SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report for

PROPOSED AMENDED RULE 1168 – ADHESIVE AND SEALANT APPLICATIONS

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EXECUTIVE SUMMARY

Rule 1168 was adopted in April 1989 to control volatile organic compounds (VOC) emissions from adhesives applications. The rule has been amended 13 times since, the last in January 2005. The rule limits VOC content in 41 categories of adhesives, adhesive primers, caulks, sealants and sealant primers. The rule applies to products used during manufacturing at stationary sources and to products used by consumers that are not regulated by the California Air Resources Board (CARB) in the Consumer Products Regulation (CPR).

The current rule inventory is estimated to be 3.5 tons per day (tpd) of VOC emissions, which includes large and small sources, excluding foam sealants that are not currently regulated by the Rule 1168 or the CARB's CPR. Foam sealants are estimated to contribute another 4.7 tpd of VOC emissions, increasing the total estimated inventory from use of adhesives and sealant to 8.2 tpd. The majority of emissions, approximately 97 percent, come from smaller facilities. The adhesive and sealants usage is primarily for area source uses (e.g., architectural uses), which normally does not require permits to operate from the SCAQMD.

Over the past 15 years since the last major reduction in VOC limits from adhesive and sealant applications, the technology of low-VOC products has improved significantly. In particular, adhesives and sealants used for architectural and construction applications have significantly reduced VOC contents. Much of this progress can be attributed to efforts to "green" products used during the construction, repair and maintenance of buildings for both professionals and consumers.

As part of the rule development process, District staff developed a voluntary survey of regulated products sales in the SCAQMD to improve the emission inventory and to assess product market share. The survey was designed and conducted with feedback from interested stakeholders and trade associations. The response was insufficient from most of the industry and the following subsequent actions were taken:

- Notices to Comply issued to collect additional information
- Mandatory annual reporting included in proposed amended rule
- Staff technology review based on commercially available regulated products for basis of proposed limits for many categories

The 2012 Air Quality Management Plan (AQMP), specifically Control Measure CTS-02 - Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants, includes Rule 1168 as a VOC rule that may be affected by the control measure. Proposed Amended Rule (PAR) 1168 will partially implement CTS-02 and MCS-01 Application of All Feasible Measures Assessment [All Pollutants].

The purpose of PAR 1168 is to further reduce VOC and toxic air contaminant emissions from adhesives and sealants by relying on improvements in technology during the last 15 years. Staff proposes the following requirements for PAR 1168:

- Clarify that the rule applies to consumer product adhesives, adhesive primers, caulks, sealants and sealant primers not regulated by the California Air Resources Board.

- Revise, delete, and add certain definitions. Consider adding limited exemptions for exterior roofing products containing tertiary-butyl acetate (TBAC) and dimethyl carbonate (DMC).
- Amend VOC limits for certain adhesives, adhesive primers, caulks, sealants and sealant primers.
- Establish new categories and VOC content limits.
- Add requirements for labeling regulated product containers.
- Add test methods for VOC content analysis.
- Include annual reporting requirements for sales of regulated products.
- Prohibit the use of Group II Exempt Solvents, except volatile methyl siloxanes, for regulated products.
- Remove or limit some existing exemptions.
- Expand the applicability of the rule to include aerosol adhesives.
- Include streamlined recordkeeping options for regulated products with VOC content of 50 g/L or less.

The estimated rule inventory is 8.2 tpd combining the current rule inventory of 3.5 tpd with estimated emissions from previously unaccounted and unregulated foam sealants of 4.2 tpd. The projected emission reductions from the proposed amendments are 0.7 tons per day of VOC emissions in 2016, another 3.7 tons per day in 2017, and for an overall reduction of 4.4 tons per day by 2019.

BACKGROUND

Rule 1168 was adopted in April 1989 to control VOC emissions from adhesives applications. The rule has been amended 13 times since, the last in January 2005. In 1997 several categories were included including sealants and sealant primers. In terms of VOC reductions, the last six amendments, dating back to 1998, have been associated with attempts to minimize VOC emissions from ABS, PVC and CPVC and Top and Trim adhesives. The amendments either extended effective dates or rescinded the proposed limits. During that period, several key amendments were made to prohibit sales of non-compliant products and to restrict the usage of some toxic chemicals including methylene chloride, perchloroethylene and trichloroethylene.

The rule limits VOC content in 41 categories of adhesives, adhesive primers, caulks, sealants and sealant primers. The rule applies to products used during manufacturing at stationary sources and to products used by consumers that are not regulated by the California Air Resources Board in the Consumer Products Regulation. Additionally, Health and Safety Code § 41712 (h) prohibited air districts to adopt any regulations for aerosol adhesives, irrespective of use, until January 1, 2000. For the past two decades Rule 1168 has completely exempted aerosol adhesives and products subject to the Consumer Products Regulation.

Adhesive use subject to the rule spans a wide range of industries that have miscellaneous uses during manufacturing. The industry sectors that make extensive use of products subject to this rule include:

- Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing (NAICS 333415)
- All Other Rubber Product Manufacturing (NAICS 326299)
- Commercial and Institutional Building Construction (NAICS 236220)
- Custom Architectural Woodwork and Millwork Manufacturing (NAICS 337212)
- Drywall and Insulation Contractors (NAICS 238310)
- Flooring Contractors (NAICS 238330)
- Footwear Manufacturing (NAICS 316210)
- Glass and Glazing Contractors (NAICS 238150)
- Hardwood Veneer and Plywood Manufacturing (NAICS 321211)
- Household Furniture (except Wood and Metal) Manufacturing (NAICS 337125)
- Industrial Building Construction (NAICS 236210)
- Manufactured Home (Mobile Home) Manufacturing (NAICS 321991)
- Motor Vehicle Seating and Interior Trim Manufacturing (NAICS 336360)
- New Multifamily Housing Construction (except For-Sale Builders) (NAICS 236116)
- New Single-Family Housing Construction (except For-Sale Builders) (NAICS 236115)
- Office Furniture (except Wood) Manufacturing (NAICS 337214)
- Oil and Gas Pipeline and Related Structures Construction (NAICS 237120)
- Other Millwork (including Flooring) (NAICS 321918)
- Plumbing, Heating, and Air-Conditioning Contractors (NAICS 238220)
- Polystyrene Foam Product Manufacturing (NAICS 326140)
- Residential Remodelers (NAICS 236118)
- Roofing Contractors (NAICS 238160)
- Rubber Product Manufacturing for Mechanical Use (NAICS 326291)
- Showcase, Partition, Shelving, and Locker Manufacturing (NAICS 337215)
- Siding Contractors (NAICS 238170)
- Surgical Appliance and Supplies Manufacturing (NAICS 339113)
- Tile and Terrazzo Contractors (NAICS 238340)
- Tire Retreading (NAICS 326212)
- Urethane and Other Foam Product (except Polystyrene) Manufacturing (NAICS 326150)
- Water and Sewer Line and Related Structures Construction (NAICS 237110)
- Wood Container and Pallet Manufacturing (NAICS 321920)
- Wood Kitchen Cabinet and Countertop Manufacturing (NAICS 337110)
- Wood Window and Door Manufacturing (NAICS 321911)

The industries that supply regulated products to facilities are covered by Asphalt Shingle and Coating Materials Manufacturing (NAICS 324122 and 325520) and Adhesive Manufacturing (NAICS 325520).

According to the 2012 Air Quality Management Plan, the total emissions inventory for PAR 1168 is estimated to be 3.5 tons per day (tpd). The inventory does not include consumer products subject to the California Air Resources Board's Consumer Products Regulation (CPR) nor previously unaccounted and unregulated foam sealants, which are estimated to contribute another 4.7 tpd for a combined total inventory of 8.2 tpd. The inventory does include emissions from small sources with permits, facilities that report as part of the Annual Emissions Reporting

(AER) Program, and an estimate of emissions from small sources that do not have permits. Inclusion in the AER Program is limited to larger facilities that emit at least four tons per year of a criteria pollutant. In 2012, the AER facilities emitted 0.1 tons per day of VOC. However, emissions from AER facilities represent three percent of the overall inventory of Rule 1168. The majority of emissions come from the large number of smaller facilities not subject to the AER program. The adhesive and sealants usage is primarily for architectural applications which are not normally subject to SCAQMD permitting requirements. Additionally, smaller sources may be more apt to take advantage of the 55 gallon per year exemption from VOC content limits provided for in the rule. As part of this rule development the SCAQMD conducted a voluntary survey of product sales. The results from the survey were somewhat inconclusive because of limited participation. However, there were some categories where the sales data showed some clear trends towards lower VOC adhesive and sealant technologies, particularly in products used for architectural and construction applications. Staff will continue to refine the emissions inventory estimates included in this preliminary draft staff report based on additional data collected prior to the public hearing.

AVAILABLE TECHNOLOGY ASSESSMENT

Adhesive, as defined in the rule, is a substance that is used to bond one surface to another by attachment. Very simply, it is a substance that is sticky in nature and can span a broad range of chemistries from products produced from plants and animals, to contact, pressure sensitive and reactive adhesives. Attachment may occur mechanically, by infusing into the substrate or chemically, through chemical or electrostatic bonding. Using this definition, paints and coatings could be characterized as having adhesive properties; however, an adhesive must bond one surface to another surface, excluding the application of subsequent coatings. Sealants are very similar to adhesives except that they must also fill, seal or waterproof gaps or joints between two surfaces. As defined in this proposed rule, sealants are limited to products that are not continuous coatings. Products that are continuous coatings and are used to seal or waterproof gaps are sealers or mastic products and subject to Rule 1113 – Architectural Coatings. Similarly, staff has reviewed liquid membrane products used as air barriers and considers these products to be subject to Rule 1113 because they are continuous films used as a barrier in architectural applications. These definitions may be further refined over the rule amendment process to better defined products used under the various air barrier programs.

Over the past 13 years since the last major reduction in VOC limits from adhesive and sealant applications, the technology of low-VOC products has improved significantly. In particular, adhesives and sealants used for architectural and construction applications. Staff conducted a survey, designed in cooperation with interested stakeholders including trade associations, to capture this trend. Response was limited and many categories did not have sufficient information. There were some categories that had sufficient data to draw conclusions. For example, more than 99 percent of reported Multipurpose Construction Adhesives have a regulatory VOC content (less water and exempt solvents) less than 50 grams per liter (g/L). The sales weighted average (SWA) regulatory VOC content of for these products is 34 g/L while the sales weighted average material VOC content is 25 g/L. Tables 1 though 6 below list the information gathered as a result of the voluntary survey, and summarizes the SWA regulatory VOC content reported for various survey categories. The tables do not include products subject to the CPR.

Table 1 – SWA Regulatory VOC Content for Reported Selected Architectural Adhesives

Category	Current VOC Content Limit (g/L)	Regulatory SWA VOC Content (g/L)
Carpet Pad Adhesive	50	Insufficient Response
Ceramic Tile Adhesive	65	Insufficient Response
Cove Base Adhesive	50	21
Dry Wall and Panel Adhesive	50	Insufficient Response
Indoor Flooring Adhesive	50	25
Multipurpose Construction Adhesive	70	34
Other Roof Adhesive	250	81
Outdoor Floor Covering Adhesive	150	Insufficient Response
Rubber Floor Adhesive	60	Insufficient Response
Single Ply Roof Membrane Adhesive	250	197
Structural Glazing Adhesive	100	Insufficient Response
Structural Wood Member Adhesive	140	Insufficient Response
Subfloor Adhesive	50	53
VCT and Asphalt Tile Adhesive	50	Insufficient Response
Wood Flooring Adhesive	100	2

Table 2 – SWA Regulatory VOC Content for Reported Selected Other Adhesives

Category	Current VOC Content Limit (g/L)	Regulatory SWA VOC Content (g/L)
ABS Welding	325	Insufficient Response
Computer Diskette Manufacturing	350	Insufficient Response
Contact Adhesive	80	81
CPVC Welding	490	Insufficient Response
Plastic Cement Welding	250	Insufficient Response
PVC Welding	510	Insufficient Response
Rubber Vulcanization Adhesive	850	Insufficient Response
Special Purpose Contact Adhesive	250	300
Thin Metal Laminating	780	Insufficient Response
Tire Retread	100	Insufficient Response
Top and Trim Adhesive	250	Insufficient Response
Waterproof Resorcinol Glue	170	Insufficient Response
All Other Adhesives	250	Insufficient Response

Table 3 – SWA Regulatory VOC Content for Reported Substrate Specific Adhesives

Category	Current VOC Content Limit (g/L)	Regulatory SWA VOC Content (g/L)
Metal	30	Insufficient Response
Plastic Foams	50	Insufficient Response
Porous Material (except wood)	50	Insufficient Response
Wood	30	Insufficient Response
Fiberglass	80	Insufficient Response
Reinforced Plastic Composite	250	Insufficient Response
Other Substrates	250	4

Table 4 – SWA Regulatory VOC Content for Reported Sealants and Caulks

Category	Current VOC Content Limit (g/L)	Regulatory SWA VOC Content (g/L)
Architectural	30	Insufficient Response
Foam Sealant	None	Insufficient Response
Marine Deck	760	Insufficient Response
All Other Roof	300	Insufficient Response
Single-Ply Roof Membrane	450	94
All Other Architectural	250	32
Roadway	250	Insufficient Response
All Other Sealants	420	172

Table 5 – SWA Regulatory VOC Content for Reported Adhesive Primers

Category	Current VOC Content Limit (g/L)	Regulatory SWA VOC Content (g/L)
Adhesive Primer for Plastic	550	Insufficient Response
Adhesive Primer for Traffic Marking Tape	150	Insufficient Response
Automotive Glass	700	Insufficient Response
All Other Adhesive Primers	250	Insufficient Response

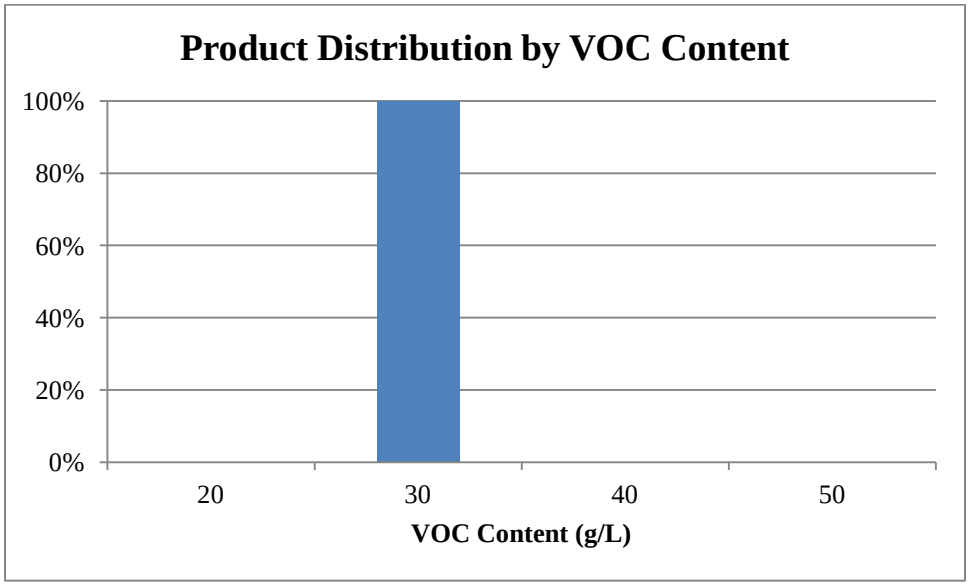
Table 6 – SWA Regulatory VOC Content for Reported Sealant Primers

Category	Current VOC Content Limit (g/L)	Regulatory SWA VOC Content (g/L)
Architectural		
Marine Deck	760	Insufficient Response
Non Porous	250	Insufficient Response
Porous	775	Insufficient Response
All Other Sealant Primers	750	Insufficient Response

Categories listed as "Insufficient Response" means that limited volumes (<5,000 gallons sold), or limited responses (fewer than five products reported) were received from the surveys. Inclusion of this information may provide sufficient data for calculating market share of some manufacturers.

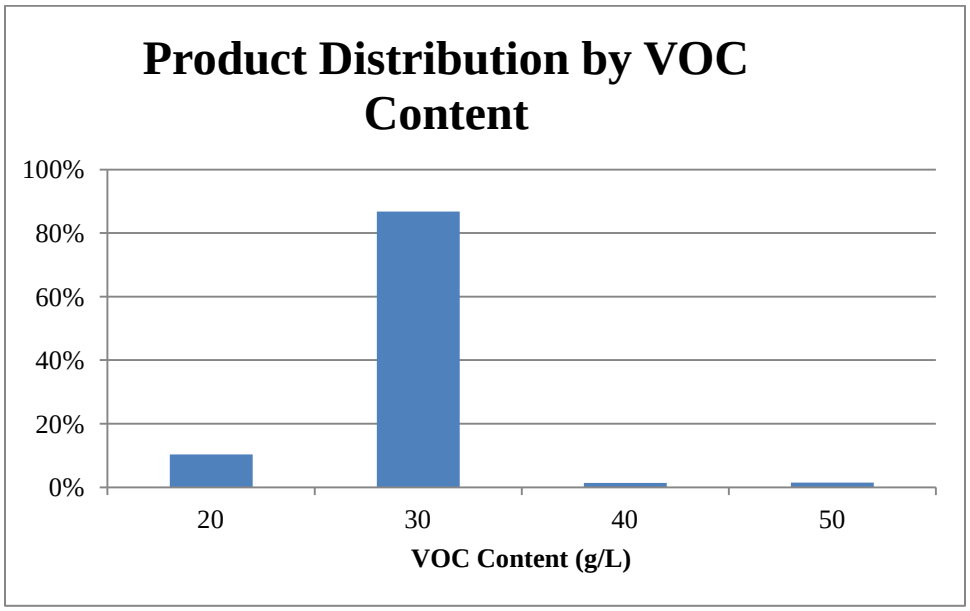
For those categories not listed as insufficient response, the VOC Product Distribution was determined. The VOC content in the Figures 1 though 13 below represent the VOC content at or below the listed value. Products reported as subject to the CPR are not included. For product confidentiality purposes, specific volumes are not provided.

Figure 1 – Adhesive - Cove Base Adhesives



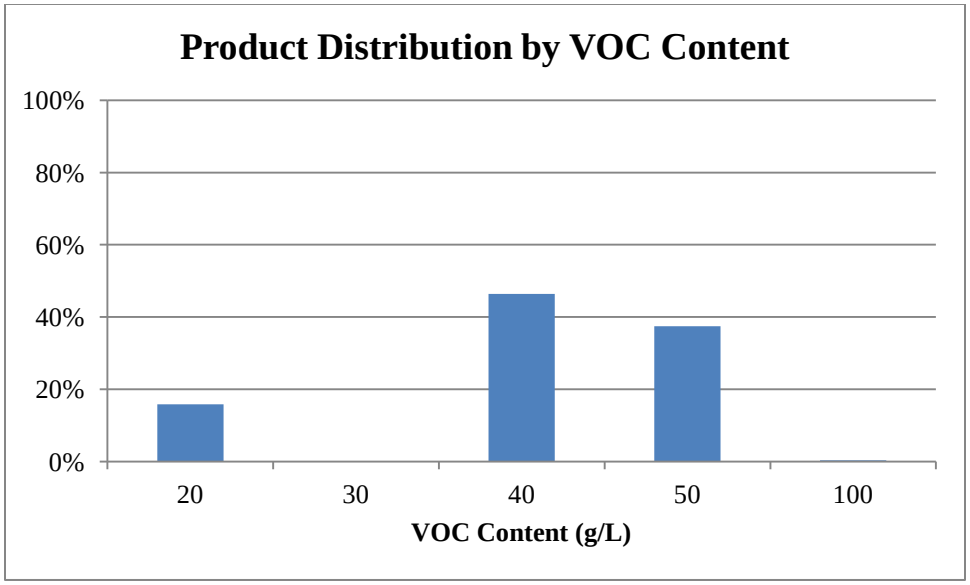
The Cove Base adhesives reported were water-based technologies with VOC content ranging between 20 and 30 g/L.

Figure 2 – Adhesive - Indoor Flooring Adhesives



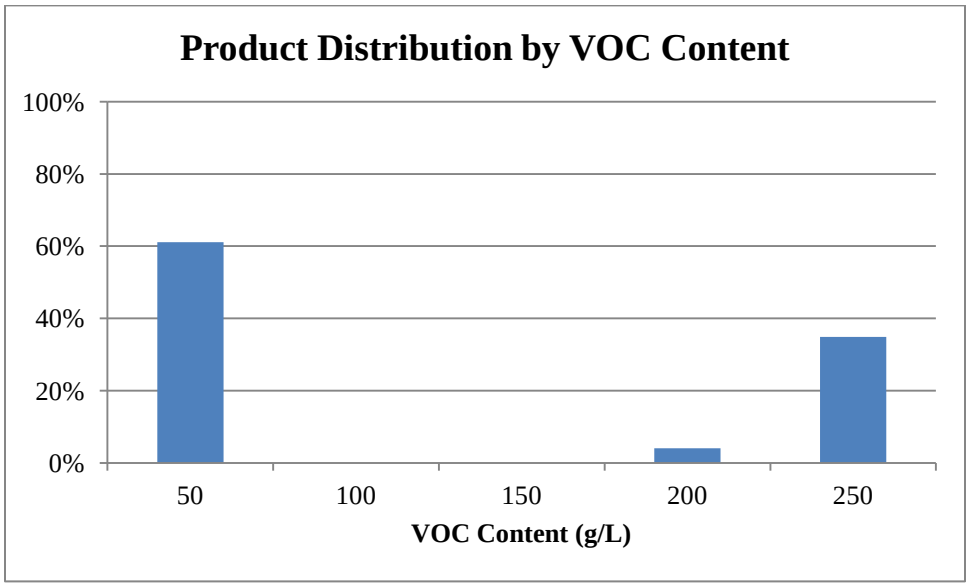
The Indoor Flooring adhesives were labeled as carpet or multi-purpose floor covering products. They are water-based technologies, with most having VOC content below 30 g/L.

Figure 3 - Adhesive - Multipurpose Construction Adhesives



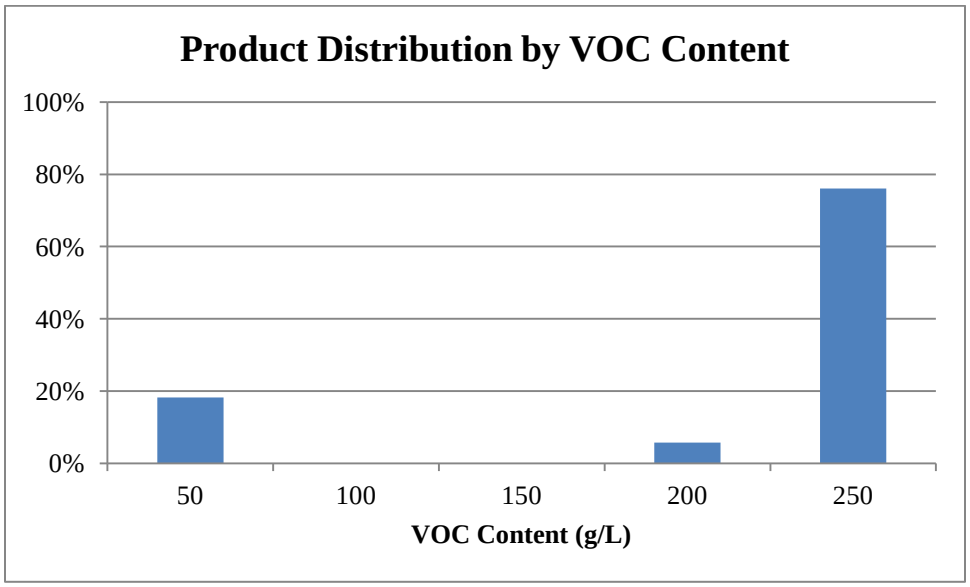
Multipurpose Construction adhesives were primarily latex and polyurethane based. Nearly all products reported sold were below 50 g/L. The majority of products sold were below 40 g/L.

Figure 4 – Adhesive - Other Roof Adhesives



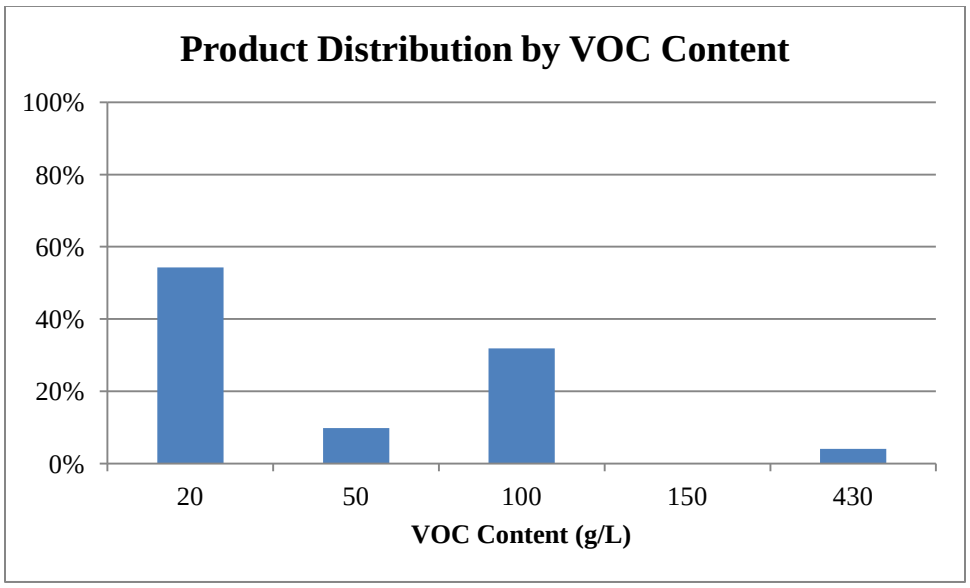
Other Roof Adhesives represents all adhesives used for roof construction and repair except for single ply roofs. The wide variety of roofs is reflected in the wide range of adhesive technologies utilized in this category, including 100% solids, asphaltic, water-based and solvent-based among others.

Figure 5 – Adhesive - Single Ply Roof Adhesives



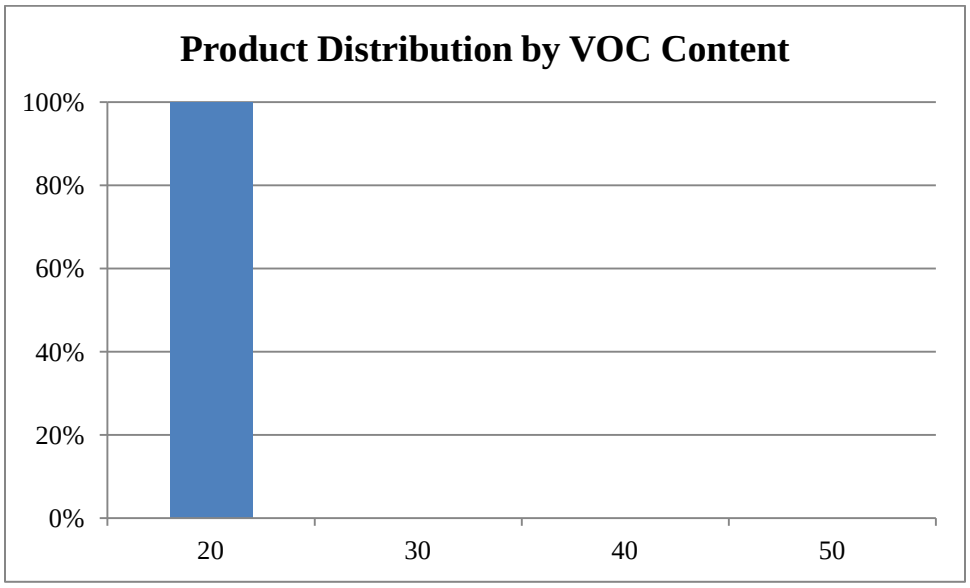
While there is some use of low-VOC content Single Ply Roof Adhesives, the majority of sales are traditional solvent-based adhesives with VOC contents above 200 g/L.

Figure 6 – Adhesive - Subfloor Adhesives



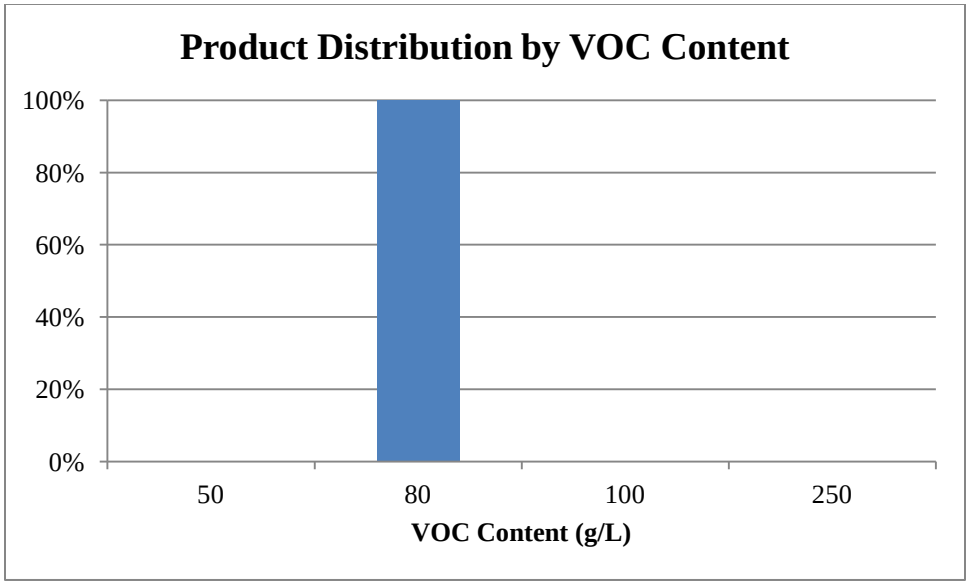
Reported Subfloor Adhesives were exempt solvent or water-based products, typically with a VOC content of 20 g/L or less. However, there were significant reported sales of products that do not meet the current VOC content limit in the rule, and staff will further investigate this issue.

Figure 7 – Adhesive - Wood Floor Adhesives



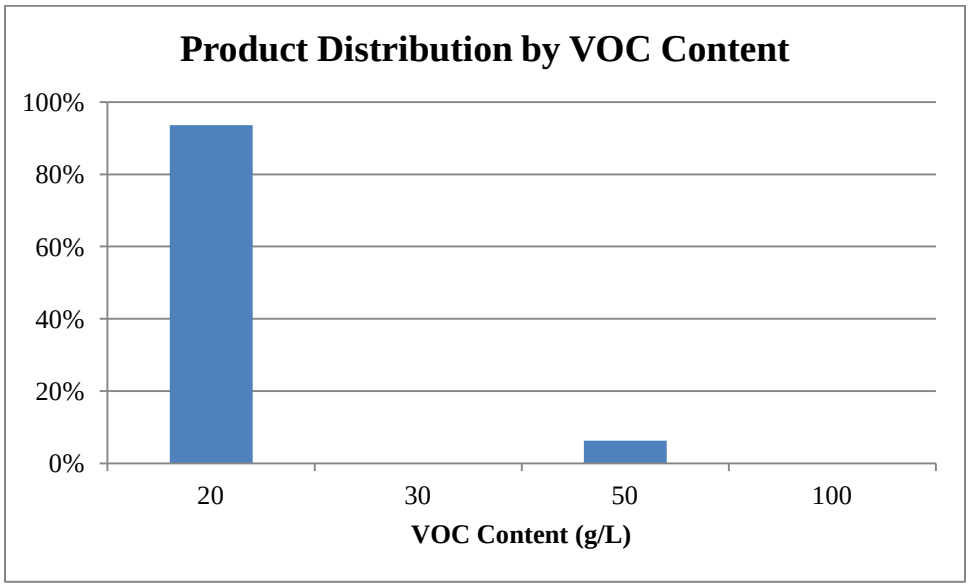
All of the reported Wood Floor Adhesives have VOC contents below 20 g/L. The products include water-based and 100% solids technologies.

Figure 8 – Adhesive - Contact Adhesives



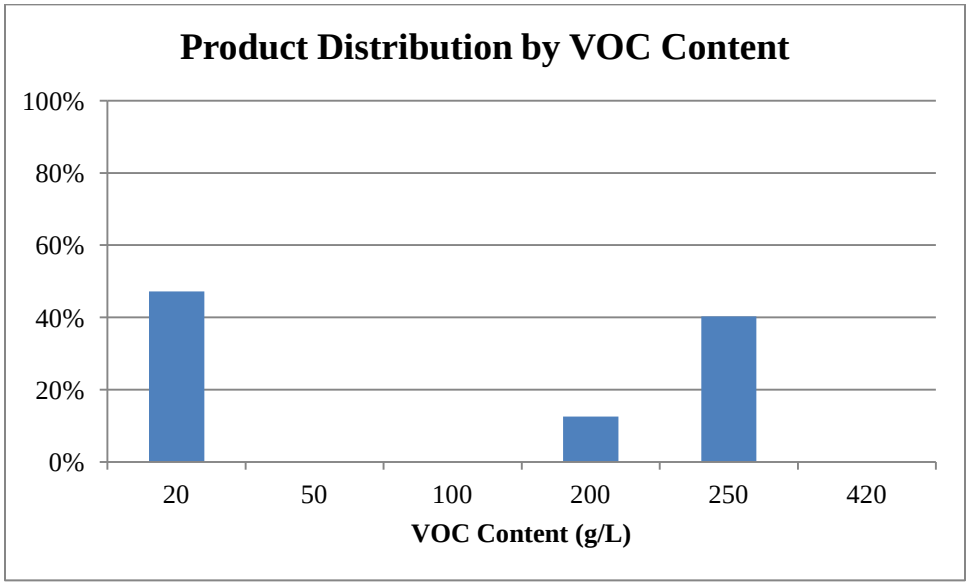
Nearly all of the volume reported for Contact Adhesives had 80 g/L VOC content. There were small amounts reported for near-zero VOC contact adhesives and the same for higher VOC content products.

Figure 9 – Adhesive - Other Substrate Adhesives



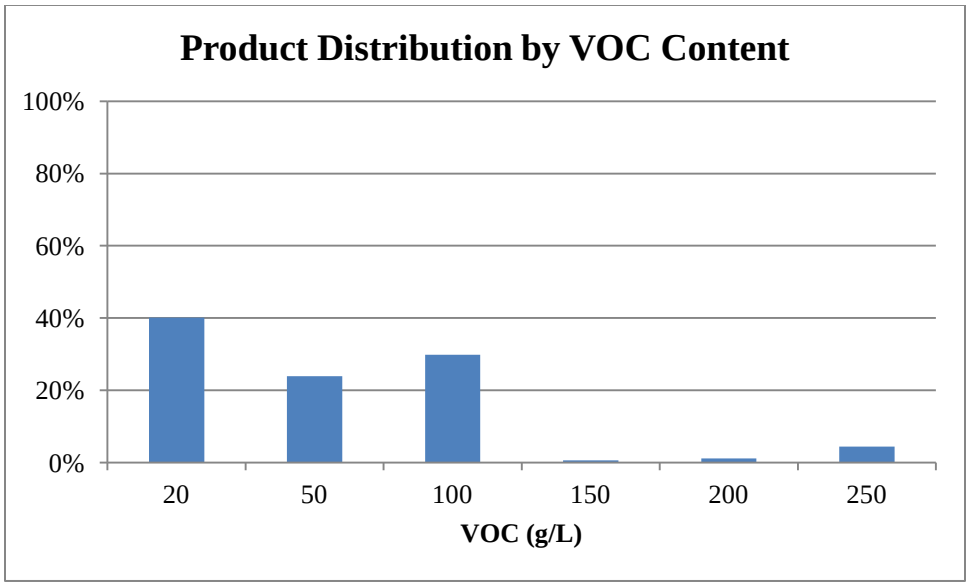
The Other Substrate Adhesives category regulates adhesives made for a substrate, without a specific end-use labeled, but excluding metal, plastic foams, wood, fiberglass, composite and porous substrates. These products may include acrylate, anaerobic, epoxy, urethane and 100% solids technologies. Despite the current 250 g/L limit in the rule for Other Substrate Adhesives, the reported products were primarily low-VOC content with 20 g/L or less.

Figure 10 – Sealant - Single Ply Roof Membrane Sealants



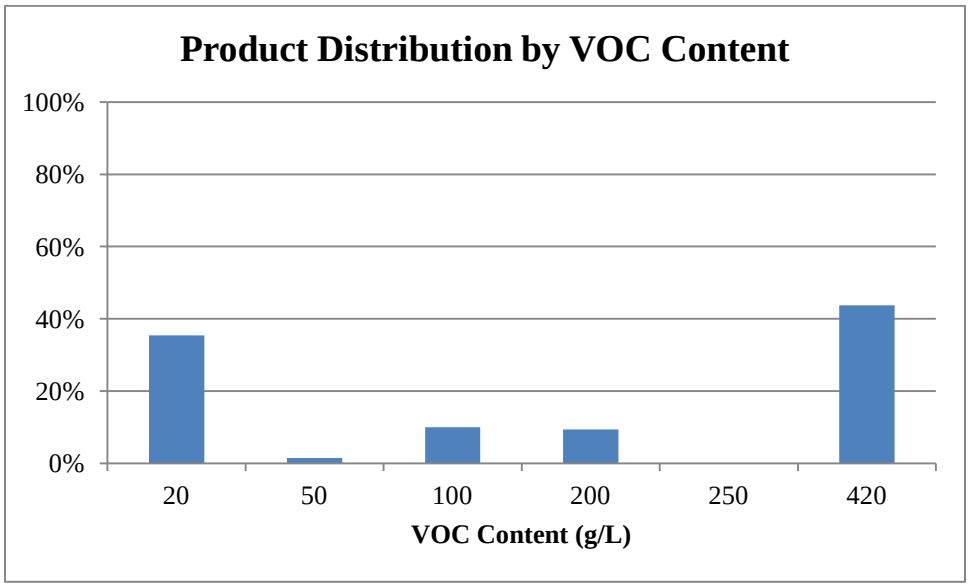
Reported Single Ply Roof Membrane Sealants can be amongst products with very low VOC content and 100 percent solids and more traditional solvent-based products with VOC contents between 170 and 250 g/L. No products were reported between 250 g/L and the current rule limit of 420 g/L.

Figure 11 – Sealant - All Other Architectural Sealants



All Other Architectural Sealants are comprised of sealants used for construction and repair of buildings and their appurtenances excluding Foam, Marine Deck and roof sealants. They include acoustic and waterproofing caulks and sealants. The products are generally latex or silicone based. Many have very low VOC content and most have a VOC content below 100 g/L, well below the current 420 g/L limit in the rule.

Figure 12 – Sealant - All Other Sealants



The All Other Sealants category is a catch-all for sealant products that are not used for architectural or roadway applications. They may include automotive and marine uses, sidewalk repair or other miscellaneous applications. Products are mainly solvent-based or 100% solids.

During the survey process manufacturers and suppliers of regulated products correctly pointed out that sales of DMC and TBAC containing products would be limited because the two solvents are not exempt from VOC regulations as they are in much of the United States. In other parts of the country many products contain TBAC as a way to reduce VOC content, lower price and presumably improve product characteristics.

Due to the insufficient response for several categories, staff conducted a technology review of commercially available regulated products and is adding a mandatory reporting requirement in PAR1168. Staff has also issued Notices to Comply to collect more detailed information which will be used to refine the emissions inventory and subsequent potential emission reductions. In the meantime, staff conducted a technology review of commercially-available regulated products, which is the basis for the proposed limits for numerous categories discussed in the subsequent section of this preliminary draft staff report.

PROPOSED AMENDED RULE

Staff proposes the following for PAR 1168:

Purpose and Applicability (a)

The purpose and applicability clarifies that the purpose of the rule is to reduce VOC and toxic air contaminants from adhesives, adhesive primers, caulks, sealants and sealant primers. Furthermore, the rule applies to persons who sell or use these products, including products used

by consumers that are unregulated by the California Air Resources Board's Consumer Products Regulation and consumer products used for manufacturing purposes.

Definitions (b)

Changes are proposed to the definitions to clarify the meaning of terms used within the regulation and to remove definitions that are obsolete. Additionally, many definitions are revised to provide more consistency between this regulation and the Ozone Transport Commission's Model Rule for Adhesives and Sealants. The model rule is utilized as the framework for a number of states' adhesive regulations.

Some definitions refer to categories that have been incorporated into the catch-all "Other" category which led to confusion. An effort has been made to make it clear that regulated products without a specific category limit are subject to the appropriate "Other" limit. Definitions that restated a dictionary definition and provided no additional insight have also been deleted. The proposed rule will remove the following definitions as obsolete:

- Acrylic
- Adhesive Bonding Primer
- Adhesive Primer for Plastic
- Adhesive Promoter
- Adhesive Solid
- Aerosol Spray Can
- Aerospace Component
- Aircraft
- Aircraft Tire Repair
- Architectural Sealant or Sealant Primer
- Ceramic Tiles
- Coating Solid
- Foam
- Glue
- Low-Solids Adhesive Primer
- Modified Bituminous Primer
- Modified Bituminous Materials
- Nonmembrane Roof Adhesive
- Nonmembrane Roof Sealant
- Orthotics and Prosthetics
- Polycarbonate
- Polyethylene Terephalate Glycol (PETG)
- Polyurethane Foams
- Primer
- Propellant
- Rubber Foam
- Space Vehicle
- Viscosity
- Wood Parquet Flooring

- Wood Plank Flooring

Definitions that are revised or added to be more consistent with the OTC Model Rule include the following:

- Adhesive
- Adhesive Primer
- Adhesive Tape or Paper
- Automotive Glass Adhesive Primer
- Contact Adhesive
- Cove Base
- Cyanoacrylate Adhesive
- Indoor Flooring Adhesive
- Outdoor Floor Covering Adhesive
- Plastics
- Rubber

Many definitions are revised to improve readability. However, the following modifications to definitions address changes in rule concepts:

- Adhesive Primer (b)(3) and Sealant Primer (b)(53) – Primers must be film-forming to clarify that solvents used to clean and prepare the surface prior to application of an adhesive or sealant is subject to Rule 1171 – Solvent Cleaning Operations. Additionally, language was added to clarify that other terminology used in lieu of "primer" including but not limited to "promoter" or "bonding primer" are to be classified as "primer" in this rule.
- Architectural Appurtenance (b)(7) – The definition was made consistent with the terminology used in Rule 1113 – Architectural Coatings.
- Exempt Compounds (b)(20) – The definition now includes a reference to Volatile Organic Compound (VOC) (b)(70) to allow a limited exemption of tertiary butyl acetate and dimethyl carbonate.
- Foam Sealant (b)(24) – Foam Sealants, including Insulating Foam (b)(30) were previously unregulated and a definition is added.
- Regulated Product (b)(47) – A definition is added to clarify that the rule applies to adhesive, adhesive primers, caulks, sealants and sealant primers whenever this term is utilized.
- Rubber Vulcanization (b)(51) – This definition will replace Sheet-Applied Rubber Lining Operation (b)(70) to clarify which operations are subject to the VOC content limits in this category. The previous definition allowed some rubber bonding operations unnecessarily high VOC content limits while not addressing technology limitation for vulcanization operations.
- Volatile Organic Compound (VOC) (b)(69) – This definition has been modified to allow TBAC and DMC to be exempt as a VOC for purposes of VOC emission limitations and VOC content limits for roofing regulated products. However, TBAC will remain a VOC for recordkeeping, emission reporting, modeling and inventory requirements.

- Waterproof Resorcinol Glue (b)(70) – Added for consistency with the California Air Resources Board's Control Techniques Guideline (CTG) for adhesives and sealants.

Finally, while the term "caulk" is already part of the "Sealant" definition, the term has been added to the applicability and VOC content limit tables to improve clarity and readability.

Requirements (c)

VOC Limits (c)(1)

Two approaches are taken to determine new proposed VOC limits for regulated products. The first approach, which is more heavily relied upon because of insufficient survey response, is to investigate available products on market shelves and distributor, supplier and manufacturer websites. The second, where available, is to review product sales information provided in the survey. The data is analyzed to examine market trends and market share of low-VOC products. The products sales information is provided above in the Available Technology Assessment portion of this document. The available product research is provided below by product category. This represents only a sampling of products and not every product is listed.

Category: Adhesives - ABS Welding

Product Name	**VOC Content (g/L)**
EZ Weld Low VOC Cement	325
Genova ABS Cement	< 325
JC Whitlam	< 325
Oatey ABS 60-70%	< 325
Oatey Medium	< 325
Schwartz Y6	325
Spears ABS-71	< 325
Spears ABS-73	< 325
Weld On 771	< 325
Weld On 773	< 325
Proposed:	**To Be Determined**

The lack of specific VOC information and survey data makes evaluation of the category difficult. Further investigation, including laboratory analysis and detailed VOC information is necessary to make an appropriate determination. Currently, the proposed rule does not change the limit for ABS Welding products.

Category: Adhesive - Architectural Applications – Carpet Pad Adhesives

Product Name	VOC Content (g/L)
DAP 7079800185	0
DAP 7079800186	34
Henry's 351	4
Henry's 377	4
Henry's 451	3
Henry's Indoor Carpet Repair	0
Parabond 2850	0
Roberts 3095	0
Roberts 6700	0
Shaw 6300	0
Proposed:	**20**

Nearly all of the reviewed products have a VOC content near zero. The proposed limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – Ceramic Tile Adhesives

Product Name	VOC Content (g/L)
Custom Building Products T1-60	59
DAP MP Ceramic Adhesive	63
DuraPro AF0044	1
Franklin Titebond Wall and Floor Ceramic Tile Adhesive	0
HB Fuller TA0101	0
Henry Ceramic Tile Repair Adhesive	65
Polygem 307	0
Promo Pro Mastic 2000	54
Welcote Ceramic Tile Adhesive	2
Proposed:	**20**

The higher VOC content Ceramic Tile Adhesives contain non-negligible amounts of ethylene glycol and mineral spirits or Stoddard solvent. The near-zero VOC product are epoxy, high solids or water-based. The proposed limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – Cove Base Adhesives

Product Name	VOC Content (g/L)
AAT 432	0
DAP Btn Cove	27
Franklin International Green Choice	28
HB Fuller TEC 714	5
Henry 440	0
Johnsonite 960	1
PPG CB-10	38
PPG Liquid Nails Cove Base Adhesive	10
Red Devil Cove	10
STP Cove Base	65
WF Taylor Envirotec 2040	21
Proposed:	**20**

The majority of Cove Base Adhesives are low-VOC water-based or high-solids products. All reported sales of Cove Base Adhesives had VOC contents of 30 g/L or less. The proposed limit is 20 g/L.

Category: Adhesive - Architectural Applications – Dry Wall and Panel Adhesives

Product Name	VOC Content (g/L)
Chem Link Wallsecure	< 20
Franklin International Drywall	5
Franklin International Greenchoice Drywall	3
Franklin Provantage	< 50
Franklin Titebond Pro Drywall	389
Grip Rite Dry Wall	3
Henkel Drywall	3
Liquid Nails DWP-24	32
OSI F38	8
Red Devil Drywall	7
Proposed:	**20**

Most of the Dry Wall and Panel Adhesives reviewed contain small quantities of ethylene glycol (usually less than two percent). Despite the presence of this VOC, the overall VOC content for the majority of reviewed products remains well below the proposed limit of 20 g/L.

Category: Adhesive - Architectural Applications – Indoor Flooring Adhesives

Product Name	VOC Content (g/L)
Henry's 351	4
Henry's 377	0
Henry's 451	3
Henry's 663	76
Parabond M2850	1
Roberts 3095	0
Roberts 6700	0
Shaw 6300	0
Weldwood Carpet Adhesive	0
WF Taylor Envirotec 2055	21
WF Taylor Envirotec 900	25
Proposed:	**20**

Indoor Flooring Adhesives are primarily water-based or high solids formulations. Nearly all of the reported sales of Indoor Flooring Adhesives were of products that had VOC contents below 25 g/L. The proposed limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – Multipurpose Construction Adhesives

Product Name	VOC Content (g/L)
DAP BEATS the Nail VOC-SC	8
DAP FRP 4	31
Franklin International Greenchoice Heavy Duty Construction Adhesive	7
Henkel Loctite PL	45
Henkel Loctite PL 200	2
Henkel OSI SF450	5
PPG FRP-310	34
PPG LN-902	17
PPG LN-903	31
Red Devil Construction Adhesive 0776	7
Proposed:	**20**

Similar to the reported sales of Multipurpose Construction Adhesives are all below 50 g/L VOC content. Of the products reviewed, nearly half are below the proposed limit of 20 g/L. The proposed limit is 20 g/L.

Category: Adhesive - Architectural Applications – Other Roof Adhesives

Product Name	VOC Content (g/L)
Tremco Burmastic LV	200
Tremco Ecolastic	29
Tremco ELS	169
Tremco Polyroof SF	21
Tremco Powerply Standard Cold	202
Tremco Premium IV	0
Ashland Pliobond 1746	213
Ashland Pliobond 7008	12
PPG FRP-310	34
PPG LN-902	17
PPG LN-903	31
Red Devil Construction Adhesive 0776	7
Proposed:	**100**

Other Roof Adhesives consist of roofing products excluding Single Ply Roof Membrane Adhesives. The reviewed products split into solvent-based adhesive and high-solids or water-based products. The proposed VOC limit of 100 g/L assumes that some portion of the VOC in solvent-based products would transition to TBAC or DMC, in addition to the use of some currently utilized exempt solvents.

Category: Adhesive - Architectural Applications – Outdoor Floor Covering Adhesives

Product Name	VOC Content (g/L)
APAC 631	104
DAP All Weather Outdoor Carpet	335
DuraPro AF00038	2
HB Fuller TEC SS	0
Henry 663	73
Parabond 2850	0
Powerhold 700	328
Roberts 6700	0
Shaw 6300	0
XL Brand Stix 1100	0
Proposed:	**20**

Most of the reviewed Outdoor Floor Covering Adhesives are very low in VOC content. Two of the products reviewed have VOC contents that exceed the current limit in Rule 1168. The proposed VOC content limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – Rubber Floor Adhesives

Product Name	VOC Content (g/L)
APAC 989	37
Bostik Green Fusion	0
Burke BR 711	0
Chemrex 941	45
EcoSpray 1300	0
Egrip III	0
Johnsonite 140	0
RHC 3100	0
ROP 500	0
Statbond	10
Proposed:	**20**

The majority of products reviewed in this category have a VOC content of 10 g/L or less. Products in this category are water-based, reactive or high solids. The proposed limit is 20 g/L.

Category: Adhesive - Architectural Applications – Single Ply Roof Membrane Adhesives

Product Name	VOC Content (g/L)
Alfa 611	< 250
Ashland Pliobond 1746	213
Ashland Pliobond 7008	12
Carlisle Low VOC Bonding Adhesive	250
Carlisle SynTec Aquabase 120	4
Chemlink EPDM	34
Fiberlite 190	190
Firestone 816	< 250
GAF Everguard	242
Tremco TPA LV	199
Tremco Tremply HP4510	17
WeatherBond	0
Proposed:	**100**

Most of the products in the Single Ply Roof Membrane Adhesive category have a VOC content of 190 g/L or above. These products are solvent-based and may already contain exempt solvents including PCBTF. There are some water-based products available on the market. From the survey data it appears that the water-based products represent approximately 10 to 20 percent of the market share. The proposed limit of 100 g/L assumes that some portion of the VOC in solvent-based products would transition to TBAC or DMC containing products, in addition to the use of some currently utilized exempt solvents.

Category: Adhesive - Architectural Applications – Structural Glazing Adhesives

Product Name	VOC Content (g/L)
Dow 983	18
Dow 995	30
Garland Greenlock	0
GE 7700	17
GE SCS 2000	20
GE SSG 4000	37
GE SSG 4600	21
Sika SG 500	2
Proposed:	**40**

The Structural Glazing Adhesives reviewed all have VOC contents of 40 g/L or below. The proposed limit for this category is 40 g/L.

Category: Adhesive - Architectural Applications – Structural Wood Member Adhesives

Product Name	VOC Content (g/L)
Ashland Isoset WD3	20
BASF Chemrex CX-941	45
Chem Link M-1 Structural Adhesive	19
Eco-Bond MRN 175	0
Franklin International Greenchoice Polyurethane Construction Adhesive	20
Franklin International Titebond PROvantage Heavy Duty Construction Adhesive	44
Greenlock Structural Adhesive Xl-2139	0
Liquid Nails Wood Projects Construction Adhesive 740	17
Proposed:	**20**

The Structural Wood Member Adhesives reviewed all have VOC contents of 50 g/L or below and most are 20 g/L or below. The proposed limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – Subfloor Adhesives

Product Name	VOC Content (g/L)
DAP 4000 Subfloor Adhesive	427
DAP 7000 Low VOC Subfloor Adhesive	193
GripRite GRSUBA28VF	27
Henkel Loctite PL400 VOC Heavy Duty Subfloor & Deck	5
Henkel Nail Power VOC Subfloor Adhesive	47
OSI SF-450	5
PPG LN-902	17
Red Devil Subfloor and Deck Adhesive	7
Titebond Greenchoice Subfloor	27
Vermeister ZeroMono	0
Proposed:	**20**

The low-VOC products include both solvent-based and water-based technologies. According to product sales data, the majority of compliant product sold is below 20 g/L. The proposed limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – VCT and Asphalt Tile Adhesives

Product Name	VOC Content (g/L)
AAT 370	0
Henry's 430	1
OSI 600	360
Roberts 2038	2
Roberts 2075	0
Tec 713	0
WF Taylor Envirotec 2033	23
Proposed:	**20**

Nearly all of the products reviewed have VOC contents below 20 g/L and all but one had VOC contents below 30 g/L. The lone product reviewed above 30 g/L does not meet the current VOC limit of 50 g/L. The proposed limit for this category is 20 g/L.

Category: Adhesive - Architectural Applications – Wood Flooring Adhesives

Product Name	VOC Content (g/L)
APAC 979	15
APAC 999	20
BASF Chemrex 1000	0
Bostik EFA	100
DriTac AllinOne	0
Franklin Titebond 230	44
Shaw 4051	0
TEC Woodlock	0
Vermeister Monosil	0
WF Taylor Meta-Tec MS-Plus	0
Proposed:	**20**

Nearly all of the products reviewed had a VOC content of 20 g/L or below. All of the reported sales were of products that had a VOC content of 20 g/L or below. The proposed limit for this category is 20 g/L.

Category: Adhesive - Contact Adhesive

Product Name	VOC Content (g/L)
3M Fastbond 2000NF	77
3M Fastbond 30H	76
3M Scotchweld 60CA	73
DAP Weldwood Nonflammable Contact Adhesive	90
DAP Weldwood Original Contact Cement	647
Henry 473	430
ITW TACC STA PUT Z100	0
Johnsonite 945	0
Loctite Latex Contact Cement	5
Wilson Art 730-731	< 40
Proposed:	**No Change**

Nearly all of the product sales reported for contact adhesives were for products with roughly 80 g/L VOC content. Some of the reviewed products had high VOC content and represent previously unregulated consumer products that will now fall under the proposed rule requirements. Those consumer products are basically rubber dissolved in solvent and the industrial low-VOC content alternatives are water-based or exempt solvent based technologies. The proposed rule does not change the VOC content limit for this category.

Category: Adhesive - Top and Trim Adhesives

Several earlier amendments to Rule 1168 addressed the VOC content limit for Top and Trim adhesives used for automobile marine trim, including, but not limited to, headliners, vinyl tops, vinyl trim, sunroofs, dash covering, door covering, floor covering, panel covering and

upholstery. In the December 2004 Staff Report for Proposed Amended Rule 1168, the following assessment was made for Top and Trim Adhesives:

> "Although initial results were promising on the availability and use of top and trim adhesives meeting the 250 grams VOC per liter standard by January 1, 2005, more recent information reveals that additional time will be required to develop acceptable products meeting that limit. Therefore, staff is recommending that the compliance date for the 250 grams of VOC per liter standard be moved to January 1, 2007 and the current limit of 540 grams of VOC per liter remain in effect until then."

While the initial results were promising, the technical challenge of high heat resistance was never overcome and Top and Trim Adhesive users switched to higher VOC products (620 g/L), using the 55 gallon per year exemption. All reported sales for the Top and Trim category in 2012 was for the high VOC products. Rather than decrease emissions from this category by 0.2 tpd, the 250 g/L limit in conjunction with the volume usage exemption increased emissions by 0.04 tpd. To address this migration to exempted products, staff is proposing to reinstate the 540 g/L limit and exclude Top and Trim Adhesives from the 55 gallon per year exemption.

Category: Adhesive - Waterproof Resorcinol Glue

The definition and VOC limit are identical to the provisions included in the OTC Model Rule for Adhesives and Sealants. The proposed limit for this category is 180 g/L.

Category: Sealant - Architectural - Foam Sealant

Product Name	**VOC Content (g/L)**
Dow Great Stuff Big Gap Filler	< 40
Fomo Handifoam 40	0
Fomo Handifoam Eco Foam	< 250
Fomo Straw Foam Sealant	165
Hilti CF812	2
Honeywell Enovate	206
Icynene LD50	0
ITW TACC Miracle FoamSeal 2100A	<1
ITW TACC Miracle FoamSeal F6400 LVR	< 1
OSI Greenseries Pro Foam ii	< 250
Owens Corning ProPink One	206
Red Devil Foam & Fill Minimal Expanding	150
Red Devil Foam & Fill Triple Expanding	150
Tiger Foam	0
Tremco Low Rise Foam Insulation Adhesive	0
Proposed:	**200**

Foam Sealants are products used to fill and form durable, airtight seals to common building substrates. They are typically sprayed into building cavities to provide water resistance, thermal

resistance or acoustic dampening. Their use has been increasing as building owners and property managers seek to reduce building energy consumption. The foam itself is typically polyurethane or two-component isocyanate-based and contains little or no VOC. However, the propellants used in some of the aerosol products do contribute to the VOC content. As they are substantially different from typical semi-solid paste or gel caulks and sealants, some may have concluded that these products would not be considered to be Architectural Sealants. To alleviate the confusion, staff is proposing to specifically define the category and assign a VOC content of 200 g/L, effective January 1, 2015. The limit is proposed to be further reduced to 20 g/L, effective January 1, 2017. As the VOC in these products is predominantly from the propellants, it is expected that to comply with the proposed limits, manufacturers will use alternative non-VOC propellants or utilize application techniques that do not depend on propellants to disburse the product. Staff will also continue to assess the use of air barriers programs with similar technology.

Category: Sealant – Architectural – All Other Roof Sealants

Product Name	**VOC Content (g/L)**
DAP Premium Polyurethane Roof & Flashing Sealant	5
DeWitt's 617	14
Franklin International Titebond Roof Cement	300
Franklin International Titebond WeatherMaster Metal Roof Sealant	28
Henry 900	5
Loctite PL Polyurethane Roof & Flashing Sealant	44
Tremco Reglet Joint Sealant 30	53
Tremco TremSEAL Pitch Pocket Sealer	0
White Lightning Asphalt Roof Cement	202
Proposed:	**50**

This category includes all roof sealants except Single Ply Roof Membrane Sealants. Most of the products in the Single Ply Roof Membrane Adhesive category have a VOC content of 50 g/L or less. These products are asphalt or polyurethane-based. The proposed limit for this category is 50 g/L.

Category: Sealant – Architectural – Single Ply Roof Membrane Sealants

Product Name	VOC Content (g/L)
ADCO Millenium LPS	0
Carlisle Universal Single-Ply Sealant	0
Carlisle Water Cut Off Mastic	250
Carlisle White Pourable Sealer	0
Firestone UltraPly TPO Cut Edge Sealant	178
Firestone UltraPly TPO General Purpose Sealant	250
Firestone Water Block Seal 20	176
Mule-Hide Universal Single Ply Sealant	0
Seaman Fibertite 101	82
TremSeal S	1
Proposed:	**100**

As seen in the reported data, the Single Ply Roof Membrane Sealants are divided between very low VOC content water-based or 100 percent solids technology and solvent-based technologies, including exempt solvent-based products with VOC contents between 170 and 250 g/L. The proposed limit of 100 g/L is based on the transition of some portion of the VOC in solvent-based products to TBAC or DMC, in addition to the use of some currently utilized exempt solvents.

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Category: Sealant – Architectural – All Other Architectural Sealants

Product Name	VOC Content (g/L)
BOSS 370 HVAC/R Silicone Sealant	29
C.R. Laurence M66	9
Color Rite ASC	22
DAP Alex Plus Clear	44
DAP Rely-On Vinyl Latex	66
Franklin International Titebond All Purpose	14
Franklin International Title Multi-Purpose 100% Silicone	29
Henkel Loctite Polyseamseal All Purpose	142
Henry HE925B	10
Kel Kem Red Hi Temp Silicone	32
Mapeflex P1	25
Mapei Planibond JF	36
OSI Greenseries Flameseal	33
OSI Greenseries SC-175	45
Pecora 864	98
Project 1 6000-6500	28
Surebond SB-188	30
White Lightning MaXimum Paintable Polymer Sealant	30

White Lightning Polyurethane	50 – 60
White Lightning WL30060	45
Proposed:	**50**

All Other Architectural Sealants includes all sealants, except roofing sealants, used during the construction, maintenance or repair of building structures and their appurtenances. Most of the reviewed products are water-based, silicone-based or high solids products with very low VOC content. The proposed limit for this category is 50 g/L.

Category: Sealant – Roadway Sealants

Product Name	**VOC Content (g/L)**
DAP Blacktop VOC – Compliant Filler and Sealer	0
Enviroseal LAS-320-HD	< 25
Franklin International Concrete Repair	21
Franklin International Titebond Blacktop Repair	21
Henkel Loctite PL Concrete Crack Sealant	43
Mapei Planiseal RapidJoint 15	28
Red Devil Blacktop Driveway Repair	18
Red Devil Blacktop Repair - Acrylic	20
White Lightning Concrete Driveway Repair	14
Proposed:	**50**

Roadway sealants are applied on blacktop and concrete driveways and roads. The majority of the products are low-VOC content latex or two-component 100 percent solids technologies. All of the products reviewed will meet the proposed limit of 50 g/L.

Proposed VOC Content Limits

The proposed changes to VOC limits for regulated products are provided in Table 7 below. The effective date for most of the proposed changes is January 1, 2016. Two product categories, Rubber Vulcanization Adhesives and Foam Sealants, have extended effective dates of January 1, 2019 and January 1, 2017, respectively, to allow additional time for product reformulation.

Table 7 – Regulated Product Proposed VOC Content Limits

Category	VOC Content Limit (g/L)*				
	Current	**1/1/2015**	**1/1/2016**	**1/1/2017**	**1/1/2019**
Adhesives					
Architectural Applications					
Carpet Pad Adhesive	50		20		
Ceramic Tile Adhesive	65		20		
Cove Base Adhesive	50		20		
Dry Wall and Panel Adhesive	50		20		
Indoor Flooring Adhesive	50		20		
Multipurpose Construction Adhesive	70		20		
Other Roof Adhesive	250		100		
Outdoor Floor Covering Adhesive	150		20		
Rubber Floor Adhesive	60		20		
Single Ply Roof Membrane Adhesive	250		100		
Structural Glazing Adhesive	100		40		
Structural Wood Member Adhesive	140		50		
Subfloor Adhesive	50		20		
VCT and Asphalt Tile Adhesive	50		20		
Wood Flooring Adhesive	100		20		
Rubber Vulcanization Adhesive	850				250
Top and Trim Adhesive	250		540		
Waterproof Resorcinol Glue			170		
Substrate Specific Adhesive Applications**					
Plastic Foams	50		20		
Reinforced Plastic Composite			200		
Sealants and Caulks					
Architectural					
Foam Sealant		200		20	
All Other Roof	300		50		
Single-Ply Roof Membrane	450		100		
All Other Architectural	250		50		
Roadway	250		50		
Sealant Primers					
Architectural					
Porous	775		250		

Disposal of Regulated Products and VOC-Laden Cloth (c)(2)
The requirements are clarified to specify that disposal provisions apply to all regulated products and VOC laden cloth or paper, not just products used for stripping cured adhesives or sealants.

Solvent Cleaning Operations (c)(3)
The requirements are clarified that all cleaning operations are subject to Rule 1171 – Solvent Cleaning Operations.

Transfer Efficiency (c)(4)
The requirements are clarified. The exclusion for high viscosity regulated products is moved to paragraph (j)(14).

Air Pollution Control Equipment (c)(5)
The requirement for the use of air pollution control equipment to comply with the rule is made consistent with other VOC rules. Specifically, the control device must collect at least 90 percent by weight of VOC emissions and reduce collected emissions by at least 95 percent by weight for an overall minimum efficiency of 85 percent by weight.

Regulated Product Categorization (c)(7)
Previously, the most restrictive clause for regulated products only applied to other source specific rules. The requirements are expanded to include any more restrictive limit included in Table 1 of Rule 1168 as well.

Labeling (c)(9)
VOC content and date of manufacturing are proposed for inclusion on the container labels of regulated products. The labeling requirement would become effective January 1, 2016 and would not apply to products in containers of two ounces or less or to products subject to the CPR. The labeling requirements are consistent with the OTC Model Rule.

Storage and Mixing (c)(10) and (c)(11)
The proposed rule requires that containers for storage or mixing shall remain closed except while in use. Containers of products with VOC content in excess of the limits, may not be stored on premises except for use in approved air pollution control equipment or to be sold and used outside the SCAQMD.

Methods of Analysis (e)

Two additional VOC content methods are included in the proposal. SCAQMD Method 313 - Determination of Volatile Organic Compounds VOC by Gas Chromatography-Mass Spectrometry is included for high water content or high exempt solvent content regulated products. For regulated products containing reactive diluents, Appendix A to Subpart PPPP of CFR Part 63 – Determination of Weight Volatile Matter Content and Weight Solids Content of Reactive Adhesives is included. Both methods provide improved accuracy for verifying low-

VOC regulated products, and is intended to improve compliance determinations and facilitate the use of regulated products with VOC contents of 50 g/L or less.

Reporting (g)

The proposal would replace the prohibition of specification requirement and instead require manufacturers or suppliers of regulated products to report product sales within the District. This provision would provide improved inventory data and would be a more effective compliance tool than relying on a Prohibition of Specifications. The report will include the following information:

- Product manufacturer (as labeled)
- Product name and code
- Applicable Rule 1168 category
- Regulatory VOC content – Products
- Material VOC content
- Volume sold for use within District

Manufacturers or suppliers of products sold to a user under the 55 gallon per year exemption in paragraph (j)(6) shall provide the volume sold and the name and address of the company utilizing the exemption. This will allow the District to better assess the continued need for the exemption by product category and improve the enforceability of the annual limitation.

Lastly, manufacturers or suppliers of regulated product shall maintain records of VOC content determination. VOC content determination may be made by calculation based on product formulation or by laboratory analysis. The data used in determining VOC content must be retained for five years and be made available upon request. VOC content values of 20 g/L or lower may be reported as "20 g/L or less". Otherwise, the calculated or analyzed VOC content shall be reported.

Prohibition of Sales and Use (h)

Currently the regulation prohibits the sale and use of regulated products that contain chloroform, ethylene dichloride, methylene chloride, perchloroethylene and trichloroethylene. The proposal will expand this prohibition to also include all Group II exempt solvents except volatile methyl siloxanes (VMS). Small, but non-negligible quantities of VMS are widely used in silicone-based sealants.

Sell-through and use-through provisions are included in the proposed rule to allow manufacturers and suppliers to deplete regulated products in the warehouse or on the shelf. The provision also allows users to use up remaining product rather than having to dispose of them. The sell-through and use-through effective dates should accommodate the typical one year shelf life of these regulated products.

The prohibition of sales does not apply to products subject to the CPR or to manufacturers or suppliers who inform their distributors in writing that the regulated product is not to be used in

the District, and who maintain such notification letters for five years, available to the Executive Officer upon request.

Exemptions (j)

The proposed rule includes an exemption from recordkeeping for products that contain 50 g/L or less VOC content. It is hoped that this will be an incentive for users of Super-Compliant regulated products.

An exemption is proposed for adhesive tapes and papers, which do not have an appreciable VOC content. This exemption does not include primers for such products.

Effective January 1, 2016, the 55 gallon per year exemption will no longer be available to users of Rubber Vulcanization Adhesives or Top and Trim Adhesives. These two categories of uses were nearly completely dependent on the exemption because no effective lower VOC content products were available. As noted in the VOC content limits discussion above, the proposed rule includes higher VOC content limits for these two categories. Because effective compliant products should become available under these categories, the exemption is no longer necessary for these operations.

The complete exemption of all aerosol adhesive uses is proposed to be replaced by a more limited exemption. Up to 16 ounces per day, determined on a rolling monthly average would be exempt in manufacturing operations. Higher usage of aerosol products would be subject to the same VOC content limits as any other type of regulated product. Similarly, consumer products subject to the CPR would no longer be exempt when used in manufacturing operations. These two proposed changes to the exemptions would level the playing field for products used in manufacturing operations. The current exemption encourages the use of higher-VOC content consumer products rather than available lower VOC content products.

Finally, the proposed rule includes a general exemption from the rule as an added incentive for the use of regulated products with VOC contents of 20 g/L or less. These products would continue to be subject to requirements under subdivisions (g) and (h), which relates to reporting and use of air toxic air contaminants in product formulation.

EMISSION INVENTORY

The emission inventory for the proposed rule was determined by reviewing the 2012 AQMP inventory emissions for adhesive and sealants, reviewing reported emissions for 2012 as part of the Annual Emissions Reporting (AER) program, and by examining survey data provided by adhesive and sealant manufacturers and suppliers.

According to the 2012 AQMP, emissions from adhesives and sealants subject to the rule are estimated to be 3.5 tpd. The VOC emissions reported through the AER program in 2012 totals 0.1 tons per day, or just three percent of overall emissions subject to the rule. The majority of the emissions come from small volume users including manufacturing, commercial, and

consumer applications. Architectural uses appear to be the most prevalent use with 84 percent of reported products falling into one of the architectural categories.

Since the survey only provided a fraction of the products sold in the SCAQMD, staff scaled the survey data to estimate the contribution by category. Exceptions include the Rubber Vulcanization Adhesives, Top and Trim Adhesives, Single Ply Roof Membrane Sealant and all roofing adhesives where staff believes industry provided sufficient information regarding sales volume. Additionally, ABS, PVC, and CPVC emission estimates were taken from the 2004 Staff Report.

Foam Sealants were previously not included in inventory estimates. To determine the contribution from these products, staff used national sales data from an industry report and adjusted the estimate based on population. According to the study, approximately 673 million pounds of foam sealants were used nationwide. SCAQMD represents 5.4 percent of the national population and thus it is estimated that 36 million pounds of foam sealants are used in SCAQMD. The majority of foam sealants are applied using non-aerosol methods and emit negligible VOC. Assuming that residential open cell insulating foam is applied using aerosol products, 48 percent or approximately 17.2 million pounds are applied annually in SCAQMD. Assuming an average VOC content of 20 percent by weight, the additional contribution to the inventory for foam sealants is estimated to be 4.7 tons per day.

Daily VOC emissions estimated from all sources are 8.2 tons per day as detailed below in Table 8.

Table 8 – VOC Emission Inventory

Emission Source	Emissions (tons per day)
AER	0.1
Area Sources	3.4
Subtotal	3.5
Foam Sealants	4.7
Total	**8.2**

EMISSION REDUCTIONS

The proposed rule will reduce the VOC content limits for most of the architectural adhesive and sealant categories and adhesives used on plastic foam substrates. The proposal includes new VOC content limits for Waterproof Resorcinol Glue and Foam Sealants. Also proposed is to increase the VOC content limit for Top and Trim Adhesives.

The emission reductions are estimated using the scaled emission inventory data along with SWA information collected from the survey. SWA material VOC content is determined by reviewing available products. The emissions reductions are calculated by assuming that the material VOC content of those above the proposed limit will be reduced to the same SWA material VOC content of the products that already meet the proposed limit. The estimated emission reductions are presented in Table 9 below.

Table 9 – Estimated Emission Reductions

Emission Source	Current Emissions (tons per day)	Emission Reductions (tons per day)
AER	0.1	None
Area Sources*	3.4	0.7
Subtotal	3.5	
Foam Sealants	4.7	3.7
Total	**8.2**	**4.4**

* Does not include up to 0.1tpd from Top and Trim Adhesives currently utilizing the 55 gallon per year exemption.

The emission reductions from the proposed amendments will be 0.7 tons per day in 2016 and another 3.7 tons per day in 2017 for an overall reduction of 4.4 tons per day by 2019.

PAR 1168 will partially implement CTS-02 and MCS-01.

COST-EFFECTIVENESS AND INCREMENTAL COST-EFFECTIVENESS

The cost effectiveness and incremental cost effectiveness data will be included in subsequent versions of the staff report.

COMPARATIVE ANALYSIS

Health and Safety Code Section 40727.2 requires a written analysis comparing the proposed rule with existing federal and SCAQMD regulations. There are no other existing or proposed SCAQMD rules that directly apply to the same source type (adhesive and sealant applications). The federal government has suggested standards in the form of a Control Techniques Guideline for Miscellaneous Industrial Adhesives, but has no regulatory requirements. The Draft staff report will include such a comparative analysis.

SOCIOECONOMIC ASSESSMENT

A socioeconomic analysis of Proposed Amended Rule 1168 will be performed. A draft report will be released no later than 30 days prior to the SCAQMD Governing Board hearing.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) and SCAQMD Rule 110, appropriate documentation will be prepared to analyze any potential adverse environmental impacts associated with the Proposed Amended Rule 1168. Comments received at the public workshop and CEQA scoping meeting will be considered when preparing the CEQA document.

DRAFT FINDINGS UNDER THE CALIFORNIA HEALTH AND SAFETY CODE

Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the hearing. The draft findings are as follows:

Necessity – State and federal health-based ambient air quality standards for ozone are regularly and significantly exceeded in the SCAQMD. The reduction of VOC from Proposed Amended Rule 1168 is part of a comprehensive strategy to meet federal and state air quality standards.

Authority - The SCAQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code Sections 39002, 40000, 40001, 40440, 40441, 40702 and 41508.

Clarity - The SCAQMD Governing Board has determined that Proposed Amended Rule 1168 – Adhesive and Sealant Applications, is written and displayed so that the meaning can be easily understood by persons directly affected by them.

Consistency - The SCAQMD Governing Board has determined that Proposed Amended Rule 1168 – Adhesive and Sealant Applications, is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

Non-Duplication - The SCAQMD Governing Board has determined that Proposed Amended Rule 1168 – Adhesive and Sealant Applications, does 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 SCAQMD.

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

REFERENCES

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OTC Markets, Spray Foam Markets Overview, retrieved October 22, 2013 from https://www.otciq.com/otciq/ajax/showFinancialReportById.pdf?id=102327.

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SCAQMD, Final 2012 Air Quality Management Plan, February 2013.

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