	30.060	28.628	11.848	91.141	86.801	44.346	341.122	324.878
Xylene	5.8617	45.090	42.943	17.773	136.712	130.202	66.519	511.683	487.318
Methyl Ethyl Ketone	19.5389	150.299	143.142	59.242	455.705	434.005	221.729	1705.611	1624.392
Isopropol Alchol	39.0778	300.598	286.284	118.483	911.411	868.010	443.459	3411.223	3248.784
Ethylene Glycol	7.8156	60.120	57.257	23.697	182.282	173.602	88.692	682.245	649.757
Propylene	58.6166	450.897	429.426	177.725	1367.116	1302.016	665.188	5116.834	4873.176
Glycol Ethers & Acetates	0.3908	3.006	2.863	1.185	9.114	8.680	4.435	34.112	32.488
EGBE	0.3908	3.006	2.863	1.185	9.114	8.680	4.435	34.112	32.488
EGEE	3.9078	30.060	28.628	11.848	91.141	86.801	44.346	341.122	324.878
EGME	0.3908	3.006	2.863	1.185	9.114	8.680	4.435	34.112	32.488
Toulene Diisocyante	0.0019	0.014	0.136	0.006	0.043	0.412	0.021	0.162	1.543
Hexmethylene Diisocyanate	0.0002	0.002	0.014	0.001	0.005	0.043	0.002	0.017	0.162
Isocyanate	0.0019	0.014	0.136	0.006	0.043	0.412	0.021	0.162	1.543

Acute Exposure Analysis (HIA)

Compound	25m QHR lbs/hr	25m Usage gals/day	50m QHR lbs/hr	50m Usage gals/day	100m QHR lbs/hr	100m Usage gals/day
Toluene	20.00	152.38	39.98	304.58	107.10	815.96
Xylene	2.20	16.76	4.40	33.50	11.78	89.76
Methyl Ethyl Ketone	15.00	114.29	29.98	228.43	80.32	611.97
Isopropol Alchol	1.50	11.43	3.00	22.84	8.03	61.20
Glycol Ethers & Acetates	0.77	5.84	1.53	11.67	4.10	31.27
EGBE	0.75	5.71	1.50	11.42	4.02	30.60
EGEE	0.19	1.41	0.37	2.82	0.99	7.55
EGME	0.17	1.26	0.33	2.51	0.88	6.73

*Proposed OEHHA Values

APPENDIX F

RESPONSES TO COMMENTS ON THE DRAFT SUBSEQUENT ENVIRONMENTAL ASSESSMENT

Comment Letter #1:	**Sanitation Districts of Los Angeles County**
Comment Letter #2:	**Society for Protective Coatings**
Comment Letter #3:	**Benjamin Moore & Co.**
Comment Letter #4:	**Kessler & Associates, Inc.**
Comment Letter #5:	**National Paint & Coatings Association**
Comment Letter #6:	**Smiland & Khachigian**
Comment Letter #7:	**Southern California Association of Governments**

The SCAQMD received a total of seven comment letters on the Draft SEA for PAR 1113. The SCAQMD also received CEQA-related comments during the March 31, 1999, and April 28, 1999 Public Consultation Meetings. The comment letters and responses to the comments contained in the seven letters as well as responses to Public Consultation Meetings comments are contained herein.

COMMENT LETTER #1

SANITATION DISTRICTS OF LOS ANGELES COUNTY

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422

CHARLES W. CARRY
Chief Engineer and General Manager

April 21, 1999

File No: 31-380.10B

Mr. Darren W. Stroud
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

Dear Mr. Stroud:

Comments on PAR 1113 Draft Subsequent Environmental Assessment

The County Sanitation Districts of Los Angeles County (LACSD) appreciate the opportunity to comment on PAR 1113 Draft Subsequent Environmental Assessment dated March 19, 1999. Our comments are as follows:

1-1 In the environmental assessment, SCAQMD staff determined the durability of low VOC coatings is comparable to conventional coatings based on qualitative descriptions from product data sheets. The information contained in the product data sheets must be verified through laboratory and field testing before the durability of the coating can be judged. LACSD is interested in working with the SCAQMD in evaluating the durability of low or zero VOC coatings for wastewater applications as part of the technology assessments.

1-2 SCAQMD should conduct additional research into the potential for public exposure to diisocyanates from spraying low or zero VOC two-component polyurethane. On page 4-57, SCAQMD commits to conducting a technical assessment one year prior to each rule limit to determine if environmental issues are associated with the manufacture and use of reformulated products. It is not clear whether the technology assessment will be started or completed one year prior to the implementation dates. The technology assessments should be completed one year prior to allow end-users adequate time to prepare for the new products.

1-3 In the response to the Du Pont comment letter section 8-3 on page C-8-1, staff stated that SCAQMD appreciates the need for end-users to evaluate the performance of low VOC coatings. Even though the compliance dates have been extended, end-users can only evaluate coatings as they become commercially available. Industrial maintenance coatings typically have a shelf life of one-year, therefore, it should not be assumed that end-users can use non-compliant coatings for an

Recycled Paper

Darren W. Stroud 2 April 21, 1999

1-3 cont. additional three years after the implementation dates.

Thank you for an opportunity to express our concerns and we look forward to working with SCAQMD in the technology assessment. If you have any questions, please contact Ms. Preeti Ghuman of this office at (562) 699-7411, extension 2138.

Yours very truly,

Charles W. Carry

for Gregory M. Adams
Assistant Departmental Engineer
Office Engineering Department

GMA:PKG:tk

cc: Naveen Berry

COMMENT LETTER #1
Sanitation Districts of Los Angeles County
April 21, 1999

1-1 The commentator asserts that the information contained in product data sheets regarding coating durability must be verified through laboratory and field testing. The SCAQMD staff evaluated the durability of low-VOC coatings based on both the qualitative (e.g. excellent adhesion) as well as quantitative (e.g. adhesion of 800 per ASTM Test Method D4541-05) information from the product data sheets. For PAR 1113 the SCAQMD staff conducted an exhaustive and comprehensive analysis of currently available low VOC compliant as well as conventional coatings that forms the primary basis for PAR 1113. This analysis evaluated hundreds of coatings from approximately 40 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time. The conclusion of this analysis reveals that low-VOC complaint coatings are currently commercially available with comparable durability characteristics to meet the interim and final VOC content limits. The SCAQMD staff will continue to monitor future studies and encourage public participation. The commentator is also referred to response to comment #2-1.

1-2 The commentator indicates that SCAQMD staff should conduct additional research concerning the potential exposure of the public to the release of diisocyanate compounds during the spraying of zero- or low-VOC two component IM systems. At the time of the release of the Draft SEA on March 23, 1999, PAR 1113 contained a provision that prohibited the spraying of two component IM systems containing diisocyanate compounds beginning January 1, 2005. This provision was thought to be necessary to protect the public from the potential adverse effects of exposure to these compounds, which are mainly a concern during spraying applications for two-component coating systems. However, based on testimony received at the Public Consultation Meeting on March 31, 1999, and additional research conducted by the SCAQMD staff, the SCAQMD staff has concluded that the provision was overly conservative and is no longer necessary for the protection of public health. This conclusion is based on the following: (1) the chemistry of the two component systems does not permit the release of substantial quantities of diisocyanate compounds during spraying since the chemistry is designed to completely use up all the diisocyanate during mixing of the two components; (2) field monitoring shows at distances of 15 feet and greater detectable levels of these compounds are well below established and recommended exposure thresholds; and (3) provisions in PAR 1113 preclude the use of these coatings for residential uses. Therefore, based upon currently available information the SCAQMD does not expect that the spraying of zero- or low-VOC two component IM systems containing diisocyanate compounds will result in significant

adverse acute human health impacts to the public. The commentator is referred to Human Health Impacts section of Chapter 4 in the Final SEA for a further discussion of this issue.

The SCAQMD will conduct and complete a technology assessment one-year prior to the interim and final VOC content limits becoming effective. The technology assessment will evaluate the availability and feasibility of compliant coatings. Since the language regarding technology assessments is included in PAR 1113, the SCAQMD will be required to revise the VOC content limits or extend the compliance dates depending on the results of the technology assessment. This continuing evaluation requirement assures that future limits will always be based on the commercially available coating technology. Furthermore, if during the technology assessment it is determined that changes are necessary to Rule 1113, the changes will be evaluated to determine CEQA applicability and, if necessary, a CEQA analysis will be prepared.

1-3 The commentator indicates that the SCAQMD cannot assume that the end user will be able to use non-compliant IM coatings for up to three years after the VOC content limits go into effect because low-VOC compliant IM coatings have a shelf life of typically one year. The SCAQMD assumes for the purposes of this comment that the commentator is referring to the three-year sell-through provision of PAR 1113 when mentioning the ability to use non-compliant coating three years after the implementation dates. Based on the SCAQMD's research and analysis, there are currently commercially available IM, as well as other coating categories, with shelf lives up to three years. The SCAQMD can provide the commentator with the names of the companies that currently have compliant low-VOC IM coatings with shelf lives up to three years

The commentator should be aware that PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant IM coatings are unavailable by the completion of the technology assessment to meet the applicable limit, the SCAQMD will report back to the Governing Board as to the appropriateness of maintaining the existing VOC content limits. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology.

COMMENT LETTER #2

SOCIETY FOR PROTECTIVE COATINGS

Darren Stroud

From: Bernie Appleman [appleman@sspc.org]
Sent: Wednesday, April 21, 1999 4:03 PM
To: Darren W. Stroud
Cc: Bernie Appleman
Subject: Comments on draft SEA

SSPC: The Society for Protective Coatings
40 24th Street, 8th Floor
Pittsburgh, PA 15222-4656

April 21, 1999

South Coast Air Quality Management District
21865 E.Copley Drive
Diamond Bar, CA 91765-4182
Attn: Darren W. Stroud

Dear Mr. Stroud

Comments by SSPC on SCAQMD Draft SEA on Proposed Amended Rule 1113

General Comments
SSPC is a not for profit technical organization representing facility owners (public and private), applicators, and suppliers of materials, equipment and services. SSPC has a history of cooperating with environmental health & safety regulatory organiation to minimize the impact of coating operations on the health and welfare of the public and the work force..

SSPC's members use or supply coatings in the class defined as industrial maintenance. SSPC's comment are primarily directed at this category, although they may also be applicable to related categories such as rust preventive coatings,

2-1 Overall, we believe that the SEA did not acquire enough data (particularly field data) to support some of the conclusions regarding the impact. The analysis relied too heavily upon the unsubstantiated claims of a small number of manufacturers which may not represent the mainstream of industrial maintenance coatings technology.

Specific Comments

2-2 page 4-13 to 4-14 regarding need for more touch-up and repair work and more frequent recoating. It is stated that "staff met with numerous resin and coating manufacturers .. and also reviewed coating product data sheets."
We believe that low VOC coatings (eg at 250 to 100g/l or less) do not have proven field performance characteristics for application or durability. Resin manufacturers rarely have long term data on coating durability as they do not work directly with the end users. Also coating product data sheets provide very little information on the long term properties of coatings. The reason coating manufacturers have not been furnishing lower VOC coating is precisely because they are not suitable for many industrial maintenance exposures and applications.

2-3 page 4-15 regarding comparison between alkyds and acrylics as binders. Water-borne acrylics have definite application limitations under conditions of low temperature and high humidity .Under these conditions, proper film coalescence is not achieved and the coating is susceptible to being washed off and a weakened film results. Therefore acrylic

1

2-3 cont. waterborne coatings can not be used in these situations. In many instances adequate low VOC coatings are simply not available

2-4 page 4-33 regarding the potential hazard of substituting acetone for conventional solvents. We believe that because of its increased volatility, acetone may present a significant increase in fire or explosion hazard compared to conventional solvents.
The report cites interviews with several local fire departments. We believe that this level of research and analysis is inadequate to support the conclusions and there is a need for additional investigation on this issue

2-5 page 5-8 regarding alternative C.
The numbers developed in the SEA demonstrate that the impact of adopting alternative C (no reduction in VOC for industrial maintenance and rust preventive coatings in 2005) would be relatively small based on the percent of emission reduction loss.. We believe that this alternative should be seriously considered and ultimately adopted by the SCAQMD if the current analysis is accurate. We believe that over the next 5 to 8 years there may be significant advances in coatings technology for industrial maintenance coatings based on lower VOC (eg 100g/l or less). Such advances would allow the industry to reduce VOC emissions below the level estimated for 2002. However, because of the uncertainty of R&D and the enormous challenge of developing ultra low VOC coatings with acceptable application and performance properties the VOC limits proposed for of 2005 should be delayed until the technology is proven. Presently even the limits proposed in 2002 are not technologically feasible for many industrial maintenance applications.

SSPC appreciates the opportunity to submit these comments and would be willing to discuss in further detail any of the above comments.

Respectfully submitted

Bernard R. Appleman

2

COMMENT LETTER #2
Society for Protective Coatings
April 21, 1999

2-1 The SCAQMD conducted an exhaustive and comprehensive survey of currently available low-VOC coatings and conventional coatings. This analysis evaluated hundreds of coatings from over 40 coating manufacturers, including the largest coatings manufacturers that distribute coatings nationally as well as smaller local manufacturers. As a result, coatings were evaluated from manufacturers that are considered to be representative of AIM coating manufacturers.

The survey specifically included obtaining information on the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, scrubability, pot life, shelf life, gloss and drying time. These coating characteristics were primarily obtained from coating product data sheets (see the tables in Appendix D and the related summary tables in Chapter 4). In addition, to obtaining information from the coating product data sheets, staff called manufacturers directly to obtain additional or supplemental information on coating characteristics.

Product data sheets are prepared by the coating manufacturers to provide their customers or potential clients with information regarding important characteristics of their coatings. The information contained in the product data information sheets is typically based on laboratory tests and may also include field study data. Some commentators have asserted that these product data information sheets are simply marketing tools and, therefore, insufficient, inadequate, or unreliable. Staff contends that the product data information sheets provide reliable information because this is data typically generated by the manufacturers themselves and is often the only information coating users have available to assist them in choosing products. Providing inaccurate information as a marketing tool does not make good business sense as it would alienate potential customers. Staff understands that some characteristics are described qualitatively rather than quantitatively, e.g., "excellent" versus "good" quality coatings. Other features, however, such as chemical or corrosion resistance, coverage area at a specified thickness per gallon, etc., are verifiable characteristics. Coatings customers depend on these coating characteristic descriptions to assist them with selecting coatings for their particular coating applications.

In addition to identifying and evaluating low VOC coatings, the survey of the product data information sheets also evaluated conventional coatings. The survey results, therefore, provided a side-by-side comparison of performance characteristics for both low VOC and conventional coatings based upon the information contained in the product data information sheets. The product data information sheets are considered

to be good indicators of coating characteristics in light of the fact that the information provided therein was based on the manufacturers' own field tests and was readily accessible. The data sheets where used to complement the coating survey. The survey evaluated and compared various attributes for both low VOC and conventional architectural coatings, such as drying time, surface preparation, solids content, coverage and durability. These specific coating characteristics were specifically identified and evaluated in response to industry comments asserting that these characteristics are superior in conventional coatings. As a result, the industry contends that low VOC coatings will ultimately result in greater VOC emissions because they are less durable and require more coats, require more coating to cover the same surface area as conventional coatings, etc. These industry issues have been analyzed in detail in the "Air Quality" section of Chapter 4.

The SCAQMD's survey revealed that there are currently approximately 103 low-VOC IM coatings that comply with the 2002 interim compliance date and 140 that comply with the 2006 final compliance date (Table F-1). The SCAQMD has never asserted that this information demonstrates that there are compliant coatings available for every coating application. The survey demonstrates that compliant coatings for both the 2002 and 2006 VOC content limits are available for a number of coating applications. In addition to demonstrating that future compliant coatings are currently available for many applications, one of the most important points demonstrated by the survey is that there are resin technologies currently available that may be transferred to other coating categories and coating applications. Further, according to the SCAQMD's survey, many of these currently available coatings that comply with the future VOC content limits can meet desired performance characteristics as compared to conventional high-VOC coatings. Further, the Draft SEA has comprehensively evaluated the potential adverse environmental impacts associated with the implementation of PAR 1113 and has concluded that no significant adverse significant impacts are anticipated.

TABLE F-1
Currently Available Architectural Coatings that Comply with the PAR 1113 Future Interim and Final VOC Content Limits

COATING TYPE	**Current VOC Limit (gms/liter)**	**# of Samples**	**VOC Limit (gms/liter) Effective 7/1/2002**	**# of Samples**	**VOC Limit (gms/liter) Effective 7/1/2006**	**# of Samples**
Floor Coatings	420	9	100	5	50	13
Industrial Maintenance Coatings	420	47	250	26	100	61
Non-Flat Coatings	250	10	150	29	50	16
Primers, Sealers, and Undercoaters	350	28	200	10	100	29
Quick-Dry Enamels	400	3	250	7	50	0
Quick-Dry Primers, Sealers and Undercoaters	exempt	9	200	6	100	17
Rust Preventative Coatings	400	6	no change	n/a	100	4
Stains	350	3	250	10	no change	n/a
Water-proofing Sealers	400	5	250	10	no change	n/a
Total # of Samples		**120**		**103**		**140**

A study by the National Technical System (NTS) was initiated to assess application and durability characteristics of zero-VOC, low-VOC, and high-VOC coatings. These results have been shown to be consistent with staff's own technology assessment.

The results of the study indicate that the zero-VOC IM coatings systems tested are equal and, in some cases, superior to high-VOC coatings for characteristics which include, but are not limited to, mar resistance, adhesion, abrasion resistance, corrosion protection, and some application characteristics. The NTS results also indicate that some zero-VOC nonflats, primers, sealers, and undercoaters have limited application characteristics when compared to high-VOC coatings. These include overall lower rankings for leveling, sagging, and brushing properties. Nevertheless, the results also demonstrate that there are some zero-VOC nonflats, primers, sealers, and undercoaters available with application characteristics that are generally comparable to conventional high-VOC coatings.

In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual field application characteristics. The 1998 CARB survey has also been completed. Staff plans to utilize the on-going testing results for future technology assessments.

2-2 Commentator is referred to response to comment #2-1.

2-3 Acrylic-based coatings are clearly a better coating for concrete and metal surfaces exposed to direct sunlight than alkyd-based coatings. Urethane and epoxy IM coatings, however, are the highest performing coatings recommended for use on concrete and steel.

2-4 The commentator asserts that the SCAQMD's analysis of the potential hazards impacts associated with the use of reformulated acetone-based compliant coatings is inadequate because it relies on information obtained from interviews with local fire departments and not an actual analysis of acetone's volatility as compared to other solvents. However, in making this assertion the commentator references the Public Services Impacts section of Chapter 4 in the Draft SEA not the Hazards Impact section as the commentator's assertion seems to be directed towards. Thus, it is unclear specifically what the commentator referring to. In any event, whether the commentator is referring to the Public Services Impacts, Hazards Impacts, or both sections the SCAQMD disagrees with the commentator's assertion for several reasons. First, in the context of PAR 1113, it should be noted that the use of acetone in the reformulation of compliant coatings is relatively small. Waterproofing sealers are the only affected coating categories where some amount of acetone reformulation is expected to occur. These categories constitute a very small group of coatings compared to the total coating categories impacted by PAR 1113. Acetone

reformulation was considered to be the "worst-case" for the purposes of public services and hazards impacts associated with the implementation of PAR 1113. Thus, the SCAQMD's environmental impact analysis tends to overestimate the public services and hazards impacts from PAR 1113.

Second, the SCAQMD did not solely rely on information from local fire departments in analyzing the impacts associated with the use of reformulated acetone-based coatings. The SCAQMD conducted its on independent review of the flashpoint, vapor pressure, and flammable range, (e.g., the span between the lower explosive limit (LEL) and the upper explosive limit (UEL)) of acetone, currently used solvents, and replacement solvents (see Tables 3-14 and 4-7 in Final SEA). This analysis revealed that acetone in comparison with currently used solvents has comparable volatility and flammability characteristics. In addition, the SCAQMD conducted extensive environmental review of the use of acetone when it exempted acetone as a VOC in Rule 102 – Definitions of Terms (SCAQMD #950914JN, November 1995). Based on these analyses coupled with the information received from local fire departments, the SCAQMD concluded that PAR 1113 would not create significant adverse public services or hazards impacts.

Specifically, in the context of public services impacts, potential adverse impacts to fire departments can occur two ways: (1) more frequent responses; and (2) more frequent inspections. To determine whether PAR 1113 would significantly increase or alter fire department's level of service (i.e., increased responses to fires, explosions, or inspections), the SCAQMD sought their input. Feedback received from these authorities indicates that, based upon their extensive professional experience as a result of years of regulating the use and storage of flammable materials, the use of acetone will pose no greater risks than the use of existing solvents such as: MEK, toluene, butyl acetate, etc., even though acetone is slightly more flammable. Based on this input and other related information, SCAQMD staff concluded that PAR 1113 would not result in any significant impacts to public services compared to the existing situation. Thus, the commentator under estimates the importance of the input from fire departments in determining public services impacts from PAR 1113. Furthermore, the SCAQMD expects that anyone handling acetone-based coatings or any other flammable liquids will strictly adhere to the storing, dispensing, and handling requirements of these materials to lessen the danger of fire and explosion

In regards to hazard impacts, the SCAQMD also analyzed the probability of increased accidents and their consequences associated with acetone reformulation. First, the SCAQMD found that many coatings are already formulated with acetone and, therefore, are already being transported in the district. Second, many conventional coatings are formulated with other solvents that are considered as flammable as acetone (e.g., t-butyl acetate, toluene, xylene, MEK, isopropanol, butyl acetate, and

isobutyl alcohol). Based upon staff review of coating product information sheets. future compliant low VOC coatings are expected to be formulated with less or non flammable materials such as texanol, propylene glycol, etc. Consequently, it is anticipated that future compliant coatings will follow the existing trend of moving away from hazardous coating formulations to less or non-hazardous formulations.

Additionally, it is expected that an incident (i.e., spill or explosion), involving the transporting of acetone-based coatings will produce less toxic impacts than other conventional coatings containing solvents such as toluene, xylene, MEK, etc. Acetone has a higher TLV (750 ppm), PEL (750 ppm) and IDLH (20,000 ppm) compared to other conventional solvents. These high exposure limits coupled with acetone's higher vapor pressure indicate that acetone would evaporate quickly in a spill such that extended human exposure to significant levels that could cause harm are unlikely. Further, acetone is also considered to have the same or less toxic effects as other conventional solvents. As a result, even if exposure were to occur, which is highly unlikely, the human health effects would be the same or less compared with existing architectural coatings.

Information received from various fire authorities indicates that even though acetone is slightly more flammable than other conventional solvents it would be treated the same in the event of a fire or explosion because conventional solvents are also flammable. Since PAR 1113 does not increase the probability that a transport accident will occur and the fire authorities would handle this type of incident the same compared with coatings formulated with conventional solvents as with acetone-based coatings, the hazard impacts are not considered to be significant.

2-5 The SCAQMD disagrees with the commentator's assertion that the VOC emission reductions from industrial maintenance and rust preventative coatings is relatively small. As shown in Table 5-2 of the Final SEA, the industrial maintenance and rust preventative coating categories are expected to generate VOC emission reductions of approximately 6.45 tons per day, which represents almost 30 percent of the total VOC emission reductions from the proposed amendments. Considering that it is becoming more difficult to identify sources from which VOC emission reductions can be obtained, a 6.45 tons per day reduction represents a substantial amount.

The Final SEA for PAR 1113 will be provided to the Governing Board for their consideration prior to the public hearing for PAR 1113. Whether the proposed project is adopted is ultimately the Board's decision based upon the information contained in the CEQA document, the staff report, and received during the public testimony portion of the public hearing.

Based upon staff review of the product information materials for AIM coatings, there is currently a wide range of AIM coatings available that complies with the interim VOC content limits contained in PAR 1113. Further, based upon the results of the SCAQMD's NTS study, these currently available coatings that comply with the interim and final VOC content limit requirements have comparable coating and durability characteristics compared to existing high VOC coatings. Based upon the availability of coatings and resin technologies that already comply with the interim compliance date, the 2002 compliance dates provides sufficient time to further increase the availability of coatings that comply with the interim limits.

With regard to the 2005 compliance limits, staff review of the coating product information materials indicated that there are a limited number of currently available compliant coatings. Further, there are some resin technologies available that could be used to formulate coatings that could comply with the 2005 VOC content limits. In addition, industry input indicates that research and development of new coatings where the resin technology is currently available takes approximately three to five years. Further, industry has industry indicated that if a resin technology is not currently available, research and development of new coatings takes approximately five to seven years. While it is anticipated that the previously proposed 2005 final compliance date would provide sufficient time for research and development of compliant low VOC content coatings, staff has further extended the deadline to 2006.

PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant coatings are unavailable by the completion of the technology assessment, staff will report back to the Board as to the appropriateness of maintaining the existing VOC content limits.

COMMENT LETTER #3

BENJAMIN MOORE & CO.

Benjamin Moore & Co. *Paints • Stains • Clear Finishes*

TECHNICAL & ADMINISTRATIVE CENTER - 360 POINTE 303 • P.O. BOX 4000 • PARSIPPANY, NEW JERSEY 07054-4000 • PHONE [illegible] • FAX [illegible]

April 21, 1999

South Coast Air Quality Management District
Darren W. Stroud
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

Re: Notice of Completion of a Draft Subsequent Environmental Assessment
Proposed Amended Rule 1113 - Architectural Coatings

Dear Mr. Stroud:

3-1 Benjamin Moore & Co. has developed and manufactured AIM Coatings for over 115 years. Since the early fifties manufacture and distribution has been at our Commerce, CA plant where we employ over 80 people. Currently we make for sale to our 61 "licensed" private paint dealers approximately 300 different lines of paint available in an infinite breadth of color through our "color matching system" and product finishes. The current PAR1113 will outlaw over 70% of these products and will destroy our business in the South Coast and my companies reputation as a manufacturer of very high quality AIM Coatings.

3-2 The above referenced document grossly simplifies the paint business and is intentionally misleading when it comes to describing AIM Coatings categories. As a national paint company we have pleaded for uniform language relative to the USEPA AIM VOC Rule Part 59 400 to 413 when it comes to definitions, administration and labeling, while recognizing the need for a different Table of Standards (TOS) for the South Coast. Staff has not been responsive to this need. We have repeatedly voiced our objection to limits that are past the limit of current or foreseeable technology and are not enforceable by Method 24 and the Federal definition of VOC that excludes the volume of water in the calculation or test. This concern has also been virtually ignored by Staff. Finally we have requested additional deminimous specialty categories with higher limits for coatings that don't fit in the all encompassing categories with the extremely low limits as proposed by Staff. Rather than listen to these requests we have been given two new categories where, if used, we are penalized for products so positioned, specifically "floor coatings" and "rust preventative coatings".

3-3 For Staff to claim 50 g/l paints are available to meet all our customers needs on the basis of hearsay, marketing brochures, and raw material suppliers sales literature when we have 115 years of sales history to the contrary stretches the truth beyond breaking. We are not in the business of selling solvent, rather we are in the business of selling top quality paint. The trend is very much toward water based paint because of cost, health and safety and ease of use. To regulate us out of the solvent paint business using the propositions outline in this SEA document is at best unfair and false. Our customers will not pay more for product that only provides low VOC. In fact in our case our "0" VOC products discussed in the "DRAFT Staff Report ..." of 2/17/99 on page 49 have been so unsuccessful in the market place that they have been withdrawn from sale.

3-4 Finally Staff continuously asserts there are new magic ingredients that make water paint technology user friendly yet many of these materials are VOC's in themselves. We have requested exemptions for these materials on the basis of low volatility and/or lack of reactivity. This has also been categorically rejected with only an averaging carrot given in response. We can not avail ourselves of this option when the down side is a $25,000 per day fine.

We hope these concerns are addressed and the writer can be contacted at 973-252-2650 if there are any questions.

Sincerely,

Barry A. Jenkin (Regulatory Affairs)

NORWALK, CT • NEW YORK, NY • [illegible] • SAN FRANCISCO, CA • [illegible] • BOSTON, MA • RICHMOND, VA • [illegible] • CHICAGO, IL • ST. LOUIS, MO
CLEVELAND, OH • HOUSTON, TX • DALLAS, TX • [illegible] • ORLANDO, FL • [illegible] • SAN DIEGO, CA • LOS ANGELES, CA • [illegible] • WILMINGTON, DE

Established 1883

COMMENT LETTER #3
Benjamin Moore & Co.
April 21, 1999

3-1 The SCAQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits. The commentator is encouraged to review the technology discussed in detail for each coating category in the Staff Report for Proposed Amended Rule 1113, as well as the comprehensive list of coatings included as Appendix D of the Subsequent Environmental Assessment.

Nonetheless, the SCAQMD has added an Averaging Provision to provide additional compliance flexibility for coating manufacturers, which allows a manufacturer to average their emissions from a long list of coating categories. This provision would allow the manufacturer to continue selling a line of coatings that may not comply with the actual VOC limit, by offsetting those emissions with sales of coatings that are below the compliance limits. Some manufacturers have recognized the potential cost savings of this flexible approach. In addition, the SCAQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the SCAQMD will revise the limit or further extend the deadlines prior to implementation.

The SCAQMD has incorporated industry suggestions into the Averaging Provision to provide for a simplified, flexibility option that would allow compliance with the proposed amendments with lesser socioeconomic impacts.

3-2 The SCAQMD has worked closely with USEPA and educational institutions over the past several years to identify alternative test methods for measuring the VOC content of low-VOC architectural coatings. Under a contract with USEPA, the Research Triangle Institute has developed alternative test methods to Method 24. These include a modified Method 24, a single-injection headspace analysis, a multiple headspace extraction analysis, and an automated thermal desorption (ATD) analysis. The ATD approach has provided results that were closest to the Method 24 measured values. The SCAQMD fully anticipates the development and approval of an alternative test method over the next few years, prior to implementation of VOC limits at or below 50 g/l.

Staff has analyzed the national AIM rule's categories and definitions, as well as the VOC limits. Staff believes that adding additional categories into the Table of

Standards with the default 250 g/l limit will add to confusion, instead of simplifying the rule. For example, the national AIM rule has separate categories for interior and exterior nonflats, but has the same VOC limit. This does not add any simplicity to the rule, just redundancy. The current Rule 1113 – Architectural Coatings currently contains an exemption for coatings sold in containers having a capacity of one quart or less (Rule 1113(g)(1)(A)). Staff has added two coating categories, floor coatings and rust preventative coatings, consistent with the national AIM rule. However, the current and future proposed VOC limits are different than those found in the national AIM rule. Staff has adopted the national AIM rule definitions and provisions for some categories, where appropriate.

3-3 The commentator is referred to response to comment 2-1.

3-4 Staff makes no assertions regarding "magic ingredients" in water-based coatings. Staff has acknowledged in the past that even water-based coatings may contain VOCs. The important point, however, is that the primary solvent component of water-based coatings is water, not organic solvents. Water does not contribute to ozone formation as does VOC solvents.

Staff has received recommendations in the past to include exemptions for coatings formulated with solvents that are considered to have low volatility or low vapor pressure based on CARB's consumer products rule, which has a low vapor pressure exemption. According to CARB, however, its low vapor pressure exemption was initially meant for high molecular weight resins, surfactants, detergents, and paraffins/waxes commonly found in consumer products. Based on new data, CARB is proposing to delay implementation of the low vapor pressure exemption. CARB plans to evaluate how much of these new solvent mixtures that meet the LVP definition are found in consumer products and design a study to assess the fate of LVP solvents. The study is expected to occur no earlier than the end of 1999.

The low vapor pressure exemption was originally intended by CARB to be limited to consumer products where the organic compounds are washed away. These typically do not evaporate into the air. For architectural coatings, the solvents evaporate and go into the air. For that reason, CARB has not included a low vapor pressure exemption for aerosol paints.

The approved EPA test method for measuring VOC (Method 24) measures low vapor pressure compounds as VOCs. Therefore, they should not be considered exempt in architectural coatings regulations according to EPA. For this reason, a low vapor pressure exemption is not considered to be a feasible alternative.

Exemptions, or an architectural coatings rule that is based on solvent reactivity has also been discussed and considered in the past. A reactivity-based approach has also been rejected for the following reasons. As discussed in Chapter 4 of the Draft SEA, the science of VOC reactivity is still in its early stages, with more comprehensive studies being conducted to refine VOC reactivity data. Until these studies are completed, the SCAQMD agrees with the EPA that it would not be prudent to implement a control strategy for VOC emissions based principally on VOC reactivity at this time. In its 1995 Report to Congress entitled "*Study of Volatile Organic Compound Emissions From Consumer and Commercial Products*," the EPA concluded, "To be most effective, ozone control strategies ideally should be based not only on mass VOC and NOx emissions but should consider the relative photochemical reactivity of individual species, the VOC-to-NOx ratios prevalent in specific airsheds, and other factors which could work together to minimize the formation of ozone with adverse impacts. Reactivity data on VOC, especially those compounds used to formulate consumer products and commercial products, is extremely limited. Better data, which can be obtained only at great expense, is needed if the EPA is to consider relative photochemical reactivity in any VOC control strategy. In the meantime, a practical approach is to act on the basis of mass VOC emissions." Thus, until more comprehensive VOC reactivity studies are completed that yield more refined speciation profiles for architectural coatings, the SCAQMD will continue to use a mass VOC control strategy. The SCAQMD welcomes any new scientific data that industry can provide to aid the SCAQMD in making VOC reactivity-based strategy a viable control option.

In general, the relative contribution of a specific VOC under different atmospheric conditions needs to be better understood before data can be used for policy-making. Dr. William Carter recently received funding for a three million dollar ozone chamber, which will include studying VOC reactivity. The SCAQMD is also contributing funding to this ozone chamber. A working group will be established to guide reactivity research. It is expected that it will take 18 to 24 months to have the chamber running. The results of future studies may result in sufficient information to include reactivity-based control provisions in Rule 1113 and other coatings rules.

Reactivity-based regulations have also been discussed at Industry Working Group meetings (meeting #2, 10/7/98; meeting #3, 11/4/98; and meeting #4, 12/9/98). At Industry Working Group meeting #3, Dr. Carter explained that EPA does consider whether a VOC is reactive or non-reactive. EPA staff feels the high uncertainties of the MIR values would not make it a sound strategy until values are refined. EPA and private groups have established NARSTO to coordinate research related to reactivity policy.

While vehicle exhaust has been extensively studied for reactivity, it was only three years ago that glycols, esters, ketones, etc. were being studied. Uncertainty values vary for the best understood species by 30 percent for absolute reactivity and 20 percent for relative reactivity. For species that have not been studied extensively, uncertainty can be much greater. The value of the uncertainties is very difficult to isolate, but attempts to numerically identify uncertainties have been made.

Some specific problems (scientific issues) associated with reactivity-based regulations include:

- Assumptions in the current airshed models are too simplified, and do not represent airshed conditions in Basin.
- Studying the reactivity of halogenated compounds is frustrating because currently there is no way to simulate reactivity under current models and chamber conditions.
- Information on the reactivity of alcohol amines indicates that there is a high degree of uncertainty associated with the reactivity of these compounds and additional study is necessary.
- The reactivity of aromatics is still not well understood and current mechanism may not correlate well.
- Quantifying reactivity uncertainties is difficult – particularly for most compounds found in architectural coatings.
- The existing atmospheric chamber is not for studying reactivity in low-NOx environments.

NOx levels, absolute concentrations, also affect reactivity. Temperature and light intensity can also affect reactivity, but this relationship has not yet been studied. In urban areas, time and place of VOC and NOx emissions can also have effect; Absolute reactivity is scenario dependent and is more variable, whereas relative reactivity is less scenario dependent, and therefore less variable, and is the more important scale. The current scenarios represent the center of urban areas' NOx levels. The maximum incremental reactivity varies for each VOC species. Generally, under current scenarios, the VOC:NOx ratio is approximately 6.0, which is consistent with NOx levels in the downtown area of Los Angeles.

Although the above information indicates that the science regarding VOC reactivities is currently not well developed, the SCAQMD acknowledges that when the science becomes reasonably well developed a reactivity-based regulatory approach may

provide an alternative or additional means to assist in making progress towards attaining and maintaining the state and national ambient air quality standards fc ozone. To address potential future advances in knowledge about reactivity, the SCAQMD has added language to PAR 1113 provision (f)(3), which requires the Executive Officer to further conduct a study to assess the reactivity of architectural coatings.

Although the averaging compliance option in PAR 1113 is one means of complying with the rule provisions, it is not anticipated to be the only means. It is expected that the interim and final compliance dates provide sufficient time for research and development of compliant coatings. This assertion is based on the current availability of low and zero VOC coatings. Staff evaluated the coating product information sheets for a substantial number of both low VOC and currently compliant conventional coatings comprising a number of AIM coating categories. This evaluation identified coating characteristics such as VOC content, drying time, pot life, shelf life, durability characteristics, etc. The products evaluated are listed in the Tables in Appendix D, which are summarized in Table 4-2 in Chapter 4 of the Final SEA. This survey of product information sheets demonstrates that for a number of AIM coating categories, compliant coatings already exist. Given the time available for research and development, the number of compliant coatings for the affected coating categories is expected to increase substantially

COMMENT LETTER #4

KESSLER & ASSOCIATES, INC.

Kessler & Associates, Inc.

April 21, 1999

Mr. Darren Stroud, Air Quality Specialist
CEQA Section of the Planning, Rule Development, and Area Sources Division
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765

Subject: Comments on Draft Subsequent Environmental Assessment for Proposed Amended Rule 1113 – *Architectural Coatings*

Dear Mr. Stroud:

Kessler & Associates, Inc., a government affairs firm, represents Dunn-Edwards Corporation (Dunn-Edwards) a Los Angeles, California-based manufacturer and se\. .r of quality architectural coatings. This letter is in response to the South Coast Air Quality Management District's (SCAQMD's) Draft Subsequent Environmental Assessment (EA) prepared for Proposed Amended Rule 1113 – *Architectural Coatings*.

4-1 Thank you for allowing us the opportunity to comment on the potential impacts of this proposed rulemaking. We have restricted our comments to those areas of the EA where additional technical data or analyses are necessary to more accurately assess potential environmental impacts. Our comments on the Notice of Preparation have not been addressed in this document with respect to the reactivity of specific VOCs and the contribution of emissions from architectural coatings on the formation of ozone in the South Coast Air Basin.

Page 1-1 – Introduction

4-2 We have a general comment concerning the intent of this rulemaking. Rule 1113 does not regulate volatile organic compound (VOC) emissions, but rather regulates the VOC

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4-2 cont. content of architectural coatings. Regulation based on content rather than emissions assumes a direct correlation between VOC content and effect on ozone. This concept is not *a priori* correct.

Furthermore, all VOCs may not contribute equally, if at all, to ozone formation. This theme is continued throughout Chapter 4 – Air Quality Impacts.

Page 1-7 – Air Quality

4-3 The Draft EA states, "The adoption and implementation of PAR 1113 is expected to produce long-term VOC emission reductions." Whether limiting VOC content of architectural coatings actually reduces emissions and, ultimately, ozone formation is unclear by the District's analysis. District staff has indicated that current Urban Airshed Models cannot demonstrate measurable results from a source as small as the District's estimate for the entire coatings category. Therefore, implementation of the Proposed Rule may not result in a reduction in ozone formation.

Reactivity

4-4 We believe that a reactivity-based regulatory scheme will provide the District with the means of reaching and maintaining the ozone standard in a manner that is more cost-effective and equitable in its impact on the regulated community. A reactivity-based approach is consistent with the mandates of the Clean Air Act (Sections 183(e)). In addition, regulation based on VOC mass content without regard to reactivity allows the possibility of adverse environmental impacts through reformulation using ingredients that are more reactive.

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Page 1-11 and Page 4-32 – Maintenance at Public Facilities

4-5 Staff concluded that "no significant public service impacts are anticipated from the proposed rulemaking for maintenance at public facilities." In the absence of long-term testing of complying coatings used for maintenance of water treatment facilities, bridges, safety railings, fire escapes, and other essential public uses, this finding is unfounded.

Page 2-3 – Background

4-6 According to this document, "...due to the lack of durability information contained in the EMU study, the SCAQMD contracted with National Technical Systems (NTS) to conduct a comparison study that will evaluate the durability and application characteristics of ...coating categories."

We must note that the environmental impacts of the Proposed Amended Rule will depend, to a large extent, on the durability and application characteristics of complying substitutes for coatings unavailable in the future due to the proposed lower limits. Insofar as the results of the NTS study are not available, the District lacks the factual basis for assessing environmental impacts, and has instead relied upon unfounded speculation and unsubstantiated competitive marketing claims.

We believe, therefore, that the Amendments to Rule 1113 and the CEQA analysis are premature, given the AQMD's inability to fully consider this crucial factor. We urge District staff to consider these results in future rulemaking efforts and in the Technology Assessments which have been added to the rule to ensure that high quality, durable coatings are available.

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Page 2-4 - Background

4-7 The term "technical assessment" as used by District staff in this document actually refers to a literature search of product data sheets and promotional articles. AQMD staff has relied on unverified claims made in marketing materials and is using this as justification for establishing future VOC limits and timelines. This is an inadequate basis for this rule. A genuine, scientific technology assessment requires extensive testing of various coatings on a variety of substrates in both interior and exterior exposures representative of conditions experienced in the South Coast Air Basin.

Page 3-19 – Strategy for Attaining the National and State Ozone Standards

4-8 Page 3-19 states, "without additional AIM regulations, the summer-day average inventory for AIM coating emissions will increase due to population growth by the following: 68.2 tons per day in 1997; 74.7 tons per day by 2005; and 79.4 tons per day by the year 2010. If left unregulated, AIM coating emissions alone would account for more than 26 percent of the VOC emissions inventory targeted for 2010."

This comment does not reflect the market-driven technological advancements that have occurred and will continue to occur, even in the absence of regulation. During the past 50 years, market forces have driven the demand for coatings with lower-VOC levels. In 1950, virtually all architectural coatings were solventborne; by 1975 (25 years later and in the absence of regulation), more than 70 percent by volume were low-VOC waterborne products. Similar market forces such as consumer preference for low-odor, health and safety concerns, and price competition operate to reduce VOC content to the lowest possible levels consistent with desired performance characteristics.

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4-8 cont. This is apparent in the recently released CARB AIM survey data. The AQMD should base the AQMP inventory on this information. The 1998 Draft CARB survey indicates a 82 percent/18 percent waterborne to solventborne split as opposed to the 1993 survey which showed 74 percent and 26 percent respectively.

Page 4-4 – Film Thickness

4-9 Viscosity data as well as solids volume date is needed to speculate on applied film thickness. However, no viscosity data is listed in this Draft EA. Averaged coverage data from data sheets is not accurate. Actual application comparisons are required. Higher volume solids are evident in averages for lower VOC floor, industrial maintenance coatings, and water proofing sealers.

Page 4-11 - More Priming

4-10 The product data sheets may indicate comparable coverage, but substrate-specific testing is required to verify claims that additional surface preparation, including priming is not required to successfully applying reformulated products.

Page 4-12 – More Topcoats

4-11 The additives cited in the EA to improve flow and leveling problems and deal with oily or contaminated surfaces are expensive and can compromise the final properties of the film. For example, they may cause water sensitivity, embrittlement, and loss of ultraviolet (UV) resistance. Actual testing is required to determine the extent to which more topcoats may be required to successfully apply reformulated products.

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Pages 4-13 – 4-14 – More Touch-Ups and Repair

4-12 The document cites the use of "hypersurfactants and reactive diluents" that have improved the overall performance of low to zero-VOC coatings to achieve "comparable" if not superior performance to traditional, solvent containing coatings. These coatings have performance limitations and their costs can be substantially higher than that for traditional coatings. Actual testing is required to determine the durability of such coatings and the extent to which additional touch-up may be necessary.

Page 4-14 – 4-15 – More Frequent Recoating

4-13 The use of UV absorbers or free radical scavengers to increase coating life can result in significant costs and can produce undesirable side effects. These producers often have objectionable odors and result in coating discoloration.

Page 4-17 - More Reactivity

4-14 As mentioned in our comments above, Dunn-Edwards encourages the District to move towards a reactivity-based regulatory scheme for preventing the exceedance of the ozone standard as quickly as practicable.

This document does not discuss the negative reactivity that certain VOCs have in the atmosphere. Dr. William Carter of UCR contends that under certain conditions involving lower NOx levels or higher VOC-to-NOx ratios, VOCs actually inhibit the formation of ozone rather than contribute to it.

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Page 4-19 (bottom of page) – More Reactivity

4-15 The statement quoted from the paper entitled "Application of Reactivity Criteria to Architectural Coatings" is true only with respect to replacement of solventborne flat coatings with waterborne flat coatings. The paper cited continues to explain why reactivity is significant with regard to the "non-flat coatings category, which constitutes 23% of volume and is almost evenly divided at present between waterborne latex enamels and solventborne alkyd enamels. Considering reactivity, we may find that regulation results in the substitution of latex enamels for alkyd enamels and is environmentally counterproductive; i.e., exacerbates the ozone problem.

Page 4-20 – More Reactivity

4-16 This section references the state-of-the-art ozone chamber to be constructed at UCR. We trust that future rulemaking will be based on the data collected using this reactivity chamber's data and scientific findings.. The assumption that VOCs contribute equally to the formation of ozone in the ambient air is not justified by the current science. This EA does not reference the negative reactivity that certain VOCs have in the ambient air. Dr. William Carter, noted scientist in the area of atmospheric reactivity, mentioned the role of negative VOCs in lowering ozone levels at a recent AQMD meeting regarding this rule.

Page 4-39 - Solid/Hazardous Waste Impacts

4-17 The significance criteria cited on page 4-39 indicates that a project will have significant adverse solid or hazardous waste impacts if it results in the disposal of materials that exceed the capacity of designated landfills.

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4-17 cont. Dunn-Edwards does not concur that this is the appropriate measure of a significant solid waste impact. A more appropriate baseline, we believe, is the amount of paint, coatings, and containers currently landfilled or deposited at household hazardous waste roundups.

4-18 The discussion outlines possible increased solid waste generation due to: freeze/thaw problems, shorter shelf lives, and shorter pot life for two-component systems; however, there are other problems associated with the use of these replacement coatings which may result in increased solid waste impacts in the Basin. More gallons of waterborne coatings are needed to cover a comparable area due to their lower solids content; therefore, more containers would be manufactured, used, and, ultimately, disposed of in a landfill.

4-19 There is another significant problem associated with the use of zero-VOC latex-based systems as outlined in our meetings with District staff and national resin suppliers. Zero-VOC products do not include biocides necessary to eliminate an environment favorable to the growth of bacteria, molds, and fungi that can spoil a product batch.

Products ruined by microorganisms must be disposed of in a landfill. They are not appropriate for recycling or household hazardous waste programs. Dunn-Edwards is committed to limiting the amount of solid and hazardous waste generated in California. Our goal is not to fill landfills with paints and coatings.

4-20 Analysis of solid waste impacts from the proposed amendments to Rule 1113 should be based on an increased amount of paints and coatings deposited in landfills or attempted to be dropped off at household pickup areas, not a comparison to the total landfill capacity in the South Coast Basin area.

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Page 5-5 – Discussion of Alternatives

4-21 We do not concur with the discussion of Alternative A – The No Project Alternative. The recently released CARB survey demonstrates that VOC content reductions occur as a result of market demand and may continue in the future even in the absence of any additional rulemaking on architectural coatings.

4-22 We support an extended compliance deadline as a component of the proposed rule. We believe this would allow for additional, much-needed time to develop reliable lower-VOC products, particularly industrial maintenance, and rust preventative coatings. Additional research and development time is critical to ensure that coatings developed do not result in the potential negative air quality impacts outlined in our comments above.

Dunn-Edwards appreciates the District's efforts in examining innovative and meaningful approaches to dealing with ozone nonattainment. We look forward to working with District staff on this and other important technological issues. These issues are the keys to the viability of our industry and our mutual goal of clean air.

Sincerely yours,

Howard Berman

Howard Berman, Esq.
Senior Vice President and
Environmental Counsel

Kessler & Associates, Inc.

COMMENT LETTER #4
Kessler & Associates, inc.
April 21, 1999

4-1 The commentator's assertion that the Draft SEA for PAR 1113 did not address the reactivity of VOCs and the contribution of emissions from architectural coatings to ozone formation is untrue. Specific responses to all comments received on the NOP/IS for PAR 1113 were prepared and included in Appendix C of the Draft SEA. In addition, these topics were addressed in Chapter 4 of the Draft SEA for PAR 1113. With regard to reactivity, response to comment #1b-1 in Draft SEA Appendix C specifically responded to the commentator's comment. With regard to architectural coatings' contribution to ozone formation, this was addressed specifically in responses to comments #1-3 and #1a-1 of Appendix C of the Draft EA. When preparing responses to the commentator's comment on this issue, the response referred the commentator to the response to comment #1-3.

In addition to specific responses to NOP comments on reactivity, the Draft SEA includes an analysis regarding the issue of more reactivity in Chapter 4. The Draft SEA also includes a discussion of the VOC emissions inventory from AIM coatings, which contribute to ozone formation, in Chapter 3. Finally, Chapter 5 of the Draft EA included a discussion of why a reactivity-based project alternative was rejected as infeasible.

4-2 VOC content is a good indication of emissions, since VOCs in architectural coatings are intended to evaporate into the air. In addition, air quality modeling performed for the 1997 AQMP demonstrates not only the contribution VOC emissions make toward ambient ozone concentrations but also the need for further reducing VOC emissions to comply with the national and California ambient air quality standards. Further, ground level ozone formation is a result of complex chemical reactions involving both VOCs and NOx. VOCs react with hydroxyl radicals to form organic peroxyl radicals which subsequently react with nitric oxide (NO) to form nitrogen dioxide (NO_2). Nitrogen dioxide photo-disassociates to form NO and oxygen atoms. The oxygen atoms rapidly associate with molecular oxygen to form ozone. The amount of ozone formed is a function of the number of conversions of NO to NO_2 due to the organic "chain reactions." When VOC emissions are lowered, the number of NO-to-NO_2 conversions decrease. Discussions on the atmospheric chemistry of ozone formation can be found in the 1991 National Research Council report, "Rethinking the Ozone Problem in Urban and Regional Air Pollution." Specifically, page 116 states... "the presence of VOCs causes enhanced NO-to-NO_2 conversion and hence the production of concentrations of ozone that exceed those encountered in the clean background troposphere." Additionally, the SCAQMD's preliminary analysis indicates that additional reductions of VOC and NOx emissions beyond those included in the

AQMP will likely be necessary to meet the recently promulgated National Ambient Air Quality Standards for ozone and PM2.5.

Because of the extreme ozone nonattainment status of the South Coast Air Basin, the SCAQMD must control both NOx and VOC emissions if the area is to achieve ambient air quality standards. The AQMP for this district targets all feasible, cost-effective VOC emission reduction strategies from sources under its jurisdiction.

With regard to the comment that all VOCs may not contribute equally to ozone formation, i.e., reactivity, the commentator is referred to the response to comment #3-4.

4-3 The commentator is referred to the response to comment #4-2. In addition, architectural coatings is one of the largest remaining source category of VOC emissions.

4-4 The commentator is referred to the response to comments #3-4 and #4-1.

4-5 The commentator is referred to response to comment 2-1.

4-6 Since the initiation of the NTS study, SCAQMD staff has conducted its own technology assessment that is consistent with the results received so far from the NTS study. The commentator is also referred to response to comment 2-1.

4-7 The commentator is referred to response to comment 2-1.

4-8 The SCAQMD acknowledges that both regulation and the market have caused VOCs to be reduced. The Draft 1998 CARB survey data will be incorporated in the Category of Emission Source reports by CARB later this year. Subsequently, the SCAQMD will revise its emissions inventory for architectural coatings.

4-9 Though viscosity data may be beneficial for determining film thickness, it is difficult to evaluate since it is effected by ambient temperature and humidity. For example, a the viscosity of a coating may increase under cooler temperatures and drop under high temperatures. Thus, percent solids by volume is the most stable and reliable indicator. The commentator is also referred to response to comment #2-1.

4-10 Based upon the SCAQMD's technology assessment, the SCAQMD believes that given the lead time for reformulation the priming needs of low VOC coatings will be comparable to higher VOC solvent-borne coatings. Nevertheless, substrate-specific testing to verify priming requirements will be incorporated into future technology assessments for primers, sealers, and undercoaters.

4-11 The SCAQMD recognizes that there are tradeoffs of different coating characteristics that must be balanced for an optimal formulation. The NTS study finds that some zero-VOC coatings have better application characteristics than other zero-VOC coatings, and that some have application characteristics, including leveling, sag resistance, blister resistance, and final film properties similar to some higher-VOC coatings. This indicates that some manufacturers have been able to overcome or balance application properties with the addition of rheology modifiers and other additives.

4-12 The NTS study shows comparable durability of low to zero-VOC coatings with traditional, solvent containing coatings. The commentator is also referred to response to comment #4-11.

4-13 According to Light Stabilizers for Paints (Dr Andreas Valet, 1997) and "Additives for Trade Sales and Industrial Coatings" (Ciba, 1997), UV absorbers and free radical scavengers are additives which protect the structural integrity of coatings against corrosion and degradation. No data has been provided which substantiates the commentator's claim that UV absorbers or free radical scavengers cause coating discoloration and objectionable odors. Further, these coatings are used on exterior surfaces and, as such, would not be expected to result in additional adverse odor impacts.

4-14 The Draft SEA for PAR 1113 discussed the lack of information regarding a reactivity-based regulation. With regard to the comment regarding NOx-to-VOC ratios and the effect on ozone formation, the commentator is referred to the response to comment #3-4. The commentator is also referred to the response to comment #4-1.

4-15 The commentator is referred to the responses to comments #3-4 and #4-1.

4-16 With regard to VOC reactivity, including "negative reactivity" and Dr. Carter's work on VOC reactivity, the commentator is referred to the responses to comments #3-4 and #4-1. To the extent that the ozone chamber to be constructed at U.C. Riverside provides necessary and reliable information about reactivity of individual VOCs, this information will be used as appropriate in future amendments to existing coatings rules or entirely new rules. The SCAQMD supports future reactivity studies pertaining to architectural coatings.

4-17 The commentator advocates using the total amount of paint, coatings, and containers currently landfilled or deposited at hazardous waste roundups as the solid waste significance threshold instead of the total landfill capacity in the district. The SCAQMD disagrees with the commentator's proposal for several reasons. First, the SCAQMD as the lead agency has the discretion to establish its own significance

thresholds for its projects (CEQA Guidelines §15064.7 (a)). Significance thresholds used by the SCAQMD are derived from a number of sources including SCAQMD rules and regulations, other lea agencies that have established significance thresholds, and Appendix G of the CEQA guidelines, which is considered indicative of public health and environmental impacts. Appendix G indicates that a project would be considered to result in a significant Utility and Service Systems impact if landfills serving the project did not have sufficient capacity to meet the project's solid waste needs. Thus, the SCAQMD's solid waste significance threshold is consistent with the total-landfill-capacity threshold approach in the CEQA Guidelines.

Second, the establishment of total-landfill-capacity significance threshold provides uniformity for all SCAQMD projects. This approach allows the SCAQMD to keep a running total of the cumulative effects of its projects since it has one threshold to measure against. To adopt the commentator's proposal would mean that the SCAQMD would have to adopt separate significance thresholds for each project. This would lead to confusion amongst the public and result in potential inconsistent application by SCAQMD staff for rule and permitting projects.

Finally, the SCAQMD has no information as to the amount of paints, coatings, or containers currently landfilled or deposited at hazardous waste roundups. The commentator has conveniently omitted this information from its comment. Without such information, the SCAQMD cannot assess the validity of whether such a threshold is suited for the SCAQMD's purposes.

4-18 The commentator alleges that the solid waste impacts analysis does not include all potential impacts associated with PAR 1113. The commentator asserts that more solid waste (e.g., disposal of containers) could be generated since more water-borne coatings are required to cover a comparable area due to their low solids content. As part of the environmental impacts analysis for PAR 1113, the SCAQMD conducted an exhaustive and comprehensive analysis of currently available low VOC coatings that forms the primary basis for PAR 1113. This analysis evaluated hundreds of coatings from approximately 40 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time (see the tables in Appendix D and the related summary tables in Chapter 4 of the Final SEA). The analysis of resin manufacturers and coating formulators product data sheets provides the most accurate information available to the SCAQMD, which is based on qualitative and quantitative information (e.g., laboratory testing, actual product usage data, and field testing data). The SCAQMD's analysis of these product data sheets indicates that overall low-VOC compliant coatings had comparable performance characteristics to conventional coatings for both the interim and final VOC content limits.

The SCAQMD's product data sheet analysis has since been corroborated by the results from the NTS study specifically in the context of the interim VOC content limits. For the final VOC content limits, the results of the NTS study indicate that some of the compliant coatings may have some application concerns, while other zero-VOC coatings have comparable application characteristics when compared to conventional high-VOC coatings. As a result, the SCAQMD has given coating formulators seven years to reformulate their coatings to correct coating application problems. This time period is consistent with input received from resin manufacturers and coating formulators that it takes five to seven years to reformulate coatings to make it commercially available based on emerging resin technology. PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant coatings are unavailable by the completion of the technology assessment to meet the final limit, the SCAQMD will report back to the Governing Board as to the appropriateness of maintaining the existing VOC content limits. Accordingly, the overall the solids content and coverage area for low-VOC affected coatings are comparable to conventional coatings. Therefore, solid waste impacts resulting from alleged solids content and coverage issues are not expected from PAR 1113.

Additionally, the solid waste impacts analysis represents the "worst-case" because it assumes that five and one percent (total six percent) of all coatings as well as ten percent of all IM and floor coatings could potentially be landfilled for freeze-thaw, shelf-life, and pot-life problems. This analysis overestimates the solid waste impacts associated with PAR 1113 because it is highly unlikely that this amount of coatings would all fail at the same time and be disposed of on the same day. Therefore, even if additional solid waste were generated as alleged by the commentator, it would fall somewhere in the SCAQMD's analysis. Thus, the SCAQMD has extensively analyzed the solid waste impacts associated with PAR 1113.

Regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the preliminary results from the NTS study the commentator is referred to response to comment #2-1.

4-19 The commentator indicates that zero-VOC latex-based technology does not include biocides necessary to prevent spoilage from bacteria, molds, and fungi. As a result, the commentator alleges that spoiled paint will have to be landfilled, and thus, increasing in landfill impacts. The SCAQMD is aware that true zero-VOC technology may not contain biocides. However, the SCAQMD's proposed interim and final limits are set to allow for the addition of some VOC. For example, the final limits for nonflat paints, which are predominantly consists of latex-based technology, is set at 50 g/l. The allowance of some VOC will allow coating formulators to include rheology

modifiers and biocide to spoilage as alleged by the commentator. Therefore, the SCAQMD does not anticipate that significant solid waste impacts will be generated as a result of paint spoilage.

However, in the event there is some disposal of latex-based paint due to spoilage from bacteria, molds, and fungi, significant solid waste impacts will not occur. Since the SCAQMD's analysis overestimates the solid waste impacts associated with PAR 1113, the disposal of latex-based paints due to spoilage would fall within the range of the SCAQMD's analysis. The commentator is referred to response to comment #4-18.

4-20 The commentator is referred to response to comment #4-17.

4-21 The behavior of manufacturers in developing lower-VOC coatings and the public's acceptance of those products have occurred in conjunction with regulatory limits being placed on the products. There is no indication that the market would have moved at the same speed or to the same extent absent environmental regulations. The fact that EPA published a national AIM coatings rule in September 1998 to meet the obligations of Section 183(e) of the Clean Air Act, also indicates their position that regulations are necessary to drive the market forces. In addition, a study prepared for Inform Inc., a non-profit environmental research organization, entitled *Stirring Up Innovation: Environmental Improvements in Paints and Adhesives*, found that environmental regulation have been a strong driving force promoting innovation in the paint industry.

4-22 With regard to the need for additional time to develop compliant coatings, the commentator is referred to the response to comment #2-5.

COMMENT LETTER #5

NATIONAL PAINT & COATINGS ASSOCIATION

April 21, 1999

National Paint & Coatings Association

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RE: Comments on the Completed Draft Subsequent Environmental Assessment for Proposed Amended Rule (PAR) 1113 - Architectural and Industrial Maintenance (AIM) Coatings

The NPCA is providing comments on the South Coast Air Quality Management District's (SCAQMD) Completed Draft Subsequent Environmental Assessment (SEA). NPCA in December 1998 provided comments on the predecessor document – the Initial Staff Draft Subsequent Environmental Assessment.

While we acknowledge that the current proposal has increased some of the proposed limits above those proposed in the Initial Staff Draft, the underlying fundamental problems that we raised in regard to the Initial Staff Draft have not been adequately addressed in the Completed Draft document. Additionally, the Completed Draft raises some new factual issues.

I. General Comments on Completed Draft Subsequent Environmental Assessment

A. Rush to Judgment Without Adequate Information

5-1 The primary defect with the rulemaking process remains that the District is unnecessarily moving ahead on a fast track rulemaking schedule before pertinent data is made available by staff and can be adequately reviewed by industry and the District. This is essential to making an informed decision concerning the technological and economic feasibility of the proposed revised VOC limits under Rule 1113.

This pertinent data includes the National Technical System (NTS) comparative study concerning coatings performance and additional details from the CARB AIM emissions inventory, especially coatings speciation data. (Only summaries of the CARB inventory and the NTS study has been released to the public to date... The District's fast track rulemaking schedule precludes sufficient time for a thorough examination and discussion of the results of all of the information collected in these two important data gatherings.

5-2 In this connection we note that the District has changed the date for a Board decision from February 12, 1999 to May 14, 1999. But we also note that the

coatings care

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5-2 cont.

District in its February 17 Draft Staff Report stated its expectation that it would be only a "few weeks" until the NTS study would be finished. The importance of this study to the decision making process cannot be overemphasized. The key issue for decision is not whether low VOC coatings currently exist that are below currently applicable VOC limits. They do. The issue is whether they are adequate to meet all of the performance needs for all of the coatings in their category and whether reasonable inferences for even lower VOC levels can be made based upon current coating technologies and performance characteristics. The NTS study that is to make side-by-side comparisons of performance characteristics of lower and higher VOC coatings in specific coatings categories and subcategories is therefore essential to this rulemaking. As of this writing the full study has not been released to industry.

5-3

In addition, important features of the study are being deleted in order to meet the May 14 scheduled Board decision. We now understand that this includes the elimination of field tests of the application performance characteristics of the coatings. Laboratory tests are to be substituted in their place.

In this connection it must also be noted that in general there is no substitute for field testing application, performance and durability characteristics of coatings and this is especially true in the case of the radical reformulations being recommended by staff.

Staff acknowledges the importance of this kind of information in making its determinations. For example, the Completed Draft SEA states: "Due to the lack of durability information contained [in a previous study] the SCAQMD contacted the National Technical Systems to conduct a comparison study that will evaluate the durability and application characteristics between low- and zero-VOC coatings compared with high VOC coatings." (Completed Draft SEA at page 2-3.) Undoubtedly in an effort to meet the May 14 Board decision date, staff now plans to conduct the application characteristics tests in the laboratory instead of conducting lengthier, but more reliable, field tests. Again this underlines the "rush to judgment" nature of this rulemaking for which the earliest compliance dates for proposed revised VOC limits is January 1, 2002

5-4

The failure to provide for an adequate review and comment on the full results of NTS study (originally expected by staff to be available "a few weeks" after February 17, 1999, and thus before the issuance of the Completed Draft SEA) seriously undermines the adequacy of the staff's findings in the Completed Draft SEA relating to coatings performance issues. This is particularly true with respect to the current and foreseeable coatings technologies that are considered by staff to be available or feasible in the future which staff uses to justify many of its findings of "no significant environmental impact", especially relating to air quality issues. Staff's efforts to shore up this deficiency in Chapter Four and Appendix D of the Completed Draft SEA by a partial review of coatings product

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5-4 cont. data sheets that are not analyzed in terms of their specifically intended substrate and application specifications and requirements is not an adequate substitute for the full results of the NTS study. Nor is it the reasoned analysis required by CEQA.

5-5 It is the consensus of the NPCA membership that at a minimum five years would be required for coatings reformulation, field testing and development if feasible limits were proposed by the SCAQMD.

5-6 Although the proposed revisions would allow for a technology review to ascertain the "product availability" of the lower VOC coatings one year before they are to become effective, this time frame is too short to respond to with the development of effective coatings should the SCAQMD determine that the limits are feasible.

5-7 The determination also will turn upon the staff's interpretation of what it considers to be "available". We take little comfort from the staff's determinations in this document concerning what they may consider to be "available" coatings. For example, citing the 1998 CARB Survey, the staff finds "availability" of coatings in the industrial maintenance coatings category at the proposed VOC limits for 2002 when the survey shows that currently only 27% of the coatings meet the proposed 2002 level and only 11% meet the proposed 2005 limit. (Completed Draft SEA at page 3-3) The report does indicate that the coatings are available for "some applications", suggesting not all applications. But totally absent from staff's discussion of this topic is any indication that it will apply the "availability" criteria in a manner that draws distinctions among the performance characteristics and requirements of the coatings subcategories that make up the industrial maintenance coatings category. As this is not being done in the current proposed rule amendment, we have little reason to believe that it will be done in future technology assessments under the amended rule.

5-8 In any case, even if SCAQMD should determine that the VOC limits are not feasible for all coatings in a category, the standards may nonetheless become part of EPA enforceable SIP requirements that can be enforced irrespective of the SCAQMD's determination.

All of this means that the establishment in Rule 1113 of low VOC limits as being potentially feasible at some time in the future raises the very real risk that they will be imposed irrespective of whether they are ultimately proven to be technologically unfeasible. The federal enforceability of these SIP requirements further compels the conclusion that SCAQMD staff should develop realistic proposals for future limits. As will be demonstrated in our more specific comments, this has not occurred. And again this argues for delaying consideration of the proposal until information already being developed by staff is made more available for industry review.

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B. Four General Recommendations

The gist of the four general recommendations that were made in our December 1998 comments on the Initial Staff Draft Subsequent Environmental Assessment remains the same.

5-9
- Postpone the currently scheduled May 14, 1999 presentation on the proposed revisions to Rule 1113 to the SCAQMD Board until both the NTS comparative study and the CARB inventory results are made fully available to the regulated community, which includes chemists with extensive knowledge of the paint technology issues involved in this matter, has an opportunity to review and discuss the findings of the studies with District staff.

5-10
- The NTS study should be expanded to include ongoing real world weathering and durability testing that manufacturers and applicators can monitor in the future. It should not be truncated to exclude initially planned tests such as coatings field application tests.

5-11
- The District relies for much of its proposed lower VOC coatings limits on currently available low VOC coatings technology. A low VOC product technology in a general class of coatings may be successfully used currently to meet the performance requirements of one or more application and exposure environments. However, there must first be a thorough evaluation of this technology before it can be mandated as being feasible <u>for all or even most of the application, performance, and exposure requirements of the general class of coatings to which it belongs</u>.

5-12
- The SCAQMD AIM rule should adopt the national AIM rule as a template, incorporating the national rule's product definitions, reporting and labeling requirements, as well as the national rule's "less than or equal to" one liter package size exemption. It must be acknowledged that the SCAQMD will specify lower VOC limits for coatings than those of the national rule. This may necessitate the greater division of separate coatings categories in the SCAQMD AIM rule than those that exist in the national rule. But the basic components of both rules should be as uniform as possible to reduce the inefficiencies associated with having to address the special VOC reduction needs of the SCAQMD.

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II. Comments on Specific Features of the Completed Draft Subsequent Environmental Assessment

Below are our comments on specific features of the Completed Draft Subsequent Environmental Assessment.

A. Inadequate Technology Assessments Based on Product Information Sheets

Completed Draft SEA at page 2-4

"Since the NTS study was initiated, staff continued to conduct its technology assessment of low-and zero-VOC coatings affected by the proposed amendments and has gained additional information pertaining to their performance characteristics . . . . Based on this assessment, staff believes that both the proposed compliance limits and deadlines are achievable. Staff will nevertheless reassess the deadlines based upon the laboratory results of the NTS study. These results are expected to be completed sometime in the March/April 1999 time frame."

5-13

Comment: Staff's "analysis" of the performance characteristics of compliant products was based almost entirely, if not exclusively, on manufacturer's claims from product information sheets and with no reference to the real-life performance characteristics of the coatings and their specific end uses. Manufacturer product data sheets are often promotional in nature and based upon applying coatings in ideal conditions, e.g., thorough preparation of substrate and ideal weather conditions. Moreover, it is now April 21, 1999, and the NTS data are still not fully available for review and comment.

B. Completed Draft SEA Indicates Only VOC Limit Deadlines and Not the Limits Themselves May Change Depending on Final Results of NTS Study

Completed Draft SEA at page 3-2

"The Eastern Michigan Study "concluded that low- and zero-VOC coatings are currently available for the proposed coating categories, but did not reach conclusions regarding the overall performance of these coatings, as compared to current solvent-based coating formulations."

5-14

Staff will reassess the deadlines based on the laboratory results of the NTS study."

Comment: Does this second paragraph mean that staff will not reassess the proposed VOC limits based on the NTS study? If this is so than it suggests that the staff is already convinced that its recommended VOC limits are

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5-14 cont. technologically feasible and that the final results of the NTS study will not change its view.

C. Completed Draft SEA Demonstrates that Distinctions Between Different Coatings Technologies and Performance and Application Requirements Not Understood by Staff

Completed Draft SEA at pages 4-3 to 4-4

"...{T}he appellate court has already determined that six of the eight issues . asserted by industry and contractors had been adequately addressed in the previously prepared CEQA document . . . . [¶] It should be noted that during the November 1996 rulemaking process, the eight issues as mentioned above were discussed in detail for flats and lacquers . . . in the Draft and Final Subsequent Environmental Assessment for the November 1996 rule amendments. In each case it was concluded that the coating manufacturers' and contractors' claims for an increase in emissions as a result of the reformulation of the low-VOC coatings were not supported by any credible or empirical evidence. The Los Angeles County Superior Court has upheld this conclusion to date."

5-15 **Comment:** These prior analyses were, with some minor exceptions, done for other products and SCAQMD does not demonstrate why these analyses would apply to the product categories at issue in this rulemaking which involves completely different products. This is an example, but not the only one, where the staff's analysis demonstrates a lack of understanding or disregard of important distinctions that exist between different coatings technologies and end user performance requirements. Elsewhere in the Completed Draft SEA, the staff dismisses concerns raised about surface preparation requirements for different coatings by stating that all coatings require surface preparation. This is a truism that avoids the key issue. The key issue here is the degree of surface preparation that is required for different coatings technologies.

D. More Thickness Discussion Demonstrates Misunderstanding of Industry's Position on Issue and SCAQMD's Continued Failure to Draw Distinctions Among Coatings Formulated for Different Performance and Application Requirements

Completed Draft SEA at pages 4-5 to 4-5 (More Thickness)

5-16 *"SCAQMD staff evaluated product data sheets for approximately 340 conventional and low-VOC coatings to compare solids content . . . . Staff has asserted in the past and continues to maintain that a coating with more solids will actually cover a greater surface area. . . . . [¶] These results indicate that currently available low-VOC coatings are not necessarily formulated with a higher solids content. Further, a higher solids content does not result in a*

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significant reduction in the coverage area. The information from the coating product data sheets tends to corroborate a positive correlation between solids content and the coverage area."

5-16 cont.

Comment: Coatings are developed to be applied with different mil thickness to meet their particular performance requirements. To make valid comparisons on this score, high and low VOC coatings formulated for particular performance requirements must be compared with each other. It is clear that this was not done by staff. It is also clear that staff did not actually test the surface area coverage for zero-, low-, and high-VOC products. For some applications, no such products exist. Also, the results are *averaged* by VOC content, not by products with similar performance characteristics, which does not allow for a reasoned analysis of comparable products. In order to conclude that the proposed VOC levels would not result in increase thickness, and potentially increased emissions, it is incumbent upon SCAQMD to present data showing that information.

E. Thinning Discussion Ducks the Key Issue -- Whether There Will Be Increased Thinning When the Proposed Lower VOC Limits Become Effective

Completed Draft SEA pages 4-8 to 4-11 (Illegal Thinning)

5-17

"Thinning should not be a problem because compliant coatings are available that may be applied without thinning. Even if some thinning occurs, thinning would likely be done with water or exempt solvents. Finally, current practice indicates that coating applicators do not engage in widespread thinning, and even when thinning occurs, the coatings VOC content limits are not exceeded. As a result, claims of thinning resulting in significant adverse air quality impacts are unfounded."

Comment: Staff's conclusions regarding thinning do not constitute an adequate discussion of this issue. Current thinning practice of contractors which now can use coatings with higher VOC levels not requiring additional thinning to be effectively used -- 420 grams per liter in the case of industrial maintenance coatings-- is not relevant to predicting what will occur when the level is dropped to 250 grams per liter and 100 grams per liter and application becomes difficult without additional thinning. The assumption that compliant coatings that require no thinning at the proposed VOC limits will be available assumes away the issue entirely -- it does not address it. The same is true of the statement that if thinning occurs it will likely involve only water or exempt solvents. Exempt solvents are not uniformly suited for all the coatings at issue here.

F. Rejection of No Additional Priming Argument

5-18

Completed Draft SEA pages 4-11 to 4-12 (More Priming)

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5-18 cont.

"Information from the coating product data sheets indicated that low-VOC coatings do not require substantially different surface preparation than conventional coatings. According to the product data sheets, conventional and low-VOC coatings required similar measures for the preparation of the surface (i.e., apply to clean, dry surfaces), and application of the coatings (i.e. brush, roller or spray). Both low-VOC coatings and conventional coatings for both architectural and industrial maintenance applications have demonstrated the ability to adhere to a variety of surfaces."

Comment: Staff's "analysis" of the performance characteristics of compliant products was based almost entirely, if not exclusively, on manufacturer's claims from product information sheets and with no reference to the real-life performance characteristics of the coatings and their specific end uses. As was noted in point D above, to make valid comparisons, high and low VOC coatings formulated for particular end user requirements must be compared with each other. It is clear that this was not done by staff.

5-19

Additionally, there was no response to the industry assertion that water-borne sealers do not penetrate and seal porous substances like wood as well as traditional solvent-borne sealers.

G. More Conclusions Based on Product Data Sheets

Comment: As with paragraph A, above, staff's "analysis" of the performance characteristics of compliant products in the following cases was based almost entirely, if not exclusively, on manufacturer's claims from product information sheets and with no reference to the real-life performance characteristics of the coatings and their specific end uses.

5-20

Completed Draft SEA pages 4-12 to 4-13

(More Topcoats)"According to the product data sheets for the sampled coatings, water-borne coatings have proven durability qualities."

Completed Draft SEA pages 4-13 to 4-14

(More Touch-Ups and Repair Work) "based on the durability characteristics information contained in the product data sheets, low-VOC coatings and conventional coatings have comparable durability characteristics."

5-21

Completed Draft SEA pages 4-14 to 4-16

(More Frequent Recoating) "Coatings manufacturers' own data sheets show that the low-VOC coatings for both architectural and industrial maintenance applications are durable and long lasting."

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5-21 cont. **Comment:** Here SCAQMD also relied upon data from the Eastern Michigan study which "emphasizes the superior durability of acrylic coatings" over alkyd coatings. Yet, there is nothing but speculation to support the implied conclusion that acrylic coatings will be available for all of the applications covered by the current proposed rule amendments.

Completed Draft SEA pages 4-16 to 4-17

5-22 *(Substitution) "based on staff research of resin manufacturers' and coatings formulators' product data sheets, there are, generally, a substantial number of low-VOC coatings that are currently available, that have performance characteristics comparable to conventional coatings . . . . Second, PAR 1113 prohibits the application of certain coatings in specified settings. . . . . Third, the type of performance (e.g., durability) desired in some settings would prohibit the use of certain coatings. For example, in an IM setting a coating with a life of 10 years or more is typically desired due to the harshness of the environment. Therefore, it is unlikely that a rust preventative coating with a typical life of five years would be used in place of an IM coating. Fourth, PAR 1113 requires that when a coating can be used in more than one coating category the lower limit of the two categories is applicable. . . . Lastly, SCQAMD enforcement records reveal that there is greater than 99 percent compliance rate with Rule 1113. Thus, it is highly unlikely that coating applicators will violate Rule 1113 by substituting higher-VOC coatings for lower-VOC coatings.*

Comment: Second point - 1113 does not prevent all coatings from being used by contractors outside of their compliance category.

5-23 Third point – if a product is not available that would last 10 years, why would the contractor not use a product that will work, if only for 5 years, and only give a warranty for that long? The alternative is a product that won't work at all if no compliant product is available. This analysis is a non-sequitur.

5-24 Fourth point - theoretically, any coating "could" be used in another category if there is no restriction on the contractor. Section 1113(c)(3) only applies if a dual-use representation is made "anywhere on the container . . . on any sticker or label affixed thereto, or in any sales or advertising literature." it does not apply to contractor substitution.

5-25 Fifth point - compliance with today's limits is a poor predictor of compliance with the future limits, and an inadequate analysis under CEQA. The Los Angeles Superior Court in 1990 rejected SCAQMD's conclusion that thinning would not occur because it was "illegal" as an inadequate analysis under CEQA.

H. Water Demand Impact Analysis Inadequate

9

Completed Draft SEA pages 4-27

(Water Demand Impacts) "The SCAQMD staff will conduct a technical assessment one year prior to each of the rule limit requirements to determine where the technology is at that time and what, if any, environmental issues are associated with the manufacture and use of such reformulated products."

5-26 This statement is made in the section regarding Water Demand Impacts. It is unclear whether staff proposes to review all environmental impacts associated with the future rule limits, or just water demand impacts. Furthermore, it is unclear whether staff is committing SCAQMD to a formal environmental assessment such as the current process. NPCA strongly urges that SCAQMD commit to a rigorous environmental assessment at the time of technology assessments undertaken under Rule 1113.

I. Water Quality Impact Analysis Inadequate

Completed Draft SEA pages 4-28

5-27 *(Water Quality Impacts) "A research report released in March of 1977 demonstrated that latex (nonflat technology) paint is, in fact, not a hazardous waste product."*

The NPCA agrees with this conclusion. Unfortunately there are authorities in the California hazardous waste program that do not share this view and this practical fact and its impact should be analyzed by the staff.

J. Acetone Flammability Analysis Inadequate

Completed Draft SEA pages 4-33 to 4-36

(Public Services Impacts—Fire Departments) Acetone Flammability.

5-28 Staff's discussion of the flammability aspects of acetone flammability issues is a repeat of the discussion advanced in the FSEA for the November 1996 amendment to the lacquer VOC limits. The same lack of analysis required by CEQA applies to these proposed amendments.

The opinions received from the fire department authorities, and upon which SCAQMD exclusively relied, were only abstract statements as to the relative risks of fire hazards presented by acetone and other solvents. Significantly, SCAQMD omitted discussion of the effect of vapor pressure. None of the information from the fire authorities addressed the issue of acetone's significantly higher vapor pressure, and the fact that there would be significantly higher concentrations of acetone in the air, and able to ignite, than other solvents used in the same amount. SCAQMD recognized that acetone had a higher

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5-28 cont.

evaporation rate than other solvents. Yet, it simply failed to acknowledge this higher evaporation rate in addressing the hazard impacts from the substitution of acetone for other solvents. SCAQMD completely failed to respond to comments about the fire hazards posed by acetone-containing lacquers as actually used on the job site, and that failure violates CEQA.

5-29

The DSEA relies upon the opinion of Captain Lee of the Los Angeles County Fire Department. In a letter of June 12, Captain Lee noted that "acetone presents the highest degree of fire hazard of the four solvents, but is not significantly more hazardous than the others." His analysis was expressly based on the Uniform Fire Code (UFC), which treats all of the solvents as "Class I Flammable Liquids." Similar information was given on a June 3, 1996, site visit to a Los Angeles County Fire Station. 20 AR 5545. At a May 30, 1996, meeting with the Diamond Bar Fire Department, Captain Horton said that his agency would handle all products with flashpoint below 65 degrees the same. 20 AR 5578. The Costa Mesa Fire Department also said that they would handle all Class I substances the same. 20 AR 5579. The Orange County Fire Authority also said that, based on the UFC classifications, acetone would not pose any greater danger. 20 AR 5581.

All of the opinions from the fire authorities are based on the UFC, which designates acetone and the solvents it replaces as Class I substances. The UFC's classifications are derived from the NFPA 704 Standard for Identification of the Fire Hazards for Materials. "As originally conceived, the purpose of the standard is to safeguard the lives of those individuals who may be concerned with fires occurring in an industrial plant or storage location where the fire hazards of materials may not be readily apparent." Id. The standard is addressed to "the health, flammability, reactivity, and related hazards that may be presented by short-term, acute exposure to a material during handling under conditions of fire, spill, or similar emergencies." Id. (emphasis added). "This standard provides a simple, readily recognized, easily understood system of markings that provides a general idea of the hazards of a material and the severity of these hazards as they relate to handling, fire prevention, exposure, and control." Id. "This system is intended to provide basic information to fire fighting, emergency, and other personnel, enabling them to more easily decide whether to evacuate the area or to commence emergency control procedures. It is also intended to provide them with information to assist in selecting fire fighting tactics and emergency procedures." Id. (emphasis added).

It is clear from the description of the NFPA Standard classifications contained in the UFC that they simply have nothing to do with the potential hazards from the use of coatings in the field. Nothing in the administrative record for the 1996 amendments demonstrates why it was reasonable for SCAQMD to rely upon this classification system to address the question of hazards posed by the field use of lacquers. As the industry comments pointed out, acetone has a very low

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5-29 cont. flashpoint (flashpoint being defined as "the minimum temperature at which a liquid gives off vapors in sufficient concentration to form an ignitable mixture with air . . . ."). Its vapor pressure, i.e., how readily it will evaporate from an applied coating, is much greater than the solvents SCAQMD intends it to replace. It has a greater flammable range than any of these other solvents. The opinions of the fire authorities, based exclusively on the UFC classifications, do not address the relative fire hazard of acetone, compared to other solvents, in lacquers being used by painters in the field. These opinions were not direct evidence of no significant fire hazard from the use of acetone, and are a totally impermissible basis from which SCAQMD could reach an inference that was consistent with its prejudgment of the issue.

K. Solid/Hazardous Waste Impacts Analysis Inadequate

5-30 Completed Draft SEA pages 4-40

(Solid/Hazardous Waste Impacts) "even if some compliant coatings are landfilled due to freeze-thaw, shelf life, or pot life problems, the total amount of solid waste material deposited in district landfills will not create a significant solid waste impact."

First, it is interesting to note that total disposal is estimated at between 28-52 tons per day; the estimated air emissions reductions are only 20 tons per day. If the emissions reductions are significant, why are the disposal increases not?

Second, see paragraph I above regarding latex waste disposal.

L. Hazard Impacts Analysis Inadequate

5-31 Completed Draft SEA pages 4-42 to 4-43

See discussion above regarding acetone flammability.

See discussion above regarding water quality impacts.

M. Chapter 5 (Alternatives)

5-32 As is noted in our summary recommendations above, staff should utilize the coatings categories specified in the national AIM rule, and develop VOC limits based on rational distinctions between coatings categories. This alternative should be analyzed for its potential environmental effects, so that the Board may make a reasoned decision as to the feasibility of the project and the proposed alternatives in light of all information currently available.

5-33 We agree with the District's findings that reactivity-based alternative may not be a feasible alternative <u>at this time</u>. But we believe current research that is

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5-33 cont. underway may provide data that will allow the District and the California Air Resources Board (CARB) to implement a reactivity-based alternative compliance policy in the future. This is one of the reasons why we are urging the District to expand the Technology Assessment Provision [Paragraph (f)] of the rule to consider " any new scientific knowledge concerning the environmental fate and availability of VOC compounds used in architectural coatings, including any new atmospheric chamber studies and modeling techniques."

5-34 The District also should support research into environmental fate and atmospheric availability of the VOC species that are utilized in architectural coatings. There have been some interesting developments lately in this area under a Design for the Environment (DFE) program of the US Environmental Protection Agency. The developments strongly suggest that a significant amount of VOCs associated with residential coatings may be trapped in their substrate and not emitted. This research also may prove to be useful in determining the true degree to which VOCs contained in AIM coatings contribute to the VOC emissions that must be reduced in the SCAQMD basin to meet air quality standards.

5-35 We also request that staff consider an alternative in lieu of the proposed 2005 VOC limits that would establish an industry increments of progress program. Under such a program industry would demonstrate to the District its progress in developing lower VOC AIM coatings across the full spectrum of AIM coatings to achieve the needed VOC emissions reductions. Such an approach would be far more realistic and practical than the arbitrary selection of low VOC limits for individual coatings categories that are not within the reasonably foreseeable coatings technology.

III. Proposed Amended Rule 1113 - Response to Specific Proposed Amendments:

5-36 Addition of a definition for "Floor Coatings" [Paragraph (b)(16)]:

The definition should be revised to read as follows:

> ***FLOOR COATINGS*** *are opaque coatings that are formulated for application to flooring, including but not limited to decks, porches, gymnasiums for purposes of abrasion resistance.*

5-37 Addition of a definition for "High Temperature Industrial Maintenance Coatings" [Paragraph (b)(20)]:

The NPCA supports the addition of the new definition for "high temperature maintenance coatings" as it appears in the Proposed Amended Rule in

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5-37 cont. Appendix A of the Completed Draft SEA and the proposed VOC limit of 550 g/l. This change recognizes the true realities concerning the current state of formulation technology for these unique coatings products.

Revision of the definition of "Industrial Maintenance Primers and Topcoats [Paragraph (b)(21)]:

5-38 The NPCA supports the use of the definition as proposed in the Draft Staff Report (page 102) of the February 25 1999 version of the proposed rule with one important modification -- that a separate category be established for " Industrial Maintenance Primers, Sealers and Undercoaters". This is a clarification of our position that was stated in our comments on the Draft Staff Report that were submitted on April 15, 1999.

The current definition for Industrial Maintenance Coatings should be replaced with the following definitions:

> ***INDUSTRIAL MAINTENACE COATINGS*** *are intermediate coatings and topcoats formulated for and applied to substrates that are exposed to one or more of the following extreme environmental conditions in industrial, commercial, or institutional facilities:*
>
> *(A) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous), or chronic exposure of interior surfaces to moisture condensation;*
>
> 5-39 *(B) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemical fumes, chemical mixtures, or solutions;*
>
> *(C) repeated exposure to temperatures in excess of 250 degrees Fahrenheit;*
>
> *(D) repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial solvents, cleaners, or scouring agents; or*
>
> *(E) exterior exposure of metal structures.*
>
> *Industrial Maintenance Coatings are not for residential use or for use in areas of industrial, commercial, or institutional facilities not exposed to such extreme environmental conditions, such as office space and meeting rooms.*
>
> ***INDUSTRIAL MAINTENANCE PRIMERS, SEALERS, AND UNDERCOATERS*** *are primers, sealers and undercoaters that are an integral part of an industrial maintenance coatings system formulated for*

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5-39 cont.

and applied to substrates that are exposed to one or more of the following extreme environmental conditions in industrial, commercial, or institutional facilities:

(A) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous), or chronic exposure of interior surfaces to moisture condensation;

(B) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemical fumes, chemical mixtures, or solutions;

(C) repeated exposure to temperatures in excess of 250 degrees Fahrenheit;

(D) repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial solvents, cleaners, or scouring agents; or

(E) exterior exposure of metal structures.

5-40

Addition of a definition for "Non-Flat Coatings" [Paragraph (b)]:

The NPCA supports the addition of the new category and definition for "non-flat" coatings. The NPCA (as stated in previous comments submitted on January 5, 1999, March 2, 1999 and April 15, 1999) recommends that at a minimum at least one subcategory for "High Gloss Non-Flat Coatings" be added to the proposed Table of Standards.

We also would like to point out that the "non-flat coatings" category is not a "specialty" category of AIM coatings but one that makes up over 25% of the AIM coatings sales at both the national and California levels.

5-41

Addition of the definition of "Rust Preventative Coating" [Paragraph (b)(36)]:

As stated in our comments of April 15, 1999, the definition for "rust preventative coatings" should be revised to read as follows:

***RUST PREVENTATIVE COATINGS** are coatings formulated for use in preventing the corrosion of metal surfaces in residential, institutional, and commercial situations.*

5-42

Revision of the definition for of Waterproofing Sealers [Paragraph (b)(49) and addition of the of a definition for Waterproofing Concrete/Masonry Sealers [Paragraph (b)(51)]:

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5-42 cont. As stated in our comments of April 15, 1999, we support the splitting of the "Waterproofing Sealers category into two categories: "Waterproofing Concrete/Masonry Sealers" and "Waterproofing Wood Sealers" as long as the definition for the "Waterproofing Wood Sealers" is 1) modified to reflect the national definition and 2) has a VOC limit that reflects the current state of the technology for this category of coatings that provide protection with a single coating application. The definition of "Waterproofing Concrete/Masonry Sealers is acceptable as currently written.

VOC Limits and Deadline Dates

5-43 We are not including any recommendations on specific VOC limits in our comments to the District. We will continue to reserve commenting on specific VOC limits until after industry has had an opportunity to review the NTS study data and any other data that the District is relying on to determine the new VOC limits, including speciation data from the CARB inventory.

As to the proposed effective dates of January 1, 2002 and January 1, 2005, we believe that the earliest date for the first round of revisions should be no earlier than five years from the date of adoption.

5-44 Additionally this should be done only after the expanded Technical Assessment (which we proposed in our comment of April 15, 1999) has been completed and the results reviewed with industry at least a year before limits are established. That it requires a minimum of five years to develop and introduce a new coatings technology is well supported by ample testimony from coating manufacturers, raw material suppliers and coatings applicators.

5-45 As noted earlier in our discussion of Alternatives, for the second round of reductions, we believe that the VOC limits should not be set individual coatings category. As an alternative, a performance oriented hard target for overall emissions reductions for all AIM coatings could be set. An expanded technology assessment that would consider technology advances for all categories of AIM products would be undertaken. This could include increments of progress reports from industry. While this option has not been openly discussed by all the regulated parties, it clearly offers a more practical and realistic approach than the arbitrary establishment of VOC that are not within reasonably foreseeable technology developments.

Labels for "Industrial Maintenance Coatings" [Paragraph (d)(5)]:

5-46 The required label statement for "Industrial Maintenance coatings" should be revised to include all four of the options that are allowed in the national AIM

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5-46 cont. regulation (40CFR Part 59.405 (b) Container labeling requirements) not limited to just the one statement from in the proposed revision of Rule 1113.

5-47 Spray Application of two component polyurethane Industrial Maintenance Coatings [Paragraph (d)(8)]:

We endorse the recommendation made by the PDCA in its comments of April 1, 1999 and urge the District to remove this provision.

Robert J. Nelson
Director of Environmental Affairs

Jim Sell
Senior Counsel

COMMENT LETTER #5
National Paint & Coatings Association
April 21, 1999

5-1 The commentator is referred to response to comment #2-1.

5-2 Since the initiation of the NTS study, staff has conducted its own technology assessment, which concludes that low-VOC coatings are available. Results form the NTS study are consistent with staff's assessment. The commentator is also referred to responses to comments #1-1 and #2-1.

5-3 In addition to the laboratory testing, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff never intended to delay rulemaking to await results from the field studies that could take up to several years of results. Staff plans to utilize the on-going filed testing results for future technology assessments.

5-4 The commentator is referred to responses to comments #1-1 and #2-1.

5-5 The SCAQMD believes all the proposed limits are feasible, and has further extended the time for development of compliant coatings. The commentator is referred to responses to comments #1-1 and #2-1.

5-6 The SCAQMD's experience with rule development indicates that the proposed timing of the technical assessments provides adequate time to revise the rule if necessary.

5-7 As noted in response to comment #2-1, availability refers not only to coatings complying with future VOC content limits, but also includes coating characteristics such as coverage area, corrosion resistance, etc. The NTS study also shows that some low- and zero-VOC coatings have performance characteristics comparable to, and in some cases superior to, conventional high VOC coatings. Both the staff survey and the NTS study evaluated industrial maintenance coatings. In response to industry, staff has proposed subcategories of coatings under industrial maintenance. Since staff has identified future compliant coatings and their performance characteristics as part of the current Rule 1113 amendment process and has responded to industry concerns, there is no reason to believe that a similar process will not occur as part of future technology assessments for Rule 1113. For additional information, the commentator is referred to the response to comment #2-1.

5-8 The issue raised by the commentator, i.e., relaxation of rule requirements contained in an approved State Implementation Plan (SIP), is referred to as a SIP gap because it creates a gap in terms of emission reductions anticipated in the SIP and the actual emissions that can feasibly be attained. This issue has arisen in the past so the

SCAQMD has established a working relationship with the U.S. EPA to resolve SIP gap issues. For example, in the most recent Rule 1113 amendment, EPA committed to expeditiously resolving any issues regarding a SIP gap.

5-9 The initial results of the CARB inventory has been made available since March 1999. In addition, the NTS study was designed and run at the outset with industry oversight. The results so far are consistent with staff's own assessment. The commentator is also referred to response to comment #2-1.

5-10 The commentator is referred to response to comment #5-3.

5-11 The commentator asserts that all though a coating may perform adequately for some applications it may not perform as well in other applications. The commentator advocates that the SCAQMD thoroughly evaluate all affected coatings for all or even most applications before moving forward with PAR 1113. The SCAQMD has thoroughly analyzed the performance of coating categories affected by PAR 1113. The SCAQMD has found through its investigation that there are commercially available compliant coatings that meet the interim and final VOC content limits of PAR 1113 (see Table 3-1 in Chapter 3 of the Final SEA). According to the product data sheets analyzed by the SCAQMD, many of these compliant coatings perform comparable to conventional coatings in a variety of applications (see Appendix D and summary tables in Chapter 4 of the Final SEA). Furthermore, the results from the NTS study shows that some coatings complying with the interim and final limits perform as well as conventional high-VOC coatings, while some compliant final coatings have application shortcomings compared to conventional high-VOC coatings.

However, the SCAQMD acknowledges the fact that additional time for research and development may be needed to develop low-VOC compliant products that exhibit more enhanced performance characteristics. Therefore, the PAR 1113 contains an extended compliance schedule to ensure adequate time for research and development needs. In the context of the interim VOC content limits, PAR 1113 would allow an additional three years for coating formulators to develop coatings to meet the desired end users' performance requirements. This is consistent with the information provided by coating formulators and resin manufacturers that it typically takes three to five years to meet end users' performance requirements once resin technology is available. Based on SCAQMD research and investigation, resin technology currently exists to meet the interim compliance limits (as illustrated by the 1998 CARB Survey and summarized in Table 3-1 of this SEA).

In the context of the final VOC content limits, PAR 1113 would allow an additional seven years for coating formulators to develop coatings to meet the desired end users'

performance requirements. This is consistent with the information provided by coating formulators and resin manufacturers that it typically takes five to seven years to develop resin technology that will meet end users' performance requirements. Although SCAQMD investigation indicates that resin technology currently exists that can meet the final VOC content limits, the SCAQMD acknowledges that some additional research and development is required before the technology can meet all of end users' requirements.

The SCAQMD will conduct and complete one-year prior to the interim and final VOC content limits going into effect a technology assessment. The technology assessment will further confirm the availability and feasibility of compliant coatings. Since the language regarding technology assessments is included in PAR 1113, the SCAQMD will be required to revise the VOC limits or extend the compliance dates depending on the results of the technology assessment. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology.

5-12 Staff has analyzed the national AIM rule's categories and definitions, as well as the VOC limits. Staff believes that additional categories in the Table of Standards with the default 250 g/l limit will add to confusion, instead of simplifying the rule. For example, the national AIM rule has separate categories for interior and exterior nonflats, but has the same VOC limit. This does not add any simplicity to the rule, just redundancy. The current Rule 1113 – Architectural Coatings currently contains an exemption for coatings sold in containers having a capacity of one quart or less (Rule 1113(g)(1)(A)). Staff has created two new coating categories: floor coatings and rust preventative coatings. However, the current and future proposed VOC limits are different than those found in the national AIM rule. Staff has adopted the national AIM rule definitions and provisions for some categories, where appropriate.

5-13 The commentator is referred to response to comment #2-1.

5-14 Staff of course will also reassess VOC limits if necessary. The commentator is also referred to response to comment #2-1.

5-15 The commentator is referred to responses to comments #4-11 and #5-11.

5-16 The commentator is referred to response to comment #2-1.

5-17 The commentator contends that current thinning practices of contractors which can now use higher-VOC coatings is not relevant to future thinning practices associated with the use of low-VOC compliant coatings. The commentator also states that using this approach constitutes an inadequate analysis and assumes away the issue. The SCAQMD strongly disagrees with the commentator's assertions for several reasons.

First, the analysis of current thinning practices disputes industry's contention made in 1990 that illegal thinning occurred on a widespread basis. Current thinning practices suggest that application s follow manufacturers recommended practice regarding thinning and do not thin in excess of rule limits. Thus, if excessive thinning practices do not currently exist coupled with the commercial availability of compliant coatings to meet future limits, then excessive thinning is not likely to occur in the future. The SCAQMD has found this later scenario to be applicable for PAR 1113.

Second, the SCAQMD's field investigations of actual painting sites in the South Coast Basin and CARB's investigation of other areas in California that have VOC limits for coatings indicate that thinning of coatings exists but rarely beyond the actual compliance limits. Even in cases where thinning does occur, it is rarer still for paints to be thinned to levels that would exceed applicable VOC content limits. The result of the SCAQMD's investigations is that widespread thinning does not occur often; when it does occur, it is unlikely to occur at a level that would lead to a substantial emissions increase when compared with emissions from higher VOC coatings. Further, manufacturers that recommend thinning of their coatings give specific directions on their paint can labels as to the amount of thinner that can added without exceeding the Rule 1113 VOC content limit.

Third, throughout the development of PAR 1113 and during the 1996 rule making effort for Rule 1113 the SCAQMD requested that industry provide any thinning studies that they may have conducted to support their contentions about excessive thinning practices. To date, the SCAQMD has received no countervailing thinning studies from industry to indicate that thinning is occurring to a greater extent than the above data would indicate.

Fourth, the SCAQMD has conducted an exhaustive and comprehensive analysis of currently available low VOC coatings as well as conventional coatings. This analysis evaluated hundreds of coatings from approximately 40 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time (see tables in Appendix D and Chapter 4 of the Final SEA). The industry's product data sheets provide the most accurate information that is based on qualitative and quantitative information (e.g., laboratory testing, actual product usage data, and field testing data). This analysis showed that low-VOC compliant coatings are commercially available with comparable performance characteristics that can meet the interim and final VOC content limits.

The SCAQMD product data sheet analysis has since been corroborated by the NTS study specifically in the context of the interim VOC content limits. The results of the NTS study indicate, however, that some of the coatings compliant with the final VOC

content limits may have some application issues. As a result, the SCAQMD has given coating formulators seven years to reformulate their coatings to correct any coating application issues. This time period is consistent with input received from resin manufacturers and coating formulators that it takes five to seven years to reformulate coatings to make it commercially available based on emerging resin technology. PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant coatings are unavailable by the completion of the technology assessment to meet the final limit, the SCAQMD will report back to the Governing Board as to the appropriateness of maintaining or delaying the existing VOC content limits.

Lastly, the Draft and Final SEA fully complies with CEQA as it contains an extensive discussion of the potential for thinning as it could relate to air quality impacts as required by the 1990 court order. Accordingly, the SCAQMD has concluded based on its thorough analysis of this issue that significant air quality impacts will not result from thinning practices associated with the implementation of PAR 1113.

The commentator is referred to response to comment #2-1 regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the results from the NTS study.

5-18 The commentator is referred to response to comment #2-1.

5-19 The SCAQMD has reviewed numerous product data sheets for primers, sealers, and undercoaters that have good adhesion to a variety of substrates. These include adhesion over weathered alkyds. These products have specific surface preparation requirements that must be followed to achieve optimal performance. Further, the NTS study has shown that the zero-VOC coatings actually have better dry adhesion than their higher-VOC counterparts.

The SCAQMD, however, has raised the interim and final limits, as well extended the compliance dates for primers, sealers, and undercoaters based on comments provided by industry. The initial proposal required an interim limit of 100 g/l and a final limit of 50 g/l. However, these have been raised to 200 g/l and 100 g/l, effective July 1, 2002 and July 1, 2006, respectively. Furthermore, a manufacturer can use the flexibility of the Averaging Provision to maintain their lines of noncompliant coatings, by offsetting with supercompliant coatings. Finally, in response to comments received regarding concrete protective coatings, the SCAQMD has created a new category called Waterproofing Concrete/Masonry Sealers, which was a direct results of concerns for waterproofing concrete substrates, especially vertical surfaces. This new category includes both pigmented and clear concrete waterproofing sealers.

5-20 The commentator is referred to response to comment #2-1.

5-21 Acrylic coatings are currently available for a variety of categories, including stains, PSUs, nonflats, waterproofing wood sealers, floor, and IM coatings.

5-22 The commentator asserts that PAR 1113 does not prevent contractors from using coatings outside their compliance category. The SCAQMD assumes that the commentator is alleging that the rule language of PAR 1113 does not specifically prevent substitution. The SCAQMD disagrees with commentator because PAR 1113 does contain language that discourages substitution. First, it should be noted that PAR 1113 applies not only to contractors but anyone who supplies, sells, offers for sale, applies, solicits the application of, or manufactures for use architectural coatings in the district. Second, the definition language contained in PAR 1113 limits the use of certain coatings to specific applications. Third, PAR 1113(c)(3) requires that when coatings can be used in more than one coating category the lower VOC content limit is applicable. Lastly, clarifying language has been added to PAR 1113 to restrict coatings to their intended uses. For example, it will be a violation of PAR 1113 to apply a roof coating on any substrate it was not intended for. These provisions when viewed independently or cumulatively provide the user of architectural coatings subject to PAR 1113 with a strong indication that unless PAR 1113 specifically allows it, substitution of low-VOC compliant coatings with higher-VOC coatings is prohibited.

Furthermore, the rule language of Rule 1113 coupled with the fact that compliant coatings are commercially available has been effective in providing a strong deterrent against substitution. SCAQMD enforcement records reveal that there has been a better than 99 percent compliance rate with Rule 1113. This enforcement trend is expected to continue with the adoption of PAR 1113 since further clarification has been added to the rule language to make it clearer that substitution is not allowed and compliant coatings are commercially available for use to meet the interim and final compliance VOC content limits.

5-23 The commentator asserts that the SCAQMD's substitution analysis does not make sense since a contractor is likely to substitute a less durable coating if it performs adequately and give a shorter warranty. The SCAQMD strongly disagrees with the commentator's contention. The SCAQMD in analyzing the potential for substitution investigated whether it was likely that a rust preventative coating with a typical durability of five years would be substituted for an IM coating with a typical durability of ten years or greater. The SCAQMD concluded that based on end user durability requirements, a rust preventative coating would not be used since its performance is much less than an IM coating. Furthermore, significant substitution from all affected coating categories is not likely to occur because uses for various

replacement coatings are different and have different performance characteristics. For example, the proposed substitutes have limited specific uses and some of the proposed substitutes would be cost prohibitive.

This is just one of the rationales for the SCAQMD's conclusion that substitution of low-VOC compliant coatings by high-VOC non-compliant coatings will not occur. By focusing on this one rationale the commentator misconstrues the SCAQMD's complete analysis of this issue.

To further respond to the commentator's assertion that substitution would occur, the SCAQMD has evaluated as a "worst-case" four substitution scenarios, including the commentator's (i.e., a rust preventative coating would be substituted for an IM coating). The substitution scenarios evaluated include: a two-coat nonflat system replaced by a four- or five-coat IM system; a two-coat nonflat system replaced by a three-coat rust preventative coating system: a two-coat nonflat system replaced by a two-oat PSU system; and a four or five coat IM system replaced by a three coat rust preventative coating system.

To analyze these four scenarios, the SCAQMD first established a current, interim limit, and final limit emission baseline per coating system. The baseline VOC calculations take into consideration the average coverage based on the product data sheets researched by the SCAQMD, VOC content, and the durability of the system (see the tables in Appendix D and Table 4-2 in Chapter 4) to arrive at an annual VOC emission rate for the coating system. The current, interim limit, and final limit, annual VOC emission rate for the four substitution scenarios is presented in Tables F-2 through F-4.

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TABLE F-2
COMPARISON OF SUBSTITUTE COATING SYSTEMS (CURRENT)

Coating System	TYPICAL COMPONENTS	Current VOC Content Limit (g/l)	Average Coverage (ft^2/gal)	Emissions per Component (g VOC/ft^2)	Total System VOC (g VOC/ft^2)	Durability (yrs)	Annual Total System VOC Emission Rate (g VOC/ft^2)/yr
IM – 5 Coats	1 Primer	420	380	4.18	22	10	2.2
	2 Mid/2 Top		350	18.16			
IM – 4 Coats	2 Primer	420	380	8.36	17	5	3.4
	2 Top		350	9.08			
RP – 3 Coats	1 Primer	400	460	3.14	10	5	2.0
	2 Top		440	6.57			
NF – 2 Coats	1 Primer	350	400	3.31	6	5	1.2
	1 Top	250	400	2.36			
PSU – 2 Coats	2 Primer	350	400	6.63	7	2	3.5

TABLE F-3
COMPARISON OF SUBSTITUTE COATING SYSTEMS (INTERIM -2002)

Coating System	TYPICAL COMPONENTS	Interim VOC Content Limit (g/l)	Average Coverage (ft^2/gal)	Emissions per Component (g VOC/ft^2)	Total System VOC (g VOC/ft^2)	Durability (yrs)	Annual Total System VOC Emission Rate (g VOC/ft^2)/yr
IM – 5 Coats	1 Primer	250	300	2.15	12	10	1.2
	2 Mid/2 Top		275	9.4			
IM – 4 Coats	2 Primer	250	300	4.30	9	5	1.8
	2 Top		275	4.70			
RP – 3 Coats	1 Primer	400	460	2.72	8	5	1.6
	2 Top		440	5.69			
NF – 2 Coats	1 Primer	200	350	1.77	2	5	0.4
	1 Top	150	360	0.67			
PSU – 2 Coats	2 Primer	200	350	3.54	4	2	2.0

TABLE F-4
COMPARISON OF SUBSTITUTE COATING SYSTEMS (FINAL - 2006)

Coating System	TYPICAL COMPONENTS	Final VOC Content Limit (g/l)	Average Coverage (ft^2/gal)	Emissions per Component (g VOC/ft^2)	Total System VOC (g VOC/ft^2)	Durability (yrs)	Annual Total System VOC Emission Rate (g VOC/ft^2)/yr
IM – 5 Coats	1 Primer	100	330	0.54	3	10	0.3
	2 Mid/2 Top		320	2.20			
IM – 4 Coats	2 Primer	100	330	1.08	2	5	0.4
	2 Top		320	1.10			
RP – 3 Coats	1 Primer	100	300	0.74	2	10	0.2
	2 Top		300	1.48			
NF – 2 Coats	1 Primer	100	370	0.40	1	5	0.2
	1 Top	50	400	0.18			
PSU – 2 Coats	2 Primer	100	370	0.79	1	2	0.5

IM = Industrial Maintenance
RP = Rust Preventive
NF = Nonflat
PSU = Primers, Sealers, and Undercoaters

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The interim VOC limit change that could potentially result from the four substitution scenarios is presented in Table F-5.

TABLE F-5
VOC CHANGE ASSOCIATED WITH EACH SUBSTITUTION SCENARIO (INTERIM)

Interim Coating System	Annual Total System VOC Emission Rate (g VOC/ft²)/yr	Substitute Coating System	Annual Total System VOC Emission Rate (g VOC/ft²)/yr	VOC Change (g VOC/ft²)/yr
NF-2 (150 g/l)	0.4	IM-5 (250 g/1)	1.2	+0.8
NF-2 (150 g/l)	0.4	IM-4 (250 g/1)	1.8	+1.4
NF-2 (150 g/l)	0.4	RP-3 (400 g/l)	1.6	+1.2
NF-2 (150 g/l)	0.4	PSU – 2 (100 g/l)	2.0	+1.6
IM-5 (250 g/1)	1.2	RP-3 (350 g/l)	1.6	+0.4
IM-4 (250 g/1)	1.8	RP-3 (350 g/l)	1.6	-0.2

The final limit VOC change that could potentially result from three of the four substitution scenarios is presented in Table F-6. It should be noted that the SCAQMD did not analyze the IM system being replaced by a rust preventative coating system scenario since both of these coatings will have the same final VOC content limit.

TABLE F-6
VOC CHANGE ASSOCIATED WITH EACH SUBSTITUTION SCENARIO (FINAL)

Final Coating System	Annual Total System VOC Emission Rate (g VOC/ft²)/yr	Substitute Coating System	Annual Total System VOC Emission Rate (g VOC/ft²)/yr	VOC Change (g VOC/ft²)/yr
NF-2 (50 g/l)	0.2	IM-5 (100 g/1)	0.3	+0.1
NF-2 (50 g/l)	0.2	IM-4 (100 g/1)	0.4	+0.2
NF-2 (50 g/l)	0.2	RP-3 (100 g/l)	0.2	=
NF-2 (50 g/l)	0.2	PSU – 2 (100 g/l)	0.5	+0.3

IM = Industrial Maintenance
RP = Rust Preventive
NF = Nonflat
PSU = Primers, Sealers, and Undercoaters

As shown in Tables F-5 and F-6, if the four substitution scenarios were to occur, although unlikely due to rule prohibitions or performance desirability, there could be an increase in VOC emissions for some systems on an area covered per year basis. However, even if substitution were to occur, PAR 1113 would still achieve overall VOC emission reductions. As presented in Table F-7, the SCAQMD analyzed several variations of the four substitution

scenarios discussed above to determine the net effect if substitution were to occur. As a starting point for the first three scenarios, the SCAQMD assumed that 10 percent of the nonflat (NF) coating usage in the interim and final years would be replaced by higher-VOC IM, rust preventative (RP), or primers, sealers, and undercoaters (PSU). The SCAQMD also analyzed a single substitution scenario where 10 percent of the IM coating usage in the interim and final years would be replaced by higher-VOC rust preventative coatings. For these single substitution scenarios, 10 percent substitution of nonflat and IM coatings represents an extremely conservative assumption considering that Rule 1113 has a greater than 99 percent compliance history.

Additionally, as a "worst-case" the SCAQMD analyzed two scenarios where a combination of higher-VOC coatings may be substituted for lower-VOC coatings. In one of the combination scenarios, the SCAQMD assumed that 30 percent of the nonflat coating usage in the interim and final years would be replaced by higher-VOC IM (10 percent), rust preventative (10 percent), and PSU coatings (10 percent). In the other combination scenario, the SCAQMD assumed that both the 30 percent nonflat and 10 percent IM substitution scenarios would occur at the same time. The results of the SCAQMD's substitution analysis and the net effect to PAR 1113 overall VOC emission reductions are presented in Table F-7.

TABLE F-7
NET EFFECT OF POTENTIAL SUBSTITUTION

Substitution Scenarios	Interim Limit VOC Increase (tons/day)	Final Limit VOC Increase (tons/day)	Remaining VOC Reductions (tons/day)	Loss of VOC Reductions (tons/day)
10% of NF replaced by IM	1.26	0.33	19.47	2.33
10% of NF replaced by RP	3.36	0.47	17.22	4.58
10% of NF replaced by PSU	0.47	0.24	20.35	1.45
30% of NF replaced by IM/RP/PSU	7.32	1.69	10.56	11.24
10% of IM replaced by RP	0.43	0.04	20.78	1.02
30% NF and 10% IM	7.75	1.73	9.54	12.26

IM = Industrial Maintenance
RP = Rust Preventive
NF = Nonflat
PSU = Primers, Sealers, and Undercoaters

As shown in table F-7, even if substitution where to occur, PAR 1113 would still achieve overall VOC emission reductions.

As part of the environmental impacts analysis for PAR 1113, the SCAQMD conducted an exhaustive and comprehensive analysis of currently available low VOC coatings that forms the primary basis for PAR 1113. This analysis evaluated hundreds

of coatings from approximately 13 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, *durability*, pot life, shelf life, gloss, and drying time (see the tables in Appendix D and the related summary tables in Chapter 4 of the Final SEA). The analysis of resin manufacturers and coating formulators product data sheets provides the most accurate information available to the SCAQMD, which is based on qualitative and quantitative information (e.g., laboratory testing, actual product usage data, and field testing data). The available information from product data sheets indicates that for industrial maintenance floor coatings, low-VOC coatings tended to have a higher solids content, with a slightly, but not substantially lower average coverage area than conventional coatings. For most other coating categories affected by PAR 1113, the solids content and area of coverage for low-VOC coatings was, on average, comparable to conventional coatings although some categories (e.g., quick-dry primers, sealers, and undercoaters and stains) had slightly less coverage than conventional coatings in these categories.

The SCAQMD product data sheet analysis has since been corroborated by the NTS study specifically in the context of the interim VOC content limits. For the final VOC content limits the preliminary results of the NTS study indicate that the compliant coatings may have some application problems. As a result, the SCAQMD has given coating formulators seven years to reformulate their coatings to correct coating application problems. Furthermore, PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant coatings are unavailable by the completion of the technology assessment to meet the final limit, the SCAQMD will report back to the Governing Board as to the appropriateness of maintaining the existing VOC content limits.

Regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the preliminary results from the NTS study the commentator is referred to response to comment #2-1.

5-24 First and foremost, the SCAQMD's research and investigation reveals that compliant coatings are commercially available for use to meet the interim and final compliance VOC content limits. Therefore, it is not likely that substitution will occur. Second, clarifying language has been added to PAR 1113 that will make it clear that coatings should only be used for their intended purposes. This should further alleviate the potential for substitution. Lastly, even if there is some limited substitution due to the implementation of PAR 1113, overall emission reductions will still be achieved. The commentator is referred to responses to comments #5-22 and #5-23.

5-25 Current substitution practices serves as an indication of whether substitution is a widely accepted practice that will likely continue in the future. More importantly, the SCAQMD has determined that substitution is unlikely to occur since compliant coatings will be available. Again, the SCAQMD has conducted an extensive analysis of currently available low VOC coatings as well as conventional coatings. This analysis evaluated hundreds of coatings. Based on this analysis, PAR 1113 is not expected to result in the substitution of low-VOC compliant coatings with higher-VOC coatings. Even if there is some limited substitution due to the implementation of PAR 1113, overall emission reductions will still be achieved. Therefore, adverse air quality impacts are not expected to result due to substitution associated with the implementation of PAR 1113. The commentator is referred to responses to comments #5-22, #5-23, and #5-24.

5-26 The commentator indicates that it is unclear whether the SCAQMD will review all environmental or just water impacts associated with future limits at the time the technology assessment is undertaken. The commentator advocates that a rigorous environmental assessment be undertaken during the technology assessment. The SCAQMD will conduct and complete one-year prior to the interim and final VOC content limits going into effect a technology assessment. The technology assessment will further confirm the availability and feasibility of compliant coatings. Since the language regarding technology assessments is included in PAR 1113, the SCAQMD intends to revise the VOC limits or extend the compliance dates depending on the results of the technology assessment. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology. Any revision of Rule 1113 will require another assessment of the environmental impacts, if any, of the proposed changes.

5-27 The commentator cites a portion of the Draft SEA on page 4-28 which states "A research report release in March 1997 demonstrated that latex (nonflat technology) paint is, in fact, not a hazardous waste product." The commentator states that it agrees with this conclusion. However, the commentator then points out that authorities in California do not share this view and therefore this should be analyzed.

The SCAQMD appreciates the commentator's concurrence on this issue. The SCAQMD believes that this information is still accurate concerning EPA's view that latex paint based on current coating technology is not a hazardous waste.

Indeed, due to federal regulation of hazardous air pollutants, coating formulators have replaced many of the more hazardous solvents (e.g., EGBE) with less hazardous solvents (e.g., texanol) in latex paint formulations. Therefore, today's latex-based paint formulations are expected to contain even less hazardous compounds.

The commentator's blanket assertion that California authorities would consider all latex paint a hazardous waste is not necessarily correct. Therefore, clarification on this issue is appropriate. It should be noted that the SCAQMD believes its understanding of how latex paint would be treated under federal law is accurate as presented in the Draft and Final SEA.

In the context of California law, discussions with the Department of Toxic Substances Control (DTSC) reveals that the DTSC would not consider latex paint as a hazardous waste in its virgin (e.g., pure) form. Furthermore, specifically relevant to PAR 1113, DTSC recommends cleaning equipment (e.g., brushes, rollers, and spray guns) used to apply latex paint with water in sinks or other facilities that flows directly to a wastewater treatment facility. Thus, wastewater generated from the cleaning of painting equipment applying latex paint may be properly disposed of into the sewer system.

However, the DTSC indicates that when coating formulators add various ingredients (e.g., pigments, binders, biocides, etc.) to virgin latex paint it becomes a hazardous waste. In this form, latex paint cannot be disposed of into sewers, unless it is a constituent of wastewater generated from equipment cleaning activities, or storm drains. The DTSC's position on this issue, for the most part, is based on a 1995 study conducted by California Polytechnic State University (Cal Poly). The Cal Poly study collected waste latex samples over a three-year period from Household Hazardous Waste (HHW) programs throughout California. The results of the study indicated that 94 percent of the samples tested failed the California's toxicity criteria and were classified as hazardous waste.

However, the validity of the 1995 Cal Poly study in the context of PAR 1113 is somewhat questionable. The study analyzed samples collected from HHW programs throughout California. According to DTSC information, a lot of the paint collected by HHW programs is on the average 10 years old and contains more hazardous constituents than today's paints. Due to federal regulation of hazardous air pollutants, coating formulators have replaced many of the more hazardous solvents (e.g., EGBE) with less hazardous solvents (e.g., texanol) in latex paint formulations. Therefore, today's latex-based paint formulations are not expected to contain the amount and type of hazardous compounds as coating formulations from 10 years ago.

Furthermore, the Cal Poly study did not analyze samples from equipment cleaning practices associated with the use of latex paint. The vast majority of water quality impacts potentially associated with PAR 1113 will be generated from equipment cleaning, where waste water will be disposed of properly down the sewer system. Therefore current latex-based paint is disposed of improperly, there remains a valid question whether it would be truly considered a hazardous waste.

However, assuming that latex paint based on current technology is hazardous waste, this does not change the SCAQMD's overall conclusion that significant adverse water quality impacts are not anticipated from PAR 1113. As explained above, disposal practices are not expected to change with the implementation of PAR 1113. In other words, PAR 1113 will not cause an increase in the amount of coating currently disposed properly or improperly in sewer systems, storm drains, groundwater, or landfills. The SCAQMD's 1996 survey bears this out. Furthermore, non-hazardous solvents in low-VOC compliant coatings are replacing hazardous solvents in conventional coatings. Lastly, public outreach programs initiated by the commentator, the SCAQMD, the California Integrated Waste Management Board, and others will further reduce the improper disposal of coatings by paint contractors and the public.

5-28 The commentator asserts that the SCAQMD's analysis of the potential public services impacts associated with the use of reformulated acetone-based compliant coatings is inadequate because it relies on information obtained from interviews with local fire departments and not an actual analysis of acetone's volatility as compared to other solvents. The SCAQMD disagrees with the commentator's assertion for several reasons.

First, in the context of PAR 1113, it should be noted that the use of acetone in the reformulation of complaint coatings is relatively small. Acetone reformulation was considered to be the "worst-case" for the purposes of public services and hazards impacts associated with the implementation of PAR 1113. Thus, the SCAQMD's environmental impact analysis tends to overestimate the public services and hazards impacts from PAR 1113.

Second, the SCAQMD did not solely rely on information from local fire departments in analyzing the impacts associated with the use of reformulated acetone-based coatings. The SCAQMD conducted its on independent review of the flashpoint, vapor pressure, and flammable range, (e.g., the span between the lower explosive limit (LEL) and the upper explosive limit (UEL)) of acetone, currently used solvents, and replacement solvents (see Table 4-7 in Final SEA). This analysis revealed that acetone in comparison with currently used solvents has comparable volatility and flammability characteristics. Based on this analysis coupled with the information received from local fire departments, the SCAQMD concluded that PAR 1113 would not create significant adverse public services or hazards impacts.

Third, potential adverse impacts to fire departments can occur two ways: (1) more frequent responses; and (2) more frequent inspections. To determine whether PAR 1113 would significantly increase or alter fire department's level of service (i.e., increased responses to fires, explosions, or inspections), the SCAQMD sought their

input. Feedback received from these authorities indicates that, based upon their extensive professional experience as a result of years of regulating the use and storage of flammable materials, the use of acetone will pose no greater risks than the use of existing solvents such as: MEK, toluene, butyl acetate, etc., even though acetone is slightly more flammable. Thus, the commentator underestimates the importance of the input from fire departments in determining public services impacts from PAR 1113. Furthermore, the SCAQMD expects that anyone handling acetone-based coatings or any other flammable liquids will strictly adhere to the storing, dispensing, and handling requirements of these materials to lessen the danger of fire and explosion.

Accordingly, the SCAQMD does not anticipate that PAR 1113 will not result in significant adverse public service impacts (e.g., fire departments). The commentator is also referred to response to comment #2-4.

5-29 The commentator indicates that the opinions of the fire authorities, based exclusively on the UFC classifications, do not address the relative fire hazard of acetone, compared to other solvents, in *lacquers* being used by painters in the field. Furthermore, the commentator alleges that these opinions were not direct evidence of no significant fire hazards impacts from the use of acetone, and are a totally impermissible basis from which SCAQMD could reach an inference that was consistent with its prejudgment of the issue.

The SCAQMD assumes for the purposes of this comment that the commentator when referring to lacquers actually means the coating categories affected by PAR 1113. Lacquers were addressed in the 1996 amendments and are not involved with this rule-making effort. In any event, the SCAQMD adamantly disagrees with the commentator's assertions for several compelling reasons. First, the SCAQMD did not solely rely on information from local fire departments in analyzing the impacts associated with the use of reformulated acetone-based coatings. The SCAQMD conducted its on independent review of the flashpoint, vapor pressure, and flammable range, (e.g., the span between the lower explosive limit (LEL) and the upper explosive limit (UEL)) of acetone, currently used solvents, and replacement solvents (see Table 4-7 in Final SEA). This analysis revealed that acetone in comparison with currently used solvents has comparable volatility and flammability characteristics. Thus, it is a mischaracterization on the commentator's part to assert that the SCAQMD's does not address the relative fire hazard of acetone, compared to other solvents.

Second, the information received from fire authorities is highly relevant because it provides an understanding of how they would handle an accidental release or explosion associated with the use of acetone both during transport and in the field. Feedback received from these authorities indicates that, based upon their extensive

professional experience as a result of years of regulating the use and storage of flammable materials, the use of acetone will pose no greater risks than the use of existing solvents such as: MEK, toluene, butyl acetate, etc., even though acetone is slightly more flammable. Furthermore, since PAR 1113 does not increase the probability that a transport accident will occur and the fire authorities would handle this type of incident the same compared with coatings formulated with conventional solvents as with acetone-based coatings, the hazard impacts are not considered to be significant. Thus, the commentator under estimates the importance of the input from fire departments in determining hazards impacts from PAR 1113.

Third, it should be noted that the use of acetone in the reformulation of complaint coatings is relatively small. Sealers and floor coatings are the only affected coating categories where some amount of acetone reformulation is expected to occur. These categories constitute a very small group of coatings compared to the total coating categories impacted by PAR 1113. Acetone reformulation was considered to be the "worst-case" for the purposes of public services and hazards impacts associated with the implementation of PAR 1113. Thus, the SCAQMD's environmental impact analysis tends to overestimate the public services and hazards impacts from PAR 1113.

Finally, the SCAQMD also analyzed the probability of increased accidents and their consequences associated with acetone reformulation. The SCAQMD found that many coatings are already formulated with acetone and, therefore, are already being transported in the district. Additionally, many conventional coatings are formulated with other solvents that are considered as flammable as acetone (e.g., t-butyl acetate, toluene, xylene, MEK, isopropanol, butyl acetate, and isobutyl alcohol). Based upon SCAQMD review of coating product information sheets, future compliant low VOC coatings are expected to be formulated with less or non-flammable materials such as texanol, propylene glycol, etc. Consequently, it is anticipated that future compliant coatings will follow the existing trend of moving away from hazardous coating formulations to less or non-hazardous formulations.

5-30 The commentator questions why 28 – 52 tons per day of solid waste impacts associated with PAR 1113 are not considered significant considering the fact that PAR 1113 will reduce VOC emissions by 20 tons per day. The commentator's comparison of solid waste impacts to VOC emissions reductions is analogous to comparing apples to oranges (e.g., not a like comparison). The commentator is trying to insinuate that because solid waste impacts should be significant because they are in the numerical range as PAR 1113's *significant air quality benefits*. This comparison misconstrues the SCAQMD's solid waste impact analysis.

Thresholds of significance are different for various environmental media. The SCAQMD has developed different significance thresholds for air, water, solid/hazardous waste, transportation, etc. To determine if a project has significant solid waste impacts, the SCAQMD totals all solid waste generated from a project on a daily basis and then compares this total to the total permitted landfill capacity in the district. In the context of PAR 1113, the "worst-case" daily solid waste that could potentially be generated was estimated to be 28 tons in 2002 (interim year), 38 tons in 2006 (final year), and 52 tons in 2010. When comparing these totals to the total permitted landfill capacity in the district, which are 0.03 percent in 2002, 0.04 percent in 2006, and 0.05 percent in 2010, the potential impacts were deemed not significant. The commentator is also referred to responses to comments #4-17 and #4-18.

The commentator also asserts that since California authorities consider latex paint a hazardous waste this impact should be analyzed in the context of solid waste. The SCAQMD has analyzed the hazardous waste impacts associated with PAR 1113 and concluded that significant impacts are not expected to occur. The district has sufficient disposal capacity to handle any hazardous waste generated from PAR 1113.

However, specifically in the context of the disposal of latex paints, significant adverse hazardous waste impacts are not expected for several reasons. First, the solid waste analysis compensates for the potential disposal of latex paint. The solid waste impacts analysis represents a "worst-case" because it assumes that five and one percent (total six percent) of all affected coatings as well as ten percent of all IM and floor coatings could potentially be landfilled. Since this analysis overestimates the solid waste impacts associated with PAR 1113 because it is highly unlikely that this amount of coatings would all be disposed of on the same day, latex paint would fall within the range of this analysis.

Second, as a result of federal regulations, coating formulators have replaced many of the more hazardous solvents (e.g., EGBE) with less hazardous solvents (e.g., texanol). Therefore, latex paint based on current or future coating technology may not truly be a hazardous waste. It should be noted that latex paint that is dried out naturally may be disposed of properly into landfills and is not considered a hazardous waste per se.

Third, assuming that latex paint based on current technology is hazardous waste this does not change the SCAQMD's overall conclusion that significant adverse hazardous waste impacts are not anticipated from PAR 1113. Disposal practices are not expected to change with the implementation of PAR 1113. In other words, PAR 1113 will not cause an increase in the amount of coatings currently disposed of properly or improperly in landfills. Additionally, the SCAQMD's 1996 survey bears this out, public outreach programs initiated by the commentator, the SCAQMD, the California

Integrated Waste Management Board, and others will further reduce the improper disposal of coatings by paint contractors and the public.

5-31 The commentator is referred to responses to comments #5-27, #5-28, #5-29, and #5-30.

5-32 The issue of whether or not to consider an alternative similar to the national AIM coating rule was addressed in response to comment #4-5 in Appendix C of the Draft SEA for PAR 1113. For example, staff analyzed the national AIM rule's categories and definitions, as well as the VOC limits and concluded that this rule would require adding additional coating categories to the Rule 1113 Table of Standards with the default VOC content limit of 250 g/l limit. Adding additional coating categories with the default VOC content limit would only make the rule more confusing, instead of simplifying the rule. For example, the national AIM rule has separate categories for interior and exterior nonflats, which have the same VOC limit. This does not add any simplicity to the rule, just redundancy. The current Rule 1113 – Architectural Coatings currently contains an exemption for coatings sold in containers having a capacity of one quart or less (Rule 1113(g)(1)(A)). To address industry comments regarding adding additional coating categories, staff has created several new coating categories. However, the current and future proposed VOC limits are different than those found in the national AIM rule, which would not generate VOC emission reductions to the same level as PAR 1113. Staff has, however, adopted the national AIM rule definitions and provisions for some categories, where appropriate.

5-33 The SCAQMD acknowledges and concurs with the commentator that a reactivity-based alternative is not feasible at this time. With regard to a reactivity-based rule, the science regarding VOC reactivities is currently not well developed, the SCAQMD acknowledges that when the science becomes reasonably well developed a reactivity-based regulatory approach may provide an alternative or additional means to assist in making progress towards attaining and maintaining the state and national ambient air quality standards for ozone. To address potential future advances in knowledge about reactivity, the SCAQMD has added language to PAR 1113 provision (f)(3)which will address the commentator's concern. See also responses to comments #3-4 and #4-1.

5-34 Fate and availability studies are currently under evaluation by the California Air Resources Board. The SCAQMD will provide assistance as needed and appropriate. The results of these and other relevant studies will be considered during future SCAQMD rulemaking. As of today, the science is not adequate to support rulemaking based on these claims.

5-35 An increments of progress alternative appears to be similar to a performance-based approach. The concept for a performance-based rule provision or project alternative

was originally raised by members of the Industry Working Group (see "Industry Working Group Meetings" discussion in Chapter 2). Rather than establish lower VOC content requirements for specified categories of coatings, this alternative would establish emission standards based on emissions per area covered or coating durability.

This alternative was rejected as infeasible because the Industry Working Group could not reach consensus on how to establish performance standards as this depends on the type of application or coating technology. For example, alkyd-based coating formulations currently have a life cycle of five to seven years, while urethane-based coating formulations may have a life cycle of approximately 20 years. Agreement could not be reached concerning the appropriate standard for each type of coating technology. As a result, this alternative has been dropped from further consideration. However, an average provision ahs been expanded to include additional AIM coatings.

5-36 The definition of floor coatings has been changed as requested.

5-37 Thank you for your comment.

5-38 The SCAQMD has found a variety of products that meet the proposed rule limits for the category in question. Therefore, staff does not support a separate category for industrial maintenance primers, sealers, and undercoaters.

5-39 The commentator is referred to response to comment #5-38.

5-40 Your comment is noted.

5-41 The rust preventative definition has been revised as suggested.

5-42 A new definition for waterproofing concrete/masonry sealers (PAR 1113 §(b)(53) has been added to the proposed amendments as suggested.

5-43 The interim compliance date has been extended to July 1, 2002, and the final compliance date has been extended to July 1, 2006. Based on the number of AIM coatings that are currently available that meet the both the 2002 and 2006 compliance dates, and the fact that performance characteristics for many of the future compliant coatings (especially coatings that comply with the interim VOC content limits) are equivalent, or in some cases superior to conventional high VOC coatings, both compliance dates would appear to allow sufficient time to reformulated coatings using existing resin technologies or develop new formulations.

Staff has considered the comments provided by end-users, coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing. The commentator is also referred to response to comment #2-1.

5-44 Compliance deadlines are a necessary component of the proposed amendments to provide incentives for the coatings industry to perform the necessary research and development of compliant coatings. Without compliance dates there would be little incentive to develop compliant coatings and any technology assessment performed would likely result in a more limited range of compliant products than would otherwise be the case. The commentator is referred to response to comment #5-43.

5-45 For consideration of a performance-based approach the commentator is referred to the response to comment #5-35.

5-46 The SCAQMD has modified the proposed amendments and removed the labeling requirement for industrial maintenance coatings in order to avoid duplication of the National AIM rule. However, the staff asserts that labeling of rust-preventative coatings will mitigate any potential misuse of those coatings, and enhance the enforceability.

5-47 In response to comments, as well as additional information collected to mitigate the concerns to the general public pertaining to use of two-component polyurethane coatings, the AQMD has removed this provision from the proposed rule. For a more detailed explanation, the commentator is referred to the response to comment #1-2.

COMMENT LETTER #6

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April 21, 1999

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Mr. Darren W. Stroud
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Re: Draft SEA for Proposed Rule 1113 Amendments

Dear Mr. Stroud:

We are legal counsel for EL RAP, a leading California paint industry trade association, as well as for 18 paint manufacturers, three painting contractors, and seven retail paint dealers. We write to comment upon the Draft Subsequent Environmental Assessment, dated March 19, 1999, relating to the amendments to SCAQMD's Rule 1113 staff proposes for adoption at the May board meeting.

6-1 The proposed amendments would depart from prior practice and impose extremely low limits in 2003, and even more draconian limits in 2005, on various architectural coatings, including non-flats, industrial maintenance (high performance) coatings, quick-dry enamels, and primers, sealers, and undercoaters. These amendments would ban approximately 99% of all such coatings now bought, sold, and used in SCAQMD, and force manufacturers to make, dealers to sell, and contractors and do-it-yourselfers to use, those special-purpose coatings that they now freely choose to make, sell, and use only in exceptional cases (low-odor, graffiti abatement, apartment re-paint). These truly unprecedented proposals, if adopted, would radically transform the coatings industry and market in SCAQMD.

6-2 Notwithstanding the extreme nature of your proposals, the Draft SEA blithely concludes (at 1-1) that "the proposed

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6-2 amendments will not generate any significant adverse environmental impacts." This conclusion is not only incorrect, but also incredible. That is because the Draft SEA totally fails to address the massive adverse environmental impacts a ban of 99% of any product line – certainly these product lines – is bound to entail.

6-3 Certain such impacts will arise even if, as SCAQMD conveniently assumes, the special-purpose paints so few people now elect to use will somehow prove to become perfect substitutes for those paints virtually all users now freely choose. Surely the remote possibility that this rosy scenario will occur is eclipsed by two much more likely scenarios. Initially, we are likely to encounter a market in which many users, although disgruntled, will attempt to use the remaining low-organic compound substitutes. But later, after wide-spread product failures, we will find ourselves in a situation in which users have become so dissatisfied that they altogether stop using paints to coat substrates or switch to non-paint substitute products to protect substrates. In each of these two likely scenarios, severe adverse environmental impacts arise.

6-4 The adverse environmental impacts ignored in the Draft SEA include (1) aesthetic impacts, (2) health and safety impacts, (3) increased reactivity impacts, (4) increased volatility impacts, (5) increased emission impacts, and (6) impacts resulting from the increased manufacture and installation of non-paint substitutes.

6-5 We regret that the staff did not give the public a 45-day comment period, as promised during the December 9, 1998 public consultation meeting. The truncated 30-day period has proved prejudicial to our clients. Accordingly, we reserve the right to submit additional comments in the next 15 days and to receive written responses thereto.

I. PRODUCTS ON THE MARKET TODAY

6-6 The non-flat product category subject to further proposed regulation is very broad and includes various sub-categories. Approximately 1,000,000 gallons of high-gloss non-flats are sold in the SCAQMD each year. Roughly 250,000 gallons thereof are solvent-borne and made with alkyd resins. About 750,000 gallons of high-gloss non-flats are water-borne and use acrylic resins.

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Special purpose (low-organic compound) non-flats do not successfully achieve a high gloss.

Approximately 7,000,000 gallons of semi-gloss non-flat coatings are sold in the SCAQMD each year. Substantially all of these are water-borne. Roughly 3,450,000 such gallons are made with acrylic resins and used for interior or exterior applications. About 3,450,000 gallons are made with latex or vinyl resins and used primarily for interior applications. Only approximately 100,000 gallons of semi-gloss non-flats are made each year with low-organic compounds, and they are used only for apartment re-paint, low-odor, or graffiti abatement situations.

6-6 cont.

Approximately 2,000,000 gallons of satin or eggshell non-flats are sold in SCAQMD each year. Virtually all these coatings are water-borne. About 450,000 such gallons are made with acrylic resins and used on both interior and exterior surfaces. About 1,450,000 gallons are made with traditional latex or vinyl resins and used primarily for interior applications. Only about 100,000 gallons of satin or eggshell non-flats contain low-organic compound technology and are used for apartment, low-odor, and graffiti purposes.

Approximately 2,000,000 gallons of industrial maintenance coatings are sold in SCAQMD each year. Approximately 860,000 gallons of quick dry primers, sealers and undercoaters are sold in SCAQMD each year. Approximately 2,800,000 gallons of primers, sealers and undercoaters are sold in SCAQMD each year. Approximately 400,000 gallons of quick dry enamels are sold in SCAQMD each year.

II. 2002 BANS

The proposed 2002 non-flat limit of 150 g/L, to be effective at the start of 2002, would effectively outlaw substantially all high-gloss non-flats in the SCAQMD, whether solvent-borne or water-borne, interior or exterior.

6-7

The 150 g/L limit would also ban nearly half of all semi-gloss non-flats, including substantially all made with acrylic resins and most such products used for exterior applications.

The 150 g/L limit would further outlaw about a quarter of all eggshell and satin non-flats, again including substantially all acrylics and most exteriors.

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6-7 cont.

The 250 g/L limit on industrial maintenance coatings would ban approximately 70% of the volume of coatings sold in SCAQMD. The 200 g/L limit on primers sealers and undercoaters would ban approximately one-third of the volume of those coatings sold in SCAQMD. The 200 g/L limit on quick dry primers, sealers and undercoaters would ban approximately 80% of the volume of those coatings sold in SCAQMD.

The 150 g/L limit on quick dry enamels would ban all such coatings sold in SCAQMD.

III. SIGNIFICANT ENVIRONMENTAL EFFECTS OF 2002 BANS

6-8

To the extent the Draft SEA does purport to assess any environmental impacts, it does so in omnibus fashion, without reference to limit or coating. Such collective assessments are proper only if and when the known similarities of members of a class are present throughout the class. *Dithiocarbamate Task Force v. EPA*, 98 F.3d 1394, 1399, 1405 (D.C. Cir. 1996). Accordingly, the Draft SEA must assess the effect of the 2002 limit, itself, on each affected coating. This type of limit-specific and category-specific analysis must be carried out for all impacts. In particular, it must be carried out for the following five impacts which are either completely omitted, or essentially ignored, in the Draft SEA.

A. AESTHETIC IMPACTS

6-9

CEQA provides that it is the policy of California to take all actions necessary to provide its people with "enjoyment of aesthetic, . . . scenic, and historic environmental qualities." Pub. Res. Code § 21001(b). The environment must be pleasing to the senses and intellect of man, and regulations must provide a decent home and satisfying living environment for every Californian. *Id.* at §§ 21000(b), (g); 21001(d). Under the CEQA Guidelines, a project is deemed to have a significant effect on the environment if it will have a "substantial, demonstrable negative aesthetic effect." 14 Cal. Code Regs., App. G(b).

In *Quail Botanical Gardens Foundation, Inc. v. City of Encinitas*, 29 Cal.App.4th 1597, 1603-07 (1994) the court set aside the certification of a negative declaration based upon the city's failure to analyze the aesthetic impacts (impaired ocean views) of the project (a residential subdivision). The court found substantial evidence supporting a fair argument of the

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possibility of such impact. It ruled that Appendix G(b) of the Guidelines established "a rebuttable presumption" that aesthetic impacts are significant. *Id.* at 1604. The court found it "self-evident" that the project would have negative effects on "beauty." *Id.* at 1604, 1606. Any assertions to the contrary by the city were not adequate to support a decision to dispense with environmental analysis of the aesthetic impacts. *Id.* at 1607.

6-9 cont.

EPA has recently analyzed the protective and aesthetic properties of paint, including those at risk here. These are the two basic functions of paint – both of which enhance the environment. In the last two decades the hundreds of thousands of men and women who make, sell and apply paint for a living and the hundreds of millions who apply it to their own houses have accomplished perhaps as much as any group in America to protect our environment. The substitution limits being proposed would have severe adverse impacts. The EPA criteria document correctly concludes that paint occupies the highest position on the aesthetic benefit scale. The EPA criteria document also correctly notes that paint occupies the highest position on the functional benefit scale. In numerous other respects, as well, the threatened coatings provide important health and safety benefits: (a) they inhibit formation of mold, fungi, and mildew on interior surfaces and they promote the removal of such organisms and the disinfecting of such surfaces; (b) they are used to color code process piping for safe maintenance and repair; (c) they help resist corrosion of bridges, balconies, and various other metal structures which support human activity. Substitution limits severely impair these protective and aesthetic functions of paint.

Here, SCAQMD's environmental checklist stated that "no significant impacts adversely affecting existing visual resources such as scenic views or vistas, etc. are anticipated to occur." The Draft SEA repeats (at 4-63) this same conclusion and, responding to comments, goes on to invoke the rosy scenario:

> ". . . [T]he rule contains a compliance schedule sufficient for coating formulators to produce acceptable quality low-VOC products. . . . The current compliance schedule should ensure that formulators have sufficient time to reformulate products that exhibit the desired performance characteristics."

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6-9 cont. Substantial expert and lay testimony has been, and will be, presented – and, indeed, it is self-evident – that outlawing substantially all high-gloss non-flats, exterior non-flats, and interior acrylic semi-gloss, satin, and eggshell non-flats will have significant adverse aesthetic impacts.

Substantial expert testimony has been, and will be, presented that formulators will not be able to reformulate, test, and market high-gloss, exterior, or interior acrylic non-flats and industrial maintenance coatings by January 1, 2002. This is so for two reasons. First, when proven resin technology exists manufacturers still require three to five years to develop products with the new resins. Second, resin technology does not currently exist, nor can its existence reasonably be predicted, to provide the required performance characteristics in the coatings subject to the proposed amendments. At the December 9, 1998 public workshop a representative of one of the world's leading resin manufacturers said the following about the current and reasonably foreseeable coatings technology:

> "Over those years, many advancements have been made, and as a result, water based polymers now provide excellent performance for a number of coatings applications. For example, in the architectural coatings area, these polymers have enabled coatings manufacturers to significantly reduce the level of VOCs in their products aimed at several coating segments.
>
> 6-10 It's our opinion, however, there are a number of application areas which require a high level of coatings performance. A number of these would be primers and corrosion resistant coatings, high performance semi-gloss paints, and high performance or even average performance high-gloss latex enamels.
>
> Current state of technology water-based coatings performance is still limited by the current VOCs. Technology still does not offer the viable alternatives needed to meet the aggressive VOC limits in the proposed amendments to Rule 1113 within the time frame specified.
>
> While we continue with research to develop higher performance products at as low a VOC as possible, we cannot predict the results of our research with any

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6-10 cont. certainty. We encourage the setting of a more reasonable timeline for the coatings manufacturers and their suppliers to develop the needed technology. We also encourage periodic reassessments of what is technically feasible."

B. HEALTH AND SAFETY IMPACTS

In CEQA the Legislature declared its intent that governmental agencies identify critical thresholds for the "health and safety" of Californians and take necessary actions to prevent such thresholds being reached. Pub. Res. Code § 21000(d).

The Draft SEA contains an extensive discussion about the health impacts from certain constituents of coatings. The Draft SEA is silent, however, regarding the health and safety impacts the replacement coatings themselves will cause due to their vastly inferior performance characteristics.

6-11 At the December 9, 1998 public workshop a representative of the California Department of Transportation stated that industrial maintenance coatings used for steel structures containing 250 g/L VOC had been "pretty successful" and provide "reasonably good" performance but that Cal Trans "have got some real concerns with the availability of good performing coatings that will meet" the proposed amendments. These concerns included the inability of required replacement coatings to adequately protect structural steel bridges. Similarly, a representative of the Metropolitan Water District stated that the amendments would reduce his approved coatings from 100 to 4, and that the remaining coatings would not be suitable for required industrial use. He further stated that failure of the inadequate substitutes "could result in possible harm to the public". Additionally, a representative from PDCA, which represents 250 painting contractors in SCAQMD, stated that failure of unproven replacement coatings can cause structural, equipment and environmental damage.

C. INCREASED REACTIVITY

6-12 SCAQMD has often focused on the relative reactivity of various organic compounds. Old Rule 66 was the classic case. As another example, SCAQMD adopted Rule 1170 to compel fuel dispensing stations to install methanol-compatible underground

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storage tanks, because methanol is less reactive than gasoline. In its June 10, 1988 report on proposed architectural coatings emission charges, SCAQMD said this: ". . . [D]ifferent solvents have different degrees of reactivity, which affect the formation of photochemical smog differently. . To encourage coating manufacturers to shun solvents with high reactivity, coatings with low reactivity solvents should be charged less . . ."

ARB has confirmed that the majority scientific view supports the use of reactivity scaling in clean air regulation. 47-Z Cal.Reg.Not.Reg. 92 (Nov. 4, 1992). ARB there said: "The concept that different hydrocarbons react at different rates is supported by a large body of theoretical, laboratory and observational data . . ." Id. at 1535. ARB undoubtedly had in mind work such as that currently being conducted by Professors Carter and Weiner at U.C. Riverside and Professor Chameides at Georgia Tech.

Section 183(e)(2)(A)(i) of the CAA provides that EPA shall study VOC emissions from products in order to "determine their potential to contribute to ozone." Section 183(e)(2)(B)(iii) provides that in both listing and regulating EPA shall take into consideration those products which emit "highly reactive" VOCs into the air. Section 183(e)(3)(4) provides that EPA shall list products "on a reactivity-adjusted basis."

6-12 cont.

The National Research Council study performed under the CAA states that ". . . VOCs vary widely in the speed with which they react in the troposphere and in the extent to which they promote . . . ozone formation. . . ." *Rethinking The Ozone Problem* at 153.

Finally, the court decisions in California have confirmed the need to examine relative reactivity of reformulated and substitution coatings before regulating. The judgment against Ventura County APCD, for example, invalidated its amendments for its failure to analyze the significant effect on air quality due to "increased reactivity" of the VOCs in the substituted products. The judgment against Bay Area AQMD did the same.

For these reasons, South Coast AQMD cannot ignore the relative reactivities of the mineral spirits in solvent-borne coatings and the glycol compounds in water-borne coatings.

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Organic compounds exhibit wide variations in reactivity with respect to ozone formation. NRC, *Rethinking the Ozone Problem* at 153, 154, 160, 161. The relative reactivities of individual compounds can differ by more than an order of magnitude from one compound to another. *Russell et al.*, "Urban Ozone Control and Atmospheric Reactivity of Organic Gases," *Science* (1995) at 491. Ignoring reactivity may lead to measures that are ineffective or counter-productive. *Id.* at 491, 195. Reactivity-based regulatory systems will reduce more ozone at all cost levels than mass-based systems. *McBride et al.*, "Cost-Benefit and Uncertainty Issues in Using Organic Reactivity to Regulate Urban Ozone", *Environmental Science & Technology* (vol. 31, no. 5 1997) at 241. On one scale, the compounds in solvent-borne coatings, mineral spirits, are roughly half as reactive as those emitted by motor vehicles. Harley et al., "Respeciation of Organic Gas Emissions," *Environ. Sci. Technol.* (1992) 2395 at 2401, Fig. 1. On the other hand, the glycol compounds in water-borne architectural coatings have been described as low-volatility species. *Id.* at 2400. Dr. William
6-13 P.L. Carter recently concluded that current reactivity scales may be overestimating the ozone impacts of mineral spirits and similar petroleum-based mixtures by a factor of 2 or more. "Investigation of the Atmospheric Ozone Formation Potentials of Selected Mineral Spirits" (July 25, 1997).

These results are not surprising considering the physical properties of typical mineral spirits, which are so-called long chain alkanes of C_6 or greater.

The Draft SEA contains (at 4-17 to 4-21 and 5-3 to 5-4) purported discussions of the reactivity issue. But it fails to assess the reactivity effects of any 2002 limit on any coating category, as required. In particular, the 2002 limits will outlaw all solvent-borne non-flats, industrial maintenance coatings, and quick-dry enamels. Therefore, makers, sellers, and users will be forced to manufacture, sell, and apply water-borne substitutes. The best scientific evidence extant to date and, based thereon, the widely-held hypotheses of the leading experts,
6-14 strongly suggests, with a high degree of probability, that the glycol compounds prevalent in the substitute water-borne products are far more reactive than the mineral spirit compounds prevalent in the outlawed solvent-borne products.

The Draft SEA ignores this data. It states (at 4-20) that it is "not . . . prudent" to act on such data because it is

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6-14 cont. not yet complete. However, the Draft SEA does not cite any authority for the proposition that glycol compounds are not significantly more reactive than mineral spirits. The Draft SEA simply assumes the worst of the three possible scenarios. Rather than postponing regulation until it concludes that sufficient data exist to support the most likely hypothesis, or acting according to that hypothesis, SCAQMD persists in regulating according to a theory which has no scientific proponents.

SCAQMD claims (at 4-20) that it is "speculative" to conclude that there will be increased reactivity. This claim is incorrect and, therefore, does not excuse SCAQMD's failure to analyze this impact. The case of *Alliance of Small Emitters/Metals Industry v. SCAQMD*, 60 Cal.App.4th 55, 65-68 (1997), in which a claim of excuse based on speculation was upheld, is clearly distinguishable. There, as an excuse for failing to analyze certain future environmental impacts, SCAQMD contended that the technologies that would be used to comply with the out-year rules were "unknown" at promulgation time. *Id.* at 65, 66. The court accepted this contention, holding that "any efforts to assess the impact of unknown and unknowable technology would be pure speculation." *Id.* at 67.

6-15 Here, by contrast, the special-purpose products which will be used to substitute for the products banned by the 2002 limits are neither "unknown" nor "unknowable." Indeed, they have existed and have been actively marketed – but with extremely limited success – for years. There is no reason why SCAQMD could not have assessed the relative reactivities of the products to be banned and those to be substituted long before now, or waited to regulate on the basis of such an assessment, if it had only wanted to do so. Instead, SCAQMD prefers to regulate prematurely and blind.

"[A]n agency must use its best efforts to find out . . . all that it reasonably can." 14 Cal. Code Regs. § 15144. It is required to conduct a "thorough investigation" of each impact. *Id.* At § 15145. An agency has "an obligation imposed by CEQA to collect information" regarding impacts and it violates that duty when it approves a project where it lacks "necessary information." *Sierra Club v. State Board of Forestry*, 7 C.4th 1215, 1220, 1235-37 (1994).

6-16 Projects are usually operative in future years, and an agency must address the significant effects of future operative

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rules. "Drafting an EIR . . . necessarily involves some degree of forecasting . . . [A]n agency must use its best efforts to . . . disclose all that it reasonably can." 14 Cal. Code Regs. at § 15144. In *Laurel Heights Improvement Assn. v. Regents of University of California*, 47 C.3d 376 (1988), the court made clear that, while the extent of the precision of the analysis may be reduced, the fact that the effects of a project will occur in the future does not create an exemption:

> ". . . UCSF should have discussed in the EIR at least the general effects of the reasonably foreseeable future uses, . . . the environmental effects of those uses, and the currently anticipated measures for mitigating those effects.
>
> ". . . A detailed environmental analysis of every precise use that may conceivably occur is not necessary at this stage. [Citation] The fact that precision may not be possible, however, does not mean that no analysis is required. [Quoting Guideline Section 15144] With the vast intellectual resources at its disposal, the University can surely make informed judgments as to probable future activities at the Laurel Heights facility.
>
> ". . . We find no authority that exempts an agency from complying with the law, environmental or otherwise, merely because the agency's task may be difficult . . ." *Id.* at 398-99.
>
> ". . . [T]he difficulty of assessing future impacts . . . does not excuse preparation of an EIR; such difficulty only reduces the level of specificity required . . ." *Carmel-By-The-Sea v. Board of Supervisors*, 183 Cal.App.3d 225, 250 (1986); *Antioch v. City Council*, 187 Cal.App.3d 1325, 1336-37 (1986); *Rio Vista Farm Bureau Center v. Solano County*, 5 Cal.App.4th 351, 374 (1992).

6-16 cont.

An agency's "bare conclusions" do not satisfy CEQA's requirement to create an informational document which will inform public decision-makers and the general public of the environmental effects of projects they propose to approve. *Santiago County Water District v. County of Orange*, 118 Cal.App.3d 818, 831 (1981); *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus*, 27 Cal.App.4th 713, 727 (1994). *Citizens to Preserve the Ojai v. County of Ventura*, 176 Cal.App.3d 421, 429 (1985); CEQA Guidelines § 15088(b)

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("Conclusory statements unsupported by actual information will not suffice").

6-16 cont. A study conducted after approval of a project will inevitably have a diminished influence on decision making. *Sundstrom v. County of Mendocino*, 202 Cal.App.3d 296, 307 (1988). CEQA is intended to assure that the environmental consequences of a government decision on whether to approve a project will be considered before, not after, that decision is made. *Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal.App.4th 182, 196 (1996).

D. INCREASED VOLATILITY

Because of their physical and chemical properties, including low rates of evaporation, the glycol compounds found in water-borne coatings do not disperse widely enough nor remain in the atmosphere long enough to participate in ozone formation to any significant extent. Typically, these compounds may be absorbed by building surfaces, pavement, soil, or vegetation; or they may be subtracted from the air through interaction with water vapor, dust, or other particulate matter.

A useful surrogate for atmospheric availability is volatility, measured as vapor pressure. Consumer product regulations in several states, including those of the California Air Resources Board, specify a VOC vapor pressure threshold of 0.1 mm Hg @ 20° C. Compounds with vapor pressures at or below that threshold are exempt from regulation. U.S. EPA recently included the same threshold in its national rule for consumer products, noting in a report to Congress (at 5-5) that such "products often contain ingredients which are of extremely low volatility (i.e., some ingredients evaporate at such a low rate
6-17 that they do not enter the air to any appreciable degree)."

At the limits imposed in 2002 substitution of solvent-borne coatings for water-borne coatings will result in increased volatility. For example, a solvent-borne 350 g/L rust preventative coating can be substituted for a water-borne industrial maintenance coating at 250 g/L.

The Draft SEA asserts (at 4-21, 5-2) that organic compounds in architectual coatings are intended to and do "evaporate" in the air. This general statement is true as to the mineral spirit compounds in solvent-borne coatings. But is it

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6-17 cont. true as to those glycol compounds in water-borne coatings? That is the issue the Draft SEA is bound, but fails, to address.

E. INCREASED EMISSIONS

6-18 The substitution of higher VOC, and thus better performing, coatings for the inferior products the proposed amendments will require results in increased emissions. For example industrial maintenance coatings at 250 g/L and rust preventative coatings at 350 g/L may be substituted for banned coatings in other categories.

6-19 SCAQMD concludes (at 4-16 to 4-17) that there are five reasons why "widespread substitution will not occur" and that there will be "no significant adverse air quality impacts" therefrom. Each of the five reasons is so obviously false that this example of the rosy scenario cannot stand.

6-20 First, the Draft SEA cites its review of certain selected "product data sheets" (collated at Appendix D and Table 4-2) and, based on that review, concludes that the substitutes have performance characteristics "comparable" to the high-performance categories. However, the District has commissioned National Technical Systems to conduce a side-by-side comparison of zero, low and high-VOC coatings to analyze their application and durability characteristics. This study was designed to develop objective data in contrast to the subjective marketing claims contained in manufacturers' promotional literature. Although numerous staff members have stated that the NTS study is a critical component of the current rule making and potentially provides much of the foundation therefor, the Draft SEA inexplicably states (at C-3-1, C-4-1) that "the proposed amendments do not rely on this study for the development of PAR". Thus, the Draft SEA chooses to rely on anecdotal accounts rather than the empirical results from the NTS study. In addition to improperly ignoring the NTS results, it has come to our attention that staff has unilaterally deleted critical portions of NTS's original scope of work.

6-21 Second, the Draft SEA claims that Rule 1113 "prohibits the application" of the high-performance coatings in certain situations. This is false. The rule would mandate that manufacturers place certain labels on cans. It would mandate certain painting practices. But it does not "prohibit" the "application" of any coating in any circumstance.

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6-22 Third, the Draft SEA argues that certain uses of certain high-performance substitute are "unlikely." This does not cover the cases in question.

6-23 Fourth, the Draft SEA notes Rule 1113(c)(3). But this, too, governs how manufacturers make and market products. It has no bearing at all on what products users buy and apply.

6-24 Fifth, the Draft SEA argues that there is now "greater than 99 percent compliance" with Rule 1113. This is true because the rule, as now in effect, allows most high-quality products to be made and sold. But when e.g. high-gloss, exterior, and industrial maintenance products are banned, the situation will be unprecedented. Past compliance rates cannot realistically be expected to apply to the new situation.

IV. 2005 BANS

6-25 The 2005 non-flat limit of 50 g/L would effectively outlaw substantially all semi-gloss, satin, and eggshell latex and vinyl non-flats used primarily for interior applications.

The 100 g/L limit for industrial maintenance coatings will outlaw about 150,000 gallons of water-borne acrylic coatings per year. This will leave only the two-component catalyzed products.

The 100 g/L limit for primers, sealers, and undercoaters will ban roughly 1,000,000 gallons of water-borne products per year.

The 100 g/L limit for quick-dry primers, sealers, and undercoaters will outlaw approximately 35,000 gallons of water-borne products per year.

V. SIGNIFICANT ENVIRONMENTAL EFFECTS OF 2005 BANS

6-26 Again, the Draft SEA fails to analyze the impacts of any one of the 2005 limits as to any one of the coating categories. Instead, it assesses certain impacts, but on an omnibus basis. Furthermore, it omits any analyses of the following impacts:

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A. AESTHETIC IMPACTS

6-27 When the 2005 limits go into effect, the market will undergo revolutionary disruption. Consumers will be left with three choices. First, they can try to use low-organic compound non-flats now used for special purposes (graffiti, odor, apartments) for general purposes. Second, they can use two-component catalyzed systems in the industrial maintenance area. Third, they can leave substrates unpainted or use non-paint protective products. The adverse aesthetic impacts of all these scenarios are severe, but have not been analyzed in the Draft SEA.

6-28 Even as to industrial maintenance coatings, many users will not apply two-component systems, nor hire professionals to apply them, because of the complexity and expense thereof.

6-29 The assertion in the Draft SEA (at 4-63) that manufacturers' will produce "acceptable quality low-VOC products" and "products that exhibit the desired performance characteristics" by 2005 is wholly unsupported by the record and, therefore, mere wishful thinking. The Draft SEA must analyze the possible – indeed, the highly likely – scenario that users will apply low-sheen interior odor, graffiti, and apartment paints to all kitchens, bathrooms, windows, balconies and railings.

6-30 The wide spread use of these low-quality water-borne product's will have substantial adverse aesthetic impacts. Such impacts include decreased durability and hide capacity as well as an inability to produce sheen.

6-31 An alternative scenario will be the failure to apply paints to substrates. All one has to do is go to any impoverished community or residence and judge the aesthetics of unpainted structures.

6-32 A final likely scenario is where property owners switch from paint to other types of substrate protection. Such a switch will detract from a diverse environment.

B. HEALTH & SAFETY

6-33 If all substrates were painted with the low-quality, coatings contemplated by the proposed amendments, the health and safety benefits provided by paints today would be severly degraded. The concerns voiced by representatives of MWD, Cal

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6-33 cont. Trans and FDCA discussed above would only be exacerbated by the 2005 limits.

If all substrates were left unpainted, all such benefits would be eliminated.

6-34 Alternatively, if all substrates were to be protected by non-paint products, certain health and safety benefits would be impaired.

C. MISCELLANEOUS IMPACTS

6-35 If other surface finishing materials (e.g., stucco, vinyl, aluminum, tile, plastic, paneling, or wall covering) replace paint, society will bear various other ecological burdens associated therewith: Other forms of pollution will increase, and material and energy resources will be needlessly wasted.

For example, wall coverings are applied with adhesives containing organic compounds. Many such materials are manufactured in processes emitting NO_x.

VI. ALTERNATIVES

6-36 The Draft SEA (at 5-1 to 5-5) improperly dismisses as "infeasible" alternative approaches which are, in fact, feasible.

6-37 SCAQMD asserts (at 5-2) that exemptions for low volatility compounds (glycols) "is not appropriate for paints." This makes no sense, as EPA and ARB have exempted products from regulation containing the very same compounds.

6-38 SCAQMD also rejects (at 5-3 to 5-4) reactivity-based controls. This is clearly feasible. Congress mandates that EPA regulate consumer products on a reactivity-adjusted basis. The Draft SEA concedes that ARB "required speciation profiles on all coatings included in the 1998 CARB Survey," and that the "results . . . are still under evaluation." It is feasible – in fact, required – to use those results.

6-39 The Draft SEA also states (at 5-5) that seasonal regulation is "infeasible due to . . . lack of enforceability." SCAQMD proposes to regulate painting practices in Rule 1113(d)(7). If it is feasible to enforce such mandates, it is feasible to enforce seasonal prohibitions.

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6-40 The Draft SEA ignores the most obvious alternative of mandating limits which require reformulation, but not substitution, such as those in EPA's regulation. This would have the supplemental benefits of avoiding preemption and promoting federal-state consistency. The failure to include and analyze such alternatives is fatal under CEQA.

Conclusion

6-41 The staff "must specifically respond" to each of the above comments about the serious failures of the Draft SEA. *Dunn-Edwards Corp. v. SCAQMD*, 19 Cal.App.4th 519, 534 (1993). If any such comments are rejected, the responses "must particularly set forth in detail the reasons" therefor. *Id.* The staff is bound under CEQA to provide board members with information on the above missing impacts and alternatives "which enables them to make a decision which intelligently takes account of the environmental consequences. [Citations]" *Id.*

6-42 SCAQMD proposes to ban virtually all glossy enamels and undercoaters made, sold, and used in the basin today. Obviously, any project that revolutionary is going to have massive environmental impacts. As shown above, the Draft SEA fails to think about those impacts, as mandated by CEQA.

Very truly yours,

William M. Smiland/mmg

William M. Smiland

WMS/mmg

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COMMENT LETTER #6
Smiland & Khachigian
April 21, 1999

6-1 The commentator appears to infer that non-compliant coatings will be eliminated as a result of adopting and implementing PAR 1113, but no compliant coatings will become available. Based upon the number of future compliant coatings currently available (see Table F-1 in response to comment #2-1) and the fact that there is substantial time available to develop compliant coatings, especially for the final July 1, 2006 compliance date, it is likely that existing coatings may be reformulated using currently available resin technologies or completely new compliant coatings will be developed.

Further, the SCAQMD will conduct and complete a technology assessment one-year prior to the interim and final VOC content limits becoming effective. The technology assessment will evaluate the availability and feasibility of compliant coatings. Since the language regarding technology assessments is included in PAR 1113, the SCAQMD will be required to conduct this assessment and consider revising the VOC content limits or extend the compliance dates depending on the results of the technology assessment. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology.

6-2 The commentator states, "[T]he Draft SEA blithely concludes (at 1-1) that 'the proposed amendments will not generate any significant adverse environmental impacts.'" The statement cited by the commentator is a statement in Chapter 1 that summarizes the conclusions of the extensive analysis contained in Chapter 4 of the Draft SEA. The conclusions of insignificance are based on extensive surveys of currently available low and zero-VOC coatings, as well as extensive analyses of specific issues identified by staff and raised by the public and the affected industry in comments on the NOP/IS prepared for PAR 1113. Consequently, the conclusion that PAR 1113 is not expected to generate significant adverse environmental impacts is based on substantial evidence and is not a blithe conclusion as asserted by the commentator. The commentator is also referred to the environmental analyses in Chapter 4 of the Final SEA for PAR 1113, as well as the analysis of the relative merits of each of the proposed project alternatives contained in Chapter 5.

6-3 The commentator asserts that the SCAQMD's "rosy scenario" that complaint coatings will be available in the interim and final compliance years is eclipsed by two more likely scenarios: low organic compound substitution and finally non-paint substitutes. The SCAQMD is not clear what the commentator means when it says "low organic compounds." The SCAQMD assumes for the purposes of this comment the commentator is referring to low-VOC coatings when it says "low organic

compounds." The SCAQMD will proceed on this assumption in answering this comment and subsequent comments using the terminology "low organic compounds."

In any event, the SCAQMD disagrees with the commentator's contentions. As part of the environmental impacts analysis for PAR 1113, the SCAQMD conducted an exhaustive and comprehensive analysis of currently available low-VOC compliant coatings as well as conventional coatings. The SCAQMD's analysis reviewed hundreds of product data sheets and compared the VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time (see the tables in Appendix D and the related summary tables in Chapter 4 of the Final SEA) of affected coating categories. The SCAQMD has found through its investigation of these product data sheets that there are commercially available compliant coatings that meet the interim and final VOC content limits of PAR 1113. According to the product data sheets analyzed by the SCAQMD, many of these compliant coatings perform comparable to conventional coatings in a variety of applications (see Appendix D and summary tables in Chapter 4 of the Final SEA). Furthermore, the results from the NTS study show that compliant interim (2002) coatings perform overall as well as conventional coatings. While some of the compliant final (2006) compliant coatings have some application shortcomings compared to conventional coatings, PAR 1113 provides an additional seven years to give coating formulators the necessary time to reformulate coatings to meet the final VOC content limits. This additional time is consistent with the information provided by various resin manufactures and coating manufacturers that it takes five to seven years for new product development. Therefore, based on the SCAQMD's product data sheet analysis coupled with the results from the NTS study, substitution of low-VOC compliant coatings with higher-VOC coatings is not anticipated from the implementation of PAR 1113.

Furthermore, even if there is some limited substitution due to the implementation of PAR 1113, overall emission reductions will still be achieved. The SCAQMD has analyzed four probable substitution scenarios including the substitution of an IM coating by a rust preventative coating. This analysis reveals that even under a "worst-case" where several types of coatings are being substituted with higher-VOC coatings in large numbers PAR 1113 still achieves overall emission reductions. The commentator is referred to Chapter 4 of the Final SEA.

In regards to commentator's assertion that eventually users will switch to non-paint substitutes due to wide-spread failures associated with the use of low-VOC compliant, as stated above compliant low-VOC coatings are currently commercially available that can meet both the interim and final VOC content limits. Therefore, it is highly speculative that users will abandon paints altogether for non-paint substitutes when compliant performing coatings are available for use. Further, other than the

commentator's assertion, the commentator provides no evidence that this scenario will actually occur.

It should be noted that non-paint substrates (e.g., stucco, siding, concrete, etc.) are currently used in the district. However, their use for the most part has nothing to do with the availability of compliant performing coatings, but more with user preferences (e.g., aesthetics).

6-4 The commentator incorrectly asserts that the Draft SEA for PAR 1113 ignores the following environmental impacts: (1) aesthetic impacts; (2) health and safety impacts; (3) increased reactivity impacts; (4) increased volatility impacts; (5) increased emission impacts; and (6) impacts resulting from the increased manufacture and installation of non-paint substitutes.

With regard to aesthetic impacts, response to comment 1-16 in Appendix C of the Draft SEA for PAR 1113 addressed this issue by providing a detailed response explaining why PAR 1113 was not expected to generate significant adverse aesthetic impacts. Aesthetic impacts were also addressed in the "Environmental Impacts Found Not to Be Significant" section in Chapter 4 of the Draft SEA for PAR 1113.

Health and safety impacts were discussed in detail in the "Human Health Impacts" and "Hazard Impacts" sections, respectively, in Chapter 4 of the Draft SEA for PAR 1113. Responses to written comments #1-9, #1-12, and #3-17 in Appendix C of the Draft SEA for PAR 1113 also addressed potential hazard impacts. Safety and human health issues were also addressed in the responses to written comments #1-12 and #5-5, as well as responses to oral comments #6, #7, and #8.

Potential reactivity impacts were specifically addressed in the "More Reactivity" section of Chapter 4 of the Draft SEA for PAR 1113. This topic was also extensively addressed in response to comment #1b-1 in Appendix C of the Draft SEA for PAR 1113. In addition, the reasons for rejecting a reactivity-based alternative were addressed in Chapter 5 of the Draft SEA.

Volatility impacts were addressed in the "Low Vapor Pressure" section of Chapter 4 in the Draft SEA for PAR 1113. This topic was also addressed in response to comment #1c-12 in Appendix C of the Draft SEA.

The industry issue regarding potential increases in VOC emissions from PAR 1113 were addressed in the following sections of Chapter 4: "More Thickness," "Illegal Thinning," "More Priming," "More Topcoats," "More Touch-ups and Repair Work," "More Frequent Recoating," and "Substitution."

The industry issue regarding substitution was specifically addressed in the "Substitution" section of Chapter 4 of the Draft and Final SEA for PAR 1113.

6-5 While staff may have suggested a 45-day comment period in December 1998, staff subsequently determined that a 30-day review period was adequate given the lack of any significant environmental impacts.

6-6 The data provided is noted.

6-7 The commentator is referred to the responses to comments #2-1 and #6-1.

6-8 The commentator alleges that the Draft SEA's "omnibus fashion" of analysis does not separately analyze the impacts associated with the interim and final VOC content limits. The commentator states that the SCAQMD must carry out a limit-specific and category-specific analysis for all five environmental topics analyzed by the SCAQMD. The SCAQMD disagrees with the commentator's assertion that a limit-specific and category-specific analysis is required for each environmental topic in order to adequately analyzed the impacts from PAR 1113. The type and level of analysis that is required is dependent on the environmental topic under review.

For example, in the context of air quality impacts, Tables 4-2 and 4-3 of the Draft and Final SEA reveal that the SCAQMD thoroughly analyzed the limit-specific and category-specific performance characteristics of affected coatings. The results of this analysis revealed that compliant coatings are currently commercially available to meet the interim and final VOC content limits. This analysis served as the basis for analyzing the industry's eight issues (e.g., more thickness, more thinning, more priming, more topcoats, more touch-up and repair, more frequent recoating, more substitution, and more reactivity) as well as the other environmental areas analyzed by the SCAQMD.

For the remaining environmental topics (e.g., water resources, public services, transportation/circulation, solid/hazardous waste, hazards, and human health), a quantitative and/or qualitative limit-specific or category-specific analysis was all that was required to thoroughly analyze the impacts associated with PAR 1113. For quantitative limit-specific impacts analyses, the commentator is referred to Tables 4-5 (water demand), 4-6 (water quality), and 4-8 (solid waste) of the Draft and Final SEA. For quantitative category-specific analyses based on coating technology, the reader is referred to Tables 4-7 (public services and hazards) and 4-8 – 4-12a (human health) of the Draft and Final SEA. For a qualitative analyses based on category-specific analyses based on coating technology, the reader is referred to Water Resources, Public Services, Transportation/Circulation, Solid/Hazardous Waste, Hazards, And Human Health sections of the Draft and Final SEA.

As demonstrated by the thoroughness of these analyses, the SCAQMD has substantially meet its requirements under CEQA in determining the environmental impacts associated with PAR 1113. Accordingly, the SCAQMD concluded that the implementation of PAR 1113 would not result in significant environmental impacts in any environmental topic.

6-9 SCAQMD staff does not concur with the commentator's assertion that significant aesthetic impacts will occur. The commentator does not explicitly state in what way significant aesthetic impacts would occur. He implies that they may occur to those "who apply it [paint] to their own houses." First, industrial maintenance coatings are not typically used for residential use or for use in painting the outside of buildings, although some nonflat coatings may be used for a structure's exterior trim. In spite of this, based upon information on currently available compliant products, performance characteristics of existing and reformulated products should be sufficient to meet the weathering impacts on outdoor structures. This is particularly true in light of the fact that the rule contains sufficient time for research and development of AIM coatings in addition to those that are currently available (see also response to comment #3-4).

6-10 The SCAQMD recognizes that coating manufacturers that do not have compliant products will need to reformulate their existing coatings. However, numerous manufacturers, including the commentator's company, have numerous compliant coatings that meet the proposed interim and final compliance coatings now. Also, the proposed modified Averaging Provision would provide the coating manufacturers with the flexibility to retain certain lines of noncompliant products, and focus their research and development efforts on fewer lines of products. The commentator is also referred to responses to comments #1-1 and #2-1. See also Table 3-1 of the Final SEA.

6-11 The SCAQMD concurs with the commentator's statement that the Draft SEA contains an exhaustive discussion of the health and safety (e.g., hazards, and human health) impacts from certain constituents of coatings. However, the SCAQMD disagrees with the commentator's assertion that the SCAQMD did not analyze the hazards and human health impacts from replacement coatings. In order to determine the hazards and human health impacts associated with low-VOC complaint replacement coatings, the SCAQMD determined the individual constituents (e.g., solvents) of the coatings and then compared them to conventional solvents. This comparison provided the SCAQMD with an indication of the incremental impacts associated with the use of low-VOC complaint replacement coatings. As shown in the Hazards Impacts and Human Health Impacts sections in Chapter 4 of the Draft and Final SEA, the SCAQMD has found that no significant hazards and human health impacts are associated with low-VOC compliant replacement coatings.

The commentator cites testimony given by CalTrans, MWD, and PDCA at the December 9, 1998 Public Worskshop regarding their concerns with the availability o IM coatings that meet the proposed amendments. In particular, the commentator highlights Caltrans' testimony noting that they are currently happy with a 250 g/l IM coating used for steel structures but it is concerned with the availability of IM coatings to meet the final limits. This statement corroborates the SCAQMD's analysis that low-VOC compliant coatings are commercially available to meet the interim VOC content limits (07/01/02). PAR 1113 sets the interim VOC content limit for IM coatings at 250 g/l. In the context of the final VOC content limits, the IM coating limit drops to 100 g/l in 07/01/06. Based on the SCAQMD's product data sheet analysis of hundreds of coatings, low-VOC IM coatings are currently available that can meet the final limit. However, the results of the NTS study indicate that some of these compliant coatings may have some application problems. For this reason, the SCAQMD has given coating formulators seven years to reformulate their coatings. This time period is consistent with input received from resin manufacturers and coating formulators that it takes five to seven years to reformulate coatings to make it commercially available based on emerging resin technology. PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant IM coatings are unavailable by the completion of the technology assessment to meet the final limit, the SCAQMD wil' report back to the Governing Board as to the appropriateness of maintaining or delaying the existing VOC content limits.

6-12 With regard to reactivity of solvent-based coatings the commentator is referred to the response to comment #3-4.

6-13 With regard to a reactivity based rule, the commentator is referred to the responses to comments #3-4 and #4-1. It should be noted that methanol, relative to Rule 1170, was considered a promising alternative clean fuel, especially for mobile sources, because of its potential as a NOx control strategy and, therefore, an ozone control strategy, not because it may or may not be less reactive than gasoline.

6-14 The commentator indicates that the best scientific evidence strongly suggests that glycol compounds prevalent in compliant water-borne coatings are more reactive than mineral spirits prevalent in solvent-borne coatings. The commentator asserts that the SCAQMD ignores this data. The SCAQMD has not ignored the fact the different solvents have different reactivities. Nor does the SCAQMD dispute the fact that different VOCs have different reactivities. Furthermore, the SCAQMD is not opposed to the use of VOC reactivity control strategy as evidenced by the inclusion of rule language in PAR 1113 to commit the SCAQMD to assess the reactivity of architectural coatings during technology assessments. However, given the state of

science in this field and the fact that several studies are currently being undertaken to refine reactivity numbers for architectural coating solvents as well as the future building of an ozone reaction chamber, the SCAQMD agrees with the EPA that it is more prudent to utilize a mass VOC emissions control strategy at this time. In its 1995 Report to Congress entitled "*Study of Volatile Organic Compound Emissions From Consumer and Commercial Products*," the EPA concluded, "To be most effective, ozone control strategies ideally should be based not only on mass VOC and NOx emissions but should consider the relative photochemical reactivity of individual species, the VOC-to-NOx ratios prevalent in specific airsheds, and other factors which could work together to minimize the formation of ozone with adverse impacts. Reactivity data on VOC, especially those compounds used to formulate consumer products and commercial products, is extremely limited. Better data, which can be obtained only at great expense, is needed if the EPA is to consider relative photochemical reactivity in any VOC control strategy. In the meantime, a practical approach is to act on the basis of mass VOC emissions." Thus, until more comprehensive VOC reactivity studies are completed that yield more refined speciation profiles for architectural coatings, the SCAQMD will continue to use a mass VOC control strategy. In fact, Dr. Carter himself has expressed the need for more study to be done to determine the reactivity of various compounds. In furtherance of that effort, he is currently conducting a study for CARB that will further evaluate and refine the atmospheric potential of selected VOCs (e.g., glycol ethers) emitted from consumer products and industrial sources, which includes chemical classes used in architectural. The SCAQMD welcomes any new scientific data that industry can provide to aid the SCAQMD in moving from a mass VOC emissions reduction strategy to a control strategy based on VOC reactivity.

It should be noted that the commentator's assertion that glycol compounds are prevalent in compliant water-borne coatings is not consistent with the SCAQMD's findings. Because many glycol compounds are considered hazardous air pollutants, many coating formulators are replacing these compounds with less hazardous compounds. The Censullo report, which is intended to upgrade the species profiles for a number of sources within the general categories of industrial and architectural coating operations, reported that the four most common solvents in the 52 randomly chosen water-borne coatings (flats and non-flats) were: texanol (found in 37/52); propylene glycol (31/52); diethylene glycol butyl ether (23/52); and ethylene glycol (14/52). It appears from this information that the use of solvents such as texanol in water-borne coating formulations, is prevalent today and should continue into the future with the eventual replacement of more hazardous glycol compounds. Therefore, since the trend appears to be the replacement of glycol compounds in compliant water-borne systems with less hazardous compounds, it is even more prudent to wait until better scientific reactivity data is available.

6-15 The commentator contends that since it is known which compliant coatings will be used to meet the interim limit (2002) there is no reason why the SCAQMD should not analyze the relative reactivities of the compliant coatings compared to conventional coatings. The commentator's contention blurs the real issue associated with the use of a reactivity-based regulatory approach. The SCAQMD agrees with the commentator that it is well known that compliant coatings are commercially available to meet the PAR 1113 VOC content limits. However, based on the SCAQMD's research to date, the science of reactivity analysis has not reached the level of sophistication that it can accurately predict how various VOCs in coatings upon release in the atmosphere contribute to ozone formation through reaction with other compounds. Therefore, it is premature at this time to rely on a reactivity-based approach for PAR 1113. The commentator is referred to responses to comments #3-4 and #6-14.

6-16 The commentator cites CEQA Guidelines §15144 regarding disclosure requirements. The SCAQMD is aware of CEQA requirements for preparing environmental analyses. Further, the SEA for PAR 1113 complies with all relevant CEQA requirements.

The commentator then cites CEQA case law, Laurel Heights Improvement Assn. v. Regents of University of California, 47 C.3d 376 (1988), implying that the Draft SEA for PAR 1113 has not analyzed potential adverse environmental impacts and relies on "bare conclusions." The Draft SEA for PAR 1113 does not rely on "bare conclusions," but relies on extensive data surveys and analyses of potential adverse impacts to a number of environmental topics. As noted in response to comment #6-2, the conclusion that PAR 1113 is not expected to generate significant adverse environmental impacts is based on substantial evidence and does not rely on, "A study conducted after approval of a project..." The commentator is also referred to the environmental analyses in Chapter 4 of the Final SEA for PAR 1113.

6-17 The commentator alleges that because glycol compounds have low evaporation rates they do not disperse widely enough nor remain in the atmosphere long enough to contribute significantly to ozone formation. The commentator further alleges that the Draft SEA fails to analyze this issue. The commentator's allegation contradicts its implications in other comments that because glycol compounds as compared to mineral spirits prevalent in conventional coatings have higher reactivities they contribute more to ozone formation. Thus, it is unclear exactly what point the commentator is trying to make.

In any event, the commentator is incorrect in alleging that the SCAQMD has not considered a low-volatility approach for PAR 1113. In Chapter 5 of the Draft and Final SEA, although not specifically focusing on glycol compounds, the SCAQMD extensively discussed the feasibility of such an approach in the broad context of architectural coatings.. The SCAQMD noted that although CARB has included a low

vapor pressure (LVP) exemption in their Consumer Products regulation, CARB staff indicates that the LVP exemption was placed into the proposed regulation because of specific additives found in consumer products, such as surfactants, paraffins, and other heavier compounds that are typically washed away before they evaporate into the air. Furthermore, CARB has indicated that the LVP exemption was not intended to apply to solvents used in AIM coatings, since these solvents are intended to evaporate into the air. For that reason, CARB has not provided an LVP exemption in their aerosol paints rule.

Additionally, USEPA also did not include an LVP exemption in the National AIM Rule and USEPA staff has communicated to the SCAQMD that they do not support an LVP exemption for the architectural coatings rule. USEPA staff concludes that any VOCs (non-exempt solvent species) that are included in the approved test method are considered to be part of the overall VOC content of the coating, and should not be exempted. Using the currently approved test method, testing of coatings containing some of the LVP solvents includes identifying some LVP solvents as VOCs. As a result, because a LVP exemption is not appropriate for paints, a low vapor pressure alternative is considered to be infeasible.

6-18 The commentator asserts that as a result of PAR 1113 low-VOC compliant coatings will be substituted by higher-VOC coatings resulting in increased emissions. The commentator alleges that 250 g/l IM and 350 g/l rust preventative (RP) coatings will be substituted for low-VOC compliant coatings. As part of the environmental impacts analysis for PAR 1113, the SCAQMD conducted an extensive analysis of currently available low VOC coatings and conventional coatings. This analysis evaluated hundreds of coatings from approximately 40 manufacturers and considered the following coating characteristics: VOC content, percent solids by volume, coverage, adhesion, durability, pot life, shelf life, gloss, and drying time (see the tables in Appendix D and the related summary tables in Chapter 4 of the Final SEA). The SCAQMD's analysis of resin manufacturers and coating formulators product data sheets indicates that overall low-VOC compliant coatings had comparable performance characteristics to conventional coatings. Additionally, the conclusion was further corroborated by the NTS study. The results of the NTS study also indicate, however, that some of the compliant coatings may have some application problems, more so for the final compliance limits. As a result, the SCAQMD has given coating formulators seven years to reformulate their coatings to correct coating application problems. This time period is consistent with input received from resin manufacturers and coating formulators that it takes five to seven years to reformulate coatings to make it commercially available based on emerging resin technology. PAR 1113 contains a technology assessment provision whereby approximately one year prior to the interim and final compliance dates staff will perform a technology assessment of the availability of compliant coatings. If compliant IM coatings are

unavailable by the completion of the technology assessment to meet the final limit, the SCAQMD will report back to the Governing Board as to the appropriateness o: maintaining the existing VOC content limits. Accordingly, substitution of low-VOC compliant coatings with higher-VOC coatings is not anticipated from the implementation of PAR 1113.

Furthermore, even if there is some limited substitution due to the implementation of PAR 1113, as alleged by the commentator, overall emission reductions will still be achieved. The SCAQMD has analyzed four probable substitution scenarios including the substitution scenarios suggested by the commentator. This analysis reveals that even under a "worst-case" where several types of coatings are being substituted with higher-VOC coatings in large numbers PAR 1113 still achieves overall emission reductions. The commentator is referred to Chapter 4 of the Final SEA.

6-19 The commentator asserts that the SCAQMD's five reasons why substitution will not occur are obviously false. The strongly disagrees with the commentator's assertion and refers the commentator to responses to comments #5-22 - #5-25.

6-20 Regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the preliminary results from the NTS study the commentator is referred to response to comment #2-1. The commentator is also referred to responses to comments #5-22 - #5-25 and #6-18 regarding potential substitution of low-VOC compliant coatings by higher-VOC coatings.

6-21 The commentator is referred to responses to comments #5-22, #5-23, and #6-18.

6-22 The commentator is referred to responses to comments #5-23 and #6-18.

6-23 The commentator is referred to responses to comments #5-24 and #6-18.

6-24 The commentator is referred to responses to comments #5-25 and #6-18.

6-25 The commentator is referred to responses to comments #2-1 and #6-1.

6-26 The commentator is referred to response to comment #6-8.

6-27 It is assumed that the commentator is implying that the performance characteristics of compliant low VOC coatings will be inferior to conventional coatings, so substitutions such as those identified by the commentator will need to be used. Staff reviewed coating product data sheets (see the tables in Appendix D and the relevant summary tables in Chapter 4) to obtain durability information for low VOC coatings and conventional coatings. Based upon a comparison of the coating product information sheets, staff concluded that low VOC coatings have durability characteristics

comparable to conventional coatings. Further, based on current availability of low and zero-VOC AIM coatings for a wide range of applications, it is anticipated that even more compliant coatings will be available by the 2002 and 2006 compliance dates (see also response to comment #3-4 regarding availability of low and zero-VOC compliant coatings).

Staff has found both single-component and two-component low- and zero-VOC coatings for a variety of uses. These can be brushed, rolled or sprayed using conventional coating gun technologies. However, staff recognizes that some fast-cure zero-VOC technologies require using plural spray technology. In any event, it is anticipated that even greater numbers of one- and two component AIM coatings will be available by the 2006 compliance date. Even industry has stated that research and development of new coating systems takes only three to five years.

Based on staff research of the product data sheets, there are, generally, a substantial number of low VOC coatings that are currently available, that have performance characteristics comparable to conventional coatings. In addition, there is no indication that non-paint protective products such as brick, siding, and tiles would be substitutes for either interior or exterior flat coatings. Even if they were substituted for painted surfaces, this practice of using non-paint protective products is currently a common practice. See also the air quality analysis in Chapter 4 regarding substitution.

6-28 Staff has found numerous single-component and two-component, zero-VOC industrial maintenance coatings, with pot lives of up to three hours (see the tables in Appendix D). These can be brushed, rolled or sprayed using conventional coating gun technologies. However, staff recognizes that some fast-cure zero-VOC technologies require using plural spray technology. However, the increased cost of the application equipment is more than offset by the faster dry time and quicker turnaround time associated with the fast cure coatings. It should be noted that two-component coating systems are already used in certain applications, e.g., industrial maintenance applications, although such equipment requires training to achieve desired coating characteristics. The final compliance date for the 100 g/l VOC limit for industrial maintenance coatings is July 1, 2006, which provides adequate time for contractor training with the increased use of two-component coatings.

6-29 The commentator alleges that the SCAQMD's assertion that acceptable low-VOC quality coatings will be available that exhibit desired performance characteristics is wholly unsupported by the record. The SCAQMD has thoroughly analyzed the availability as well as the quality of commercially available coatings that meet the interim and final VOC content limits of PAR 1113. The SCAQMD has comprehensively analyzed hundreds of resin manufacturer's and coating formulator's product data sheets. The SCAQMD's analysis of these product data sheets indicates

that overall low-VOC compliant coatings had comparable performance characteristics to conventional coatings for both the interim and final VOC content limits.

Regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the results from the NTS study the commentator is referred to response to comment #2-1. The commentator is also referred to responses to comments #5-22 - #5-25 and #6-18 regarding potential substitution of low-VOC compliant coatings by higher-VOC coatings.

6-30 The commentator is referred to the responses to comments #6-9 and #6-27.

6-31 With regard to the durability of low and zero-VOC the commentator is referred to the response to comment #6-29. The commentator is referred to the responses to comments #6-9 and #6-27. The fact that an "impoverished community" may or may not have unpainted structures is unrelated to the quality of low VOC coatings, especially since relatively high VOC coatings are currently available, but is instead related more to socioeconomic factors.

6-32 With regard to using non-paint substrates the commentator is referred to the response to comment #6-27.

6-33 The commentator contends that if all substrates were painted with low-quality paint, health and safety (e.g., hazards and human health) benefits offered by paints would be severely compromised. This statement is contrary to the SCAQMD's findings concerning commercially available low-VOC compliant coatings. Based on the SCAQMD's research, investigation, and analysis, low-VOC compliant are currently commercially available to meet the interim and final VOC content limits. Furthermore, the SCAQMD has included extended compliance deadlines to allow coating formulators additional time to correct potential coating application problems associated with the final VOC content limits. Accordingly, since low-VOC compliant coatings are commercially available and additional time is provided for reformulation, the SCAQMD does not expect significant hazards and human health impacts from the implementation of PAR 1113.

The commentator is referred to response to comment #2-1 regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the results from the NTS study. The commentator is also referred to responses to comments #6-8 and #6-11 regarding hazard and human health impacts from the use of low-VOC compliant coatings.

6-34 The commentator contends that if all substrates were protected with non-paint substrates, health and safety (e.g., hazards and human health) benefits offered by paints would be impaired. Since the commentator does not explain how non-paint

substrates would impair the hazard and human health benefits of paint it difficult to understand the commentator's contention. In any event, this statement is contrary to the SCAQMD's findings concerning commercially available low-VOC compliant coatings. Regarding the SCAQMD's review of resin manufacturer's and coating formulator's product data sheets and the preliminary results from the NTS, study the commentator is referred to response to comment #2-1. The commentator is also referred to responses to comments #6-8 and #6-11 regarding hazard and human health impacts from the use of low-VOC compliant coatings.

6-35 The commentator asserts that use of non-paint protective coatings will generate VOC emissions from adhesive products or NOx emissions from the manufacture of adhesives. First, the SCAQMD disagrees with this assertion because it is anticipated that compliant AIM coatings will be available in the future (see response to comment #3-4).

Even if it were true that the use of adhesives increases as a result of implementing PAR 1113, the SCAQMD strictly regulates the VOC content of adhesives in Rule 1168 – Adhesive Applications. Based upon the requirements in Rule 1168, depending on the adhesive application, use of compliant adhesives would have no effect on VOC emissions or could potentially reduce VOC emissions to a certain extent compared to the existing setting because the VOC content requirements are generally equivalent or less than the VOC content requirements currently required for AIM coatings.

Further, even if the adhesive manufacturing process involved some type of combustion process such as a boiler or heater, NOx emissions associated with adhesive production would not create significant adverse air quality impacts for the following reasons. Any new, modified, or relocated combustion equipment in the district is subject to Regulation XIII –New Source Review. This regulation strictly regulates NOx emissions from combustion equipment by requiring: that emissions comply with the lowest achievable emissions rate; installation of best achievable control technology (BACT), and emissions offsets if emissions are greater than one pound per day. Equipment not subject to Regulation XIII would most likely be subject to Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters, which establishes stringent NOx control requirements.

6-36 Consistent with CEQA Guidelines §15126.6(c) the SCAQMD has described the reasons for rejecting a number of alternatives in Chapter 5. This comment does not explain why the commentator assumes that the alternatives rejected as infeasible are feasible.

6-37 With regard to rejecting a low volatility-based alternative the commentator is referred to the response to comment #3-4. See also Chapter 5 of the Final SEA for PAR 1113.

6-38 With regard to rejecting a reactivity-based alternative the commentator is referred to the response to comment #3-4. See also Chapter 5 of the Final SEA for PAR 1113.

6-39 SCAQMD staff has evaluated a seasonal regulation alternative that would allow architectural coatings with VOC content limits higher than those contained in PAR 1113 and rejected it as an infeasible alternative for the following reason. Based on discussions with industry, it has been suggested that this alternative may be infeasible because it may be difficult for coatings distributors to manage architectural coating stocks to ensure that only compliant coatings are sold during the high ozone season. As a result, this alternative is rejected as infeasible. See also the discussion in Chapter 5 of "Alternatives rejected as infeasible."

In addition to the issues identified by staff, one commentator (see comment letter #3) expressed concerns with a seasonal alternative because of the additional costs to coatings retailers of changing their stocks up to four times per year. Another concern raised by this commentator was the SCAQMD's ability to enforce a seasonal alternative.

6-40 Many low- and zero-VOC coatings are currently available for use, and are manufactured by small and large coating manufacturers. Thus, the SCAQMD has no basis to believe that significant amount of substitution will occur as a result of the proposed amendments. The expected approach for meeting future VOC content limits is through reformulation. Significant substitution is not likely to occur because uses for various replacement coatings are different and have different performance characteristics. For example, the proposed substitutes have limited specific uses, they do not provide the same aesthetic appeal, and some of the proposed substitutes would be cost prohibitive. Even if there is some limited substitution due to the implementation of PAR 1113, emission reductions will still be achieved.

6-41 The SCAQMD is aware of the requirements to respond to comments on the draft CEQA document. This appendix, Appendix F, provides detailed and extensive responses to all comments received on the Draft SEA for PAR 1113. Further, the SCAQMD disagrees with the commentator's assertion that the Draft SEA for PAR 1113 does not include a comprehensive analysis of potential adverse impacts from implementing PAR 1113 (see the responses to comments #6-2 and #6-16). Finally, the Final SEA for PAR 1113, including responses to comments on the Draft SEA (Appendix F), will be provided to all Board members prior to the public hearing for PAR 1113.

6-42 The commentator appears to infer that non-compliant coatings will be eliminated as a result of adopting and implementing PAR 1113, but no compliant coatings will become available. Based upon the number of future compliant coatings currently available (see Table F-1 in response to comment #2-1) and the fact that there is substantial time available to develop compliant coatings, especially for the final July 1, 2006 compliance date, it is likely that existing coatings may be reformulated using currently available resin technologies or completely new compliant coatings will be developed.

Further, the SCAQMD will conduct and complete a technology assessment one-year prior to the interim and final VOC content limits becoming effective. The technology assessment will evaluate the availability and feasibility of compliant coatings. Since the language regarding technology assessments is included in PAR 1113, the SCAQMD will be required to revise the VOC content limits or extend the compliance dates depending on the results of the technology assessment. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology. Furthermore, if during the technology assessment it is determined that changes are necessary to Rule 1113, the changes will be evaluated to determine CEQA applicability and, if necessary, a CEQA analysis will be prepared.

Based upon the above considerations, as well as the comprehensive analysis of potential adverse impacts of implementing PAR 1113 contained in Chapter 4, no significant adverse impacts were identified.

COMMENT LETTER #7

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

SOUTHERN CALIFORNIA

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County of Orange: [illegible]

County of Riverside: [illegible]

County of San Bernardino: [illegible]

County of Ventura: [illegible]

Printed on Recycled Paper

April 13, 1999

Mr. Darren W. Stroud
SCAQMD Headquarters
21865 E. Copley Drive
Diamond Bar, CA 91765

RE: SCAG Clearinghouse I9900112 Proposed Amended Rule 1113

Dear Mr. Stroud:

7-1

We have reviewed the above referenced document and determined that it is not regionally significant per Areawide Clearinghouse criteria. Therefore, the project does not warrant clearinghouse comments at this time. Should there be a change in the scope of the project, we would appreciate the opportunity to review and comment at that time.

A description of the project was published in the **April 1, 1999** Intergovernmental Review Report for public review and comment.

The project title and SCAG Clearinghouse number should be used in all correspondence with SCAG concerning this project. Correspondence should be sent to the attention of the Clearinghouse Coordinator. If you have any questions, please contact me at (213) 236-1917.

Sincerely,

J. DAVID STEIN
Manager, Performance Assessment
and Implementation

JDS:lj

COMMENT LETTER #7
Southern California Association of Governments
April 13, 1999

7-1 The SCAQMD acknowledges and agrees with the commentator that PAR 1113 is not a regionally significant project. The SCAG Clearinghouse number is I9900112.

PUBLIC CONSULTATION MEETING COMMENTS

March 31, 1999 and April 28, 1999
Public Consultation Meetings
(CEQA Comments)

The following are summaries of environmental impact-related comments received at either the March 31, 1999, or April 28, 1999 Public Consultation Meetings held for PAR 1113.

COMMENT #1: Exemptions need to be given for some categories or applications that do not perform at the lower VOC limits. Some coatings will be eliminated. These coatings protect workers around containment areas that have the possibility of an accidental release or spill.

RESPONSE #1: Please see response to comment #2-1 regarding the availability of future compliant coatings. Staff has also extended the interim compliance date to July 1, 2002, and the final compliance date to July 1, 2006.

The SCAQMD will conduct and complete a technology assessment one-year prior to the interim and final VOC content limits becoming effective. The technology assessment will evaluate the availability and feasibility of compliant coatings. Since the language regarding technology assessments is included in PAR 1113, the SCAQMD will be required to revise the VOC content limits or extend the compliance dates depending on the results of the technology assessment. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology. Furthermore, if during the technology assessment it is changes are necessary to Rule 1113, the changes will be evaluated to determine CEQA applicability and, if necessary, a CEQA analysis will be prepared.

Additionally, the SCAQMD has added three new categories (i.e., Essential Public Service Coating; Bituminous Roof Coatings; and Recycled Flats and Nonflats) to further define the differences in coating applications and the ability to achieve a certain compliance limit.

COMMENT #2: Conclusions in the Draft SEA are largely derived from marketing information and are not based on the NTS Study. The conclusions should be based on the study.

RESPONSE #2: Please refer to the response to comment #2-1.

COMMENT #3: Paints products are the largest amount of household hazardous waste generated. More of an effort needs to be made to recycle paints.

RESPONSE #3: The fact that paint products constitute a large portion of household hazardous wastes is an existing problem and is not expected to increase substantially as a result of implementing PAR 1113. In certain controlled situations, coatings applied in spray booths for example, excess water-based coatings can often be reused compared to solvent-based coatings that need to be disposed of properly. To the extent that PAR 1113 increases the usage of water-based coatings, disposal impacts could be reduced slightly.

It should also be noted that some jurisdictions that collect paints as part of household hazardous waste programs may mix together compatible and usable coatings for painting out graffiti.

For additional information please refer to the response to comment #5-27.

COMMENT #4: A concern was raised regarding the availability of compliant coatings that are suitable for wastewater treatment facilities.

RESPONSE #4: Staff has analyzed the use of the lower-VOC technologies for a variety of uses. The low- and zero-VOC industrial maintenance coatings are recommended for a variety of industrial uses, including but not limited to refineries, chemical facilities, food processing, pulp and paper manufacturing, bridge, pipeline, and wastewater treatment facilities. Staff can provide information on currently available coatings that could be used for wastewater treatment facilities. Nonetheless, staff has added an Essential Public Services
Coating category with an interim VOC limit of 340 g/l, effective July 1, 2002,which is higher than that of the general IM coating category.

COMMENT #5: Concerned with the cross-media impacts from the disposal of waterborne coatings.

RESPONSE #5: Please refer to the responses to comments #5-27 and #6-8.

COMMENT #6: Multi-component coatings are not appropriate for residential use. Specific NIOSH equipment should be used with 2-component systems. A residential user

does not understand this. Homeowners wear dust-preventive masks instead of masks that prevent organic vapors.

RESPONSE #6: It should be noted that two-component coating systems are already used in certain applications, e.g., industrial maintenance applications and such equipment requires training to achieve desired coating characteristics. Industrial maintenance coatings are typically not used by, or available to the residential do-it-yourselfer. In addition, such coating may not be used in residential settings.

COMMENT #7: The ecological burdens of Rule 1113 amendments depend upon the performance of the substitutes.

RESPONSE #7: The SCAQMD comprehensively analyzed potential adverse impacts from adopting and implementing PAR 1113. This analysis, contained in Chapter 4 of the Draft SEA, concluded that PAR 1113 is not anticipated to generate significant adverse environmental impacts. Consequently, no "ecological burdens" are expected as a result of implementing PAR 1113.

COMMENT #8: Concerns were expressed regarding a proposed prohibition on spraying two-component IM coatings containing diisocyanates (Rule 1113 §(d)(8)). The prohibition was proposed due to preliminary data suggesting adverse health effects from exposure to diisocyantes. Many speakers noted, however, that the chemistry of these systems make it unlikely that diisocyanate compounds would be emitted during the spraying process.

RESPONSE #8: The SCAQMD evaluated this issue by conducting a thorough technical literature search as well as contacting experts in the field. From this further research, the SCAQMD obtained a study conducted by Mobay (now Bayer) that provided monitoring results from the spraying of two a component IM system containing HDI poly-isocynate during the painting of a bridge and a chemical manufacturing plant. The results from the study are summarized below in Table F-8.

The results of SCAQMD's evaluation is the conclusion that a prohibition on the spraying of two-component IM coatings containing diisocyanates is not necessary. Further, since PAR 1113 restricts the use of IM coatings to IM settings, the public's exposure to these coatings are minimized. Accordingly, the SCAQMD does not expect that the spraying of two-component low VOC IM systems containing diisocyanates will expose the general public to acute significant adverse human health impacts.

TABLE F-8
SHORT-TERM ACUTE EXPOSURE
FROM THE SPRAYING OF A TWO-COMPONENT
IM SYSTEM CONTAINING HDI POLY-ISOCYNATE

Fleming Park Bridge, Neville Island, Pennsylvania		
Spraying Two-Component Polyurethane Intermediate Coat		
Sample Site	**Monomeric HDI (ppb)**	**HDI Poly-isocyanate (mg/m^3)**
Painter #1	2.4	2.5
Painter #2	1.9	2.2
Panter #3	4.1	5.2
Downwind 50 ft*	0.5	<0.02
Deck	0.6	0.09
Under the Bridge	<0.4	0.02
TLV/STEL	**20.0****	**1.0*****
Spraying Two-Component Polyurethane Top Coat		
Sample Site	**Monomeric HDI (ppb)**	**HDI Poly-isocyanate (mg/m^3)**
Painter #1	4.6	1.65
Painter #2	4.0	1.81
Mixer/Supervisor	0.7	0.03
Deck	<0.06	<0.03
In Truck	<0.06	<0.03
Under the Bridge 25 ft*	<0.07	<0.03
Under the Bridge 25 ft*	<0.07	<0.07
Under the Bridge 15 ft*	1.6	0.8
Downwind 50 ft*	1.3	0.8
Mixing Area	0.8	0.04
TLV/STEL	**20.0****	**1.0*****

TABLE F-8 (CONCLUDED)
SHORT-TERM ACUTE EXPOSURE
FROM THE SPRAYING OF A TWO COMPONENT
IM SYSTEM CONTAINING HDI POLY-ISOCYNATE

Mobay New Martinsville, WV Plant		
Spraying Two-Component Polyurethane Top Coat on Chemical Storage Tank		
Sample Site	**Monomeric HDI (ppb)**	**HDI Poly-isocyanate (mg/m^3)**
Painter	0.9	0.14
Painter Helper	<0.2	<.0.02
Downwind 25 ft* (North)	<0.2	<.0.02
Above Painters	<0.2	<.0.02
East 25 ft*	<0.2	<.0.02
Downwind 50 ft*	<0.2	<.0.02
West 15 ft*	<0.2	<.0.02
Upwind 15 ft*	<0.3	<.0.03
TLV/STEL	**20.0****	**1.0*****
Spraying Two-Component Polyurethane Top Coat on Waste Treatment Tank		
Sample Site	**Monomeric HDI (ppb)**	**HDI Poly-isocyanate (mg/m^3)**
Painter	0.9	0.16
Upwind 15 ft*	0.9	<0.04
Downwind 15 ft*	1.4	0.24
Downwind 35 ft*	<0.4	<0.04
STEL	**20.0****	**1.0*****

* Distances are average number of feet from spray gun.

**.ACGIH has established a Threshold Level Value as an eight hour Time-Weighted Average (TLV-TWA) for HDI of 5 parts per billion (ppb). Although Permissible Exposure Limits (PELs) have been established for several diisocyanate compounds, federal OSHA has not established on for HDI. Mobay (now Bayer) endorses the ACGIH's Short Term Exposure Limit (STEL) of 20 ppb for HDI. This concentration should not be exceeded not even for brief periods.

*** ACGIH and federal OSHA have not TLV-TWA or a PEL for HDI poly-isocyanates. However, Mobay (now Bayer) recommends a TLV-TWA of 0.5 mg/m^3 for HDI poly-isocyanates. Mobay (now Bayer) also recommends a short STEL (averaged over 15 minutes) of 1 mg/m^3 for HDI poly-isocyanates.

APPENDIX E

RESPONSES TO COMMENTS - STAFF REPORT

RULE 1113 - ARCHITECTURAL COATINGS
PUBLIC CONSULTATION MEETING
MARCH 31, 1999

PUBLIC COMMENTS/AQMD RESPONSES

1. REFERENCE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA MARCH 1, 1999

ISSUE:

...as an end-user of AIM coatings on critical components of the water delivery system, Metropolitan has concerns with respect to the availability of satisfactory, compliant AIM coatings once the rule becomes effective.

Available Replacement Coatings

1-1 ***Issue****: The SCAQMD is proposing amendments to Rule 1113 which include: adding a definition of "Industrial Maintenance Coatings"; and reducing VOC limits in specific AIM categories, including Industrial Maintenance coatings (from 420 g/l to 250 g/l, effective July 1, 2001, and from 250 g/l to100 g/l effective January 1, 2005). While supportive of the need to reduce VOC emissions (1997AQMP short term goal of 50% by the year 2010), Metropolitan has concerns regarding the timely availability of compliant coatings which meet field needs. As an essential public service, Metropolitan has the responsibility to ensure the reliability and safety of the water delivery system. Over the past thirty years, Metropolitan has established a rigorous performance testing program to evaluate all coatings and materials of construction prior to approval for use on Metropolitan's industrial structures, such as steel tanks, bridges, equipment, and concrete foundations. For a first generation coating to be accepted, the process involves two to three years of performance testing by Metropolitan's Engineering Division Materials and Metallurgy Section, followed by an additional three years of field testing in an actual field construction project. Therefore, as non-compliant coatings are phased out, it can take as many as six years for any new compliant coatings to be demonstrated as suitable for a public water service.*

RESPONSE:

Staff has considered the comments provided by end-users, coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing. In addition, the AQMD is committing to working on an additional technology assessment with the essential public service agencies. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

1-2 ***Recommendation****: To address the above concerns, Metropolitan recommends that the list of Industrial Maintenance Coatings, their VOC limits and phased effective dates, be modified to accommodate the critical needs of public services such as Metropolitan.*

RESPONSE:

The AQMD concurs with your recommendation, and therefore is extending the compliance dates, as well as committing to a technology assessment. Staff looks forward to working with MWD and other public agencies in designing the technology assessments. Furthermore, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage

2. REFERENCE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA MARCH 17, 1999

ISSUE:

Metropolitan continues to be supportive of the SCAQMD's goal. of reducing volatile organic compound (VOC) emissions from the application of architectural/industrial maintenance (AIM) coatings, and understands the approach of encouraging coatings reformulation towards zero-VOC coatings. In the third revised draft dated February 25, 1999, the SCAQMD has taken into account the cumulative input from industry and has added more coating categories, raised proposed VOC limits for some categories, and modified definitions. While these changes provide some relief in allowing end-users additional time to identify compliant coatings, Metropolitan continues to have concerns with respect to the timely availability of certain coatings which directly impact the ability to protect and prolong the life of Metropolitan's water delivery infrastructure.

Available Replacement Coatings

2-1 ***Issue:*** *The SCAQMD is proposing amendments to Rule 1113 which include: adding a definition of 14 "Industrial Maintenance Coatings"; and reducing VOC limits in specific AIM categories, including Industrial Maintenance Coatings (from 420 g/l to 250 g/l, effective January 1, 2002, and from 250 g/l to 100 g/l effective January 1, 2005). While supportive of the need to reduce VOC emissions (1997 AQMP short term goal of 50% by the year 2010), Metropolitan has concerns regarding the timely availability of compliant coatings which meet field needs. As initially expressed in the March 1, 1999 comment letter, Metropolitan's key concern is that sufficient time is provided to allow for identification and performance testing of new, compliant coatings and for approval of their use on industrial structures, such as steel tanks, bridges, equipment, and concrete foundations. It can take as many as six years for a new compliant coating to be demonstrated as suitable for public water service. Once the new coating has been proven to be acceptable, it is placed on Metropolitan's "approved list", which is also relied upon by Metropolitan's Member Agencies.*

RESPONSE:

Staff has considered the comments provided by end-users, coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing. In addition, the AQMD is committing to working on an additional technology assessment with the essential public service agencies.

2-2 ***Recommendation****: To address the above concerns, Metropolitan recommends that the list of Industrial Maintenance Coatings, their VOC limits and phased effective dates, be modified to accommodate the critical needs of public services such as Metropolitan...By gradually reducing the VOC limits of the above coatings categories, and providing phased effective dates, sufficient time would be allowed for Metropolitan to identify and test new compliant coatings for these critical applications.*

RESPONSE:

The AQMD appreciates the proposed additional coating categories, as well as MWD's recommendations for VOC limits and future compliance dates. However, the AQMD believes that the specific categories detailed in your letter, specifically immersion coatings, coating for exterior exposure to structural steel, and direct burial in soil, compliant coatings are available today. The AQMD has found coatings that are currently available for the interim (July 1, 2002) limit and for the final (July 1, 2006) limit. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

Available Repair Coatings

2-3 ***Issue****: Currently, Metropolitan has many structures that are coated with solvent borne coatings. Over time, these structures will require patch repair and maintenance using a compatible coating system. In order to maintain manufacturer warranty of the coating, the same solvent borne coating that was originally applied, or a repair coating approved by the manufacturer would need to be utilized. Once PAR 1113 becomes effective, these coatings may not meet the required VOC limits. The alternative to utilizing the original coating would be complete removal and recoating of the entire structure, which would most likely result in release of a higher VOC volume overall.*

RESPONSE:

The AQMD recommends, as a part of the future technology assessments, to evaluate compatibility of currently available compliant coatings with existing coatings on the structure. The AQMD has identified various coatings that indicate compatibility with a variety of coatings. For limited touch-up and repair work, the rule contains a small container exemption (Rule 1113 (g)(1)(A)) that allows the availability of non-compliant coatings for limited maintenance work. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage

2-4 ***Recommendation****: To address the above issue, Metropolitan recommends that end-users be allowed to purchase and use the original coatings (i.e., solvent-borne coatings) to repair and maintain structures with existing coatings after the amendments to Rule 1113 become effective. Such an approach would promote overall VOC reduction for such activities. Metropolitan is committed to reducing VOC emissions in accordance with PAR 1113 activities. Metropolitan has been in contact with manufacturers of candidate lower VOC coatings, and a visit to Park Water Company is planned for later this week to observe and evaluate their "zero VOC" coating operations. Metropolitan also remains very interested in pursing cooperative efforts with the SCAQMD to review/share performance testing results and/or test coatings at our corrosion control lab.*

RESPONSE:

The AQMD appreciates the effort MWD is placing on evaluating compliant products, and would like to offer assistance in identifying specific coatings or manufacturers that have compliant coatings. See Response to Comment 2-3 for additional information on repair and maintenance coatings.

3. REFERENCE ALLIANCE OF MOTION PICTURE & TELEVISION PRODUCERS MARCH 24, 1999

ISSUE:

On behalf of the Environmental Committee of the Alliance of Motion Picture and Television Producers (AMPTP) I am writing to you to provide our input regarding the proposed changes to Rule 1113 - Architectural Coatings. The Studio membership of the AMPTP includes Disney, Fox, MGM, Paramount, Sony, Universal & Warner Bros. The Environmental Committee is not opposed to the proposed volatile organic compound (VOC) reductions for the following coatings: Floor, Industrial Maintenance, Nonflats, Primers, Sealers and Undercoaters, Quick-Dry Primers, Sealers and Undercoaters, Roof, and Rust Preventative.

3-1 The Environmental Committee is concerned about the proposed VOC reductions for Quick-Dry Enamels. These products are used extensively for the painting of motion picture and television sets. Our experience, and extensive testing, has shown that Quick-Dry Enamels with a VOC content of less than 250 grams per liter (g/l) simply do not work for our applications. In the motion picture and television industry, there are constant, rapid changes made to the appearance of sets. The decisions for these changes are made by any of a number of individuals including the Director, Art Director, Set Designer, and others. The ability to make these rapid changes is crucial to the successful completion of all productions. Quick-Dry Enamels which have less than 250 g/l of VOCs tend to be non- blocking (i.e, they stick together). They also have strong odors which elicit complaints and people will decline to work in the same room when they are being applied or drying. We have worked very closely with the manufacturers and vendors of Quick-Dry Enamels and we do not believe that they will have products that are suitable for our needs which contain less than 250 g/l by the year 2002 or 2005. Accordingly, we ask that you do not lower the Rule 1113 VOC limit for Quick Dry Enamels below 250 g/l.

RESPONSE:

In response to comments received, the AQMD is proposing an interim limit of 250 g/l for the quick-dry enamels. However, the AQMD has identified numerous non-flat coatings that comply with the gloss level and dry times of a quick-dry enamel. Therefore, the AQMD is still proposing a final compliance limit of 50 g/l, effective July 1, 2006. This provides seven years for additional testing and refinement of coatings that are currently available.

4. REFERENCE DEPARTMENT OF WATER RESOURCES
MARCH 29, 1999

ISSUE:

4-1 DWR recognizes and supports SCAQMD's goal of reducing volatile organic compound (VOC) emissions from architectural/industrial maintenance coatings (AIM). However, as an end-user of AIM coatings on critical components of DWR's delivery systems, there is a major concern with the availability of satisfactory compliant AIM coatings once the rule becomes effective. Loss of use of current coatings would result in excellerated damage to pipelines and machinery used to convey water; and jeopardizing reliable water delivery to much of Southern California.

Therefore, we urge the SCAQMD to continue allowing the use of coatings with the higher VOC limits until such time that new coating can be developed and tested for their performance. Any additional lowering of VOC limit will be contingent upon the satisfactory performance of the lower VOC material actually applied to structures in the field.

RESPONSE:

The AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits. We encourage the Department of Water Resources to conduct their own technology assessment to evaluate currently available coatings for their specific uses. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage

5. REFERENCE PDCA
APRIL 1, 1999

ISSUE:

The following are PDCA's recommended changes to the March 19, 1999 Revised Proposed Draft toRule 1113 -Architectural Coatings which are in addition to PD CA's recommended changes dated
February 24, 1999:

5-1 (b) Definitions
(21) Industrial Maintenance Coatings
ADD (E exterior exposure of metal structures and equipment.
ADD (F) interior exposed concrete, metal structures and equipment where process mechanical equipment and piping are present

RATIONALE:
This added language completes the definition as currently used in the industry. The term Exterior Exposed Structures needed to be clarified to include equipment that is in or around those structures. Also, the term Interior Exposed needs to be added to include structures and equipment that need the protection from chemical and product spills as well as wash downs that occur in process or conveyance areas.

RESPONSE:

The AQMD feels that the current definition for industrial maintenance coatings covers both of the specific exposures the commentator is referencing. Specifically, the proposed definition lists a variety of environmental conditions, including exterior exposure of metal structures and chemical exposure.

5-2 (d) Administrative Requirements

DELETE (8) Industrial Maintenance Coatings - Two-Component Polyurethanes
Effective January 1, 2005, industrial maintenance coatings comprised of two-component polyurethane resins shall be applied using roller or brush only. Spray application is prohibited.

RATIONALE:

Eliminate paragraph (d-8) Industrial Maintenance Coatings. This paragraph would eliminate most two-component polyrethanes because most of them need to be spray applied. This would also eliminate all the high (60-250 mil) build two-component urethanes which must be spray applied and are used extensively for the protection of steel tanks and concrete hydraulic structures where abrasion and chemical levels are high.

RESPONSE:

In response to comments, as well as additional information collected to mitigate the concerns to the general public pertaining to use of two-component polyurethane coatings, the AQMD has removed this provision from the proposed rule. For a more detailed explanation, please refer to the response 1-2 of the Comments and Responses Section of the Subsequent Environmental Assessment Report.

5-3 PDCA recommends again, as it did in its December 30, 1998 letter and February 24, 1999 letter, that SCAQMD withhold its proposed VOC reduction limits until industry and SCAQMD have studied and discussed the results of both the joint SCAQMD performance study currently being conducted by National Technical System (NTS) and the California Air Resources Board (CARB) study. Therefore, PDCA recommends, in the strongest possible terms, that the May 14, 1999 staff presentation to the Board be moved to at least August 1999 to allow time for these studies to be completed, reviewed and evaluated.

RESPONSE:

The 1998 CARB survey has been completed and forwarded to industry members. The laboratory testing of the NTS study is also complete. This study analyzed application and durability characteristics in greater detail, and the results show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including, but not limited to, coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of the zero-VOC coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments.

The results were initially forwarded and discussed with the Technical Advisory Committee, comprised of members from the Industry, on April 12, 1999. A summary of the study was presented to the AQMD Governing Board's Stationary Source Committee, which is attended by the public, and a summary of the results were passed out to the public. Members of the architectural coatings industry were present at the last meeting, held on April 23, 1999. Subsequent discussions with the Technical Advisory Committee regarding the interim report were conducted on April 26, 1999. Finally, the summary of the Phase II Assessment Study results were presented to the public at the working group meeting on April 28, 1999. This summary is included as Appendix G of the Staff Report.

6. REFERENCE BENJAMIN MOORE & CO.
APRIL 2. 1999

ISSUE:

We were a charter member of the National AIM VOC Reg/Neg and stand by our need for National Rule uniformity, at least in terms of Rule language, definitions, labeling and administrative requirements.

6-1 We concede there may be special environmental considerations in the South Coast AQMD and the fact that the US Congress acceded to states rights on the issue of preemption. Therefore we acknowledge the need for a different table of standards than in the National Rule. We do not however abrogate our right and responsibility to our customers, your citizens, to the best top quality paint we can produce. As a consequence we cannot agree to the proposed PAR 1113 as it now stands. Besides lack of uniformity with the national rule, it sets limits so low that by the current definition and testing methodology the rule cannot be enforced. We cannot manufacture compliant product, and in fact we are penalized for some water based products that have the very additives you quote in your justification for these low limits.

We are willing to negotiate with the SCAQMD on a realistic set of limits for VOC, in the can, and are willing to participate in a workable averaging program at a realistic VOC level. The staff proposals to date are not responsive to this position.

We have low VOC (in the can) products but contrary to your report our "0" VOC technology was a marketing failure and has been withdrawn from sale. At current VOC levels Benjamin Moore & Co. can and is doing business in the South Coast providing high Quality products to our customers. However, at the proposed VOC limits we can provide only second and third quality level product with untestable VOC content. This will force Benjamin Moore & Co. out of the paint business in the SCAQMD.

RESPONSE:

We appreciate and thank Benjamin Moore & Company in its recognition of the special environmental conditions present in the South Coast Air Basin, and the areas need for more stringent VOC limits. The AQMD would appreciate Benjamin Moore & Co.'s, as well as any other coatings manufacturers' recommendations for future VOC limits. However, even after numerous requests for this type of feedback from Benjamin Moore & Co., as well as other coatings manufacturers, and the National Paint & Coatings Association, the AQMD has not received any specific proposals regarding recommended VOC limits for the nine coating categories included in the current proposal. The AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits.

The AQMD has found numerous zero-VOC coatings, including zero-VOC products offered by the commentator. Other companies continue to market their zero-VOC coatings. The AQMD would

like to emphasize that the future limits are not proposed below 50 g/l, allowing for the use of some co-solvent.

Nonetheless, the AQMD has added an Averaging compliance option to provide additional compliance flexibility for coating manufacturers, which allows a manufacturer to average their emissions from a long list of coating categories. This provision would allow the manufacturer to continue selling a line of coatings that may not comply with the actual VOC limit, by offsetting those emissions with sales of coatings that are below the compliance limits. Some manufacturers have recognized the potential cost savings of this flexible approach. In addition, the AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

6-2 We endorse postponing the presentation of the PAR 1113 to the Board till all the data is in on product quality(NTS Study) and a more reasoned and complete discussion has been held on the proposal. We also wholeheartedly endorse dropping the very speculative 2005 table of standards which can't be proven technologically feasible today contrary to your list of expert manufacturers and users of paint.

RESPONSE:

The laboratory testing of the NTS study is complete. This study analyzed application and durability characteristics in greater detail, and the results show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including, but not limited to, coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of the zero-VOC coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments. Nonetheless, as a result of comments provided by industry, staff has raised the interim and final limits for some categories, as well as extended the interim and final compliance dates by up to an additional 18 months.

The AQMD disagrees that the final limits are speculative. The commentator is encouraged to review the technology discussed in detail for each coating category in the staff report, as well as the comprehensive list of coatings included as Appendix D of the Subsequent Environmental Assessment.

7. REFERENCE THE BETTER PAINT TRAY LLC
APRIL 2, 1999

ISSUE:

7-1 Unlike Robert Wendell and the group at large, we do not think that section C-5 addresses the problem sufficiently. The entire focus of this group is addressed toward the professional painter when in actuality the bulk of material applied to a surface is done so in a secondary market—homeowners doing maintenance, repair and repaint. As manufacturers of a industry related item, we enjoy a unique perspective of the industry. We understand the position of the manufacturers of coatings, and a general reluctance of regulation of any kind. As patents on paint trays with lids go back at least two decades, there is a historical reluctance on the part of the coatings industry to accept this technology. We feel that that is a deceptive position, when in fact the largest category of paint trays sold are sold to the Do-It-Yourselfer as kits and are sold in reclosable paint trays-nationally some 180 million units annually.

RESPONSE:

The AQMD agrees with the commentator that almost 50% of the total paint usage is by the do-it-yourself user, and the other half is used by professional painting contractors. The AQMD fully supports any measures that support reduction of VOC emissions, as well as overall pollution prevention.

The AQMD plans to conduct outreach efforts as a part of the implementation plan. This outreach effort will incorporate pollution prevention measures related to the use of architectural coatings.

7-2 Section C-5 needs to be expanded and clarified to include "All architectural coating containers, used to apply the contents therein to a surface direct from said container by pouring, siphoning, brushing, rolling, padding, ragging or other means, shall be closed with their own lid when said application is interrupted, delayed or transfer of said contents is completed. These architectural coating containers include, but should not be limited to: drums, buckets, cans, pails, trays or other application containers."

RESPONSE:

The AQMD has revised paragraph (c)(5) to minimize release of VOCs or to minimize evaporation of paint when these coatings are not being applied.

8. REFERENCE CHEVRON PRODUCTS COMPANY
APRIL 7, 1999

ISSUE:

Your adjustment of the VOC limits in this category will allow us to continue to use our Temperature Indicating safety paints, ensuring safe operations in the Refinery.

Chevron would like to additionally comment on the proposed Industrial Maintenance Coating VOC limits to be imposed in the years 2002 and 2005. The District proposes to lower the limit in this category from 420 to 250 VOC's in the year 2002, and eventually down to 100 VOC's in the year 2005.

8-1 I have enclosed some confidential information from our Corporate Coatings Manual to illustrate some major problems that we face if the VOC limits are lowered in 2002 and 2005. This Manual contains our approved list of coatings used in the Refinery for painting steel structures, tanks, 9-1 furnaces, vessels, etc. I have highlighted the paints that we will not be allowed to use if the present proposed amended rule is approved. If you review the list you will see that almost every paint we use in the refinery to paint any kind of structural steel facility will not be allowed in 2002 or 2005.

RESPONSE:

The AQMD thanks the commentator is providing detailed information regarding the current specified paints for their facilities. However, the AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006, including high performance industrial maintenance coatings. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits. We encourage the commentator to initiate their own technology assessment to evaluate currently available coatings for their specific uses. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

Many of the manufacturers that you currently have in your list actually have compliant products available with both the interim and final compliance limits. Some of these products were tested in the National Technical Systems study. The results indicated that the currently available coatings that comply with the final limit perform as well as, and in some performance characteristics, better than the higher-VOC coatings widely used today. Generally, the Industrial Maintenance Coatings evaluated in this study performed well for durability characteristics, as well as for their application characteristics.

8-2 I have reviewed the paints we use to paint tanks and have determined that 21% of the paints we use for tank coating will not be allowed under the current limit of 420 VOC's. Another 73% will drop out in 2002, and the final 6.3% will drop out in 2005. In other words, none of the paints in our approved listing for tank coating will be allowed in 2005. This leaves us with no paint alternative for tank coating. Similar problems will arise with coatings for vessels, exchangers, furnaces, piping, etc. High Performance Industrial maintenance coatings are needed to prevent corrosion and to maintain our equipment in good operating order.

These proposed limits could greatly hinder our ability to maintain our equipment in good order.

RESPONSE:

There are currently coatings available for the different substrates and environmental conditions that you describe. In response to comments received from industry, the AQMD has extended the compliance dates by up to 18 additional months to provide necessary time for additional laboratory and field testing that end-users would like to conduct prior to specifying the new coatings for use. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

9. REFERENCE THE FLECTO COMPANY, INC.
APRIL 9, 1999

ISSUE:

9-1 The main concern of The Flecto Company, Inc. is in the definitions and specifically the definition concerning the new category "Floor Coatings". There is currently a significant difference between the definition in the Architectural and Industrial Maintenance Rule developed by the Federal EPA and the SCAQMD definition modification. The federal AIM definition pertains to pigmented coatings for porches, floors, and decks and is specific in its reference to the exemptions of "Varnishes". The current version of the new definition in the SCAQMD does not make this reference but we feet that it should to achieve a consistent approach. Since it appears that you are addressing more control of the Industrial Maintenance Categories as one of your chief goals, we believe this definition modification is also consistent. Varnishes sold through small and large retail outlets are generally sold for Do-It-Yourself (DIY) projects with more limited application for Industrial Maintenance.

RESPONSE:

Staff is proposing to add the definition of "Floor Coatings" as stated in the National AIM Rule. Staff has revised the definition to clarify that this category is for **opaque** floor coatings with the proposed limit of 400 g/l, effective upon rule adoption with a 100 g/l limit effective July 1, 2002, and a further reduction to 50 g/l effective July 1, 2006. The varnishes, and other clear floor coatings, will remain at the current VOC limit for clear wood finishes.

9-2 In labeling, some of these Varnishes will carry recommendations specifically for Floors or be labeled as a "Floor Finish" as the primary end use. This may be confusing to man), even if the "Floor Coating" definition is modified to include the term pigmented. A clarifying statement for inclusion in the Rule is suggested. This statement would spell out that the Varnish VOC will be limited under the Varnish Category even if a Flooring application is recommended.

RESPONSE:

As suggested, staff is proposing to revise the definition of "Floor Coatings" to limit the definition to opaque floor coatings only, as stated in the National AIM Rule, for consistency and to reflect the state of the technology.

9-3 Lastly, our data submitted for consideration under the last Architectural Coating Survey was submitted as Varnish Information, as I suspect most of our competitors have done, and was not included in the Floor Coating category. Therefore, the VOC affect based on the survey data will be as you have predicted. It seems that this wording change would clarify and highlight the coatings you would like to limit without a change in the quantities of VOC reduction.

RESPONSE:

The AQMD recognizes the reporting for the 1998 CARB survey, and therefore, has not revised the emission reductions estimates from this category.

10. REFERENCE CITY OF PASADENA POWER SUPPLY BUSINESS UNIT
APRIL 14, 1999

ISSUE:

10-1 To the best of PWP information, there are no known reduced VOC coatings (i.e. < 420 grams/liter) that are proven to adequately protect its electrical equipment. PWP is concerned that lower VOC coatings will allow electrical equipment to corrode earlier and result in either premature failure (i.e. extreme corrosion or possibly arcing to ground fault or even catastrophic explosion) or having to clean and re-coat much sooner.

In addition, when electrical equipment needs to be cleaned and coated in the field, the power must be turned off for certain business and industrial customers. Therefore, for these companies it is critical to apply industrial maintenance coatings that dry within one work shift that is considered to be eight and one half hours. Furthermore, these customers do not want their power to be interrupted again for a long time, so PWP applies coatings that protect for 10 years or more. Therefore, PWP requests an exemption to retain the 420 grams/liter limit for coating its electrical equipment.

RESPONSE:

The AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006, including high performance industrial maintenance coatings recommended for electrical equipment. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits. We encourage the commentator to initiate their own technology assessment to evaluate currently available coatings for their specific uses. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

A total of twenty zero-, low-, and high-VOC coatings were tested by National Technical Systems to evaluate their application and durability characteristics. The results indicated that the currently available coatings that comply with the final limit perform as well as, and in some performance characteristics, better than the higher-VOC coatings widely used today. Generally, the Industrial Maintenance Coatings evaluated in this study performed well for durability characteristics, as well as their application characteristics. Specifically, to your dry time concerns, most of the zero-VOC and low-VOC coatings actually had shorter dry times when compared to higher-VOC coatings.

Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage

10-2 PWIP requests the following reduced VOC content limits for coatings which fall under the Industrial Maintenance Coatings classification (not including coatings for electrical equipment identified above).

Current	*420*
2004	*350*
2005	*250*

These reduced VOC content limits in years 2004 and 2005 would only become effective if a field testing indicates satisfactory replacement for the currently allowed 420 grams/liter coatings. The testing should be done for a minimum of two years jointly with utilities.

RESPONSE:

The AQMD thanks the commentator for the specific recommendation for future VOC limits. However, the AQMD staff has identified numerous industrial maintenance coatings that comply with both the interim and final proposed limits. A comprehensive list of these coatings, including industrial maintenance coatings, is included in Appendix D of the Subsequent Environmental Assessment. Nonetheless, as a result of comments provided by industry, staff has raised the interim and final limits for some categories, as well as extended the interim and final compliance dates by up to an additional 18 months. This revision results in a total of seven years for necessary laboratory and field testing. In addition, the AQMD is committing to working on an additional technology assessment with the essential public service agencies.

Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

10-3 The PAR 1113 allows the manufacturers to manufacturing non-compliant coatings and comply with the VOC content limits by manufacturing compliant coatings whereby the overall average VOC content is in compliance with the VOC limit. However, the end user may not be able to benefit from this plan because the manufacturer may not produce enough non-compliant coatings available for projects at the time they are needed. Currently, averaging is limited only to coatings selected by the manufacturer and covers a period it specifies. Therefore, if coatings needed for usage on critical structures were not identified in the manufacturer's previously submitted plan, the averaging provision would not be of benefit. In addition, the manufacturer may demand an exorbitant cost to provide the non-compliant coatings.

PWP recommends that the VOC content limits stated in the first two bullets above be adopted to help remedy this situation.

RESPONSE:

The AQMD has been in several meetings with numerous coating manufacturers to revise the Averaging Compliance Option, including the formula used to calculate emissions, and streamlining

the Program submittal, approval, modification, and renewal requirements. The coating manufacturers have worked diligently with the AQMD to revise the language, and look forward to the flexibility provided by the Averaging Compliance Option. The AQMD would like to encourage end-users to approach coating manufacturers to ensure that they have available, for any highly specialized uses, coatings that do not comply with the Table of Standards. Your comment pertaining to the exorbitant cost for non-compliant coatings is speculative. Compliance with the averaging compliance option is expected to be less costly for the manufacturers compared to having to reformulate all their products. Such benefits are expected to be passed on to the end user, under competitive free market conditions. The AQMD has identified industrial maintenance coatings that work in variety of environmental conditions, and encourage the commentator to evaluate the technology available today, and rely on the availability of non-compliant coatings on a limited basis.

10-4 PWP requires that potable water immersion coatings be National Sanitation Federation (NSF) compliant. PWP requests that SCAQMD make available list of manufacturers whose coatings tested in the National Technical Systems study are NSF certified. This information should not be considered SCAQMD recommendation list.

RESPONSE:

AQMD staff has identified numerous manufacturers of immersion coatings that comply with the proposed VOC limits and have NSF and ANSI approval for use for potable water storage. Examples include United Coatings, Madison Coatings, Poly-Brid, and Zebron. There may be additional manufacturers of compliant immersion coatings approved for potable water use.

10-5 PWP requests that the "Industrial Maintenance Coatings" definition be amended to include substrates that are exposed to the moisture that dielectric insulating oil picks up from air. This oil is contained in tanks, circuit breakers, and transformers. PWP recommends that subparagraph (b)(21)(A) should be changed to read:

(A) immersion in water, <u>dielectric insulating oil</u>, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moister condensation;

RESPONSE:

The AQMD believes the definition of industrial maintenance coatings, with the different environmental conditions, is broad enough to include exposure to dielectric insulating oil. Therefore, further modification is not warranted at this time.

10-6 The current and "effective date of adoption" VOC content limits were not included for the "High Temperature Industrial Maintenance Coatings" category. We recommend that these VOC limits be included.

RESPONSE:

The rule language has been clarified to reflect that the VOC content for "high temperature industrial maintenance coatings" will be lowered to 550 g/l, effective July 1, 2002, and further lowered to 420 g/l, effective July 1, 2006. There is no current VOC limit, and a new VOC limit will not be established until July 1, 2002.

10-7 Paragraph (g)(2) states that the VOC content limit of 350 grams/liter for "Quick-Dry Primers, Sealers, and Undercoats" does not apply to the end user of the coating provided that the manufacturer submits an annual report to SCAQMD pursuant to this paragraph. PWP requests that SCAQMD explain how the end user will be informed that the report was submitted whereby the VOC content limit of 350 grams/liter will not apply to the end user.

RESPONSE:

Compliance with this provision is verified by the inspector when a quick-dry primer, sealer, and undercoater is sold or used by checking the database of manufacturers that submit the reports. If an end user plans on using a quick-dry primer, sealer, and undercoater which is higher than the currently 350 g/l VOC limit, they should contact the manufacturer to verify that the manufacturer is in compliance with paragraph (g)(2). If the manufacturer has not submitted a report, the end user should not use that manufacturer's product, since they would also be in noncompliance with Rule 1113.

10-8 Paragraph (d)(8) prohibits the spray application of "Two-Component Polyurethane Resins" starting January 1, 2005 and requires that it must be applied using roller or brush only. This prohibition is meant to protect the workers and public from adverse health effects.

Roller or brush application is much slower then spraying and can not cover surface areas nearly as well as spray coating can. Therefore, PWP applies these coatings by spray application. PWP adequately protects its workers by requiring them to wear protective suits with an air supply. For the public, the PWP recommends that the SCAQMD determine by a study if there are adverse public health effects and publish the report for comment by industry.

RESPONSE:

In response to comments, as well as additional information collected to mitigate the concerns to the general public pertaining to use of two-component polyurethane coatings, the AQMD has removed this provision from the proposed rule. For a more detailed explanation, please refer to the response 1-2 of the Comments and Responses Section of the Subsequent Environmental Assessment Report.

10-9 Paragraph (g)(4) states that the January 1, 2005 limit for lacquers shall not apply until January 1, 2007 and the July 1, 2008 VOC limit for flat coatings shall not be applicable to any manufacturer that meets certain criteria listed in this paragraph. However, the PAR 1113 does not allow the end user to use these exempt coatings. The PWP requests that the PAR be amended to state that the end user is allowed to use exempt coatings. In addition, PWP recommends that the labeling of these coatings state this exemption.

RESPONSE:

This specific exemption was included in the rule amendments to Rule 1113 adopted in November 1996. This exemption was specifically offered to mitigate some socio-economic impacts on small manufacturers of these lacquers. These small manufacturers have not expressed that they plan on utilizing this exemption, as the smaller manufacturers have lacquers that comply with the proposed January 1, 2005 limit for lacquers. The labeling requirements you propose may place additional costs on manufacturers that may utilize this exemption.

10-10 PWP recommends that the end user be allowed to use repair and maintenance coatings the same as that originally used for up to 25 percent of the surface area previously coated. In order to maintain manufacturer warranty of the original coatings, the same coatings that was originally applied, or another repair coating approved by the manufacturer would need to be used. However, the repair coatings may not meet the reduced VOC limits. Therefore, to repair the structure would require removing all the existing coating and coat the entire structure resulting in higher VOC emissions.

RESPONSE:

The AQMD recommends, as a part of the future technology assessments, to evaluate compatibility of currently available compliant coatings with existing coatings on the structure. The AQMD has identified various coatings that indicate compatibility with a variety of coatings. For limited touch-up and repair work, the rule contains a small container exemption (Rule 1113 (g)(1)(A)) that allows the availability of non-compliant coatings for limited maintenance work. Additionally, allowance of up to 25 percent of the surface area per year for repair would indicate that the entire structure could be painted every four years. The AQMD believes that if up to 25% of surface area of a coated substrate needs maintenance, there is a significant problem with the original coating or the application of the original coating, and maybe the whole substrate should be properly prepared and recoated with a coating that would provide a more reasonable service life. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

10-11 The PAR 1113 allows the end user to use existing (already purchased) non-compliant coating for three years after the VOC limit is reduced. However, coatings such as latex and enamel coatings only have a shelf-life of approximately one year so that the end user cannot benefit from the last two years of this grace period.

RESPONSE:

The AQMD has numerous data sheets that indicate shelf life ranging from one year to three years, depending on the specific coating and manufacturer. This three year time frame was requested by manufacturers, based on their own stability tests and shelf life evaluations.

11. REFERENCE COUNTY OF ORANGE INTEGRATED WASTE MANAGEMENT DEPARTMENT APRIL 14, 1999

ISSUE:

11-1 The Integrated Waste Management Department (IWMD) opposes the SCAQMD Proposed Amended Rule 1113 - Architectural Coatings. As it currently stands, the rule will negatively impact the Household Hazardous Waste Collection Program (HHWCP) and its recycled latex program in the year 2001 when the 100 grams per liter VOC testing goes into effect. Further, the current proposed changes eliminate the HHWCPs option to expand the recycled latex paint program to include other paint products. IWMD strongly urges the SCAQMD to exempt HHWCP recycled paint programs from Rule 1113.

RESPONSE

The AQMD is creating a new category called "recycled flats and non-flats" (paragraph (b)(37)) and proposing a VOC limit of 250 g/l upon rule adoption. The VOC content will then be lowered to 100 g/l effective July 1, 2006, which should provide ample time for the paints collected at HHWCPs to reflect the new limits adopted four to five years prior to the implementation of the new limit. Reporting requirements for recycled flats and non-flats will be established to track total recycled paint usage.

11-2 Rule 1113 requires a higher level of testing for the paint sent to the manufacturer for reprocessing. This added cost would effectively eliminate the recycled paint program for financially prudent, if not environmentally sound, reasons. The elimination of this program would have an adverse impact on the cities and non-profit organizations that realize such significant benefits from the free recycled paint.

In addition, IWMD consistently seeks further means for reusing and recycling the materials brought to the HHWCP. The current proposed amendments to Rule 1113 would eliminate IWMDs options to include other paint products in the recycled paint program. The best solution to this issue would be to provide an exemption from Rule 1113 for programs that remove these products from the waste stream and seek means of reusing them in the manner for which they were originally produced.

It is our understanding that SCAQMD is conducting testing of recycled paint and has agreed to include IWMDs paint in the test. Staff has indicated that some consideration may be given to recycled paint. IWMID strongly urges the SCAQMD to exempt HHWCP recycled paint programs from compliance with Rule 1113.

RESPONSE

The AQMD is currently conducting a laboratory analysis of a sample obtained from IWMD's recycled paint program. Future random samples will be collected and tested to track the actual VOC content of recycled flats and nonflats collected at HHWCP, *pro bono*. Furthermore, the recycled paint category includes both flats and nonflats to allow IWMD's efforts in expanding their recycled paint program.

12. REFERENCE DOT (Cal Trans) ENGINEERING SERVICE CENTER
APRIL 14, 1999

ISSUE:

This correspondence contains a summary of Caltrans comments to Proposed Amended Rule 1113, Architectural Coatings (PAR 1113), and a request for additional modifications to PAR 1113. Caltrans believes these modifications are necessary so that we can continue to maintain portions of the transportation system in the Los Angeles area within our realm of responsibility.

Caltrans, shares the concerns of the SCAQMD regarding the impact volatile organic compounds (VOC) contained in industrial maintenance coatings have on air quality. Since 1978, we have been Striving to utilize protective coatings with VOC contents less than 250 g/L, the ultimate limit proposed in 1978. This effort has entailed extensive evaluations of available low-VOC coatings from industrial coating suppliers and in-house formula development utilizing recommendations from raw material suppliers when available coatings have not met our requirements. Our efforts have been quite successful with over 90% of our current coating usage meeting the 2003 proposed limit.

The average VOC for all of our industrial maintenance coating use for 1998 was less than 200 g/L. Unfortunately, despite our best efforts, we still need to use coatings with higher VOC levels for isolated areas on most structures and for a few structures located adjacent to the coast.

12-1 We currently have no replacement products for these higher VOC coatings. We estimate that it will take us a minimum of 3 to 6 years to evaluate and fully implement compliant coatings for these uses assuming such coatings are available today.

RESPONSE:

The AQMD commends Caltrans in its proactive approach to maximize emission reductions from its use of architectural and industrial maintenance coatings. In response to the need for some specialty coatings, Caltrans is encouraged to contact coating manufacturers of those specialty coatings to take advantage of the Averaging Compliance Option. However, the AQMD also encourages Caltrans to participate in the testing of currently available technology for those specialty uses. These specialty use coatings (e.g. urethane coatings) are available from numerous coating manufacturers, in both single component and two-component formulations. Lastly, the AQMD is committing to working on an additional technology assessment with the essential public service agencies assess the technology available today.

Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

12-2 Consequently, we request that the implementation date for the 250 g/L requirement be extended to January 1, 2005. This date should be contingent upon a thorough review to ensure acceptable performance of these coatings as applied under field conditions prior to the effective date. We further request a delay in implementing a reduction to 100 g/L until at least 2008 to allow sufficient time to evaluate compliant coatings without interfering with evaluations of the 250 g/L coatings.

RESPONSE:

See Response to Comment 4-1.

12-3 If the implementation dates cannot be delayed, Caltrans has an alternative suggestion. PAR 1113 contains an averaging provision that would allow manufacturers of protective coatings to offset sales of higher VOC coatings with sales of lower VOC coatings under specified requirements.

We could comply with the 250 g/L limit today if this provision were allowed for end users. We would be willing to maintain and provide records of coating use to the SCAQMD to show that the average VOC for our total coating use within the district meets the specified limits.

RESPONSE:

The AQMD has evaluated programs to allow end users to average their emissions. However, the process has proven, especially for VOC sources, to be tedious and cumbersome, and not considered enforceable without the cumbersome requirements. Furthermore, allowing end users to average their emissions will potentially result in double counting of the emission reduction benefits to be achieved by the manufacturers subject to averaging problems.

13. REFERENCE DWP, CITY OF L.A.
APRIL 14, 1999

ISSUE:

13-1 LADWP reiterates its position stated in its January 26, 1999 letter to you that there are no known reduced VOC coatings (i.e., < 420 grams/liter) that are proven to adequately protect its electrical equipment. LADWP is concerned that lower VOC coatings will allow electrical equipment to corrode earlier and result in either premature failure (i.e., extreme corrosion or possibly arcing to ground fault or even catastrophic explosion) or having to clean and re-coat much sooner.

In addition, when electrical equipment needs to be cleaned and coated in the field, the power must be turned off for certain business and industrial customers. These companies lose money for each day they must shut down during power interruption. Therefore, for these companies, it is critical to apply industrial maintenance coatings that dry within one work shift that is considered to be eight-and-one-half hours. Furthermore, these customers do not want their power to be interrupted again for a long time, so LADWP applies coatings that protect for 10 years or more such as the ones it is currently using (i.e., coatings identified in our January 26, 1999 letter to you).

RESPONSE:

See Response to Comment 10-1.

13-2 Therefore, LADWP requests an exemption to retain the 420 grams/liter limit for coating its electrical equipment.

RESPONSE:

See Response to Comment 10-1.

13-3 LADWP requests the following reduced VOC content limits for coatings which fall under the Industrial Maintenance Coatings; classification (not including coatings for electrical equipment identified above).

Current	*420*
2004	*350*
2005	*250*

These reduced VOC content limits in years 2004 and 2005 would only become effective if LADWP/South Coast Air Quality Management District (SCAQMD)-approved testing shows that there are suitable replacements for the current allowed 420 grams/liter coatings. As of to date, this has not been done.

RESPONSE:

See Response to Comment 10-2.

13-4 LADWP proposes that the testing be performed by an LADWP/SCAQMD approved testing company and test procedure. The program (three years minimum) would start by testing coatings LADWP currently uses (e.g., immersion in water and structural steel exposed to atmospheric conditions) to establish a baseline for comparison to other coatings subsequently tested by the same procedure. The test results would be presented in reports provided to both the SCAQMD and LADWP. An example where testing should be performed is for potable water immersion coatings. LADWP expects these coatings to last 20 to 25 years as previous coatings have. LADWP has close to 100 potable water tanks that hold from 1,000,000 to 3,000,000 gallons each and must be protected from corrosion.

RESPONSE:

The AQMD supports the concept of a joint study. Therefore, the AQMD is committing to working on an additional technology assessment with the essential public service agencies. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limits prior to the date of implementation of the new limit.

13-5 The PAR 1113 allows the manufacturers to manufacture non-compliant coatings and comply with the VOC content limits by manufacturing compliant coatings whereby the overall average VOC content is in compliance with the VOC limit. However, the end user may not be able to benefit from this plan because the manufacturer may not produce enough non-compliant coatings available for projects at the time they are needed. Currently, averaging is limited only to coatings selected by the manufacturer and covers a period it specifies. Therefore, if coatings needed for usage on critical structures were not identified in the manufacturer's previously submitted plan, the averaging provision would not be of benefit. In addition, the manufacturer may demand an exorbitant cost to provide the non-compliant coatings.

LADWP recommends that the VOC content limits stated in the first two bullets above be adopted to help remedy this situation.

RESPONSE:

See Response to Comment 10-3.

13-6 LADWP requires that potable water immersion Coatings be National Sanitation Federation (NSF) compliant. LADWP requests that SCAQMD identify how many of the coatings tested in the National Technical Systems study are NSF certified. The NSF list of current certified coatings is enclosed. LADWP further requests that the associated VOC content and test results be provided. This will help in LADWP's search for acceptable coatings without divulging the manufacturer's names that we understand you are prohibited from doing to eliminate the chance of favoritism.

RESPONSE:

See Response to Comment 10-4.

13-7 LADWP requests that the "Industrial Maintenance Coatings" definition be amended to include substrates that are exposed to the moisture that dielectric insulating oil picks up from air. This oil is contained in tanks, circuit breakers, and transformers. LADWP recommends that subparagraph (b)(21)(A) should 13 7 be changed to read:

> *(A) immersion in water, dielectric Insulating oil, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moister condensation;*

RESPONSE:

See Response to Comment 10-5.

13-8 The current and "effective date of adoption" VOC content limits were not included for the "High Temperature Industrial Maintenance Coatings" category. We recommend that these VOC limits be included.

RESPONSE:

See Response to Comment 10-6.

13-9 Paragraph (g)(2) states that the VOC content limit of 350 grams/liter for "Quick-Dry Primers, Sealers, and Undercoats" does not apply to the end user of the coating provided that the manufacturer submits an annual report to (3 SCAOMD pursuant to this paragraph. LADWP requests that SCAQMD explain how the end user will be informed that the report was submitted whereby the VOC content limit of 350 grams/liter will not apply to the end user.

RESPONSE:

See Response to Comment 10-7.

13-10 Paragraph (d)(8) prohibits the spray application of "Two-Component Polyurethane Resins" starting January 1, 2005 and requires that it must be applied using roller or brush only. This prohibition is meant to protect the workers and public from adverse health effects. Roller or brush application is much slower then spraying and cannot cover surface areas nearly as well as spray coating can. Therefore, LADWP applies these coatings by spray application. LADWP adequately protects its workers by requiring them to wear protective suits with an air supply. For the public, prior to any prohibition, the LADWP recommends that the SCAQMD determine by a study if there are adverse public health effects and publish the report for comment by industry.

RESPONSE:

See Response to Comment 10-8.

13-11 Paragraph (g)(4) states that the January 1, 2005 limit for lacquers shall not apply until January 1, 2007 and the July 1, 2008 VOC limit for flat coatings shall not be applicable to any manufacturer that meets certain criteria listed in this paragraph. However, the PAR 1113 does not allow the end user to use these exempt coatings. The LADWP requests that the PAR be amended to state that the end user is allowed to use exempt coatings. In addition, LADWP recommends that the labeling of these coatings state this exemption.

RESPONSE

See Response to Comment 10-9.

13-12 LADWP recommends that the end user be allowed to use repair and maintenance coatings the same as that originally used for up to 25 percent of the surface area previously coated. In order to maintain manufacturer warranty of the original coatings, the same coatings that were originally applied or another repair coating approved by the manufacturer, would need to be used. However, the repair coatings may not meet the reduced VOC limits. Therefore, to repair the structure would require removing all the existing coating and coating the entire structure resulting in higher VOC emissions.

RESPONSE:

See Response to Comment 10-10.

13-13 The PAR 1113 allows the end user to use existing (already purchased) non- compliant coating for three years after the VOC limit is reduced. However, coatings such as latex and enamel coatings only have a shelf-life of approximately one year so that the end user cannot benefit from the last two years of this grace period.

RESPONSE:

See Response to Comment 10-11

14. REFERENCE HENRY COMPANY
APRIL 14, 1999

ISSUE:

District staff have assured me verbally that the proposed averaging provision may permit Henry Company to meet the new requirements with practical and affordable formulas. Since this indeed seems possible, I must reserve the right to renew some of those comments until the requirements of the averaging provision are fully defined.

14-1 However, I must renew my objection to a proposed change to the Table of Standards in Section c (2) which calls for an immediate reduction in the maximum VOC limit for Roof Coatings from 300 g/l to 250 g/l. The proposed averaging provisions, even if they become available in the future, can not affect the immediate burden that this change imposes.

RESPONSE:

The AQMD has created a specialty category called "Bituminous Roof Coatings" with a proposed VOC limit of 300 g/l upon date of adoption. This VOC limit will be reduced to 250 g/l, effective July 1, 2002. Subsequently, the commentator can utilize the Averaging compliance option if they are unable to reformulate their bituminous roof coatings to comply with the 250 g/l VOC limit.

14-2 Henry Company manufactures a number of different asphaltic roof coatings which comply with the current limit of 300 g/l. The proposed change will require the immediate reformulation of many of our products; this would be a severe strain on our technical resources and would result in manufacturing cost increases for those products.

RESPONSE:

See Response to Comment 14-1.

14-3 District staff have stated repeatedly that this change can be implemented without allowing industry any development time because the new requirement merely conforms Rule 1113 to the new Federal AIM limits

This statement is not correct for our products. The new Federal requirement for bituminous coatings is 500 g/l.

Roof Coatings represent a very small fraction of architectural coatings as a whole. I suggest at the least that the effective date for this rule change be postponed until July 2001 to allow sufficient time for reformulation.

RESPONSE:

Roof coatings are still proposed to be reduced to 250 g/l upon date of adoption. This change is to comply with the National AIM Rule, to be implemented on September 13, 1999. However, a specialty coating category has been created for roof coatings containing bituminous coating materials.

15. REFERENCE MULTI-AGENCY COMMENTS LETTER
APRIL 14, 1999

ISSUE:

This correspondence represents the collective comments to Proposed Amended Rule 1113, Architectural Coatings (PAR 1113) of four major California public agencies - the Metropolitan Water District of Southern California (Metropolitan), the California Department of Water Resources (DWR), the California Department of Transportation (Caltrans), and the Los Angeles Department of Water and Power (LADWP).

MWD and Caltrans currently have laboratories which conduct technical assessments of coatings utilized on their public structures, the results of which are often relied upon by other related public entities. The comments herein reflect our common views and concerns as affected agencies located in the South Coast Air Quality Management District (SCAQMD).

A. Proposed Modifications to PAR 1113
1) <u>Time Required for Testing of Available Replacement Coatings</u>

15-1 ***Issue****: The SCAQMD is proposing amendments to Rule 1113 which include reducing VOC limits for Industrial Maintenance Coatings – from 420 g/l to 250 g/l, effective January 1, 2002, and from 250 g/l to 100 g/l effective January 1, 2005. While supportive of the need to reduce VOC emissions from architectural coatings (1997 AQMP goal of 50% reduction by the year 2010, and the federally enforceable 1994 AQMP goal of 75 %), as public agencies we have concerns regarding the timely availability of compliant coatings which meet field needs. A lack of coatings which have been demonstrated to perform comparably to existing products could conceivably result in the use of coatings which may not adequately protect and possibly result in accelerated damage to our public infrastructures ('e.g., pipelines, water conveyance equipment, tanks, or bridges). This would seriously impact our essential services to the public of reliable water delivery and highway integrity.*

RESPONSE:

See Response to Comments 2-1 and 2-2.

15-2 ***Recommendation****: Time is required to identify, and perform laboratory and field tests of new compliant coatings. Five to six years is required for this process. For example, the coating evaluation process at Caltrans entails a laboratory screening and characterization, including a health and safety review (4 months), cyclic corrosion testing in the laboratory (8 months), field application tests (2 years), and specification development (2 years).*

Therefore, we request that the VOC limits and effective dates be modified from 420 g/l to 350 g/l, effective 2004; and from 350 to 250 g/l, effective 2005, for three industrial maintenance coating usages critical to our services: 1) immersion; 2) structural steel exposed to atmospheric and chemical conditions; and 3) direct burial in soil (excluding LADWP electrical equipment). These proposed VOC limits and their associated effective dates would help ensure that new compliant

coatings demonstrate comparable performance to the previously used higher VOC containing coatings in order to minimize any additional maintenance which would potentially create significant public service and safety concerns.

RESPONSE:

See Response to Comments 2-1 and 2-2.

2) Available Repair Coatings

15-3 ***Issue:*** *Currently, Metropolitan, DWR, Caltrans and LADWP have structures that are coated with solvent bome coatings. Over time, these structures will require patch repair and maintenance using a compatible coating system. In order to maintain manufacturer warranty of the coating, the same solvent bome coating that was originally applied, or a repair coating approved by the manufacturer would need to be utilized. Once PAR 1113 becomes effective, these coatings may not meet the required VOC limits. The alternative to utilizing the original coating would be complete removal and recoating (primer, intermediate and topcoat) of the entire structure, which will result in release of a higher VOC volume overall.*

RESPONSE:

See Response to Comment 10-10

15-4 ***Recommendation:*** *We recommend that end-users be allowed to purchase and use the original coatings (i.e., solvent-bome coatings) to repair and maintain structures (e.g., if touch-up/repair is required of 25% of the structure) with existing coatings after the amendments to Rule 1113 become effective. Such an approach would promote overall VOC reduction for such activities.*

RESPONSE:

See Response to Comment 10-10.

3) 1/1/05 Prohibition of Spray Application of Two-Component Polyurethanes ion

15-5 **Issue**: To address potential worker and public health concerns, the March 1999 PAR 1113 contains a provision which prohibits spray application of industrial maintenance coatings, two-component polyurethane resins, effective January 1, 2005. While it is the practice of each of our agencies to substitute less hazardous coatings whenever possible, we are concerned that such a prohibition will have a severe impact if, and when, the use of two-component polyurethane resins is necessitated. For the coatings of large structures, the alternative roller or brush application would be extremely time intensive and may be impractical given the short set time of the resins.

RESPONSE:

See Response to Comment 10-8

15-6 ***Recommendation****: From our experiences with currently accepted coating application practices and personnel exposure monitoring results, we recommend that spray application of polyurethane resins continue to be allowed as long as prudent precautions to minimize potential health exposures are taken. This would involve use of engineering controls and personnel protective equipment.. Spray application should not be conducted if potential exposure to the public cannot be mitigated, as our safe work practices currently dictate. Additionally, less hazardous coatings should be substituted whenever possible.*

RESPONSE:

See Response to Comment 10-8.

B. Additional Issues with PAR 1113

1) Technical Assessments for Available Replacement Coatings

15-7 ***Issue****: The background information provided with PAR 1113, and the March 19, 1999 Draft Subsequent Environmental Assessment (SEA) indicate that low-VOC coatings are available in a variety of formulations, depending on their recommended uses. Based upon their review of coating product data sheets, SCAQMD staff concluded that low VOC coatings have durability characteristics comparable to conventional coatings, and therefore, no significant adverse infrastructure or public services (e.g., maintenance at public facilities) impacts are anticipated from implementing PAR 1113. However, it has been our experience that the performance characteristics represented in the manufacturers' technical product data sheets are not obtainable under our laboratory testing or actual usage conditions. Therefore, as affected public agencies, we feel that the conclusion regarding no significant public services impacts cannot be made based on manufacturer product data sheet representations.*

Specifically, it is Metropolitan's experience that 75 % of the coatings tested in its Corrosion Control Laboratory fail to meet the physical and performance characteristics stated in the manufacturer's data sheets. In addition, 80 % of the coatings tested in the lab fail to meet Metropolitan's performance standards and are rejected for poor performance reasons. To exemplify this, the Table of Metropolitan Water District Coating Performance Testing Results (Attachment 1) identifies five coatings that Metropolitan has tested and rejected for performance reasons, and which can be compared to the information provided in the SEA, Appendix D, Summary of Coating Characteristics.

RESPONSE:

See Response to Comment 6-2.

15-8 ***Recommendation:*** *In order to provide end-users with the confidence that the low VOC coatings meet performance standards, actual testing needs to be conducted. Assessments such as the NTS study being conducted by the SCAQMD may provide credible information for the end-user. Such assessments should be designed to evaluate the true performance of VOC compliant coating formulations under accelerated laboratory and actual field conditions. Also, as many of the individual coatings are part of multi-component systems, they should be tested as part of the system.*

Metropolitan and Caltrans are each aggressively attempting to identify and test lower VOC coatings. In fact, since 1978 when 250 g/l was originally proposed as the limit in many architectural coating regulations, Caltrans has attempted to comply with a self-imposed 250 g/l VOC level in coating specifications. Additionally, representatives from MWD, Caltrans and LADWP recently visited Park Water Company to observe their "zero VOC" coating activities. While beneficial in identifying potential compliant coatings available for water service use, unfortunately a closer review of Park Water's coating practices identified significant differences in the substrates, coating practices, methods of preparation and application, and performance expectations. Therefore, we feel that accelerated laboratory and field testing continue to be warranted.

In order to provide sufficient time for adequate performance testing, we again recommend that the VOC limits and effective dates be modified as detailed above in A. 1). Additionally, Metropolitan, Caltrans and LADWP are interested in pursuing cooperative efforts with the SCAQMD to review/share performance testing results and/or test coatings at each of our laboratories.

RESPONSE:

The laboratory testing of the NTS study is complete. This study analyzed application and durability characteristics in greater detail, and the results show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including, but not limited to, coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of the zero-VOC coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments. Nonetheless, as a result of comments provided by industry, staff has raised the interim and final limits for some categories, as well as extended the interim and final compliance dates by up to an additional 18 months.

The AQMD disagrees that the final limits are speculative. The commentator is encouraged to review the technology discussed in detail for each coating category in the staff report, as well as the comprehensive list of coatings included as Appendix D of the Subsequent Environmental Assessment.

Staff has considered the comments provided by end-users, coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final propos allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing. In addition, the AQMD is committing to working on an additional technology assessment with the essential public service agencies.

2) Averaging Provision

15-9 ***Issue:*** *PAR 1113 contains an averaging provision that manufacturers may utilize to comply with the VOC limits specified in (c)(2) Table of Standards. This provision can be beneficial in potentially providing end-users with the option of obtaining a coating containing a VOC content higher than that specified in the rule's Table of Standards. However, from our public agency end-user perspective there is a concern that the provision may not be sufficient enough to ensure the availability of coatings required by large projects. Currently, averaging is limited only to coatings selected by the manufacturer and covers a period specified by the manufacturer. Therefore, if coatings needed for usage on critical public structures were not identified in the manufacturer's previously submitted Program, the averaging provision would not be of benefit.*

RESPONSE:

See Response to Comment 10-7

15-10 ***Recommendation:*** *To ensure the continued availability of coatings, in addition to the identified averaging 1,c-jo provisions, we continue to recommend that the VOC limits and effective dates be modified as detailed in A. 1).*

RESPONSE:

See Response to Comment 10-7

3) Sell-Through Provision

15-11 ***Issue:*** *PAR 1113 contains the "sell-through" provision, whereby sale or application of a coating manufactured prior to the effective date of the corresponding standard in the Table of Standards shall not constitute a violation until 3 years after the effective date of the standard. This provision may provide end-users with some relief in that they can continue to purchase and apply higher VOC containing coatings for an additional 3 years. However, many industrial maintenance coatings have a shelf-life of less than 3 years (typically I year). Therefore, although available, in practice industrial maintenance coatings may only be useable for I year after the effective date of the standard.*

RESPONSE:

See Response to Comment 10-11

15-12 ***Recommendation:*** *To ensure the continued availability of coatings for use on critical public structures, we continue to recommend that the VOC limits and effective dates be modified as detailed in A. 1).*

RESPONSE:

See Response to Comment 10-11.

16. REFERENCE MWD
APRIL 13, 1999

ISSUE:

The comments herein reflect Metropolitan's views and concerns as an affected agency.

Metropolitan is recommending the following:

16-1 1) VOC limits of 350 g/I (effective 2004) and 250 g/I (effective 2005) for 3 critical coating usages;

RESPONSE:

See Response to Comment 2-2

16-2 2) Purchase and use of original coatings for repair and maintenance of existing structures

RESPONSE:

See Response to Comment 10-10.

16-3 3) Continued allowance of spray application of polyurethane resins with adequate safety precautions.

RESPONSE:

See Response to Comment 10-8.

Metropolitan's specific concerns relative to these recommendations, are outlined below.

A. Proposed Modifications to PAR 1113
1) <u>Time Required for Testing of Available Replacement Coatings</u>

16-4 ***Issue****: The SCAQMD is proposing amendments to Rule 1113 which include: adding a definition of "Industrial Maintenance Coatings"; and reducing VOC limits in specific AIM categories, including Industrial Maintenance Coatings (from 420 g/I to 250 g/l, effective January 1, 2002, and from 250 g/I to 100 g/I effective January 1, 2005). While supportive of the need to reduce VOC emissions (1997 AQMP short term goal of 50% by the year 2010), Metropolitan has concerns regarding the timely availability of compliant coatings which meet field needs. As initially expressed in our March 1, 1999 and March 17, 1999 comment letters, Metropolitan's concern is that sufficient time needs to be provided to allow for identification and performance testing of new, compliant coatings and for approval of their use on our key industrial structures, such as steel tanks, bridges, equipment, and concrete foundations. The new compliant coatings that have been identified do not have wide application history in our industry. Long term*

laboratory testing is an essential pre-requisite for all new coatings. As such, it can take as many as six years for a new compliant coating to be demonstrated as suitable for public water service. Once the new coating has been proven to be acceptable, it is placed on Metropolitan's "approved list", which is also relied upon by Metropolitan's Member Agencies.

RESPONSE:

See Response to Comments 2-1 and 2-2.

16-5 ***Recommendation:*** *To address the above concerns, Metropolitan continues to recommend that the list of Industrial Maintenance Coatings, their VOC limits and phased effective dates, be modified to accommodate the critical needs of public services such as Metropolitan. In our previous two comment letters, alternative VOC limits, effective dates, and related impacts for coating categories significant to Metropolitan's operations have been provided. To summarize, Metropolitan again requests that the SCAQMD modify the VOC limits and their phased effective dates (from 420 g/l to 350 g/l, effective 2004; and from 350 to 250 g/l, effective 2005) for three industrial maintenance coating usages critical to public water services: 1) immersion; 2) structural steel exposed to atmospheric and chemical conditions; and 3) direct burial in soil. These proposed VOC limits and their associated effective dates would help ensure that new compliant coatings demonstrate comparable performance to the previously used higher VOC containing coatings in order to minimize any additional maintenance which would potentially create significant public service and safety concerns.*

RESPONSE:

See Response to Comments 2-1 and 2-2.

2) Available Repair Coating

16-6 ***Issue****: Currently, Metropolitan has many structures that are coated with solvent home coatings. Over time, these structures will require patch repair and maintenance using a compatible coating system. In order to maintain manufacturer warranty of the coating, the same solvent borne coating that was originally applied, or a repair coating approved by the manufacturer would need to be utilized. Once PAR 1113 becomes effective, these coatings may not meet the required VOC limits. The alternative to utilizing the original coating would be complete removal and recoating (primer, intermediate and topcoat) of the entire structure, which would result in release of a higher VOC volume overall.*

RESPONSE:

See Response to Comment 10-10.

16-7 ***Recommendation****: As discussed in our March 17, 1999 correspondence, to address the above issue Metropolitan recommends that end-users be allowed to purchase. and use the original coatings (e.g., if touch-up/repair is required of 25% of the structure) with existing coatings after*

the amendments to Rule 1113 become effective. Such an approach would promote overall VOC reduction for such activities.

RESPONSE:

See Response to Comment 10-10.

3) 1/1/05 Prohibition of Spray Application of Two-Component Polyurethanes

16-8 ***Issue:*** *To address potential worker and public health concerns, the March 1999 PAR 1113 contains a provision which prohibits spray application of industrial maintenance coatings, two-component polyurethane resins, effective January 1, 2005. While it is Metropolitan's practice to substitute less hazardous coatings whenever possible, we are concerned that such a prohibition will have a severe impact if, and when, the use of two-component polyurethane resins is necessitated. For the coatings of large structures and equipment (e.g., tanks, pumps, electrical panels, bridges) at Metropolitan, the alternative roller or brush application would be extremely time intensive and may be impractical given the short set time of the resins.*

RESPONSE:

See Response to Comment 10-8.

16-9 ***Recommendation:*** *To date, Metropolitan's painting crews routinely apply two-component polyurethane coatings [e.g., Amershield Polyurethane containing hexamethylenediisocyanate (HDI);Lupranate M-20S A & B and Burtin Corp. Poly Blend A & B, both containing methylene bisphenyl isocyanate (MDI)], in a variety of environments, ranging from open air to shop conditions. Metropolitan minimizes worker exposure to isocyanates through the use of engineering controls and personnel protective equipment. When industrial hygiene evaluations were conducted during a sampling of these operations, employee exposures were consistently well below the Cal/OSHA permissible exposure limits. No adverse public exposures have been reported either. Therefore, Metropolitan recommends that spray application of polyurethane resins continue to be allowed as long as prudent precautions to minimize potential health exposures are taken. Spray application should not be conducted if potential exposure to the public cannot be mitigated, as is Metropolitan's current safe work practice. Additionally, less hazardous coatings should be substituted whenever possible.*

RESPONSE:

See Response to Comment 10-8.

B. Additional Issues with PAR 1113
1) Technical Assessments for Available Replacement Coatings

16-10 ***Issue:*** *Both the background information provided with PAR 1113, and the March 19, 1999 Draft Subsequent Environmental Assessment (SEA), indicate that low-VOC coatings are available in a variety of formulations, depending on their recommended uses. Based upon their review of*

coating product data sheets, SCAQMD staff concluded that low VOC coatings have durability characteristics comparable to conventional coatings, and therefore, no significant adverse infrastructure or public services (e.g., maintenance at public facilities) impacts are anticipated from implementing PAR 1113. However, it has been Metropolitan's experience that 75 % of the coatings tested in our Corrosion Control Laboratory fail to meet the physical and performance characteristics stated in the manufacturer's technical product data sheets. In addition, 80 % of the coatings tested in our lab fail to meet Metropolitan's performance standards and are rejected for poor performance reasons. To exemplify this, the Table of Metropolitan Water District Coating Performance Testing Results identifies five coatings that Metropolitan has tested and rejected for performance reasons, and which can be compared to the information provided in the SEA, Apperidix D, Summary of Coating Characteristics.

RESPONSE:

See Response to Comment 6-2.

16-11 ***Recommendation****: In order to provide end-users with the confidence that the low VOC coatings meet performance standards, actual testing needs to be conducted. Assessments such as the NITS study being conducted by the SCAQMD may provide credible information for the end-user. Such assessments should be designed to evaluate the true performance of VOC compliant coatingformulations under accelerated laboratory and actual field conditions. Also, as many of the individual coatings are part of multi-component systems, they should be tested as part of the system. Along these lines, Metropolitan is continuing efforts to identify and test lower VOC coatings. Samples have been received from Coating Resources, Sierra Pacific, Madison, and Ameron, and we are in the preliminary stages of testing these products [please refer to Attachment 2 for a summary of the American Society for Testing and Materials (ASTM) standardized test methods which Metropolitan currently runs on coatings and adhesives]. Additionally, Metropolitan has reviewed the "zero VOU coating activities of Park Water Company. While beneficial in identifying potential compliant coatings available for water service use, unfortunately a closer review of Park Water's coating practices identified significant differences in the substrates, coating practices, methods of preparation and application, and performance expectations. As such, Metropolitan looks forward to the results from testing the candidate coatings in our Corrosion Control Laboratory.*

In order to provide sufficient time for adequate performance testing, Metropolitan again recommends that the phased effective dates be modified as detailed in A. 1). Additionally, as previously discussed, Metropolitan continues to be very interested in pursuing cooperative efforts with the SCAQMD to review/share performance testing results and/or test coatings at our corrosion control lab.

RESPONSE:

See Response to Comment 15-8.

2) Averaging Provision

16-12 ***Issue:*** *PAR 1113 contains an averaging provision that manufacturers may utilize to comply with the VOC limits specified in (c)(2) Table of Standards. This provision can be beneficial in potentially providing end-users with the option of obtaining a coating containing a VOC content higher than that specified in the rule's Table of Standards. However, from our public agency end-user perspective there is a concern that the provision may not be sufficient enough to ensure the availability of coatings required by large projects. Currently, averaging is limited only to coatings selected by the manufacturer and covers a period specified by the manufacturer. Therefore, if coatings needed for usage on critical public structures were not identified in the manufacturer's previously submitted Program, the averaging provision would not be of benefit.*

RESPONSE:

See Response to Comment 10-7.

16-13 Recommendation: *To ensure the continued availability of coatings, in addition to the identified averaging provisions, Metropolitan continues to recommend that the VOC limits and effective dates be modified as detailed in Item 1).*

RESPONSE:

See Response to Comment 10-7.

3) Sell-Through Provision

16-14 ***Issue:*** *PAR 1113 contains the "sell-through" provision, whereby sale or application of a coating manufactured prior to the effective date of the corresponding standard in the Table of Standards shall not constitute a violation until 3 years after the effective date of the standard. This provision may provide end-users with some relief in that they can continue to purchase higher VOC containing coatings for an additional 3 years. However, many industrial maintenance coatings have a shelf-life of less than 3) years (typically I year). Therefore, in practice, industrial maintenance coatings may only be available for I year after the effective date of the standard.*

RESPONSE:

See Response to Comment 10-11.

16-15 ***Recommendation:*** *To ensure the continued availability of coatings for use on critical public structures, Metropolitan continues to recommend that the VOC limits and effective dates be modified as detailed in Item 1).*

RESPONSE:

See Response to Comment 10-11.

17. REFERENCE COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY APRIL 15, 1999

ISSUE:

LACSD understands the need to reduce VOC emissions in the South Coast Air Basin and offers the following comments on the February 25, 1999 proposed rule amendments. LACSD will evaluate the performance of low or zero VOC coatings used in our industry.

17-1 As part of the technology assessments, LACSD would like to work with SCAQMD in testing reformulated industrial maintenance coatings suitable for wastewater environments. Coatings that perform well at other industrial facilities, including water treatment environments, will not necessarily perform well at wastewater facilities due to the unique, severely corrosive conditions that can exist. Since we operate our facilities around the clock, 365 days a year, we must use proven coatings. Prior to applying the reformulated coatings, we would like to have at a minimum, two and one half years for laboratory testing with concurrent field testing. -Two and one half years is needed for a laboratory testing program to determine appropriate ASTM test methods suitable for wastewater environments, write a test protocol, select products and purchase coatings, investigate and select a laboratory, conduct testing and evaluate results. At the same time, in-house field testing will be conducted to evaluate the coatings in-situ. LACSD would like to incorporate our test results into SCAQMD's technology assessment. In order to a] low adequate time, LAC SD recommends an extension of the 250 g/L technology assessment until January 1, 2002 and the effective date until January 1 2003. In addition, an extension of the 100 g/L technology assessment until January 1, 2005 and the effective date until January 1, 2006 for the same reasons stated above. This would allow users of the products to conduct an adequate analysis of low or zero VOC coatings currently available for their specific environments.

RESPONSE:

See Response to Comment 2-1 and 2-2.

17-2 All coatings used in the technology assessments should be commercially available for testing by end-users. In the Draft Subsequent Environmental Assessment dated March 19, 1999, information on manufacturer's product data sheets was used to compare conventional coatings to low VOC coatings. Product data sheets are provided as marketing tools from coating manufacturers and the information contained therein must be verified. Therefore, coatings used in the technology assessments must be available at least two and one half years prior to the assessment to allow laboratory verification of manufacturer's data. For SCAQMD's proposed January 1, 2001 technology assessment, only coatings available by June 1, 1999 can be effectively considered. If the SCAQMD requires a coating available after June 1, 1999, it does not provide end-users the minimum time needed to evaluate the coating.

RESPONSE:

The staff's technology assessment included a thorough review of hundreds of technical data sheets, evaluating both qualitative and quantitative laboratory test data. Most technical data sheets include

results of a variety of testing conducted, using established ASTM test methods, for different coating characteristics, including information on adhesion, impact resistance, corrosion resistance, coverage, etc.. All of this data was considered, and compared with information provided on higher-VOC coatings from technical data sheets. Based on this comparison of performance data, qualitative statements were included for overall performance, including durability. The information included in the technical data sheets have been corroborated by the NTS study for various coating characteristics, including adhesion, mar resistance, and coverage.

17-3 Furthermore, if a coating is available three and one half years prior to the effective date, applicators can be properly trained. Low or zero VOC coatings can require non-conventional application techniques; supplemental training will be necessary for proper application of the coatings in the field. Current LACSD concrete coating specifications require the applicator to have a minimum of five years experience in the application of the specific coating. The coating performance is verified by three case histories of application on the same substrate for projects similar in scope. It is an industry standard to request field performance histories prior to coating specification.

RESPONSE:

The AQMD believes that LACSD has a sound coatings program, and encourages LACSD to initiate the testing of currently available coatings as soon as feasible to ensure that sufficient time is available to conduct testing, as well as training of applicators, if needed.

17-4 The rule amendments include a three year sell-through provision. However, due to coating shelf life in our industry, LACSD will be able to apply coatings for only one year after the effective dates. Therefore, it may not be a reasonable assumption that industrial maintenance end-users will be able to continue to apply conventional coatings for several years after the effective dates, while evaluating low VOC coatings.

RESPONSE:

See Response to Comment 10-11.

17-5 If the low or zero VOC coatings tested perform satisfactorily in the laboratory and field tests, LACSD would incorporate these coatings into our coating specifications. However, if problems are discovered during testing, LACSD needs SCAQMD's assurance that Rule 1113 will be revised appropriately. The revisions would either raise the VOC content limits for the industrial maintenance category or create specific exclusions. Of course, SCAQMD will need to defend the revised limits to the US EPA to avoid backsliding inferences.

RESPONSE:

See Response to Comment 2-2.

17-6 To reduce air emissions from recoating existing structures, LACSD recommends that application of parent coatings with VOC content below 420g/L be allowed for touch up and maintenance. Touch-up would be allowed when the surface area to be recoated is less than 20% of the total surface area. Coating 20% of surface area with 420 g/L coating would produce less emissions than coating 100% of the area with 100 g/L coating, provided similar coverage areas. In the Subsequent Environmental Assessment on page 4-5, SCAQMD staff concluded low VOC industrial maintenance coatings have slightly less coverage potential than conventional coatings. Therefore, actual emissions using a small amount of 420 g/L coating would be lower than allowable emissions applying 100 g/L coating to the entire structure. This clause can sunset on January 1, 2008. Without this clause, some structures will need to be completely recoated because the lower VOC coatings may not adhere to existing solvent-borne coatings.

RESPONSE:

See Response to Comment 10-10. A 20% of total area could result in coating of the whole substrate within 5 years. The AQMD has accounted for a slight increase in volume of coating needed, as the solids percent by volume decrease for the lower VOC coatings. Adjusting for this slight increase in volume of coating still yields significant emission reductions. As far a comparison of total VOC emissions from a 420 g/l, solvent-based coating with a 100 g/l waterborne coatings, one should look at the VOC – material (with the water and exempt solvents) for emission comparison. Your comparison of emissions may not be the same under the above scenario, since the material VOC of a 100 g/l is significantly lower, depending on the solids content.

Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

17-7 SCAQMD needs to further research potential public exposure to diisocyanates from low or zero VOC two-component polyurethanes. Two-component polyurethanes are sprayed for conventional application. For large structures it is not practical to apply polyurethane with rollers or brushes. Additional research should be conducted to estimate public exposure as part of the industrial maintainance technology assessment prior to implementation of the ban on spraying two- component polyurethanes. Efficient application of low or zero VOC coatings is essential to minimize downtime during maintenance and construction projects.

RESPONSE:

See Response to Comment 10-8.

17-8 LACSD recommends Section (d)(7) - Painting Practices be revised as follows: "Architectural coatings containers and paint trays shall be kept closed at all times except when actively painting. Brushes and rollers should be cleaned and stored in closed, non-adsorbent. non-leaking containers." Actively painting should be defined as applying, mixing, removing or adding paint.

RESPONSE:

The AQMD has revised paragraph (c)(5) to address your concerns.

18. REFERENCE HAIGHT, BROWN & BONESTEEL, L.L.P.FOR NPCA
APRIL 15,1999

ISSUE:

The following comments on the February 17, 1999, Draft Staff Report for Proposed Amendments to Rule 1113 are offered on behalf of the National Paint & Coatings Association, Inc.

A. More Time Needed to Evaluate Data.

The dynamic, ongoing, unsettled nature of this rulemaking has created difficulties for industry to adequately respond to staff s changing positions and conclusions. We recognize that some of these changes have been positive, including the increasing of some of the proposed VOC limits; but we still believe that all of the proposed revised VOC limits suffer from one or more of the following defects:

18-1 There is no reasonably foreseeable technology that would achieve some of the limits.

RESPONSE:

The AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits.

18-2 Some limits might be completely appropriate for some applications in a coating category but completely inappropriate for others. This is the reason for our recommendations that major categories need to be subcategorized and additional specialty categories need to be added to the rule.

RESPONSE:

The AQMD has created new categories where staff has been unable to gather sufficient information or identify equivalent use. Examples of these include new categories for bituminous roof coatings and rust preventative coatings. Additionally, the revised Averaging compliance option should allow the manufacturer to retain some specialty coatings that do not comply with the VOC limits in the Table of Standards. In addition, the AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

18-3 A particular limit might be achieved but at unacceptably high additional costs.

RESPONSE:

The commentator is making a generic statement about the potential additional costs. The additional cost could be the result of using novel resin technology, exempt solvent, and additives or a combination of all. Furthermore, the Socio-Economic Assessment estimates an increased cost of 20% for coatings that comply with the final VOC limits, effective July 1, 2006. The AQMD is not sure what the commentator considers to be an "unacceptably high additional costs".

18-4 As we have noted in previous comments, a central issue at stake here concerns the adequacy of performance characteristics of lower VOC coatings. In this connection we reiterate the need for access to the National Technical Systems (NTS) study. As noted in the February 17 Draft Staff report: "This study will analyze application and durability characteristics in greater detail, and the results will rank the coatings based on performance. " The February 17, 1999 Report goes on to say that, "The study is expected to be completed within the next few weeks."

As of this writing on April 15, 1999, the results of the NTS study have yet to be released to industry and the proposed revisions continue to be scheduled for Board approval on May 14, 1999. We again ask the staff to delay the submission of its proposal to the Board for three months in order to allow sufficient time for a full evaluation of the study's results.

RESPONSE:

The laboratory testing of the NTS study is complete. This study analyzed application and durability characteristics in greater detail, and the results show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including, but not limited to, coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. However, the NTS results also highlight application characteristics of the zero-VOC nonflats and primers, sealers, and undercoaters that are somewhat limited for many but not all zero-VOC coatings, when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments. Nonetheless, as a result of comments provided by industry, staff has raised the interim and final limits for some categories, as well as extended the interim and final compliance dates by up to an additional 18 months.

The results were initially forwarded and discussed with the Technical Advisory Committee, comprised of members from the Industry, on April 12, 1999. A summary of the study was presented to the AQMD Governing Board's Stationary Source Committee, which is attended by the public. Members of the architectural coatings industry were present at the last meeting, held on April 23, 1999. Subsequent discussions with the Technical Advisory Committee regarding the interim report were conducted on April 26, 1999. Finally, the summary of the Phase II Assessment

Study results were presented to the public at the working group meeting on April 28, 1999. This summary is included as Appendix G of the Staff Report.

B. Use Federal National AIM Coatings Rule As A Template

18-5 As we have stated in earlier comments, the District should adopt the federal national AIM coatings rule as a template, incorporating the rule's product definitions, reporting and labeling requirements, as well as the "less than or equal to" one liter package size exemption. Due to the unique environmental conditions in the District, we acknowledge that the District may have to specify lower VOC limits for some of thc coatings than those in the national rule. But the basic components of both rules should be as uniform as possible to reduce the inefficiencies associated with having to address the special VOC reduction needs of the SCAQMD. The adoption of the national rule as a template in the SCAQMD also would assist industry in more readily identifying coatings categories where additional VOC reductions might be obtained. In part this is true because these coatings are sold in large volumes on a national basis and thus are the beneficiaries of focused research and development efforts to lower their VOC content.

Also because of its national industry wide role, the national rule offers a good baseline for implementing possible effective economic incentive programs in which VOC reductions obtained from some coatings lines might be used to offset VOC emissions from others.

RESPONSE:

The AQMD has incorporated definitions and other elements of the National AIM rule, where appropriate. However, the AQMD does not believe it is necessary to adopt all of the categories in the National AIM rule, since paragraph (c)(1) of Rule 1113 covers all other categories with VOC content limits of 250 g/l. Furthermore, a rule with fewer categories is a lot easier to implement and enforce. Lastly, the VOC limits in the National AIM Rule do not achieve the reductions in VOCs that are possible and necessary.

Additionally, the AQMD has included the Averaging compliance option, which provides flexibility by providing an alternative compliance option. This is deemed to be a powerful economic incentive program for industry regulated by Rule 1113. The AQMD has revised, in conjunction with industry, the Averaging compliance option to make it a more viable option for coating manufacturers.

II. NEED FOR ADDITIONAL CATEGORIES AND SUBCATEGORIES

18-6 We reiterate our request for additional coatings categories and subcategories. We recognize that the District's latest proposal includes some new coatings subcategories. However, these are not sufficient to address the issues that we outlined in our January 5, 1999 comments to an earlier version of the Draft Staff Report. The District's proposed revisions would lower the current VOC limits for some of the largest and most important categories of AIM products, e.g., industrial maintenance coatings, non-flat coatings; primers, sealers and undercoaters; stains, and waterproofing sealers. In proposing this, as a practical matter the District must also consider the further subcategorizing of these categories and the inclusion of additional coatings categories for a

number of special end use high performance AIM products that are currently included in one of these broad coatings categories. By doing this the District can lower the VOC limit for a subcategory of coatings within a broad category to take advantage of the availability and/or emerging technology for that subcategory while simultaneously ensuring that the reduced limits do not apply to other coatings subcategories within the general category for which the reduced limits would not he technically feasible.

You will note that our proposal in this respect has changed since our January 5, 1999 comments, reflecting on-going discussions with staff.

RESPONSE:

The AQMD has created several new categories in response to comments received from industry. These include bituminous roof coatings, recycled flat and nonflat coatings, rust preventative coatings, and floor coatings. The AQMD has found technology that complies with both the interim and final proposed limits for other categories.

A. Additional Categories

18-7 As indicated in our general recommendations for the revision of Rule 1113, we believe that all of the categories that appear in the national rule should be recognized in Rule 1113 with the understanding that the VOC limits for some may well have to be lower than the limits in the national rule. At a minimum, the following specialty categories from the national AIM rule should be included in the Table of Standards:

Anti-graffiti coatings
Concrete Protective coatings
Tank Lining coatings

Definitions for all of the above coatings categories except "Tank Lining coatings" are provided in the national AIM rule (40 CFR Part 59.401).

RESPONSE:

As indicated in the Response to Comment #18-6, the AQMD has found coatings that comply with the proposed limits for each of the above mentioned categories. In response to comments received regarding concrete protective coatings, the AQMD has created another new category called Waterproofing Concrete/Masonry Sealers, which was a direct results of concerns for waterproofing concrete substrates, especially vertical surfaces. This new category includes both pigmented and clear concrete waterproofing sealers.

B. Additional Subcategories

We recommend the following subcategories be incorporated into the revision of the Table of Standards for Rule 1113.

18-8

***High Gloss Non-flats**: A high gloss subcategory should be recognized for the Non-flat category. The 1998 California Air Resources Board (CARB) Architectural Coatings Survey reported that approximately 9.7 percent of the non-flat coatings sold in California in 1996 were high gloss non-flat coatings. Clearly this is an important subcategory of the non-flat coatings and one which presents some of the most difficult technical challenges in reformulation to lower VOC levels.*

***Specialty Primers**: A subcategory for specialty primers that are formulated to be applied over hard to paint surfaces such as smoke or water damaged substrates or chalky surfaces should be established.*

***Semi-Transparent Stains**: Semi-transparent stains unlike paints or opaque stains utilize penetration of the substrate rather than the formation of a surface film as their mechanism for protection. As the VOC level for these products is lowered they begin to act more like paint and form a film over the substrate and do not penetrate into it. Instead of enhancing the natural grain of the wood substrate, which is the desired affect of using a semi-transparent stain, the film formation actually hides the grain of the wood. A subcategory for semi-transparent stains should be established.*

***High Gloss Industrial Maintenance Coatings**: A subcategory for high gloss industrial maintenance coating with a gloss of 85' and greater on a sixty degree meter should be established. These specialty products represent only a very a small but necessary segment of the industrial maintenance market.*

***Industrial Maintenance Primers**: As with any architectural coatings system the primer is the key to providing long term durability, particularly under the harsh environmental conditions that are faced by industrial maintenance coatings systems. The primer is the lynch pin that ties the whole system to the substrate. The ability of the primer to adhere to a marginally prepared or a deteriorated substrate is crucial. As the allowable VOC level for industrial maintenance coatings is lowered, it becomes increasingly difficult to formulate a primer that will perform under all of the various substrate conditions that painters face in the industrial, commercial and institutional settings. Therefore the need for a separate subcategory for industrial maintenance primers with a higher VOC limit becomes more important as industrial maintenance top coat VOC limits are lowered.*

RESPONSE:

High-Gloss Nonflats
The AQMD has found coatings that meet the high-gloss definition for both interior and exterior uses, for both the interim and final VOC limits. A detailed discussion of these coatings can be found in the Staff Report, as well as a listing is included in Appendix D of the Subsequent Environmental Assessment. Additionally, the Averaging compliance option will allow a

manufacturer to continue selling their smaller volume, non-compliant coatings, as long as they offset those increased emissions with coatings that are below the compliance limits.

Specialty Primers
The AQMD has found primers that are recommended for smoke or water damage, as well as for chalky surfaces. If the chalky surfaces are on metal substrates, then the applicable coating would be a rust preventative coating. For wood substrates, adequate primer technology is available now that complies with the interim and final compliance dates. A detailed discussion of these coatings can be found in the Staff Report, as well as a listing is included in Appendix D of the Subsequent Environmental Assessment. Additionally, the Averaging compliance option will allow a manufacturer to continue selling their smaller volume, non-compliant coatings, as long as they offset those increased emissions with coatings that are below the compliance limits

Semi-Transparent Stains
The AQMD has found interior and exterior semi-transparent stains that comply with the proposed 250 g/l limit. Appendix D of the Subsequent Environmental Assessment contains a list of compliant semi-transparent stains. There is also an extensive discussion of these products in the staff report.

High Gloss Industrial Maintenance Coatings
Industrial maintenance coatings found as a part of the AQMD's technology assessment includes a variety of gloss levels. The majority of the two-component urethane topcoats discussed in the staff report are for industrial maintenance coatings that have a gloss of 85 degrees or greater on a sixty degree meter.

Industrial Maintenance Primers
The AQMD has found a variety of industrial maintenance primers, including zinc and epoxy technology, that meet the proposed July 1, 2002 and July 1, 2006 limit for industrial maintenance coatings. Staff does not support a separate category for industrial maintenance primers based on staff findings.

III. DEFINITIONS

We recommend that the current definitions in Rule 1113 be revised or created to reflect the nationally recognized AIM definitions (40 CFR Part 59.401) and to define our suggested coatings categories and subcategories.

18-9

> ***High Gloss coating*** *means a coating that registers a gloss greater than 700 on a 60 degree meter.*
> ***High Gloss Industrial Maintenance*** *coating means a coating that registers a gloss greater than 85' on a 60 degree meter.*
> ***Tank Lining coating*** *means an industrial maintenance coating formulated and recommended for application to the interior surfaces of storage tank and reservoirs*

exposed to immersion in water, wastewater, organic solvents and chemical solutions (aqueous and non-aqueous solutions).
***Semi-transparent Stain means** a coating that produces a dry film with minimal coloring that does not completely conceal substrate or its natural texture or grain pattern.*
***Specialty Primer means** a coating formulated and recommended for application to a substrate to block stains, odors, or efflorescence; to seal fire, smoke or water damage; or to condition chalky surfaces.*
***Floor coatings** are opaque coatings that are formulated for application to flooring, including but not limited to decks, porches, gymnasiums; for purposes of abrasion resistance.*
***Rust Preventative coatings** are coatings formulated for use in preventing the corrosion of metal surfaces in residential, institutional, and commercial situations.*

Including the aforementioned recommendations concerning additional subcategories and revised definitions of coatings categories will allow the manufacturers and users to more readily identify specific categories and subcategories that can not be technically or economically reformulated or replaced by lower VOC products.

RESPONSE:

The AQMD has incorporated definitions for floor coating and rust preventative coatings, as well as limited the definition of floor coatings to opaque floor coatings. The AQMD does not concur with addition of definitions for high gloss coating, high gloss industrial maintenance coating, tank lining coating, semi-transparent stain, and specialty primer. Staff has found adequate number of coatings for each of the additional categories proposed by the commentator. The commentator is referred to the extensive discussion regarding the availability of each of these coatings in the Staff Report, as well as Appendix D of Subsequent Environmental Assessment.

IV. TECHNOLOGY ASSESSMENT PROVISION

We suggested the following revisions to paragraph (f) to more fully reflect important developments in coatings technology, as well as advances in our understanding of the science of ozone formation and the contribution of coatings materials.

18-10 We also note that some of the dates will change if staff changes the effective dates of the limits, which we understand is under consideration by staff.

(f) Technology Assessment for Flats; Non-Flats; Primers; Sealers, and Undercoaters, Floor Coatings; Rust Preventative Coatings; Industrial Maintenance Coatings; Quick-Dry Enamels; Quick-Dry primers, Sealers, and Undercoaters, Stains; Waterproofing Sealer- Wood; and Lacquer Coatings.

The Executive Officer shall conduct:

(1) A technology assessment for the future VOC limit for flat coatings as specified in paragraph (c)(2) by July 1, 2000 and July 1, 2007.

(2) .4 technology assessmentfor thefuture VOC limit./or lacquers specified in paragraph (c) (2) by January 1, 2004.

(3) A technology assessment for the future VOC limit for non-flats; primer, sealers, and undercoaters; floor coatings, rust preventative coatings; industrial maintenance coatings, quick-dry enamels, quick-dry primers, sealers, an undercoaters; stains. waterproofing sealer-wood as specified in paragraph (c)(2) by January 1, 2001 and January 1, 2004.*

In conducting the above technology assessments, the Executive Officer shall consider any applicable future California Air resources Board surveys on architectural coatings ***and any new*** *scientific knowledge concerning the environmental fate and availability of VOC compounds used in architectural coatings including any new atmospheric chamber studies and modeling techniques.*

After each technology assessment, the Executive Officer shall report to the Governing Board as to the appropriateness of maintaining the future VOC limit(s) or modifying the specific limit(s) or other limits in the rule, taking in to account changes in coatings technology, market forces, and advances in atmospheric science (reactivity, modeling etc.)

RESPONSE:
The AQMD has expanded the categories that will be assessed in the future technology assessments. In addition, the AQMD has also added another technology assessment to assess the scientific basis for a reactivity-based ozone control strategy. However, the AQMD has not incorporated the commentator's proposed assessment of environmental fate and availability of VOC compounds. The need for these fate and availability studies are currently under evaluation by the California Air Resources Board.

V. NPCA RESPONSE TO SPECIFIC PROPOSED AMENDMENTS TO RULE 1113 (11/20/98 DRAFT)

18-11

A. Addition of definition of " High Temperature Maintenance Coatings" (1113 (b)(19))

The NPCA supports the addition of the new definition for "high temperature maintenance coatings" and the proposed VOC limit of 550 g/l. This change recognizes the true realities concerning the current level of formulation technology for these type of unique coatings products.

B. Definition of "Industrial Maintenance Primers and Topcoats".

The NPCA supports the change in the definition as proposed in the Draft Staff report (page 103) of the February 25, 1999 version of the proposed rule.

C. Addition of the definition for "Non-flat Coatings" (1113 (b)(28))

The NPCA supports the addition of the new category and definition for "non-flat" coatings. The NPCA, as stated above, recommends that a 'High Gloss Non-Flat subcategory be added.

D. Revision of the definition of "Quick-Dry Enamels" (1113 (b)(31))

The NPCA urges the District to drop the sunset clause that has been added to the definition. We disagree with the conclusion in the Staff Report that "numerous acrylic and alkyd emulsions meet the gloss and dry times of a quick dry enamel " and also meet the performance characteristics of a true quick dry enamel. The Staff Report points out the "waterborne formulations actually dry faster than typical solvent-bone formulations but the report fails to point out the what they are comparing is only surface dry and not the "dry-though" which is the true indicator that the film is fully cured and will be block resistant when pressure is applied to it.

E. Revision of the definition of "Quick Dry Primers, Sealers, and Undercoaters" (1113)(b)(32))

The NPCA urges the District to drop the sunset clause that has been added to the definition. Most of our technical experts disagree with the Report's implication of technological feasibility reflected by the statement that "district staff found numerous primers, sealers, and undercoaters that comply with the proposed, and meet the dry time requirements of a quick-dry primer. sealer, undercoater ". This language demonstrates that the Report fails to address the real issue in determining whether a coating is technically feasible at a lower VOC level. The real issue is whether these lower VOC products meet all the required performance characteristics of an effective true quick-dry primer, sealer, undercoater, and not simply whether they surface dry within an acceptable period of time.

F. Revision of the definition of "Waterproofing Sealers" (1113 (b)(47))

The NPCA can support the splitting of the Waterproofing category into the two categories Waterproofing Concrete/Masonry Sealers and Waterproofing Wood Sealers" as long as the definition for the Waterproofing Wood Sealers is 1) modified to reflect the national definition and 2) has a VOC limit which reflects current state of the technology for these coatings that provide protection with a single coating application.

RESPONSE:

A. High Temperature Maintenance Coatings
The AQMD agrees with the commentator.

B. Industrial Maintenance Primers and Topcoats
The proposed amendments delete the term "industrial maintenance primers and topcoats" and renames the category "industrial maintenance coatings". However, the reference to Page 103 of the staff report is not accurate.

C. Non-Flat Coatings
The AQMD has added a new category called "nonflat coatings", but does not support the addition of "high gloss non-flat" category.

D. Quick-Dry Enamels
The sunset clause has been removed from the definition. Additionally, the interim limit for quick-dry enamels has been raised to 250 g/l, effective July 1, 2002. This category is also included in the list of categories that can be used in the Averaging compliance option.

E. Quick-dry primers, sealers, and undercoaters
Based on the 1996 CARB survey, the AQMD has found that 44% of the total volume of quick-dry enamels already meet the proposed 200 g/l limit, effective July 1, 2002, 12% of the overall volume already complies with the proposed 100 g/l, effective July 1, 2006. This clearly shows that performance is acceptable to the consumer for lower VOC quick-dry primers, sealers, and undercoaters. Removal of the sunset clause for this category is not warranted at this time. However, the Averaging Compliance Option have been expanded to allow for averaging quick-dry primers, sealers, and undercoaters.

f. Waterproofing Sealers
The definition for both the waterproofing concrete/masonry sealers and the waterproofing wood sealers has been reviewed by manufacturers. An additional change is not warranted at this time.

VI. THE AVERAGING PLAN.

The averaging plan set forth in Appendix A suffers from two shortcomings discussed in the working group meeting of April 7. These relate to the problems with Method 24 for determining VOC content, as well as the question of "violations" should an averaging plan not be met.

18-12

A. Method 24

As was identified by several commentators during the 1996 rulemaking, Method 24 is unreliable when measuring low-VOC coatings. It's not that the test is repeatable, it's simply that the VOC content is subject to too great a margin of error at these levels.

B. Number of Violations

Appendix (G) provides that An exceedance of the allowable emissions for any compliance period that the Averaging Plan is in effect shall constitute a single, separate violation of the requirements qf this section for each day of the applicable compliance period.

This language is ambiguous, and staff was questioned as to whether a manufacturer which had violated their averaging plan would have committed ***one*** *violation, or one violation for the averaging plan and one for each unit of product sold, pursuant to the plan, which exceeded the VOC limit for that category. Staff responded that the District would view violations of both the plan and individual products. Given that "unlawful" conduct is actionable by any private party "in the public interest" under California Business & Professions Code § 17200, manufacturers are concerned that an innocent violation of the averaging provision could expose them to third-party*

liability should environmentalists or others determine that AQMD is being too lenient in addressing the violation.

The following language was proposed to attempt to initially address the two above problems with the averaging provision.

For purposes of determining compliance with the averaging- plan. actual emissions shall be calculated at the conclusion of the compliance period, based on the lower of (a) the actual VOC content of all coatings included in the plan, as demonstrated by contemporaneous production records maintained by, the manufacturer, or (b) testing for VOC content performed on actual products sold with the District pursuant to generally accepted methodology.

We suggest that the District adopt specific language in the Rule providing that violations are not intended to be actionable "unlawful" business practices under § 17200, which may be the only way to deal with this problem.

RESPONSE:

A. Method 24

The AQMD has worked closely with USEPA and educational institutions over the past several years to identify alternative test methods for measuring the VOC content of low-VOC architectural coatings. Under a contract with USEPA, the Research Triangle Institute has developed alternative test methods to Method 24. These include a modified Method 24, a single-injection headspace analysis, a multiple headspace extraction analysis, and an automated thermal desorption (ATD) analysis. The ATD approach has provided results that were closest to the Method 24 measured values. The AQMD fully anticipates the development and approval of an alternative test method over the next few years, prior to implementation of VOC limits at or below 50 g/l.

B. Averaging

Over the past several weeks, the AQMD has worked extensively with various coating manufacturers that are interested in the flexibility provided by the Averaging Compliance Option. These manufacturers have provided extensive feedback to staff pertaining to the equation as well as other requirements. The AQMD has incorporated these into the Averaging compliance option to provide for a simplified, flexibility option that would allow compliance with the proposed amendments with lesser socio-economic impacts, while maintaining the enforceability of the provisions. Staff believes that the new equation for calculating allowable and actual emissions, as well as the extensively revised language in Appendix A indeed simplifies the overall Program submittal, renewal, modification, and termination process. The language in the violations section is necessary to ensure compliance with the provisions, and the language pertaining to 'single, separate violation' has been clarified. Additional language has been added to clarify minor violations. Based on the AQMD's legal review, the provision, as currently worded is necessary to ensure full compliance. The AQMD does not intend that violations be prosecuted as unlawful business practices under section 17200.

19. REFERENCE RAM-MAR PAINTING, INC.
APRIL 15, 1999

ISSUE:

19-1 Your proposed strategy of combining VOC limitations on primers, sealers and undercoats is not workable due to the variety of different substrates that need to be painted on a house. Some of these are drywall, wood, plaster, ferrous metal, galvanized metal, aluminum, brick, precast cement Surfaces, preprimed and prefinished items, such as powder coats, epoxies, urethanes and other solvent coatings that come from other areas of the country. All of these substrates require a different coating system to enable prime, seal or undercoat. For example, drywall primer can be formulated in a manner that would not be an acceptable prime, for galvanized metal, ferrous metal or a prefinished or preprimed substrate. Some of these surfaces, such as fireplace chimney caps and fireboxes require high temperature coatings or certain exterior wood requires a flame retardant coating as required by city, county or fire department ordinances. Even different types of wood will require a different type of primer depending on whether it is smooth or roughsawn, tannic acid content and the type of finishing system being used. Prefinished gutters and downspouts can not be finished without a barrier or tie coat of primer due to the baked on enamel finish or powder coat on the surface. As you can see, listing industrial maintenance coatings only for industrial service and not architectural housing is severely limiting the ability of the paint manufacturer and the painting contractor to use the appropriate primer, sealer or undercoat and finishing system for the intended service of the substrate.

RESPONSE:

The current proposed amended rule allows for different limits for primers recommended for different substrates. For example, the new category called rust preventative coatings allows for specialty primers necessary for corrosion resistance on metal substrates in commercial and residential areas. Additionally, for areas with harsh environmental conditions, as defined in the industrial maintenance coatings definition, primers recommended for industrial maintenance uses can be used. These industrial maintenance coatings, however, are not allowed for areas without the specific environmental conditions included in the definition, including residential and commercial areas. Furthermore, a new specialty coating category called high temperature industrial maintenance coatings allows for primers and topcoats recommended specifically for areas exposed to high temperatures. Lastly, there is the general primer, sealer, and undercoater category that covers other areas, including drywall, masonry, plasterboard, and wood. Staff has analyzed primers, sealers, and undercoaters that are recommended for a variety of uses, including stain-blocking, interior and exterior uses, and adhesion to masonry. The limitation of industrial maintenance coatings in residential and commercial use is consistent with the National Rule on AIM Coatings.

19-2 At the public meeting, the cost of the reformulation was discussed and you anticipate a 20% increase for reformulation. I believe there are some areas that you have not considered in your cost analysis. I do not believe that you considered the additional cost to the painting contractor or the homeowners. Personnel will need to be retrained to properly apply these new coatings. More coats may be necessary for proper coverage of surfaces. Coverage rates may be less. Also the cost of correction of any failures that occur with products formulated and placed on the market for use without adequate field testing of the products due to very short reformulation time. As a painting contractor who has several lawsuits pending due to the current coatings not meeting the life expectancy of the California homebuyer, I can well believe that there will be a substantial increase in litigation due to the failure of an inadequately tested product being placed on the market.

RESPONSE:

The socio-economic impact assessment includes a 10% increase for interim limits and a 20% increase in the price of coatings complying with final limits. This price increase includes not only the increased cost of the raw materials, but also cost of reformulating, testing, and commercialization, as well as other costs included in the pricing. The assessment assumes that all of this cost will be passed onto the consumer in the form of a higher price of the coating. However, the AQMD has several references that indicate that compliant coatings are available at no incremental costs when compared to conventional coatings used today. Nonetheless, staff has analyzed an increased costs for each and every coating category on a per gallon basis. The AQMD, during the public workshop and public consultation meetings, has repeatedly asked members of the industry for actual costs associated with litigation, retraining of personnel, as well as any additional costs incurred by painting contractors. To date, the AQMD has not received any specific information pertaining to these additional costs from coating manufacturers or professional painting contractors, including Painting and Decorating Contractors of America.

19-3 Architects, substrate manufacturers and government agencies are going to need time to evaluate these products and specify them as appropriate material for use on their substrates. without voiding their warranties, which I will then be in breach of contract by applying coatings that are not acceptable for their surfaces.

RESPONSE:

Staff has considered the comments provided by end-users (including governmental agencies), coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing.

19-4 In closing, my comments are that more categories of paint coatings that are substrate specific are needed. The total cost of reformulation needs to be re-assessed. Manufacturers and contractors need more time for reformulation and field testing of paint coatings to insure that they perform as intended. Architects and substrate manufacturers need more time to specify which coatings will be acceptable for their surfaces.

RESPONSE:

See Responses to Comments 19-1, 19-2, and 19-3.

20. REFERENCE SHERWIN WILLIAMS
APRIL 15, 1999

ISSUE:

Timing - Of Hearing

20-1 The Sherwin-Williams Company is very concerned over the timing of this project. The District has National Technical Systems (NTS) under contract to complete the Phase II Assessment of Architectural Coatings. In the original Work Group meetings in fall of 1998, we were led to believe that this NTS study would form the basis for this rule development, that it would be used to support the rule adoption. It is referred to repeatedly throughout the Draft Staff Report. However, as of April 14, 1999 with only four weeks remaining before the scheduled Hearing date of May 14, 1999, the parties to be regulated by this rule adoption have not been provided with the results of this Study. This places an unreasonable burden on industry, since we have been unable to evaluate the technical feasibility of the limits in relationship to the data from the Assessment and since we will have an inadequate time period -- if any - during which to perform such an evaluation prior to the Hearing. This study is expected to reveal performance differences, VOC content - performance relationships, durability issues, etc. that will be critically important in determining the appropriate VOC content limits.

RESPONSE:

The laboratory testing of the NTS study is complete and was made available in April 1999. This study analyzed application and durability characteristics in greater detail, and the results show that zero-VOC coatings available today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including, but not limited to, coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. Generally, the Industrial Maintenance Coatings evaluated in this study performed well for durability characteristics, as well as their application characteristics. However, the NTS results also highlight application characteristics of the zero-VOC nonflats and primers, sealers, and undercoaters that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments. Nonetheless, as a result of comments provided by industry, staff has raised the interim and final limits for some categories, as well as extended the interim and final compliance dates by up to an additional 18 months.

The results were initially forwarded and discussed with the Technical Advisory Committee, comprised of members from the Industry, on April 12, 1999. A summary of the study was presented to the AQMD Governing Board's Stationary Source Committee, which is attended by the public, and a summary of the results were passed out to the public. Members of the architectural coatings industry were present at the last meeting, held on April 23, 1999. Subsequent discussions with the Technical Advisory Committee regarding the interim report were conducted on April 26,

1999. Finally, the summary of the Phase II Assessment Study results were presented to the public at the working group meeting on April 28, 1999. This summary is included as Appendix G of the Staff Report.

Additionally, the Draft Staff Report for PAR 1113 - Architectural Coatings was made available to the public on February 17, 1999. The Draft Subsequent Environmental Assessment documentation was released on March 19, 1999 and the Draft Socioeconomic Analysis was made available for public review on April 13,1999. All required reports relative to the amendments of Rule 1113 have been released in a timely manner by District Staff and within the statutorily required 30 days prior to the scheduled May 14, 1999 Public Hearing. The information contained in these documents have substantiated the technological feasibility of the limits set in the proposed rule.

During the rulemaking process, AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006, including high performance industrial maintenance coatings. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits. However, the AQMD is committing, in conjunction with industry, to further assessing these coatings as a part of the future technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

The commentator is encouraged to review the technology discussed in detail for each coating category in the staff report, as well as the comprehensive list of coatings included as Appendix D of the Subsequent Environmental Assessment.

20-2 The Draft Staff Report provides the following guidance on the importance of the NTS study: "In order to obtain such performance data regarding application and durability characteristics of the low- and zero- VOC coatings currently available, the AQMD contracted with National Technical Systems (NTS) to do a side-by-side comparison of zero-, low- and high- VOC coatings." With this introduction in the package of information provided to the Governing Board to persuade the Board to set the Hearing date for May 14, 1999, one would assume that the data was available and used in the rule development process. Instead, the data has not been available to the parties to be regulated by this proposed rulemaking and staff has developed each of the proposals without benefit of this data.

RESPONSE:

See Response to Comment 20-1.

20-3 In addition, the NTS Assessment results on accelerated weathering will not be available for several more weeks. With the Hearing in 4 weeks, it appears that these results will not be used in any part of the rule development. These accelerated weathering studies are the first indication of long term exterior durability effects and may reveal issues undisclosed in company-supplied information, on which staff is depending for the current staff report and proposal. Since the proposed rule has a significant impact on exterior coatings (including exterior nonflat coatings, industrial maintenance coatings, exterior stains, exterior primer, sealer, and undercoaters, and

exterior rust preventative coatings), it is critical that these results be available and evaluated (by both industry and staff) prior to a final rule proposal and prior to the rule adoption Hearing.

The NTS study is referred to repeatedly throughout the Draft Staff Report dated February 17, 1999 with statements, such as:

1. *In the industrial maintenance coating discussion, the NTS report is to be "available soon, including the prohesion chamber weatherability" results.*
2. *In the nonflat coatings discussion, the NTS report is to be available "in the near future.*
3. *In the discussion of the primer, sealer, and undercoater category, the NTS report is to be "available soon."*
4. *The NTS report is also referred to in the discussion of the quick dry primer, sealer, and undercoater category.*
5. *The NTS report is also referred to in the discussion of stain category.*
5. *The NTS report is also referred to in the discussion of the waterproofing wood sealer category.*

This document calls out to be "heard" prior to the rule adoption - with sufficient time for evaluation by the parties to be regulated.

We recommend the Hearing date be postponed until the August Board meeting.

RESPONSE:

As indicated in the Response to Comment 20-1, the summary of the NTS study, as well as the report, has been available to the public for several weeks. The results are consistent with staff's own technology assessment, and show that the proposed limits and compliance dates are feasible. The commentator refers to accelerated weathering studies included in the NTS study. The laboratory accelerated weathering studies are completed and show overall comparable performance for the low- and zero-VOC coatings, and in some cases, superior performance than the higher solvent-containing coatings. The commentator is encouraged to review the prohesion test chamber study data included in the summary and the actual study for laboratory accelerated test data. However, in search for accelerated and real time exposure data with better correlation, the NTS study also includes outdoor accelerated and real time accelerated tests. The results from these studies may not be available for several years and will be incorporated into future technology assessments, required by the rule.

Therefore, the AQMD does not support the concept of extending the public hearing from the currently scheduled May 14, 1999 public hearing date.

20-4 In addition, comments on the Draft Staff Report are due on April 15, 1999 and comments on the Draft Subsequent Environmental Assessment are due April 21, 1999. The current schedule does not provide an adequate time period for a 30-day Notice period prior to the Hearing Date with a modified proposal. Thus, we must assume that changes to the proposal will not be significant enough to require such a notice period and that many pertinent comments will not be given the weight they deserve.

For all of these reasons we respectfully request the Hearing date for Rule 1113 - Architectural Coatings be postponed until the August, 1999 Governing Board Meeting.

RESPONSE:

All comments will be given the weight they deserve. Many comments have caused the staff to propose changes to the rule. Many of these changes are meaningful, although they do not trigger a legal requirement to delay the rule adoption hearing.

20-5 Staff has proposed a two-phase approach to the reduction of the VOC content: the first reduction would be effective on 1/ 1/2002 and the second reduction to be effective on 1/ 1/2005. This is in contrast to the time periods for product development and implementation for the flat coating VOC reductions. Amended in 1996, the VOC content limits for flat coatings were reduced from 250 g/l to 100 g/l five years later (7/1/2001) and to 50 g/l seven years later than that, providing a total of twelve years from the rule adoption. However, staff's current proposal plans to reduce the VOC content limits of nine additional categories in 2.5 years, with a further reduction in 5.5 years. This is unreasonable for several reasons:

1. *The Sherwin-Williams Company and most of industry needs much more time to achieve the required reductions.*

2. *With the flat coatings having a major limit change on 7/1/2001, we can anticipate some implementation problems which will need to be resolved at the same time as the new lower limits need to be implemented for the additional nine categories. Industry staffing will be inadequate to accomplish both without major problems developing.*

3. *The new limits effective on 1/1/2002 will require multiple significant technological breakthroughs to accomplish for the many and varied products represented by such broad categories as nonflat coatings (as well as quick dry enamels), primers, sealers, undercoaters (as well as the quick dry primers, sealers, undercoaters), industrial maintenance coatings, rust preventative coatings, floor coatings (with residential as well as industrial / commercial / institutional uses), and stains (interior, exterior, semi-transparent and opaque). Meeting the performance requirements for complex categories such as these can not be accomplished with a single formulation, but rather will require multiple product offerings. For example, consider the numbers of nonflat products which we will need to develop:*

    a. *An exterior nonflat semi-gloss coating*
    b. *An interior nonflat semi-gloss coating*
    c. *An exterior nonflat satin (or eggshell) coating*
    d. *An interior nonflat satin (or eggshell) coating*
    e. *An interior nonflat high gloss coating*

NOTE: Exterior coatings are not appropriate for use in interior applications because film formation requirements are different, the use of mildewcides in exterior coatings frequently exceed the levels acceptable for interior usage, harder resins are used for interior surfaces, etc.

A similar scenario exists for stains (exterior semi -transparent, interior semi- transparent, exterior opaque, etc.) and for primers (interior drywall (plaster, masonry, etc.), interior hardwood, interior plywood, exterior wood (e.g. shingles, etc.), exterior composition board, etc.). An even more complex situation exists for sealers which have varied uses (wood, concrete, interior, exterior, etc.) and for industrial maintenance coatings which are used in a wide variety of situations (chemical plants and exposures, waste water treatment plants, food, water, and beverage, and bridges and other highway structures, immersion service, petrochemcials, paper and pulp mills, etc.) and for a diverse set of environmental conditions (see proposed definition for environmental conditions). Multiple products are needed to satisfy all of the performance requirements for each of these situations and conditions. In many situations these coatings are specified by governmental agencies and / or are approved by such agencies, prior to use. For example, coatings for use inside of potable water tanks are approved by the National Sanitation Foundation (NSF). The Sherwin-Williams Company has 16 currently approved, all of which comply with the current VOC limits in South Coast: of these only six products (representing only 8% of the volume distributed into CA) will remain available on 1/l/2002 and only two products (representing only 5% of the volume distributed into CA) will remain available on 1/1/2005.

RESPONSE:

1.
Staff has considered the comments provided by end-users, coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation

2.
The AQMD encourages the commentator to assess the currently available coatings and resin systems to initiate their research and development programs now. However, based on similar comments from members of the industry, the interim limit has been revised to July 1, 2002 to provide additional time for manufacturers.

3.
The AQMD recognizes that coating manufacturers that do not have compliant products will need to reformulate their existing coatings. However, numerous manufacturers, including the commentator's company, have numerous compliant coatings that meet the proposed interim and final compliance coatings now. The staff report has a comprehensive discussion of all of the coating categories impacted with by the current proposal. Staff has identified nonflat coatings, industrial maintenance coatings, stains, waterproofing wood sealers, and primers, sealers, and

undercoaters that are recommended for interior and exterior, as well as dual usage. Staff has also identified potable water tanks immersion coatings that comply with the proposed limits. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

Lastly, the Averaging Compliance Option will provide the coating manufacturers with the flexibility to retain certain lines of noncompliant products, and focus their research and development efforts on fewer lines of products.

20-6 We recommend only one set of reductions be considered for adoption with an effective date no earlier than 1/1/2005. This would provide the needed time to accomplish the significantly lower limits for the multitude of categories to meet the varying performance requirements and would be on "par" with the earlier adoption of lower limits for flat coatings by providing 6.5 years

RESPONSE:

Staff has considered the comments provided by end-users, coating manufacturers, and resin suppliers pertaining to testing and commercialization of technology. In response, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing.

The AQMD has received some support from coating manufacturers for these timeframes. The revised, simplified Averaging Compliance Option also provide the coating manufacturers with the flexibility to retain certain lines of noncompliant products, and focus their research and development efforts on fewer lines of products.

Furthermore, the interim limits are necessary to provide for the emission reductions called for in the 1997 AQMP. Therefore, the AQMD does not concur with the commentator on having only one set of reductions.

Future Re-Evaluation of Rule Prior to Lower Limits becoming Effective

20-7 It is noteworthy that the Preliminary Draft Staff Report indicated a Feasibility review would be performed for (some) of the categories to insure product performance is adequate in products meeting the limits, prior to the first effective date. However, the Draft Staff Report now refers to a Product Availability Assessment, rather than a feasibility review of performance issues. This dramatic change in approach supports our concerns over having two Tables of Standards adopted at this time. and over the specific rule effective dates for the lower limits. We stress that we believe it appropriate to have only one lower set of limits adopted at this time and that the effective date for these limits should be no earlier than 7/1/2005 - providing the same 5 years as that provided upon adoption of the initial lowering of the limit for flat coatings.

RESPONSE:

Based on on-going weathering and application tests included in the NTS study, as well as additional technology assessments requirements in the rule, the AQMD will conduct product availability assessments that will include a thorough review of application and durability characteristics.

Exempt Solvents

20-8 If acetone is used to achieve a low solids, low viscosity, compliant formula, a negative - impact results from the significantly increased risk associated with the increased flammability. The use of acetone would change the formulations which are currently combustible to flammable, and lower the flash point from above 100 F to significantly below 65 F. This would significantly increase the hazards of fires and explosions. In addition it changes the shipping class as well as the storage class of the product. This is a very significant change. The Draft Staff Report compares the warnings on lacquer thinners with those on acetone. HOWEVER, lacquer thinners are recommended for use with lacquers! Not for use with the floor coatings, high temperature coatings, industrial maintenance coatings, nonflat coatings, primers, sealers & undercoaters, quick dry primers, sealers, and undercoaters, roof coatings, rust preventative coatings, stains, and waterproofing sealers for wood which are the subject of the current rule development.

RESPONSE:

The commentator may be misunderstanding the content of the acetone discussion of the staff report. The staff report includes a discussion of acetone, since it could potentially be a replacement solvent for some of the categories included in the current proposal.

Specifically, the staff report clearly indicates that in the current proposed rule, acetone may be used as a replacement solvent for waterproofing wood sealer formulations. Although acetone is volatile, odorous and flammable, it offers a relatively inexpensive alternative to VOCs at $2.10 a gallon.

The staff report also discusses other exempt solvents, including Oxsol 100 (p-chlorobenzotrifluoride). This designer solvent is manufactured by Occidental Chemical Corporation, and was delisted as a VOC in 1994. This solvent can be used to extend or replace

many organic solvents, including toluene, xylene, mineral spirits, acetone, methyl ethyl ketone, tricholorethylene, and percholoroethylene. This product is less toxic than toluene, is not consider a Hazardous Air Pollutant or an Ozone-Depleting Substance. This solvent can be used as a replacement solvent for a variety of coating categories, but is more expensive.

USEPA is also in the process of delisting t-butyl acetate, which may also help coating formulators in utilizing exempt solvents in their formulations.

Exempt solvents are considered to be a viable alternative to other, more toxic solvents currently found in various coatings. The technology assessment for a reactivity based ozone control strategy may result in exemption of many different solvents, depending on their overall contribution towards ozone formation.

The commentator should refer to the Subsequent Environmental Assessment for the November 1996 amendments for this rule, as well as the staff report for Rule 102, is referenced for a more in-depth analysis of acetone as a substitute solvent.

20-9 The Draft Staff Report confirms that there is a significant difference between flammable and combustible materials. It discusses interviews with four local fire departments on the hazards associated with acetone-containing coatings. All four indicated that they would be equally concerned with any coating or solvent which has a flash point below 65 F. The report quoted Captain Michael R. Lee, County of Los Angeles, Fire Department, as stating, "... Acetone represents the highest degree of fire hazard of the four solvent considered..." (The four solvents a acetone, xylene, methyl ethyl ketone, and butyl acetate. However, the most common solvent used in solvent borne floor coatings, high temperature coatings, industrial maintenance coatings, nonflat coatings, primers, sealers & undercoaters, quick dry primers, sealers, and undercoaters, roof coatings, rust preventative coatings, stains, and waterproofing sealers for wood is mineral spirits, with a flash point of 105 F (combustible) - a solvent which is not considered a Hazardous Air Pollutant by U. S. Environmental Protection Agency nor by CARB.)

The cost differential between acetone and mineral spirits is over 100% - acetone costing more. This pales in comparison to the other issues surrounding the use of acetone in the coatings that are the subject ofthe current rule development.

RESPONSE:

See Response to Comment 20-8.

20-10 The other exempt solvent which is potentially applicable to coatings is Oxol 100. The use of Oxol would significantly increase the cost of the formulas. Oxol is several times the cost of the mineral spirits that would need to be replaced by at least 50% to achieve the projected limit of 200 g/l.

RESPONSE:

See Response to Comment 20-8

Reference to Sherwin-Williams Products

20-11 The Draft Staff Report continues to misrepresent the VOC contents of Sherwin-Williams's coatings. We discussed this issue in our comments on the Preliminary Draft Staff Report - and yet the correction is not a remedy to our concerns. For example, in discussing nonflat coatings the Draft Staff Report now states: "..Sherwin-Williams markets an exterior line of flat, satin, and gloss 100% acrylic paints (A-100® Line) that have a VOC content of 58 g/l, 38 g/l, and 49 g/l. respectively." Much later in the paragraph the following sentence appears: "The VOC content information provided above is for white paints only." The proper, non-misleading correction would be to say: "The leading white paint for Sherwin-Williams's exterior line of flat, satin, and gloss 100% acrylic paints (in the A-100® Line) have VOC contents of 58 g/l, 38 g/l, and 49 g/l, respectively."

This problem exists throughout all references to Sherwin-Williams products that staff found in our Guide for Specifiers and Applicators.

RESPONSE:

The AQMD believes that the indication that the VOC limits reported in *Guide for Specifiers and Applicators* are for white-colored paints only is not misleading, and indicate a fact.

Limits and Categories

Floor Coatings

20-12 The Staff report concentrates on alternative low VOC content floor coatings which are currently classified for sale in the District as multicomponent industrial maintenance coatings. Intact, the Governing Board package specifically states that the floor coatings are a subset of the industrial maintenance category. However, there are a number of products which are used for residential floors, decks, and porches which are currently classified for sale in the District as nonflat coatings. A limit of 100 grams per liter is not possible for these coatings, and is lower than the proposed limit of 150 g11 for standard nonflat coatings. This does not make sense, since these are nonflat coatings which need to meet much more severe performance criteria.

As requested during the Public Consultation Meeting of March 31, 1999, we are submitting as Confidential Business Information of The Sherwin-Williams Company detailed information on the sales of our nonflat floor coatings and of our industrial maintenance floor coatings. We strongly

recommend either that this category be divided into two categories, one for multi- component systems with a VOC content limit of 100 g/l and one for coatings more appropriate for residential use with a VOC content limit of 250 g/l for use in residential settings.

RESPONSE:

The AQMD does not concur with the commentator that only two-component floor coatings are included in the floor coating category. The staff report does include an extensive discussion of two-component, high performance floor coatings. However, the final staff report includes a discussion of an acrylic-based, single component, high performing floor coatings with a VOC content less than 50 g/l. Specifically, this coating is manufactured and sold by Coatings Resources Corporation for both industrial and residential uses. There are numerous other acrylic-based, single component floor coatings available for commercial and residential uses.

Industrial Maintenance Coatings - Definition
20-13 The proposed definition for industrial maintenance coatings poses several problems because it limits use of these coatings to industrial facilities. However, these coatings are legitimately used and needed in a number of additional situations including on bridges and tanks, and in institutional and commercial facilities. Infact, the Draft Staff Report highlights uses of these coatings on bridges and marine (What application was meant since coatings for ships are covered under other SCAQMD regulations), as well as water and waste treatment facilities. (Apparently. the treatment facility would be considered industrial but the storage tanks would not (?). This does not make sense. Bridges need heavy duty protection of all surfaces, including metal, concrete, and other masonry. As the Draft Staff Report recognizes, the typical coatings used are industrial maintenance coatings, which are formulated for such protective applications. While usually part of an industrial site, tanks can also be free standing and independent (such as, city water tanks). Institutions, such as hospitals, nursing homes, day care centers, etc. need coating systems which can withstand cleaning with strong chemical and abrasive cleansers to remove blood and other bodily fluids. Commercial operations take several forms: restaurants which require coatings which can withstand cleaning with strong chemical and abrasive cleansers to remove oil, grease, and food residues; public buildings (such as, sports arenas) requiring a variety of coatings: rust preventative on metal stairwells, but also heavy duty coatings for masonry / concrete surfaces where a significant amount of contact or disinfecting ability is needed (some walls, bathrooms, etc.). Typical job specifications for the coating of sports arenas includes both low VOC waterborne systems and higher performance industrial maintenance and rust preventative coatings.

RESPONSE:

The AQMD has revised the definition of industrial maintenance to clarify the use of industrial maintenance coatings.

20-14 The definition of industrial maintenance coatings approved in the 1989 (California) Air Resources Board / California Air Pollution Control Officers Association Suggested Control Measure for Architectural Coatings includes most of these needed applications. Likewise, the SCAQMD proposal included in the Draft Staff Report included most of these needed uses. However, the SCAQMD proposal included in the Draft Subsequent Environmental Assessment which we have been told is the "current" proposal did not.

CARB/CAPCOA SCM:
"INDUSTRIAL MAINTENANCE COATINGS: high performance coatings formulated for and applied to substrates in industrial, commercial, or institutional situations that are exposed to one or more of the following extreme environmental conditions:
i) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation;
(ii) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, chemical mixtures, or solutions;
(iii) repeated exposure to temperatures in excess of 250 F;
iv) repeated heavy abrasion, including mechanical wear and repeated scrubbing with industrial solvents, cleansers, or scouring agents; or
(v) exterior exposure of metal structures.
Industrial maintenance coatings are not for residential use or for use in areas of industrial, commercial, or institutional facilities such as office space or meeting rooms."

Since this definition very clearly lists the environmental conditions warranting the use of an industrial maintenance coating, it "protects" the District from misuse issues. We strongly recommend the following additions to this definition (explicitly allowing the use of such coatings on bridges and on and in storage tanks) as shown below:

<u>Industrial maintenance coatings can be used on the structural support members of bridges and in and on storage tanks but are not for residential use nor or for use in areas of industrial, commercial, or institutional facilities such as office space or meeting rooms. They can also to be used on metal surfaces found in the interior of these facilities.</u>

This definition removes the extra limitations which are needlessly and dangerously restrictive from the Draft Staff Report definition.

RESPONSE:

See Response to Comment 20-13.

Industrial Maintenance Coatings - Limits
20-15 The proposed limit of 250 grams per liter on I/I/2002 is feasible with one important exception: coatings used for tank and pipe linings. These are immersion service coatings, in constant contact with a variety of chemicals, including - but not limited to - water, wastewater and sewage, petrochemicals, and other chemicals. The performance required for such service is exceptionally high and necessitates higher technology formulations. These formulations must undergo several years of immersion tests prior to introduction and have high liabilities for failure. Storage tank capacities vary widely; a typical storage tank may hold 100,00 gallons, with some holding as much as 500,000 gallons. The liability for contamination of such tanks is tremendous. There are no accelerated testing schemes to determine how a product will perform in such service; thus, several years of actual immersion testing must be accomplished before any reputable manufacturer would risk product introduction.

RESPONSE:

The AQMD has found industrial maintenance coatings that comply with the proposed interim and final limits, even for tank and pipe immersion coatings, including NSF/ANSI approved use for potable water. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

20-16 These formulations typically cost 40-75% more than standard industrial maintenance coatings with comparable VOC contents and comparable resin types. For example, an epoxy appropriate for use in a petrochemical storage tank with a VOC content of 300 g/l would cost 40-75% more than a standard industrial maintenance epoxy with the same VOC content. Thus, the District has some built-in protection for providing a separate category for pipe and tank linings. We recommend the following definition:

TANK COATINGS: high performance coatings formulated for and applied to chemical or water pipes or tanks that are exposed to one or more of the following extreme environmental conditions:
(a) immersion in water, wastewater, or chemical solutions (aqueous and non-aqueous solutions), or chronic exposure of interior surfaces to moisture condensation; or
(b) acute or chronic exposure to corrosive, caustic or acidic agents, or to chemicals, chemical fumes, chemical mixtures, or solutions.

We recommend the following schedule of VOC content limit reductions for this unique category:

Tank & Pipe Coatings 420

Effective On Adoption	*Effective I/2002*	*Effective I/2005*	*Effective I/2008*
420	*400*	*350*	*250 g/l*

RESPONSE:

See Response to Comment 20-15.

20-17
Nonflat Coatings
The staff report discusses the technological developments which support the concept of a future limit at 50 g/l. The discussion of Rohm & Haas crosslinking latexes, Emulsion E313 1, SF091 and Hydro 30 is incomplete. In addition to concerns with the freeze thaw stability of the latex and associated nonflat coatings and in addition to significant concerns with the cost differential compared to current latexes, the Sherwin-Williams Company has concerns with the ability to successfully apply this coating at lower temperatures. (NOTE. while this resin is only for interior use, low temperature applications can be encountered in such coating applications during new home constructions.) These latexes also limit the ability of the coating manufacturer to develop a variety of product lines with differentiated performances. We are also very concerned about colorant development and stability. The Draft Staff Report indicates discoloration can be caused by the use of aldehydes and formaldehyude: these chemicals can be found in colorants. Hence, our concern over the use of colorants with these new latex developments.

The Draft Staff Report suggests that freeze thaw stability can be achieved with the use of surfactants, without sacrificing other characteristics. In our vast experience with freeze thaw stability issues, we have not found this to be true. Freeze thaw stabilizers are volatile organic compounds like propylene glycol.

The Draft Staff Report discussed the zero-VOC technology developed by Conlux and offered by PPA Technologies. With our acquisition of Conlux, Sherwin-Williams evaluated this technology and determined that there were a number of unresolved concerns with this technology, including the possible presence of residual monomer.

The Draft Staff Report discussed the Air Products & Chemicals AIRFLEX technology. While our evaluations are incomplete, we have concerns about the need to introduce co-solvents to this supposedly "zero" VOC system to achieve low temperature applications.

RESPONSE:

The AQMD would like to thank the commentator in sharing its limited experience with the resin systems discussed in the staff report. The data reported in the staff report was obtained from the resin suppliers directly, who informed us of the product's strengths and limitations, as well as the strong potential for utilizing these resin systems. The AQMD requests that the commentator provide any of its laboratory analyses of Rohm & Haas's, PPA Technology's, and Air Products and Chemical's resin systems. The laboratory analyses may be utilized in support of future technology assessments.

20-18 The Draft Staff Report depended heavily on the Sherwin-Williams products described in our 1998-1999 Painting & Coating Systems Guide for Specifiers and Applicators. Comparing the ProC]assic@ Waterborne Acrylic Semi-Gloss and Gloss product lines to alkyds systems, we claim "finishes that are equal to alkyd enamels for flow and leveling" - however, these systems are less durable than alkyd systems. Our SuperPaint@ Exterior High Gloss Enamel (A85) has "superior performance in block resistance, moisture resistance, gloss retention, and flow and leveling" when compared to other exterior gloss latex coatings. Our EverClean@ Interior Satin (A97) and Semi-

Gloss (A98) cost significantly more than standard latex satin and semi-gloss products, and require special care during application due to the short wet edge time.

Table 8 of the Draft Staff Report shows the availability of "zero" VOC coatings. Only one national company has a product for exterior usage. In addition, none of the other four manufacturers who claim to have such products suitable for exterior use have sales placing them within the top 25 companies.

We agree with the concern expressed in the Draft Staff Report about the inferior wet edge of "zero" VOC coatings compared to standard latex coatings. This problem, however, is more significant to contractors than indicated in the Report. In exterior coating applications the lack of a wet edge will cause unsightly lines and lap marks - in such situations, ideally, one would apply the paint continuously across an individual board (such as on siding) so that a wet edge across each board could be maintained. For conventional nonflats this is not an issue, since the coating will maintain a wet edge for a time period sufficient to coat a significant portion of the building and to "cut in" to blend and level the demarcation points.

RESPONSE:

The AQMD recognizes some of the application characteristics that need to be further refined for the zero-VOC coating systems. In response to this need for refining application characteristics, the current proposal allows for an additional seven years to comply with the 50 g/l limit for nonflats and 100 g/l limit for primers, sealers, and undercoaters. As indicated in the staff report, the NTS study identified some of these application characteristics for zero-VOC coatings that are ranked lower than the higher-VOC alkyd based coatings. However, some zero-VOC coatings had comparable application characteristics to their higher-VOC counterparts.

As far as overall durability discussions, the staff report has quoted or extracted information from the product data sheets. Again, the AQMD requests detailed laboratory testing information that compares the durability characteristics of the *ProClassic® Waterborne Acrylic Semi-Gloss and Gloss product lines to alkyds systems* that shows inferior durability than alkyd systems. The commentator is also referred to the staff report that includes a discussion on durability of coatings.

The socio-economic impact assessment report accounts for an increase in price of compliant coatings, as compared to current coatings. Therefore the higher cost of the *Our EverClean® Interior Satin (A97) and Semi-Gloss (A98)* has been incorporated into staff's analysis.

Quick Dry Enamels and Quick Dry Primers, Sealers & Undercoaters
20-19 The Draft Staff Report discussed a study by Harlan & Associates for CARB, analyzing coatings claiming to be (or labeled as) quick dry enamels and quick dry primers, sealers & undercoaters., According to the Draft Staff Report, this study found that "most" of these coatings did not meet the VOC regulatory definitions for the "quick dry" classifications. However, the impact of this "revelation" is just that the District (and other regulatory bodies) need to enforce the definitions more carefully.

We agree with the Draft Staff Report that low VOC quick dry alkyd enamels tend to yellow more severely and more quickly than their higher VOC counterparts. We also agree that lower VOC alkyd and waterborne quick dry enamels have longer dry times than their higher VOC counterparts, especially in cooler, more humid conditions. However, we do not agree that the blocking and hardness of the waterborne formulations are "alkyd-like." The "ropey" uneven appearance of waterborne quick dry enamels can NOT be eliminated nor reduced with "proper surface preparation" as stated in the Draft Staff Report. This problem is a characteristic of the latex and rheology of the system. Rheology modifiers which prevent this problem by improving flow and leveling have negative impacts on blister resistance, sag resistance, and dirt pick up resistance. Blister resistance is important since without it the paint film can blister when water gets underneath it, possibly from the structure "breathing" out, sometimes from high moisture areas (such as bathrooms, kitchens, etc.), sometimes from rain penetration. This blistering is unsightly and will cause the film to peel. Sag resistance is important since without it the film sags, droops, curtains, runs, and results in an uneven and unsightly appearance. Dirt pick up resistance is important since without it flying dust and dirt will stick to, or become imbedded in, the film.

RESPONSE:

The AQMD recognizes that there are tradeoffs of different coating characteristics that must be balanced for an optimal formulation. The NTS study finds that some zero-VOC coatings have better application characteristics than other zero-VOC coatings, and that some have application characteristics, including leveling, sag resistance, blister resistance, and final film properties similar to some higher-VOC coatings. This indicates that some manufacturers have been able to overcome or balance application properties with the addition of rheology modifiers and other additives.

The AQMD requests that the commentator provide its detailed laboratory analysis to staff.

20-20 Contrary to the Draft Staff Report, we do NOT agree that recent technological advancements in additives for low VOC waterborne quick dry primers, sealers, and undercoaters have adequately shortened the dry times, especially under cool temperatures and high humidity conditions. We continue to have concerns over the number of complaints we receive - even with traditional waterborne systems. Application of waterborne coatings at lower temperatures and at higher humidities is particularly challenging and solutions have not yet been developed.

RESPONSE:

The NTS study shows that overall the acrylic-based waterborne (low- and zero-VOC) coatings have shorter dry times than higher-VOC, alkyd-based coatings. Some lower-VOC coatings have shorter dry times even under higher humidity and low temperatures.

Additionally, staff has reviewed technical and product data sheets for a variety of low-VOC coatings that claim to have acceptable dry times, even under low temperature and high humidity conditions.

Primers, sealers, and undercoaters
20-21 The Draft Staff Report has ignored the critical role primers, sealers, and undercoaters play in preparing substrates, especially substrates in marginal condition, for the topcoat. The performance of the topcoat rests on this foundation, and in non-ideal situations, the performance of the topcoat depends on the quality of the primer, sealer, or underoater.

We recommend the separation of this category into a drywall primer category with a lower limit and wood, cement, concrete primer categories with limits maintained at 350 g/l.

RESPONSE:

The AQMD has reviewed numerous product data sheets for primers, sealers, and undercoaters that have good adhesion to a variety of substrates. These include adhesion over weathered alkyds. These products have specific surface preparation requirements that must be followed to achieve optimal performance.

The AQMD has raised the interim and final limits, as well extended the compliance dates for primers, sealers, and undercoaters based on comments provided by industry. The initial proposal required an interim limit of 100 g/l and a final limit of 50 g/l. However, these have been raised to 200 g/l and 100 g/l, effective July 1, 2002 and July 1, 2006, respectively. Furthermore, a manufacturer can use the flexibility of the Averaging compliance option to maintain their lines of noncompliant coatings, by offsetting with supercompliant coatings.

Stains

20-22 The Draft Staff Report referred to the June 1998 issue of Consumer Reports magazine. This issue reported on a study of nine semi-transparent stains. It is important to not that these stains were all for EXTERIOR use.

One of the difficulties in lowering the VOC content of waterborne stains relates to the intrinsic nature of the system, which consists of resin (usually a latex), pigments, and a small amount of additives (including volatile organic compounds. If the level of pigments are increased, then the quality of film is reduced. If the resin level is increased, additional volatile organic compounds are needed to insure film formation, freeze thaw stability, colorant acceptance, etc. The level of resin can not be increased without increasing these additives. Thus, the solids can not be increased and the only way to reduce the VOC content is to reduce the quality. This is especially true for the exterior semi-transparent stains, where higher solids are undesirable. Thus we recommned that the limit for exterior semi-transparent stains be maintained at 350 g/l.

Interior Wood Stains

The Draft Staff Report did not consider the impact of the VOC limit reduction on interior wood stains. Specifically, the Report describes the stain category products as "used extensively in cabins and homes with soft wood exterior siding, as well as deck coating." This description does not mention the use of interior semi-transparent stains on interilor wood cabinetry, floors, trim, doors, etc. The only examples provided for potentially compliant products is a statement concerning a Vianova resin used in Europe - however, even that discussion stresses the potential exterior use of the resin. A blanket statement is included that Sherwin-Williams, Okon, Performance Coatings, FSM, PPA, Rhinogard, and Sierra Coatings have products with VOC contents below 100 g/l - However, speaking for Sherwin-Williams we do NOT have interior wood stains at that level. In addition, no examples of commercially available interior wood stain products are given. This entire discussion needs to consider interior wood clear and semi- transparent stains separately from exterior opaque and exterior semi-transparent stains.

The lowering of the limit for stains to 250 g/l is the effective ban of solvent home stains. The same arguments against the use of exempt solvents and of increased solids discussed for interior wood sealers apply to these stains.

RESPONSE:

The discussion in the staff report pertaining to stains has been expanded to include interior and exterior semi-transparent stains, as well as exterior opaque stains. Additionally, a brief discussion of compliant, interior semi-transparent stains has been added. In a recent public consultation meeting, a representative of a large, local coatings company, with a large share of the wood coating market, supported the proposed compliance limit of 250 g/l for the stains category, including interior semi-transparent stains. Appendix D of the SEA contains an extensive list of stains that comply with the proposed 250 g/l limit.

The AQMD proposes to reduce the VOC limit of stains, interior and exterior, to 250 g/l, effective July 1, 2002. Nevertheless, a coating manufacturer can utilize the Averaging Compliance Option to continue marketing their non-compliant stains.

20-23 Alternative water borne interior wood stains pose several problems in addition to those discussed for water borne or high solids wood sealers, when compared to the solvent home coatings they are meant to replace. While the effect of grain raising caused by water home stains is the same as for water borne sealers, sanding is not a viable option for stains. This is due to the potential removal of color which will be caused by sanding To avoid this color removal, sanding must occur after sealing or subsequent topcoating (with varnish or lacquer. This can cause entrapment of microfoam in the middle coats. This microfoam can not be removed when the raised grain is finally sanded.

Lapping is another problem attributed to water home interior wood stains. Larger areas such as floors are prone to lap marks caused by the fast drying of such stains and subsequent overlapping of a stain application. The only remedy for lap marks is a full re-sanding of the floor. As discussed above, this is expensive and distressing since it reduces the long term service life of the wood floor (sanding the floor removes a layer of the wood; a floor can only be sanded about three or four times before there is not enough wood left to avoid nails and to maintain its integrity. Thus, the full replacement expense of the floor can be divided by 3 or 4 to determine the cost of removing a wood layer by sanding - in addition to the direct costs of the sanding and coating re-applications.)

Even water-borne stains include the use of VOC solvents to reduce the dry times. Reducing the VOC limit to 250g/l would cause water home stain formulas to dry even faster, enhancing the potential for lapping problems. The longer dry time provided by currently compliant oil based stains prevent lap marks from forming.

We strongly recommend the limit for interior wood stains be maintained at 350 g/l.

RESPONSE:

See Response to Comment 20-22.

The AQMD also requests any laboratory test data or other empirical studies to support the above comments regarding performance limitations. These results may be incorporated into future technology assessments.

20-24 Again, we strongly recommend the VOC content limit not be changed for the stain category without a more thorough evaluation of the specific sub categories - interior wood clear and semi-transparent stains, exterior opaque stains, and exterior semi-transparent stains.

RESPONSE:

See Response to Comment 20-22.

Waterproofing Sealers
20-25 The Draft Staff Report refers to Cuprinol® Clear Deck and Wood Seal. This coating may not even qualify as a sealer, based on the definition of a sealer. The current definition for a sealer states, "SEALERS are coatings applied to substrates to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate." However, this product can be used alone without subsequent coatings. It penetrates and seals the substrate so that other materials (which could be topcoats, but also could be contaminants, grease, oil, water) are not absorbed by the substrate.

Cuprinol® Clear Deck and Wood Seal is not as forgiving as solvent based products. In addition, waterborne waterproofing sealers do not have the durability of higher VOC solvent home systems. Contrary to the Draft Staff Report which states "there are no major issues with waterproofing wood sealers, with the exception of durability," we consider such durability issues to be very significant issues. The Draft Staff Report refers to the June 1998 Consumer Reports magazine report of their study on waterproofing sealers for exterior use on decks.

RESPONSE:

The commentator should be looking at the definition of waterproofing wood sealers, which is the reference made by the commentator in the comment. The commentator appears to misunderstand the applicability of the definition, since they refer to the definition of a 'sealer' for a product that is clearly a waterproofing wood sealer, based on the commentator's description of the product.

The Consumer Reports article suggests that durability of exterior waterproofing wood sealers, typically used on wood decks, is poor for both solvent-based and waterborne products. The article indicates that these substrates typically need to be recoated every year.

Interior Wood Sealers
20-26 The lowering of the VOC limit for sealers and quick dry sealers to 200g/I will force these mineral spirits based products to either raise solids or use alternative exempt solvents. The use of acetone is unacceptable due to the highly flammable nature of this solvent and the use of Oxol 100 is too expensive. (See earlier discussion on the use of Exempt Solvents.) The increase of solids is unacceptable due to the significantly longer dry-time which would result. Beyond dry-time, cost will be increased significantly (approximately 100%) due to the required doubling of solids. Also, the corresponding increase in viscosity as a result of increasing the solids content would force applicators to apply much thicker films, which reduces coverage and again increases the cost per square foot of sealer applied.

Compliance with the proposed limit of 200 g/l would force oil based sealers to become cost prohibitive, less efficacious, potentially dangerous, and would effectively ban all performing products in this category.

The only remaining alternative to solvent borne interior wood sealers would be waterborne sealers. While presently on the market, these products are less efficacious for 3 important reasons.

1 *The first is the negative impact waterborne sealers have on grain raise. When water is applied to bare wood surfaces, wood fibers swell and create a rough feel and appearance. Any steps taken to alleviate this effect such as sanding will increase the cost job.*
2. *The second reason is water based sealers are more expensive than solvent borne sealers.*
3. *The third reason is the impact of panelization. In areas where fluctuations of humidity cause the expansion and contraction of wood (such as, flooring) - even after sealing and topcoating - water home sealers can cause the wood boards to become glued together. As the wood naturally expands and contracts (with humidity and temperature variations), large cracks will appear in the flooring as a result of being glued. Solvent home sealers do not panelize wood (flooring).*

The remedial action required for this panelization is the replacement of the floor. This is an enormous expense. To prevent dust accumulation in all crevices, on all surfaces, into all upholstered furniture etc., removal of all objects - including clothing, pictures, personal belongings, furniture, light fixtures, appliances, window treatments, etc. - to new building emptiness would be needed. This "inconvenience" would be extra costly.

RESPONSE:

The AQMD has found interior wood sealers that comply with both the interim 200 g/l limit, as well as the final, 100 g/l limit. The AQMD has received support for this proposed limit from coating manufacturers. Nonetheless, staff has added technology assessments for primers, sealers, undercoaters one year prior to the implementation of the lower limits. If the technology assessments indicate a need for higher limits, staff will amend the rule to reflect the state of the technology.

However, coating manufacturers can use the Averaging Compliance Option to comply with the proposed limits.

Labeling Requirements
20-27 Sherwin-Williams has a number of concerns with the multitude of new labeling requirements proposed in the most recent proposal. Labeling industrial maintenance coatings one way and rust preventative an opposing way means that a single coating (e.g. Sherwin-Williams's DTM Acrylic) which complies with both limits and conditions of use could not be marketed for both uses. Rather, separate stock would need to be maintained for the two uses. This is a unreasonable requirement and adds an additional burden on compliance without discernible benefit.

RESPONSE:

The AQMD has revised the proposal and removed the labeling requirement for industrial maintenance coatings in order to avoid duplication of the National AIM rule. However, the AQMD believes that labeling of rust-preventative coatings will mitigate any potential misuse of those coatings, and enhance the enforceability.

20-28 Other proposed labeling provisions are also of concern. The wording for industrial maintenance is different from that included in the national rule and from that included in a number of California District rules. This means a multitude of different sentences would be needed on the each container, conveying the same message in varying words. This is an unreasonable extra burden and accomplishes no air quality benefit, but adds significantly to the cost of compliance.

RESPONSE:

See Response to Comment 20-27.

21. REFERENCE LAW OFFICES OF SMILAND & KHACHIGIAN
APRIL 15, 1999

The AQMD's position regarding similar comments received from the law offices of Smiland & Khachigian (S&K) dated June 26, 1996 in response to the Draft Subsequent Environmental Assessment for: Proposed Amended Rule 1113 - Architectural Coatings remain unchanged. This current comment letter again reiterates the same issues, and the AQMD's response to many of the same issues raised almost two and one half years ago have been upheld by the Courts, as they were considered in resultant litigation.

We are counsel for a number of paint manufacturers, retailers, and contractors who manufacture, sell, or apply architectural coatings in the South Coast AQMD. We also represent the Environmental Legislative & Regulatory Program of the Southern California Paint & Coatings Association (EL RAP"). EL RAP's members are primarily smaller and local or regional coatings manufacturers, dealers, and contractors who make, sell, and use a major share of the architectural coatings in California. Other members of EL RAP include suppliers of raw materials, equipment, and services to the industry, and organized labor. We have represented numerous paint companies during the past 22 years in various administrative and judicial proceedings relating to the regulation of such coatings by air quality regulators at the federal, state, and local levels.

This letter is written in response to and provides comments on the Draft Staff Report For: proposed Amendments to Rule 1113 - Architectural Coatings, dated February 17, 1999.

21-1 I. PROCEDURAL ISSUE

(1) As a preliminary issue, we note that Health Safety Code ("HSC") Section 40440.5(c)(3) requires the preparation of a staff report on any proposed rule not less than 30 days prior to the public hearing of the south coast district board to adopt such rule. The public hearing on the proposed amendments discussed in the February 17, 1999 draft staff report is scheduled for May 14, 1999. Thus the date of preparation of the final staff report, including, inter alia, responses to public comments will obviously be in violation of Section 40440.5(c)(3). As you may recall, the public hearing on staff's proposed amendments to Rule 1113 relating to flats and lacquers was postponed from its originally scheduled date of October 11, 1996 because the board and the public had been given insufficient time to review the final staff report. In addition to violating the statute, staff's current attempt to foist an ill-conceived and inadequately analyzed proposal on the board and the public is both disastrous public policy and a dereliction of its duty.

RESPONSE

S&K Issue (1)

The Draft Staff Report for PAR 1113 - Architectural Coatings was made available to the public on February 17, 1999. The Draft Subsequent Environmental Assessment documentation was released on March 19, 1999 and the Draft Socioeconomic Analysis was made available for public review on April 13,1999. All required reports relative to the amendments of Rule 1113 have been released in

a timely manner by District Staff and within the statutorily required 30 days prior to the scheduled May 14, 1999 Public Hearing.

II. BASIC ISSUES

(2) The air quality regulation of architectural coatings has been vetted more or less thoroughly in the legislative, executive, and judicial branches of the local, state, and federal levels of government during the past two decades. In the course of the great paint debate four basic issues have crystallized.

21-2 (3) One basic issue has been this: do the VOC emissions from the targeted coatings contribute significantly to the ground-level urban ozone problem? Regulators have generally assumed that such coatings are significant contributors. The evidence now shows, however, that this assumption requires careful reconsideration.

21-3 (4) Of course, VOC emissions from all architectural coatings represent a small percentage of total VOC emissions. The percentage of VOC emissions from architectural coatings has been chronically overstated by staff due to its failure to include (natural) VOC emissions from trees and vegetation.

21-4 (5) Developments subsequent to South Coast AQMD's 1989-1990 rulemaking show that any VOC emissions the proposed amendments attempt to eliminate are even more insignificant than previously believed. In late 1990 Congress directed the National Research Council to conduct certain basic studies on ozone. That study concludes that VOC emissions from mobile sources, always known to be by far the major type of source, "have been underestimated . . . by a factor of two to four." National Research Council, Rethinking The Ozone Problem In Urban And Regional Air Pollution (1991) at 7.

21-5 (6) Furthermore, regulators have traditionally ignored biogenic VOC emissions. But the above study finds that such emissions "can have a significant effect on photochemical ozone formation" and recommends that they "must be more adequately assessed" before ozone control strategies are applied, Rethinking The Ozone-Problem at 8. Thus, new knowledge not available in 1990 demonstrates that the VOC emissions under attack are de minimis.

21-6 (7) Indeed, recent research powerfully suggests that NO,, not VOC, is the dominant cause of the ozone problem and that the assault on VOC, which has been the heart of the anti-ozone strategy for two decades, has been to a major extent unnecessary. The above study finds that "NO, control is necessary for effective reduction of ozone,, in many areas and recommends that to substantially reduce ozone "the control of No. emissions will probably be necessary in addition to, or instead of, the control of VOCs.11 Rethinking The Ozone Problem at 11. As one of that study's authors and leading scientific experts has written: "...[A] mounting body of evidence now suggests that the nation's ozone-control strategy has significant flaws." Chameides, "Controlling Urban Ozone," National -Science (Aug. 1993) at 193. He concludes: "The inference is that NO_x, not VOCs, is driving the production of ozone and that the effective control of this pollution will require the imposition of NO_x-- rather than VOC -- emissions controls." Id. at 195.

21-7 (8) Ozone irritates the lungs of active and sensitive persons on hot summer afternoons. The ostensible purpose of the proposed amendments, and the statutes authorizing such regulation, is tc reduce such irritation. The long-chain VOC in paint are both "heavy" and "cold" when they evaporate upon either, inside or outside application. It is highly doubtful that they play a significant role in ozone formation. We think that South Coast AQMD cannot demonstrate that the proposed amendments, even if they produced the VOC emission reductions claimed, would measurably ameliorate any breath taken by any person in the basin.

RESPONSE:

S&K Issues (2-8)

Scientific evidence supports the theory that VOCs play a significant role in the formation of ozone. VOC reductions are needed from both mobile and stationary sources (as outlined in the AQMP). The need to regulate VOCs with respect to reducing ozone formation is discussed extensively in both the Draft SEA and the Draft Staff Report prepared for this rule.

Rule 1113 does regulate the allowable VOC content of architectural coatings. Coatings with lower VOC contents will result in lower VOC emissions through their application and use. The AQMD regulates emissions of both VOC and NOx sources as a necessary strategy to attain the federal and state ozone standards. Ozone formation depends on both pollutants and architectural coating usage is a significant contributor of VOC emissions.

Ground level ozone formation is a result of complex chemical reactions involving both VOCs and NOx. VOCs react with hydroxyl radicals to form organic peroxyl radicals which subsequently react with nitric oxide (NO) to form nitrogen dioxide (NO_2). Nitrogen dioxide photo-disassociates to form NO and oxygen atoms. The oxygen atoms rapidly associate with molecular oxygen to form ozone. The amount of ozone formed is a function of the number of conversions of NO to NO_2 due to the organic "chain reactions." When VOC emissions are lowered, the number of NO-to-NO_2 conversions decrease. Discussions on the atmospheric chemistry of ozone formation can be found in the 1991 National Research Council report, "Rethinking the Ozone Problem in Urban and Regional Air Pollution." Specifically, page 116 states... "the presence of VOCs causes enhanced NO-to-NO_2 conversion and hence the production of concentrations of ozone that exceed those encountered in the clean background troposphere."

Because of the extreme ozone nonattainment status of the South Coast Air Basin, the AQMD must control both NOx and VOC emissions if the area is to achieve ambient air quality standards. The AQMP for this district targets all feasible, cost-effective VOC emission reduction strategies from sources under its jurisdiction.

The relative effectiveness of VOC and NOx controls for reducing ozone in a particular area depends on the ambient VOC:NOx ratios in that area. The historic trend demonstrated by the modeling done for each of the successive AQMPs indicates that there is a correlation between a mass VOC reduction and ozone reduction. This rule does not assume any PM10 emission reductions will result although negligible benefits in terms of PM10 reductions are generally associated with a reduction in VOCs.

The AQMD has authority to regulate emissions from stationary and area sources but has limited authority to regulate mobile sources. The authority for mobile source regulation falls primarily to the CARB. Since CARB is responsible for regulating mobile sources, they are also responsible for maintaining accurate emission factors for mobile sources. The CARB frequently refines these factors based on better modeling data, modeling techniques, etc.

The mobile source emissions inventory, both on-road and off-road, for the Draft 1997 AQMP was developed jointly by the AQMD, CARB, and SCAG. CARB is responsible for developing mobile source emission factors that are based upon the actual fleet mix in the South Coast Basin. SCAG is responsible for developing mobile source activity levels in the South Coast Basin. These factors are forwarded to the AQMD where they are input into the DTIM-2 (Direct Travel Impact Model) developed by Cal-Trans. The total combination of emissions from stationary, area, and mobile sources forms the AQMD's inventory for planning purposes.

A refined inventory has been included in the Draft 1997 AQMP. According to the Draft 1997 AQMP for the baseline year of 1993 mobile source emissions (including petroleum processing, storage, and transfer) contributed approximately 69 percent of the total VOC emissions. Stationary and area sources contributed the remaining 31 percent. Forecasting out to the year 2010, the Draft 1997 AQMP indicates, that assuming: (1) existing rules are in effect and no further rule making is done for stationary and mobile sources, including Rule 1113; and (2) CARB has implemented its low emission vehicle and zero emission vehicle regulations, mobile source emissions would contribute approximately 43 percent of the total VOC emissions and stationary and area sources would contribute the remaining 57 percent.

When modeling the 2010 numbers under the aforementioned scenario, the results indicate that the state and federal ozone standards would still be exceeded. Therefore, even when a large percentage of VOC and NOx emissions are reduced from the mobile source sector, further reductions are still required from stationary and area sources in order for this air basin to attain and maintain state and national ambient air quality standards for ozone.

The commentator suggests that the proposed VOC reductions would not result in any measurable amelioration of any breath taken by any person in the Basin. The AQMD sponsored a study indicating that the health costs related to pollution are over $9 billion a year--maybe as high as $20 billion yearly. The AQMD jurisdiction encompasses the four-county region including Los Angeles and Orange counties and parts of Riverside and San Bernardino counties, an area of 12,000 square miles, more than 14 million people (the second most populous urban area in the United States),and almost half the population of the State of California

A report entitled Ambient Ozone Exposure and Emergency Hospital Admissions and Emergency Room Visits for Respiratory Problems in Thirteen U.S. Cities, commissioned by the American Lung Association, was completed by the Harvard University School of Public Health in June of 1996. The report studied hospital emergency room admissions due to respiratory ailments in thirteen urban areas within the United States. The report attempted to delineate those admissions according to the effects of ozone exposure on the individuals. The data collected was obtained from a variety of published results on the effects of ozone and respiratory admissions in the thirteen urban area hospitals.

The findings indicated that ground level ozone was associated with respiratory admissions in 10 to 15 thousand cases in the thirteen cities during the 1993 and 1994 high ozone season. Additional information obtained linked high level ozone with between 30 and 50 thousand emergency room visits during that same period. Los Angeles was part of the study, with admission data supplied by the California Office of Statewide Health Planning and Development. The data was broken down by the patients' residence zip code, enabling the Los Angeles County data to be extrapolated.

One of the most significant conclusions of the report is that, "Continuing efforts are needed to reduce ozone formation, because it is clear that this pollutant can impact the health and economic well-being of individuals in urban areas as well as society increasingly burdened by health-care costs. Preventing ground-level ozone formation can prevent some of the need for hospital admissions and visits by people in respiratory distress...preventing exposure to unhealthful ozone levels through the implementation of pollution control is essential to avoiding public exposure to this potent air pollutant."

21-8 (9) A second basic issue is the rationale for the new proposal to outlaw certain high-performance or special-purpose water-borne coatings. The South Coast AQMD's new reasoning, we speculate, may be two-fold: First, approximately half, or more, of all VOCs emitted in South Coast AQMD as a result of the application of architectural coatings are emitted from water-borne coatings. Second, the VOCs (glycol compounds) used in water-borne coatings tend to be significantly more reactive than the VOCs used in solvent-borne coatings, for the reasons discussed in detail below. Is this the basis for the apparent new policy shift?

RESPONSE

S&K Issue (9)

The proposed amendments do not represent a policy shift but rather a continuation of the policy to seek the lowest possible VOC content for each type of coating.

The AQMD does not dispute the fact that different VOCs have different reactivities. VOC control based on reactivity, however, is not currently a viable regulatory approach because the limited amount of specific information available regarding actual or relative reactivities of the many VOCs used in coatings products.

As discussed in Chapter 4 of the Draft SEA, the science of VOC reactivity is still in its early stages, with more comprehensive studies being conducted to refine VOC reactivity data. Until these studies are completed, the AQMD agrees with the EPA that it would not be prudent to implement a control strategy for VOC emissions based principally on VOC reactivity at this time. In its 1995 Report to Congress entitled "*Study of Volatile Organic Compound Emissions From Consumer and Commercial Products*," the EPA concluded, "To be most effective, ozone control strategies ideally should be based not only on mass VOC and NOx emissions but should consider the relative photochemical reactivity of individual species, the VOC-to-NOx ratios prevalent in specific airsheds, and other factors which could work together to minimize the formation of ozone with adverse impacts. Reactivity data on VOC, especially those compounds used to formulate consumer products and commercial products, is extremely limited. Better data, which can be obtained only at great expense, is needed if the EPA is to consider relative photochemical reactivity in any VOC

control strategy. In the meantime, a practical approach is to act on the basis of mass VOC emissions." Thus, until more comprehensive VOC reactivity studies are completed that yield more refined speciation profiles for architectural coatings, the AQMD will continue to use a mass VOC control strategy. The AQMD welcomes any new scientific data that industry can provide to aid the AQMD in moving from a mass VOC emissions reduction strategy to a control strategy based on VOC reactivity.

Additionally, to abandon the mass VOC approach at this stage in the development of the VOC reactivity approach, could hinder the AQMD's ability to meet the State and Federal ozone standards. Since, this air basin has the dirtiest air in the nation, any delays in making progress to clean the air could have detrimental health impacts to the populous of Southern California. Nonetheless, the AQMD is committed to continue working with industry on exploring the reactivity issue and developing a reactivity-based regulatory approach, if feasible.

21-9 (10) Alternatively, if South Coast AQMD intends to initiate an even more extreme policy of outlawing all traditional architectural coatings, solvent-borne and water-borne, it should say so, identify the substitute products and processes people will turn to instead of coatings for the beautification and protection of their houses, offices, and factories, and assess at the outset the massive economic and environmental impacts of any such revolutionary new policy.

RESPONSE:

S&K Issue (10)

PAR 1113 is not expected to "outlaw" traditional architectural coatings or force the use of substitutes. Numerous products that comply with both the interim and final limits are available on the market today. This issue has been comprehensively analyzed in Chapter 4 of the Draft SEA. The AQMD has analyzed all air quality benefits associated with implementation of these amendments and includes as a "worst-case" assessment a matrix of possible substitutes.

Many low- and zero-VOC coatings in each of the categories are currently available for use by several major manufacturers. Significant substitution is not likely to occur because uses for various potential replacement coatings are different and have different performance characteristics. For example, the proposed substitutes have limited specific uses, they do not provide the same aesthetic appeal, some are low solids, therefore, they do not cover as well, and some of the proposed substitutes would be cost prohibitive. Even if there is some limited substitution due to the implementation of PAR 1113, emission reductions will still be achieved. Air quality impacts associated with performance are addressed at great length in Chapter 4 of the Draft SEA.

Compliant coatings that can meet the future limits now can be used in a majority of coating applications. The situations where further development is required, as voiced by industry in various Working Group Meetings and Public Workshops, are some specific areas of concern, including corrosion prevention on ferrous metal substrates found in residential and commercial facilities. In response to this concern, staff created a specialty category called rust preventative coatings, and does not require a reduction from the current 400 g/l VOC limit until July 1, 2006.

AQMD staff has extensively evaluated the current state of low-VOC and zero-VOC coatings. Saff's technology assessment indicates that there are numerous products that comply with the interim limits, as well as, to a lesser extent, with the final limits. Most, if not all, of these low-VOC or zero-VOC coatings, come with similar guaranties or warranties of performance as compared to existing high-VOC coatings.

21-10 (11) A third basic question in paint regulation is this: should VOC limits aim at reformulation of coatings which may contribute to the ozone problem, or at replacing them with substitute coatings? Some limits are set so as to require manufacturers to "reformulate,, their products to take out all excess or unnecessary VOCs and thereby arguably to improve those products from an air quality perspective. Other limits are set even lower so that the coating subject thereto can, as a practical matter, no longer be marketed, forcing consumers to replace it with less desired or undesired ,substitute coatings. The latter limits effectively prohibit the manufacture, sale, or use of the coatings.

21-11 (12) Two fallacies have often been employed by the advocates of substitution limits. They frequently assume that VOC content reductions in the can have a one-for-one relationship to VOC emission reductions in the air. But this is true, if at all, only as to reformulation limits. Once below the optimal limit, a limit becomes environmentally counterproductive as well as economically disastrous, as described in detail below.

21-12 (13) Various calculation methods have been devised to project VOC reductions that may occur as a result of the implementation of regulatory standards. When a limit effects reformulation, rather than substitution, the best assumptions for projecting reductions are that targeted products would be replaced by improved products containing the same volume of solids as the targeted products and formulated at the applicable standard. This has been called the "constant solids,, calculation method. However, it is fallacious to assume that this calculation method is proper for substitution limits (such as those now proposed for the ten categories of coatings at issue), for the reasons stated herein. As to such limits, the so-called "constant gallons" methodology is generally deemed appropriate.

RESPONSE TO 21-10 THROUGH 21-12

S&K Issue (11,12&13)

As previously stated the AQMD has no basis to believe that significant amount of substitution will occur. The expected approach for meeting future VOC content limits is through **reformulation.** AQMD staff concurs with the commentator that the constant solids approach for determining VOC emissions is appropriate. The AQMD's calculation methodology for PAR 1113 is based on accepted methods of calculation and is consistent with past practice and methods used by industry, U.S. EPA, and CARB.

Many low- and zero-VOC coatings are currently available for use, and are manufactured by small and large coating manufacturers. Significant substitution is not likely to occur because uses for various replacement coatings are different and have different performance characteristics. For example, the proposed substitutes have limited specific uses, they do not provide the same aesthetic

appeal, and some of the proposed substitutes would be cost prohibitive. Even if there is some limited substitution due to the implementation of PAR 1113, emission reductions will still be achieved. Air quality impacts associated with performance are addressed at great length in Chapter 4 of the Draft SEA.

21-13 (14) The fourth main issue during the paint debate of the past 22 years is, as follows: by what date ought any substitution limit go into effect? Certain amendments to paint rules have been called "technology-forcing" by their advocates. The technology-forcing system of regulation has been defined as "the daring principle that invention can be stimulated by setting future requirements that cannot be met by existing technology." Currie, Air Pollution:Federal Law And Analysis § 2.51. One U.S. Senator called it "the novel concept . . . of brinkmanship" 116 Cong.Rec. 32,904 (1970). The theory and practice of technology-forcing have been subjects of substantial criticism. E.g-,Henderson, Pearson, "Implementing Federal Environmental Policies: The Limits of Aspirational Commands," 78 Colum. L. Rev. 1364 (1978); LaPierre, "Technology-Forcing And Federal Environmental Protection Statutes," 62 Iowa L. Rev. 771 (1977)

21-14 (15) The courts have suggested that air quality rulemakers must comply with certain procedures when they employ the technology-forcing device. When such a rule is initially adopted, the rulemakers must be able to demonstrate that the methodology they use to fix their prediction of a technological breakthrough, and the limit and deadline based thereon, are reasonable and reliable. In short, a technology-forcing rule may not be based on "crystal ball" gazing. International Harvester Co. v. Ruckelshaus, 478 F.2d 615, 629, 643 (D.C. Cir. 1973).

(16) Furthermore, if the predicted technological breakthrough does not, in fact, occur by the deadline, as so often happens, regulators must provide an "escape hatch" by raising the limit or extending the deadline. Id.

21-15 (17) When regulators fail to set reasonable limits and deadlines at the adoption date, or fail to provide the necessary relief at the effective date, the limit cannot accurately be said to have been "technology-forcing" at all. In reality, it was a disguised prohibition. In the history of paint regulation both crystal-ball gazing and failure to open escape hatches, i.e.outright bans in the name of "technology forcing," have been all too frequent.

RESPONSE TO COMMENTS 21-13 THROUGH 21-15

S&K Issue (14,15,16&17)

The commentator misconstrues the case of *International Harvester v. Ruckelshaus* as defining a legal test for what is considered technology-forcing. In any event, PAR 1113 meets applicable legal requirements set forth in that case. Many compliant materials are currently available to meet even the final effective rule limits; therefore this rule is not intended to 'ban" the use of any products. Besides providing an extended period for reformulation, the rule provides two additional safeguards or "escape hatches": inclusion of a technology assessment prior to the rule's effective dates and provision by state law of variance exceptions for users that still cannot meet the limits.

Technology reviews have been performed when requested by the Board, and an "escape hatch" has been provided I several instances. For example, under the NOx/SOx RECLAIM program, a

commitment was made to perform technology reviews for six categories of sources. All technology reviews were completed as of July 1996 and specific RECLAIM allocations were modified either higher or were unchanged. Also, the AQMD conducted a Rule 1136 technology assessment several years ago, which concluded that compliant materials were not available for all categories resulting in a rule amendment in 1996.

Staff's technology assessment for PAR 1113 has concluded that compliant coatings are available today for the proposed interim and final limits. Since the language regarding technology assessments is included in the rule language, the AQMD will be required to revise the VOC limit or extend the compliance dates depending on the result of the assessment provision. Additionally, as demonstrated in this rule making, the AQMD is extending the compliance dates for the lower VOC limits for all the coating categories.

In Chapter 4 of the Draft SEA and the Draft Staff Report, the technology assessment reveals that compliant coatings that meet future VOC content limits with desired performance characteristics are currently available and are being used. Therefore, PAR 1113 is based on the current state of coating technology.

Industry has commented in various forums that the currently available compliant coatings cannot be used in every situation. To address this concern, PAR 1113 contains options such as an averaging compliance option, a sell through provision and long time frame to develop complaint coatings. Therefore, with these provisions that allow flexibility in complying with future limits, it is expected that industry will be able to comply with PAR 1113. The PAR 1113 rule making effort includes a continuing evaluation of the state of coating technology both current and future. This continuing evaluation requirement assures that future limits will always be based on the current state of coating technology.

The Working Group industry representatives have been apprised on the averaging provision since July 1996 and the AQMD staff has worked closely with industry to develop a simplified averaging program, including using an equation developed by members of the industry to simply the method of calculating emissions, as well as revised language to simply plan submittal, renewal, modification, and termination.

AQMD staff recognizes that low-VOC coatings are currently available and product testing and manufacturer's guarantees indicate they are adequate for many. AQMD has further acknowledged that these currently available coatings may have some application limitations, therefore, has included an implementation time frame to ensure refinement of these products to attain better application characteristics.

III. FEDERALISM

A. Triplication

21-16 (18) For 22 years paint manufacturers, retail dealers, painting contractors, the man and women who work for those businesses, and the people who buy and use their goods and services have been subject to three concurrent levels of regulation. If paint products were not being regulated or outlawed by South Coast AQMD and other local agencies, then they were being assaulted by ARE and other state agencies. And if they were not being banned or controlled at the state level, they were under attach by Congress or EPA. Our clients refer to this pernicious phenomenon as ,triplication" 02- "triple teaming." When all three levels of government are well staffed, well financed, and aggressive, as is the case here, two of the three efforts, at least, are completely wasteful. of both public and private resources. This serious problem has taken on new urgency in the 1990s as a matter of law.

(19) The federal Constitution establishes several principles under which delicate questions of federalism are to be resolved. The proposed amendments raise significant questions under the federal Constitution in at least four respects, discussed below.

(20) These issues are also raised by the HSC, itself. The South Coast AQMD shall adopt rules within the scope of its authority (which, incidentally, does not expressly include architectural coatings) that "are not in conflict with...federal laws and rules." HSC §§ 40440(a), 40441. Before amending a rule the board shall make findings of "consistency" and "nonduplication." Id. at § 40727. Consistency means among other things that the amendment is "in harmony with, and not...contradictory to" federal law, Id. at §40727(e). Nonduplication means that the amendment "does not impose the same requirements" as federal regulation. Id. at 40727(f). HSC §40727.2(a), (c)-(e), adopted in 1997, requires a comparative analysis of the federal-state conflicts the proposed rules would create.

B. Section 183 (e) Preemption

21-17 (21) Article VI, clause 2 of the U.S. Constitution provides that "...the laws of the United States...shall be the supreme law of the land." State law is preempted under the Supremacy Clause if federal law so thoroughly occupies a legislative field as to make reasonable the inference that Congress left no room for the states to supplement it. Cipollone v. Liggett Group, 505 U.S. 504, 516 (1992). Courts often find preemption in the clean air field. For example, in Hancock v. Train, 426 U.S. 167 (1976), the U.S. Supreme Court held that, as Congress had not clearly mandated that federal facilities were required to get state permits, the states were preempted from requiring them. The Court noted that the state's police power in the area of air pollution control did not constitute the kind of clear and unambiguous authorization necessary. 426 U.S. at 186. n. 47. In American Motors Corp v.Blum, 603 F.2d 978, 981 (D.C. Cir. 1979) the court invalidated a decision permitting a state to deny a small business exemption mandated in the CAA on the ground that the state regulation was "inconsistent" with Congressional intent and "a frustration of congressional. Purpose". In California -v. Navy, 624 F.2d 885 (9th Cir. 1980) the Ninth Circuit engaged in statutory construction to determine the intent of Congress. It found that one of the purposes of federal preemption was "uniformity" of standards. 624 F.2d at 887. The court held that

preemption of product specification and performance accommodates the Congressional principle of "protecting ...paramount federal...interests." The 1990 CAA amendments went further than eve before in "federalizing" air pollution regulation. several such changes support a preemption argument as to architectural coatings. Section 101(a)(3) was amended to find that only the reduction or elimination of the amount of pollutants produced or created "at the source" is a primary state responsibility. More specifically, Sections 183 (e) (3) (A) , (3) (C) , (6) , (7) , and (8) may also reflect an intent by Congress to occupy the field, at least as to the manufacture and sale of paint, and at least after EPA has adopted national regulations covering those products. The House Report so suggests at various places. "Where national regulation and uniformity is necessary, the legislation so indicates." H.R. Rep. 101-490 (May 17, 1990) at 163. Sources covered by Section 183(e) "...can be more effectively controlled at a national level, or with Federal guidance." Id. at 248. Indeed, the House Report specifically contemplates that AIM coatings "...will he covered by a national rule..." Id. at 251. The South Coast AQMD's lawyers should give the board and the public their carefully-considered opinion as to whether or not the enactment of Section 183(e) of the CAA, and EPA's adoption of a national architectural coatings rule that operates in the district, have occupied the field and thereby preempted regulation thereof at the state and local level.

C. Violation of Antitrust Laws

21-18 (22) Federal antitrust law also constrains a local government's authority to adopt regulations where, as here, they have obvious and severe anticompetitive effects. In Community Communications v.Boulder, 455 U.S. 40 (1982), the U.S. Supreme Court held that a local government would not be exempt from the federal antitrust laws unless, among other things, it acted under "clearly articulated and affirmatively expressed" authorization of the state legislature to suppress competition. Id. at 51, 55. The Court found that the state's general delegation of lawmaking power was not a sufficient authorization to enact anticompetitive laws. The principle announced in Boulder has been frequently applied to subject local government actions producing anticompetitive effects to federal antitrust scrutiny. E.g. Parks v. Watson, 716 F.2d 646, 662-64 (9th Cir. 1983); Medic Air Corp. v. Air Ambulance, Authority, 843 F.2d 1187, 1189 (9th Cir. 1988) ; Lancaster Community Hospital v. Antelope Valley Hospital District, 940 F.2d 397, 399-404 (9th Cir. 1991). A second test must be met to secure antitrust immunity: the local agency must actively supervise and implement the anticompetitive program so authorized. California retail Liquor Dealers Assn. V. Midcal Aluminum Inc., 445 U.S. 97, 105 (1980); Patrick v- Burget, 486 U. S. 94, 100-101 (1988); FTC v. Ticor Title Insurance Com., 504 U.S. 621, 633 (1992). Both tests for establishing immunity are intended to insure that state and local agencies accept "political responsibility" for the anti-competitive policies they adopt and carry out. FTC, 504 U.S. at 636. For the reasons discussed below, Rule 1113 has a massive adverse impact on competition in the paint industry. South Coast AQMD should determine and express its opinion about whether further
regulation is lawful under the federal antitrust laws.

D. Interstate Commerce Clause

21-19 (23) The U.S. Constitution delegates to Congress the power to "regulate commerce...among the several states." U.S. Const., Art. I, § 8, cl.3. Under the so-called "dormant" aspect of that

clause, "the States may not impose regulations that place an undue burden on interstate commerce." U.S. v. Lopez, 115 S-Ct. 1624, 1640 (1995) (Kennedy, J., concurring). Congress enacted Section 183(e) of the CAA, and EPA adopted a national architectural coatings rule, on the premise that the manufacture and sale of such products constitute interstate commerce. Congress, EPA, and certain members of the paint industry frequently tout the supposed need for national regulation in the name of "uniformity," claiming that the burdens of multi-jurisdictional regulation of such commerce are undue. if so, state and local regulation of paint would be unconstitutional under the dormant interstate commerce clause. We urge South Coast AQMD to formulate and publish a position on this important legal question.

E. Federal Mandate

21-20 (24) The CAA, as amended in 1990, provides that severe non-attainment areas, of which our basin is the sole example, "shall" adopt a state implementation plan, and revisions thereto, containing reasonably available control measures, as well as various specific forms of highly controversial regulation. 42 U.S.C. §§ 7410, 7502, 7511 a(e). The CAA further provides that failure to meet these federal mandates will result in various severe "sanctions" specified in the statute. Id. at §§ 7410(m), 7509. South Coast AQMD's staff has typically argued that its regulation of architectural coatings is mandated by these provisions of the CAA. For example, the current draft staff report states (at p. 6) that the proposed regulations are to carry out its Air Quality Management Plan which was, in turn, mandated by federal statute. However, this claim is dubious under important new decisions enforcing the Tenth Amendment to the U.S. Constitution. The Tenth Amendment provides that the "powers not delegated" to the federal government by the Constitution are "reserved" to the states or the people. The U.S. Supreme Court struck down federal legislation under this amendment in New York v U.S., 505 U.S. 144 (1992). That case holds that Congress may not command states or localities to regulate "according to the instructions of Congress" or "pursuant to Congress, direction." Id. at 175-76. Such a direct order is "beyond the authority of Congress." Id. The federal government, said the Court, may not "conscript" state and local governments as its.agents. Id. at 178. This basic principle of federalism is designed, among other things, to deter "the avoidance of personal responsibility" on the part of state and local officials. Id. at 183. The Ninth Circuit has recently followed New York in striking down "direct; commands to the states to regulate according to Congress' instructions." .Board of Natural Resources v. Brown, 992 F.2d 937, 947 (9th Cir. 1993). Indeed, this principle had previously been applied in the clean air area. District of Columbia v. Train, 521 F.2d 971, 994 (D.C. Cir. 1975). The South Coast AQMD should set forth its legal opinion as to whether the above provisions of the CAA, as amended in 1990, and any local regulations adopted pursuant thereto, are valid under the Tenth Amendment.

(25) This principle has been promoted by Congress in the Unfunded Mandates Reform Act of 1995. 2 U.S.C. §1501 et seq. The purposes of the Act include ending the imposition of federal mandates on local government without adequate federal funding. Id. at §1501(2). The Senate finds that Congress should be concerned about shifting costs from federal to local authorities. Id. at §1513(a)(1). And the newly expressed sense of the Senate is that the federal government should not shift such costs to local governments. Id. At § 91513(b).

RESPONSE:

S&K Issue (18-25)

The commentator suggests that no governmental entity in the United States may regulate architectural coatings by arguing the following: local government may not regulate because of violations of the federal antitrust laws, both local and state government may not regulate because of violations of the Interstate Commerce Clause and preemption by the federal Clean Air Act, and federal government may not regulate because the federal Clean Air Act is invalid under the Tenth Amendment of the Constitution. The District's attorneys have carefully reviewed the legal arguments presented and find they have no merit.

AQMD regulation to achieve clean air standards, even if such may affect competition, is a state action not subject to antitrust laws, as held in *City of Columbus v. Omni Outdoor Advertising* (1991) 111 S.Ct. 1344. The federal Clean Air Act does not preempt regulation of architectural coatings because Section 116 of the Act specifically authorizes state regulation except where expressly preempted. Section 183(e) specifically contemplates state and local regulation in these areas. The "dormant" Interstate Commerce Clause argument is invalid because Congress has specifically authorized state and local agencies to regulate to reach clean air standards and because any burden on interstate commerce is not clearly excessive in relation to local benefits; see *Minnesota v. Clover Leaf Creamery Co.* 449 U.S. 456, 101 S.Ct. 715, 66 L.Ed. 2d 659 (1981). Finally, the argument that the federal Clean Air Act is invalid under the Tenth Amendment of the Constitution is incorrect because the Clean Air Act validly offers states the choice of regulating according to federal standards or having state law preempted by federal regulation; see *New York v. U.S.* (1992) 112 S.Ct. 2408, 2424. Provisions requiring state implementation plans under the Clean Air Act such as are challenged here have been upheld against this argument. (see *Friends of the Earth v. Carey* (2d Cir. 1977) 552 F2d 25, and *State of Missouri v. United States* (1996) 918 F. Supp. 1320). A similar case upheld the Clean Air Act under Title V, *Commonwealth of Virginia v. Browner* (4th Cir., 1996) 80 F3d 869)). The District reserves the right to rely on additional arguments in court should the occasion arise.

The AQMD has complied with all applicable Health & Safety Code requirements.

IV. ECONOMIC IMPACTS

A. Absence of Timely Analysis

21-21 (26) The draft staff report contains absolutely no discussion of the economic impacts nor the cost-effectiveness of the proposed amendments at issue. The draft report states (at p. 70) that "The Draft Socio-Economic Assessment and Cost Effectiveness study is currently being conducted by staff and will be included as Appendix H of the final staff report". Pursuant to HSC Section 40440.5, a final staff report is required at least 30 days prior to the public hearing at which the board considers adoption of the proposed amendments. As discussed more fully below, the Legislature has in recent years imposed upon the South Coast AQMD substantial analytical requirements regarding the economic impacts and cost-effectiveness of proposed rule amendments. Further, the board now must "actively consider the socioeconomic impact of regulations and make

a good faith effort to minimize adverse economic impacts." HSC §40728.5(a). The board's, and interested commentors', receipt of their first look at the staff's economic impact and cost-effectiveness analyses a mere 30 days before potentially adopting the amendments does not promote the active consideration of such impacts nor the good faith efforts to minimize them, as required by law. Further, the inclusion of the staff's economic and cost-effectiveness analyses for the first time in the final staff report does not allow the essential comment and response period. The economic analyses mandated by the HSC are critically important components of the information needed by the board and the public to understand and consider the proposed amendments. withholding any substantive discussion of these questions until the last possible moment subverts the purpose for which the analyses are incorporated into the rulemaking process.

RESPONSE:

S&K Issue (26)

The commentator is referred to the Draft Socioeconomic Report for a discussion of economic issues associated with PAR 1113. A specific response can be found in Appendix C, Part I, of the same report. The cost effectiveness, including incremental cost effectiveness, as well as the socio-economic impact assessment data was presented to the public during the Public Consultation Meeting on March 31, 1999. This draft socio-economic impact report was made available to the public on April 13, 1999.

B. Necessity

21-22 (27) Since 1990 the Legislature has imposed an important new duty on South Coast AQMD to perform an "assessment" of the "necessity" of any amendment. HSC §§ 40440.8(a), (b)(6); The South Coast AQMD board shall make a finding of necessity, i.e. that "a need exists" for each amendment. Id. at § § 40727(a), (b).

(28) An assessment of the need for the amendments in question will, first, require the South Coast AQMD to assess how well the market pushed VOC reductions from paint before the advent of regulation in 1977 compared with how well regulation has pushed it since then. This assessment will show that the market pushed production from 100% solvent-borne to about 25% solvent-borne by 1977. Regulation probably has done relatively little to improve upon what the unregulated market would have done since then. Many responsible government regulators and consultants have so acknowledged. The first report published by regulators in 1977 conceded that the trend toward water-borne usage would probably continue whether or not solvent-borne paints were regulated. At the June 29, 1977 ARB hearing in Los Angeles executive officer of one of the leading districts reasoned that the force of law should be instituted to echo market forces "so that we get some credit for it." There is no need for regulation, at least to the extent it seeks to force technological breakthroughs or ban valuable products. History proves that the industry has every incentive to seek and the capacity to find such innovations without government involvement.

(29) Furthermore, the following comments demonstrate that the currently proposed amendments would create substantial economic detriments, without providing any environmental benefits. The residents of the basin have no "need" for such a law.

RESPONSE:

S&K Issue (27-29)

It is true that a significant shift towards increased use of waterborne coatings has taken place over the last twenty years. This trend was clearly illustrated by the 1998 CARB Survey. It is interesting to note, however, that this shift has resulted in significant emission reductions per capita, with usage per capita remaining fairly constant. The AQMD believes that this shift has been encouraged by a variety of environmental regulations, including air pollution control laws. It is also interesting to note that the first architectural coatings rule was developed in 1977 in the District, about the period that the commentator indicates that this shift started.

The commentator is referred to the Draft Socioeconomic Report for a discussion of economic issues associated with PAR 1113. A specific response can be found in Appendix C, Part I, of the same report.

C. Technological Feasibility

(30) In developing a specific control measure, South Coast AQMD shall also consider the proposed measure's "technological feasibility." HSC § 40922(b). An important recent case establishes that where a statute requires an agency to set a "feasible" level, the agency must, "face the tradeoff" resulting therefrom and express its judgment about whether the tradeoff is "worth it," Competitive Enterprise Institute v.NHTSA, 956 F.2d 321, 323-24 (D.C. Cir. 1992).

RESPONSE:

S&K Issue (30)

Technological feasibility was considered prior to development of the control measure for architectural coatings, for the AQMP. This initial assessment has since been expanded and has resulted in the development of amendments to Rule 1113 – Architectural Coatings, adopted November 8, 1996, as well as the current rule proposal.

(31) The architectural coatings industry has repeatedly informed staff of the technological infeasibility of the kinds of drastic limits now being proposed. For example, at the December 9, 1998 public workshop a representative of one of the world's leading resin manufacturers said the following about the current and reasonably foreseeable coatings technology:

"Over those years, many advancements have been made, and as a result, water-based polymers now provide excellent performance for a number of coatings applications. For example, in the architectural coatings area, these polymers have enabled coatings manufacturers to significantly reduce the level of VOCs in their products aimed at several coating segments.

It's our opinion, however, there are a number of application areas which require a high level of coatings performance. A number of these would be primers and corrosion resistant coatings, high performance semi-gloss paints, and high performance or even average performance high-gloss latex enamels. Current state of technology water-based coatings performance is still limited by the current VOCs. Technology still does not offer the viable alternatives needed to meet the aggressive VOC limits in the proposed amendments to Rule 1113 within the time frame specified.

While we continue with research to develop higher performance products at as low a VOC as possible, we cannot predict the results of our research with any certainty. We encourage the setting of a more reasonable timeline for the coatings manufacturers and their suppliers to develop the needed technology. We also encourage periodic reassessments of what is technically feasible."

The draft staff report does not address this or numerous other similar comments to Staff.

(32) The District has commissioned National Technical Systems to conduct a side-by-side comparison of zero, low and high-VOC coatings to analyze their application and durability characteristics. The results of this study are obviously critical to a complete understanding of the technological feasibility and public acceptability of the coatings that will be available following the reduction in VOC limits to 100 g/L and 50 g/L, yet staff proposes to push ahead its regulatory effort without the benefit of such information. In addition to the dramatically late, and therefore essentially useless, distribution of these data, I understand that staff has unilaterally deleted critical portions of the original scope of work of NTS. This action smacks of a variation of the classic bait-and-switch technique where the genuine article is promised and a cheap imitation is delivered.

(33) The proposed amendments in question do not meet the requirement of technological feasibility. The South Coast AQMD's economic assessment must face, among other things, the tradeoffs of anticompetitive effects on local, regional, and niche manufacturers, painting contractors, and retail paint dealers, the risk of discharging or dislocating substantial numbers of workers, and consumers paying much more for paint jobs and getting much less, all described in detail below.

RESPONSE

S&K Issues (31-33)

The AQMD has conducted a thorough technology assessment of coatings available today that comply with the proposed limits for July 1, 2002 and July 1, 2006, including high performance industrial maintenance coatings. Based on a detailed analysis of qualitative and quantitative data, staff has concluded that coatings with equivalent performance are available for the interim and final limits. The AQMD will assess, in conjunction with industry, these coatings as a part of the technology assessments to evaluate the performance. If the future technology assessments do not demonstrate adequate performance, the AQMD will revise the limit prior to implementation.

The laboratory testing of the NTS study is also complete. This study analyzed application and durability characteristics in greater detail, and the results show that zero-VOC coatings available

today, when compared to high-VOC coatings are equal, and in some cases, superior in performance characteristics, including, but not limited to, coverage, mar resistance, adhesion, abrasion resistance, and corrosion protection. Generally, the Industrial Maintenance Coatings evaluated in this study performed well for durability characteristics, as well as for their application characteristics. However, the NTS results also highlight application characteristics of the zero-VOC coatings that are somewhat limited when compared to solvent-based, high-VOC coatings. Those include lower rankings for leveling, sagging, and brushing properties. Those results are consistent with staff's own technology assessment. In addition to the laboratory results, the NTS study will continue with additional testing, including accelerated actual exposure, real time actual exposure, and actual application characteristics. Staff plans to utilize the on-going testing results for future technology assessments. Nonetheless, as a result of comments provided by industry, staff has raised the interim and final limits for some categories, as well as extended the interim and final compliance dates by up to an additional 18 months.

The commentator is encouraged to review the technology discussed in detail for each coating category in the staff report, as well as the comprehensive list of coatings included as Appendix D of the Subsequent Environmental Assessment.

In response to public comments, the final proposal allows for an additional 18 months for the implementation of the final VOC limit. This revision results in a total of seven years for necessary laboratory and field testing. In addition, the AQMD is committing to working on an additional technology assessment with the essential public service agencies.

The AQMD strongly believes that the current proposal is technically and economically feasible. The current proposal has received support from some coating manufacturers.

D. Public Acceptability

21-24 (34) In developing a specific control measure, South Coast AQMD shall consider the proposed measure's "public acceptability". This means, in part, that: an analysis must be made of whether the public is likely, or able, to use and accept the products that must be substituted for the banned coatings. Strikingly powerful comments on the public's unwillingness, and, in fact, inability to use the inferior substitutes were made at the December 9, 1998 public workshop. A representative of the California Department of Transportation stated that industrial maintenance coatings used for steel structures containing 250 g/L VOC had been "pretty successful" and provide "reasonably good" performance but that they "have got some real concerns with the availability of good performing coatings that will meet" the proposed amendments. Similarly, a representative of the Metropolitan Water District stated that the amendments would reduce his approved coatings from 100 to 4, and that the remaining coatings would not be suitable for required industrial use. He further stated that failure of the inadequate substitutes "could result in possible harm to the public".

The draft staff report does not address these or other similar comments.

RESPONSE

S&K Issue (34)

The proposal discussed during the December 9, 1998 Public Workshop has been revised significantly, based on comments received at the workshop, as well as subsequent written comments. In addition to the creation of specialty coating categories, the proposal includes higher interim and final limits for most of the categories, and extension of the compliance dates. Your reference to the representative from Caltrans is taken out of context, since over 90% of the total volume of industrial maintenance coatings used by Caltrans already complies with the proposed interim limit of 250 g/l for industrial maintenance coatings. Additionally, Metropolitan Water District also has numerous coating systems that comply with the interim limit, as well as some coatings that comply with the final limits for industrial maintenance coatings. Nonetheless, staff has created a specialty category called "essential public service coating" which has a higher interim limit of 340 g/l, effective July 1, 2002. This category is for specific maintenance areas commonly found in water and power generation, bridges and roadways, as well as potable water storage.

Additionally, the commentator is referred to the Draft Socioeconomic Report for a discussion of economic issues associated with PAR 1113.

E. Economic Assessment And Analysis

21-25 (35) The Legislature has imposed on the South Coast AQMD stringent duties requiring it to analyze the adverse economic impacts of rule amendments. The South Coast AQMD is now required to prepare a report including "economic...analyses." HSC § 40440.5(c)(3). It is required to perform "an assessment of the socioeconomic impacts" of the amendments. Id. at §§ 40440.8(a), 40728.5(a). Such impacts include (1) the "type of industries affected," (2) "employment," (3) the "economy," and (4) the "range of probable costs, including costs to industry." Id. at H 40440.8(b), 40728.5(b). The South Coast AQMD shall consider and make public findings making "specific reference to the direct costs expected to be incurred by regulated parties, including businesses and individuals." Id. at 40703. The board shall "actively consider" these impacts. Id. at 40728.5(a). Most important, it shall "make a good faith effort to minimize adverse" economic impacts. Id. The South Coast AQMD must also comply with Section 40920.6 of the HSC. The type of control technology referred to therein is defined as limitations taking into account "economic impacts" by each category. Id. at §40406.

(36) Employment is threatened by the proposed amendments. Manufacturers, dealers, and contractors who emphasize the manufacture, sale, or application of the coatings which would be banned by the amendments employ a substantial number of people in South Coast AQMD. The proposed amendments threaten many of those jobs with termination or dislocation. An EPA criteria document published under Section 183(e) correctly points out that the reformulation approach. to regulation "warrants a higher priority" than the substitution approach, because the latter causes "greater economic dislocation," including "layoffs."

(37) As applied to architectural coatings, substitution amendments, such as those now proposed, would have substantial adverse impacts upon consumer demand. The EPA criteria document

correctly concludes that "a product with high commercial demand would be given a low priority for regulation." Architectural coatings which would be prohibited by the proposed amendments are currently made and sold now for one reason only, the existence of commercial demand. The demand is not generated by mass media advertising, as the local and regional manufacturers which make such products tend not to engage in such advertising. The demand is not in the main generated as a result of manufacturers promoting such products through their own retail outlets, as such manufacturers usually do not operate such outlets. Instead, the commercial demand exists primarily for two reasons. First, professional painters, experts in the field, frequently choose to apply the products in question. Second, independent retail dealers, also experts in their field, frequently recommend such coatings to their do-it-yourself customers. in short, the commercial demand for the products at risk is real, substantial, and value-based. Reformulation at least preserves our clients' ability to serve that demand. Substitution, on the other hand, would force consumers to use alternative products with higher costs. The EPA criteria document correctly states that the former at comparable cost "warrants a higher priority for regulation" than the latter at comparable cost, because it is "less disruptive to . . . the consumer." The proposed amendments would impose several types of increased costs on consumers. First, in many cases the cost per gallon of the substitute product would be higher -- frequently much higher -- than the product eliminated. Second, the substitutes are often accompanied by much higher labor costs, which compose the major costs of any professional paint job, due to increased failures, the use of more prime coats or topcoats, and more frequent repainting.

(38) The Legislature has directed the South Coast AQMD to pay special attention to the risks posed by its rules to small businesses. Most manufacturers, contractors, and dealers adversely impacted by substitution rules easily meet the definition of a "small business." HSC § 40448.8. South Coast AQMD shall perform an "assessment" in connection with a rulemaking of "socioeconomic impacts" including the "type of business, including small business, affected," and the "costs to...business, including small business," of the amendments. Id. at S 40728.5(a), (b)(1), (3). The board shall "actively consider" such impacts, and it shall "make a good faith effort to minimize adverse" impacts. Id. at S 40728.5(a).

(39) In this connection, the Legislature has directed that South Coast AQMD shall maintain an office of small business assistance and shall establish a small business assistance program. Id. at S§ 40448, 40448.8. The office shall provide information on the "economic impact" of its rules on "small businesses." Id. at § 40448. In 1988 South Coast AQMD commissioned ICF Consulting Associates, Inc. to study the effect of its rules on small business, as mandated by the HSC. ICF's June 17, 1988 report reviewed, among other things, SCAQMD Rule 1113, with a view to identifying such impacts. The report concluded, as follows: "National firms . . . primarily manufacture water-based coatings"; many {r]egional" and "local" manufacturers occupy the "specialized market niche,, for solvent- borne paints; many manufacturers of solvent-borne paints "sell primarily to independent dealers"; "solvent-based coatings. . . . are sold for specific uses requiring higher quality coatings"; the rule has "significant economic impacts" on such local manufacturers and independent dealers; the affected businesses "face regulatory costs that are not faced by other members of the industry"; such costs include [p]ermanent sales losses"; such businesses "are unable to pass compliance costs through to consumers"; and, accordingly, only a very few such businesses are expected to "survive." South Coast AQMD must actively consider the findings of its own consultant and make a good faith effort to minimize these impacts.

(40) The EPA criteria document states that the reformulation approach "warrants a higher priority for regulation" than the substitution approach, because it is "less disruptive to the affected industry," as the latter approach causes "greater economic dislocation," including "shutdowns." The EPA criteria document also states that a category with a large percentage of businesses that are small businesses and a large total number of small businesses is subject to the "lowest priority" for regulation. Do you not agree?

(41) It is widely recognized that regulations and, in particular, environmental regulations have particularly harsh effects on small business and that regulation has often had the primary effect of promoting the competitive positions of certain well-placed industries or companies as against their less influential competitors. Hays, "Political Choice In Regulatory Administration" in McCraw, Regulation In Perspective: Historical Essays (1981) at 134; Vogel, "The 'New' Social Regulation In Historical And Comparative Perspective," Id. at 174; Rabin, "Federal Regulation In Historical Perspective," 38 Stan. L. Rev. 1189, 1226, 1245, 1257 (1986); Breyer, Regulation And Its Reform (1982) at 269-70; Noll, Owen, The Political Economy Of Deregulation: Interest Groups In the Regulatory Process (1983) at 39. Economists have shown that regulations affect some persons adversely, and others beneficially. As stated by a leading study, "every act of government . . . creates winners and losers within the competitive sector of the economy...Leone, Who Profits: Winners, Losers, And Government Regulation (1986) at 3. This phenomenon is particularly evident in environmental regulations promoted by interest groups which have the effect of "constraining competitors from producing certain goods." Id. at 17. Another leading economist has written;"...[N]o matter how disinterested the goal of public policy, the policy is bent to politically influential groups at the cost of the less influential. The Clean Air Acts provide striking examples...The abatement of air pollution, an admirable social goal, is largely thwarted by these special interest policies." Stigler, Memories Of An Uregulated Economist (1988) at 119-20.

(42) Certain national and multinational manufacturers have tended to support substitution rules, as they do not specialize in the high-quality specialty coatings at risk. Examples of such support abound, including these three: ICI, a British corporation, is one of the largest paint manufacturers in the world. Glidden, the second largest manufacturer in the U.S., is a division of ICI. ICI-Glidden has candidly admitted that uniform substitution limits would provide it with a "competitive edge." Chemical & Engineering News, (Oct. 30, 1989) at 41. Sherwin Williams Company, the largest architectural coatings manufacturer in America, "testified in favor" and "approved" of South Coast AQMIDIB original adoption of the lacquer and other amendments in question on February 2, 1990. Dunn-Edwards v.South Coast AQMD, 19 Cal.App.4th at 528 n. 5, 529. In February 1992 the Bay Area AQMD wrote to us saying it had received "considerable pressure from competitors" of our clients to enforce its rule amendments, even though such amendments had already been invalidated by-judge Pollak.

(43) The Legislature has not given South Coast AQMD any clearly articulated and affirmatively expressed authority to suppress competition. Community Communications, 455 U.S. at 51, 55. The Legislature could not have contemplated that the authority it did delegate to South Coast AQMD would be used to engineer the transformation of an industry from a state of near perfect competition to one threatening oligopoly. Indeed, the Legislature directed South Coast AQMD to analyze economic impacts of its rules, which of course includes anticompetitive effects, and to pay

special attention to the effects of the rules on small businesses, the most important of which are anticompetitive effects.

RESPONSE:

S&K Issue (35-43)

The commentator is referred to the Draft Socioeconomic Report for a discussion of economic issues associated with PAR 1113. A specific response can be found in Appendix C, Part I, of the same report.

F. Cost -Effectiveness

21-26 (44) The Legislature has imposed the duty upon South coast AQMD to make a comparative analysis of alternative measures based on their relative cost-effectiveness. The South Coast AQMD shall prepare a report including "an analysis of alternative control measures." HSC S 40440.5(c)(3). It must perform an "assessment" of the "availability . . . of alternatives" to each amendment. Id. at H 40440.8(a), (b) (4), 40728.5(a) , (b) (4) . South Coast AQMD rule amendments shall be "cost-effective." Id. at § 40440(c). The South Coast AQMD shall perform an "assessment" of the "cost effectiveness of alternatives" to proposed amendments. Id. at §§ 40440.8(a),(b)(4), 40728.5(a), (b)(4). Such analysis shall contain a list which "ranks" each available and proposed measure "from the least cost-effective to the most cost-effective." Id. at 59 40922(a) and (b). The South Coast AQMD shall make public its "findings related to the cost-effectiveness" of a measure. Id. at § § 40440(e), 40703. It shall "actively consider" such matters. Id. at S 40728.5(a). It shall also "make a good faith effort to minimize adverse,, impacts in so doing. Id. Finally, Section 40920.6 of the HSC sets out a detailed scheme by which a district must assess the "cost-effectiveness" of potential control options.

(45) "[C]ost-effectiveness analysis...entails a detailed comparison of alternative ways of achieving the same objective." Stiglitz, Economics of the Public Sector (1986) at 264. Cost-effectiveness analysis asks the following question: "for two alternative programs that accomplish a particular goal, which is cheaper." Gramlich, Benefit-Cost Analysis Of Government Programs (1981) at 7.

(46) In order to assess cost-effectiveness it is obviously critical to determine if, and to what extent, the regulation is effective in achieving its goal. with respect to incorporating the relative reactivity of different VOC species in its regulatory scheme, the draft staff report states that "it would not be prudent to implement a reactivity-based ozone reduction strategy based on incomplete science." However, South Coast AQMD has often focused on the relative reactivity of various VOCs. Old Rule 66 was the classic case. As another example, South Coast AQMD adopted Rule 1170 to compel fuel dispensing stations to install methanol-compatible underground storage tanks, because methanol is less reactive than gasoline. And in its June 10, 1988 report on proposed architectural coatings emission charges, South Coast AQMD said this: "[D]ifferent solvents have different degrees of reactivity, which affect the formation of photochemical smog differently. To encourage coating manufacturers to shun solvents with high reactivity, coatings with low reactivity solvents should be charged less...." ARB has recently confirmed that the majority scientific view supports

the use of reactivity scaling in clean air regulation. 47-Z Cal.Reg.Not.Reg. 92 (Nov. 4, 1992). The ARB there said: "The concept that different hydrocarbons react at different rates is supported by a large body of theoretical, laboratory and observational data Id. at 1535. ARB undoubtedly had in mind work such as that currently being conducted by Professors Carter and Weiner at U.C. Riverside and Professor Chameides at Georgia Tech. New Section 183(e)(2)(A)(i) of the CAA provides that EPA shall study VOC emissions from products in order to "determine their potential to contribute to ozone." Section 183(e)(2)(iii) provides that in both listing and regulating EPA shall take! into consideration those products which emit "highly reactive!" VOCs into the air. Section 183(e)(3)(4) provides that EPA shall list products "on a reactivity-adjusted basis." The National Research Council study performed under the CAA states that "...VOCs vary widely in the speed with which they react in the troposphere and in the extent to which they promote...ozone formation..." Rethinking The Ozone Problem at 153. Finally, the court decisions in California have confirmed the need to examine relative reactivity of reformulated and substitution coatings before regulating. The judgment against Ventura County APCD, for example, invalidated its amendments for its failure to analyze the significant effect on air quality due to "increased reactivity" of the VOCs in the substituted products. The judgment against Bay Area AQMD did the same. South Coast AQMD cannot ignore the relative reactivities of the mineral spirits in solvent-borne coatings and the glycol compounds in water-borne coatings. It is indeed ironic for the draft staff report to base its conclusion that reactivity-based VOC control is imprudent on references to Dr. Carter when Dr. Carter himself stated at the District's November 4, 1998 working Group Meeting that in order for a VOC control strategy to be cost-effective, it must take into account relative reactivities.

(47) A reformulation alternative may arguably be cost-effective, as such limits can reduce VOC, and possibly ozone, without imposing catastrophic economic costs. The substitution amendments now being proposed by South Coast AQMD, however, can not be claimed to be cost-effective, because they harm both the economy and the environment. The former must rank far higher on the cost-effectiveness scale compared to the latter. In short, the new cost-effectiveness statutes effectively bar adoption of the proposed amendments.

RESPONSE:

S&K Issue (44-47)

The commentator is referred to the Draft Socioeconomic Report for a discussion of economic issues associated with PAR 1113. A specific response can be found in Appendix C, Part I, of the same report.

In addition, the AQMD has also added another technology assessment to assess the scientific basis for a reactivity-based ozone control strategy.

21-26 (48) The proposed amendments purport to implement the general concepts discussed in control measures #94CTS-07 from the 1994 AQMP and #97CTS-07 from the 1997 AQMP. Those control measures state that they propose coating "reformulation" to reduce VOC emissions from coating applications. They state that "reformulations" effected as a result will increase costs. They do not contemplate any "substitution" limits of the type South Coast AQMD now proposes.

The rule amendments South Coast AQMD adopts shall "carry out the plan." HSC § 40440(a). Although the draft staff report pays lip-service to a reformulation approach, the number of banned products belies such a claim. For example, it acknowledges (at p. 37) that 9-010 currently available products in the industrial maintenance category will be banned in 2002 and (at p. 49) that 2,433 currently available products in the nonflat category will be similarly banned. The massive economic impacts of such bans are not even mentioned, much less analyzed, in the draft staff report.

(49) Formulas for consumer and commercial products are property. Packmayr Gun Works v. Olin Mathieson Chemical Corp., Pen Co., 502 F.2d 802, 807-08 (9th Cir. 1974); Formulabs, Inc. v. Hartley Pen Co., 275 F.2d 52, 56-57 (9th Cir. 1960). So, too, is business good will. Hunt v. Phinney, 177 Cal.App.2d 212, 216 (1960). The proposed amendments would destroy overnight the formulas, good will, and other intangibles manufacturers have developed and based their businesses on for many years. Again, the draft staff report does not even mention, much less analyze, this aspect of the massive costs impacts the amendments will produce.

RESPONSE

S&K Issue (48&49)

This rule is being adopted to implement a control measure from the AQMP, and will require the reformulation of many coatings. The rule is not intended to ban any products.

21-27 V. CONCLUSION

(50) In view of all the above, our clients and their colleagues find themselves asking: why in the world is South Coast AQMD threatening to outlaw thousands of necessary and irreplaceable coatings? It is obvious that the bans will harm small businesses, workers, and consumers. The evidence powerfully shows that they will produce no environmental or health benefits. There is no necessity for the bans, as market forces inherently produce the incentives necessary to drive VOCs out of paint products. Substitution rules, such as those you now propose, are not technologically feasible. Reformulation rules of the kind already in place can be cost-effective. Finally, local action where EPA has simultaneously imposed its own rules is redundant, wasteful, and constitutionally dubious. Therefore, in our view, there is no valid and legitimate basis for proceeding further with the proposed amendments at this time.

RESPONSE:

S&K Issue (50)

The commentator is referred to the response to comment 21-7 for a discussion on regulating architectural coatings. The rationale for regulating architectural coatings is comprehensively discussed in Chapters 3 and 4 of the Draft SEA.

(51) What is the real motivation for the proposed amendments? Of course, we do not read minds. Each member of the South Coast AQMD board or staff who has been or will become personally involved in implementing this project at this time may have had a different motive or a different mixture of motives from all the others who participated. Of course, we do not even know for sure the identifies of all the persons involved. But one could infer that a substantial factor in bringing about this action at this time is an attempt to "retaliate" against one faction of the paint industry, including our clients, for having engaged in various forms of constitutionally protected political expression (speeches, press interviews, pamphlets, lawsuits, etc.) which were perceived to be harmful to the interests of such persons, and to "chill" that faction and its members from engaging in such expression in the future.

RESPONSE:

S&K Issue (51)

The commentator is referred to the response to comment 21-7 for a discussion on regulating architectural coatings. The rationale for regulating architectural coatings is comprehensively discussed in Chapters 3 and 4 of the Draft SEA.

(52) Numerous cases have held that this practice by a government agency is actionable under the First Amendment to the U.S. Constitution. E.g., U.S. v. Steele, 461 F.2d 1148 (9th Cir.1972); U.S. v. Oaks, 508 F.2d 1403 (9th Cir. 1974) ceret. Denied 426 U.S. 952 (1992); Gibson v. U.S., 781 F.2d 1334, 1338 (9th Cir. 1986) cert.denied 479 U.S. 1054 (1967); Allen v. Scribner, 812 F.2d 426, 430-36 (9th Cir. 1987) modified 828 F.2d 1445 (9th Cir. 1987). In the leading case of Soranno's Gasco, Inc. v. Morgan, 874 F.2d 1310 (9th Cir. 1989) a California air pollution control district and several of its staff members singled out for administrative actions (information requests, lifting a permit for failure to provide information, publication of facts to the permit holder's customers) a business which had previously generated adverse publicity for the district and instituted suit challenging the legality of one of the district's rules. The business sued the district and its staff members for damages for having violated its First Amendment rights in taking such actions. The court held that a valid claim for relief was stated by the business. The court held that the business had "a protected interest in commenting on the actions of government officials." 874 F.2d at 1314. It also recognized the business' First Amendment "right of access to the court." Id. The court said that the evidence suggested that "protected expression was a substantial factor in the decision" by the clean air regulators to move against the business. Id. at 1315. It referred to "several facts from which a fact finder could infer a retaliatory motive." Id. These included (a) a statement by one regulator to the plaintiff which so "intimated," (b) the "auspicious" timing and nature of the regulatory actions, and (c) other facts suggesting a desire "to maximize the harm inflicted" upon plaintiff. Id. at 1315-16. The court held that the regulators had failed to demonstrate that they "would have [so acted] in the absence of (plaintiff's) protected activity." Id. at 1316. (Emphasis in original.)

(53) We do not assert here that. any particular individual was involved in the decision to propose these amendments at this time or possessed any particular motivation. However, we do submit that the manifest lack of merit of the proposed amendments makes their proposal suspicious and may well warrant an inference of a retaliatory motive. in summary, we respectfully request that:

(a) The staff report responds in detail to each and every one of the comments in the above enumerated paragraphs; and

(b) The leaders, staff, and the attorneys for South Coast AQMD take such other actions in response to these comments as are appropriate to its full compliance with law and conscientious service of the public interest.

RESPONSE TO COMMENTS 52 & 53

The present rule making action was not motivated by a desire to affect the commentators' First Amendment rights, but strictly to achieve reductions in VOC emissions that will assist the AQMD in its attainment goals with the ozone standard.

APPENDIX F

SOCIO-ECONOMIC IMPACT ASSESSMENT

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

APPENDIX F

ADDENDUM TO STAFF REPORT

FINAL
SOCIOECONOMIC IMPACT ASSESSMENT

PROPOSED AMENDMENTS TO RULE 1113

MAY 1999

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EXECUTIVE SUMMARY

The potential impacts of the proposed amendments to Rule 1113 are summarized as follows:

- The proposed amendments lower VOC limits for the coating categories of industrial maintenance; non-flats; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; roof coatings; floor coatings, rust preventative coatings, stains, and waterproofing wood sealers. Lowering the VOC limits of these categories will achieve an emission reduction of about 21.8 tons per day in the year 2006.

- The total cost impact from lowering the VOC limits of these categories is estimated at $58.3 million annually, when averaged over the 2002-2015 period. This cost represents 0.4 percent of the average projected sales of the chemical sector (SIC 28) for the period of 2002-2015.

- During 2002-2015, the proposed amendments are estimated to result in an average of 1,492 jobs foregone annually in the four-county area. The average annual number of jobs foregone is about 0.015 percent of the average number of jobs in the four-county area for the period of 2002-2015.

- The profit of the chemical and allied industry where paint manufacturers belong in the four-county area is projected to decrease by 0.0039 percent in 2005 and 0.0131 percent in 2015, relative to the national chemical and allied industry.

- The proposed amendments could result in an increase in the product price of construction sector (SIC 15-17), a local industry which includes painting contractors, by 0.0019 percent and 0.0599 percent in 2005 and 2015, respectively.

- Three specific provisions would reduce cost impacts for affected sources: an averaging provision, small container exemption, and "sell-through" provision which allows remaining non-compliant inventory to be sold for three years after the compliance date. These cost reductions have not been included in the cost analysis.

Socioeconomic Analysis of Proposed Amendments to Rule 1113

The proposed amendments to Rule 1113 implement control measure CTS-07 in both the 1997 and the 1994 AQMPs. The amendments call for lower VOC content limits for the coating categories of industrial maintenance; non-flats; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; roof coatings; floor coatings; rust preventative coatings; stains; and waterproofing wood sealers.

Affected Sources

The proposed amendments to Rule 1113 would potentially impact industries engaged in manufacturing paint, varnishes, enamels and allied products (SIC 2851); and end users of architectural coatings. End users include do-it-yourself consumers, and painting and paper hanging contractors (SIC 1721).

Control Costs

Reformulation of coatings to achieve lower VOC content is the method of control expected to be used by coatings manufacturers to meet the proposed VOC requirements. Reformulation is a process performed by the resin (raw material) suppliers and generally includes developing and testing a new formula. Once the formula is developed, paint manufacturers would use it to produce reformulated products. The paint manufacturers' efforts generally include additional reformulation, testing, marketing, and labeling of the compliant product. For the purpose of this analysis, the resin suppliers and paint manufacturers are both considered as one sector, i.e., paint and allied products (SIC 2851).

The cost estimates of the proposed amendments are developed based upon cost information from coating manufacturers and resin suppliers. For the most part, resin suppliers were the most cooperative in providing cost data to the District. On the other hand, nearly all coating manufacturers declined to provide cost data. Based upon the limited information available, the District estimates the proposed limits would result in price increases for future coatings compliant with the interim limits to increase by up to 10% and those compliant with the final limits to increase by up to 20%. These price increases reflect not only any increased raw material costs but also other manufacturing costs to be recouped by the coatings manufacturer, such as research and development (R&D), testing, marketing, labeling, etc.

These estimated price increases are supported by the cost information received from the resin suppliers, and have been confirmed for some coating categories by at least two coating manufacturers. In addition, recently published information further supports these estimates.[1]

[1] Case Study of DeVoe & Raynolds Co, published in *Stirring Up Innovation* (1994) (noting a 10% increase in cost for < 250 g/l industrial maintenance, non-flat, and wood stain coatings). *Superior Performance Coatings* (paper distributed by Superior Coatings at April 28, 1998 Architectural Coatings Technology Conference) (noting a 0 to 10% increase in the cost per gallon for zero-VOC nonflat, primer sealer and undercoater, rust preventative, industrial maintenance, and stain coatings).

Further, some of the information received by the District indicates no additional increase in cost,[2] or even lesser cost if measured in terms of cost per area applied. [3]

Based on the information received, staff has conservatively assumed that there will be a 10 percent price increase per gallon for compliant coatings meeting the interim limits in 2002 and a 20 percent price increase per gallon for compliant coatings meeting the final limits in 2006. This assumption is made across the board for most of the affected coating categories, as shown in Table 1. Only a 10% increase is assumed for stains and waterproofing wood sealers, since those categories do not a 2006 compliance limit. Only a 20% increase is assumed for rust preventative coatings, since that category has no 2002 interim compliance limit. All other coating categories not listed in Table 1 are assumed to have no cost increase, since data indicates that more than 90 percent of the coatings currently available in the market are compliant with the future limits.

Table 1
Cost per Gallon Increase By Category

Coatings Category	2002	2006
Industrial Maintenance	$4	$8
Rust Preventative Coatings	No Limit	$4
Floor Coatings	$3	$6
Non-Flats	$2	$4
Primers, Sealers, and Undercoaters (PSU)	$2	$4
Quick-Dry PSU	$2	$4
Quick-Dry Enamels	$2	$4
Stains	$2.5	$2.5
Waterproof Wood Sealers	$2	$2

Due to the lack of specific and reliable data on the cost of reformulation for each individual product, it is assumed that the interim 10-percent price increase will stay up to the year 2005 and the 20-percent price increase for the final compliance date will continue to 2015. This assumption is used to recognize the fact that reformulation is typically a one-time investment whose useful life goes beyond the year in which reformulation occurs.

Table 2 shows the annual cost and the average annual cost from the years 2002 to 2015 by category. The average costs are derived by multiplying the estimated number of gallons used from the CARB survey by the additional cost of compliance in each category for both interim and final proposed limits.[4] The costs reflect not only the price increases, but also differences in the amount of usage between compliant and non-compliant coatings, where a difference in percentage of solids by volume exists between currently compliant coatings and future compliant coatings. The detailed cost analysis is in Appendix B.

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[2] *VOC free Paints and Inks at NO EXTRA COST* (paper distributed by PPA Technologies, Inc at April 28, 1998 Architectural Coatings Technology Conference) (noting no additional cost per gallon for zero-VOC nonflat, primer sealer and undercoater, rust preventative, industrial maintenance, and stain coatings).

[3] Presentation by Ameron International at April 28, 1998 Architectural Coatings Technology Conference (comparing cost per area of low-VOC industrial maintenance coating with higher VOC coatings taking into account application costs and performance).

[4] Draft 1998 CARB Architectural Coatings Survey.

Table 2
Average Annual Cost by Category
(Millions of 1998 Dollars)

Coatings Category	2002	2006	Average Annual (2002-2015)
Industrial Maintenance	$6,401,964	$16,833,767	$13,853,252
Rust Preventative Coatings	No Limit	$1,854,968	$1,324,977
Floor Coatings	$903,655	$1,482,755	$1,317,298
Non-Flats	$8,928,836	$41,124,453	$31,925,705
Primers, Sealers, and Undercoaters (PSU)	$1,200,618	$6,601,051	$5,058,070
Quick-Dry PSU	$535,174	$2,463,380	$1,912,464
Quick-Dry Enamels	$797,022	$2,230,732	$1,821,101
Stains	$738,161	$738,161	$738,161
Waterproofing Wood Sealers	$344,266	$344,266	$344,266
Total	**$19,849,695**	**$73,673,534**	**$58,295,294**

Based on recent data received from industry sources, it is assumed that painting contractors account for an estimated 45 percent of total paint sales and consumers account for an estimated 55 percent of total paint sales. Table 3 provides a summary of the estimated costs to these two sectors of the economy to which the cost of the proposed amendments is allocated.

Table 3
Estimated Annual Cost of
Proposed Amendments to Rule 1113 (Millions of 1998 $)

Industry	2002	2006	Average Annual (2002-2015)
Painting Contractors (SIC 1721)	$8.9	$33.1	$26.3
Consumers	$10.9	$40.5	$32.0
Total Cost	$19.8	$73.6	$58.3

The paint contractors and consumers could incur additional costs beyond the cost presented above. For the paint contractors, it could be the cost of training, learning, and testing the new reformulated coatings; frequent painting; possible construction defects; and litigation costs. For consumers, the additional cost could include the cost of repainting or not obtaining the desired quality. These additional costs are not based on any empirical studies. Rather, they are based on claims made by coating manufacturers and paint contractors. No reliable data on such costs are available. The overall cost imposed on paint contractors will be largely passed on to consumers.

Several provisions in the proposed amendments attempt to minimize the cost impacts on affected businesses. The phase-in of the proposed amendments should ensure that the research and

development costs of reformulation be spread over an extended period of time, and thereby relieving potential significant burden at any point in time. Also, the phase-in of the proposed amendments should provide adequate time for reformulation, so that any sales losses resulting from the amendments can be mitigated.

The proposed averaging provision allows the continued production of non-compliant coatings if their VOC emissions are offset by the production of other coatings that have VOC content sufficiently below their respective limits. The averaging provision would reduce the possibility of sudden product withdrawal from the market and the resulting potential losses in sales. An economist representing one coating manufacturer has informed us that the potential cost savings from the averaging provision could be quite large.[5] The proposed amendments continue a provision from the current rule that allows the sale and use of inventoried non-compliant coatings for a period of three years after their scheduled compliance date. The current rule also allows an exemption for non-compliant coatings that are in containers of one quart or less.

The gradual phase-in of the proposed amendments, averaging, "sell-through," and small container exemption provisions would reduce the cost impacts on coatings manufacturers, wholesalers, and retailers who, otherwise, would have to sell off or dispose of their inventory of non-compliant coatings by the compliance date. The monetary value of these cost mitigation provisions cannot be quantified in this assessment.

Cost-Effectiveness Analysis

The overall cost-effectiveness of the proposed amendments, (total costs/total emission reductions) over the years 2002-2015, is estimated to be $13,317 per ton. This cost-effectiveness value is within the range of recently adopted VOC rules. The cost-effectiveness and the average cost-effectiveness values for both the interim and final compliance dates by category are presented in Table 4.

Table 4
Cost-Effectiveness of the Proposed Amendments
By Category ($/ton of 1998 Dollars)

Coatings Category	2002	2006	Total Cost-Effectiveness (2002-2015)
Industrial Maintenance	$6,050	$17,514	$14,009
Rust Preventative Coatings	No Limit	$5,554	$5,554
Floor Coatings	$7,955	$25,787	$17,915
Non-Flats	$11,287	$21,453	$20,012
Primers, Sealers, and Undercoaters (PSU)	$2,227	$24,916	$14,736
Quick-Dry PSU	$957	$19,582	$7,661
Quick-Dry Enamels	$2,023	$9,256	$6,397
Stains	$1,788	$1,788	$1,788
Waterproofing Wood Sealers	$1,804	$1,804	$1,804
Total Cost-Effectiveness	**$4,891**	**$1,6354**	**$13,317**

[5] May 6, 1999 letter to Jack Broadbent from Robert Hahn.

The cost-effectiveness of primers, sealers, and undercoaters (PSU); and quick-dry PSU coatings is estimated to be $24,916 and $19,582 per ton, respectively for the final compliance date in 2006. This is due mainly to the fact that emission reductions estimated from the second phase are substantially lower than those from Phase one.

Small Business Impacts

Small businesses are a subset of all businesses potentially affected by the proposed amendments. The number of small businesses affected varies according to the specific definition of "small business" used. There are several commonly used definitions of "small business." Each of these definitions is described below. These definitions can be applied to the affected businesses to identify subject small businesses.

Based on the 1996 County Business Patterns (CBP), a total of 1,568 businesses, located in the four-county area, are in the industries of chemical and allied products and painting and paper hanging (Table 5).[6] However, not all these businesses are affected by the proposed amendments to Rule 1113.

Table 5
Affected Industries and Percentage of Small Business

Industry (SIC)	Number of Businesses	% with 10 Employees or fewer
Chemicals and Allied Products (2851)	108	30.6
Painting and Paper Hanging (1721)	1,460	82.5
Total	1,568	80.0

Affected Small Business

The AQMD defines a "small business" in Rule 102—Definitions—as one that employs 10 or fewer persons and that earns $500,000 or less in gross annual receipts. Based on the AQMD's permit database, 138 facilities in SIC 2851 are potentially affected by Rule 1113. The Dun & Bradstreet (1998) database has data on the gross annual sales and employment of only 38 of these 138 facilities. Using the AQMD's small business definition, two of these 38 facilities qualify as small businesses. For the other affected facilities in other SIC codes, the District has no information in its permit database, since these sources are usually not permitted.

The federal Small Business Administration (SBA), the federal Clean Air Act Amendments of 1990 (CAAA), and the California Department of Health Services (DHS) also provide their own definitions of a small business. Two common characteristics of the SBA, CAAA, and DHS small business definitions are the following: (1) standards are unique to each industry type, and (2) the businesses have to be independently owned and operated, and cannot be dominant in their field.

The SBA's definition of a small business uses the criterion of either gross annual receipts or number of employees. The criterion varies by four-digit SIC code. A business entity may be an individual proprietorship, partnership, limited liability company, corporation, joint venture,

[6] County Business Patterns, 1996 California. U.S. Department of Commerce, Bureau of the Census.

association, trust, or cooperative. Employment or sales of all domestic and foreign affiliates have to be considered in determining whether the entity is a small business.

A business in the painting and paper hanging industry with less than $7 million gross annual receipts is considered a small business by the SBA. For SIC 2851, paint and allied products (of which architectural coatings manufacturers represent about 40 percent), the SBA defines a "small business" as one having 500 employees or fewer. Out of the 138 manufacturers in the AQMD permit database, 62 have employment data. Using the SBA size criterion, all 62 paint manufacturers qualify as small businesses.

Based on inputs from the regulatory negotiation process, the EPA (1996) has defined a "small business" as one having less than $10 million in annual architectural coatings sales and less than $50 million in total annual sales (of all products). In its 1995/1996 publication, the Coating Agenda America (CAA) also defines a "small business" as one which earns less than $10 million in gross annual receipts. The 1998 EPA study indicated that about 31 percent (out of a total of 116) of the paint companies surveyed had gross annual sales less than $10 million. The 1998 CARB study indicated that about 50 percent (out of a total of 155) of companies surveyed had gross annual sales less than $10 million. Also, based on the 1998 CARB survey, only nine percent of these companies had less than 10 employees.

The CAAA classifies a facility as a "small business stationary source" if it (1) employs 100 or fewer employees, (2) does not emit more than 10 tons per year of either VOC or NOx, and (3) is a small business as defined by the SBA. The DHS definition of a small business uses an annual gross receipt criterion (ranging from $1 million to $9.5 million, depending on industry type) for non-manufacturing industries and an employment criterion of fewer than 250 employees for manufacturing industries.

Under the SBA's, CAAA's, and CAA's definitions of small business, most of the companies affected by the proposed amendments to Rule 1113 could potentially be small businesses. The number of affected small businesses will be smaller under the AQMD's definition.

Other Potential Impacts

According to the 1998 EPA study, small paint manufacturers' products have a higher VOC content than the industry average. This is because these firms usually focus on smaller markets and produce high performance specialty coatings. Due to their narrow production lines, some of these small local companies may be unable to take advantage of the proposed averaging provision and, therefore, could be disproportionately impacted by the proposed amendments. Furthermore, since the costs of reformulating products are independent of product volume, the proposed amendments could impose higher average costs per unit of product on small coating producers.

In contrast with the 1998 EPA findings, staff has found that many of the small paint manufacturers located in the Basin have already manufactured reformulated and marketed coatings that comply with the proposed interim and final VOC limits. Small local coatings manufacturers have a market niche in performance coatings that comply with the proposed interim and final VOC limits.

Results from the REMI Model

The potential job and other socioeconomic impacts of the proposed amendments to Rule 1113 were projected through the use of the Regional Economic Models, Inc. (REMI) model. The REMI model is an economic and demographic forecasting and simulation model designed to examine the economic and demographic effects resulting from policy initiatives or external events in a local economy. The REMI model used in this analysis contains historical economic data of the four-county area through 1995.

The REMI analysis considers the costs (savings) to the affected sectors and benefits to product and service providers resulting from implementing the proposed amendments. Appendix A has a detailed description of the REMI model. The analysis covers the period from 2002 to 2015.

Employment Impacts

The total employment impacts of the proposed amendments in key years and by industry are shown in Table 6. It is estimated that a total of 374 jobs will be forgone in the year 2002 to meet the interim VOC limits. In 2006, when the final VOC limits become effective, the number of jobs forgone rises to 1,464. In 2015, the number of jobs foregone will be 2,120. Proposed amendments to Rule 1113 are expected to result in approximately 1,492 jobs forgone annually, on average, between 2002 and 2015.

The sectors with the greatest job impacts from the proposed amendments are the construction sector (SICs 15-17). The increased cost of paints and contractor-provided painting services would reduce consumer spending on other goods and services. As a result, it is expected that there would be jobs forgone in the industries of eating and drinking (SIC 58), rest of retail (SICs 52-57, 59), wholesale (SICs 50-51), miscellaneous business services (SIC 73), medical (SIC 80), and miscellaneous professional services (SICs 81, 87, 89). The chemicals (SIC 28) sector is projected to add jobs due to increased expenditures made on reformulated coatings (and other associated activities) in this sector.

Table 6
Employment Impact of Proposed Amendments by Industry by Year

Industry (SIC)	2002	2006	2015	Average Annual (2002-2015)
Lumber (24)	-1	-5	-6	-5
Furniture (25)	-4	-13	-15	-12
Stone, Clay, etc. (32)	-1	-5	-7	-5
Primary Metals (33)	0	-2	-3	-2
Fabricated Metal (34)	-2	-8	-13	-9
Non-electric Machinery (35)	-3	-8	-9	-7
Elect. Equipment (36)	-2	-7	-8	-7
Motor Veh. (371)	-1	-2	-2	-2
Rest of Transp. Equip. (372-379)	-1	-3	-5	-4
Instruments (38)	-2	-8	-10	-8
Misc. Manuf. (39)	-1	-4	-7	-5
Food (20)	-3	-12	-14	-11
Tobacco Manuf. (21)	0	0	0	0
Textiles (22)	-1	-3	-4	-3
Apparel (23)	-3	-10	-12	-9
Paper (26)	0	-2	-5	-3
Printing (27)	-2	-8	-14	-9
Chemicals (28)	30	107	81	74
Petroleum Products (29)	-1	-3	-3	-2
Rubber (30)	0	-2	-7	-4
Leather (31)	0	-1	-1	-1
Mining (10,12-14)	-1	-2	-3	-2
Construction (15-17)	-44	-170	-233	-168
Railroad (40)	0	0	0	0
Trucking (42)	-3	-11	-13	-11
Local/Interurban (41)	-2	-9	-12	-9
Air Transp. (45)	-1	-4	-4	-4
Other Transp. (44,46-47)	-1	-5	-7	-5
Communication (48)	-4	-14	-12	-11
Public Utilities (49)	-3	-10	-13	-10
Banking (60)	-10	-38	-44	-34
Insurance (63,64)	-8	-30	-38	-29
Credit & Finance (61-62,67)	-8	-33	-42	-31
Real Estate (65)	-11	-37	-25	-26
Eating & Drinking (58)	-34	-123	-146	-110
Rest of Retail (52-57,59)	-76	-271	-311	-241
Wholesale (50-51)	-17	-62	-78	-59
Hotels (70)	-2	-12	-24	-15
Personal Serv. & Repair (72,76)	-15	-58	-79	-56
Private Household (88)	-6	-20	-22	-17
Auto Repair/Serv. (75)	-9	-36	-42	-32
Misc. Busi. Serv. (73)	-26	-109	-185	-124
Amuse. & Recreation (79)	-14	-54	-66	-49
Motion Pictures (78)	-1	-5	-9	-6
Medical (80)	-4	-22	-61	-33
Misc. Prof. Serv. (81,87,89)	-21	-85	-132	-92
Education (82)	-21	-79	-87	-68
Non-Profit Org. (83)	-23	-93	-112	-83
Agri/Forest/Fish Serv. (07-09)	-3	-13	-19	-13
Government	-8	-60	-237	-122
TOTAL	**-374**	**-1464**	**-2120**	**-1492**

The projected job impacts of the proposed amendments to Rule 1113 were further disaggregated by dividing the potentially affected industries and occupations into five groups according to the annual wages of industries and weekly earnings of occupations, respectively.

It is projected that industry groups 1 through 4 could experience job reductions ranging from 0.0041 to 0.0277 percent compared with their baseline job growth in the years 2005 and 2015. Industry group 5, however, could experience job creations. This is mainly due to the positive job impact exerted on the chemical sector (SIC 28). Table 7 describes the job impact on each industry group. Table A-2 in Appendix A has a detailed list of industries in each group.

Table 7
Employment Impact by Industry Group
Of Proposed Amendments to Rule 1113

Group	Average Annual Wage	% Job Impact from Baseline (Year) 2005	2015	SIC Codes
1	< $16,941	-.0076	-.0262	07-09,21,23,52-59,65,72, 75,76,79,88
2	$17,695 - $21,243	-.0073	-.0277	15-17,25,31,39, 41,42,,70,73, 82,83
3	$23,254 - $30,919	-.0049	-.0192	20,22,24,27,30,32, 34,371,46,47
4	$31,720 - $39,511	-.0041	-.0016	10-14,26,36,45, 60-64,80,81
5	$40,962 - $61,420	.0017	.0032	28,29,372-379,35,38,40,48,49, 78

Source: ES-202 Data, Bureau of Labor Statistics, 1995 and REMI, 1995.

Occupational impacts are also expected to vary between years and occupations. All occupation groups are expected to face reduced job growth in 2005 and 2015, as shown in Table 8. Occupations in Group 1 include farm workers, private household workers, textile workers, and retail salespersons. Table A-1 in Appendix A shows the classification of 94 occupations into the five different groups.

Table 8
Employment Impact by Occupation Group
of Proposed Amendments to Rule 1113

Group	Median Weekly Earnings	% Job Impact from Baseline (Year) 2005	2015	Number. of Occupations
1	$187 - $298	-.0061	-.0227	19
2	$312 - $380	-.0044	-.0175	19
3	$385 - $510	-.0066	-.0246	20
4	$511 - $643	-.0052	-.0204	20
5	$658 - $1170	-.0042	-.0164	16

Source: Current Population Survey, 1995 and REMI, 1995.

Competitiveness of Industries

Some of the paint manufacturers located in the Basin have already reformulated and marketed coatings that comply with the proposed interim and final VOC limits. Some of the small local coatings manufacturers have a market niche in performance coatings that comply with the proposed interim and final VOC limits. This could put these small companies (e.g., Hart Polymers, and Coatings Resources Corp.) in a competitive advantage relative to the large, mass-market coatings producers.

Affected industries can either pass on the additional cost of doing business to consumers, or absorb this cost. In the REMI model, national industries whose main sales territory is in the nation, are assumed to absorb the added cost of emission controls. Such industries will face reduced profits. As Table 9 shows, the profits of chemical and allied products where paint manufacturers belong are projected to decrease by slightly relative to their national counterpart. The additional demand for (or sales of) the paint products exerts pressure on input markets, thereby, leading to increases in wage rates and rental prices of capital. The higher cost of doing business therefore reduces profits.

Table 9
Impacts on Profits of National Industries
of Proposed Amendments to Rule 1113
(percent of baseline sales)

Industry (SIC)	2005	2015
Lumber (24)	-.0010	-.0040
Furniture (25)	-.0020	-.0058
Paper & Allied Products (26)	-.0022	-.0068
Chemicals and Allied Products (28)	-.0039	-.0131
Fabricated Metal (34)	-.0010	-.0050
Instruments (38)	-.0020	-.0060

Industries whose main market area is local are more likely to pass the additional cost of doing business to consumers in terms of higher prices. Table 10 shows that the selling price of construction sector (SIC 15-17), which includes painting contractors, by 0.0019 percent and 0.0599 percent in 2005 and 2015, respectively.

Table 10
Impacts on Selling Prices of Regional Industries of Proposed Amendments to Rule 1113
(percent of baseline sales)

Industry (SIC)	2005	2015
Construction (15-17)	.0019	.0599
Auto Repair & Services (75)	.0027	.0100
Medical (80)	.0018	.0045
Eating and Drinking (58)	.0010	.0047
Trucking (42)	.0030	.0012
Amusement & Recreation (79)	.0026	.0096

Impact on Price Indices

The proposed amendments will have minor impacts on the price index of consumer goods. In the year 2005, the average price of consumer goods is projected to increase by approximately 0.0050 to 0.0053 percent for all income groups. That increase is expected to rise to 0.0165 and 0.0172 percent in the year 2015, as shown in Table 11. The increase in price indices will have a potential to decrease the purchasing power of consumers, thus leading to a loss in their welfare.

Table 11
Impact on the Price Index of Consumption Goods by Income Group
(percent of baseline)

Group	Year 2005	Year 2015
1st Quintile	0.0053	0.0172
2nd Quintile	0.0051	0.0167
3rd Quintile	0.0052	0.0165
4th Quintile	0.0050	0.0165
5th Quintile	0.0051	0.0165

Source: Consumer Expenditure Survey, 1995 and REMI, 1995.

Alternatives to Proposed Amendments

Staff has identified three alternatives to the proposed amendments, as outlined in the Environmental Assessment prepared pursuant to the California Environmental Quality Act (CEQA). An initial staff proposal as presented in the preliminary staff report dated November 10, 1998) is also analyzed. Relative to the proposed amendments, the initial staff proposal proposed to lower limits for all affected categories with more stringent interim (100 g/l) and final (50 g/l) VOC compliance limits. Since the initial proposal, staff has created several additional categories,

including rust preventative, bituminous, roof, recycled flats and non-flats , essential public service, and floor coatings.

Alternative A, the No Project Alternative, is the existing Rule 1113. Compared to the proposed amendments, Alternative B would delay the interim VOC content limits to January 1, 2003 and the final VOC content limits to January 1, 2008. Relative to the proposed amendments, Alternative C would remove the proposed final VOC content limits for industrial maintenance and rust preventative coatings.

Table 12 presents a comparison of the alternatives interms of emission reductions, cost-effectiveness, annual average cost, and jobs forgone. Of all these alternatives, including the initial proposal, the proposed project has the highest average annual cost ($58.3 million) with a job impact of 1,492 jobs forgone. The initial proposal has the next highest impacts with annual average cost ($51.2 million) and the highest cost-effectiveness value ($15,415 per ton). Staff did not conduct an employment impact analysis for the initial proposal, but the number of jobs foregone is expected to be slightly lower than that of the proposed project. The Alternative B, which is estimated to have an average annual cost of $53 million per year and 1,300 jobs foregone has the next highest impacts. Alternative C has the lowest impact, with a $49.5 million annual average cost and 1,230 jobs forgone.

Table 12
Comparison of Alternatives to Proposed Amendments
(in 1998 Dollars)

Alternative	Emissions Reduction (tons/day in 2006)	Cost-Effectiveness* ($/ton)	Annual Average Cost (in Millions) (2002-2015)	Annual Average Job Impact (2002-2015)
Initial Proposal**	20.15	$15,415	$51.2	N/A
Proposed Amendments	21.80	$13,316	$58.3	-1,492
Alternative A	0	N/A	0	0
Alternative B	21.80*	$12,224	$53.0	-1,300
Alternative C	18.30	$11,885	$49.5	-1,230

The emission reductions as well as costs estimations for the initial proposal were based on the preliminary CARB survey. The rest of the alternatives was based on the Draft CARB survey.
*Emissions in the year 2008.

Rule Adoption Relative to the Cost-Effectiveness Schedule

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether proposed rules being considered for adoption are being presented in rank order by cost-effectiveness as defined in the AQMP. The 1997 Air Quality Management Plan (AQMP) analyzed and ranked all control measures by their cost-effectiveness (from smallest to largest values). It is generally recommended that the most cost-effective actions (smallest values) be taken first. The proposed amendments to Rule 1113 implement control measure CTS-07 in the 1994 and 1997 AQMPs. In the 1997 AQMP, CTS-07 had the largest cost-effectiveness value among all the quantified measures.

CTS-07 is proposed to be implemented out of order of cost-effectiveness values because, out of the control measures yet to be implemented, it achieves one of the largest amounts of VOC reductions. Other key control measures achieving similarly large reductions have already been implemented. Obtaining large emission reductions is necessary to expeditiously achieve healthful air quality standards. Cost-effectiveness of other measures in the 1997 AQMP are set forth in Appendix IV-A of the 1997 AQMP.

Incremental Cost-Effectiveness

Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for a proposed regulation with more than one control options that would achieve the emission reduction objective relative to ozone, CO, SOx, NOx, and their precursors in the proposed regulation. Incremental cost-effectiveness is defined as the difference between costs of two potential control options, divided by the difference in emission reductions between those control options.

Compliance with the proposed amendments to Rule 1113 is achieved through the use of reformulated coatings and possibly the averaging of lower VOC products with higher VOC products. Since only this single control option exists for architectural coatings, it is not possible to calculate incremental cost-effectiveness for different control options for the proposed amendments to Rule 1113. Nevertheless, to provide additional information, the incremental cost-effectiveness[7] values between the CEQA alternatives are presented in Table 13. For example, it would cost $25,750 more per additional ton of emission reductions, if one moves from alternative B (delayed compliance dates to 2003 and 2008) to the proposed project.

Table 13
Comparison of Incremental Cost effectiveness of CEQA Alternatives (in 1998 Dollars)

CEQA Alternatives	Incremental Cost-Effectiveness Between CEQA Alternatives ($/ton)
Initial Project to Proposed Project	$4,174
Alternative B to Proposed Project	$25,750
Alternative C to Proposed Project	$41,633
Alternative C to Alternative B	$2,315

[7] Incremental cost effectiveness was assessed by accounting for the costs and emission reductions between two alternatives from 2002 to 2015, inclusive.

APPENDIX A

The REMI Model

At the March 17, 1989 Air Quality Management Plan (AQMP) adoption hearing, the AQMD Governing Board adopted a resolution calling for the incorporation of an analysis of impacted industries, range of control costs, cost-effectiveness, and public health benefits into the evaluation of economic impacts of all proposed rules. Since then, the District has provided an analysis of socioeconomic impacts for each proposed rule.

In an effort to expand socioeconomic impact assessments for proposed rules and AQMP revisions, the AQMD has purchased a computerized economic model from Regional Economic Models, Inc. (REMI) for the counties of Los Angeles, Orange, Riverside, and San Bernardino. The structure and assumptions of the model are briefly described below.

FRAMEWORK OF THE REMI MODEL

The AQMD REMI model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino. The model is comprised of a standard module, a demographic/migration module, and an input-output module. The standard module has 53 industries (2-digit SIC) or 214 industries (3-digit SIC), 94 occupations, and 25 final demand sectors. The demographic/migration module captures population changes due to births, deaths, and migration; and has 202 age/sex cohorts. The input-output module contains detailed inter-industry relationships for 466 sectors. The input-output module is used to assess the detailed inter-industry effects of a policy change. The effects are then fed into the standard module to allow for the assessment of total effects.

The standard module can be divided into the following five components: (1) production (output); (2) labor and capital demand; (3) population and labor supply; (4) wages, and prices, and profits; and (5) market share. These five components are interrelated and the linkages are depicted in Figure A-1.

Each component is built upon a two-step process. First, producers and consumers throughout all regions of the country have similar behavioral characteristics. Because of these similarities, statistical techniques can be used to estimate economic responses based on studies done throughout the United States. The second step of the modeling process is region specific, and involves calibration of the model based on region-specific historical data.

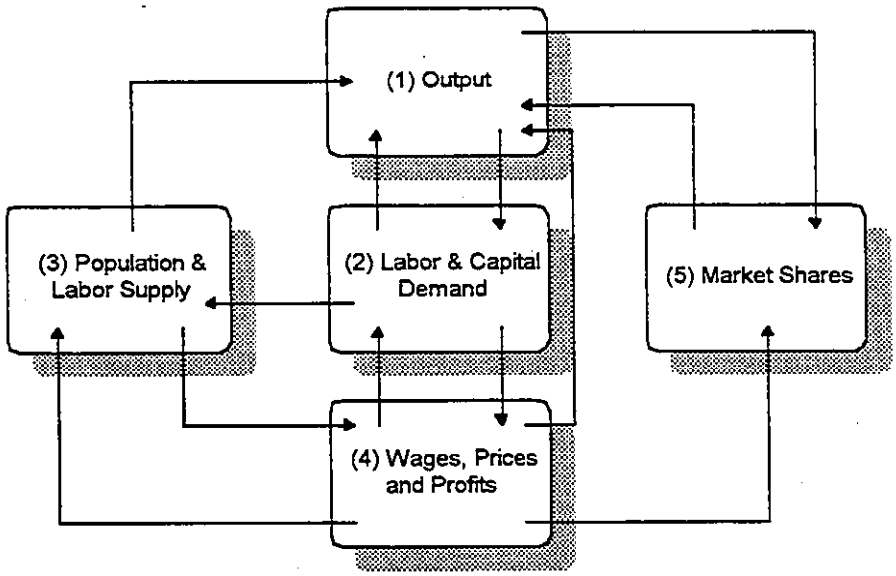
ASSUMPTIONS OF THE REMI MODEL

The REMI model has been built based on well-established economic theory and is updated regularly to incorporate new findings in economic theory and new historical data. Major assumptions behind the REMI model fall into the following three categories: overall,

production, and population and labor. The major assumptions behind the REMI model are as follows:

FIGURE A-1

Components of REMI Model



Overall

1. Production costs, such as capital equipment, labor and fuel, are allowed to be substituted based on the changes in relative costs of these inputs to those in the United States. Total production costs are the sum of input costs weighted by their usage.

2. Location of a firm is driven by profitability.

3. All industries sell to both local and national markets. The model calculates the proportions of local demand that an industry can satisfy and its export share. Exports are divided into shipments from one county to the remaining counties (e.g., counties of Los Angeles, Orange, Riverside, and San Bernardino) and sales outside of the four-county region.

4. For pricing purposes, industries are classified as national or regional. Goods sold in national markets must be priced at the average national price to be competitive. National industries, on average, supply more than 50 percent of their output to national markets. Regional industries sell more than 50 percent of their output locally. The national industries in the model are hotels and manufacturing sectors with the exception of stone, clay, and glass; printing and publishing; and petroleum and coal products. The regional industries consist of mining, construction, finance, wholesale and retail trade, services (except hotels), and agriculture.

5. The REMI model consists of exogenous and endogenous economic variables. Values of exogenous variables are determined outside of the model. Exogenous

variables are a driving force of change in the regional economy. The resulting changes are reflected in the values of endogenous variables calculated by the model. Therefore, policy changes can be simulated by changing exogenous variables whose values are developed by District staff as inputs to the REMI model. For example, increases in demand for control equipment due to a rule can be simulated by increasing the sales of the supplier of control equipment. The impact of such a policy change includes changes in employment, among others.

6. There will be two avenues for market expansion. First, as the cost of production decreases, firms become more competitive in the export market and more competitive with imports. Second, markets are assumed to expand as a region's economy grows.

Production

1. Production costs affect regional competitiveness which impacts the shares of local and export markets. As the relative production costs increase, there will be a reduction in the proportion of local demand which can be satisfied locally as imported goods are substituted for local goods.

2. Production levels drive labor demand which interacts with labor supply to determine wage rates. Combined with other production costs, e.g., capital and fuel costs, wages determine relative production costs in the four-county region compared to the rest of the United States.

3. Production levels are determined by the total demand which consists of consumption, investment, government spending, and net exports. Employment is determined by the level of production and labor intensity, i.e., number of employees per unit of production.

4. An increase in demand will increase production by a factor greater than one because of indirect impacts.

Population and Labor

1. There are four types of migrants: international migrants, retired migrants, former military personnel, and economic migrants. These economic migrants are individuals moving to the region for employment opportunities. They respond to both economic and amenity factors.

2. The demographic section of the model predicts the number of births and deaths that occur in the population. Labor supply is derived from the indigenous labor force and potential job migrants.

3. Labor is segmented by occupation as well as by industry. Employment within an industry is translated to occupation level employment through the use of occupational skill requirements by industry.

VERIFICATION OF THE MODEL

The AQMD version of the REMI model was independently evaluated by the University of Pittsburgh in 1989 to determine its forecasting and simulation capabilities. The model's performance was judged to meet accepted standards of practice (Cassing and Giarratani, 1990).[8]

ENHANCEMENTS TO THE MODEL

The AQMD socioeconomic assessment process is an evolving one. The assessment has expanded from impacts on directly-affected industries to include employment impacts on all industries. In 1992, enhancements were made to the REMI model to allow the assessment of impacts on different income groups and on low- versus high-wage groups.

Using the nationwide median weekly earnings of full-time workers from the 1995 BLS Employment and Earnings, 94 occupations in the REMI model were ranked in ascending order of earnings and divided into five (quintile) groups. Table A-1 shows how the 94 civilian occupations were ranked. In doing so, the percentage changes of a policy on each quintile of earnings can thus be reported for occupational wage rate, employment, and wage bill.

TABLE A-1

Ranking of Occupational Earnings

Occupation	Median Weekly Earnings	Quintile Group
Cashiers	$237	1
Cleaning Workers	$290	1
Counter & Rent Clerks	$271	1
Farm Occupations	$261	1
Fishers, Hunters, & Trappers	$287	1
Food Prep. & Service Workers	$260	1
Hand Helpers, Laborers	$319	1
Health Service Workers	$288	1
Mail Clerks & Messengers	$318	1
Non-farm Animal Care Workers	$295	1
Non-farm Gardeners	$287	1
Other Agricultural-Related Workers	$287	1
Other Sales Workers, Nec.	$282	1
Other Service Workers, Nec.	$299	1
Personal Service Workers	$289	1
Private Household Workers	$195	1
Retail Salespersons	$287	1
Stock Clerks, Sales Workers	$271	1
Textile & Related Operators	$266	1

[8]S. Cassing and F. Giarratani, An Evaluation of the South Coast Air Quality Management District's REMI Model, SCAQMD, El Monte, CA., 1990.

TABLE A-1

(Continued)

Occupation	Median Weekly Earnings	Quintile Group
Woodworking Machine Operators	$323	1
Comb. Machine Tool Operators	$361	2
Communication Equipment Operators	$390	2
Financial Record Processing Workers	$386	2
Forestry & Logging Occupations	$358	2
Hand Workers	$384	2
Information Clerks	$342	2
Machine Tool Cut & Form Operators	$545	2
Metal Fabrication Machine Operators	$361	2
Non-Financial Record Processing Workers	$389	2
Numerical Control Machine Tool Operators	$361	2
Other Clerical Workers, Nec.	$361	2
Other Machine Operators, Nec.	$389	2
Other Precision Workers, Nec.	$386	2
Precision Assemblers	$386	2
Precision Food Workers	$344	2
Precision Print Workers	$386	2
Precision Textile, Apparel Workers	$324	2
Precision Woodworkers	$380	2
Secretaries, Stenographers, & Typists	$396	2
Adjustment, Investment, & Collections Occupations	$424	3
Communication Equipment Mechanics, Installers	$539	3
Computer & Related Equipment Operators	$440	3
Construction Trades Occupations	$506	3
Farm Operators & Managers	$403	3
Health Technicians & Technology Occupations	$469	3
Material Moving Operators	$457	3
Metal & Plastic Machine Operators	$437	3
Motor Vehicle Operators	$475	3
Other Mechanical, Installers, Nec.	$520	3
Other Transportation Operators, Nec.	$476	3
Printing, Binding & Related Workers	$447	3
Protective Services Occupations	$528	3
Recording, Scheduling, and Dispatching Workers	$408	3
Soc., Recreation, & Religious Workers	$496	3
Supervisors, Farm, Forest, & Agriculture	$421	3
Travel Agents	$413	3
Vehicle, & Mobile Equipment Mechanics	$500	3
Water & Liquid Waste Occupations	$496	3
Blue Collar Workers Supervisors	$599	4
Chemical Plant & System Operators	$628	4
Elec. Equip. Mechanics, Installers	$624	4
Electric Power Operators, Distribution Workers	$628	4
Engineering & Science Technicians	$598	4
Gas & Petroleum Plant Workers	$628	4
Insurance Sales Workers	$602	4
Machinery & Related Mechanics, Installers	$361	4
Management Support Occupations	$611	4
Other Plant & System Operators, Nec.	$628	4

TABLE A-1

(Continued)

Occupation	Median Weekly Earnings	Quintile Group
Other Technicians	$674	4
Postal Clerks, & Mail Workers	$587	4
Precision Inspectors, Testers	$561	4
Precision Metal Workers	$561	4
Real Estate Agents	$589	4
Stationary Engineers	$628	4
Teachers, Librarians, & Counselors	$621	4
Writers, Artists, Entertainers	$598	4
Architects & Surveyors	$724	5
Computer, Math., and Operations Research Analysts	$854	5
Engineers	$925	5
Health Assessment & Treatment Occupations	$699	5
Health Diagnosing Occupations	$1,043	5
Judges, Magistrates	$1,130	5
Lawyers	$1,125	5
Life Scientists	$706	5
Managerial and Administrative Occupations	$684	5
Mining, Quarrying Occupations	$684	5
Oil & Gas Extraction Occupations	$684	5
Other Extraction Occupations, Nec.	$684	5
Other Professional Workers, Nec.	$718	5
Physical Scientists	$762	5
Rail Transportation Workers	$741	5
Secur. & Fin. Srvcs. Workers	$707	5
Social Scientists	$691	5
Water Transportation Workers	$711	5

The 1995 BEA employment and wage series for the four-county area provided the average annual wage per worker (full-time and part-time) for the 49 private non-farm industries at the 2-digit SIC level in the REMI model. By ranking the 49 industries in ascending order of the average annual wage per worker, we can divide them into five equal groups, as shown in Table A-2. The percentage change in employment, wage bill, and wage rate resulting from a policy can thus be reported for each quintile of wages, by sector.

The annual Consumer Expenditure Survey (CEX), published by the BLS, provides a continuous flow of information on the buying habits of American households. The CEX reports average annual expenditures and characteristics of households by income group. There are five income groups. By linking consumption expenditures in the REMI model with spending patterns of the five income groups in the CEX, we can then develop a composite price change for consumer goods for each income group.

TABLE A-2

Ranking of Wages by Sector

Industry (SIC)	Average Annual Wage	Quintile Group
Agri/Forest/Fish Serv. (07-09)	$10,417	1
Amuse. & Recreation (79)	$15,676	1
Apparel (23)	$15,800	1
Eating & Drinking (58)	$10,813	1
Education (82)	$16,016	1
Insurance (63,64)	$37,008	1
Personal Serv. & Repair (72,76)	$8,833	1
Private Household (88)	$11,028	1
Real Estate (65)	$11,086	1
Rest of Retail (52-57,59)	$16,239	1
Tobacco Manuf. (21)	$610	1
Auto Repair/Serv. (75)	$16,649	2
Construction (15-17)	$19,079	2
Furniture (25)	$18,953	2
Hotels (70)	$16,846	2
Leather (31)	$16,846	2
Local/Interurban (41)	$16,931	2
Misc. Busi. Serv. (73)	$21,321	2
Misc. Manuf. (39)	$19,627	2
Non-Profit Org. (83)	$20,231	2
Trucking (42)	$21,373	2
Credit & Finance (61-62,67)	$28,836	3
Fabricated Metal (34)	$27,797	3
Food (20)	$30,022	3
Lumber (24)	$22,411	3
Mining (10,12-14)	$26,386	3
Other Transp. (44,46-47)	$27,662	3
Printing (27)	$28,872	3
Rubber (30)	$26,809	3
Stone, Clay, etc. (32)	$26,769	3
Textiles (22)	$21,447	3
Air Transp. (45)	$36,145	4
Banking (60)	$39,914	4
Elect. Equipment (36)	$42,549	4
Medical (80)	$30,819	4
Misc. Prof. Serv. (81,87,89)	$30,562	4
Motor Veh. (371)	$30,658	4
Paper (26)	$36,183	4
Primary Metals (33)	$30,784	4
Wholesale (50-51)	$33,970	4
Chemicals (28)	$42,966	5
Communication (48)	$44,646	5
Instruments (38)	$48,899	5
Motion Pictures (78)	$43,851	5
Non-electric Machinery (35)	$45,137	5
Petroleum Products (29)	$64,120	5
Public Utilities (49)	$46,838	5
Railroad (40)	$47,390	5
Rest of Transp. Equip. (372-379)	$46,059	5

APPENDIX B

Assumptions of the Socioeconomic Analysis for Proposed Amendments to Rule 1113

The socioeconomic impacts of the proposed amendments on the four-county economy were analyzed using policy variables in the REMI model. These policy variables represent direct impacts of a policy initiative and were used as inputs to the REMI model. Three types of policy variables for the analysis of the amendments were chosen: changes in the costs of doing business for affected sectors, changes in spending on goods and services, and changes in purchasing power of consumers. For the proposed amendments a 14-year analysis period (from 2002 to 2015) was used.

The proposed amendments lower VOC limits for the coating categories of industrial maintenance; non-flats; primers, sealers, and undercoaters; quick-dry enamels; quick-dry primers, sealers, and undercoaters; roof coatings; floor coatings; rust preventative coatings; stains; and waterproofing wood sealers. Lowering the VOC limits of these categories will achieve an emission reduction of about 21.8 tpd on an average annual basis.

Reformulation and other Expenditures

While stimulating the local economy and creating jobs, the increased prices of reformulated architectural coatings (and other associated spending) translates to additional sales value to paint manufacturers (SIC 2851). Price increases were assumed to start in the year 2002 when compliance with the interim limits is due. The price increases would continue until the final compliance date (year 2006) kicks in. When that occurs, another round of price increases begins and continues until the end of the analysis period (2015). The additional sales were allocated to each county based on the sector's output in that county.

Cost of Doing Business

The additional cost of doing business for the sectors that use architectural coatings is calculated by multiplying the price differences (per gallon) between compliant coatings and non-compliant coatings by the gallons of paints used in the four-county area. The 1998 CARB survey was used to arrive at the number of gallons of paints used in each category. The 1998 U.S. EPA "Economic Impact and Regulatory Flexibility Analyses of the Final Architectural Coatings VOC Rule" as well as recent data collected from resin suppliers and paint manufacturers of low-VOC coatings were used to arrive at price differences.

Table B-1 shows the percentage of existing coatings complying with the interim as well as the final limits in each category. Table B-2 shows the number of gallons that has yet to comply with the interim and final limits, respectively, in each coating category.

Table B-1
Percentages of Compliance with the Interim and Final Limits
(Based on Total Volume of Sales in 1996)

Coatings Category	% complying with Interim Limits*	% complying with Final Limits
Industrial Maintenance	28	15
Rust Preventative Coatings	No Interim Limit	0
Floor Coatings	35	25
Non-Flats	56	2
Primers, Sealers, and Undercoaters (PSU)	74	43
Quick-Dry PSU	35	17
Quick-Dry Enamels**	2**	0**
Stains	53	No Final limit
Waterproofing Wood Sealers	11	No Final Limit

* Draft 1998 CARB Architectural Coatings Survey

**Numerous nonflat coatings not included in this category also meet the definition of quick-dry enamel.

Table B-2
Projected Number of Gallons to be reformulated
(by Category)

Coatings Category	Amount Of Gallons (2002)*	Amount of Gallons (2006)*
Industrial Maintenance	1,600,491	2,104,221
Rust Preventative Coatings	No Limit	927,484
Floor Coatings	301,218	247,126
Non-Flats	4,464,418	10,281,113
Primers, Sealers, and Undercoaters (PSU)	600,309	1,650,263
Quick-Dry PSU	267,587	615,845
Quick-Dry Enamels	398,511	557,683
Stains	295,264	295,264
Waterproofing Wood Sealers	172,133	172,133

*Adjustments made for solid content, and does not account for potential increased usage based on population increase.

Based on information provided by the industry, it was assumed that consumers would purchase about 55 percent and painting contractors would purchase about 45 percent of total architectural coatings sold in the four-county area.

The use of the REMI model requires that the additional cost of doing business be developed for affected sectors in each county. The additional cost for paint contractors was allocated to the counties of Los Angeles, Orange, Riverside, and San Bernardino in proportion to each county's share of the total number of establishments in SIC 1721 (painting and paper hanging contractors) from the 1996 County Business Patterns (CBP).

Consumers' Purchasing Power

The price increase in coatings reduces consumers' purchasing power. Reduction in purchasing power of consumers was distributed among the four counties based on the disposable income in each county.

APPENDIX C

Responses to Comments

Responses to the comments provided by Smiland & Khachigian on April 15, 1999

Absence of Timely Analysis

Issue (26)

As noted by the commentator, a staff report needs to be prepared at least 30 days prior to the rule adoption hearing. A staff report as well as socioeconomic analyses were timely made available to the public. Additionally, at various public consultation sessions prior to that time, District staff have presented cost-effectiveness values for the proposed amendments, including incremental cost-effectiveness values, as specified in Health and Safety Code Section 40920.6.

Necessity

Issues (27 - 30)

The commentator contends that there is no need for PAR 1113, since industry has every incentive and capacity to reduce emissions from architectural coatings. The District welcomes any industry attempt to reduce emissions, and PAR 1113 allows for such attempts.

Additionally, Staff believes the commentator misconstrues the relationship, if any, between technological feasibility as intended in Health and Safety Code Section 40922(b) and the case *Competitive Enterprise Institute v. NHTSA*, which involves setting miles per gallon standards for automobiles. In considering the feasibility of this rule, the AQMD considered potential economic impacts. The socioeconomic report indicates that some potential future jobs may be foregone as a result of the amendments. The Board will consider these factors when deciding on the amendments.

Economic Assessment and Analysis

Issues (35 & 36)

The AQMD has satisfied all requirements of California Health and Safety Code Sections 40440.5, 40440.8, 40728.5 and 40920.6. The draft socioeconomic impact assessment for the proposed amendments analyzes affected industries, a range of control costs, cost-effectiveness, incremental cost-effectiveness, employment impacts, and other secondary economic impacts resulting from implementing the proposed amendments. The socioeconomic analysis was performed based on the assumption that existing coatings will be reformulated to meet future VOC limits. Staff does not believe that that proposed amendments would ban coatings, since compliant coatings are currently available.

As discussed in the draft socioeconomic analysis, under the SBA's, CAAA's, and CAA's definitions of small businesses, most of the companies affected by the proposed amendments to

Rule 1113 could potentially be small businesses. The number of affected small businesses will be fewer under the AQMD's definition.

Several provisions in the proposed amendments attempt to minimize impacts on small businesses. The phase-in of the proposed amendments should ensure that the research and development costs of reformulation can be spread over an extended period of time and will not impose a significant burden at any point in time. Also, the gradual phase-in of the proposed amendments should provide adequate time for reformulation so that any sales losses resulting from the amendments are minimal. The proposed averaging provision allows the continued production of non-compliant coatings if their VOC emissions are offset by the production of other coatings, which have VOC contents below their respective limits. Finally, the proposed amendments continue a provision, which allows the sale and the use of non-compliant coatings inventory for a period of three years past their compliance deadline.

Consumer Demand Impacts

Issue (37)

Reformulation of coatings to achieve lower VOC content is the method of control expected to be used by the coatings manufacturers to meet the proposed limits. The impacts of the proposed amendments on end users were analyzed in the draft socioeconomic impact assessment. Painting contractors (SIC 172) and do-it-yourself paint users would pay higher prices for reformulated coatings. The additional expense incurred by painting contractors would be most likely passed on to homeowners.

Other potential losses to paint contractors (the cost of testing the new reformulated coatings, frequent painting, possible construction defects, and litigation costs), and to consumers (the additional cost of repainting or the cost of not obtaining the desired quality) were also discussed in the draft socioeconomic analysis.

Issues (38 - 43)

Competitiveness impacts of the proposed amendments are discussed in the draft socioeconomic analysis which include the discussion of the impacts on profits of national industries (Table 9) as well as the impacts on the selling prices of regional industries (Table 10). The overall impacts are not considered to be significant (less than one percent). In addition, many manufacturers located in the Basin have already reformulated coatings and have a market niche in performance coatings which could further enhance their competitiveness relative to the national, mass-market coatings producers.

As discussed in the draft socioeconomic analysis, under the SBA's, CAAA's, and CAA's definitions of small businesses, most of the companies affected by the proposed amendments to Rule 1113 could potentially be small businesses. The number of affected small businesses will be fewer under the AQMD's definition. The use of the REMI sector model facilitates the examination of job impacts for those industries with a higher concentration of small businesses.

Several provisions in the proposed amendments attempt to minimize impacts on small businesses. The phase-in of the proposed amendments should ensure that the research and development costs

of reformulation can be spread over an extended period of time and will not impose a significant burden at any point in time. Also, the gradual phase-in of the proposed amendments should provide adequate time for reformulation so that any sales losses resulting from the amendments are minimal. The proposed averaging provision allows the continued production of non-compliant flat coatings if their VOC emissions are offset by the production of other flat coatings which have VOC contents below their respective limits. Finally, the "sell-through" provision of the proposed amendments also provides a three-year period for the inventory of non-compliant coatings to be sold after a compliance deadline.

Cost-Effectiveness

Issues (44 - 47)

Cost-effectiveness of the proposed amendments is discussed in the draft socioeconomic impact assessment. In addition, the assessment presents the cost-effectiveness of the CEQA alternatives. Further, the incremental cost-effectiveness between the CEQA alternatives is also presented in the draft socioeconomic impact assessment. Finally, all the requirements relative to cost have been or will be complied with.

Responses to the comments provided by Kessler & Associates, Inc. on April 20, 1999 on behalf of Dunn-Edwards Corporation.

Comment:

The cost-effectiveness developed for industrial maintenance (IM) coatings underestimates actual costs. We believe that the cost effectiveness for this class of coatings is much higher than represented by the AQMD. Costs should be based on applied solids and service life.

Response:

Disagree. There is a wide range of high-solids and waterborne products available for use in industrial maintenance applications. Our cost-effectiveness was based on equivalent gallons. Service life, dry film thickness, volume percent solids vary primarily as a function of the resin type. Many plural component systems such as urethanes and epoxies do not require the use of a primer and may go on at only 3 mils, as compared to alkyd systems.

The total mil thickness of an alkyd system and primer is by your own admission 4 mils. The higher costs of the waterborne coatings (gallon per gallon) are offset by their higher solids content. (The AQMD has ample data on availability of waterborne, 70% solids by volume polyurethane topcoats). Furthermore we doubt that an alkyd system would last an average of 8.5 years before recoating occurs where as urethane or epoxy based waterborne coating system would only last an average of 4-years. The AQMD requests your methodology for estimating service life, since your data is not in line with other commonly available technical data gathered as a part of the technology assessment.

Furthermore, a paper entitled " High Performance Coating Based on Epoxy Siloxane Hybrid Polymers" by technical manager Norman R. Mowrer, Ameron International, was presented on April 28, 1998 during the Architectural Coatings Technology Conference held at the AQMD. This paper compared the applied cost per square meter of a 3 coat (zinc primer, epoxy intermediate coat and polyurethane topcoat), which is the most common high-VOC industrial maintenance coatings system used for high performance areas, with a low-VOC two coat (zinc primer and epoxy polysiloxane topcoat). This analysis found that the lower VOC system was applied at a 12 percent cost saving ($16.68 per square meter vs. $18.94 per square meter). Additionally, the paper reports that the life of the low-VOC system was estimated to be approximately 20 percent greater, resulting in even a lower applied cost per square meter per year.

Responses to the comments provided by Kessler & Associates, Inc. on April 30, 1999 on behalf of Dunn-Edwards Corporation.

Comment:

The mechanisms incorporated into the proposed amendments' provisions such as averaging reactivity, and technological feasibility will enable Dunn-Edwards to comply.

Response:

Agree. Thank you.

Comment:

The additional cost per gallon for the interim limits should be 20 % instead of 10%.

Response:

For the interim limits, the 10 % price increase per gallon is reasonable, because the interim limits are much higher than the final limits and most of the coatings compliant with the interim limits are currently available at equivalent prices. In addition, staff has received information supporting a 10% increase for the interim limits. Please refer to the Final Socioeconomic Impact Assessment (pages 2, and 3) for more details.

In addition, based on comments received from the public consultation meeting held on April 28, 1999, staff raised the price per gallon from 10 percent to 20 percent for compliance with the final limits. As a result, the average annual cost of compliance as well as cost-effectiveness have increased by more than 60 percent. This 20 percent price increase per gallon would include raw material cost (increase by about 20 percent), reformulation cost as well as other associated costs of producing a compliant product such as research and development (R&D), testing, marketing, labeling, etc.

Comments:
The Chemical industry will have to hire 47 new employees per year at a cost of $4 million per year.

Response:
The REMI analysis does show additional job creations in this sector, although it is incapable of determining the precise number of employees and their specific employment costs.

Comments:
The reformulation cost must be repeated for the interim and final limits.

Response:

One of the main cost increases is the cost of new resins needed for compliance with the new limits. Other costs, such as testing, labeling, and marketing, is included in the 10 and 20 percent estimated price increase per gallon. The socioeconomic impact assessment assumes that the 10 and 20 percent price increase would be repeated in each year of the analysis. This assumption is conservative, i.e., it overstates the cost impact, because much of the reformulation expense is due to research and development, which is a one-time cost incurred during the research and development phase and not continuously for the subsequent years.

Comments:
The cost of reformulation is greatly underestimated

Response:

For the reasons stated in the Final SIA, the District believes that its estimated costs are conservative.

Comments:

The Draft SIA underestimates the cost-effectiveness values of the proposed amendments

Response:

The additional cost of reformulation as well as cost-effectiveness values have been revised per comments received from the industry representatives at the recent public consultation meeting. As explained in the Final SIA, staff believes these cost figures are conservative.

The District's cost-effectiveness values were arrived at by multiplying the total number of gallons (solvent borne and water borne) necessary to meet either the interim limits or the final limits by the incremental price increase per gallon and then dividing those by the corresponding emission reductions. The cost-effectiveness values presented by the commentator are based on subdividing within a coating category, solvent borne and water borne coatings. This approach is not consistent with the AQMD's methodology, which examines the total number of gallons which need to be reformulated to meet the proposed limits.

APPENDIX G

Summary of Phase II Assessment (NTS) Study

Phase II Assessment Study –Summary

Application Properties

• Nonflat Topcoats	High-VOC coatings generally performed best
• Primers, Sealers, & Undercoaters	High-VOC coatings generally performed best
• Industrial Maintenance Coatings	Zero-VOC performed best for leveling, and low-VOC performed best for brushing and sag resistance

Film Appearance Properties

• Nonflat Topcoats	High-VOC coatings generally performed best, with comparable general surface finish
• Primers, Sealers, & Undercoaters	High-VOC coatings generally performed best, with similar overall surface finish
• Industrial Maintenance Coatings	High-VOC coatings generally performed best

Wet & Dry Film Properties

• Nonflat Topcoats	High-VOC coatings generally performed best, with comparable general surface finish and coating uniformity
• Primers, Sealers, & Undercoaters	High-VOC coatings generally performed best, with similar overall surface finish and coating uniformity
• Industrial Maintenance Coatings	Zero- and Low-VOC coatings generally performed better than high-VOC coatings

Dry Times

• Nonflat Topcoats	Zero-VOC generally with fastest dry times, with high-VOC with slowest dry times
• Primers, Sealers, & Undercoaters	Zero-VOC generally with fastest dry times, with high-VOC with slowest dry times

Corrosion Resistance

• Industrial Maintenance Systems	Zero-VOC systems performed the best in blistering and filiform corrosion. Rust resistance similar for high-VOC and zero-VOC coatings, with low-VOC systems performing the lowest

Wet & Dry Adhesion

• Nonflat Systems	Zero-VOC coatings performed best for dry adhesion, with comparable performance for wet adhesion for all three VOC levels

*Zero-VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251 g/l

Taber Abrasion	
• Industrial Maintenance Systems	Zero-VOC coatings performed best at 500 and 1,000 cycles, with low-VOC coatings ranking lowest
Film Flexibility	
• Nonflat Topcoats	All three VOC levels with similar performance
• Industrial Maintenance	High-VOC coatings rated highest and zero-VOC coatings rated lowest.
Mar Resistance	
• Industrial Maintenance	Overall performance (grams of load at failure) was highest for low-VOC systems, with zero-VOC systems ranked second. However, it appears that that higher the dry film thickness, the better the mar resistance. Analyzing on a grams of load per mil basis, the low-VOC systems again performed best. However, the zero-VOC systems ranked lower than high-VOC systems.
Household Chemical Resistance	
• Nonflats & Quick-Dry	All the high-VOC systems passed the overall tape test. 1/3 of zero- and low-VOC systems failed the tape. Removal was to bare wood.
Adhesion to Substrate	
• Industrial Maintenance	Zero-VOC systems, overall, performed highest for adhesion, in terms of average mean strength. In terms of range, the high-VOC systems had the highest and lowest performance in this test. The low-VOC systems performed in the middle of the overall range.

*Zero-VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251 g/l

Phase II Assessment Study							
Results							
Application Properties	*Leveling Rating Range (0-10)*	*Sag Resistance*	*Blocking Resistance*	*Brushing Properties – Wet Range (1-9)*	*Brushing Properties – Dry Range (1-9)*	*Dry Bristle Streaks*	*Extent of brushing coverage of block (1-5)*
NonFlats & Quick-Dry							
Zero-VOC	0-6	Lower	Lower	1-4	2-6	Most	2-5-
Low-VOC	0-6			1-3	1-6	Some	2-5
High-VOC	4-8	Higher	Higher	1-4	1-6	Only 1	3-5
Primers, Sealers, & Undercoaters & Quick-Dry							
Zero-VOC	0-6	Lower	Lower	1-3	2-5	Most	2-4
Low-VOC	0-6			1-3	3-4	Most	2-4
High-VOC	0-6	Higher	Higher	1-2	1-3	Some	3-4
Industrial Maintenance							
Zero-VOC	6-9	Lower	N/A	1-6	1-8	Few	3-5
Low-VOC	0-4	Higher		1-4	2-9	Most	2-4
High-VOC	4-8			1-6	1-4	Some	3-5

*Zero-VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251 g/l

Phase II Assessment Study				
Results				
Film Appearance Properties	*Finish over black porous surface*	*Surface Roughness*	*Streaks*	*General Surface Finish*
NonFlats & Quick-Dry				
Zero-VOC	Slight Crinkles	Some	Only one	Mostly Smooth
Low-VOC	Mostly Smooth	None	None	Smooth
High-VOC	Smooth	None	None	Smooth, One with vertical striations
Primers, Sealers, & Undercoaters & Quick-Dry				
Zero-VOC	Some Crinkles	Some	Only one	Mostly Smooth, some with light roughness
Low-VOC	Slight Crinkles	None	None	Smooth
High-VOC	Smooth	None	None	Mostly Smooth, one with vertical striations
Industrial Maintenance				
Zero-VOC	Some smooth, grainy, and wrinkled	Some	None	Some smooth, some speckled, one with bubbles
Low-VOC	Some wrinkling and crinkles	Slight	Some	Mostly smooth, one grainy
High-VOC	Mostly smooth, some with grains	None	None	Mostly smooth

*: -VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251 g

Phase II Assessment Study					
Results					
Wet & Dry Film Properties (WW Rod#80)	*Wire Marks*	*Streaks*	*Holidays*	*General Surface Finish*	*Coating Uniformity*
Nonflats & Quick-Dry					
Zero-VOC	Some	Some	Only One	Some rough, some smooth	Good
Low-VOC	None	None	None	Smooth	Good, one fair
High-VOC	None	None	None	Smooth	Good
Primers, Sealers, & Undercoaters & Quick-Dry					
Zero-VOC	Some	Some	None	Mostly smooth, some rough	Good
Low-VOC	Few	Some	Only one	Mostly smooth, some rough	Good
High-VOC	None	Most	None	Some smooth, some rough	Good
Industrial Maintenance					
Zero-VOC	Only one	None	None	Mostly smooth, some rough	Some good, some poor
Low-VOC	Only one	None	Only one	Mostly smooth, some with ridges	Mostly good
High-VOC	Some Yes	Only one	None	Some smooth, some with ridges, and some rough	Some good, few fair

*Zero-VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251 g/l

Phase II Assessment Study				
Results				
Dry Times				
NonFlats & Quick-Dry				
Zero-VOC	Generally fastest dry times for set-to-touch, tack-free, dry hard, and dry through time			
Low-VOC	Varying times, some faster than zero-VOC coatings, but mostly slower			
High-VOC	Generally slowest dry times for set-to-touch, tack-free, dry hard, and dry through time			
Primers, Sealers, & Undercoaters & Quick-Dry				
Zero-VOC	Generally fastest dry times for set-to-touch, tack-free, dry hard, and dry through time			
Low-VOC	Varying times, some faster than zero-VOC coatings, but mostly slower			
High-VOC	Generally slowest dry times for set-to-touch, tack-free, dry hard, and dry through time			
Industrial Maintenance				
Zero-VOC	N/A			
Low-VOC	N/A			
High-VOC	N/A			
Corrosion Resistance (Prohesion @ 500 hours))	*Blister*	*Filiform Corrosion*	*Rust Resistance Range, Rating (0-10)*	
Industrial Maintenance				
Zero-VOC	None	None of Five	8-10	
Low-VOC	None	Two of Six	1-10, one with significant rust	
High-VOC	One	Three of Ten	9-10	
Wet & Dry Adhesion	*Dry*		*Wet*	
NonFlats & Quick-Dry	Grid Classification	% Area Removed	Grid Classification	% Area Removed
Zero-VOC	3B – 5B	<5 – 15 %	0B – 4B	<5 – 100%
Low-VOC	0B – 5B	0 - >65	0B – 4B	5 – 100%
High-VOC	0B – 1B	35 - >65	0B – 3B	15 – 100%

*Zero-VOC: < 50 g/l; Low-VOC: 51-250 g/l; High-VOC: > 251 g/l

Phase II Assessment Study				
Results				
Taber Abrasion	*500 Cycles Weight Loss (mg)*		*1000 C ycles Weight Loss (mg)*	
Industrial Maintenance				
Zero-VOC	10.5 – 63		23.4 – 118.9	
Low-VOC	17 – Complete Breakthrough		33.7 – Complete Breakthrough	
High-VOC	45.2 – 98.6		90 – Complete Breakthrough	
Film Flexibility				
NonFlats & Quick-Dry				
Zero-VOC	All Pass – 15.1% - 16.4% Elongation			
Low-VOC	All Pass – 14.8% - 17.0% Elongation			
High-VOC	All Pass – 15.1% - 15.7% Elongation			
Industrial Maintenance				
Zero-VOC	5 Pass, 4 Fail – 15.1% - 24.7% Elongation			
Low-VOC	Mostly Pass, One Fail – 15.1% - 20.7% Elongation			
High-VOC	Mostly Pass, One Fail – 14.9% - 17.0% Elongation			
Mar Resistance	*Dry Film Coating Thickness – System*	*Load at Failure*	*Load at Failure - Average*	*Range: Averaged load (grams) per mil*
Industrial Maintenance	*(Average of 5 measurements – mils)*	*Range (grams)*	*(grams)*	*(grams/mil)*
Zero-VOC	7.8 – 32.0	1,000 – 3,000	*1,667*	94 – 188
Low-VOC	*4.3 – 22.0*	*1,000 – 3,500*	*1,800*	*143 – 233*
High-VOC	*4.0 – 13.1*	*500 – 2,000*	*1,167*	*114 – 250*

*Zero-VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251 g/l

Phase II Assessment Study			
Results			
Household Chemical Resistance			
Nonflats & Quick-Dry	Tape		Notes
Zero-VOC	2 of 3 Pass		Failure to bare wood for one; tape would not adhere for another
Low-VOC	4 of 6 Pass		Failure to bare wood for two; tape would not adhere for another
High-VOC	All 3 Pass		
Adhesion to Substrate (Patti)	*Type of Failure*	*Mean Strength at Failure*	*Mean Strength at Failure*
Industrial Maintenance		*Range (psi)*	*Average (psi)*
Zero-VOC	Mainly cohesive and some adhesive	1,099 – 1,628	1,462
Low-VOC	Mainly cohesive and some adhesive	986 – 1,600	1,226
High-VOC	Mainly cohesive and some adhesive	603 – 2,136	1,287

* .-VOC: ≤ 50 g/l; Low-VOC: 51-250 g/l; High-VOC: ≥ 251