California Environmental Protection Agency

Air Resources Board

PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATIONS

INITIAL STATEMENT OF REASONS

Release Date:
August 7, 2009

State of California
AIR RESOURCES BOARD

INITIAL STATEMENT OF REASONS FOR PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATIONS

To be considered by the Air Resources Board at a
Public Hearing on September 24-25, 2009, at:

South Coast Air Quality Management District
Auditorium
21865 E. Copley Dr.
Diamond Bar, CA 91765

Air Resources Board
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State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATIONS

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August 2009

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

In this rulemaking, California Air Resources Board (ARB or Board) staff is proposing amendments to the Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation) and to Method 310 – Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products (Method 310). The amendments are designed to reduce VOC emissions. The proposed amendments would set new VOC limits for Multi-purpose Solvent and Paint Thinner products and lower the existing VOC limit for Double Phase Aerosol Air Fresheners. When fully implemented, about 14.7 tons per day of VOC emission reductions would be achieved. We are proposing to prohibit the use of the Toxic Air Contaminants (TAC) methylene chloride, perchloroethylene, and trichloroethylene in Multi-purpose Solvent and Paint Thinner products. In addition, the aromatic content would be limited to 1 percent by weight in these categories. Compounds with high global warming potential (GWP) would be prohibited, under the proposal, in all three of the categories proposed for regulation.

The proposed toxic compound prohibitions and the GWP limits are mitigation measures designed to ensure that exposure to chlorinated solvent compounds and compounds with a high GWP are not used, respectively, as products are reformulated to meet new VOC limits. Further, the limit on the use of aromatic compounds is a mitigation measure designed to prevent an increase in ozone forming potential of reformulated products.

The regulation is codified in title 17, California Code of Regulations, sections 94507-94517. The proposed amendments to reduce VOC emissions would partially fulfill the consumer products reduction commitment contained in the State Strategy for California's 2007 State Implementation Plan (Strategy).

As proposed, new language additions to Method 310 would clarify analytical methods used to test low VOC or high water content consumer products. Other amendments would clarify and improve existing regulatory provisions.

This Executive Summary, together with Appendix A, the Technical Support Document, is the Initial Statement of Reasons for Proposed Rulemaking required by the California Administrative Procedure Act. Appendix B contains the regulation, and Method 310, with the proposed changes shown in underline and ~~strikeout~~ format.

Among other things, this Executive Summary provides a description of the proposed amendments to the Consumer Products Regulation and to Method 310, and explains the rationale for the proposed changes. In accordance with Government Code section 11346.2(a)(1), a "plain English" summary of the proposal is provided in Chapter V of the Technical Support Document (Appendix A).

A. AUTHORITY TO REGULATE CONSUMER PRODUCTS

Consumer products are chemically formulated products used by household and institutional consumers. Examples include detergents; cleaning products; floor finishes; personal care products; lawn and garden products; air fresheners; disinfectants; automotive specialty products; paint thinners; multi-purpose solvents; and aerosol paints.

The Health and Safety Code sets forth ARB's authority to regulate consumer products to control VOCs and greenhouse gases (GHG). Section 41712 specifies requirements to reduce VOC emissions as a ground-level ozone control strategy. Section 38500 *et seq.*, establishes authority to reduce the impacts of GHGs used in consumer products to slow climate change.

1. Health and Safety Code section 41712

In 1988, the California Clean Air Act (CCAA or "the Act") added section 41712 to the California Health and Safety Code. The intent of section 41712 is primarily to reduce ground-level ozone concentrations. Section 41712, along with subsequent amendments, requires ARB to adopt regulations to achieve the maximum feasible reduction in VOC emissions from consumer products. The CCAA specified that attainment of the California State ambient air quality standards is necessary to promote and protect public health, particularly of children, older people, and those with respiratory diseases. The Legislature also directed that these standards be attained by the earliest practicable date.

Prior to adoption, the Board must determine that adequate data exist to establish that the regulations are necessary to attain State and federal ambient air quality standards; and the regulations are commercially and technologically feasible. The Act further stipulates that regulations adopted must not eliminate any product form, and that recommendations from health professionals be considered when developing VOC control measures for health benefit products.

2. Health and Safety Code section 38500 *et seq.*

In 2006, Assembly Bill (AB) 32, The California Global Warming Solutions Act of 2006, was signed into law. This law created a comprehensive, multi-year program to reduce GHG emissions in California. The California Health and Safety Code, commencing with section 38500, contains the provisions. AB 32 requires ARB to develop regulations and consider market-based compliance mechanisms that will ultimately restore California's GHG emissions to the 1990 baseline year by 2020. Beyond the requirements of AB 32, the Governor's Executive Order EO-S-03-05 calls for an 80 percent GHG reduction from 1990 levels by 2050.

AB 32, among other things, requires immediate progress, described as Discrete Early Action Measures, to reduce GHGs. Discrete Early Action Measures are defined as regulations adopted to reduce GHG emissions that become enforceable by January 1, 2010. Reduction of compounds with high GWP that are used in consumer products has been designated as a Discrete Early Action Measure (ARB, 2007b).

B. EXISTING REGULATIONS

Over the last twenty years, the Board has taken numerous actions to fulfill the legislative mandates pertaining to the regulation of consumer products. Three regulations have been adopted that affect 125 consumer product categories by setting 174 VOC limits. These limits, when fully effective, will have resulted in reducing emissions by about 200 tons per day, an overall 44 percent reduction in VOC emissions from consumer products. At its June 26, 2008, hearing, the Board approved amendments that set new or lower VOC limits for 19 categories of consumer products with an additional 25 VOC limits (ARB, 2008e). These amendments became legally effective on July 18, 2009 and will reduce VOC emissions by an additional 5.8 tons per day when fully effective. The June 2008 amendments also established the first limit to reduce the impact of Pressurized Gas Duster product emissions on global warming. Limiting the emissions of GHGs in this category is equivalent to reducing about 0.2 million metric tons of carbon dioxide per year.

We have also reduced exposure to Toxic Air Contaminants (TACs). Emissions of TACs have been reduced by over 13 tons per day by prohibiting use of chlorinated compounds in 70 categories.

In addition, two voluntary regulations, the Alternative Control Plan and the Hairspray Credit Program, have been adopted to provide compliance flexibility to companies. These five regulations are codified in title 17, California Code of Regulations, sections 94500 to 94575.

C. REGULATORY DEVELOPMENT PROCESS

In order to involve the public, the Consumer Products Regulation Workgroup (CPRWG), was reconvened in 2004. Participation in the CPRWG was, and continues to be, open to any member of the public. The CPRWG participated in the development of the 2006 Consumer and Commercial Products Survey (2006 Survey) and 2008 Paint Thinner and Multi-purpose Solvent Survey Update (Survey Update). These surveys serve as the basis for this proposal. The CPRWG was instrumental in the development of these proposed amendments. Consumer product manufacturers; chemical producers; marketers; trade associations; environmental groups; air districts; and various other stakeholders are all active participants.

In addition to the CPRWG meetings, an initial public meeting was held in August of 2008 to begin the public process of developing this proposal. A public workshop to discuss the data from the 2006 Survey and Survey Update, as well as proposed VOC

limits, was held on April 1, 2009. Prior to the April workshop, we posted materials to the consumer products program website for review and comment. A second public workshop to discuss the proposed amendments with stakeholders is scheduled for early August 2009.

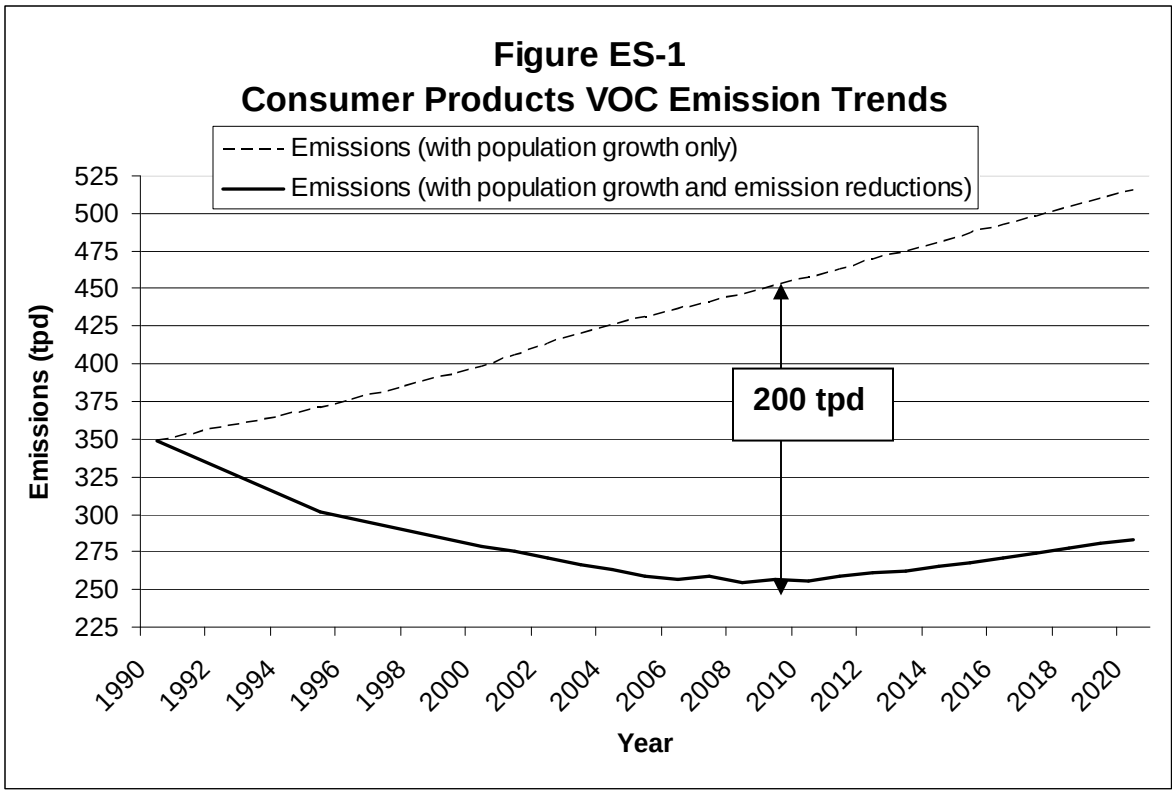
D. VOC EMISSIONS

Although each consumer product may seem to be a small source of VOC emissions, the cumulative use of these products by over 38 million Californians results in significant VOC emissions (DOF, 2008). Given the severity of the air pollution problems in California, further emission reductions from all sources contributing to the formation of ground-level ozone are necessary.

Emissions of VOCs from consumer products contribute to the formation of both ground-level ozone and particulate matter pollution. This section, however, focuses on reducing emissions from consumer products as a ground-level ozone control strategy. As evidence of the magnitude of consumer product VOC emissions, it is estimated that in 2010 consumer products emissions will be approximately 255 tons per day, or about 12 percent of the overall Statewide VOC inventory. In this same year, consumer product emissions will comprise about 19 and 7 percent of VOC emissions in the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD), respectively. Without further actions, consumer product emissions are expected to grow to approximately 283 tons per day in 2020, representing 14 percent of statewide VOC emissions (ARB, 2009a).

As control measures for other VOC sources become effective, consumer product emissions become more important in the SCAQMD. It is estimated that emissions from consumer products will be the largest source of VOC emissions in the SCAQMD in 2020. While the ozone forming potential of consumer product emissions is less than some other source categories (e.g., light duty passenger vehicles), clearly, further reductions in VOC emissions from consumer products and other VOC sources are needed if attainment of the State and federal ozone standards are to be achieved.

Despite these projections, ARB's consumer products program has made significant progress. Since 1989, ARB regulations, along with numerous amendments to the regulations, have substantially reduced VOC emissions from consumer products. Absent these regulations today, consumer product emissions would likely be about 450 tons per day. Figure ES-1 shows that statewide consumer product VOC emissions have been reduced by over 200 tons per day in 2010. However, Figure ES-1 also shows that without further actions population growth will likely reverse the trend.



The emission values in Figure ES-1 are derived from several data sources. The 1990 to 2007 emissions are taken from the ARB Forecasted Emissions by Summary Category, 2008 Almanac (ARB, 2008c). Emissions are then grown in proportion to population increase. Population growth is in accordance with estimates in the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008d). For categories regulated in the 2006 and 2008 Consumer Products Amendments, emission values from the 2003 Consumer and Commercial Products Survey and the projected emissions reductions resulting from the VOC limits approved in 2006 and 2008, are reflected in Figure ES-1.

E. CONSUMER PRODUCT VOC EMISSION REDUCTION COMMITMENTS IN THE STATE IMPLEMENTATION PLAN (SIP)

Reduction of VOC emissions is necessary to attain the ambient air quality standards for ozone. In 1988, with the passing of the CCAA, the importance of controlling emissions from consumer products was set forth. To meet the federal ozone standard, in 1994 emission reductions from consumer products became part of the State Implementation Plan (SIP) for ozone. In this SIP, consumer products measures were put in place to work towards attaining the federal peak one-hour ambient air quality standard for ozone. In the 2003 SIP, ARB again reiterated the commitment to reduce consumer products VOC emissions to meet the one-hour federal ozone standard.

In response to these mandates, three regulations with 174 VOC limits for 125 categories of consumer products (including antiperspirants and deodorants and 36 aerosol coating products categories) were established. The adopted limits to meet these commitments will achieve a 44 percent reduction in overall VOC emissions from consumer products by the year 2010.

However, the 2003 SIP was withdrawn and the remaining consumer product emission reduction commitment was incorporated into the 2007 Strategy. This Strategy includes California's plan to attain the national ozone standard of 0.08 parts per million (ppm) averaged over eight-hours. In the Strategy, ARB has committed to an additional 30 to 40 tons per day VOC reduction from consumer products by January 1, 2014. The amendments that became effective on July 18, 2009, provide the first increment, about 4.5 tons per day, toward meeting the commitment. An additional emission reduction of about 1.3 tons per day will be achieved in 2015.

Table ES-1 shows our progress toward meeting the consumer products commitment in the Strategy. The anticipated 2010 Amendments include four cleaning products categories, (non-aerosol General Purpose Cleaners and Degreasers, Glass Cleaners, and aerosol Furniture Maintenance Products) which staff are currently evaluating for further reductions. Additional discussion regarding these categories can be found in section L, Future Plans. We are continuing the review of data from the 2006 Consumer and Commercial Products Survey as a further basis for identifying and evaluating additional categories for emission reduction opportunities. If feasible, additional proposals would be brought for consideration before the Board in 2010.

Table ES-1
Consumer Product VOC Reductions Accredited Toward SIP Commitment

Consumer Products Rulemaking	VOC Reductions (tons per day)
June 2008 Amendments	4.5
September 2009 Amendments (this proposal)	14.7
2010 Cleaning Products Amendments (under development)	5 – 8
Additional Reductions from 2006 Survey Product Categories	5.8 – 12.8
Totals Reductions by January 1, 2014	**30 – 40**

The Strategy also acknowledges that VOC reductions from consumer products are becoming more difficult to achieve. In light of this, the Strategy includes a commitment to explore innovative reduction strategies in the longer term. These measures would include investigating emission reduction opportunities through reactivity-based standards and alternative market-based mechanisms. If these mechanisms cannot produce meaningful emission reductions from the consumer products source category, then other approaches would be evaluated. Some of these approaches include the purchase of VOC emission reduction credits; and funding of special projects to reduce

emissions or accelerate reductions from pollution sources outside of the consumer products industry.

The amendments proposed in this rulemaking are the second increment of emission reductions which further fulfill the Strategy commitment for VOC reductions from consumer products.

F. SCAQMD RULE 1143 – CONSUMER PAINT THINNERS AND MULTI-PURPOSE SOLVENTS

In March 2009, SCAQMD adopted Rule 1143, "Consumer Paint Thinners and Multi-Purpose Solvents" which, upon the effective date, will achieve VOC emissions reductions from consumer Multi-purpose Solvents and Paint Thinners used in the South Coast Air Basin. The VOC limits we are proposing for Multi-purpose Solvents and Paint Thinners are new limits for previously unregulated categories. In absence of a statewide regulation, SCAQMD has the authority to adopt limits affecting these products.

Upon approval of this proposal and implementation of SCAQMD Rule 1143, manufacturers of Multi-purpose Solvent and Paint Thinner products will be required to meet the Rule 1143 limits for products sold or supplied for use in the South Coast Air Basin, and the statewide limits for products sold to all areas of California, outside the South Coast Air Basin. The VOC limits we are proposing are virtually equivalent to those adopted by SCAQMD, however, the effective dates are different. The effective dates for Rule 1143 are January 1, 2010, and January 1, 2011 for the first and second tier VOC limits respectively, while our proposed effective dates are December 31, 2010 and December 31, 2013.

We are proposing to provide one additional year for manufacturers to meet the first tier limit simply due to the time necessary for State regulations to become legally effective, per State law, compared to the shortened time frame for local air district rules to become legally effective. For the second tier limit, we believe it has not been demonstrated that products meeting the 3 percent VOC limit will function as paint thinners for all solvent-borne coatings available in commerce. While we are encouraged about the future viability of low VOC thinners, such as soy based products, it has not yet been demonstrated that they are ready for introduction into the market. There is still a need for paint thinners that are compatible with solvent-borne coatings, for a period of time, in areas of the State other than the South Coast Air Basin because SCAQMD has more stringent VOC coating limits than many other areas of the state. Therefore, we determined it was appropriate that the second tier, 3 percent VOC limit be effective December 31, 2013, giving manufacturers sufficent time to develop low VOC thinners that are compatible with solvent-borne coatings.

Additionally, the second tier limit could lead to an increase in sales of more highly flammable products, such as acetone. An acetone-based "Paint Thinner" product will function differently than the former "Paint Thinner" product. Without enough lead time,

we are concerned that acetone products will be the most likely pathway to compliance. To allow sufficient time for development of less flammable, and/or less costly alternatives, we are proposing an effective date of December 31, 2013 for the 3 percent VOC limit.

In order to avoid double-counting category sales and VOC emissions, we have subtracted from the statewide values, the portion of Multi-purpose Solvent and Paint Thinner sales, VOC emissions, and reductions that occur in the South Coast Air Basin, based on population (DOF, 2008). The calculated VOC emissions and reductions for the Multi-purpose Solvent and Paint Thinner categories listed in Table ES-2, are the correct values which can be credited toward the proposed regulation. More detail on our proposal for the Multi-purpose Solvent and Paint Thinner categories can be found in the Technical Support Document, Chapter VI, section B.

G. ESTIMATED VOC EMISSIONS FROM CATEGORIES PROPOSED TO BE REGULATED

The 2006 Survey and the Survey Update serve as the basis for the proposed amendments to reduce VOC emissions. The 2006 Survey and the Survey Update provided detailed information on the formulations of consumer products proposed for regulation, including complete speciation of VOCs, low vapor pressure VOC (LVP-VOC) solvents, and key exempt ingredients. Total volumes of inorganic and other compounds were also reported. Information on sales, product form, customer types, and company size and economics were also included. For this rulemaking, the 2009 emissions and reduction estimates were grown from 2006 and 2008 sales. Annual population growth factors were calculated using the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008d). We estimate that the 2009 VOC emissions from the categories proposed for regulation are more than 22 tons per day.

H. SUMMARY OF PROPOSED AMENDMENTS

Amendments are being proposed to the following sections in the Consumer Products Regulation: section 94508 "Definitions;" section 94509 "Standards for Consumer Products;" section 94510 "Exemptions;" section 94512 "Administrative Requirements;" section 94513 "Reporting Requirements;" and section 94515 "Test Methods." The proposed amendments to these sections are summarized below. In this section, we are also providing a summary of amendments to Method 310. Chapter V of the Technical Support Document contains more detailed information on each proposed requirement.

1. Definitions (Section 94508)

Section 94508 "Definitions," provides all of the terms used in the Consumer Products Regulation which are not self-explanatory. The proposed amendments to the Regulation include the modification of three definitions, and the addition of six new definitions. These definitions are necessary to define categories proposed for VOC

limits, clarify products that are not subject to the VOC limits, or to improve the enforceability of the Consumer Products Regulation.

2. Proposed Amendments to Standards for Consumer Products (Section 94509)

Table of Standards: The proposed regulatory action would amend the existing Consumer Products Regulation by specifying VOC limits for the product categories shown in Table ES-2. Note that for Double Phase Aerosol Air Freshener we are proposing to lower the existing VOC limit to 20 percent, effective December 31, 2012. Table ES-2 also shows that statewide VOC emissions would be reduced by approximately 14.7 tons per day when the limits are fully effective. These reductions would provide further progress toward fulfilling the consumer products element in the Strategy.

Table ES-2
Proposed VOC Limits, Emissions, and Reductions at Effective Date

Product Category	Product Form	Proposed VOC Limit (percent by weight)	2009 VOC Emissions* (tons per day)	Effective Date	Reductions Upon Effective Date (tons per day)
Double Phase Aerosol Air Freshener	Aerosol	20	10.2	12/31/2012	2.0
Multi-purpose Solvent & Paint Thinner	Non-aerosol	tier 1: 30	12.5+	12/31/2010	8.4+
		tier 2: 3	---	12/31/2013	3.9+
Total Emissions 2009	**22.6 tons per day**				
Total VOC Reductions by end of 2013	**14.7 tons per day**				

* Survey emissions adjusted for market coverage, grown to the 2009 calendar year, and rounded.
+ Does not include emissions or reductions in the South Coast Air Basin.

It should be noted that the emissions and reductions listed for the Multi-purpose Solvent and Paint Thinner categories are combined because we have determined that the products are used interchangeably. A further discussion can be found in the Technical Support Document, Chapter VI, section B, "Multi-purpose Solvent and Paint Thinner."

Other Provisions:

a. Automotive Windshield Washer Fluid Label Clarification

Minor clarifying changes are proposed to the labeling requirements pertaining to dilutable automotive windshield washer fluid in section 94509(b). This proposal will require automotive windshield washer fluid manufacturers to clearly identify on the product label when the product is ready to use versus dilutable. This change is intended to ensure that the lowest VOC products are used and previously calculated emissions reductions are achieved.

b. Limit on Use of Global Warming Compounds

In accordance with AB 32, we are proposing to prohibit the use of compounds with global warming potential (GWP) values of 150 or greater in “Double Phase Aerosol Air Freshener,” “Multi-Purpose Solvent,” and “Paint Thinner” products. These provisions are contained in new subsections 94509(t) and (u). These proposals are intended to minimize the climate change impacts of products reformulated to comply with the proposed VOC limits.

c. Toxics Prohibition

Under the California Environmental Quality Act (CEQA), ARB is required to identify and mitigate any possible significant adverse environmental impacts of regulatory actions. It is unlikely, but possible, that manufacturers may, in response to new VOC limits for Multi-purpose Solvent and Paint Thinner products, choose to reformulate with chlorinated solvents that are TACs. Therefore, in accordance with CEQA, we are proposing in new subsection 94509(u), a prohibition of the use of methylene chloride, perchloroethylene, and trichloroethylene in the “Multi-purpose Solvent,” and “Paint Thinner” categories.

d. Photochemical Reactivity

Also in section 94509(u), there is a proposal to limit the use of aromatic compounds in “Multi-Purpose Solvent” and “Paint Thinner” products to 1 percent by weight. This requirement is intended to mitigate the possibility that manufacturers could replace current VOC solvents used in Multi-purpose Solvent and Paint Thinner products with highly reactive compounds.

3. Proposed Amendments to Exemptions, Section 94510(m)

Proposed Temporary Small Size Exemption for Paint Thinner: The proposal contains a provision to temporarily exempt very small (eight fluid ounces or less) containers of Paint Thinner from compliance with the VOC limits until December 31, 2013. This exemption is designed to allow consumers to continue to be able to purchase typical Paint Thinners to be used with paints where the established VOC limit allows for fairly high concentrations of solvents. In addition, there is an existing exemption from the VOC limits for architectural coatings packaged in containers with a volume of one liter (1.057 quart) or less. Therefore, we believe a limited and temporary small container exemption is appropriate for Paint Thinners. Absent this provision, these solvent-borne paint products may be discarded, resulting in increasing the solid or hazardous waste stream or affecting water quality. This proposal should mitigate these potential consequences. We expect that the emissions impacts of this small size exemption will be minimal.

4. Proposed Amendments to Administrative Requirements, Section 94512(e)

Proposed Modification to Labeling Requirements: Under the proposal, Multi-purpose Solvent and Paint Thinner products would be required to display the percent VOC content, by weight, as determined from actual formulation data. This requirement will enhance the enforceability of the proposed VOC limits for these products and provide useful information to the consumer.

On May 25, 2000, the Board approved a labeling requirement for Aerosol Adhesive Products, requiring that products display the VOC standard as is specified in the California Consumer Products Regulation (ARB, 2000). Additionally, on June 24, 2004, the Board approved the addition of four other product categories to this requirement. While the requirement we are proposing for Multi-purpose Solvent and Paint Thinner products is slightly different, requiring the VOC content of the product rather than the VOC standard, it parallels the labeling requirements previously approved by the Board.

Also, to address the concern regarding the flammability of low-VOC Multi-purpose Solvent and Paint Thinner products, "Flammable" or "Extremely Flammable" products would not be able to display a general name on the principle display panel, such as "Paint Thinner;" "Multi-purpose Solvent;" "Clean-up Solvent;" or "Paint Clean-up." Manufacturers may choose to sell a "Flammable" or "Extremely Flammable" product with one of these general names if they do one of the following: provide an attached hang tag or sticker that includes the statement "Formulated to meet California VOC limits, see warnings on label;" or display on the principle display panel in a font size as large as or larger than any other words on the panel, the common name of the chemical compound that results in the product meeting the criteria for "Flammable" or "Extremely Flammable."

These requirements are intended to alert the consumer of a potential change in formulation of these products which could present a fire hazard if used improperly. Additional discussion regarding the flammability concern is provided in K. Environmental Impacts.

5. Proposed Amendments to Reporting Requirements, Section 94513(g)

We are proposing 30 percent by weight VOC limits for Multi-purpose Solvent and Paint Thinner products, effective December 31, 2010. These limits are challenging, but feasible for manufacturers to meet within the time-frame proposed. We are also proposing technology forcing 3 percent by weight second tier VOC limits for Multi-purpose Solvent and Paint Thinner products, effective December 31, 2013. To ascertain if manufacturers are on track, and that technology advances as expected, we are proposing that manufacturers report their progress towards meeting these limits.

As proposed in new subsection 94513(g), Multi-purpose Solvent and Paint Thinner manufacturers would be required to supply by June 30, 2012, detailed written updates

on their research and development efforts undertaken to achieve compliance with the 3 percent by weight VOC limits. The reports would include sales and formulation data for products sold in 2011, as well as detailed information on the raw materials evaluated for use; maximum incremental reactivity (MIR) values for any VOC or LVP-VOC used or evaluated; the function of the raw material evaluated; hardware evaluated; testing protocols used; the results of the testing; and the cost of reformulation efforts.

6. Proposed Amendments to Test Methods, Section 94515

To ensure the ozone forming potential of Multi-purpose Solvent and Paint Thinner products does not increase as a result of the implementation of the proposed VOC limits, staff is proposing to limit the use of VOC aromatic compound content to no more than 1 percent by weight, effective December 31, 2010. A further discussion regarding the need for limiting the use of these highly reactive ingredients is provided in the Technical Support Document, Chapter VIII, Environmental Impacts.

I. COMPLIANCE WITH THE PROPOSED AMENDMENTS

Manufacturers have the flexibility to choose from a variety of formulation options to meet the applicable limits (see Chapter VI, Description of Product Categories). To comply with VOC limits, VOC solvents or propellants may need to be replaced, or partially replaced, with VOC exempt ingredients. This may require using acetone or another exempt solvent, or formulating with a VOC exempt propellant. Manufacturers may also need to change the valve, container, delivery system, or the other components of the consumer product depending on the individual formulation.

To meet the VOC limit for Double Phase Aerosol Air Fresheners, the most straightforward reformulation pathway is to utilize less hydrocarbon propellant in the formulation and add more water. Another reformulation option is to use VOC exempt propellants such as HFC-152a or HFC-134a. The likelihood of this reformulation choice is minimal because of the increased cost of these propellants. However, we are proposing a GWP limit of 150 for the category to ensure that high GWP propellants are not used in reformulations to meet the VOC limit. The proposed VOC limits can be met without a significant increase in the use of TACs or GHGs. We believe that products can and will be reformulated primarily through reduction in the amount of hydrocarbon propellant with possibly some modification or adjustments to the surfactants and/or the valve/spray nozzle.

To meet the proposed first tier VOC limits for Multi-purpose Solvent and Paint Thinner products, the most likely “reformulation” pathway is product substitution (i.e. increasing the sales of existing complying products and discontinuing sale of non-complying products). To meet the proposed second tier VOC limit for Multi-purpose Solvent and Paint Thinner products, reformulation options include developing water-based formulations, in addition to product substitution. We believe that products can and will be reformulated through reduction or replacement of VOC solvents with VOC exempt ingredients or through technologies that include using LVP–methyl esters, hydrocarbon

solvents, or water emulsion technology. Possible reformulation options could also include chlorinated toxic compounds, and compounds that could compromise the predicted ozone benefits of the limits. However, because these formulation options are not necessary, and the proposal includes specific prohibitions to prevent them, products cannot be reformulated using these options and possible adverse impacts will be prevented.

Table ES-3 summarizes, for the proposed VOC limits, data related to the complying marketshares (based on sales), as well as the number of products that currently comply relative to total number of products reported. It should be noted that there are currently a few Multi-purpose Solvent and Paint Thinner products, with significant market presence, formulated slightly above 30 percent VOC by weight. These products will only need a modest reformulation to comply with the proposed 30 percent standard. The complying marketshare in Table ES-3, for the first tier limit for the Multi-purpose Solvent and Paint Thinner categories, would be significantly higher if these products already complied with the proposed 30 percent VOC limit.

Table ES-3
Summary of Complying Products and Complying Marketshares

Product Category	Product Form	Proposed VOC Limit (wt%)	Number of Complying Products/Total	Complying Marketshare (%)
Double Phase Aerosol Air Freshener	Aerosol	20	<10 / 60*	<1
Multi-purpose Solvent & Paint Thinner	Non-aerosol	tier 1: 30	18 / 165	11.3
		tier 2: 3	15 / 165	11.2

Source: 2006 Consumer & Commercial Products Survey and Paint Thinner & Multi-purpose Solvent Survey Update.
*60 products (product groups) reported. Total of 231 products reported if fragrance variants are considered.

Manufacturers can also comply with the proposed amendments through the use of the Innovative Products Provision (IPP) or the Alternative Control Plan (ACP). The IPP allows manufacturers of “innovative products” to comply with the Consumer Products Regulation if they demonstrate through clear and convincing evidence that their product will result in less VOC emissions than a complying product that meets the applicable VOC limit. The innovative product may result in less emissions due to some characteristic of the product formulation, design, delivery system, or other factors.

The ACP allows manufacturers to average the emissions from products above and below the applicable VOC limits, as long as the overall emissions are less than or equal to the emissions that would have occurred had all the products complied with the VOC limits. Manufacturers must submit an application which includes the VOC content of the products in the plan, a method of verifying the sales of each product in the plan, and other information necessary to track overall emissions.

J. ECONOMIC IMPACTS

The economic impacts of the proposed amendments are summarized here. Our complete analysis of these impacts is contained in Chapter VII of the Technical Support Document.

1. Overall Cost

We estimate that the overall cost to comply with the proposed amendments is about $3.1 million per year for ten years, for a total of $31 million. This amount includes both recurring (e.g., raw materials) and nonrecurring (e.g., research and development) costs and is estimated based on assumptions specific to each category. The cost represents the average of low and high cost estimates and represents our prediction of the costs most likely to be incurred.

2. Cost Effectiveness

Another measure of the economic impacts of the proposal is to determine the "dollars to be spent per pound of VOC reduced," or cost effectiveness (CE). The CE of the proposed amendments has been calculated to be about $0.29 per pound of VOC reduced. This is based on expected emission reductions of about 14.7 tons per day. This cost effectiveness is better than other recent consumer products rulemakings. The CE of amendments proposed in 2004, 2006, and 2008 was about $2.40, $2.35 and $6.23 per pound of VOC reduced, respectively. The lower cost per pound of VOC reduced for this rulemaking results from the relatively large reduction in VOC emissions being achieved from only three product categories.

3. Return on Owner's Equity (ROE)

Another measure of the impacts of the proposed amendments on manufacturers is to determine the ROE. ROE is a calculation which compares a company's percentage reduction in profitability after incurring the costs associated with the proposed amendments. In calculating ROE, we make the conservative assumption that manufacturers will absorb all compliance costs without passing any of these costs on to the consumer. Our analysis found that the overall reduction in profitability ranges from 5.4 percent to about 24.2 percent, with an average reduction in profitability of about 14.8 percent. The ROE of about 24.2 percent combined the ROEs estimated from the first tier and second tier limits for the Multi-purpose Solvent and Paint Thinner categories. Thus, the potential exists that some businesses may experience a significant impact in their profitability. In light of this, the assessment of ROE requires further explanation.

The ROE for sample businesses complying with the proposed limit for Double Phase Aerosol Air Freshener, and the first tier limit for the Multi-purpose Solvent and Paint Thinner categories, declined by about 7.5 percent. This is not a significant change in the average profitability of typical businesses in California. In factoring in the second

tier limit for the Multi-purpose Solvent and Paint Thinner categories, however, we estimated the ROE to decline by up to 14.7 percent. The overall average reduction in profitability from complying with all of the VOC limits is 14.8 percent. Because of the predicted magnitude of the percent decline in profitability for Multi-purpose Solvent/Paint Thinner product manufacturers, we believe they will pass through to the consumer a portion, or all, compliance costs to maintain their profitability. We also would expect the impact on profitability to be lessened, to a degree, if we assume a normal growth pattern occurs for this affected industry sector, with the sales and profits increasing over time.

We believe that overall, most affected businesses profitability will not be adversely affected. If they are unable to absorb all or a portion of the compliance costs, these costs will be passed through to the consumer.

4. Impacts on California Businesses

Because we believe that manufacturers will pass their compliance costs onto the consumer, we believe the proposed amendments would not significantly alter the profitability of most businesses, as shown in our ROE analysis, we do not expect a noticeable change in employment; business creation; elimination or expansion; and business competitiveness in California. However, the proposed amendments may impose economic hardship on businesses with very little or no margin of profitability.

5. Increased Cost to Consumers and Licensed Contractors

As a result of this proposal, consumers may have to pay more for some products, depending on the extent to which manufacturers pass along their compliance costs. If all assumed compliance costs are passed on to the consumer, we estimate the cost per unit increase would range from negligible or no cost for a Double Phase Aerosol Air Freshener product to about $0.75 for a Multi-purpose Solvent/Paint Thinner product reformulated to meet both tiers of proposed VOC limits. The aforementioned costs do not include typical retail mark-up.

Because we expect that to maintain profitability (see ROE analysis) some businesses will pass on compliance costs to the consumer, we estimated the increased cost the consumer may experience. By apportioning annual sales of Multi-purpose Solvent/Paint Thinner products to the California population, we estimated that residents purchase less than one container of Multi-purpose Solvent/Paint Thinner product per year. Thus, considering normal retail mark-up, the consumers' cost increase to purchase a Multi-purpose Solvent/Paint Thinner product would increase by about $1.50 per gallon.

However, Multi-purpose Solvent/Paint Thinner products are more commonly purchased by contractors. If we apportion all sales of the Multi-purpose Solvent and Paint Thinner categories to licensed contractors, we estimate purchases of approximately five gallons per year, per contractor. Considering normal retail mark-up, the cost increase per

product to licensed contractors purchasing Multi-purpose Solvent/Paint Thinner products would be about $8 per year (CDCA, 2009).

6. Fiscal Impacts

No significant adverse economic impacts to any local or State agency were identified.

K. ENVIRONMENTAL IMPACTS

The proposed amendments to the Consumer Products Regulation are primarily designed to reduce VOC emissions. Therefore, implementing the proposed VOC limits would have an overall positive impact on the environment by reducing exposure to ground-level ozone. Other proposed amendments would either have no impact or would have beneficial impacts on the environment. No significant adverse impacts were identified.

We evaluated how the proposed amendments would impact ground-level ozone concentrations; particulate matter (particularly secondary organic aerosols); climate change; stratospheric ozone depletion; solid waste disposal; water quality; energy use; public safety; agricultural resources; and air toxic emission exposure. While no significant adverse impacts are expected, in instances where a potential adverse impact was identified, staff is proposing mitigation measures in accordance with CEQA or authority granted under AB 32. A complete analysis of the potential environmental impacts of the proposal is contained in Chapter VIII of the Technical Support Document.

The proposed amendments would result in a VOC reduction of about 14.7 tons per day by the end of 2013. Our qualitative health risk assessment concludes that because VOCs are ozone precursors, public health is further protected by reducing these emissions. The actual lowering of health risks has not been quantified. However, it has been estimated (Ostro *et al.,* 2006) that about 630 fewer premature deaths would occur each year in California from exposure to ozone if California were to attain the State ozone standard. The reductions resulting from this proposal would be an incremental step toward achieving the State ozone standard. Implementing the proposed VOC limits, however, could lead to potential adverse impacts. The potential impacts identified and measures to mitigate the impact follows.

1. Limit on Use of Global Warming Compounds

Several compounds with high global warming potentials could be used in reformulated products. For Double Phase Aerosol Air Freshener products, the use of VOC-exempt propellants such as hydrofluorocarbon (HFC) 152a and HFC-134a are reformulation options. For Multi-Purpose Solvent and Paint Thinner products, there is a slight possibility that solvents with high global warming potentials could be used. To minimize climate change impacts from implementing the proposed VOC limits, we are proposing to prohibit use of compounds with GWP values above 150 in Double Phase Aerosol Air Freshener, Multi-Purpose Solvent, and Paint Thinner products. These provisions are

proposed in subsections 94509(t) and 94509(u). This proposal would allow use of the propellant HFC-152a in Double Phase Aerosol Air Freshener. However, the proposed VOC limit for this category is feasible without the use of this compound.

2. Potential Toxics Impacts

In the Survey Update, no use of methylene chloride, perchloroethylene, or trichloroethylene was reported for Multi-purpose Solvent and Paint Thinner products. However, use of these chlorinated TAC solvents, particularly the VOC-exempt compounds methylene chloride and perchloroethylene, is a potential option as products are reformulated to comply with the proposed limits. Therefore, to ensure that the public is not exposed to these chlorinated TAC solvents from use of Multi-purpose Solvent and Paint Thinner products, we are proposing in new section 94509(u), to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene in Multi-purpose Solvent and Paint Thinner products. No adverse impacts on other media are expected from this proposal.

3. Photochemical Reactivity Considerations

During development of the proposal for Multi-purpose Solvent and Paint Thinner products, we evaluated the reduction in ozone forming potential that would occur from implementation of the first tier 30 percent by weight VOC limit and the second tier 3 percent by weight VOC limit. This analysis showed that some reformulation options could result in products with higher ozone forming potential, which could erode the expected air quality benefits. To ensure that predicted reductions in ozone forming potential occur, we are proposing to limit the VOC aromatic compound content of products to 1 percent by weight. This proposal would not result in further VOC mass reductions, but would result in further reducing the ozone formation potential of reformulated products.

4. Safety

Reformulations of Multi-purpose Solvent and Paint Thinner products could result in increased fire hazards should manufacturers choose to reformulate using highly flammable solvents such as acetone or methyl acetate, both exempt VOCs. Several amendments are proposed to mitigate this potential hazard. First, new provisions are proposed in subsection 94512(e). This provision would apply to Multi-purpose Solvent and Paint Thinner products required to be labeled “Flammable” or “Extremely Flammable,” to comply with federal regulations. As proposed, these products would not be able to display a general name on the principle display panel, such as “Paint Thinner;” “Multi-purpose Solvent;” “Clean-up Solvent;” “Paint Clean-up;” or other similar name. Manufacturers may choose to sell a “Flammable” or “Extremely Flammable” product with one of these general names if they do one of the following: provide an attached hang tag or sticker that includes the statement “Formulated to meet California VOC limits, see warnings on label;” or display on the principle display panel, in a font size as large as or larger than any other words on the panel, the common name of the

chemical compound that results in the product meeting the criteria for “Flammable” or “Extremely Flammable.”

Additionally, to potentially minimize the increased fire hazard from the use of Multi-purpose Solvent and Paint Thinner products, we are proposing an effective date of December 31, 2013 for the second tier VOC limit. This additional compliance time is provided to allow for development of additional reformulation technologies and development of potentially less flammable products. We will assess progress of development of low VOC, less flammable products through a technical assessment prior to the effective date of the second tier limit. This is described below in “Technical Assessment.”

We are also proposing to temporarily exempt very small (eight fluid ounces or less) containers of Paint Thinner from compliance with the VOC limit until December 31, 2013. This measure is designed to allow consumers to purchase currently marketed Paint Thinner products to be used with previously purchased solvent-borne paints. This should further reduce potential fire hazards. Also, absent this provision, these paint products could be discarded, resulting in increasing solid or hazardous waste disposal or adversely affecting water quality. Therefore, this proposal is designed to mitigate these potential consequences.

5. Technical Assessment

As described above, several adverse impacts could occur as products reformulate to meet the proposed VOC limits, particularly the second tier VOC limit for Multi-purpose Solvent and Paint Thinner products. Because of this, we believe that an assessment of reformulations should be conducted prior to the December 31, 2013 effective date. As proposed in new subsection 94513(g), Multi-purpose Solvent and Paint Thinner manufacturers would be required to supply formulation data and detailed written updates on research and development efforts undertaken to achieve compliance with the second tier, 3 percent by weight VOC limit. These data will enable staff to perform a technology assessment in mid-2012 to evaluate manufacturers’ progress toward meeting this limit. We also intend to evaluate the safety and ozone forming potential of reformulation options, and, if necessary propose further measures to ensure that ozone reduction benefits occur and that fire hazards are minimized.

L. ENVIRONMENTAL JUSTICE

This proposal is consistent with the ARB’s Environmental Justice Policy to reduce health risks in all communities, including low-income and minority communities. Generally, use of consumer products is fairly uniform across the State, tracking with population, and their emissions are spread over the course of a day, rather than concentrated at a particular time of day. For these reasons, we do not believe that people of any given race, culture, or income would be more impacted than any others would. All Californians should benefit equally from the reduction in VOC emissions from the consumer product categories proposed for regulation.

M. FUTURE PLANS

Future activities include continued review of the 2006 Consumer and Commercial Products Survey. This survey will serve as the basis for additional VOC and GHG reductions measures for consumer products. Additional reductions are needed to meet consumer product VOC reduction commitments in the Strategy and to reduce the GWP of consumer products, under AB 32.

During 2009, we are conducting a risk assessment regarding public exposure to the potentially toxic compounds xylenes, toluene, dibutyl phthalate, and formaldehyde in nail coating formulations used in nail salons. Air quality modeling is being done to estimate outdoor exposure to these compounds from an individual business, as well as, cumulative emissions from multiple facilities.

The Paint Remover/Stripper category will also be evaluated during 2009 for potential VOC and toxic air contaminant reductions upon the completion of the 2006 Consumer and Commercial Products Survey Data Summaries.

Non-aerosol General Purpose Cleaners, General Purpose Degreasers, Glass Cleaners, and aerosol Furniture Maintenance Products are under evaluation for further regulation. Part of this evaluation is to determine if potential adverse impacts would result from the use of predicted reformulations used to comply with proposed lower VOC limits. We are working with Office of Environmental Health Hazard Assessment staff to develop health values for various LVP-VOC glycol ethers that could be used in reformulated products. We are also working with State Water Resources Control Board staff to evaluate water quality impacts from use of cleaning products. Of particular concern is a family of surfactants, the alkylphenol ethoxylates. Evidence indicates these surfactants are toxic to aquatic organisms, with the main concern being the estrogenic effects of their degradation products. Upon completion of this evaluation, we intend to propose to the Board in 2010, new limits for these categories, which we expect to achieve 5 – 8 tons per day VOC reductions toward the consumer products commitment in the Strategy.

Sales and formulation information for Dry Clean Only Spot Removers obtained from a separate survey sent out to dry cleaning chemical manufacturers on January 14, 2009, is currently being evaluated. This evaluation will enable staff to determine if reductions of VOCs and/or TACs from Dry Clean Only Spot Removers is feasible.

N. RECOMMENDATION

We recommend that the Board adopt the proposed amendments to the Consumer Products Regulation and Method 310.

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Appendix A

Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulations

Technical Support Document

I. INTRODUCTION

A. OVERVIEW

In this rulemaking, California Air Resources Board (ARB or Board) staff is proposing amendments to the Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation) and to Method 310 – Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products (Method 310). The amendments are designed to reduce VOC emissions. The proposed amendments would set new VOC limits for Multi-purpose Solvent and Paint Thinner products and lower the existing VOC limit for Double Phase Aerosol Air Fresheners. When fully implemented, about 14.7 tons per day of VOC emission reductions would be achieved by December 31, 2013. We are proposing to prohibit the use of the toxic air contaminants methylene chloride, perchloroethylene, and trichloroethylene in Multi-purpose Solvent and Paint Thinner products. In addition, the aromatic content would be limited to 1 percent in these categories. Compounds with high global warming potential (GWP) would be prohibited, under the proposal, in all three of the categories proposed for regulation.

The proposed amendments to reduce VOC emissions would partially fulfill the consumer product reduction commitment contained in the State Strategy for California's 2007 State Implementation Plan. The proposed toxic compound prohibition and the GWP limit are mitigation measures designed to ensure that exposure to chlorinated solvents and climate change impacts are minimized, respectively, as products are reformulated to meet new VOC limits. The limitation on the use of aromatic compounds is proposed to ensure that reductions of ozone generated from Multi-purpose Solvent and Paint Thinner products being reformulated to meet the mass VOC limits occur as predicted. The amendment to Method 310 is to add new language that would clarify analytical methods used to test low VOC or high water content consumer products.

This Technical Support Document, Appendix A, is ARB staff's technical justification and analysis of the proposed amendments. It is part of the Initial Statement of Reasons (ISOR) for Proposed Amendments to the California Consumer Products Regulations. The proposed amendments can be found in Appendix B of this document.

Included in this Technical Support Document is the following information:

- background information on the consumer products program related to the control of VOC and GHG emissions;
- information on the process used to develop the proposed amendments;
- an assessment of why the proposed amendments meet the requirements of State law;
- a review of the emissions from the categories proposed for regulation and the overall need for the emission reductions;

- a description of the proposed amendments;
- an analysis of the estimated economic and environmental impacts of the proposed amendments; and
- a summary of future activities.

B. ENABLING LEGISLATION

In 1988, the California Clean Air Act (CCAA or "the Act") became law and was enacted to address the State's serious air pollution problems and the inability of many areas in California to attain the State and federal ambient air quality standards. The CCAA added section 41712 to the California Health and Safety Code. Section 41712, along with subsequent amendments, requires ARB to adopt regulations to achieve the maximum feasible reduction in VOC emissions from consumer products. Prior to adoption, the Board must determine that adequate data exist to establish that the regulations are necessary to attain State and federal ambient air quality standards. The regulations must also be commercially and technologically feasible.

Section 41712 defines a consumer product as a chemically formulated product used by household and institutional consumers. Consumer products include, but are not limited to: detergents; cleaning compounds; air fresheners; polishes; floor finishes; paint thinner; multi-purpose solvents; cosmetics; personal care products such as antiperspirants and hairsprays; home, lawn, and garden products; disinfectants; sanitizers; automotive specialty products; and aerosol paints. Other paint products, such as furniture or architectural coatings, are not part of ARB's consumer products program because local air districts regulate them.

The Act further stipulates that regulations adopted must not eliminate any product form, and that recommendations from health professionals be considered when developing VOC control measures for health benefit products. Health and Safety Code section 41712, gives ARB authority to control emissions from a very diverse number of products sold statewide to household, commercial and institutional consumers. The primary goal of this section was to set forth a program to reduce ground-level ozone concentrations, as part of the overall effort to attain ambient air quality standards.

In 2006, Assembly Bill (AB) 32 was signed into law. This law created a comprehensive, multi-year program to reduce global warming compound emissions in California. AB 32 added section 1 division 25.5 (commencing with section 38500) to the California Health and Safety Code. These sections require ARB to develop regulations and consider market mechanisms that will ultimately reduce California's GHG emissions equivalent to the 1990 baseline year by 2020. Among other things, AB 32 requires ARB to make immediate progress towards the reduction of GHG emissions. Specific Discrete Early Action Measures were to be identified and regulations for the identified sources are to be adopted and enforceable by January 1, 2010. Beyond the requirements of AB 32, the Governor's Executive Order EO-S-03-05 calls for an 80 percent GHG reduction from 1990 levels by 2050.

C. BACKGROUND

1. Existing Consumer Product Regulations

To date, the Board has taken numerous actions to fulfill the legislative mandate pertaining to the regulation of VOCs in consumer products, including antiperspirants, deodorants, and aerosol coating products. Three regulations have been adopted that affect 125 consumer product categories by setting 174 VOC limits. These limits have resulted in reducing emissions by about 200 tons per day, an overall 44 percent reduction in VOC emissions.

We have also reduced exposure to toxic air contaminants (TAC). Emissions of TACs have been reduced by 13 tons per day by prohibiting use of certain chlorinated compounds in 63 categories.

In addition, two voluntary regulations, the Alternative Control Plan and the Hairspray Credit Program have been adopted to provide compliance flexibility to companies. The five consumer product regulations are codified in title 17, California Code of Regulations, sections 94500 to 94575:

- Antiperspirants and Deodorants (Article 1, sections 94500-94506.5);
- Consumer Products (Article 2, sections 94507-94517);
- Aerosol Coating Products (Article 3, sections 94520-94528);
- Alternative Control Plan (Article 4, sections 94540-94555); and
- Hairspray Credit Program (Article 5, sections 94560-94575).

Regulation of consumer products began in 1989 with adoption of the Antiperspirants and Deodorants Regulation. The “general” Consumer Products Regulation was approved in 1990 and has been amended numerous times. The most recent amendments to the Consumer Products Regulation were approved June 26, 2008 (ARB, 2008e). At the June hearing, the Board approved amendments that would set new or lower VOC limits for 19 categories of consumer products. These approved amendments will reduce VOC emissions by an additional 5.8 tons per day statewide when fully effective. Also at the June hearing, the Board approved amendments that would prohibit use of certain chlorinated compounds in an additional seven categories of consumer products. These approved amendments will reduce TAC emissions by an additional 0.2 tons per day when fully effective. The Aerosol Coatings Regulation was adopted in 1995 and was amended in 2000. A complete summary of consumer products program regulatory actions with dates of regulatory amendments are provided in Appendix C.

2. Consumer Products and the State Implementation Plan (SIP)

a. State Implementation Plans

Federal clean air laws require areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide and inhalable particulate matter to develop State Implementation Plans (SIPs) describing how they will attain national ambient air quality standards (NAAQS).

A SIP is a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), local air district rules, and State and federal regulations. Many of California's strategies apply statewide, including emission standards for cars and heavy-duty trucks, fuel regulations, and limits on emissions from consumer products. State law designates ARB as the lead agency for all purposes related to the SIP. Local air districts and other agencies, such as the Department of Pesticide Regulation, prepare SIP elements and submit them to ARB for review and approval. ARB forwards SIP revisions to the United States Environmental Protection Agency (U.S. EPA) for approval and publication in the Federal Register. The Code of Federal Regulations (CFR) Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items which are included in the California SIP. Some California SIP submittals are pending U.S. EPA approval.

Consumer product VOC emissions are known to contribute to concentrations of both ground-level ozone and particulate matter with diameters of 2.5 micrometers or less ($PM_{2.5}$). The link between consumer product VOC emissions and ground-level ozone concentrations is well-established. However, their impact on $PM_{2.5}$ concentrations is less clear. Because VOCs are ozone precursors, specific consumer product control measures have been developed related to ozone control. These measures have been included in SIPs. For this reason, our summary here focuses on consumer product strategies that have been, and are, designed to meet ambient air quality standards for ozone.

b. 1994 California State Implementation Plan for Ozone

On November 15, 1994, ARB adopted the California State Implementation Plan for Ozone (1994 SIP). This plan included measures designed to meet the previous federal peak one-hour ozone standard of 0.12 parts per million (ppm). Achieving significant VOC reductions from consumer products was a key element of the 1994 SIP. Several rulemakings were proposed and adopted to work toward meeting the SIP commitment.

c. 2003 State and Federal Strategy and 2003 South Coast SIP

On October 23, 2003, the ARB adopted the 2003 Statewide Strategy, which identified the Board's near term regulatory agenda to reduce ozone and particulate matter and to adopt new measures for each year from 2003 to 2008. The ozone control elements were again designed toward attaining the federal one-hour ozone standard.

The 2003 SIP contained two measures for consumer products. These measures were designated as CONS-1 and CONS-2. The CONS-1 measure was designed to achieve VOC emission reductions from consumer products of at least 2.3 tons per day in the South Coast Air Basin and 5.3 tons per day statewide by 2010. On June 26, 2004, the Board approved a CONS-1 measure (the "2004 Amendments"), which will achieve 3.0 tons per day in VOC emission reductions in the South Coast Air Basin by 2010, and achieve 6.9 tons per day in VOC emission reductions statewide by 2010 (ARB, 2004b). The CONS-1 measure became legally effective on June 20, 2005. As of this writing, all but one of the CONS-1 VOC limits are in full effect. The CONS-1 commitment has been fulfilled.

The ARB also committed to present new consumer product category limits to the Board between 2006 and 2008 to achieve VOC emission reductions from consumer products of between 8.5 tons per day and 15 tons per day in the South Coast Air Basin by 2010. Statewide, the CONS-2 measure was to achieve 20-35 tons per day in emission reductions by 2010. Amendments to the Consumer Products Regulation in 2006, which will result in reductions of 4.9 tons per day in South Coast and 11.5 tons per day statewide, partially fulfilled this commitment (ARB, 2006a).

The 2003 SIP was withdrawn from consideration and is no longer in effect. However, the remaining commitment from the CONS-2 measure has been incorporated in the 2007 Strategy commitment which is described below.

d. State Strategy for California's 2007 State Implementation Plan (Strategy)

In July 1997, U.S. EPA established a new federal ozone standard. As opposed to a one-hour peak ozone standard, the new ozone standard established a limit of 0.08 ppm averaged over eight hours (U.S. EPA, 1997). On April 15, 2004, U.S. EPA designated 15 areas as non-attainment in California for the eight-hour ozone standard (ARB, 2008e). Many, but not all of these areas were also designated as non-attainment for the federal one-hour standard. New non-attainment areas include a number of rural Sierra Nevada foothill counties and additional parts of the Sacramento Valley. The one-hour standard was revoked on June 15, 2005, one year after the effective date of the new designation, and SIPs showing how each area will meet the eight-hour standard were submitted to U.S. EPA in 2007.

To address the eight-hour standard, the Strategy was adopted at the September 25, 2007, Board hearing (ARB, 2007d). The Strategy describes the scope of the State's ozone and $PM_{2.5}$ non-attainment problems and sets forth ARB's plan on how California can comply with federal standards. This is a comprehensive Strategy designed to attain federal air quality standards through technologically feasible, cost effective, and far reaching measures.

The Strategy is the first plan designed to show how California will meet the national eight-hour ozone standard. Because the eight-hour standard is more stringent than the one-hour standard, U.S. EPA set presumptive deadlines that allow more time for

attainment. Nonetheless, the measures California has adopted to meet the one-hour standard remain in place and will deliver substantial new reductions over the next few years.

Specific to consumer products, in the Strategy, ARB committed to reducing consumer product VOC emissions statewide by 30 to 40 tons per day by 2014. The amendments approved at the June 26, 2008, hearing will provide about 4.5 tons per day toward meeting the commitment. An additional 1.3 tons per day of VOC emission reductions will occur by the end of 2015.

Further reductions from consumer products are important because VOC emissions from consumer products are predicted to become the largest source of VOC emissions in the South Coast Air Basin, and the third largest source in the San Joaquin Valley Air Basin by 2020. The Strategy, in combination with local actions, provides emission reductions necessary to meet the eight-hour ozone standard in these two most challenging regions.

VOC reductions from consumer products are becoming more difficult to achieve. In light of this, the Strategy includes a commitment to explore innovative reduction strategies in the longer term. One such measure would include investigating emission reduction opportunities through reactivity-based standards. A reactivity-based approach relies on the scientific principle that different chemical compounds react to form different amounts of ozone in the atmosphere. Reactivity-based standards reduce emissions of the most photochemically reactive compounds.

Alternative market-based mechanisms would also be explored to encourage the development, distribution, and purchase of cleaner, very low, or zero VOC emitting products. Examples of mechanisms to explore are an environmental product labeling program, programs where companies set their own emission reduction goals, and the use of print and broadcast media for public education. If these mechanisms cannot produce meaningful emission reductions from the consumer products source category, then other approaches would be evaluated. Some of these other approaches include the purchase of VOC emission reduction credits; and funding of special projects to reduce emissions or accelerate reductions from pollution sources outside of the consumer products industry.

e. Future State Implementation Plans

Up-to-date information on SIP activities can be found on ARB's website at: http://www.arb.ca.gov/planning/sip/sip.htm. ARB staff proposes to revise the 2007 SIP as may be appropriate in a 2010 mid-course review SIP update to: reflect the emission benefits of newly adopted regulations; provide more detail on the State's intended actions to fulfill the commitment to achieve emission reductions in total by specific dates; update as necessary the emissions inventories for federal ozone and $PM_{2.5}$ non-attainment areas; and revise as necessary other plan aspects, including motor vehicle emissions budgets. The 2010 mid-course review may show the need for additional

emission reductions from consumer products.

On March 12, 2008, U.S. EPA reduced the eight-hour "primary" ozone standard to a level of 0.075 ppm. U.S. EPA also strengthened the secondary eight-hour ozone standard to the level of 0.075 ppm, making it identical to the revised primary standard. The final rule became effective on May 27, 2008. These changes will require that new SIPs be drafted. A complete new state strategy will be developed for 2013. The 2013 SIP will likely require more VOC reductions from consumer products.

3. Consumer Products and the California Global Warming Solutions Act of 2006 (AB 32)

Various consumer products may contain GHGs in their formulations. Most often these GHGs are propellants such as hydrofluorocarbons (HFCs) and carbon dioxide (CO_2). To a lesser extent some GHGs are used as solvents.

As mentioned earlier, AB 32 requires immediate progress, described as Discrete Early Action Measures. ARB was required to identify measures and adopt regulations to reduce GHG emissions, that would be enforceable by January 1, 2010. ARB has since approved those early measures and incorporated them into California's Climate Change Scoping Plan (Scoping Plan) that was approved by the Board in December 2008. Reduction of compounds with high global warming potential (GWP) used in consumer products was designated a Discrete Early Action Measure. Therefore, as an approved measure, ARB staff has committed to eliminate or reduce the use of GHG compounds with high GWP that are used in consumer products.

The GHG emission reduction from consumer products is estimated to be 0.25 million metric tons of carbon dioxide (CO_2) equivalents or more, if feasible. The amendments approved at the June 26, 2008, Board hearing will provide about 0.23 million metric tons of CO_2 equivalents per year toward meeting the estimated feasible reduction target. In this rulemaking, we are proposing GWP limits as mitigation measures to ensure that GHG emission do not increase. These measures will not provide additional GHG reductions. However, from information we have gathered from consumer product surveys, we are currently evaluating whether GHG emission reductions from other consumer product categories are feasible. Based on this evaluation, staff may propose additional GHG reduction measures in future rulemakings.

4. National Consumer Products Regulations

On September 11, 1998, U.S. EPA promulgated a national consumer products regulation, the "National Volatile Organic Compound Emission Standards for Consumer Products (40 CFR Part 59, Subpart C, Sections 59.201 et seq.)." This action set national VOC emission standards for 24 categories of consumer products. The regulation became effective on September 11, 1998, and the VOC limits became effective on December 10, 1998. There are similarities and differences between the

California and national consumer products regulations; however, the national regulation does not preclude states from adopting more stringent regulations.
In 2006, U.S. EPA began work on amendments to their existing national consumer products regulation. Their amendments are based on California's CONS-1 (2004 Consumer Products Regulation Amendments) categories and limits. The amendments are expected to become effective in 2009, with a compliance date of January 2010.

U.S. EPA has also recently promulgated a national regulation for aerosol coatings (spray paints) based on ARB's Aerosol Coatings Regulation. This is a reactivity-based regulation. The national aerosol coatings regulation was promulgated on March 24, 2008. The compliance date is currently being amended to July 1, 2009, (U.S. EPA, 2008).

The national consumer products regulation is similar in many aspects to the California regulation. However, even after the federal 2009 amendments become effective; it will still be less effective in reducing VOC emissions from consumer products. The national regulation does not regulate a number of product categories that are currently regulated under the ARB regulation. For the categories that are regulated under both regulations, many of ARB's limits are more stringent than the federal limits. Therefore, ARB's consumer products regulations have achieved significant additional reductions over those that would be achieved by federal regulation alone.

The federal regulation also does not prohibit the use of certain toxic air contaminants. The California Consumer Products Regulation already includes prohibitions on the use of certain toxic air contaminants in 70 categories, including the amendments approved at the June 26, 2008, Board hearing, resulting in a reduction of toxic compound emissions of over 13 tons per day.

Because California has unique air quality problems, reducing VOC emissions from all categories, including consumer products, to the maximum extent feasible, is necessary to attain the federal and State ambient air quality standards for ozone.

As of the date of this staff report, there are no national consumer products regulations related to reducing GHG emissions.

REFERENCES

1. Air Resources Board. Initial Statement of Reasons for Proposed Rulemaking Proposed Amendments to the California Consumer Products Regulation. May 9, 2008. (ARB, 2008e)

2. Air Resources Board. Technical and Clarifying Modifications to April 26, 2007 Revised Draft Air Resources Board's State Strategy for California's 2007 Implementation Plan. Released April 26, 2007. Adopted by the Air Resources Board on September 27, 2007. (ARB, 2007d)

3. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation. September 29, 2006. (ARB, 2006a)

4. Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004. (ARB, 2004b)

5. United States Environmental Protection Agency. National Volatile Organic Compound Emission Standards for Aerosol Coatings; Direct Final Rule. (40 CFR Parts 51 and 59) Federal Register: March 24, 2008. Volume 73. Number 57. (U.S. EPA, 2008)

6. United States Environmental Protection Agency. National Ambient Air Quality Standards for Ozone; Final Rule. Federal Register: July 18, 1997. Volume 62. Number 138: 38855-38896. (U.S. EPA, 1997)

II. DEVELOPMENT OF PROPOSED AMENDMENTS

This chapter contains a description of the public process used to develop the proposed amendments. The Administrative Procedure Act (APA) (Government Code section 11340 *et seq*.) requires that development of regulations must allow for public input. This chapter also describes our evaluation of emission reduction opportunities, and alternatives to the final proposal that were considered.

A. PUBLIC PROCESS FOR DEVELOPING PROPOSED LIMITS

In order to involve the public, the Consumer Products Regulation Workgroup (CPRWG), was reconvened in 2004. Participation in the CPRWG was, and continues to be open to any member of the public. The CPRWG participated in the development of the 2006 Consumer and Commercial Products Survey (2006 Survey), which serves as the basis for portions of this proposal (ARB, 2007f). The CPRWG was also involved in the development of these proposed amendments.

Further outreach, beyond the CPRWG, was conducted to identify and involve stakeholders in the development of the proposed paint thinner and multi-purpose solvent amendments. As part of the process, in November 2008, ARB conducted a survey update for the Paint Thinner and Multi-purpose Solvent categories (ARB, 2008f). The intent of the survey update was to obtain sales data for the 12-month period starting from October 1, 2007, through September 30, 2008. The survey was conducted in response to comments from stakeholders that indicated the market for Multi-purpose Solvents and Paint Thinners had changed since our 2003 Consumer and Commercial Products Survey.

Consumer product manufacturers, chemical producers, marketers, trade associations, consultants, and various other stakeholders listed below, have actively participated in the process.

- American Chemistry Council
- Coalition for Clean Air
- Consumer Specialty Products Association
- Environmental Working Group
- Institute for Research and Technical Assistance
- National Aerosol Association
- National Paint and Coatings Association
- Office of the State Fire Marshal
- Western Aerosol Information Bureau

Representatives from local air districts and agencies, including the South Coast Air Quality Management District and the United States Environmental Protection Agency were also involved in the process.

ARB staff maintains a mailing list of over 5,000 companies and interested parties, including environmental and community organizations, which received information throughout the development of the proposed amendments. We have established an electronic list serve for ARB's Consumer Products Program, which has over 1,300 subscribers, to allow subscribers to receive timely, pertinent information. We also have a consumer products program public website with a webpage for the 2009 Consumer Products Regulatory Work Group Activity.

An initial public meeting was held in August of 2008 to announce to interested parties ARB's intent to regulate the products affected by this proposal. On March 30, 2009, staff posted draft volatile organic compound (VOC) limits and definitions for the categories proposed for regulation to the website. The data and proposals were discussed at a public workshop on April 1, 2009. At the meeting, staff discussed the draft regulatory categories, proposed limits, and the rulemaking timeline. The meeting served as a forum for stakeholder comments on the proposals and schedule. A second public workshop for this rulemaking is scheduled for early August 2009 to seek further input on the staff's proposal.

To solicit additional information and comments, numerous individual meetings and teleconferences were held with stakeholders. At several of these meetings, which were requested by industry associations, interested parties presented technical information related to reformulation of products. We also reviewed survey data, and researched technical literature, patents, and trade journals during the development of this proposal.

B. STAFF EVALUATION OF EMISSION REDUCTION OPPORTUNITIES

Development of the proposed amendments began with review of the data submitted for the categories proposed for regulation. These data were reported as part of the 2006 Survey and the 2008 Paint Thinner and Multi-purpose Solvent Survey Update (Survey Update). Over 570 companies responded to the surveys with information on over 12,000 products (ARB, 2007f). The 2006 Survey was designed to obtain the comprehensive information necessary to develop new consumer product emission standards that together would achieve a minimum VOC emission reduction of 30 to 40 tons per day by 2014, and GHG emission reductions equivalent to reducing an estimated 0.25 million metric tons of CO_2 (MMT CO_2e) by 2020. The Survey Update was designed to obtain sales data for the 12 month period starting from October 1, 2007, through September 30, 2008.

In addition to the survey data and staff's research, the proposal also considered technical information provided by interested parties. During the workgroup and workshop process, we presented specific proposals and alternatives to the public for consideration. Modifications were made to the original proposal after consideration and evaluation of comments.

C. ALTERNATIVES CONSIDERED

Government Code section 11346.2 requires ARB to consider and evaluate reasonable alternatives to the proposed regulation and provide reasons for rejecting those alternatives. We identified three alternative approaches to the current proposal: "No Action," "Set Different Limits," and "Set Limits for Different Categories."

1. Alternative One – No Action

A "No Action" alternative would be to forego adopting the proposed amendments, or delay adoption of the proposed measures. The "No Action" alternative would result in failing to make progress toward meeting our SIP commitments (see Chapter I, Introduction). In the case of not meeting the SIP commitments, there is a potential for loss of federal funds. The citizens of California would not benefit from the improved air quality that would result from the reduction of emissions being proposed. This alternative would have no cost to business.

2. Alternative Two – Set Different Limits

As was discussed in section B above, we thoroughly evaluated each category for which a limit is proposed. Limits were proposed based on low emitting technologies reported in the 2006 Survey and Survey Update. Stakeholders provided additional information pertinent to the categories and, in some cases, proposed alternative limits. We evaluated all comments and determined the most feasible limit and effective dates from all of the alternatives proposed or considered. The final proposal contains limits that were determined to obtain the maximum feasible reduction, were commercially and technologically feasible, preserved product forms (as required by Health and Safety Code Section 41712), and together achieved the necessary emission reductions to partially fulfill ARB's SIP commitments.

3. Alternative Three – Set Different Effective Dates

For the Multi-purpose Solvent and Paint Thinner categories, a specific alternative we analyzed was to propose the same VOC limits and time frames that the SCAQMD approved in March 2009 under Rule 1143, Consumer Paint Thinners and Multi-purpose Solvents. Rule 1143 contains two tiers of VOC limits, virtually equivalent to our proposed limits. However, the effective dates are significantly different; Rule 1143 being January 1, 2010, and January 1, 2011 for the first and second tier VOC limits respectively, while our proposed effective dates are December 31, 2010 and December 31, 2013. In our proposal, we are providing one additional year for manufacturers to meet the first tier limit simply due to the time necessary for State regulations to become legally effective, per State law, compared to the shortened time frame for local air district rules to become legally effective.

For the second tier limit, we believe it has not been demonstrated that products meeting the 3 percent VOC limit will function as paint thinners for all solvent-borne coatings

available in commerce. While we are encouraged about the future viability of low VOC thinners, such as soy based products, it has not yet been demonstrated that they are ready for introduction into the market. There is still a need for paint thinners that are compatible with solvent-borne coatings, for a period of time, in areas of the State other than SCAQMD because SCAQMD has more stringent VOC coating limits than many other areas of the state. Therefore, we determined it was appropriate that the second tier, 3 percent VOC limit be effective December 31, 2013, giving manufacturers ample time to develop low VOC thinners that are compatible with solvent-borne coatings.

Additionally, the second tier limit could lead to an increase in sales of extremely flammable products, such as acetone. An acetone-based product labeled "Paint Thinner," will be formulated differently than the former "Paint Thinner" product and will behave differently than what the household consumer is used to. Without enough lead time for manufacturers, we are concerned that acetone products will be the most likely of a limited number of known pathways to compliance. To allow ample time for development of less flammable, and/or less costly alternatives, we are proposing an effective date of December 31, 2013 for the 3 percent VOC limit.

4. Alternative Four – Set Limits for Different Categories

The proposed categories, for this current action, include three categories that were deferred during the June 2008 Amendments to the California Consumer Products Regulation, because at the time, staff could not set limits and demonstrate that the limits were commercially or technologically feasible without further investigation.

For this current action, staff is proposing new or lower VOC limits for three categories that would achieve the maximum feasible reductions, and partially fulfill ARB's SIP commitments. It should be noted that ARB has already set 174 VOC limits which, when fully effective, will have resulted in reducing emissions by about 200 tons per day, an overall 44 percent reduction in VOC emissions from consumer products. Additional product categories surveyed in the 2006 Survey will be evaluated for future regulatory action.

REFERENCES

1. Air Resources Board. Paint Thinner and Multi-purpose Solvent Survey Update. November 4, 2008. (ARB, 2008f)

2. Air Resources Board. 2006 Consumer & Commercial Products Survey. July 24, 2007. (ARB, 2007f)

III. STATUTORY REQUIREMENTS FOR EMISSION REDUCTIONS

In this chapter, we describe State law requirements related to setting volatile organic compound (VOC) limits, and how our proposals meet these criteria. We also provide information related to the number of complying products and the marketshare they hold, which indicates that the limits are commercially and technologically feasible within the timeframes provided.

A. VOC REDUCTIONS

Health and Safety Code section 41712 gives ARB authority to control emissions from a very diverse number of products sold statewide to household and commercial consumers. By law, “Consumer Product" means a chemically formulated product used by household and institutional consumers, including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings.

Section 41712 requires the Board to adopt regulations to achieve the maximum feasible reduction in VOCs emitted by consumer products after making certain determinations. Prior to adoption, the Board must determine that adequate data exist to establish that the regulations are necessary to attain State and federal ambient air quality standards and the regulations are commercially and technologically feasible, and necessary. Amendments to section 41712 in 1996 specified that regulations adopted by the Board cannot result in the elimination of a product form. Product form refers to the shape and/or structure of the product such as liquid; solid; powder; gel; crystal; aerosol; or pump spray.

The Board must consider the effect that the limits or requirements proposed for health benefit products will have on the efficacy of those products in killing or inactivating agents of infectious diseases such as viruses, bacteria, and fungi. In this regard, the Board must consult with health professionals when developing VOC control measures for health benefit products.

The Board must also meet its obligations under the State Implementation Plan (SIP). ARB’s SIP commitments are described in both the Executive Summary and in Chapter I.

Related to VOC reductions, Chapter IV describes why the proposed amendments are necessary to attain ambient air quality standards, and why the data are adequate to adopt the proposed limits. Our focus in this chapter is on why the proposed VOC limits are commercially and technologically feasible. During the early development of consumer product regulations, guidelines were established to ensure that these statutory criteria were met when setting limits. These guidelines and statutory criteria were followed in developing the proposed amendments. Section C, below, describes

the terms “technologically feasible” and “commercially feasible,” as they relate to VOC reductions.

B. GREENHOUSE GAS REDUCTIONS

Assembly Bill 32 (AB 32) was signed into law in 2006. It is codified in Health and Safety Code section 38500 *et. seq*. These sections require ARB to develop regulations and consider market mechanisms that will ultimately reduce California’s greenhouse gas emissions equivalent to the 1990 levels by 2020. It required ARB to identify a list of “discrete early action greenhouse gas reduction measures” by June 30, 2007. Once on the list, these measures are to be developed into regulatory proposals, adopted by the Board, and made legally enforceable (approved by Office of Administrative Law) by January 1, 2010. Reduction of compounds with high GWP that are used in consumer products was designated as one of these measures, and became part of the State’s comprehensive strategy when the Board approved the Scoping Plan on December 12, 2008.

In accordance with section 38562, certain criteria are to be met in developing regulations to meet GHG reduction goals. Among other things, the regulations must be equitable, minimize costs, and maximize the benefits to California. The GHG regulations are also required to be technologically feasible and cost-effective. AB 32 requires ARB to identify and evaluate emission reduction and mitigation opportunities for anthropogenic non-CO_2 GHGs such as sulfur hexafluoride (SF_6) and hydrofluorocarbons (HFC).

For this rulemaking, we evaluated the potential use of GHGs as products are reformulated to meet the VOC limits. As we found that there existed a possibility that high GWP compounds could be used, we are proposing mitigation measures.

C. TECHNOLOGICAL AND COMMERCIAL FEASIBILITY OF VOC LIMITS

The proposed VOC limits were set based on the lower VOC content technologies existing within a product category, or are based on low emitting technology transfer from other products. In doing this, staff made sure that the various product forms within each category would be preserved. For the categories proposed for regulation, there are products on the market which currently comply. Where there is low complying market share, lower emission technology exists that can provide a pathway for compliance.

1. Technologically Feasible

Health and Safety Code section 41712(b) requires that the Board adopt consumer product regulations that are “technologically feasible.” Technological feasibility is a different concept than "commercial feasibility," and does not take into account the cost of reformulating a product. We believe that a proposed limit is technologically feasible if it meets at least one of the following criteria: (1) the limit is already being met by at

least one product within the same category, or (2) the limit can reasonably be expected to be met in the time frame provided through additional development efforts.

In setting the proposed VOC limits, an effort was made, wherever possible, to ensure that multiple reformulation technologies exist which would allow products to comply. Proposed limits were set at VOC levels that staff determined could be met without increased use of toxic air contaminants, greenhouse gases, or ozone-depleting compounds. General reformulation options include addition of exempt solvents such as acetone, use of low vapor pressure (LVP)-VOC solvents, use of VOC exempt propellants, increased use of surfactants, and use of inorganic compounds.

2. Commercially Feasible

Health and Safety Code section 41712(b) also requires the Board to adopt consumer product regulations that are "commercially feasible." The term "commercially feasible" is not defined in State law. In interpreting this term, the staff has utilized the reasoning employed by the United States Court of Appeals for the District of Columbia in interpreting the federal Clean Air Act. In the leading case of International Harvester Company v. Ruckelshaus, (D.C. Cir. 1973) 478 F. 2d 615, the Court held that the U.S. EPA could promulgate technology-forcing motor vehicle emission limits which might result in fewer models and a more limited choice of engine types for consumers, as long as the basic market demand for new passenger automobiles could be generally met.

Following this reasoning, we have concluded that a regulation is "commercially feasible" as long as the "basic market demand" for a particular consumer product can be met. "Basic market demand" is the underlying need of consumers for a product to fulfill a basic, necessary function. This must be distinguished from consumer "preference," which may be towards specific attributes of a particular product. A "preference" is the choice of consumers for a certain product or products based upon fragrance, cost, texture, etc.

By way of example, a consumer has a basic market demand for a glass cleaner to remove soils, grease, dirt or grime from their windows. Glass cleaners may be formulated with glycol ether solvents or with ammonia. Consumers may choose an ammoniated glass cleaner because they prefer the performance characteristics, or they may choose a non-ammoniated glass cleaner because they dislike the smell of ammonia. This distinction is not recognized by all parties. Some stakeholders have expressed the view that consumers do not have a "basic market demand" for a general class of products, but that consumers instead have a number of separate and distinct "basic market demands" for many specialty products with differing characteristics.

ARB staff believes the consumer "preference" interpretation of "basic market demand" is inconsistent with the reasoning from the International Harvester case. To adopt such a narrow interpretation would be inconsistent with the clearly expressed legislative intent that "...the State board shall adopt regulations to achieve the maximum feasible

reduction in reactive organic compounds emitted by consumer products..." (Health and Safety Code section 41712(a)). In order to achieve emission reductions, manufacturers of high VOC products which perform the same basic function as lower VOC counterparts must reduce the amount of VOCs in their products. It is expected that when a product's formulation changes, some attributes of the product will also change. If ARB were to establish limits which accounted for every distinct feature of every product, then each product would require a limit unto itself. Using this approach, it would be impossible to achieve the maximum feasible reduction in VOC emissions.

Most currently marketed products have some unique features that differentiate them from other products. Consumers who purchase a product have demonstrated a preference over other competing products. This distinction between "preference" and "basic market demand" was clearly made in the International Harvester case. In the International Harvester case, the court stated that the proposed emission limits would be feasible even though they may result in the unavailability of certain kinds of vehicles and engine types people preferred, as long as the basic market demand for passenger cars could be generally met. Applying this principle to consumer products, the proposed amendments allow the basic market demand to be met for each product category, even though it may no longer be possible to manufacture products with some specific attributes. ARB staff believes that this approach complies with Health and Safety Code section 41712.

D. COMPLIANCE WITH THE PROPOSED AMENDMENTS

Manufacturers have the flexibility to choose from a variety of formulation options to meet the applicable limits (see Chapter VI). To comply with VOC limits, VOC solvents or propellants may need to be replaced, or partially replaced, with VOC exempt ingredients. This may require using acetone or another exempt solvent, increasing product solids, or formulating with a VOC exempt propellant. Manufacturers may also need to change the valve, container, delivery system, or the other components of the consumer product depending on the individual formulation.

To meet the VOC limit for Double Phase Aerosol Air Fresheners, the most straightforward reformulation pathway for manufacturers of non-complying products is to replace some of the hydrocarbon propellant with water. Although another reformulation option is to use VOC exempt propellants such as HFC-152a or HFC-134a. The likelihood of this reformulation choice is minimal because of the increased cost of these propellants. However, we are proposing a GWP limit of 150 for the category to ensure that incremental use of high GWP propellants are not used in reformulations to meet the VOC limit. ARB staff has proposed VOC limits that can be met without a significant increase in the use of Toxic Air Contaminants or greenhouse gases. We believe that products can and will be reformulated primarily through reduction in the amount of hydrocarbon propellant with possibly some modification or adjustments to the surfactants and/or the valve/spray nozzle.

To meet the proposed Multi-purpose Solvent and Paint Thinner first tier VOC limit, the most likely "reformulation" pathway is product substitution (i.e. increasing the sales of existing complying products and discontinuing sale of non-complying products). To meet the proposed second tier Multi-purpose Solvent and Paint Thinner VOC limits, reformulation options for manufacturers of non-complying products include, in addition to product substitution, developing water-based formulations. We believe that products can and will be reformulated through reduction or replacement of VOC solvents with VOC exempt ingredients, such as LVP-methyl esters, or water emulsion technology. Possible reformulation options could also include chlorinated toxic compounds, and compounds that could compromise the predicted ozone benefits of the limits. However, because these formulation options are not necessary, and the proposal includes specific prohibitions to prevent them, products can not be reformulated using these options and possible adverse impacts will be prevented.

Table III-1 summarizes, for the proposed VOC limits, data related to the complying market shares (based on sales), as well as the number of products or product groups that currently comply relative to total number of products reported.

Table III-1
Summary of Complying Products and Complying Marketshares

Product Category	Product Form	Proposed VOC Limit (wt%)	Number of Complying Products/Total	Complying Market Share (%)
Double Phase Aerosol Air Freshener	Aerosol	20	<10 / 60	<1
Multi-purpose Solvent & Paint Thinner	Non-aerosol	Tier 1: 30	18 / 165	11.3
		Tier 2: 3	15 / 165	11.2

Source: 2006 Consumer and Commercial Products Survey and 2008 Paint Thinner and Multi-purpose Solvent Survey Update.

Table III-1 shows that the complying marketshares range from less than 1 percent to 11.3 percent. Based on these complying marketshares and the number of complying products, we believe the proposed VOC limits, although challenging, are commercially and technologically feasible within the timeframes proposed. It should be noted that there are currently a few Multi-purpose Solvent and Paint Thinner products, with significant market presence, formulated slightly above 30 percent VOC by weight. These products will only need a modest reformulation to comply with the proposed 30 percent standard. The complying marketshare in Table III-1, for the first tier limit for Multi-purpose Solvent and Paint Thinner, would be significantly higher if these products already complied with the proposed 30 percent VOC limit.

Manufacturers can also comply with the proposed amendments through the use of the Innovative Products Provision (IPP) or the Alternative Control Plan (ACP). The IPP allows manufacturers of "innovative products" to comply with the Consumer Products Regulation if they demonstrate through clear and convincing evidence that their product will result in less VOC emissions than a complying product that meets the applicable VOC limit. The innovative product may result in less emissions due to some characteristic of the product formulation, design, delivery system, or other factors.

The ACP allows manufacturers to average the emissions from products above and below the applicable VOC limits, as long as the overall emissions are less than or equal to the emissions that would have occurred had all the products complied with the VOC limits. Manufacturers must submit an application which includes the VOC content of the products in the plan, a method of verifying the sales of each product in the plan, and other information necessary to track overall emissions.

IV. EMISSIONS

California's extreme air quality problems require unique strategies for improving air quality and slowing climate change. In this chapter, we provide an overview of criteria pollutant air quality and climate change problems which are germane to the regulation of consumer products. We also describe the need for significant emission reductions from all sources contributing to these problems. This chapter includes a description of the need for the regulation of consumer products and provides a summary of the emissions from the categories proposed for regulation. For a detailed summary of the product categories, the reader is referred to Chapter VI.

A. CRITERIA POLLUTANTS, AMBIENT AIR QUALITY STANDARDS, CLIMATE CHANGE, AND TOXIC AIR CONTAMINANTS

Federal and state ambient air quality standards have been established to protect California's population from the harmful effects of ozone and particulate matter (PM). An ambient air quality standard sets legal limits on the level of an air pollutant in the outdoor (ambient) air necessary to protect public health. Both ARB and U.S. EPA are authorized to set standards. Assembly Bill 32, the California Global Warming Solutions Act of 2006 (AB 32), was signed into law by the Governor in September 2006 to address climate change.

Volatile organic compound (VOC) emissions from consumer products contribute to the formation of both ozone and fine PM. Other sources of VOCs include emissions from fuel combustion, coatings and paints. PM pollution is the result of both direct and indirect emissions. Direct sources of PM include emissions from fuel combustion and wind erosion of soil. Indirect PM emissions result from the chemical reaction of VOCs, nitrogen oxides (NO_x), sulfur oxides, and other chemicals in the atmosphere. While carbon dioxide (CO_2) is the greenhouse gas (GHG) emitted in the largest quantity, other significant GHGs include, but are not limited to, methane, nitrous oxide, and hydrofluorocarbons (HFCs). Related to the role of consumer products, HFCs are the primary source of GHG emissions. To a lesser extent hydrochlorofluorocarbons (HCFC), and hydrofluoroethers (HFE) play a role.

1. Ozone

Ozone formation in the lower atmosphere results from a series of chemical reactions between VOCs and nitrogen oxides in the presence of sunlight. The rate of ozone generation is related closely to both the amount and reactivity of VOC emissions as well as the amount of NO_x emissions available in the atmosphere (Seinfeld and Pandis, 1998). Ozone is a colorless gas and the chief component of urban smog. It is one of the State's more persistent air quality problems. Ninety-three percent of Californians, or 36 million people, live in areas designated as non-attainment for the federal eight-hour ozone standard. California experienced 41 percent of the total national ozone exposure, based on analysis of population exposure conducted by ARB staff for the

years 2000 through 2002 (ARB, 2006b). California occupies the top five spots and has six out of the top ten areas with the highest levels of ozone (2004 design values).

It has been well documented that ozone adversely affects the respiratory function of humans and animals. Research has shown that, when inhaled, ozone can cause respiratory problems, aggravate asthma, impair the immune system, and cause increased risk of premature death. Human health studies show that short-term exposure to ozone injures the lung (ARB, 2008e). In some animal studies, permanent structural changes with long-term exposures to ozone concentrations considerably above ambient were seen; these changes remain even after periods of exposure to clean air (U.S. EPA, 2006). Exposure to levels of ozone above the current ambient air quality standard can lead to lung inflammation, lung tissue damage, and a reduction in the amount of air inhaled into the lungs.

Ozone is a strong irritant that can cause constriction of the muscle cells in the airways that result in symptoms such as coughing, chest tightness, shortness of breath, and increased asthma symptoms (ARB, 2008e). Recent evidence suggests that ozone may be linked to the onset of new asthma in very active children (McConnell *et al*., 2002). Ozone has also been associated with premature death. Based on 2004 - 2006 data, premature deaths from ozone exposure in California are estimated at 590. Ozone in sufficient doses can also increase the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Other health effects associated with ozone exposure include hospitalizations and school absences. Of course, the greatest risk from ozone exposure is to those who are active outdoors during smoggy periods, such as children, athletes, and outdoor workers.

Not only does ozone adversely affect human and animal health, but it also affects vegetation, resulting in reduced yield and quality in agricultural crops, disfiguration or unsatisfactory growth in ornamental vegetation, and damage to native plants. During the summer, ozone levels are often highest in the urban centers in Southern California, the San Joaquin Valley, and Sacramento Valley, which are adjacent to the principal production areas in the State's multibillion-dollar agricultural industry (USDA, 2006). ARB studies indicate that ozone pollution damage to crops is estimated to cost agriculture over $500 million dollars annually (ARB, 1987; ARB, 2006b).

2. Fine Particulate Matter

Particulate matter (PM) is a complex mixture of tiny particles that may consist of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. As described above, PM can be directly emitted from sources, such as diesel PM, or can be produced indirectly from sources which emit precursors that are converted to PM by atmospheric processes. Particles ten micrometers or less in diameter are defined as "respirable particulate matter" or "PM_{10}." PM_{10} and particles 2.5 micrometers or less in diameter ($PM_{2.5}$) can be inhaled deep into the lungs. $PM_{2.5}$ contributes significantly to regional

haze and reduction of visibility in California. Besides reducing visibility, the acidic portion of PM (nitrates, sulfates) can harm crops, forests, aquatic and other ecosystems (ARB, 2002).

Considerable epidemiologic research over the past 15 years has investigated the responses of humans to PM. The principal health effects of PM exposure are summarized below:

- Many studies have consistently found statistical associations between $PM_{2.5}$ and premature death with both long-term (Pope *et al*., 2004; Pope *et al*., 2002; Krewski *et al*., 2000; Laden *et al*., 2006) and daily exposures (e.g., Dominici *et al*., 2005; Dominici *et al.,* 2003; Laden *et al*., 2000). The association with premature mortality is considerably stronger for annual average $PM_{2.5}$ exposure than for daily average $PM_{2.5}$. That is, long-term exposure appears to pose a greater risk of death than short-term exposure.

- A recent study suggests that long-term exposure to $PM_{2.5}$ may influence the risk of adverse cardiovascular events in women (Miller *et al*., 2007), including hospitalization or death from heart attack or stroke.

- Daily exposure to $PM_{2.5}$ has been associated with hospitalization for heart and lung related causes (Moolgavkar, 2003; Zanobetti *et al*., 2003). Others have found that exposure to $PM_{2.5}$ resulted in increased emergency room visits, exacerbation of asthma, and other respiratory diseases (Peel *et al*., 2005; Sheppard *et al*., 2003). Other research indicates that exposure to $PM_{2.5}$ leads to increased asthma medication usage (Gent *et al*., 2003), and increased asthma symptoms (e.g., Delfino *et al*., 2002; Whittemore and Korn, 1980). Exposure to $PM_{2.5}$ has also been associated with an increase in the loss of work days (Ostro *et al*., 1993; Ostro *et al*., 1989).

- Older adults with pre-existing chronic heart or lung disease are at greatest risk of experiencing adverse effects related to $PM_{2.5}$ exposure (Moolgavkar, 2003; Dominici *et al*., 2006; Symons *et al*., 2006).

There is some evidence that particulate matter and ozone may have greater effects in children than in adults. This may be because they inhale more $PM_{2.5}$ and ozone per pound of body weight than do adults, and because they breathe more rapidly than adults. Adverse effects reported in children include reduced lung function and reduced lung growth in higher pollution areas (Gauderman *et al*., 2004; Gauderman *et al*., 2002; Gauderman *et al*., 2000) that may at least partially reverse if the child moves to an area with cleaner air (Avol *et al*., 2001); increased asthma and bronchitis symptoms (Gauderman *et al*., 2005; McConnell *et al*., 1999); increased school absenteeism (Gilliland *et al*., 2001); and increased risk of acquiring asthma for children who engage in three or more outdoor sports and live in areas with high ozone concentrations (McConnell *et al*., 2002).

3. Ambient Air Quality Standards

In April 2005, the Board reviewed California's one-hour peak standard for ozone and determined that it alone was not sufficiently protecting public health. Consequently, ARB adopted a new eight-hour ozone standard of 0.07 parts per million (ppm) averaged over eight hours, while retaining the existing one-hour ozone standard at 0.09 ppm. Regarding particulate matter, the Board adopted stricter standards in 2002, which include a PM_{10} annual average standard of 20 micrograms per cubic meter ($\mu g/m^3$) and a new annual average $PM_{2.5}$ standard of 12 $\mu g/m^3$. The State PM_{10} standard for a 24-hour period remains at 50 $\mu g/m^3$. The national and State ambient air quality standards for ozone and PM are shown in Table IV-1.

Table IV-1
Ambient Air Quality Standards for Ozone, PM_{10} and $PM_{2.5}$

Pollutant	Averaging Time	State Standard	National Standard
Ozone	1 hour	0.09 ppm (180 $\mu g/m^3$)	---
	8 hour	0.070 ppm (137 $\mu g/m^3$)	0.075 ppm* (147 $\mu g/m^3$)
PM_{10}	24 hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Arithmetic Mean	20 $\mu g/m^3$	---
$PM_{2.5}$	24 hour	---	35 $\mu g/m^3$
	Annual Arithmetic Mean	12 $\mu g/m^3$	15 $\mu g/m^3$

Source: Air Resources Board, Ambient Air Quality Standards April 1, 2008 (ARB, 2008a).
* This standard became effective on March 27, 2008. The 2007 SIP demonstrates attainment with the previous standard of 0.08ppm.

Table IV-1 reflects the newly revised national eight-hour standard for ozone of 0.075 ppm, which was promulgated on March 27, 2008. The U.S. EPA's rescission of its one-hour ozone standard is also reflected (U.S. EPA, 1997). Despite these revisions to the national standards, Table IV-1 shows that California's standards for PM and ozone continue to be more heath protective than those at the federal level.

4. Area Designations for California Ambient Air Ozone Standard

The California Clean Air Act (CCAA) of 1988 has the fundamental goal that all areas of California are to attain the State ambient air quality standards for ozone by the earliest practicable date. As specified in the CCAA, ARB has designated areas of California to be in "attainment" or "non-attainment" for the State ozone standards.

For the year 2007, Figure IV-1 shows the counties designated as non-attainment (or non-attainment transitional, which is a subcategory of non-attainment) for the State ozone standard. As shown, unhealthy levels of ozone are not limited to urban areas,

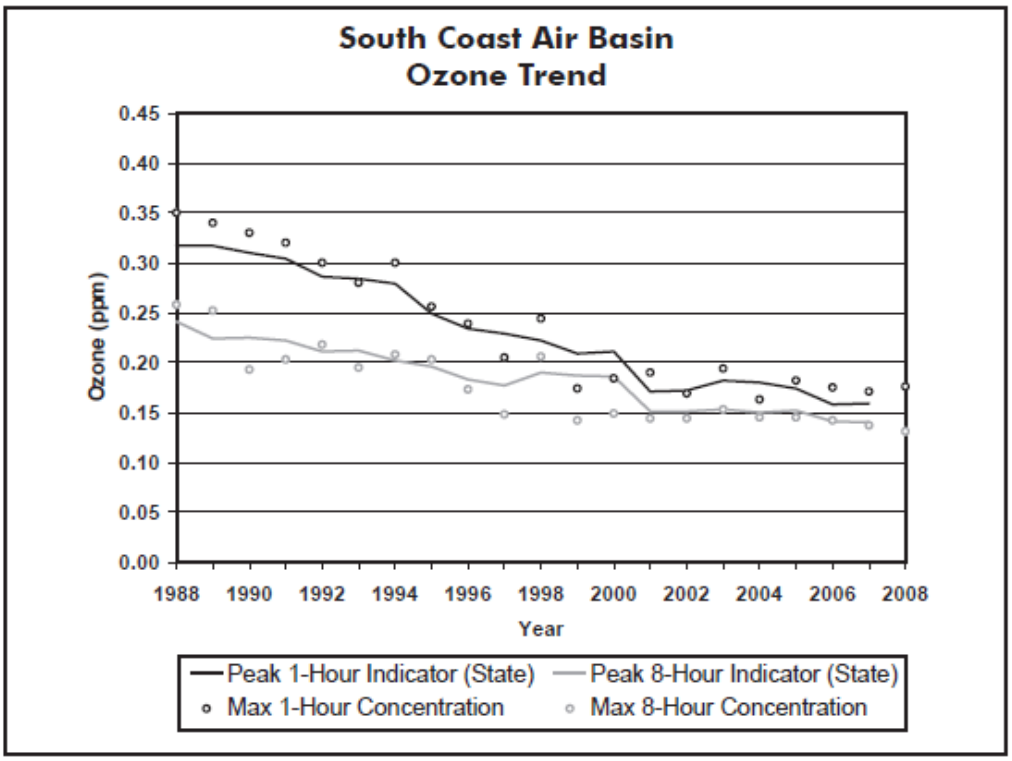
but can be found in nearly every county in California. This map clearly indicates the extent and magnitude of the ozone problem in California.

Figure IV-1

The areas that are non-attainment for the State ozone standards are also non-attainment for the previous 0.08 ppm federal eight-hour ozone standard. The new federal non-attainment designations include a number of rural Sierra Nevada foothill counties and additional parts of the Sacramento Valley. The federal one-hour standard was revoked on June 15, 2005, one year after the effective date of the designations. SIPs showing how each non-attainment area would meet the previous 0.08 ppm eight-hour ozone standard were submitted in 2007. In order to maintain progress towards clean air, the federal Clean Air Act prohibits backsliding on the control program.

Recent air quality trends have shown that progress is being made towards achieving the State ozone standard. For the South Coast Air Basin all of the ozone statistics between 1988 and 2008, show an overall steady decline, as seen in Figure IV-2. The average maximum 8-hour ozone concentration for the three year period, 2006 to 2008, was over 41 percent lower than the maximum 8-hour ozone concentration in 1990. Also, the number of days above the standards has declined dramatically. The downward trend for both the eight-hour and one-hour ozone concentrations is similar (ARB, 2009).

Figure IV-2
South Coast Air Basin Ozone Trend

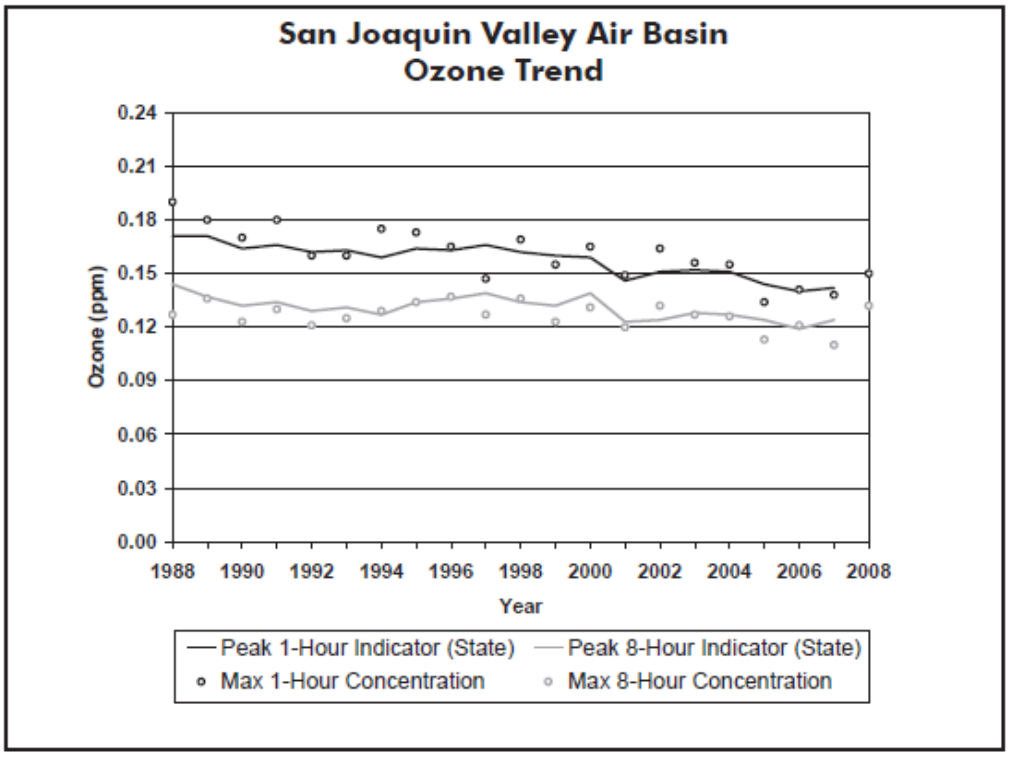


Source: ARB 2009 Almanac

The ozone problem in the San Joaquin Valley ranks among the most severe in the State. Looking at ozone air quality from a historical perspective is challenging because of the lack of long-term monitors prior to 1990. Furthermore, monitoring did not include the sites in the portions of the basin with the worst pollution problems until 1990. For

this reason, we are using 1990 as the beginning year to characterize trends. Similar to other areas of the state, exceedence days have declined at a faster rate than peak levels. From 1990 to 2008, peak levels declined by an average of 10 percent while the number of State and national eight-hour standard exceedence days declined by 17 percent and 21 percent, respectively. Most of this progress has occurred since 2003. However, the number of exceedence days in 2005 and 2007 were among the lowest in this eighteen year period (ARB, 2009). Figure IV-3 shows the ozone trend between years 1988 and 2008 for the San Joaquin Valley Air Basin.

Figure IV-3
San Joaquin Valley Air Basin Ozone Trend



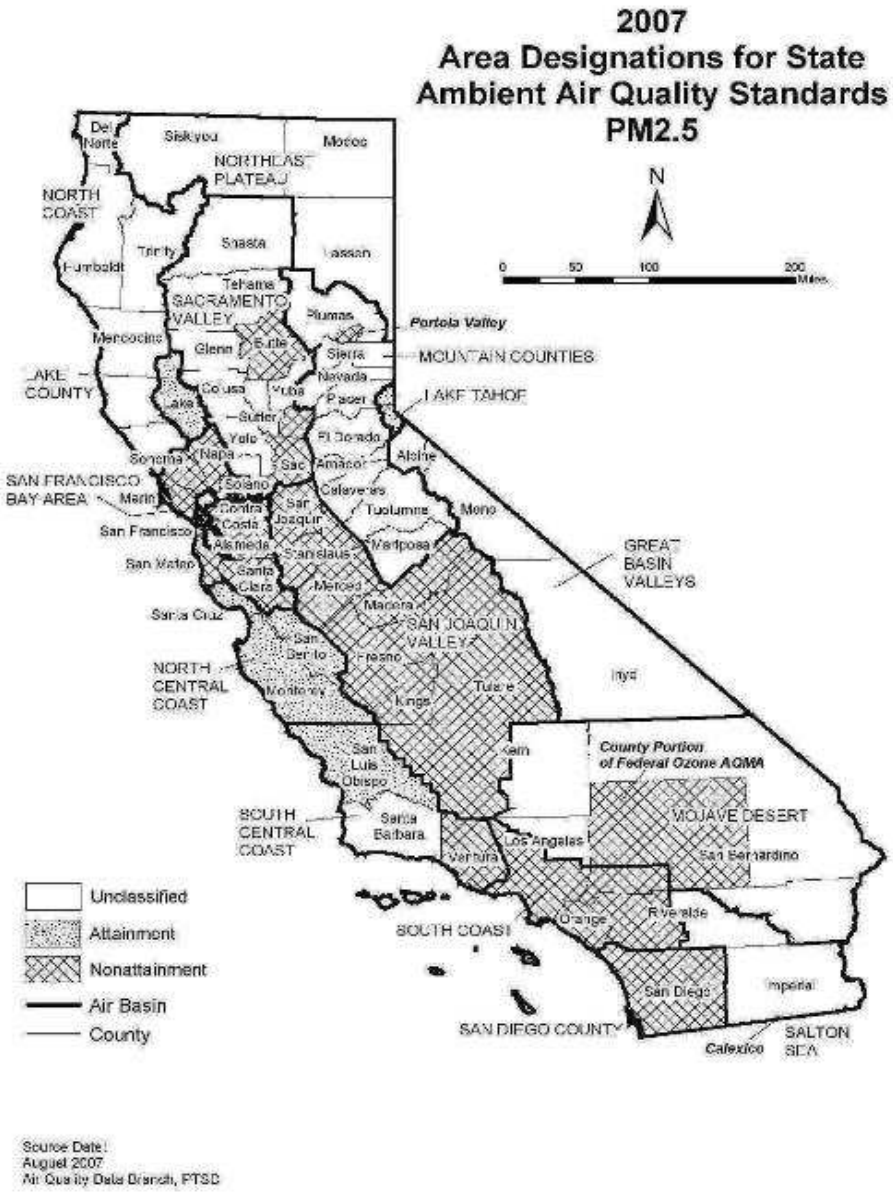
Source: ARB 2009 Almanac

Despite over 25 years of regulatory efforts and the decline of smog levels in areas such as the South Coast Air Basin and the San Joaquin Air Basin, ozone continues to be an important environmental and health concern in California and more emission reductions are necessary. The State Strategy for California's 2007 State Implementation Plan addresses the State measures necessary to meet the previous national ozone standard of 0.08 ppm averaged over eight hours.

5. Area Designations for California Ambient Air $PM_{2.5}$ Standard

Figure IV-4 shows the counties designated as non-attainment for the State $PM_{2.5}$ standard. As with ozone, unhealthy levels of $PM_{2.5}$ are not limited to urban areas, but can be found in many counties throughout California.

Figure IV-4


2007
Area Designations for State
Ambient Air Quality Standards
PM2.5
N
0
50
100
200
Miles
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Trinity
Shasta
Lassen
Humboldt
Tehama
SACRAMENTO VALLEY
Plumas
Portola Valley
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
LAKE COUNTY
Colusa
Yuba
Nevada
Lake
Placer
LAKE TAHOE
Sutter
Yolo
El Dorado
Sonoma
Napa
Sac
Amador
Alpine
SAN FRANCISCO BAY AREA
Marin
Solano
Calaveras
Contra Costa
San Joaquin
Tuolumne
Mono
San Francisco
Alameda
Stanislaus
Mariposa
GREAT BASIN VALLEYS
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
SAN JOAQUIN VALLEY
San Benito
Fresno
NORTH CENTRAL COAST
Monterey
Tulare
Inyo
Kings
Kern
County Portion of Federal Ozone AQMA
San Luis Obispo
MOJAVE DESERT
SOUTH CENTRAL COAST
Santa Barbara
Los Angeles
San Bernardino
Ventura
Riverside
Orange
SOUTH COAST
San Diego
Imperial
SAN DIEGO COUNTY
SALTON SEA
Calexico
Unclassified
Attainment
Nonattainment
Air Basin
County
Source Date:
August 2007
Air Quality Data Branch, PTSD

Related to the federal $PM_{2.5}$ standard, in December 2007, ARB submitted non-attainment area recommendations and appropriate boundaries to U.S. EPA, in response to the new federal 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$ established on December 18, 2006. The non-attainment area recommendations are based on 2004-2006 $PM_{2.5}$ air quality monitoring data. ARB recommended that the South Coast Air Quality Management District (SCAQMD); San Joaquin Valley Air Pollution Control District (SJVAPCD); Bay Area Air Quality Management District; Sacramento Metro Air Quality Management District; the combined cities of Marysville/Yuba City; the City of Chico; and the City of Calexico be designated as non-attainment for the new 24-hour $PM_{2.5}$ standard. Thus, most of the areas shown in Figure IV-4 are also non-attainment for the federal 24-hour $PM_{2.5}$ standard.

The $PM_{2.5}$ SIP for SCAQMD was approved by the Board in September 2007 and was submitted to U.S. EPA in November 2007. The $PM_{2.5}$ SIP for SJVAPCD was approved by the Board in May 2008 and was submitted to U.S. EPA in June 2008.

6. Climate Change

Climate change, or global warming, is the process whereby emissions of anthropogenic pollutants, together with other naturally-occuring gases, absorb infrared radiation in the atmosphere, leading to increases in the overall average global temperature. Changes in the atmospheric abundance of GHGs alter the energy balance of the climate system. These changes are expressed in terms of radiative forcing. The standard definition of "greenhouse gas" includes, but is not limited to, six substances as identified in the Kyoto Protocol; carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

The Global Warming Potential (GWP) of a compound may reflect a direct effect as well as an indirect effect on global warming. The direct effect is the warming due to the absorption of radiation by molecules of the compound in question. VOCs, CO_2, and HFCs all have direct effects. The indirect effect is due to the impact that the presence of the compound has on the concentration of other GHGs. For example, VOCs contribute indirectly to global warming, because they react chemically in the atmosphere to increase GHG concentrations of ozone and methane. While VOCs do have direct effects, they are considered GHGs primarily because of their role in creating ozone, and in prolonging the life of methane in the atmosphere.

By convention, the GWP index is defined relative to CO_2 which has a GWP of 1. The Second Assessment Report (SAR) (IPCC, 1996), defines the GWP of a GHG as the ratio of the time-integrated radiative forcing impact from an instantaneous release of 1 kilogram (kg) of a trace substance relative to that of 1 kg of CO_2. The standard units of measurement used to express the emissions of a GHG is, million metric tons of CO_2 equivalents (MMT CO_2e) per year.

The GWP values used by ARB are generally the 1996 SAR GWP values (ARB, 2007c). These values are used when converting emissions of GHGs to carbon dioxide

equivalent values (CO_2e). The SAR GWP values are used to be consistent with the Board's Discrete Early Action Report, other statewide and national GHG inventories, and ARB's Scoping Plan. When no SAR GWP value is listed, ARB uses the 2007 Fourth Assessment Report (FAR) GWP value (IPCC, 2007).

The climate warming impact from emissions of GHGs is the product of two factors: (1) the mass of GHG emitted, and (2) its warming potential. In addition to uncertainty in the mass of emissions, there is also uncertainty in attributes of warming potential (as a function of direct and indirect warming impacts and the atmospheric lifetime) and thus in the assessment of GWP.

7. Toxic Air Contaminants

As part of our obligations under CEQA, the ARB staff is required to evaluate and mitigate potential adverse environmental impacts resulting from regulatory proposals. Also, pursuant to Health and Safety Code section 39650 et seq., the ARB is required to identify and control toxic air contaminants (TACs). The Health and Safety Code defines a TAC as "...an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health." Moreover, in accordance with section 39666 of the Health and Safety Code, for TACs for which no safe exposure threshold has been established, the ARB is required to "…. reduce emissions to the lowest level achievable through application of best available control technology or a more effective control method…."

Several chemicals currently used in the consumer product formulations considered for regulation have been identified as TACs. An increased or continued use of TACs in any of the consumer product categories considered for regulation could lead to a potential adverse environmental impact. ARB staff has evaluated this potential and has concluded that there would be a potential adverse environmental impact of implementing the VOC limits. Therefore, staff is proposing mitigation measures designed to ensure that use of TACs will be reduced or prohibited, resulting in a positive environmental impact.

In the federal Clean Air Act Amendments of 1990, the United States Environmental Protection Agency (U.S. EPA) identified perchloroethylene (Perc), methylene chloride (MeCl), and trichloroethylene (TCE) as hazardous air pollutants (HAPs) because evidence indicated the substances may have adverse effects on human health or the environment.

Staff found that the proposed prohibition on use of Perc, MeCl, and TCE in Multi-purpose Solvent and Paint Thinner products is necessary to reduce the health risk associated with use of these compounds. Staff has identified the potential for increased chances of contracting cancer from using products containing these compounds. The proposed prohibitions are necessary to mitigate potential adverse impacts that would result from implementing VOC limits for these categories. The prohibitions would also

align with State law that requires use of BACT in instances where no safe exposure threshold is known.

B. IMPORTANCE OF REGULATING CONSUMER PRODUCTS VOC AND GHG EMISSIONS AND TOXIC AIR CONTAMINANTS

In Section A above, we described how consumer products' emissions contribute to the formation of ground level ozone and $PM_{2.5}$ and climate change. In this section, we provide information on the importance of regulating VOC and GHG emissions.

1. VOC Emissions

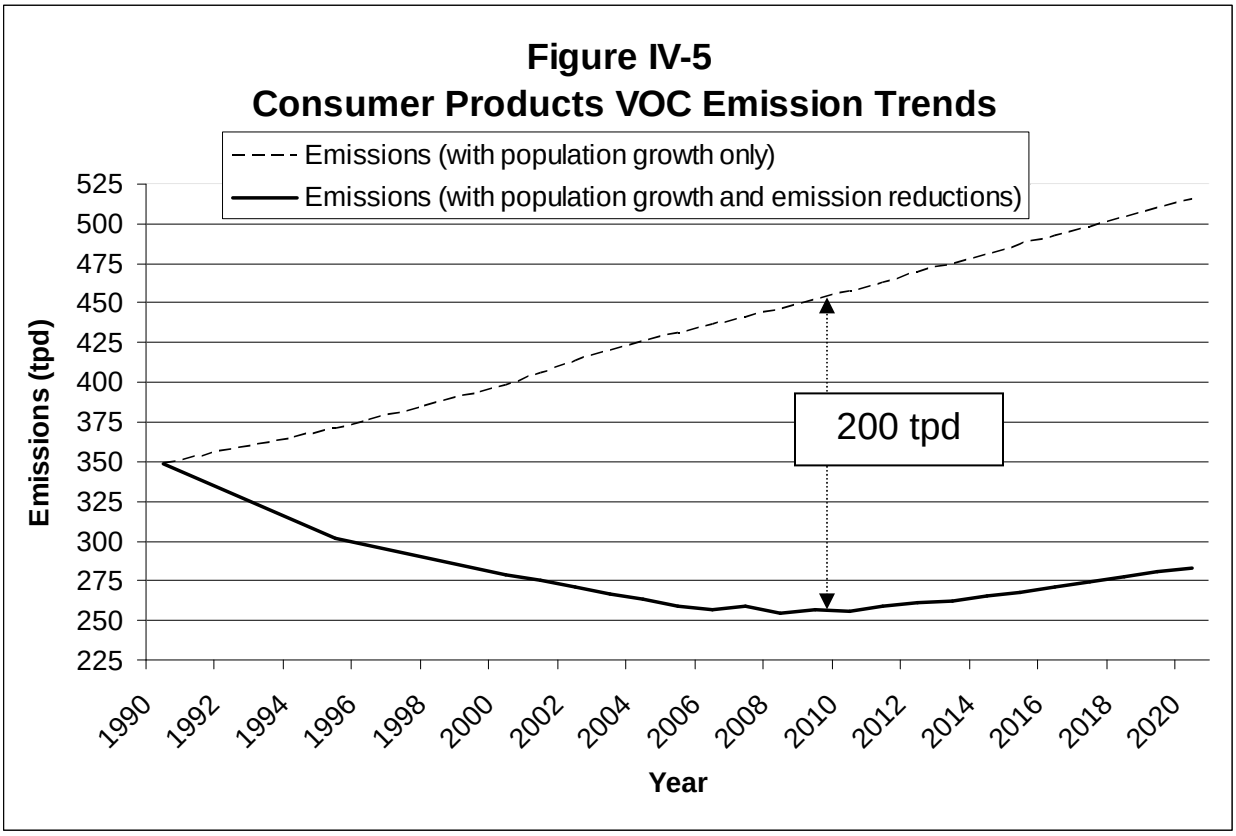
Consumer products are a significant source of VOC emissions in California. This section focuses on reducing emissions from consumer products as a ground-level ozone control strategy. Although each consumer product may seem to be a small source of emissions, the cumulative use of these products by over 38 million Californians results in significant emissions (DOF, 2007). Given the severity of the air pollution problems in California, further dramatic emission reductions from all sources contributing to ground-level ozone are necessary.

As evidence of the magnitude of consumer product VOC emissions, it is estimated that in 2010 consumer products emissions will be approximately 255 tons per day, or about 12 percent of the overall statewide VOC inventory. In this same year, consumer product emissions will comprise about 19 and 7 percent of VOC emissions in SCAQMD and SJVAPCD, respectively. Without further actions, consumer product emissions are expected to grow to approximately 283 tons per day in 2020, representing 14 percent of statewide VOC emissions (ARB, 2007h).

As control measures for other VOC sources (i.e. mobile sources) become effective, consumer product emissions become more important in the SCAQMD. It is estimated that emissions from consumer products will be the largest source of VOC emissions in the SCAQMD in 2020. However, using the maximum incremental reactivity (MIR) scale (see Title 17, CCR section 94700-94701) as the basis for comparison of ozone forming potential, consumer product emissions are over two times less reactive than are emissions from on-road motor vehicles. Regardless of the ozone-forming potential of various source categories, clearly, further reductions in VOC emissions from consumer products and other VOC sources are needed, if ozone attainment is to be achieved and maintained.

Despite these projections, ARB's consumer products program has made significant progress. Since 1989, regulations adopted by the ARB, along with numerous amendments to the regulations, have substantially reduced VOC emissions from consumer products. Absent these regulations today, consumer product emissions would likely be about 450 tons per day. Figure IV-5 shows that statewide consumer product VOC emissions have been reduced by over 200 tons per day in 2010. However, Figure IV-5 also shows that without further actions population growth would

likely reverse the trend.



The emission values in Figure IV-5 are derived from several data sources. The 1990 to 2007 emissions are taken from the ARB Forecasted Emissions by Summary Category, 2008 Almanac (ARB 2008c). Emissions are then grown in proportion to expected population increase. Population growth is in accordance with estimates in the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008d). For categories regulated in the 2008 Consumer Products Regulation Amendments, emission values from the 2003 Survey and the projected emissions reductions resulting from the VOC limits approved by the Board at its June 2008, hearing, are reflected in Figure IV-5.

As shown in Figure IV-5, the important emission reductions that have been realized from the ARB's Consumer Products Program are beginning to be partially offset by population growth. California's population is expected to grow to 40 million by 2010 (DOF, 2007). Therefore, ARB must continue its commitment to pursue additional technologically and commercially feasible reductions in consumer products emissions.

As was described in Chapter I, the Health and Safety Code, as well as SIPs, set forth requirements to control emissions. To meet the federal standards, emission reductions from consumer products became part of the California State Implementation Plan (SIP) for ozone in 1994. In this SIP, consumer products measures were put in place to work

towards attaining the federal one-hour ambient air quality standard for ozone. In the 2003 SIP, ARB reiterated the commitment to reduce consumer products VOC emissions to meet the one-hour federal ozone standard.

In response to these mandates, adopted limits will achieve a 44 percent reduction in overall VOC emissions from consumer products by the year 2010. Despite these reductions, more are necessary to attain the federal ozone standard.

In 2007, a new SIP was adopted. This State Strategy for California's 2007 State Implementation Plan (Strategy) includes California's plan to attain the federal ozone standard of 0.08 ppm averaged over eight hours. The consumer products commitment in this strategy supplements the 1994 and 2003 commitments. In the Strategy, ARB has committed to an additional 30 to 40 tons per day VOC emissions reduction from consumer products by 2014.

Because significant further VOC emissions reductions are necessary to attain the federal ozone standard, the reductions from the amendments proposed in this report are therefore "necessary" within the meaning of section 41712 of the Health and Safety Code. In addition, section 41712(b)(1) of the Health and Safety Code provides that a regulation's "necessity" is to be evaluated in terms of both the State and federal standards.

The applicable State and federal laws show that both the U.S. Congress and the California Legislature intended progress toward clean air be made as quickly as possible. The CCAA specifically declares that it is the intent of the Legislature that the State air quality standards be achieved "...by the earliest practicable date..." (See Health and Safety Code, sections 40910 and 40913(a); see also the uncodified section 1(b)(2) of the Act (Stats. 1988, Chapter 1568)). A similar intent is expressed in the federal Clean Air Act, which declares that the federal air quality standards are to be achieved "...as expeditiously as practicable..." (See sections 172(a)(2), 181(a), and 188(c) of the federal Clean Air Act). For all of the reasons described above, the proposed amendments are "necessary" within the meaning of section 41712 of the Health and Safety Code.

The amendments proposed in this rulemaking are the second increment toward fulfilling the 2007 Strategy commitment for VOC reductions from consumer products.

2. Greenhouse Gas Emissions

We acknowledge that the GHG emissions contribution of consumer products is modest relative to other sources, such as vehicle exhaust. However, the severe consequences of climate change requires reductions from any source where it is feasible. While staff is still in the process of developing the consumer product GHG inventory, we do know from past surveys that several GHGs are used in consumer products. For categories proposed for regulation, no GHGs of concern were reported. However, several GHG could be used as products reformulate.

GHG propellants and several solvents with fairly high GWPs could be used to meet the proposed VOC limits. These compounds are typically low photochemically reactive compounds that are VOC exempt and have been used as a reformulation strategy to reduce VOC content in other categories. Compounds of interest include HFCs, HCFCs, HFEs, CO_2, and N_2O. However, the propellants HFC-134a and HFC-152a are the predominate GHGs used in consumer products today. In instances where flammability is a concern, HFC-134a is used. HFC-134a is a non-flammable propellant, whereas HFC-152a is minimally flammable. Compressed CO_2 is also used as a propellant, but the GHG emissions are negligible compared to the emissions from HFCs. Table IV-2 shows some examples of GHGs that are used in consumer products.

Table IV-2
Global Warming Potential of Selected Compounds Used in Consumer Products

Compound	SAR GWP*	FAR GWP**
CO_2	1	1
HFE-7200	N/A	59
HFC-152a	140	124
HCFC-141b	N/A	725
HFC-134a	1300	1430
HFC-43 10mee	1300	1640

* 100 year timeframe, SAR value
** 100 year timeframe, FAR value

As shown in Table IV-2, HFC-152a has a GWP of 140, while HFC-134a has a GWP of 1300. The value for HFC-134a is approximately ten times greater than the GWP of HFC-152a and 1300 times greater than CO_2.

GHG emissions data are available from the 2006 Consumer and Commercial Products Survey (2006 Survey). In the 2006 Survey, we surveyed manufacturers of consumer products to determine the usage of compounds with high GWP in several categories of consumer products. The 2006 Survey will be used to develop the GHG inventory for consumer products. We will evaluate the survey data for product categories where compounds with high GWP are used to determine if there is a potential to reduce them without increasing the use of VOCs. Additionally, we will identify product categories where the pathway to reformulation may increase the use of high GWP compounds and set GWP limits as a mitigation measure.

To minimize climate change impacts, we are proposing to prohibit the use of compounds with a GWP of 150 or higher.

3. Toxic Air Contaminant Emissions

Under the California Environmental Quality Act, ARB is required to identify and mitigate any possible significant adverse environmental impacts of regulatory actions. It is unlikely, but possible, that manufacturers may, in response to new VOC limits for Multi-purpose Solvent and Paint Thinner products, choose to reformulate with chlorinated

solvents that are TACs. Therefore, in accordance with CEQA, we are proposing in new subsection 94509(u), a prohibition of the use of methylene chloride, perchloroethylene, and trichloroethylene in the "Multi-purpose Solvent," and "Paint Thinner" categories.

C. ESTIMATED EMISSIONS FROM CATEGORIES PROPOSED TO BE REGULATED

1. Consumer and Commercial Products Surveys

The 2006 Consumer and Commercial Products Survey (2006 Survey) was mailed to over 5,000 companies in July 2007. The Paint Thinner and Multi-purpose Solvent Survey Update (Survey Update) was sent to twenty-one companies in November 2008. Data received from the 2006 Survey and the Survey Update formed the basis for the emissions used in this rulemaking.

The 2006 Survey and the Survey Update provided staff with detailed information on the formulations of consumer products proposed for regulation, including complete speciation of VOCs, low vapor pressure VOC (LVP-VOC) solvents, and key exempt ingredients (ARB, 2007f; ARB, 2008f). Total volumes of inorganic and other compounds were also provided. Information on sales, product form, customer types, and company size and economics were also requested.

The results of the Surveys for the categories proposed for regulation were discussed at the April 1, 2009, public workshop, and input from industry was used to correct inaccuracies in the data. For this rulemaking, the 2009 emissions and reduction estimates, when the limits become effective, were grown from 2006 and 2008 sales data and the State Department of Finance's 2008 population estimates. Population growth is in accordance with estimates in the California Environmental Protection Agency's (Cal/EPA) Statewide Human Population Table found in the Population and Vehicle Trends Report (ARB, 2008d).

Staff is confident that the 2006 Survey had adequate representation of the available technologies for Double Phase Aerosol Air Freshener, and the Survey Update had adequate representation of the Multi-purpose Solvent and Paint Thinner technologies, in the market place and finds that the data meet the requirement in Health and Safety Code section 41712(b) to base regulations on "adequate data." This assumption has been verified by discussions with manufacturers, category research, shelf surveys, and the wide range of VOC content reported for products in the categories slated for regulation.

The proposed amendments were developed based on the 2006 Survey results, as well as results from the Survey Update conducted in November 2008. The intent of the survey update was to obtain sales data for the 12 month period starting from October 1, 2007, through September 30, 2008. The survey was conducted in response to comments from stakeholders that indicated the market for Multi-purpose Solvent and

Paint Thinner had changed since these categories were last surveyed during our 2003 Survey.

In developing these proposals, we worked with stakeholders on each category proposed for regulation. Numerous product labels and associated literature for each category were analyzed. Category information was also obtained from shelf surveys, trade journals, Internet sites, textbooks, patents, and directly from manufacturers.

2. Emission Estimates for Categories

The total VOC emissions from the categories proposed for regulation are estimated to be about 22.7 tons per day in 2009. Table IV-3 summarizes these emissions, as well as the anticipated VOC emission reductions when the proposed limits become effective.

In March 2009, the South Coast Air Quality Management District (SCAQMD) adopted Rule 1143, Consumer Paint Thinners and Multi-purpose Solvents (Rule 1143) which will achieve VOC emission reductions from consumer paint thinners and multi-purpose solvents used in the South Coast Air Basin. In order to avoid double-counting of VOC emissions and emission reductions, staff has subtracted from the statewide values, the portion of Multi-purpose Solvent and Paint Thinner VOC emissions and reductions that can be attributed to the South Coast Air Basin, based on population (DOF, 2008). Approximately 43 percent of California's population resides in the South Coast Air Basin, therefore 43 percent of the VOC emissions and reductions from the Multi-purpose Solvent and Paint Thinner categories were subtracted from the statewide values shown in Table IV-3.

If adopted, once all limits become effective, the VOC emission reductions will be approximately 14.7 tons per day.

Table IV-3
Proposed VOC Limits, Emissions, and Reductions at Effective Date

Product Category	Product Form	Proposed VOC Limit (percent by weight)	2009 VOC Emissions* (tons per day)	Effective Date	Reductions Upon Effective Date (tons per day)
Double Phase Aerosol Air Freshener	Aerosol	20	10.2	12/31/2012	2.0
Multi-purpose Solvent & Paint Thinner	Non-aerosol	Tier 1: 30	12.5+	12/31/2010	8.4+
		Tier 2: 3	---	12/31/2013	3.9+
Total Emissions 2009	**22.6 tons per day**				
Total Reductions by end of 2013	**14.7 tons per day**				

* Survey emissions adjusted for market coverage, grown to the 2009 calendar year, and rounded.
+ Does not include SCAQMD Rule 1143 reductions.

3. Greenhouse Gas Emissions

Development of the proposed amendments to minimize use of high GWP value compounds began with the emissions data and product formula data from the 2006 Survey and the Survey Update. According to the data reported, hydrofluorocarbon (HFC) propellants are not currently used in Double Phase Aerosol Air Freshener. In addition, no high GWP solvents are used in Multi-purpose Solvent and Paint Thinner products. This finding demonstrates that HFC propellants and high GWP solvents, are not critical to the formulation of Double Phase Aerosol Air Freshener, Multi-purpose Solvent, or Paint Thinner products.

However, one reformulation pathway to meet the proposed VOC limit for Double Phase Aerosol Air Freshener, could be to replace some of the VOC propellant with VOC exempt propellants such as HFC-152a or HFC-134a. HFC-134a has a GWP of 1300 while HFC-152a has a GWP of 140. In addition, it is possible that manufacturers could choose to use high GWP solvents as a reformulation option in response to the VOC limits for Multi-purpose Solvent and Paint Thinner. Consequently, in this rulemaking, we are proposing a GWP limit for Double Phase Aerosol Air Freshener products, Multi-purpose Solvent, and Paint Thinner products as a mitigation measure to minimize climate change impacts as products are reformulated.

The proposed GWP limit of 150 prevents the use of HFC-134a in reformulated Double Phase Aerosol Air Freshener, which would potentially significantly increase GHG emissions, but would allow use of HFC-152a. If a small amount of HFC-152a were used in formulations the impact on climate change would likely be negligible. The proposed GWP limit also prevents the use of high GWP solvents in Multi-purpose Solvent and Paint Thinner. Because of cost and corporate policies, we also do not believe that it is likely that manufacturers would choose options that would significantly increase GHG emissions in these categories. If adopted by ARB, this will be the second and third GWP standards in place for consumer products in California.

3. Toxic Air Contaminants

In the Survey Update, no use of methylene chloride, perchloroethylene, or trichloroethylene was reported for Multi-purpose Solvent and Paint Thinner products. However, use of these chlorinated TAC solvents, particularly the VOC-exempt compounds methylene chloride and perchloroethylene, is a potential option as products are reformulated to comply with the proposed limits. Therefore, to ensure that the public is not exposed to these chlorinated TAC solvents from use of Multi-purpose Solvent and Paint Thinner products, we are proposing in new section 94509(u), to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene in Multi-purpose Solvent and Paint Thinner products. No adverse impacts on other media are expected from this proposal.

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V. PROPOSED AMENDMENTS TO THE CONSUMER PRODUCTS REGULATION AND METHOD 310

In this chapter, we provide a plain English description of the proposed amendments to the California Regulation for Reducing Emissions from Consumer Products (Consumer Products Regulation) and explain the rationale for the amendments. The regulation is codified in title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 8.5, Article 2, Consumer Products, sections 94507-94517. A description of the proposed changes to Method 310 "Determination of Volatile Organic Compounds (VOC) in Consumer Products and Reactive Organic Compounds in Aerosol Coating Products" (Method 310) is also included.

Where applicable, key terms or concepts involved in each proposed amendment are described. The discussion in this chapter is intended to satisfy the requirements of Government Code section 11343.2, which requires that a non-controlling "plain English" summary of the regulation be made available to the public. The proposed amendments to the Consumer Products Regulation and Method 310 can be found in Appendix B.

Amendments are being proposed to the following sections in the Consumer Products Regulation: section 94508 "Definitions;" section 94509 "Standards for Consumer Products;" section 94510 "Exemptions;" section 94511 "Innovative Products;" section 94512 "Administrative Requirements;" section 94513 "Reporting Requirements;" and section 94515 "Test Methods." New sections are being proposed for Method 310. The Method 310 new sections are: 3.3.7, 4.3, 4.3.1, and 4.3.2. All of these amendments are discussed below in detail.

In the sections below, we describe the proposed amendments and the rationale for them. The proposal includes six new definitions, the modification of three existing definitions, a lower VOC limit for one category, new VOC limits for two categories and a global warming potential (GWP) limit for the three categories. For Multi-purpose Solvents and Paint Thinners, our proposal also includes special labeling and reporting requirements; a prohibition on the use of Toxic Air Contaminant (TAC) chlorinated solvents; a limitation on the VOC aromatic compound content along with a requirement to supply information to aid in enforcing this provision; and special labeling and reporting requirements. A more detailed discussion of the existing regulatory requirements for consumer products can be found in additional ARB publications which are referenced at the end of this chapter (ARB, 2008b; ARB, 2006a; ARB, 2004b; ARB, 1999; ARB, 1997b; ARB, 1991a; ARB, 1990c).

A. DEFINITIONS (SECTION 94508)

Section 94508, "Definitions," provides all the terms used in the Consumer Products Regulation which are not self-explanatory. The proposed amendments to the regulation include new definitions for "Aromatic Compound;" "Artist's Solvent/Thinner;" "High-Temperature Coating;" "Industrial Maintenance Coating;" "Paint Clean-up;" and "Zinc-Rich Primer." These new definitions are in support of the new Paint Thinner standards

to help clarify products that are not subject to the VOC limits. The proposed amendments include modified definitions of "ASTM," "Multi-purpose Solvent," and "Paint Thinner." The ASTM definition was changed to reflect the proper name of the organization that develops standard analytical test methods. We are proposing to modify the "Multi-purpose Solvent" and "Paint Thinner" definitions to clarify products included in or excluded from the categories, and to improve enforcement of the regulation. The "Paint Thinner" definition was revised to make it clear that it does not include "Artist's Solvent/Thinner" and, therefore, these products are not subject to the regulation if the size requirements in the new "Artist's Solvent/Thinner" definition are met.

Artists' Solvents and Thinners were surveyed in ARB's 2006 Consumer and Commercial Products Survey (ARB, 2007f). The category sales and emissions reported for these products were minuscule. Also, based on market research and consultations with industry experts, we have learned that these products are required to meet the Labeling of Hazardous Art Materials Act (LHAMA) within the Federal Hazardous Substances Act. LHAMA requires that any art material, including solvents, meet ASTM D 4236, Standard Practice for Labeling Art Materials for Chronic Health Hazards, to protect consumers of any age from potential health hazards of these products (ASTM, 2005). ASTM D 4236 requires that the art material must be reviewed by a board certified or qualified toxicologist and labeled consistent with the standard. We visited several art material stores and noted that the sales price of Artists' Solvents and Thinners was substantially higher compared to the sales prices per volume of Multi-purpose Solvent and Paint Thinner products sold at home improvement and paint stores. Therefore, we believe that these products are unlikely substitutes for Multi-purpose Solvent and Paint Thinner products and an exemption from the proposed VOC limits and provisions is appropriate for Artist's Solvents/Thinners, labeled to meet ASTM D 4236 and packaged in containers with a capacity less than or equal to 32 fluid ounces.

The proposed amendments to the regulation also include new size parameters for both the dilutable and pre-mixed "Automotive Windshield Washer Fluid" products. These modifications are intended to clarify the types of products that are included in these categories. This change would allow a wider range of dilutable products, to encourage manufacturers to ship concentrated products. Allowing smaller containers to be sold in concentrated form should reduce product weight leading to reduced transportation costs and the air emissions associated with the movement of such products by truck or other conveyance.

B. STANDARDS FOR CONSUMER PRODUCTS (SECTION 94509)

1. Proposed Amendments to Section 94509(a) - Table of Standards

The proposed regulatory action would amend the existing Consumer Products Regulation by specifying VOC limits for the product categories shown in

Table V-1. Of the three proposed limits, Double Phase Aerosol Air Freshener been has previously regulated, while there are two tiers of new limits proposed for Multi-purpose Solvent and Paint Thinner. The effective dates of these VOC limits are shown in Table V-1 below.

Table V-1
Proposed VOC Limits, Product Forms, and Effective Dates

Product Category	Product Form	Proposed VOC Limit (percent by weight)	Effective Date
Double Phase Aerosol Air Freshener	Aerosol	20	12/31/2012
Multi-purpose Solvent: Tier 1	Non-aerosol	30	12/31/2010
Multi-purpose Solvent: Tier 2	Non-aerosol	3	12/31/2013
Paint Thinner: Tier 1	Non-aerosol	30	12/31/2010
Paint Thinner: Tier 2	Non-aerosol	3	12/31/2013
Total Emissions 2009	**22.6 tons per day**		
Total VOC Reductions 2013	**14.7 tons per day**		

We are also proposing to modify the Table of Standards to delete the "(all forms) dilutable and pre-mixed" description under "All other areas" from "Automotive Windshield Washer Fluids." This proposal is intended to clarify that the 1 percent VOC limit by weight in non-Type A Areas, applies to concentrates as well as dilutable products (after the label recommended dilution has taken place). This proposed modification should end the confusion that led some affected parties to believe that limits varied for these situations. It should be noted that there are different VOC limits pertaining to products sold in different areas of California, Type "A" areas and all other areas (non-Type A areas). Type A areas are those portions of California where freezing temperatures are expected to occur frequently.

2. Other Proposed Amendments to Section 94509

Modification to 94509(b)(3)

We are proposing to modify the provision in subsection 94509(b)(3) related to "Automotive Windshield Washer Fluids (Dilutable)" to specify that a product must specifically state on the front panel that the product should be diluted prior to use. This proposed modification is intended to make it clear to the consumer when a product should be diluted prior to use, to ensure that emission reductions continue to occur, and to enhance enforceability of the regulation.

Proposed GWP Limit – 94509(t) and (u)

For Double Phase Aerosol Air Fresheners, one possible reformulation pathway to meet lower VOC limits would be to replace, or partially replace, hydrocarbon propellant with VOC exempt propellants which could have higher Global Warming Potential (GWP) values. To ensure that this does not occur in reformulations to meet the proposed VOC limit, we are proposing in new subsection 94509(t)(1) to prohibit the use of any chemical

with a GWP value of 150 or greater. In new subsection 94509(u)(1)(A), we are proposing language prohibiting the use of any chemical with a GWP value of 150 or greater in Multi-purpose Solvents and Paint Thinners. This provision is proposed because there is a slight possibility that manufacturers could replace current VOC solvents used in Multi-purpose Solvents and Paint Thinners with compounds with high GWP. In subsections 94509(t)(2),(3), and (4), and 94509(u)(2),(3) and (4), we are adding provisions, virtually identical to those in provisions pertaining to GWP limits for other categories, to support the GWP Value limit. Specifically, these provisions include a three year product sell-through allowance for products manufactured prior to the effective date, a notification to purchasers from the supplier for products sold during the last six months of the sell-through period, and allowance for impurities. These proposals are in accordance with ARB's authority to regulate greenhouse gases under AB 32.

Proposed Toxic Air Contaminant Prohibition 94509(u)

In section 94509(u)(1)(B) we are proposing to prohibit the use of specific chlorinated TACs in "Multi-purpose Solvent," and "Paint Thinner." We believe that it is unlikely, but possible, that manufacturers may, in response to new VOC limits, choose to reformulate with chlorinated solvents that are Toxic Air Contaminants. To ensure that this does not occur, we are proposing in new subsection 94509(u)(1)(B), to prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene. Therefore, in accordance with the California Environmental Quality Act (CEQA), we are proposing mitigating measures for these two categories for which we are setting new VOC limits. In subsection 94509(u)(2), we are proposing language to allow a three year sell through for products manufactured prior to the effective date of the TAC prohibition.

Proposed Aromatic Compound Content Limit Section 94509(u)

Further, in section 94509(u)(1)(C), we are proposing to limit the VOC aromatic compound content of "Multi-Purpose Solvent" and "Paint Thinner" products to 1 percent by weight, also in accordance with CEQA. This mitigation measure is proposed to ensure that in response to new VOC limits for "Multi-Purpose Solvent" and "Paint Thinner," manufacturers do not formulate with compounds that have the potential to increase the ozone forming potential of the products. We conducted an analysis and determined that products reformulating to meet the 30 percent limit using highly reactive aromatic VOCs would erode or negate the expected ozone reduction benefits predicted. For more detail regarding the reactivity analysis see Chapter VIII, Environmental Impacts.

Finally, in section 94509(u)(2), (3) and (4), in addition to the proposals described above, we are proposing the following provisions: a three-year product sell-through allowance for products manufactured prior to the limit effective date; a notification to purchasers from the supplier for products sold during the last six months of the sell-through period; and an allowance for impurities with regards to the GWP limit and TAC prohibition.

C. TEMPORARY EXEMPTION FOR SMALL CONTAINERS – PROPOSED NEW SUBSECTION 94510(m)

We are proposing in section 94510(m) to exempt small containers of "Paint Thinner" from the VOC and aromatic compound limits until December 31, 2013. To qualify for the exemption, products must be sold and packaged in containers less than or equal to eight fluid ounces. We determined that consumers may need small amounts of paint thinner to thin solvent-borne paints. These solvent-borne paints might have been purchased years ago, before the lower VOC limits for architectural coatings came into effect, or are products in small containers that are exempt from such limits. This exemption allows these coatings to be used and, if necessary, allowed to be thinned by the consumer, rather than having the coatings become unusable and discarded. Discarded coatings could cause environmental impacts such as contaminated groundwater, or increased landfill load.

D. LABELING REQUIREMENTS FOR MULTI-PURPOSE SOLVENT AND PAINT THINNER – PROPOSED NEW SUBSECTION 94512(e)

As proposed in new subsection 94512(e)(1)(A), Multi-purpose Solvent and Paint Thinner products would be required to clearly display on the product container, the total VOC content as a percent by weight contained in the product formulation. This proposal would aid with the enforceability of the VOC limits for these categories and provide the consumer the information they need to purchase the product with the lowest VOC content.

We have also proposed in subsection 94512(e)(2) that Multi-purpose Solvent and Paint Thinner products manufactured after December 31, 2010 until December 31, 2015, and labeled "Flammable" or "Extremely Flammable" per federal laws, would not be able to display a general name on the principle display panel, such as "Paint Thinner;" "Multi-purpose Solvent;" "Clean-up Solvent;" or "Paint Clean-up." Manufacturers may choose to sell a "Flammable" or "Extremely Flammable" product with one of these general names if they do one of the following: provide an attached hang tag or sticker that includes the statement "Formulated to meet California VOC limits, see warnings on label;" or display on the principle display panel in a font size as large as or larger than any other words on the panel, the common name of the chemical compound that results in the product meeting the criteria for "Flammable" or "Extremely Flammable."

Specific federal definitions exist for Combustible, Flammable, and Extremely Flammable products that are determined by the liquid's flashpoint, or the lowest temperature at which the vapor of a combustible liquid can be ignited in air. Flammable and Extremely Flammable liquids have a lower flashpoint than Combustible liquids and, therefore, ignite or burn easier than combustible liquids, making them more hazardous. The above proposed requirement is a mitigation measure under CEQA because we determined that in response to the new VOC limits, manufacturers may switch a Combustible product with a product that is Flammable or Extremely Flammable. If

consumers were used to a product that is Combustible and, after the implementation of the VOC limits, purchase a Flammable or Extremely Flammable product, they could unknowingly risk injury or fire loss if they misused the product near an open flame or were otherwise careless with the product. It is the intent of this regulatory requirement to alert the consumer that a newly relabeled or newly reformulated product may perform differently or may have an increased fire hazard potential than the previous formulation and should be used with caution.

E. PROPOSED NEW SUBSECTION 94513(g): SPECIAL REPORTING REQUIREMENTS FOR MULTI-PURPOSE SOLVENT AND PAINT THINNER

As specified in a new subsection 94513(g), all responsible parties for Multi-purpose Solvent and Paint Thinner products must report the product formulation and sales information to the ARB prior to June 30, 2012. These special reporting requirements are necessary to perform a technical assessment of each category prior to the implementation of the second tier VOC limits. The technical assessment will include an analysis of manufacturers' progress in developing low flammability and low VOC Multi-purpose Solvent and Paint Thinner products to meet the 3 percent VOC limit, effective on December 31, 2013. In addition, the data collected will enable ARB staff to determine whether a reactivity based approach to regulating these products would be more appropriate than a mass based approach, and if compounds to be used in the new formulations present any unforeseen potential hazards.

F. PROPOSED AMENDMENTS TO SECTION 94515, TEST METHODS: VOC AROMATIC COMPOUND CONTENT

We are proposing to limit the VOC aromatic compound content of Multi-purpose Solvent and Paint Thinner products to no more than 1 percent by weight. First, in section 94515(h)(1) we are proposing to specify that the VOC content for Multi-purpose Solvent and Paint Thinner is to be determined by Method 310, or an alternative method approved by the Executive Officer. To enforce the VOC aromatic compound content limit provision, we are proposing in subsection 94515(h)(2) that specific formulation information be provided to ARB. Upon receipt of written notice, responsible parties would have ten days to supply formulation data to guide the analytical testing.

In section 94515(h)(2)(A)(i), the formulation data to be provided would include the weight fraction to the nearest 0.1 percent of each ingredient including: water; VOC; low vapor pressure (LVP)-VOC; total inorganic compounds; and exempt compounds specified in section 94508(a). For hydrocarbon solvents, the bin number as listed in the Tables of Maximum Incremental Reactivity (MIR) Values in section 94701 (a) or (b), and the initial boiling point and dry point of the solvent would be required to be provided.

To ensure that the notification letter is delivered to the correct responsible party, we are proposing in section 94515(h)(2)(A)(ii) that by March 1, 2010, and each year thereafter, the responsible party would provide to the Executive Officer contact information for the person who is to receive the notification letter. We are also clarifying in

section 94515(h)(2)(A)(iii) that a Material Safety Data Sheet (MSDS) does not meet the requirement for formulation data because the information is not detailed enough to guide analytical testing.

Finally, we are proposing in section 94515(h)(2)(B)(i) and (ii) to clarify that a violation is established if the formulation data supplied by the responsible party shows that the product does not meet the applicable VOC or aromatic content standard; and/or the manufacturer fails to respond to the notice and provide formulation data within the ten day specified time frame.

G. "DETERMINATION OF VOLATILE ORGANIC COMPOUNDS (VOC) IN CONSUMER PRODUCTS AND REACTIVE ORGANIC COMPOUNDS IN AEROSOL COATING PRODUCTS" (METHOD 310)

Method 310 is the analytical test method utilized to determine compliance with the VOC limits and other prohibitions in the Consumer Products Regulation.

The proposed changes to Method 310 are clarifications to specify the analytical approach to be used in instances where a product's VOC content is below 1 percent. These methods are already being used and/or are needed to enhance the enforceability of the new, lower VOC limits that will become effective by 2010. The proposed changes also include new VOC content calculations for products with high water content or low VOC content.

New section 3.3.7 is proposed to specify the methods to be utilized for low level VOC content samples; new section 4.3 is proposed to clarify that products subject to VOC limits below 5 percent by weight will have their VOC content determined by a low level direct determination; new section 4.3.1 is proposed to specify the equation used to determine the VOC content for aerosol products; and new section 4.3.2 is proposed to specify the equation used to determine the VOC content of non-aerosol products.

Previously in section B, number 2 (Proposed Aromatic Compound Content Limit Section 94509(u)), we describe the proposed aromatic compound content limit for Multi-purpose Solvent and Paint Thinner products. Under the procedures and testing methods specified under Method 310, laboratory staff routinely quantifies the percent by weight of many common aromatic compounds that are expected to be found in Multi-purpose Solvent and Paint Thinner products. These aromatic compounds include, but are not limited to, benzene, xylenes, toluene, and ethyl benzene. Further method development may be needed and additional amendments specified in Method 310 may be necessary in order to identify and quantify additional aromatic compounds that may be found in Multi-purpose Solvent and Paint Thinner products. Work on additional method development is currently underway. If further modifications to Method 310 or the Consumer Products Regulations are needed to address the aromatic compound content limit requirements, they would be included in the next round of regulation amendments, which are anticipated to occur in 2010.

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VI. DESCRIPTION OF PRODUCT CATEGORIES

In this chapter, we provide the technical basis for the proposed limits for each category proposed for regulation. The following information is described for each of the product categories:

- a product category description;
- information on product use and marketing;
- information on the product formulations;
- a discussion of the proposed volatile organic compound (VOC) and/or global warming potential (GWP) limit, our rationale for the proposed limit, and the options for compliance; and
- a discussion of outstanding issues associated with the proposal.

A. AIR FRESHENER: DOUBLE PHASE AEROSOL

Product Category Description:

Air Fresheners are currently regulated under the CARB Consumer Products Regulation in five subcategories: Double Phase Aerosols; Single Phase Aerosols; Dual Purpose Air Fresheners/Disinfectant aerosols; liquid/pump sprays; and solids/semisolid (ARB, 2007a). The proposal described here relates solely to Double Phase Aerosol Air Fresheners.

The definition for an Air Freshener is the following: "Air Freshener" means any product including, but not limited to, sprays, wicks, wipes, diffusers, powders, and crystals, designed or labeled for the purpose of masking odors, or freshening, cleaning, scenting, or deodorizing the air. "Air Freshener" includes dual purpose air freshener/disinfectant products. "Air Freshener" does not include products that are used on the human body, products that function primarily as cleaning products as indicated on a product label, Odor Remover/Eliminator," or "Toilet/Urinal Care Product."

A Double Phase Aerosol Air Freshener is defined as an aerosol air freshener with the liquid contents in two or more distinct phases that require the product container be shaken before use to mix the phases, producing an emulsion (ARB, 2007a). An aerosol product is a pressurized spray system that dispenses product ingredients by means of a propellant contained in a product or a product's container or a mechanically induced force.

Double Phase Aerosol Air Fresheners were first regulated under "Phase I" of the Consumer Products Regulation adopted in October 1990. A description of these products is included in the Technical Support Document for that rulemaking (ARB, 1990b). Products were required to meet a VOC limit of 30 percent by weight, effective January 1, 1993. In an effort to obtain further emission reductions, the Board adopted in October 1999, as part of "Midterm Measures II" of the Consumer Products

rulemaking, a VOC limit of 25 percent by weight effective December 31, 2004 (ARB, 1999a; ARB 1999b). In this rulemaking, we are proposing to further reduce the VOC limit for Double Phase Aerosol Air Fresheners and add a limit on the GWP of chemical compounds used in the products.

Product Use and Marketing:

According to ARB's 2006 Consumer and Commercial Products Survey (2006 Survey) and product labels, aerosol air fresheners are generally used in household, institutional and commercial settings, and automobiles (ARB, 2007f). These products are used to treat unpleasant odors and fragrance the air in bathrooms, laundry areas, food preparation areas, and institutional settings. According to recent articles in industry journals and Internet sites, home fragrance retail sales in the United States in 2007 were over $5 billion (Esposito, 2008; Euromonitor, 2008). Aerosol air fresheners were reported to be the fastest growing home fragrance product category in 2007 with sales of almost $500 million.

Double Phase Aerosol Air Fresheners are "instant action" products that produce a fine mist when sprayed. The amount of product emitted, or fragrance released, is controlled by the user by depressing the actuator button (nozzle) on the product container. According to the 2006 Survey, Double Phase Aerosol Air Freshener products are sold predominantly to household consumers (ARB, 2007f). These products can be purchased through supermarkets; grocery stores; discount stores; mass merchandisers; hardware stores; automotive parts stores; warehouse stores; and home centers. Consumers may also purchase products through home sales, catalog sales, and the Internet.

Table VI-1 summarizes the sales and emissions from Double Phase Aerosol Air Freshener products, based on the 2006 Survey (ARB, 2007f). Sixty products or product groups were reported in the 2006 Survey by about two dozen companies. Each product group may have multiple fragrance variants or product sizes, or a combination of both. Considering fragrance variants, 231 total individual products were reported for this category. The data have been grown to the 2009 calendar year. Total category sales are about 82,912 pounds per day with estimated VOC emissions of 20,309 pounds (ten tons) per day in California. Although not shown in Table VI-1, the sales-weighted average VOC content for this category is 24.5 percent by weight, excluding fragrance. This indicates most of the product formulations have VOC content very near the maximum allowed by the current 25 percent by weight VOC limit (ARB, 2007f).

Table VI-1
Double Phase Aerosol Air Freshener*

Product Form	Number of Products/Product Groups	2009 Category Sales (lbs/day)**	2009 Adjusted VOC Emissions (lbs/day)**
Aerosol	60	82,912	20,309

* Based on 2006 Consumer and Commercial Products Survey (ARB, 2007f).

** Survey data adjusted for complete market coverage and grown by population to 2009 (see Chapter IV, Emissions).

Product Formulation:

The main ingredients found in Double Phase Aerosol Air Freshener products are water, propellants, and fragrance mixtures. Other ingredients in the product formulation may include solvents; co-solvents; emulsifiers; surfactants; and corrosion inhibitors.

Double Phase Aerosol Air Freshener ingredients contain liquid contents in two or more distinct phases that require the product container to be shaken before use to mix the phases, producing an emulsion. The top phase consists of hydrocarbon propellant and some fragrance or emulsifier. The bottom phase consists of water, which may be as high as 80 percent of the product by weight according to the 2006 Survey, and some fragrance or emulsifier (CSPA, 2009; ARB, 2007f).

The propellants used are typically hydrocarbon blends of n-butane, isobutane and propane. However, products formulated with dimethyl ether as a propellant were also reported in the 2006 Survey (ARB, 2007f). Blends used may vary depending on the desired pressure, container and components used. According to the 2006 Survey, propellant content in the Double Phase Aerosol Air Freshener category ranged from 15 percent to about 27 percent of product weight (ARB, 2007f).[1]

As in most aerosol products, the propellants in aerosol air fresheners are present in both liquid and gas phases. The liquid propellant sits atop the denser liquid phase(s) and functions as a reservoir to replenish the propellant in the gas phase. The gas phase provides the pressure that discharges the product. When the product is shaken, the fragrance and, if present, solvents, emulsifiers and surfactants, produce a homogenous oil-in-water emulsion that allows the product to be uniformly sprayed (ARB, 1999a).

Fragrance mixtures typically constitute less than 2 percent of product weight, according to the 2006 Survey. Fragrance mixtures contain aroma and other ingredients that scent

[1] Products with VOC content greater than 25 percent by weight reported in the 2006 Survey were assumed to qualify for the "sell-through of products" provision of the Consumer Products Regulations in section 94509(c) (ARB, 2007a). Since there was a December 31, 2004, effective date for the 25 percent by weight VOC limit, the sell-through period for Double Phase Aerosol Air Freshener products did not end until December 31, 2007. For evaluations of VOC reductions achieved by this proposal, we assumed that such products had been reformulated to comply with the 25 percent by weight VOC limit.

the air, or mask odors. Fragrance mixtures are typically composed of many ingredients, including VOC and low vapor pressure-VOC (LVP-VOC) ingredients (FMA, 2006). The Consumer Products Regulation allows an exemption from the VOC limits in the Table of Standards for fragrance up to 2 percent by weight of the product. Fragrance is defined as a substance or complex mixture of aroma chemicals, natural essential oils, and other functional components with a combined vapor pressure not in excess of 2 millimeters mercury (mm Hg) at 20 degrees Celsius (ARB, 2007a).

Solvents; co-solvents; emulsifiers; surfactants; and corrosion inhibitors may be used in the product formulation and are typically present in small amounts. Some ingredients may be present to solubilize fragrance, aid mixing of fragrance to create a homogeneous liquid that can be sprayed, and control volatilization of the air freshener mist droplets. Solvent and other ingredients may be present to increase the vapor pressure in a product, and, along with the product valve and nozzle, serve to control mist droplet or particle size. VOC solvents reported in the 2006 Survey include ethanol and isopropanol. Acetone and Isopar M are examples of exempt and LVP-VOC solvents, respectively, that were reported. Emulsifiers and surfactant materials are typically LVP-VOC materials (ARB, 2007f; ARB, 1999a).

LVP-VOC glycols, such as dipropylene glycol and propylene glycol, were reported in the 2006 Survey for some of the Double Phase Aerosol Air Freshener products (ARB, 2007f). Double Phase Aerosol Air Freshener products that contained these glycols generally made “Deodorizer” and “Odor Eliminator” claims on their labels (ARB, 2007f).

Proposed VOC Limit and Compliance:

The proposed VOC limit for Double Phase Aerosol Air Freshener is 20 percent by weight with an effective date of December 31, 2012. As shown in Table VI-2, the proposal would result in emission reductions of 3,900 pounds per day, or about 2.0 tons per day, statewide in 2012. As indicated previously, adjusted VOC emissions from Double Phase Aerosol Air Freshener products are about 20,300 pounds per day, or about 10.2 tons per day. The sales weighted average VOC content is 24.5 percent by weight, excluding fragrance. A limited number of products with VOC content equal to or lower than 20 percent by weight were reported in the 2006 Survey, indicating that further reductions can be achieved from this category and that the proposed limit, while challenging, is both technologically and commercially feasible (ARB, 2007f). However, the complying products represent less than 1 percent of the category sales.

Recognizing that the 20 percent by weight VOC limit is challenging for manufacturers to meet, this proposal provides an extended period of over three years, until December 31, 2012, for manufacturers to produce complying products. The extended time is proposed to accommodate the complex and lengthy product development process necessary for reformulating approximately 200 non-complying products and fragrance variants.

Table VI-2
Double Phase Aerosol Air Freshener Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products/ Product Groups	Complying Market Share (%)	2009 Adjusted Emission Reductions (lbs/day)**	2012 Adjusted Emission Reductions (lbs/day)+
Aerosol	20	<10	<1	3,750	3,900

* Based on 2006 Consumer and Commercial Products Survey (ARB, 2007f).
** Emission reductions adjusted for complete market coverage, grown by population to 2009, and rounded (see Chapter IV, Emissions).
+ Emission reductions adjusted for complete market coverage, grown by population to 2012, and rounded (see Chapter IV, Emissions).

As described earlier, Double Phase Aerosol Air Freshener ingredients include water, emulsifiers, surfactants, glycols, solvents, hydrocarbon propellants, and fragrance mixtures. The emulsifiers, surfactants and glycols typically used are LVP- VOCs which are exempt from applicable VOC limits. Materials such as acetone and Isopar M are also exempt from applicable VOC limits. In general, other than the fragrance mixtures and VOC solvents such as ethanol or isopropanol, which are found in small amounts, the predominant VOC ingredients are the hydrocarbon propellants (ARB, 2007f). For most Double Phase Aerosol Air Fresheners, reformulation to meet the proposed VOC limit of 20 percent by weight will involve replacing some of the hydrocarbon propellant or VOC solvent with water or a VOC exempt solvent. Changes to product components such as valves and actuators may be necessary to retain acceptable product performance characteristics such as spray mist size and pattern.

According to the 2006 Survey, exempt compounds, acetone and Isopar M, are used in some Double Phase Aerosol Air Fresheners (ARB, 2007f). Acetone is an exempt VOC solvent that is fast drying and is completely miscible with water. The use of acetone increases the vapor pressure in the product, reducing the amount of propellant needed to discharge the product. An example formulation that may include acetone would use water along with the higher pressure propellants propane and dimethyl ether (ARB, 1999a). Another example would be to use a LVP-VOC hydrocarbon solvent, such as Isopar M, in place of a solvent containing VOCs.

During discussions with industry representatives in January and March 2009, we learned that it would be challenging to reformulate large numbers of non-complying products and the removal of propellant would affect product performance. Industry representatives stated that lowering the propellant content to comply with the proposed 20 percent by weight VOC limit would most likely require adjustments to other product ingredients, and/or addition of ingredients to ensure acceptable product performance, stability, and consumer acceptance of fragrance (CSPA, 2009; S.C. Johnson, 2009b; Reckitt Benckiser, 2009). It was indicated that changes in the valve, actuator and propellant would likely need to take place to accommodate the formulation adjustments. As a result of these changes, additional consumer usage and fragrance preference studies would also need to be conducted.

In light of the potential technical modifications needed to the aerosol spray dispensing system, we acknowledge that the reformulation effort will be challenging for manufacturers. However, we also believe that products with less propellant can be developed. Given these challenges, we determined that an implementation date of December 31, 2012, would allow for the necessary modifications and additional testing of products to comply with the proposed 20 percent by weight VOC limit. Discussions with industry representatives, evaluation of products reported in the 2006 Survey for Double Phase Aerosol Air Fresheners, and our research demonstrate that the proposal for a 20 percent by weight VOC limit, effective December 31, 2012, although challenging, is both technologically and commercially feasible (ARB, 2007f; CSPA, 2009a).

Proposed Global Warming Potential (GWP) Limit and Compliance:

Pursuant to ARB's responsibilities under Assembly Bill 32, reductions of greenhouse gases (GHGs) from consumer products are necessary (ARB, 2008e). Consumer products use various GHGs, mostly as propellants. Although the GHG emissions contribution from consumer products can be relatively low, the severity of the climate change problem requires reductions from any source where it is feasible. In this rulemaking, we are proposing a GWP value[2] limit of 150 for Double Phase Aerosol Air Fresheners. No high GWP chemical compounds, such as HFC-152a or HFC-134a, were reported in the product formulations in the 2006 Survey (ARB, 2007f). However, to ensure that there is no significant increase in GHG emissions from products reformulated to comply with the proposed 20 percent by weight VOC limit, we are proposing, as a mitigation measure, a limit on the GWP for any chemical compound used in Double Phase Aerosol Air Freshener products, effective December 31, 2012. The GWP limit of 150 does not apply to any chemicals present as contaminants, which in aggregate are 0.1 percent by weight or less.

The VOC exempt propellants, HFC-134a and HFC-152a, are the predominant GHGs used in consumer products today. When flammability is a concern, HFC-134a is used because it is a non-flammable propellant. HFC-152a is minimally flammable. HFC-152a has a GWP value of 140, which is one hundred and forty times greater than the GWP value of CO_2. HFC-134a has a GWP value of 1300, which is approximately ten times greater than the GWP value of HFC-152a and 1300 times greater than CO_2 (ARB, 2008e).

[2] We are using the GWP definition of the Intergovernmental Panel on Climate Change (IPCC). GWP provides a measure of a compound's impact on global warming compared to carbon dioxide (CO_2). The GWP value definition specifies that the 100-year GWP values in the Second Assessment Report (SAR) of IPCC would be used to determine compliance (IPCC, 1996). The definition further specifies that, if the SAR does not contain a GWP value for a specific chemical or compound, then the IPCC, Fourth Assessment Report (FAR) GWP value for that chemical or compound can be used (IPCC, 2007). If there is no GWP value listed for a specific chemical or compound in the SAR or the FAR, then the GWP value is assumed to be equal to the applicable GWP value standard.

According to the 2006 Survey, hydrocarbon propellants such as n-butane, isobutane and propane are the 'propellant of choice' for Double Phase Aerosol Air Freshener products (ARB, 2007f). As stated previously, HFC-152a and HFC-134a were not present in the products reported, which demonstrates that these VOC exempt propellants are not critical to the formulation of Double Phase Aerosol Air Freshener products. The hydrocarbon propellants and other materials reported in the 2006 Survey, such as dimethyl ether, acetone and ethanol have GWP values that are less than ten or are not listed by the IPCC. In the case where the IPCC does not list a GWP value for ingredients used, then the GWP value is assumed to be equal to the emission standard.

Manufacturers can reformulate their products to comply with the proposed 20 percent by weight VOC limit without the use of VOC exempt propellants such as HFC-152a or HFC-134a. If a manufacturer finds it necessary to formulate a product with a VOC exempt propellant, the GWP limit of 150 allows the option of using HFC-152a, but not HFC-134a with its higher GWP value of 1300. Incorporating HFC-152a or HFC-134a would take considerable product development resources and increase propellant costs by as much as 350 percent over hydrocarbon propellants currently in use (ARB, 2008e). Because of the additional cost, if a manufacturer were to use a VOC exempt propellant to comply with the proposed VOC limit, we would expect small amounts of HFC-152a to be blended with less expensive hydrocarbon propellants.

As previously stated, the proposed GWP limit of 150, effective December 31, 2012, is a mitigation measure designed to cap, or limit, the potential for GHG emissions increases from Double Phase Aerosol Air Fresheners reformulated to meet the proposed 20 percent by weight VOC limit. The GWP limit allows the use of a VOC exempt propellant, if necessary. However, no increase in GHG emissions from Double Phase Aerosol Air Fresheners is expected as products are most likely to be reformulated to meet both the 20 percent by weight VOC limit and the GWP limit of 150 without the use of HFC-152a (ARB, 2007f; Reckitt Benckiser, 2009; SC Johnson, 2009b).

Issues:

a. Issue: A 20 percent by weight VOC limit for Double Phase Aerosol Air Fresheners does not seem realistic; especially when there is very little complying market share and very few products that comply with the proposed limit.

Response: We acknowledge that only a limited number of products with VOC content equal to or lower than 20 percent by weight, representing less than 1 percent of the category sales, were reported in the 2006 Survey. However, our evaluation of the Double Phase Aerosol Air Freshener products reported in the 2006 Survey and discussions with industry representatives demonstrate that our proposal of 20 percent by weight VOC limit, effective December 31, 2012, for this category, while challenging, is both technologically and commercially feasible.

b. Issue: The 20 percent by weight VOC limit for Double Phase Aerosol Air Fresheners will be a challenge to meet. December 31, 2011, the effective date in

the original proposal published in August 2008, does not provide sufficient time for manufacturers to reformulate all their products to meet the proposed VOC limit. More time is needed to evaluate propellants and valve/actuator combinations, conduct laboratory tests, and conduct consumer fragrance acceptance and use studies.

Response: Recognizing that the 20 percent by weight VOC limit may be challenging for manufacturers to meet, we agree that an additional year should be added to the effective date primarily due to the large number of products predicted to be reformulated. An effective date of December 31, 2012, will provide manufacturers with additional time that will accommodate the complex and lengthy product development process necessary for reformulating approximately 200 products and fragrance variants.

c. Issue: A study funded by a prominent environmental group indicated that several different types of air fresheners contain high levels of a number of phthalates. ARB should consider banning the use of phthalates in air fresheners.

Response: The most commonly used phthalate in cosmetics and personal care products according to the literature is diethyl phthalate (DEP). When present in fragrances, perfumes and other products, it is used as a solvent to help blend fragrance ingredients and as a fixative to make fragrances last longer (CI, 2009). No phthalates were specifically reported for any Double Phase Aerosol Air Freshener product in the 2006 Survey.

We understand, however, that the air freshener industry has taken voluntary action to reduce the use of phthalates. The United States fragrance industry has instructed its members to use DEP in fragrances and not to use dibutyl phthalate (DBP) and diethyl hexyl phthalate (DEHP) (FMA, 2007). Additionally, major manufacturers of air fresheners have taken proactive positions and have adopted, or are in the process of adopting, a “no-phthalates” policy for their products (SC Johnson, 2009a; SC Johnson, 2009b; Reckitt Benckiser, 2009). As reported in the 2006 Survey, fragrance in Double Phase Aerosol Air Freshener products ranged from 0.1 to about 2 percent by weight of total product formulation. Therefore, DEP, if used in the fragrance mixtures at all, would most likely be present in minimal amounts. We would not expect DBP or DEHP to be used in Double Phase Aerosol Air Fresheners because of their chemical properties and industry policies. Considering the industry policies, and the limited use, exposure to phthalates in Double Phase Aerosol Air Fresheners, if any, would be negligible. Therefore, we believe that mitigation measures related to the use of phthalates in Double Phase Aerosol Air Fresheners cannot be justified without additional data.

d. Issue: Industry representatives recommend that no GWP limit be adopted by ARB to allow for the formulation of products with HFC-134a for certain critical uses requiring total non-flammability.

Response: Industry representatives have not indicated that they are aware of products containing HFC-134a currently in commerce and have not identified any specific critical uses (CSPA, 2009a). Additionally, no non-flammable products were reported in the 2006 Survey. Therefore, prohibiting the use of HFC-134a (GWP value of 1300) while allowing the use of HFC-152a (GWP value of 140), is an appropriate mitigation measure to limit GHG emissions increases from Double Phase Aerosol Air Fresheners reformulated to meet the proposed 20 percent by weight VOC limit.

B. MULTI-PURPOSE SOLVENT AND PAINT THINNER

This section provides information on two proposals that are related, one for the category "Multi-purpose Solvent," and another for "Paint Thinner." The information in this section is presented in the following parts, first, a product category description for Multi-purpose Solvent followed by a product category description for Paint Thinner. These descriptions will be followed by a discussion of "Thinners and Solvents" combined.

Product Category Descriptions:

Multi-purpose Solvent:

Multi-purpose Solvent (MPS) products are liquid products designed or labeled to be used for dispersing, dissolving, or removing contaminants or other organic materials. The category also includes products that do not display specific use instructions or a specific end-use function on the product container or packaging. MPS also includes "Paint Clean-up" products, products labeled to prepare surfaces for painting, and solvents used in institutional facilities, except for laboratory reagents used in analytical; educational; research; scientific; or other laboratories.

MPS does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines; solvents labeled for the clean-up of application equipment used for polyaspartic and polyurea coatings; or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment.

The category also does not include any product making any representation that the product may be used as, or is suitable for use as, a consumer product which qualifies under another definition in section 94508 (the "definitions" section of the general consumer products regulation). Such products are not MPS and are subject to the "Most Restrictive Limit" provision of section 94512. For example, adhesive removers which can technically meet the definition of Multi-purpose Solvent, are not MPS because they are defined in section 94508 as "Adhesive Remover."

"Multi-Purpose Solvent" was originally defined as an exclusion to the definition of "Spot Remover" in the Consumer Products Regulation Amendments of July 1997 (ARB,

1997). In the November 2006 Consumer Products Regulation Amendments, the definition was modified to clearly exclude multi-function products (products that make multiple regulated claims on the label) and clearly include packaged solvents (organic solvents without specific use claims, such as mineral spirits or methyl ethyl ketone) (ARB, 2006). The above description for MPS, includes new proposed language to the existing regulatory definition that will clarify products that are included in the category and products that are not included in the category.

Paint Thinner:

Paint Thinner products are liquid products used for reducing the viscosity of coating compositions or components, that prominently display the term "Paint Thinner," "Lacquer Thinner," "Thinner," or "Reducer" on the front panel of its packaging.

The Board originally approved a definition for "Paint Thinner" in the Consumer Products Regulation Amendments of June 2004. We are proposing the following new language to the existing regulatory definition that will clarify products that are not included in the category. Paint Thinner does not include thinners labeled for the thinning of Industrial Maintenance Coatings, Zinc-Rich Primers, and High Temperature Coatings. This category also does not include products labeled and used exclusively as a component in a specific coating or "Artist's Solvent/Thinner."

Thinners and Solvents:

We conducted shelf surveys at more than 100 home improvement and mass market retail stores throughout California and always found Multi-purpose Solvent and Paint Thinner products sold adjacently on store shelves (ARB, 2009). Based on market research and consultations with industry experts, we concluded that these products are often used interchangeably by consumers to thin solvent-borne paint, clean application equipment, and remove contaminants from a variety of surfaces. Therefore, we consider it appropriate to present the remaining information in this section for Multi-purpose Solvent and Paint Thinner, in one combined discussion, referred to as "Thinners and Solvents."

Table VI-3 below summarizes the sales and emissions from Thinners and Solvents based on the results of the ARB's Paint Thinner and Multi-purpose Solvent Survey Update (ARB, 2008f). In November 2008, we conducted a Paint Thinner and Multi-purpose Solvent Survey Update for the 12-month period, October 1, 2007 through September 30, 2008, because of recent, significant changes to the Thinner and Solvent market. Previous to the survey update, we used data from the 2003 Consumer and Commercial Products Survey to evaluate these categories (ARB, 2004). We have held multiple meetings throughout the development of this proposal. Stakeholders requested an update to the 2003 survey data. We conducted the survey update and posted updated Thinners and Solvents data to the Consumer Products Program website in early March 2009.

Table VI-3
Thinners and Solvents*

Product Form	Number of Products	Jurisdiction	2009 Category Sales (lbs/day)	2009 Adjusted VOC Emissions (lbs/day)**
Liquid	165	Statewide	54,380	43,620
		SCAQMD	23,320	18,700
		Total* **	**31,060+**	**24,920+**

***** Based on Paint Thinner and Multi-purpose Solvent Survey Update. (ARB, 2008f)
****** Survey emissions adjusted for complete market coverage and rounded (see Chapter IV, Emissions).
+ Does not include Rule 1143 sales or VOC emissions.

On March 6, 2009, the South Coast Air Quality Management District (SCAQMD) adopted Rule 1143, "Consumer Paint Thinners and Multi-Purpose Solvents" (Rule 1143) which, upon the effective date, will achieve VOC emissions reductions from consumer Multi-purpose Solvents and Paint Thinners used in the South Coast Air Basin.

In order to avoid double-counting category sales and VOC emissions, we have subtracted from the statewide values in Table VI-3, the portion that can be attributed to the South Coast Air Basin based on population (DOF, 2008). Table VI-3 above (see "Total" row) shows that Thinners and Solvents have estimated VOC emissions of about 12.5 tons per day (24,920 pounds per day) in California, excluding the South Coast Air Basin.

Product Uses and Marketing:

Thinners and Solvents are used by individual consumers, commercial services, and institutional users to thin paint prior to applying to surfaces. They are also used to remove general contaminants and organic material, other than those contaminants removed by products in currently defined categories. These products are used on a variety of solvent resistant substrates such as cement and paint application equipment.

Thinners and Solvents are typically sold to household consumers and paint contractors in one quart or one gallon metal containers, and are sold primarily in home improvement stores; retail paint stores; general mass market stores; discount stores; and automotive aftermarket retail stores. These products are also sold to industrial or institutional users through distributors.

Product Formulations:

Thinners and Solvents are comprised of chemical compounds such as ethyl alcohol, methyl ethyl ketone, toluene, xylene isomers, or acetone; a mixture of these or similar chemical compounds; or packaged as hydrocarbon solvents labeled "mineral spirits."

Some products may contain LVP-VOC or VOC exempt compounds, though most products are nearly 100 percent VOC.

Proposed VOC Limits and Compliance:

We are proposing two tiers of VOC limits for Multi-purpose Solvent and Paint Thinner. The first tier VOC limit is 30 percent by weight, effective December 31, 2010. As shown in Table VI-4, using adjusted emissions, the proposed 30 percent limit will result in an estimated VOC emission reduction of about 17,000 pounds per day, or about 8.4 tons per day, in 2010. As stated previously, the VOC emission reductions shown in Table VI-4 do not include the reductions achieved by Rule 1143.

Table VI-4
Multi-purpose Solvent and Paint Thinner Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Jurisdiction	2009 Emissions Reductions (lbs/day)**	Emissions Reductions (lbs/day)+
Liquid	30	18	11.3	Statewide	29,140	29,510
				SCAQMD	12,500	12,640
				Total* **	**16,640*** **	**16,870*** **
Liquid	3	15	11.2	Statewide	13,030	13,710
				SCAQMD	5,590	5,850
				Total* **	**7,440*** **	**7,860*** **

* Based on Paint Thinner and Multi-purpose Solvent Survey Update. (ARB, 2008f)
** Survey emissions adjusted for complete market coverage, grown by population to 2009, and rounded (see Chapter IV, Emissions).
*** Does not include Rule 1143 reductions.
+ Emissions reductions adjusted for complete market coverage, grown by population to 2010 for the 30 percent VOC limit; and to 2013 for the 3 percent VOC limit; and rounded (see Chapter IV, Emissions).

Table VI-4 also shows that 18 products, representing approximately 11.3 percent of the total Thinners and Solvents market on a sales basis, currently comply with the proposed 30 percent VOC limit. There are also a number of water/hydrocarbon solvent emulsions, currently in commerce, that are formulated slightly above 30 percent VOC. These products will only need a modest reformulation to comply with the 30 percent VOC standard. It should be noted that the 11.3 percent complying marketshare, in Table VI-4, would be significantly higher if these products already complied with the proposed 30 percent VOC limit. We believe this demonstrates that the first tier VOC limit of 30 percent by weight can be met using existing technology.

A technology forcing second tier limit of 3 percent VOC by weight, effective December 31, 2013, is also proposed. As shown in Table VI-4, the 3 percent limit would reduce emissions by nearly 8,000 additional pounds per day VOC or 3.9 tons per day. Table VI-4 also shows that 15 products, representing 11.2 percent of the market, currently comply with the proposed 3 percent limit.

The overwhelming majority of existing products that meet the 3 percent VOC limit are formulated with pure acetone. We believe that the 3 percent VOC limit is challenging because products formulated with pure acetone have not been demonstrated to adequately thin all types of coatings. In addition, concerns regarding the flammability of acetone have been raised. Later in this section, we discuss our response to this concern. Chapter VIII, Environmental Impacts, also contains a discussion regarding flammability. When fully effective, these two limits would reduce VOC emissions from Thinners and Solvents by about 12.7 tons per day in the State, outside of the South Coast Air Basin.

The proposed VOC limits are designed to reduce the use of VOCs in Thinner and Solvent formulations, resulting in a reduction of ambient ozone formation. For the 30 percent limit, reformulation options include increasing production of existing complying products, switching to water-based formulations, or replacing VOC solvents with VOC exempt ingredients. Reformulation options to meet the proposed 3 percent limit include emerging technologies such as soy-based products, in addition to the methods listed previously with the 30 percent limit.

Upon approval of the proposed VOC limits, and implementation of SCAQMD Rule 1143, manufacturers of Multi-purpose Solvent and Paint Thinner products will be required to meet the Rule 1143 limits for products sold or supplied for use in the South Coast Air Basin, and the statewide limits for products sold to all areas of California, outside the South Coast Air Basin. The VOC limits we are proposing are virtually equivalent to those adopted by SCAQMD, however, the effective dates are different. The effective dates for Rule 1143 are January 1, 2010, and January 1, 2011 for the first and second tier VOC limits respectively, while our proposed effective dates are December 31, 2010 and December 31, 2013.

To ensure the ozone forming potential of Multi-purpose Solvent and Paint Thinner products does not increase as a result of the implementation of the proposed VOC limits, we are proposing to limit the use of VOC aromatic compounds to no more than 1 percent by weight, effective December 31, 2010. We are proposing that Thinners and Solvents available Statewide meet this requirement. The proposed limitation on the use of VOC aromatic compounds is unique to the State regulation, and is not required by SCAQMD Rule 1143. Therefore, this provision would apply statewide and result in an additional ozone reduction benefit in the SCAQMD. Additional discussion regarding the need for limiting the use of these highly reactive ingredients can be found in Chapter VIII, Environmental Impacts.

While we believe that there are several products and reformulation pathways currently available to meet the 30 percent VOC limit, we acknowledge that technology advances are necessary to meet the future 3 percent limit. To that end, we are proposing to work with industry to assess progress as the December 31, 2013, compliance date approaches. We are proposing a technology assessment in 2012, to evaluate manufacturers' progress toward meeting the 3 percent limit.

Proposed Global Warming Potential (GWP) Limit and Compliance:

Pursuant to ARB's responsibilities under Assembly Bill 32, reductions of GHGs from consumer products are necessary (ARB, 2008e). Consumer products use various GHGs, mostly as propellants and to a limited extent as solvents. Although the GHG emissions contribution from consumer products can be relatively low, the severity of the climate change problem requires reductions or limitations from any source where it is feasible. No solvents with high GWP values were reported in the Paint Thinner and Multi-purpose Solvent Survey Update (ARB, 2008f). However, to ensure that there is no significant increase in GHG emissions from products reformulated to comply with the proposed VOC limits, we are proposing, as a Statewide mitigation measure, a GWP limit of 150 for any chemical compound used in Thinner and Solvent products, effective December 31, 2010. The proposed GWP limit is unique to the State regulation, and is not required by SCAQMD Rule 1143. Therefore, this provision would apply statewide and result in an additional GHG reduction benefit in the SCAQMD.

Proposed Toxics Prohibition:

None of the products reported in the survey update, including products that comply with the proposed VOC limits, are currently formulated with methylene chloride, perchloroethylene, or trichloroethylene. To prevent the potential use of these Toxic Air Contaminants as manufacturers reformulate products to comply with the proposed limits, we are proposing to prohibit their use in the Multi-purpose Solvent and Paint Thinner categories effective December 31, 2010. Methylene chloride and perchloroethylene are exempt VOC solvents, therefore, without the prohibition, high concentrations of these solvents could be used as reformulation options. While trichloroethylene meets the definition of VOC, without the prohibition, it could be used in Thinner and Solvent formulations that meet the proposed VOC limits. The health effects associated with exposure to perchloroethylene, methylene chloride and trichloroethylene, are well established. More information on the health effects of these solvents can be found in Chapter VIII of the Technical Support Document for the June 2008 Consumer Products Regulation Amendments (ARB, 2008e). In Rule 1143, SCAQMD has prohibited from consumer paint thinners and multi-purpose solvents, greater than 0.1 percent by weight of "Group II exempt compounds listed in Rule 102." Group II exempt compounds include methylene chloride and perchloroethylene. Therefore, the statewide toxics prohibition differs slightly from SCAQMD Rule 1143 in that it prohibits one additional toxic compound, trichloroethylene.

Photochemical Reactivity:

As mentioned previously, we are proposing in section 94509(u), to limit the use of aromatic compounds in products in the Multi-Purpose Solvent and Paint Thinner categories to 1 percent by weight, effective December 31, 2010. This Statewide requirement is intended to mitigate the possibility that manufacturers could replace current VOC solvents used in Thinners and Solvents with highly reactive compounds. A

discussion related to this proposal and the potential for the VOC reductions achieved from the proposed limits for Thinners and Solvents to be eroded without this measure, is provided in Chapter VIII, Environmental Impacts. The proposed limitation on the use of VOC aromatic compounds is unique to the State regulation, and is not required by SCAQMD Rule 1143. Therefore, this provision would apply statewide and result in an additional ozone reduction benefit in the SCAQMD.

Small Size Exemption:

We are proposing to temporarily exempt very small (8 fluid ounces or less) containers of Paint Thinner from compliance with the VOC limits until December 31, 2013. This exemption is designed to allow consumers to continue to be able to purchase typical Paint Thinners to be used with paints where the established VOC limit allows for fairly high concentrations of solvents. In addition, there is an existing exemption from the VOC limits for architectural coatings packaged in containers with a volume of one liter (1.057 quart) or less. Therefore, we believe a limited, temporary small container exemption is appropriate for Paint Thinner. Absent this provision, these solvent-borne paint products may be discarded, resulting in increasing the solid or hazardous waste stream or affecting water quality. This proposal should mitigate these potential consequences. We expect the emissions impacts of this small size exemption will be minimal. The proposed small size exemption is unique to the State regulation, therefore, this provision would only apply to areas of California outside the South Coast Air Basin.

Proposed Labeling Requirements:

To enhance the enforceability of the regulation, we are proposing that Thinners and Solvents would be subject to labeling requirements as specified in proposed new subsection 94512(e) of the Consumer Products Regulation. This proposed requirement would ensure that all products clearly display the VOC content of the product, in percent by weight, as determined from actual formulation data. This information would be required to be displayed on the product container such that it is readily observable without removing or disassembling any portion of the product container or packaging. This requirement would only apply to areas of California outside the South Coast Air Basin because SCAQMD has a well established labeling rule, Rule 443.1, Labeling of Materials Containing Organic Solvents (SCAQMD, 1986). SCAQMD Rule 443.1 specifies that within the South Coast Air Basin, products in containers of 0.94 liter (one quart) capacity or larger and containing any VOC or material containing VOC manufactured after July 1, 1987, must display on the product container, the maximum VOC expressed in grams of VOC per liter of material.

Proposal to Address Product Flammability:

During the development of the Thinners and Solvents regulation proposal, numerous stakeholders expressed concern with the flammability of low-VOC products such as those containing acetone. It was brought to our attention by staff of California's Office

of the State Fire Marshal (OSFM) and some local fire department representatives, that an increased availability of flammable or extremely flammable Thinners and Solvents may contribute to additional fire losses. The fire officials believe that consumers may not realize that characteristics of products named with general terms such as “Paint Thinner” have changed as a result of the proposed VOC limits. Thus, without clear notification of this change, they contend the potential for additional fire losses is possible.

The United States Consumer Product Safety Commission (CPSC) regulations require precautionary labeling of hazardous household products, including combustible, flammable, and extremely flammable thinners and solvents (USCPSC, 2009a). CPSC labeling requirements for hazardous household products are intended to help the consumer safely use and store hazardous products and provide information that may be necessary in the event of an accident.

Many products currently in commerce, such as “Paint Thinner” and “Mineral Spirits” are combustible products per CPSC because they have “a flashpoint at or above 100^{o}F (37.8^{o}C) to and including 150^{o}F (65.6^{o}C)” (USCPSC, 2009a). “Acetone” and many currently available “Lacquer Thinner” products are considered extremely flammable per federal law because they have “a flashpoint at or below 20^{o}F (-6.7^{o}C)” (USCPSC, 2009a). The lower the flash point, the more likely the material will ignite.

As described earlier, we believe manufacturers will meet the proposed VOC limits by increasing production of existing complying products, using water-based formulations, or replacing VOC solvents with VOC exempt ingredients. Based on market research and data we received in the Paint Thinner and Multi-purpose Solvent Survey Update, an overwhelming majority of products that currently comply with the proposed VOC limits include products labeled as “Acetone” and acetone-based formulations (ARB, 2008f).

It should be mentioned that water-based Thinners and Solvents, which comply with the proposed limits, also have a presence in the market. While water-based Thinners and Solvents meet the CPSC definition of a hazardous substance and require precautionary labeling, most do not meet the combustible, flammable, or extremely flammable definitions; they have flashpoints above 150^{o}F (65.6^{o}C) (ARB, 2008f). A flashpoint above 150^{o}F (65.6^{o}C) can be attributed to the use of water in the product.

Because we believe some manufacturers may replace some of their high VOC, combustible Thinners and Solvents with lower VOC, flammable or extremely flammable products, we are proposing to prohibit manufacturers from placing general product names on the principle display panel of “Flammable,” or “Extremely Flammable” Multi-purpose Solvent and Paint Thinner products. The general product names used on products currently in commerce include, “Paint Thinner,” “Multi-purpose Solvent,” “Clean-up Solvent,” “Paint Clean-up.” The proposed prohibition includes two alternatives that manufacturers may choose from to continue selling generally named “Flammable,” or “Extremely Flammable” Multi-purpose Solvents and Paint Thinners. The first alternative includes providing a “hang tag” or “sticker” affixed to the product

that includes the statement “Formulated to meet California VOC limits, see warnings on label.” Manufacturers may also choose to display the common name of the chemical that results in the product meeting the criteria for “Flammable” or “Extremely Flammable,” in a font as large as or larger, than any of the words on the principle display panel.

The proposed prohibition does not apply to products named “Lacquer Thinner.” Many currently available Lacquer Thinners are “Extremely Flammable” because they contain greater than 1 percent acetone.

The proposed Statewide requirement would complement and be in addition to CPSC’s labeling requirement for hazardous Thinners and Solvents. Essentially, upon approval of the proposed requirement, California will have more stringent labeling requirements for hazardous Thinners and Solvents, as a result of stakeholders’ concern. We believe additional labeling is necessary to alert the consumer of a potential change in formulation of these products which could present a fire hazard if used improperly.

Additionally, to potentially minimize the increased fire hazard from the use of Thinners and Solvents, we have proposed an effective date for the 3 percent VOC limit of December 31, 2013. This additional compliance time allows for development of less flammable products. The reporting requirement mentioned previously will also allow us to evaluate potential reformulations to determine availability of less flammable products.

Proposed Technology Assessment:

As proposed in new subsection 94513(g), Thinner and Solvent manufacturers of products available Statewide would be required to supply detailed written updates on research and development efforts undertaken to achieve future compliance with the 3 percent VOC limit. The reports would include sales and formulation data for products, as well as detailed information on the raw materials evaluated for use; maximum incremental reactivity (MIR) values for any VOC or LVP-VOC used or evaluated; the function of the raw material evaluated; testing protocols used; the results of the testing; and the cost of reformulation efforts. The report would be due on June 30, 2012, and would provide data for the 2011 calendar year.

Issues:

a. **Issue:** The effective date of the proposed 3 percent VOC limit for Multi-purpose Solvents should be earlier than December 31, 2013.

   Response: As described earlier, Multi-purpose Solvent and Paint Thinner products are used interchangeably by consumers. An earlier effective date for the proposed 3 percent VOC limit for Multi-purpose Solvent would provide an opportunity for manufacturers to circumvent the limit by adding Paint Thinner claims to the product label. We believe the emission reductions attained from an

earlier implementation of the 3 percent VOC limit for Multi-purpose Solvent would not be achieved.

b. **Issue:** ARB's proposed VOC limits will likely be met with an increase of acetone or acetone-based products because acetone is exempt as a VOC. Acetone is an extremely flammable solvent that cannot be used in the same manner as a combustible product, such as Odorless Mineral Spirits. For a limited time, ARB should educate the public to prevent any additional fire losses as a result of the proposed limits.

Response: We agree that the availability of acetone and acetone-based products will likely increase as a result of the proposed VOC limits. We also agree that an education effort is necessary to alert people to the additional hazards of using a flammable or extremely flammable product compared to a combustible product such as Odorless Mineral Spirits. We are proposing to prohibit manufacturers from placing general product names on the principle display panel of "Flammable" or "Extremely Flammable" Multi-purpose Solvent and Paint Thinner products. Manufacturers may choose to continue selling generally named "Flammable" or "Extremely Flammable" Multi-purpose Solvents and Paint Thinners as long as they either: provide a "hang tag" or "sticker" affixed to the product that includes the statement "Formulated to meet California VOC limits, see warnings on label;" or display the common name of the chemical that results in the product meeting the criteria for "Flammable" or "Extremely Flammable," in a font as large as or larger, than any of the words on the principle display panel. We believe the proposed requirement will alert the consumer of a potential change in formulation of these products which could present a fire hazard if used improperly.

c. **Issue:** ARB should consider MIR standards for the Multi-purpose Solvent and Paint Thinner categories. Reactivity-based regulations will provide manufacturers more flexibility in reformulation options and may achieve greater ozone reductions.

Response: We have maintained that a mass-based VOC strategy would be the primary focus of this regulatory effort and that a reactivity strategy would only be employed if the mass-based strategies did not provide the necessary reductions. We believe the proposed mass-based limits are feasible and will achieve significant emissions reductions. Notwithstanding the above, we acknowledge that it is possible that some existing products that are 100 percent VOC could have a lower reactivity compared to some complying 30 percent products. In addition, some complying 30 percent products could have lower reactivity compared to some technologies available to meet the 3 percent limit, thus achieving no additional air quality benefit. As such, we are proposing to limit the aromatic content of Multi-purpose Solvent and Paint Thinner to 1 percent by weight, effective December 31, 2010.

We believe that limiting the aromatic compound content of these products will ensure that the ozone forming potential of reformulated products does not increase and the maximum air quality benefits are achieved. We are also proposing to conduct a technology assessment on or before June 30, 2012, to assess manufacturers' progress towards developing products that meet the proposed 3 percent VOC limit. We also intend to evaluate whether a reactivity-based regulation would achieve greater ozone reductions as opposed to the mass-based 3 percent VOC limit.

d. **Issue:** ARB should consider exempting Tertiary Butyl Acetate (TBAc) from the definition of VOC.

Response: The Office of Environmental Health Hazard Assessment considers TBAc a possible human carcinogen, therefore we are not considering exempting it as a VOC at this time. However, because we are proposing to exempt Paint Thinner products labeled to be used exclusively for Industrial Maintenance Coatings, TBAc could be used in those specific instances, if necessary.

e. **Issue:** ARB should consider a permanent small container exemption for Paint Thinner products intended for use with the solvent-borne paint. Without a small container exemption, consumers may resort to gasoline to thin their solvent-borne paint.

Response: We acknowledge that there continues to be a limited need for thinning small quantities of solvent-borne paint. Based on discussions with ARB's Architectural Coatings Program staff, there are several categories of architectural paints with VOC limits that allow for fairly high concentrations of solvents. In addition, there is an existing exemption from the VOC limits for architectural coatings packaged in containers with a volume of one liter (1.057 quart) or less. Therefore, we believe a limited, temporary small container exemption is appropriate for Paint Thinner. Additionally, this will give manufacturers time to develop low VOC thinners that are compatible with solvent-borne coatings. We are proposing an exemption for Paint Thinner products, packaged in containers with a capacity less than or equal to 8 fluid ounces, until December 31, 2013.

f. **Issue:** ARB may be preempted by federal law from requiring additional labeling on flammable and extremely flammable Multi-purpose Solvent and Paint Thinner products.

Response: We have consulted with staff from the United States Consumer Product Safety Commission (CPSC) who have explained the federal preemption clause as it pertains to federal labeling for hazardous consumer products. Based on discussions with CPSC staff, we have written a proposal that does not conflict with federal requirements.

g. Issue: The proposed 3 percent VOC limit for Paint Thinners will not allow for products that will effectively thin all paints, including solvent-borne paint.

Response: As described earlier, we are proposing to conduct a technology assessment on or before June 30, 2012, to assess manufacturers' progress towards developing products that can meet the proposed 3 percent VOC limit. We are aware that that currently, there are only a few reformulation pathways that meet the 3 percent limit. However, there is information that indicates that new technologies are under development. We will evaluate progress toward meeting the 3 percent limit in the technology assessment.

h. Issue: ARB should consider exempting natural solvents, such as d-limonene, because of its carbon neutral attributes.

Response: D-limonene is a highly reactive VOC that contributes significantly to ground level ozone formation. Also, none of the products reported in the Survey Update were formulated with d-limonene. The commenter did not provide a definition for natural solvent or any data about the attributes of natural solvents. Therefore, we do not believe it is appropriate at this time to consider this exemption.

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VII. ECONOMIC IMPACTS

This chapter provides our analysis of the estimated economic and fiscal impacts of the proposed amendments. The analysis focuses on costs to comply with the proposed VOC limits. We expect the other proposals to result in negligible or no costs. Businesses that manufacture air fresheners, multi-purpose solvents and paint thinners with VOC contents above the proposed VOC limits would incur costs to reformulate their products. Potential fiscal impacts would be costs incurred by State agencies to administer, enforce, or comply with the proposal.

Economic impact analyses are inherently imprecise, given the unpredictable behavior of companies in a highly competitive market such as consumer products. While staff has quantified the economic impacts to the extent feasible, some projections are necessarily qualitative, and based on general observations and facts known about the consumer products industry. This analysis, therefore, serves to provide a general picture of the economic impacts typical businesses might encounter. Individual companies may experience different impacts than projected.

The summary of economic impacts of the proposed limits is presented in Section A. Other possible economic impacts and mitigation paths are provided in the following sections:

B. Costs of Compliance
C. Return on Owners' Equity
D. Impacts on California Businesses, Consumers, and State and Local Agencies
E. Other Possible Economic Impacts of Regulatory Changes
F. Mitigation of Potential Impacts through Additional Regulatory Flexibility

This economic impacts analysis was conducted in accordance with the current legal requirements under the Administrative Procedure Act (APA). This analysis uses similar methodologies and assumptions as were used in the last consumer products rulemakings (ARB, 2004b; ARB, 2006a; ARB, 2008e).

A. SUMMARY OF ECONOMIC IMPACTS

Staff has estimated that the overall cost to comply with the proposed VOC limits is about $3.1 million per year for ten years ($31 million in total). This amount includes both recurring (*e.g.*, raw materials) and nonrecurring (*e.g.*, research and development) costs and is estimated based on assumptions specific to each category. The cost represents the average of low and high cost estimates and represents staff's prediction of the costs businesses would most likely incur.

Another measure of the economic impacts of the proposal is to determine the "dollars to be spent per pound of VOC reduced," or cost effectiveness. The cost effectiveness of the proposed amendments has been calculated to be about $0.29 per pound of VOC

reduced. This is based on expected emission reductions of about 14.7 tons per day. This cost effectiveness is comparatively less costly than some other recent consumer products rulemakings.

The impacts of the proposed amendments on manufacturers are estimated by determining the "return on owner's equity" (ROE). ROE is a calculation which compares a company's percentage reduction in profitability before and after incurring the costs associated with the proposed amendments. The analysis found that the overall reduction in profitability ranges from 5.4 percent for Double Phase Aerosol Air Freshener to about 24 percent for reformulation costs incurred for both the first tier and second tier limits for Multi-purpose Solvent and Paint Thinner products. Thus, the potential exists that some manufacturers of Multi-purpose Solvent and Paint Thinner products may experience a significant impact in their profitability. In light of this, the assessment of ROE requires further explanation.

Our analysis of ROE found that sample businesses in the affected industries complying with the proposed first tier limit for Multi-purpose Solvent and Paint Thinner, declined by about 9.5 percent. When the second tier limit for Multi-purpose Solvent and Paint Thinner is calculated, the ROE of the affected industries is estimated to decline by up to 24 percent. This analysis assumes that all compliance costs will be absorbed by the affected industry. However, it is most likely that affected businesses will be able to pass on at least part of the cost increase to consumers. Since consumers spend only a small portion of their annual budget on affected products, they are not expected to be sensitive to a small increase in the prices of those products. To the extent that the projected costs are passed on to consumers, the impact on business profitability is likely to be much less than estimated in our projection.

Because we expect businesses will pass on compliance costs to the consumer, we estimated the increased cost the consumer may experience. If all assumed compliance costs are passed on to the consumer, without consideration of typical retail mark-up, we estimate the cost per unit increase would range from negligible cost (net savings or no cost) for a Double Phase Aerosol Air Freshener product to about $0.75 for a Multi-purpose Solvent and Paint Thinner product reformulated to meet the proposed second tier limit unit of 3 percent VOC by weight. The value of $0.75 represents the summed per-unit cost increase for a one gallon of product reformulated to meet the first tier limits and reformulated a second time to meet the second tier limits. By apportioning annual sales of Multi-purpose Solvent and Paint Thinner products to the California population, we estimated that residents purchase less than one container of Multi-purpose Solvent and Paint Thinner per year. Thus, considering normal retail mark-up of 100 percent, the consumer's cost increase to purchase Multi-purpose Solvent and Paint Thinner would increase by about $1.50 per gallon.

We also estimated costs to contractors because they commonly purchase Multi-purpose Solvent and Paint Thinner products. If we apportion all sales of Multi-purpose Solvent and Paint Thinner products to licensed contractors, we estimate purchases of approximately five gallons per year. Considering normal retail mark-up and using our

high cost estimate, the cost increase to licensed contractors purchasing Multi-purpose Solvent/Paint Thinner products would be about $8 per year (CDCA, 2009).

Based on our ROE calculations, we believe that overall, most affected businesses will be able to absorb the costs, or will pass through some of the costs to the consumer, such that there will be no significant adverse impacts on their profitability. Therefore, we do not expect a noticeable change in employment; business creation, elimination or expansion; or business competitiveness in California. However, the proposed amendments may impose economic hardship on some businesses with very little or no margin of profitability.

We determined that there would be no significant adverse fiscal impacts to any local or State agencies.

Staff believes that the regulation cost and CE determination methodologies are conservative. For example, the average cost scenario of low and high determines the overall cost and cost effectiveness of the regulation. The low cost scenario assumes that companies would choose the lowest cost reformulation pathway, making minor adjustments to a product's formulation, or simply ceasing sale of some non-complying products. We believe that most manufacturers would choose the lowest cost reformulation option. For the high cost scenario, it is assumed that there is significant research and development, and new equipment is needed to reformulate the product. We believe that few manufacturers would need to take the high cost reformulation approach.

Details of our cost analysis are in the following sections. Additional information as to how recurring and nonrecurring costs were estimated is contained in Appendices D and E.

B. COSTS OF COMPLIANCE

The total cost of compliance of the proposal requires an estimation of the recurring and nonrecurring costs that would be expended to reformulate and bring a product to market. Recurring costs for this analysis are those associated with the cost of the raw materials. Nonrecurring costs are assumed to be one time costs and are those associated with research, development, and plant changes that may be necessary to develop a reformulated complying product. Our analysis further assumes that nonrecurring costs will be amortized over a project horizon of ten years. Summing the recurring and amortized nonrecurring costs represents the total cost to reformulate a product. We then use the total cost to estimate the potential cost per unit increase to the consumer, the cost effectiveness (CE) of the proposed amendments, and the ROE.

There are many variables in producing a product for market, and assumptions about those variables will greatly affect the outcome of any cost analysis. For each assumption, staff applied a test of "reasonableness" to determine if this was a likely approach to take, or if the event had a high probability of occurring. The following

sections describe our process for arriving at the costs to comply with the proposed amendments.

1. Recurring Costs

As part of the economic impact analysis, we evaluated the expected cost impacts from complying with the proposed VOC limits on raw material costs. The change in the cost of raw material costs are expected to be ongoing, *i.e.*, they are recurring costs.

a. Methodology

Using the data from the 2006 Survey for Double Phase Aerosol Air Freshener products and the Survey Update for Multi-purpose Solvent and Paint Thinner products, we determined the formulations which most closely reflect the "typical" compliant and non-compliant product contents. For each category staff estimated a "low cost" and "high cost" by varying costs for ingredients. Information on how raw material costs were estimated, as well as formulations evaluated (with individual weight fractions and unit prices per pound), are shown in Appendix D. While these formulations may not reflect the exact composition of existing non-compliant products and compliant products that will be marketed, we believe they are reasonably representative for the purposes of this analysis.

In this rulemaking, we used the same raw material costs as were used in the June 2008 rulemaking for consumer products (ARB, 2008e). We believe this is reasonable, if not conservative, given the declining price of oil and general economic downturn that has occurred since that rulemaking.

Except for ingredient costs, we assumed changes in packaging, delivery systems, labeling, distribution and other recurring costs would be negligible relative to baseline levels of these costs (ARB, 1997b). We believe this assumption is valid because the proposed limits should not require significant packaging or delivery system modifications. We also believe distribution costs would be the same because we do not expect manufacturers to sell and distribute "California only products." The most likely pathway for reformulation was assumed for non-compliant products. Despite this assumption, alternative formulations may allow lower-cost compliant products than shown in our analysis.

b. Results

The estimated cost of typical non-compliant and compliant formulations for each category is displayed in Table VII-1a. The values are taken from Appendix D. The difference between high and low cost non-compliant and compliant formulations yields the change in ingredient costs. As shown in Table VII-1a, Columns C_1 and C_2, the anticipated raw materials cost change ranges from no cost (net savings or no cost) to about $0.50 increase per unit (per 83 fluid ounces average unit size of Multi-purpose Solvent and Paint Thinner complying with the tier 2 limit). Note that when the cost for

raw materials in the predicted reformulated product are comparable or slightly cheaper to those currently used, rather than assigning a negative cost, we assume there will be no change in the cost of raw materials.

Table VII-1a
Estimated Change in Formula Cost per Unit*

Category	Formula Cost per Unit				Cost Increase to Comply per Unit	
	Non-compliant		Compliant		Low	High
	Low	High	Low	High		
	A_1	A_2	B_1	B_2	$C_1 = B_1 - A_1$	$C_2 = B_2 - A_2$
Air Freshener – Double Phase (aerosol)	$0.10	$0.20	$0.10	$0.20	$0.00+	$0.00+
Multi-purpose Solvent & Paint Thinner tier 1	$3.20	$4.70	$2.90	$4.30	$0.00+	$0.00+
tier 2	$2.90	$4.30	$2.80	$4.80	$0.00+	$0.50+

* Raw material costs are assumed to be $0.00 when staff estimates that materials used to reformulate are comparably priced to current materials or are less expensive than currently used.

\+ Numbers have been rounded in tables, however unrounded numbers are used for calculations in subsequent tables.

Using the change in the cost per unit from Table VII-1a, the total recurring costs per category are calculated as shown in Table VII-1b. To arrive at the total cost per category, estimated non-compliant unit sales (Column D) are multiplied by the recurring costs per unit taken from Table VII-1a. As shown in Table VII-1b, Column E_3 the average total recurring cost per category ranges from no cost to about $850,000 for the Multi-purpose Solvent and Paint Thinner products reformulated to comply with the tier 2 VOC limit.

Table VII-1b
Total Estimated Recurring Cost

Category	Annual California Noncomplying Unit Sales*	Total Annual Recurring Cost per Category+ Low Cost	High Cost	Average
	D	E_1 = D X C_1	E_2 = D X C_2	E_3 = (E_1 + E_2)/2
Air Freshener – Double Phase (aerosol)	53,748,100	$0.00	$0.00	$0.00
Multi-purpose Solvent & Paint Thinner tier 1	1,723,300	$0.00	$0.00	$0.00
tier 2	1,699,000	$0.00	$854,000	$427,000

* Assumes "typical" unit size as shown in Appendix D.
+ See Table VII-1a footnote about the use of unrounded numbers in calculations.

2. Nonrecurring Costs

In this portion of the analysis, we evaluated the impacts of nonrecurring costs likely to be expended to comply with the proposed limits. These are assumed to be costs incurred once to conduct the necessary research and development to produce a complying product. Technical literature and industry trade journals provide little information to estimate nonrecurring costs directly. This is not surprising because the consumer products industry is very competitive, and production cost data specific to a company are closely guarded trade secrets. Stakeholders have generally concurred that our assumptions for nonrecurring costs are reasonable. Appendix E displays the various phases of product development and the costs that are assigned to each phase.

a. Methodology

To estimate nonrecurring costs, we used two approaches for each product category, one for low cost, and one for high cost, with a different set of assumptions for each approach. The categories proposed for regulation are considered "household care" products. Appendix E displays how nonrecurring costs were apportioned for both high and low cost scenarios. For each category only new or additional costs were considered. Costs were not considered that would have been expected in the normal course of business if the regulation had not been in effect.

b. Results

Table VII-2, Columns A_1 and A_2, display the results of our assessment of the nonrecurring costs to be incurred for each category. These costs are taken from Appendix E. Estimated nonrecurring costs for the low cost scenario for the categories range from about $11,200 to $15,100 per product. Note also that nonrecurring costs for the high cost scenario range from about $50,000 to $75,000 per product.

Table VII-2
Estimated Nonrecurring per Product Costs to Comply with the Proposed Limits

	Cost Per Product		Amortized Cost Per Product	
	Low	High	Low	High
Category	A_1	A_2	B_1 = A_1 X CRF*	B_2 = A_2 X CRF*
Air Freshener – Double Phase (aerosol)	$11,200	$50,100	$1,800	$8,200
Multi-purpose Solvent & Paint Thinner tier 1	$15,100	$74,600	$2,500	$12,100
tier 2	$15,100	$74,600	$2,500	$12,100

*CRF = Capital Recovery Factor of 0.16275

c. Amortizing Nonrecurring Costs

The next part of our analysis assumes that nonrecurring costs will not be incurred in a single year, but would instead be amortized over ten years. To amortize nonrecurring costs, the costs shown in Columns A_1 and A_2 are then amortized using the Capital Recovery Method. This is a standard methodology and it is recommended under guidelines issued by the California Environmental Protection Agency (Cal/EPA).

The equation below shows that the estimated total nonrecurring costs per product is multiplied by the Capital Recovery Factor (CRF) to convert these costs into equal annual payments over a project horizon (i.e., the projected useful life of the investment) at a discount rate.

$$\text{Annualized nonrecurring costs} = (\text{Nonrecurring Costs}) \times [i(1+i)^n / ((1+i)^n - 1)]$$

Where:

$i(1+i)^n / ((1+i)^n - 1)$ = Capital Recovery Factor (CRF)
i = discount interest rate over project horizon, %
n = number of years in project horizon
Nonrecurring Costs = total nonrecurring cost per product

We assumed a project horizon of ten years, a commonly cited period for an investment's useful lifetime in the chemical processing industry. We also assumed a fixed interest rate of 10 percent throughout the project horizon. These assumptions are conservative and constitute standard practice in analyses of consumer products regulations, including previous consumer product rulemakings. Based on these assumptions, the Capital Recovery Factor (CRF), as shown below, is 0.16275.

$$\begin{aligned} CRF &= 0.1(1+0.1)^{10}/((1+0.1)^{10}-1) \\ &= 0.1(2.59)/1.59 \\ &= 0.259/1.59 \\ &= 0.163 \text{ (rounded)} \end{aligned}$$

Using the low cost estimate for Double Phase Aerosol Air Fresheners from Table VII-2, Column A_1, then the amortized cost is:

Amortized Cost: $11,200 X 0.16275 = $1,822.80

For the low cost scenario, as shown in Column B_1, of Table VII-2, we project per-product annualized nonrecurring costs to be about $1,800 to $2,500 for each of ten years. For the high cost scenario (Column B_2), we project per-product annualized nonrecurring costs to range from about $8,200 to $12,100 for ten years.

Next, nonrecurring costs for all non-compliant products per category are calculated by using the low and high amortized costs from Table VII-2. To arrive at the range of total nonrecurring cost per category, two different scenarios are calculated. In the low cost scenario, we assume that manufacturers will conduct research and other product development once for a given product category, and use these efforts as a basis to reformulate all their other non-complying products in the same category. As shown in Table VII-3, the low cost incurred by all businesses is the product of the low product cost (Column C) and number of companies (Column B) that have non-complying products within the given category.

In the total nonrecurring high cost scenario, we assume that reformulation costs would be incurred per product. This means that companies that have multiple non-complying products in a given category would conduct separate research and development efforts for each product in their respective product lines. Thus in this case, the high amortized cost (Column D) is multiplied by the number of non-compliant products (Column A).

As shown in Table VII-3, total category annualized nonrecurring costs range from about $43,000 to about $50,000 for the low cost scenario, and from $1.7 million to $1.8 million for the high cost scenario. Also as shown in Table VII-3, the total nonrecurring cost to industry is projected to range from about $143,000 to just over $5 million dollars per year for ten years.

Table VII-3
Estimated Total Nonrecurring Cost per Category

Category	# Non-complying Products*	# Companies	Low Cost Per Unit	High Cost Per Unit	Total Nonrecurring Cost per Category++ Low	Total Nonrecurring Cost per Category++ High
	A	B	C	D	E_1 = B X C	E_2 =D X A
Air Freshener Double Phase (aerosol)	218	24	$1,800	$8,200	$43,200	$1,787,600
Multi-purpose Solvent & Paint Thinner tier 1	137	20	$2,500	$12,100	$50,000	$1,657,700
tier 2	140	20	$2,500	$12,100	$50,000	$1,694,000
Total:	495+	44+			$143,200	$5,139,300

* Adjusted for market covered in survey. Assume 90% for all categories.
+ Tier 1 and 2 Multi-purpose Solvent & Paint Thinner products are counted twice because they will be reformulated twice. Number of Multi-purpose Solvent & Paint Thinner companies are not counted twice.
++ See Table VII-1a footnote about the use of unrounded numbers in calculations.

3. Total Costs

For each category, the total cost of reformulation is estimated by summing recurring costs (see Table VII-1b) with nonrecurring amortized costs (see Table VII-3). Table VII-4 displays the total low and high cost to reformulate all non-complying products for each category. We estimate the industry compliance costs to range from a low of about $43,000 per year for aerosol Double Phase Air Freshener products, to a high of about $2.5 million per year to comply with the second tier 2 VOC limit for Multi-purpose Solvent and Paint Thinner products. Table VII-4 (Column C_3) also shows the average cost estimate to range from about $854,000 to $1.3 million. As shown in Column C_3, the overall average cost to reformulate all non-compliant products for all categories is about $3.1 million.

Table VII-4
Estimated Total Costs to Comply with the Proposed VOC Limits

	Nonrecurring Costs		**Recurring Costs***	
	Low	High	Low	High
	A_1	A_2	B_1	B_2
Air Freshener – Double Phase (aerosol)	$43,200	$1,787,600	$0	$0
Multi-purpose Solvent & Paint Thinner tier 1	$50,000	$1,657,700	$0	$0
tier 2	$50,000	$1,694,000	$0	$845,000

	Nonrecurring and Recurring Costs+		
	Low	High	Average
	C_1= A_1+ B_1	C_2= A_2+ B_2	C_3= (C_1+ C_2)/2
Air Freshener – Double Phase (aerosol)	$43,200	$1,787,600	$915,400
Multi-purpose Solvent & Paint Thinner tier 1	$50,000	$1,657,700	$853,900
tier 2	$50,000	$2,548,000	$1,299,000
TOTAL:	$143,200	$5,993,300	$3,068,300

* A cost of $0 may indicate a per unit cost of less than one-half of one cent.
+ See Table VII-1a footnote about the use of unrounded numbers in calculations.

4. Cost per Unit

We also evaluated the potential increased cost the consumer would pay if all costs of compliance were passed onto the consumer (not including retail mark-up). For this estimate, we assumed that all recurring and nonrecurring costs are assessed only to the number of non-complying units in each category. Table VII-5 displays the result of this analysis.

For this rulemaking, as with others, we assumed products reformulated to meet the proposed limits will be marketed throughout the United States by national marketers. From our experience, we know that businesses generally formulate and distribute to the entire nation, products complying with California regulations, rather than incurring the additional cost of setting up a California specific product distribution system. This assumption is valid especially considering the number of jurisdictions that have and are continuing to adopt California standards.

Therefore, we assume that the costs of compliance will not be assessed only to products sold in California, but will be spread over products sold across the country. To do this, our analysis used the California-apportioned (by population) high and low nonrecurring costs (Table VII-3). Using this alternative approach, we discounted the nonrecurring cost per unit by the California-apportionment factor (*i.e.*, the current ratio of California to U.S. population, or 12.5 percent (CA DOF, 2007)). To illustrate, using the total tier 1 nonrecurring high cost for Multi-purpose Solvent and Paint Thinner products of $1,657,700 the nonrecurring portion of cost that would be passed onto the consumer is 12.5 percent of this amount, or $207,000. The California portion of low and high nonrecurring costs are each divided by the number of non-complying units sold in California per year (see column D of Table VII-1b). The resulting nonrecurring high and low cost per unit is then added to the recurring high and low cost per unit (taken from Table VII-1a) to arrive at the total increase in cost per unit to the consumer.

For Double Phase Aerosol Air Fresheners, the total cost of reformulating one 9 ounce product is estimated to be quite minimal. The recurring raw materials costs to reformulate Double Phase Aerosol Air Fresheners to meet the proposed limit is projected to be zero. This is because the costs of ingredients of a complying product are actually less than the cost of ingredients of a non-complying product. For the purposes of our cost calculations, in this case, as was done in economic analyses for previous rulemakings, we assume that the ingredient costs are zero. As for the recurring (research and development) while the overall costs are significant, the costs are spread over more than 50 million units, resulting in an overall negligible cost per unit.

As shown in Table VII-5, we estimate the average cost per unit increase to the California consumer to range from no cost increase to about $0.62 for the tier 2 limit for Multi-purpose Solvent and Paint Thinner products. Taken together (summing cost for tier 1 and tier 2), the worst case scenario cost increase would be about $0.75 per unit.

Because of unpredictable factors such as the highly competitive nature of the consumer products market, it is not possible to accurately predict the final retail price of products that will comply with the proposed limits when they become effective. To the extent the cost impacts are passed on to consumers, the final retail prices may be lower or higher than suggested by this analysis.

Table VII-5
Estimated Per-Unit Cost Increases from Both Annualized Nonrecurring and Annual Recurring Costs

Category	Estimated Noncompliant Unit Sales Per Day in CA	Annualized Nonrecurring Low Cost/Unit	Annualized Nonrecurring High Cost/Unit	Annual Recurring Low Cost/Unit	Annual Recurring High Cost/Unit
	A	B_1	B_2	C_1	C_2
Air Freshener – Double Phase (aerosol)	147,300	$0.00	$0.00	$0.00	$0.00
Multi-purpose Solvent & Paint Thinner tier 1	4,700	$0.00	$0.12	$0.00	$0.00
tier 2	4,700	$0.00	$0.12	$0.00	$0.50

	Total Increase Low/Unit	Total Increase High/Unit	Total Increase Mid/Unit
	D_1	D_2	D_3
Air Freshener – Double Phase (aerosol)	$0.00	$0.00	$0.00
Multi-purpose Solvent & Paint Thinner tier 1	$0.00	$0.12	$0.06
tier 2	$0.00	$0.62	$0.31

* A cost of $0 may indicate a per unit cost of less than one-half of one cent.
+ See Table VII-1a footnote about the use of unrounded numbers in calculations.

5. Cost-Effectiveness (CE)

Using the total costs displayed in Table VII-4, we evaluated the anticipated CE of the proposed new limits. Such an evaluation allows us to compare the efficiency of the proposed limits in reducing a pound of VOC relative to other existing regulatory programs.

The CE of a reduction strategy is generally defined as the ratio of total dollars to be spent to comply with the strategy (as an annual cost) to the mass reduction of the

pollutant(s) to be achieved by complying with that strategy (in annual pounds). The CE is calculated as shown by the following general equation:

$$\text{Cost Effectiveness} = \frac{\text{Total Cost to Comply}}{\text{Annual Mass Reduction in VOC}}$$

We estimate that, when fully effective, the proposed VOC limits will result in an emission reduction of about 14.7 tons per day, or 10,731,000 pounds per year. In this chapter, we have calculated that the average total cost to comply with the proposed VOC limits is three million dollars.

The CE of the proposed amendments related to complying with the VOC limits is about $0.29 per pound of VOC reduced, as shown by the following equation:

$$\frac{\$3{,}068{,}300}{10{,}731{,}000 \text{ pounds}} = \$0.29 \text{ per pound}$$

Table VII-6 shows a comparison of the CE for the proposed limits relative to other recent ARB consumer product regulations and control measures.

Table VII-6
Comparison of Cost-Effectiveness for ARB Consumer Product Regulations/Measures

Regulation/Control Measure	Cost-Effectiveness (Dollars per Pound VOC Reduced)
2009 Amendments	$0.29
2008 Amendments (ARB, 2008e)	$6.23
2006 Amendments (ARB, 2006a)	$2.35
2004 Amendments (ARB, 2004b)	$2.01 to $2.34
Aerosol Adhesives (ARB, 2000c)	$6.00
Architectural and Industrial Maintenance Coatings (ARB, 2007i)	$1.12

As shown in Table VII-6, the CE is considerably lower compared to several other recent rulemakings.

C. RETURN ON OWNERS' EQUITY

Typical California businesses are affected by the proposed new limits to the extent that the implementation of these requirements would change their profitability. To estimate reduction in profitability, this portion of the economic impacts analysis compares the Return on Owners' Equity (ROE) for affected businesses before and after inclusion of the cost to comply with the proposed requirements. The data used in this analysis are obtained from Dun and Bradstreet Industry Norms and Key Business Ratio (D&B,

2009), the ARB's 2006 Consumer and Commercial Products Survey (ARB, 2007f), the Survey Update for Paint Thinner and Multi-purpose Solvent products (ARB, 2008f), and the CE analysis described previously in section B.

1. Affected Businesses

Any business which manufactures or markets consumer products subject to the proposed new limits and requirements can be directly affected by this regulation. Also potentially affected are businesses which supply raw materials or equipment to manufacturers or marketers, and those that distribute or sell consumer products in California. The focus of this analysis, however, will be on manufacturers, marketers, and distributors that are most affected by the proposed measures.

The consumer products subject to the proposed measures are manufactured, marketed, or distributed by a large number of companies worldwide. According to our Surveys, there are about 44 companies that market the affected products in California. Many of these companies manufacture, market, and distribute a broad range of solvent, adhesive, household, and personal care products. However, some companies' business is limited to solvent manufacture. All together, there are 495 non-complying products (based on reported figures). Of the companies manufacturing these products, two small-sized firms are located in California.

These 44 companies can be described by the North American Industry Classification System codes (NAICS): 325612, Polish and Other Sanitation Good Manufacturing; and 325510, Paint and Coatings Manufacturing.

2. Analysis Approach

This analysis covers two industries with at least three affected businesses. The approach used in evaluating the potential economic impact of the proposed measures on these businesses is as follows:

(1) A typical business from each product category was selected from the Surveys respondents.
(2) A range of compliance costs were estimated for each affected product category. The average cost (see Table VII-4) for each category was used in this analysis.
(3) Compliance cost to a typical business was then estimated based on a weighted average of all product category costs in the affected industry.
(4) Estimated cost was adjusted for federal and State taxes.
(5) The ROE was calculated for each of these businesses by dividing the net profit by the net worth. The adjusted cost was then subtracted from net profit data. The results were used to calculate an adjusted ROE.
(6) The adjusted ROE was then compared with the ROE before the subtraction of the cost to determine the potential impact on the profitability of the business.

An ROE reduction of more than 10 percent in profitability assuming that all costs are absorbed by the affected company and not passed on to the consumer, is considered to indicate a potential for significant adverse economic impacts. This value has been used consistently by the ARB staff to determine impact severity and is consistent with that used by the U.S. EPA.

3. Assumptions

This analysis uses 2007-2008 Dun and Bradstreet financial data (D&B, 2009) for a nationwide typical business in the Polish and Other Sanitation Good Manufacturing industry (325612 NAICS code) and Paint and Coatings Manufacturing (325510 NAICS code). These data were used to calculate the ROEs before and after the subtraction of the compliance costs for a typical business. The calculations were based on the following assumptions:

(1) A typical business on a nationwide basis in each industry is representative of a typical California business in that industry;
(2) All affected businesses were subject to federal and State tax rates of 35 percent and 9.3 percent respectively; and
(3) Affected businesses are not able to increase the prices of their products, nor can they lower their costs of doing business through short-term cost-cutting measures.

Given the limitation of available data, we believe these assumptions are reasonable for most businesses at least in the short run; however, they may not be applicable to all businesses.

4. Results

Table VII-7 shows the results of our analysis of ROE. The percentage in reduction of profitability ranges from 5.4 percent for Double Phase Aerosol Air Fresheners to about 24.2 percent for Multi-purpose Solvent and Paint Thinner products. The ROE of 24.2 percent combines the ROEs estimated for the tier 1 and tier 2 limits for Multi-purpose Solvent and Paint Thinner products. The average reduction in profitability is about 14.8 percent.

Table VII-7
Summary of Decline in Return on Owners' Equity (ROE)

NAICS	Company Name	Percent Change in ROE
325612	Polish and Other Sanitation Good Manufacturing	
	Double Phase Aerosol Air Freshener	-5.4
325510	Paint and Coatings Manufacturing	
	Multi-purpose Solvent & Paint Thinner –tier 1	-9.5
	Multi-purpose Solvent & Paint Thinner –tier 2	-14.7
	Total tier 1 & tier 2	-24.2
Average for both Industries		**-14.8**

Because we calculated a reduction in ROE of more than 10 percent for Multi-purpose Solvent and Paint Thinner products, we have determined that there is a potential for significant impact on profitability. In light of this, the assessment of ROE requires further explanation.

The results in Table VII-7 show that our analysis of ROE found that sample businesses in the affected industries, complying with the proposed limit for Double Phase Aerosol Air Freshener, declined in profitability by about 5.4 percent. The ROE for a business affected by the tier 1 limit for Multi-purpose Solvent and Paint Thinner, declined by about 9.5 percent. These ROE values are not considered significant.

Factoring in the tier 2 limit for Multi-purpose Solvent and Paint Thinner products, the ROE is estimated to decline by up to 24.2 percent (combining both limits for Multi-purpose Solvent and Paint Thinner). However, our analysis assumes that all compliance costs will be absorbed by the affected industry. However, it is most likely that affected businesses will be able to pass on at least part of the cost increase to consumers. Since consumers spend only a small portion of their annual budget on affected products, they are not expected to be sensitive to a small increase in the prices of those products. To the extent that the projected costs are passed on to consumers, the impact on business profitability is likely to be much less than estimated in our projection.

We believe that overall, most affected businesses will be able to absorb the costs, or will pass through some of the costs to the consumer, such that there will be no significant adverse impacts on their profitability. However, the proposed amendments may impose economic hardship on some businesses with very little or no margin of profitability.

D. IMPACTS ON CALIFORNIA BUSINESSES, CONSUMERS, AND STATE AND LOCAL AGENCIES

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment must include a consideration of the impact of the proposed regulation on California jobs; business expansion, elimination or creation; and the ability of California business to compete with businesses in other states.

1. Potential Impact on California Businesses

Our profitability analysis shows a significant change in the average profitability of affected businesses that manufacture Multi-purpose Solvent and Paint Thinner products, if they absorbed the entire cost of compliance. We believe that these manufacturers will pass through at least a portion of their compliance costs to maintain profitability. Based on sales of Multi-purpose Solvent and Paint Thinner products, we expect the average California resident to buy no more than one product per year. Therefore, purchase of Multi-purpose Solvent and Paint Thinner products only accounts for a small portion of the consumer's annual budget. Thus, consumers are likely less sensitive to the price changes. For this reason, we believe businesses will be able to pass through compliance costs, and are likely to be able to recover the bulk of the cost increase from consumers. To the extent that businesses are able to pass on the increased cost to consumers, the adverse impact of the proposed measures would be less than projected in this analysis. Furthermore, the projected impact will be less if businesses are able to improve their operational efficiency, thus reducing their costs.

Nonetheless, the proposed measures may impose economic hardship on some businesses with very little or no margin of profitability. These businesses, if hard pressed, can seek relief under the variance provision of the consumer products regulation for extensions to their compliance dates. Such extensions may provide sufficient time to minimize the cost impacts to these businesses. Additional mitigation may be achieved by taking advantage of the compliance flexibility offered by the existing Innovative Product Provision (IPP) and the Alternative Control Plan (ACP) Regulation (see Section F of this chapter).

2. Potential Impact on Business Creation, Elimination or Expansion

The proposed amendments would have no noticeable impact on the status of California businesses. This is because most affected businesses are expected to be able to pass on the bulk of the reformulation cost to consumers in terms of higher prices for their products. However, if either of the two small California businesses that reported sales to us in the Survey Update have little or no margin of profitability, they may lack the financial resources to reformulate their products on a timely basis. Should the proposed measures impose significant hardship on these businesses, temporary relief in the form of a compliance date extension under the variance provision may be warranted.

On the other hand, the proposed measures may provide business opportunities for some California businesses or result in the creation of new businesses. California businesses which supply raw materials and equipment or provide consulting services to affected industries may benefit from increased industry spending on reformulation.

3. Potential Impact on Business Competitiveness

The proposed measures would have no significant impact on the ability of California businesses to compete with businesses in other states. Because the proposed measures would apply to all businesses that manufacture or market certain consumer products regardless of their location, the staff's proposal should not present any economic disadvantages specific to California businesses.

Nonetheless, the proposed amendments may have an adverse impact on the competitive position of some small, marginal businesses in California if these businesses lack resources to develop commercially acceptable products in a timely manner. As stated above, such impacts can be mitigated to a degree with a justified compliance extension under the variance provision of the Consumer Products Regulation, or through additional regulatory flexibility afforded by the IPP or the ACP Regulation (see Section F).

4. Potential Impact on California Employment

The proposed amendments are not expected to cause a noticeable change in California employment and payroll. As shown in Table VII-8, according to the U.S. Department of Commerce, California employment in the industries affected by the proposed amendments was about 4,627 in 2006, or about 7 percent of national employment in the affected industries. This represents less than 1 percent of manufacturing employment in California. Also, as shown in Table VII-8, these employees generated about $211,541 million in payroll, or about 6.3 percent of national payroll in the affected industries. This also accounts for less than 1 percent of the total California manufacturing payroll in 2006.

Table VII-8
California Employment and Payroll in Affected Industries

NAICS	Number of Employees		Payroll	
	California	California Share as Percent of U.S.	California (thousand dollars in 2006)	California Share as Percent of U.S.
325612	1,159	6.5	49,738	5.7
325510	3,468	7.5	161,803	6.5
Total	4,627	7.2	211,541	6.3

Source: (U.S. Census, 2006)

5. Impacts on California Consumers

The potential impact of the proposed amendments on consumers depends upon the ability of affected businesses to pass on the cost increases to consumers. For the Double Phase Aerosol Air Freshener proposed VOC limit and proposed tier 1 VOC limit for Multi-purpose Solvent and Paint Thinner, competitive market forces may prevent businesses from passing their cost increases on to consumers. Thus, we do not expect a significant change in retail prices. However, for the proposed tier 2 VOC limit for Multi-purpose Solvent and Paint Thinner products, businesses will likely be unable to absorb their costs of doing business. They will likely pass their cost increases on to consumers.

Assuming the affected industry will pass on the entire compliance costs to consumers in terms of higher prices, we estimate the average price of a product (including typical retail mark-up) would not increase for Double Phase Aerosol Air Fresheners, and would increase by about $0.75 per unit for Multi-purpose Solvents and Paint Thinners. For Double Phase Aerosol Air Fresheners, while the overall costs to comply with the proposed limit are significant, spreading costs over more than 50 million units, results in an overall negligible cost per product.

For Multi-purpose Solvent and Paint Thinner products, apportioning annual sales of the categories to the California population, we estimated that residents purchase less than one container of Multi-purpose Solvent and Paint Thinner per year. We also estimated in Section B of this chapter that the potential cost increase per unit from compliance with both limits would be about $0.75. Thus, considering normal retail mark-up, the consumer's cost increase to purchase Multi-purpose Solvent and Paint Thinner would increase by about $1.50 per gallon.

However, Multi-purpose Solvent and Paint Thinner products are more commonly purchased by contractors. If we apportion all sales of Multi-purpose Solvent and Paint Thinner to licensed contractors we estimate purchases of approximately five gallons per year. Considering normal retail mark-up, the cost increase to licensed contractors purchasing Multi-purpose Solvent and Paint Thinner products would be about $8 per year.

The proposed amendments may also affect consumers adversely if they result in reduced performance attributes of the products. However, this scenario is unlikely to occur for the following reasons. First, for the proposed limits, there are already complying products with a market presence. Thus, the industry already has the technology to manufacture compliant products that satisfy consumers. Second, marketers are unlikely to introduce a product which does not meet their consumers' expectations. This is because such an introduction would be damaging not only to the product sale, but also to the sale of other products sold under the same brand name (impairing so-called "brand loyalty"). Finally, the Board has provided flexibility, under the existing consumer products program, to businesses whose situations warrant an extension to their compliance dates. For companies that can justify such variances, the

additional time may afford more opportunity to explore different formulation, cost-cutting, performance-enhancing, or other marketing strategies which can help make the transition to new complying products nearly transparent to consumers.

6. Potential Impacts to California State or Local Agencies

State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

We have determined that the proposed limits will not create costs or savings, as defined in Government Code section 11346.5(a)(6), to any State agency or in federal funding to the State, costs or mandate to any local agency or school district whether or not reimbursable by the State pursuant to Part 7 (commencing with section 17500), Division 4, title 2 of the Government Code, or other non-discretionary savings to local agencies.

E. OTHER POSSIBLE ECONOMIC IMPACTS OF REGULATORY CHANGES

In addition to the proposed VOC limits, there are other proposed amendments to the Consumer Products Regulation, some of which may have a potential economic impact on affected businesses. While we do not expect any significant economic impact from any of the proposals, it is possible that there could be some increased cost to business resulting from proposed changes.

The proposed amendments would require additional labeling for Multi-purpose Solvent and Paint Thinner products. Multi-purpose Solvent and Paint Thinner products would be required to include VOC content information on their labels, as well as a sticker or hanging tag if their product is considered “flammable” or “extremely flammable.” It is likely there will be costs associated with this labeling requirement. We considered these costs in determining the total nonrecurring costs. The cost estimates for labeling are shown in Appendix E and range from about $1,500 to $7,000.

F. MITIGATION OF POTENTIAL IMPACTS THROUGH ADDITIONAL REGULATORY FLEXIBILITY

If adopted by the Board, the proposed limits will be incorporated in section 94509 of the Consumer Products Regulation (title 17, California Code of Regulations, sections 94507-94517). To complement the mandatory VOC limits, the existing consumer products program provides a very high degree of compliance flexibility, through two voluntary, market-based programs: the IPP and the ACP Regulation. These options could be evaluated to minimize cost impacts. The IPP (section 94511) allows qualified manufacturers to sell products that have VOC contents greater than the applicable VOC limit, provided they demonstrate that such products actually emit less VOCs than representative products that comply with the VOC limit. Using the

emissions averaging approach, the ACP is a voluntary regulation (title 17, CCR, sections 94540-94555) designed to allow multi-product VOC averaging as an alternative means of complying with the VOC limits.

Various manufacturers have formulated technologically-advanced IPP products that are more concentrated, higher in efficacy, or have some other chemical or physical properties that permit users to release less VOCs when using such products. To date, 14 manufacturers have submitted 26 original applications and obtained approval for 25 IPP applications involving 23 products. Based on their participation in the program, it is reasonable to conclude that manufacturers are using this program to provide consumers with products that meet their needs, while lowering costs, improving the "market value" of their products, or otherwise maintaining profit margins.

The potential benefits of emissions averaging or "bubbling" for consumer product manufacturers under the ACP regulation have been documented by ARB staff (ARB, 1994). In general, emissions averaging under approved ACPs allows manufacturers to choose the least cost or other advantageous reformulation options for its product lines. Rather than directly complying with each and every VOC limit, manufacturers can choose to "over-comply" with some reformulations in order to offset the "under-compliance" of other product lines. The ACP regulation requires the net resulting emissions from products under such averaging plans to be no greater than the level which would have resulted had all the products under the ACP bubble directly complied with the applicable limits. In short, the same emission reductions are achieved while providing a high degree of formulation and marketing flexibility to manufacturers. To date, five manufacturers have implemented approved ACP averaging programs, reducing VOC emissions by about 8.2 million pounds more than would have occurred under the mandatory VOC limits. We expect that such emissions averaging will also benefit manufacturers subject to the proposed limits.

Overall, most affected businesses will benefit from the IPP and the ACP Regulation. Both programs are completely voluntary and impose no additional costs to businesses to meet the requirements other than testing and reporting requirements. Manufacturers who take advantage of these market-based programs presumably do so because it costs less than direct compliance with the limits or it provides some other market benefits.

According to previous analyses, the potential cost differential which might result from competition under the ACP between small and large firms would not necessarily cause extreme hardship on small firms. However, inclusion of products subject to the proposed limits in an ACP may affect the level of competition between companies, which could lead to the elimination of some marginal producers for those products. Such competition may also have minor impacts on California employment and payroll. However, the impact is expected to be positive in the long term. Any potential impacts on the ability of California businesses to compete with businesses in other states are also expected to be minimal.

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VIII. ENVIRONMENTAL IMPACTS

In this rulemaking, ARB staff is proposing amendments to the Consumer Products Regulation that are designed to reduce volatile organic compound (VOC) emissions. We have evaluated the environmental impacts of the proposed amendments on atmospheric processes and other media. Overall, we found that the proposed amendments would have beneficial effects by reducing emissions that contribute to the formation of ground-level ozone. Because the pathways for reformulation to comply with the proposed amendments vary, and are only predicted, there may be some, but not significant, potential adverse impacts that could occur as a result of adoption of this proposal. Several potential adverse impacts are identified and discussed in this chapter along with measures to mitigate the potential for adverse impacts to occur.

We conducted a qualitative health risk assessment that concludes that because VOCs are ozone precursors, public health is further protected by reducing VOC emissions. The actual reduction of health risks that would result from reducing VOC emissions, if the staff's proposal were to be adopted, is not quantified in this report. However, it has been estimated that each year about 630 fewer people would die prematurely from exposure to ozone if California was to attain the State ambient air quality standard for ozone (Ostro *et al.*, 2006). About 90 percent of California residents live in areas where ozone levels exceed State and federal air quality standards. Therefore, reducing VOC emissions from these consumer product categories, because of their role as ozone precursors, will result in incremental improvement of the public's health – whether it is in terms of fewer incidences of asthma or hospitalizations, improvement in lung function, or fewer premature deaths.

Our analysis of the reasonably foreseeable environmental impacts of the methods of compliance is presented in subsections C through H below. Regarding reasonably foreseeable mitigation measures, the California Environmental Quality Act (CEQA) requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis. In addition, Senate Bill 97 (SB 97) requires the impact on greenhouse gas (GHG) emissions to be analyzed as part of the analysis under CEQA.

We have evaluated how the proposed amendments would impact ground-level ozone concentrations; particulate matter (particularly secondary organic aerosols); climate change; stratospheric ozone depletion; solid waste disposal; water quality; energy use; public safety; agricultural resources; and air toxic emission exposure.

We also reviewed the South Coast Air Quality Management District's (SCAQMD) Final Environmental Assessment for Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, and used the report as part of our evaluation of the impacts of the proposed amendments for Multi-purpose Solvent and Paint Thinner products (SCAQMD, 2009).

A. LEGAL REQUIREMENTS APPLICABLE TO THE ANALYSIS

CEQA and ARB policy require an analysis to determine the potential adverse environmental impacts of proposed regulations. Because ARB's program involving the adoption of regulations has been certified by the Secretary of Resources (see Public Resources Code section 21080.5), the CEQA environmental analysis requirements are allowed to be included in ARB's Initial Statement of Reasons instead of preparing an environmental impact report or negative declaration. In addition, ARB will respond in writing to all significant environmental points raised by the public during the public review period or at the Board hearing. These responses will be contained in the Final Statement of Reasons for the proposed amendments to the Consumer Products Regulation.

Public Resources Code section 21159 requires that the environmental impact analysis conducted by ARB include the following: (1) an analysis of the reasonably foreseeable environmental impacts of the methods of compliance; (2) an analysis of reasonably foreseeable feasible mitigation measures; and, (3) an analysis of reasonably foreseeable alternative means of compliance with the regulation. For ease of the reader, the proposed amendments are summarized below.

B. SUMMARY OF PROPOSED AMENDMENTS

We are proposing to establish new or lower VOC limits for the categories of Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner. These limits would reduce VOC emissions by about 14.7 tons per day when fully effective and would partially fulfill the consumer products reduction commitment contained in the 2007 Strategy to meet the federal ozone standard. To further reduce the ozone formation potential of emissions from Multi-purpose Solvent and Paint Thinner products, the proposal limits the amount of aromatic VOC solvent to 1 percent by weight. The proposal would also exempt eight fluid ounce containers of Multi-purpose Solvent and Paint Thinner products from compliance with the VOC limits until December 31, 2013. Artists' solvents certified to meet ASTM International's D4236 standard, and that are packaged in containers equal to or less than 32 fluid ounces, would be excluded from compliance with the VOC limits.

Several other regulatory modifications are proposed and necessary to implement the new requirements. These other regulatory proposals include:

- Several new and modified definitions;
- Prohibitions on the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products;
- Establishing a Global Warming Potential (GWP) limit for compounds used in Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products;
- Specific labeling requirements for Multi-purpose Solvent and Paint Thinner products;

- A special reporting requirement for Multi-purpose Solvent and Paint Thinner products; and
- Other clarifying language.

Amendments to ARB Method 310 are also proposed. The proposed changes are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of lower VOC limits and the aromatic compound content limit.

C. SUMMARY OF IMPACTS ON ATMOSPHERIC PROCESSES

In this section, we evaluate the impacts of the proposed amendments on atmospheric processes. The evaluation includes our assessment as to whether the proposed amendments would have positive, negative, or no impacts on these atmospheric processes.

1. Impacts of Proposed Amendments on Ground-level Ozone Concentrations

Enhanced ground-level ozone formation involves the interaction between VOCs and oxides of nitrogen (NOx) in the presence of sunlight. The rate of ozone generation is related closely to both the amount and reactivity of VOC emissions as well as the amount of NOx emissions available in the atmosphere (Seinfeld and Pandis,1998). Ozone is a colorless gas and the chief component of urban smog. It is one of the State's more persistent air quality problems. Ninety-three percent of Californians, or 36 million people, live in areas designated as non-attainment for the federal 8-hour ozone standard. It has been well documented that ozone adversely affects respiratory function of humans and animals. Research has shown that, when inhaled, ozone can cause respiratory problems, aggravate asthma, impair the immune system, and cause increased risk of premature death.

Not only does ozone adversely affect human and animal health, but it also affects vegetation throughout most of California resulting in reduced yield and quality in agricultural crops, disfiguration or unsatisfactory growth in ornamental vegetation, and damage to native plants. More information on the impacts of exposure to ozone can be found in Chapter IV, Emissions.

a. Proposed VOC Standards

The proposed amendments would reduce VOC emissions by about 14.7 tons per day. Therefore, we expect an overall positive impact on the environment because VOCs are precursors to the formation of ground level ozone. Specific to consumer products, ARB committed to reducing consumer product VOC emissions statewide by 30 to 40 tons per day by 2014. The amendments approved at the June 26, 2008, hearing will provide about 4.5 tons per day toward meeting the commitment. Upon approval of this proposal, we will have achieved 19.2 tons per day reduction from consumer products toward the 30 to 40 commitment. In addition, staff is currently evaluating further

reductions from four cleaning products categories which we plan to take to the Board in 2010. We expect to achieve 5 to 10 tons per day reductions from the cleaning products categories. The categories proposed for regulation and the corresponding VOC emission reductions are shown in Table VIII-1.

Table VIII-1
Proposed VOC Limits, Emissions, and Reductions at Effective Date

Product Category	Product Form	Proposed VOC Limit (percent by weight)	2009 VOC Emissions* (tons per day)	Effective Date	Reductions Upon Effective Date (tons per day)
Double Phase Aerosol Air Freshener	Aerosol	20	10.2	12/31/2012	2.0
Multi-purpose Solvent and Paint Thinner	Non-aerosol	tier 1: 30	12.5+	12/31/2010	8.4+
		tier 2: 3	---	12/31/2013	3.9+
Total Emissions 2009	**22.6 tons per day**				
Total VOC Reductions by end of 2013	**14.7 tons per day**				

* Survey emissions adjusted for market coverage, grown to the 2009 calendar year, and rounded.
+ Does not include emissions or reductions in the South Coast Air Basin.

As indicated in Table VIII-1, we are proposing to reduce the VOC content of Double Phase Aerosol Air Freshener products to 20 percent by weight, effective December 31, 2012. The proposed limit would reduce VOC emissions by about two tons per day at the effective date.

We are also proposing two tiers of VOC limits for Multi-purpose Solvent and Paint Thinner products. As noted in the table above, emissions and emission reductions are adjusted to account for VOC reductions already claimed *via* implementation of SCAQMD's Rule 1143. Thus, the VOC limits and effective dates proposed by ARB staff in this rulemaking would only apply to products sold in areas of California outside the South Coast Air Basin.

Discussion Related to First Tier Standard for Multi-purpose Solvent and Paint Thinner:

As proposed, the first tier limit for Multi-purpose Solvent and Paint Thinner products would reduce VOC content to 30 percent by weight, effective December 31, 2010. The second tier limit would further reduce the VOC content of Multi-purpose Solvent and Paint Thinner products to 3 percent by weight, effective December 31, 2013. In combination, these limits would reduce the mass of VOC emissions by about 12.7 tons per day (note that reductions from the first tier limit are grown from the effective date to December 31, 2013). In developing the proposal for Multi-purpose Solvent and Paint Thinner products, we analyzed the tons of ozone that, potentially, would not be formed as a result of reducing VOC emissions by mass limitations. This analysis found that the

first tier limit would likely provide a large reduction in the amount of ground level ozone formed from emissions of Multi-purpose Solvent and Paint Thinner products.

However, the analysis also revealed that, depending on the reformulation option chosen, the expected ozone reduction benefit of the first tier limit could be eroded. Additionally, the analysis found, that reformulations to meet the second tier limit, could result in increasing the ozone forming potential of products, depending on the compliance path chosen. A further discussion of this analysis, and proposals to ensure that the maximum air quality benefit from the limits is achieved, follows. The data used in this analysis are apportioned to account for adoption of SCAQMD's Rule 1143. VOC emissions and sales data are from the 2008 Paint Thinner and Multi-purpose Solvent Survey Update (Survey Update). Reactivity data are derived by using the July 7, 2004, maximum incremental reactivity (MIR) values contained in title 17, California Code of Regulations, sections 94700-94701.

In 2009, sales of 15.5 tons per day of Multi-purpose Solvent and Paint Thinner products result in about 12.5 tons per day VOC emissions. Absent regulation, by 2013 sales and VOC emissions would grow to 16.4 and 13.1 tons per day, respectively. Examples of reported products include products named Paint Thinner; Lacquer Thinners; Mineral Spirits; Acetone; Denatured Alcohol; Methyl Ethyl Ketone (MEK); Xylene; Toluene; and Paint Clean-up or surface preparation products. Although the Multi-purpose Solvent and Paint Thinner categories are defined separately in the regulation, it was apparent in our evaluation of reported Survey Update products that these products are used interchangeably. Thus, to ensure that all reductions are achieved in the shortest timeframe, staff is proposing limits for both categories with the same effective dates. While we believe that Multi-purpose Solvent products could potentially comply with the second tier, 3 percent by weight VOC limit in a shorter timeframe, because of the interchangeability of these products, we expect most manufacturers would simply re-label their Multi-purpose Solvent products as "Paint Thinner," resulting in less reductions than anticipated. Harmonizing the effective dates maximizes the reductions achievable by 2010, using existing technologies. Providing until December 31, 2013, for implementation of the second tier, 3 percent by weight VOC limit, allows time for development of additional reformulation technologies.

In the combined category of Multi-purpose Solvent and Paint Thinner products, the VOC content ranges from 0-100 percent, with a sales-weighted average VOC content of 80 percent. Products reported as containing no VOCs are comprised of solvents that have been excluded from the definition of VOC due to their low propensity to react to form ozone, or are formulated with low vapor pressure (LVP) VOC solvents. The sales-weighted average reactivity of the VOCs in the reported products is about 1.9 grams of ozone per gram of VOC (g O_3/g VOC). This reactivity value means that, on average, each gram of VOC emitted from these products will react in the atmosphere to form almost two grams of ozone. Therefore, the VOC emissions are estimated to react to lead to formation of about 24 tons per day of ozone. When considering the reactivity of the product (rather than just the reactivity of the VOCs), the product-weighted maximum

incremental reactivity (PWMIR) is about 1.5 grams of ozone per gram of product (g O_3/g product). The reported PWMIRs range from < 0.1 – 7.5 g O_3/g product.

As shown in Table VIII-1, once fully effective, the proposed VOC limits for Multi-purpose Solvent and Paint Thinner products would reduce VOC emissions by about 12.7 tons per day, with the most reductions, 8.4 tons per day, achieved by the first tier, 30 percent by weight limit. Not withstanding the above, a number of factors, including ambient pollution levels and meteorology, would affect the actual ozone reduction that would be achieved. If we use the sales-weighted average reactivity of the VOCs (1.9 g O_3/g VOC), we predict the 8.4 tons of VOC emission reductions from the first tier limit would reduce the formation of ozone by about 16 tons per day. However, the wide range of reported PWMIRs also indicates that reformulation options are available that would significantly erode—if not negate—the predicted benefit of reduced formation of ozone.

Therefore, we are proposing to limit the use of highly reactive VOC aromatic compounds (i.e., xylenes and toluene) to no more than 1 percent by weight in Multi-purpose Solvent and Paint Thinner products, effective December 31, 2010. This provision would not only ensure that the predicted reduction in ozone generation would be preserved, but would increase the ozone reduction benefits of the proposal. By way of example, in combination, the two tons per day reported emissions of xylenes and toluene (MIR values of 7.37 and 3.97 g O_3/g VOC, respectively) react leading to formation of over ten tons per day of ozone. Thus, about 16 percent of emissions represent about 43 percent of the ozone forming potential of the category. For this example, we assumed that as products reformulate, the species profile remains the same, but the relative amounts are reduced. In other words, the relative proportion of VOCs remains as they were reported in the Survey Update, but the mass of each VOC is reduced by 70 percent to meet the 30 percent by weight limit. Using this approach, we assume that the emissions of xylenes and toluene would be reduced to about 0.6 tons per day, with a resulting ozone forming potential of about three tons per day. If the 0.6 tons per day were to be replaced with an odorless mineral spirit product (MIR value = 0.91 g O_3/g VOC), the ozone forming potential would be reduced to about 0.5 tons per day, resulting in additional ozone reduction benefits.

The reader is reminded that the analysis only considered reported xylenes and toluene emissions. Other aromatic compounds are contained as fractions of various hydrocarbon solvents but are not speciated. Thus, the proposal would provide an additional air quality benefit than we are able to estimate because these aromatic constituents would be limited as well. The proposed limitation on the use of VOC aromatic compounds is unique to the State regulation, and is not required by SCAQMD Rule 1143. Therefore, this provision would apply statewide and result in an additional ozone reduction benefit in the SCAQMD.

In another scenario, if we further assume that the sales of Multi-purpose Solvent and Paint Thinner products remain about 16 tons of product per day and the PWMIR was about 0.35 g O_3/g product (similar to a 30 percent by weight VOC hydrocarbon solvent

emulsion product), we would expect about 6 tons per day of ozone to be generated from complying 30 percent by weight products. If all products were to reformulate to a 30 percent xylenes product with a PWMIR of about 2.0 g O_3/g product, the predicted ozone formation would be about 32 tons per day, a difference of about 26 tons per day. Assuming a similar scenario based on toluene (PWMIR ~ 1.2), the reformulated products would result in ozone generation of about 19 tons per day, over three times more than the ozone generated from the lower reactive emulsion product.

These scenarios do overstate what would likely occur without the proposed limitation on aromatic content. However, we note that there are currently products in commerce with similar formulations to those described here. This analysis is also oversimplified because of a variety of factors including the products reported in the Survey Update; the distribution of emissions; meteorology; and ambient pollution concentrations that affect ozone generation; but serves as an example of why the provision to limit use of highly reactive VOC aromatics in reformulated products is appropriate. Together, these provisions would maximize the air quality benefit of the first tier limit, while preserving a variety of feasible reformulation pathways.

Discussion Related to Second Tier Standard for Multi-purpose Solvent and Paint Thinner:

The ozone reduction benefit from the proposed 30 percent by weight VOC and 1 percent by weight VOC aromatic content limits is clear. However, depending on reformulation options chosen to meet the proposed 3 percent by weight VOC limit, an increase in ozone generation could occur. Products formulated to meet the 3 percent by weight VOC limit, utilizing low reactive exempt VOC solvents could be more reactive than some products formulated at the 30 percent by weight VOC limit. This means potentially more ozone would be generated by the complying 3 percent by weight VOC products. Because we can only postulate the reformulations and reactivities of Multi-purpose Solvent and Paint Thinners products developed to comply with the 30 percent by weight limit, quantifying the potential ozone disbenefit from implementing the 3 percent by weight VOC limit is not possible. We can however, provide some examples of when ozone disbenefits would occur from reformulations.

Based on the Survey Update, the weighted reactivity of products complying with the 3 percent by weight limit ranges from 0–0.83 g O_3/g product. The sales-weighted average reactivity of a 0.38 g O_3/g product is very close to the reactivity of a purely acetone product (0.43 g O_3/g product). We compared the weighted reactivity to some products already in compliance, or near compliance, with the 30 percent by weight limit (products with PWMIR less than 0.83) and discovered that there are at least three technologies that, at a mass limit of 30 percent, would have PWMIRs below those of complying 3 percent by weight products. This demonstrates that reducing VOC content from 30 to 3 percent by weight may not always result in an air quality benefit.

Based on our understanding of the existing market for Multi-purpose Solvent and Paint Thinner products, including products recently introduced into the market, we believe the

most likely reformulation path to meet the 30 percent by weight limit would include hydrocarbon solvent emulsion products. In the case of the hydrocarbon solvent emulsion products, we estimate that these products' PWMIRs would be about 0.3-0.4 g O_3/g product, which is lower than some complying 3 percent by weight products. It is unlikely that products based on this emulsion technology could reformulate to meet a 3 percent by weight limit. Consequently, these products' sales would be replaced, most likely, by the VOC-exempt, but slightly higher reactive solvent, acetone. In this case, the 3 percent by weight limit would either provide no additional air quality improvement, or could result in a slight disbenefit.

However, if products reformulated to meet the 30 percent by weight limit by blending 30 percent MEK with 70 percent acetone, the weighted reactivity would be about 0.7 g O_3/g product. In this scenario, a further ozone benefit would be achieved by implementing the 3 percent by weight limit, if these products' sales were to be replaced with a purely acetone product.

We are also aware of low VOC/exempt solvent products under development. Examples of these include soy methyl ester-based products. While likely to comply with the proposed 3 percent by weight limit, the reactivity of these products is unknown at this time.

While the 3 percent by weight limit is technologically feasible, based on complying products already being sold, and the timeframe proposed for compliance, this analysis demonstrates that to fully assess the impact of the 3 percent by weight limit requires firm knowledge of pathways chosen to reformulate to meet the 30 percent by weight limit. Absent this information, we can only postulate that some reformulations will result in further air quality improvement, while others may not.

Additionally, the 3 percent by weight limit could lead to an increase in sales of extremely flammable products, such as acetone. This type of product named "Paint Thinner" is unlike what the household consumer may be used to. Without enough lead time for manufacturers, we are concerned that acetone products will be the most likely of a limited number of known pathways to compliance. To allow ample time for development of less flammable, potentially more beneficial in terms of ozone reduction, and/or less costly alternatives, we are proposing an effective date for the 3 percent by weight limit of December 31, 2013.

As just mentioned, to fully evaluate the air quality impact of implementing the 3 percent by weight limit, and flammability of likely reformulations, would require accurate data on products reformulated to comply with the proposed 30 percent by weight VOC limit and the 1 percent by weight VOC aromatic compound limit. Thus, in new subsection 94513(g), we are proposing that manufacturers submit to ARB data for reformulated products sold in calendar year 2011 by June 30, 2012. Data required include product formulation, sales, and VOC and reactivity content. Manufacturers must also provide written updates on the research and development efforts undertaken to achieve the 3 percent by weight VOC limit.

Based on data from the 2012 reporting requirement, we will reassess the feasibility of the proposed 3 percent by weight VOC limit to ensure that further air quality benefits will be achieved. Depending on the outcome of this review, we may modify the requirements for Multi-purpose Solvent and Paint Thinner products. This may include consideration of a reactivity-based strategy rather than requiring further reductions in the mass of VOCs.

b. Proposed New or Modified Definitions and Clarifying Language

We are proposing a new definition for "Artist's Solvent/Thinner," and proposing to exclude products meeting this definition from compliance with the VOC limits for Multi-purpose Solvent and Paint Thinner. This proposal would result in forgoing about an additional 200 pounds per day VOC reduction. We believe the provision is necessary, however, because Artist's Solvent/Thinner products are designed to be used with specialty artist's, solvent-borne paints and their formulations are required to be reviewed by a toxicologist to meet specific ASTM standards.

We expect no other impact on ground level ozone concentrations from the proposed new and modified definitions and clarifying language. These language modification proposals are necessary to clarify regulatory provisions, or implement the proposed VOC limits.

c. Proposed Toxics Prohibition

We are proposing a prohibition on the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products. No products were reported that currently use these chlorinated Toxic Air Contaminants (TAC). Methylene chloride and perchloroethylene are exempt VOC solvents, while trichloroethylene is a VOC. Thus, the prohibition would remove potential exempt VOC reformulation options for Multi-purpose Solvent and Paint Thinner products. Without this proposed prohibition, there would be a potential that the proposed VOC limits could result in some additional, but small, reduction in the formation of ozone. This is because methylene chloride and perchloroethylene are both considerably less reactive than other exempt VOC solvents such as acetone. Formulating with trichloroethylene would not be likely because it is a VOC, and its use would be restricted by the proposed VOC limits. However, we believe that preventing exposure to these TAC solvents that are potential human carcinogens outweighs the small additional ozone benefit that would be achieved.

d. Proposed Global Warming Potential Limits

The proposed global warming potential (GWP) limit of 150 for compounds used in Double Phase Aerosol Air Freshener, Multi-purpose Solvent and Paint Thinner products is expected to have a negligible, if any, impact on ground level ozone concentrations.

As for Double Phase Aerosol Air Freshener products, no use of the exempt VOC propellants hydrofluorocarbon-152a (HFC-152a) and hydrofluorocarbon-134a (HFC-134a) were reported. However, use of these propellants is a potential reformulation option to meet the proposed 20 percent by weight VOC limit. The proposed GWP limit of 150 would allow use of HFC-152a, with a GWP of 140, but would preclude use of the propellant HFC-134a, which has a GWP of 1,300. The GWP values are 100 year values taken from the Second Assessment Report contained within the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) (IPCC, 2007). While the proposal allows use of HFC-152a, we do not expect it to be used extensively, if at all. In determining a feasible limit for Double Phase Aerosol Air Freshener products we considered the impacts of each potential VOC limit on climate change. To balance reductions in ground level ozone without increasing GHG emissions, we proposed a VOC limit that is feasible without use of these propellants. This balance means that we are potentially forgoing additional VOC reductions.

In the categories of Multi-purpose Solvent and Paint Thinner, no use of compounds with high GWPs was reported in the Survey Update. Therefore, we believe that chemical compounds that have a GWP greater than 150 are not critical to the formulation of Multi-purpose Solvent and Paint Thinner products. We would expect a negligible, if any, additional ozone reduction benefit if compounds with higher GWPs could be used. The main reformulation options such as use of water, odorless mineral spirits, and VOC exempt compounds, including acetone, reported in the Survey Update, have GWP values that are below 150 or are not listed by the Fourth Assessment Report of the IPCC (IPCC, 2007).

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or that are needed to enhance the enforceability of the lower VOC limits. These clarifications are expected to have no impact on ground level ozone concentrations.

2. Impacts of Proposed Amendments on Particulate Matter (Secondary Organic Aerosols)

Fine particulate matter (PM) is prevalent in the urban atmosphere (see, for example, Pandis *et al.,* 1992), and ambient PM, especially those with diameters less than two and a half micrometers ($PM_{2.5}$), is known to have negative impacts on human health (Schwartz *et al.*,1996; Moolgavkar and Luebeck, 1996). Like ozone, PM can be formed via atmospheric oxidation of organic compounds (Finlayson-Pitts and Pitts, 2000). Significant advances have been made in the theoretical and the experimental studies of the formation of secondary organic aerosols (SOA) (Pankow, 1994a; Pankow, 1994b; Odum *et al.*, 1996; Seinfeld and Pandis,1998; Harner and Bidleman, 1998; Kleindienst, *et al.*, 1999; Yu *et al.*, 1999). In addition, modeling techniques to determine the amount of ozone as well as the amount of aerosol formed from a VOC have been established (Bowman *et al.*, 1994), and the concept similar to maximum incremental reactivity is

being applied to quantitatively assess the aerosol formation potential of a VOC (*i.e.* incremental aerosol reactivity) (Griffin *et al.*, 1999).

Based on the results of these studies, we now know that there is a mechanistic linkage between the ozone formation and SOA formation potentials of a VOC. Because of this relationship, the proposed amendments may also affect the SOA formation potential of the products proposed for regulation. The analysis of the impact on SOA formation resulting from implementing the proposed VOC limits and other amendments is detailed below.

Although most organic compounds contribute to ozone formation, SOA is usually formed from photooxidation of organic compounds with carbon numbers equal to six or more (Seinfeld and Pandis, 1998). It has also been shown that aromatic compounds are more likely to participate in the formation of SOA than are alkanes (Grosjean, 1992; Pandis *et al.,* 1992). In other words, only chemicals that react fast enough in the atmosphere will generate sufficient amounts of low volatility products for forming aerosols. In general terms, the potential to form SOA among commonly used classes of VOCs used in consumer products could be described by the following order, with the lower molecular weight alkanes and ketones being least likely:

Least Likely	Lower molecular weight alkanes and ketones (6 carbons or less)
	Higher molecular weight alkanes
	Higher molecular weight aromatics (polysubstituted benzenes)
More Likely	Lower molecular weight aromatics (C6 - C8 compounds)

a. <u>Proposed VOC Standards</u>

The analysis of the potential impact on PM formation from the proposed VOC limits assumes that to meet the proposed limits will require replacing 14.7 tons per day of VOCs with14.7 tons per day of VOC exempt ingredients. To meet the proposed VOC limits, manufacturers generally have four reformulation options: use of exempt VOCs, such as acetone, para-chloro-benzotrifluoride (PCBTF), or methyl acetate; use of LVP-VOC solvents; use of water; or use of exempt VOC propellants. Substitution for VOCs with water, or VOC exempt propellants would likely result in a small reduction in SOA formation. Two of the more likely exempt VOC solvents to be used to comply, acetone, and methyl acetate, both having three carbon atoms, have little potential to contribute to SOA formation. Indeed, it has been predicted that there would be no SOA yield from acetone (Pandis *et al.,* 1992). Hence, use of these compounds could also result in a reduction in SOA. Use of PCBTF, although a heavy molecule that contains seven carbon atoms, is not likely a strong PM precursor due to its low reactivity. Therefore, use of PCBTF should not result in increasing the formation of SOA.

The proposal to limit the VOC aromatic compound content of Multi-purpose Solvent and Paint Thinner products to 1 percent by weight may provide a small reduction in SOA formation. This is because aromatic compounds, such as xylenes and toluene, are

known to have higher SOA potentials than other commonly used VOCs. However, substitution of LVP-VOC solvents for VOCs could result in a slight SOA increase (Chan *et.al.*, 2009). Biogenic hydrocarbons, such as isoprene, emitted from vegetation are known to be an important source of SOA (Ng *et al.,* 2008). Based on this study, it is reasonable to assume that some use of some bio-based solvents useful in reformulations, such as soy methyl esters, may lead to increasing SOA formation.

Because we cannot predict how manufacturers will choose to reformulate, we cannot fully evaluate the potential for an impact on SOA formation. However, it is likely to be only a slight potential for increase, if any, due to the variety of reformulation options available. At any rate, it would not be a significant adverse impact. Additionally, any reformulations that result in increasing SOA would likely be offset by reformulations which have a lower propensity to form SOA. We will continue to monitor implementation of the regulation and reassess the impacts as more data become available.

b. Proposed New or Modified Definitions and Clarifying Language

We expect no impact on SOA formation from the proposed new and modified definitions and clarifying language. These language modification proposals are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposal to prohibit use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products should have negligible or no impact on SOA formation. No products were reported in the Survey Update that use these chlorinated TAC solvents. Methylene chloride and perchloroethylene are exempt VOC solvents, while trichloroethylene is a VOC. These compounds are not expected to be potent participants in SOA formation because they are relatively small molecules. By precluding use of these solvents as a reformulation option, we would potentially forgo some additional small reduction in the production of SOA. For example, if these solvents, rather than LVP-VOC or bio-based solvents were to be used, the SOA formation potential of reformulated Multi-purpose Solvent and Paint Thinner products could be slightly lower. However, preventing the public's exposure to these TAC solvents that are potential human carcinogens outweighs, we believe, the uncertain small potential for a reduction in SOA.

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in the reformulation of Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products is expected to have negligible or no impact on PM or SOA formation. We do not believe that compounds with GWP values above 150 could be substituted in such a way to significantly change the amount of SOA formed from these categories.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of the lower VOC limits. Such changes are not expected to have an impact on SOA formation.

3. Impacts of Proposed Amendments on Climate Change

Climate change, or global warming, is the process whereby emissions of anthropogenic pollutants, together with other naturally-occurring gases, absorb infrared radiation in the atmosphere, leading to increases in the overall average global temperature. While carbon dioxide (CO_2) is the largest contributor to radiative forcing leading to warming, methane, halocarbons, nitrous oxide (N_2O), and other species also contribute to climate change.

Gases in the atmosphere can contribute to the greenhouse effect both directly and indirectly. Direct effects occur when the gas itself is a GHG. While there is relative agreement on how to account for these direct effects of GHG emissions, accounting for indirect effects is more problematic. Indirect radiative forcing occurs when chemical transformations of the original gas produce other GHGs, when a gas influences the atmospheric lifetimes of methane, and/or when a gas affects atmospheric processes that alter the radiative balance of the earth (e.g., affect cloud formation).

As mentioned earlier, the GWP of a compound may reflect a direct effect as well as an indirect effect on global warming. The direct effect is the warming due to the absorption of radiation by molecules of the compound in question. Compounds with direct effects include VOCs, CO_2, HFCs, hydrofluoroethers (HFE), and hydrochlorofluorocarbons (HCFC). Even though VOCs have direct effects, they are considered GHGs primarily because of their role in creating ozone and in prolonging the life of methane in the atmosphere, although the effect varies depending on local air quality.

The indirect effect is warming due to the impact that the presence of the compound has on the concentration of other GHGs. For example, VOCs contribute indirectly to global warming, in-so-far as they react chemically in the atmosphere in ways that increase GHG concentrations, most notably, concentrations of ozone and methane. The indirect forcing effects of VOCs is, however, still poorly quantified and requires the use of global three-dimensional chemical transport models.

a. Proposed VOC Standards

As just described, VOCs are considered GHGs because of their role in the creation of ozone. However, because the VOC limits will reduce the total amount of VOCs, and thereby ground-level ozone concentrations, the proposed VOC limits should have a slightly beneficial impact on climate change.

For Double Phase Aerosol Air Freshener products, we are aware that use of the VOC exempt propellants, HFC-152a or HFC-134a, is a compliance option for these products. Because these propellants are viable reformulation pathways, a lower VOC limit could have been set to achieve a larger VOC reduction. However, HFC-152a and HFC-134a have GWPs of 140 and 1,300, respectively (IPCC, 2007). Therefore, to minimize climate change impacts, a VOC limit was proposed which we believe to be technologically feasible without the use of compounds with high GWPs, such as HFC-134a. By considering climate change impacts, we are forgoing some additional VOC reductions.

The proposed VOC limits for Multi-purpose Solvent and Paint Thinner products are achievable without use of compounds with high GWPs. We note that no products were reported to contain high GWP compounds in the Survey Update. Therefore, chemical compounds that have high GWPs are not critical to the formulation of Multi-purpose Solvent and Paint Thinner products. We are aware of several HFC and HCFC solvents, with relatively high GWP values, that may have limited use in Multi-purpose Solvent and Paint Thinner products. However, most of these solvents are considered VOCs in California, and/or are stratospheric ozone depleting compounds. Because of these designations, the use of these compounds with high GWP values is limited with the proposed VOC limits. Thus, they are not expected to be reformulation options. The ingredients used in predicted reformulation pathways have GWP values below 150 or have no GWP value listed in the Fourth Assessment Report of the IPCC (IPCC, 2007). Therefore, the implementation of the proposed VOC limits for Multi-purpose Solvent and Paint Thinner products is not expected to impact climate change emissions.

b. Proposed New or Modified Definitions and Clarifying Language

We expect no impact on climate change resulting from the proposed new and modified definitions and clarifying language. These language modification proposals are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposal to prohibit the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products should have no impact on climate change. No use of these compounds was reported in the Survey Update. However, the proposed prohibition would prevent some potential reformulation pathways, particularly the option to use methylene chloride and perchloroethylene, which are exempt VOCs. The GWP value for methylene chloride is low and no value for perchloroethylene is listed in the Fourth Assessment Report of the IPCC (IPCC, 2007), so no additional benefit to minimizing climate change impacts would be expected in the absence of this proposal. As stated above, the proposed prohibition is not expected to increase GHG emissions because the predicted reformulation pathways rely on use of compounds that are not significant contributors to global warming.

d. Proposed Global Warming Potential Limits

In accordance with Assembly Bill 32 (AB 32), the proposed GWP limit of 150 for compounds used in Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products is designed to minimize the climate change impacts of the emissions from products in these categories. Therefore, we expect the limit to have beneficial impacts on climate change by preventing additional GHG emissions.

For Double Phase Aerosol Air Freshener products, two exempt VOC propellants are reformulation options: HFC-152a and HFC-134a. HFC-152a and HFC-134a have GWPs of 140 and 1,300, respectively (IPCC, 2007). Therefore, the GWP limit of 150 would allow use of HFC-152a but not HFC-134a. While HFC-152a is a viable reformulation option, we do not believe it would be used for the following reasons. First, we believe the more likely path to comply with the proposed VOC limit is to make modifications or adjustments of the valve and spray nozzle to reduce the amount of propellant needed to expel the product. We are also aware of manufacturers with internal environmental polices that preclude the use of HFCs. The comparatively high cost of HFC-152a also makes its use a less desirable alternative. We also note that to minimize use of HFC-152a, the VOC limit is proposed at a level which we believe to be technologically feasible without the use of compounds with high GWPs. Nevertheless, the proposal would allow for use of the propellant HFC-152a. If manufacturers choose to use HFC-152a in their reformulated Double Phase Aerosol Air Freshener products, there is potential for very slight increases in GHG emissions.

As for Multi-purpose Solvent and Paint Thinner products, no products that contain compounds with high GWP values were reported in the Survey Update. Therefore, chemical compounds that have a GWP greater than 150 are not critical to the formulation of Multi-purpose Solvent and Paint Thinner products. We are aware of several HFC and HCFC solvents, with relatively high GWP values, that may have limited use in Multi-purpose Solvent and Paint Thinner products. Many of these solvents are considered VOCs in California, and/or are stratospheric ozone depleting compounds. Because of these designations, the use of these compounds with high GWPs is already limited by the proposed VOC limits or prohibitions already existing on use of stratospheric ozone depleting compounds in the Consumer Products Regulation, section 94509(e). The GWP limit of 150 should further ensure that global warming emissions from use of Multi-purpose Solvent and Paint Thinner products do not increase. We also note that the ingredients used in predicted reformulation pathways have GWP values below 150 or have no GWP value listed in the listed in the Fourth Assessment Report of the IPCC (IPCC, 2007).

Another aspect to consider with respect to the proposed GWP limit for Multi-purpose Solvent and Paint Thinner products, is flammability. Although unlikely, as mentioned above, several HFC and HCFC solvents with high GWP values could be blended into reformulated products. Some of these solvents are non-flammable, therefore, the proposed GWP limit would preclude an option to reduce flammability. However, as

stated above, the use of most of these compounds is already prohibited, or limited, because of their status as VOCs or stratospheric ozone depleting compounds.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of the lower VOC limits. Such changes are expected to have no impact on climate change.

4. Impacts of Proposed Amendments on Stratospheric Ozone Depletion

The stratospheric ozone layer shields the earth from harmful ultraviolet (UV) radiation. Depletion of the earth's ozone layer allows a higher penetration of UV radiation to the earth's surface. This increase in UV radiation penetration leads to a greater incidence of skin cancer, cataracts, and impaired immune systems. Reduced crop yields and diminished ocean productivity are also expected. Because the chemical reactions which form ground-level ozone are driven by UV radiation, it is conceivable that a reduction in stratospheric ozone may also result in an increase in the formation of photochemical smog because of the increased levels of UV radiation on the earth's surface (ARB, 2000b). The chemicals most implicated as causing stratospheric ozone depletion are chlorofluorocarbons (CFCs), HCFCs, and other halons (U.S. EPA, 2003). Specifically, the chlorine or bromine atoms released by photolysis of the compounds react in chain reactions leading to the catalytic destruction of ozone (Finlayson-Pitts and Pitts, 2000).

Solar irradiation in the stratosphere contains sufficient UV light to break down CFCs and HCFCs to yield chlorine atoms that convert ozone to molecular oxygen. However, this UV light is not strong enough to break down HFCs and HFEs to yield fluorine atoms. In addition, the molecular structure of HFCs and HFEs includes hydrogen atoms, which renders them susceptible to attack by hydroxyl radicals in the troposphere. Therefore, these chemicals have a relatively short atmospheric lifetime which does not allow any appreciable amounts to penetrate into the stratosphere (ARB, 2008b).

To address stratospheric ozone depletion, the Montreal protocol was enacted in 1989, to phase out a number of CFCs, HCFCs, and halons. As a signatory of this protocol, the United States, in the Federal Clean Air Act of 1990, established timetables for ceasing production (see Title 6, Clean Air Act, section 602). In general, the protocol establishes dates by which certain compounds can no longer be manufactured; however, existing stocks can continue to be used in some applications until exhausted.

a. Proposed VOC Standards

Reducing VOC emissions and reformulating products with HFCs with low GWP values will have negligible or no impact on stratospheric ozone depletion. As products reformulate to meet the proposed VOC limits, provisions in the Consumer Products Regulation (see section 94509(e)) already prohibit the use of various stratospheric

ozone depleting compounds. This provision ensures there will be no increased use of stratospheric ozone depleting compounds. We also note that predicted reformulation options such as LVP-VOCs and exempt VOCs, lack chlorine. Therefore, reformulating with these compounds is not expected to increase the rate of stratospheric ozone depletion. PCBTF, an exempt VOC that is a viable reformulation option, is a chlorinated compound. It is listed under the Significant New Alternatives Program (SNAP) as an alternative for ozone-depleting substances (U.S. EPA, 2008), therefore its ozone depleting potential is likely low.

b. Proposed New or Modified Definitions and Clarifying Language

We expect no impact on stratospheric ozone depletion as a result of the proposed new and modified definitions and clarifying language. These language modification proposals are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposal to prohibit the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products should have no impact on stratospheric ozone depletion. This is because predicted reformulation options rely on compounds that are not considered stratospheric ozone depleting compounds. We note that no products were reported that contained the above toxic compounds in the Survey Update. It should also be noted that use of stratospheric ozone depleting compounds is already restricted by section 94509(e).

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products could have a slight benefit of preventing an increase in stratospheric ozone depleting compounds. This is because some compounds with higher GWPs are also stratospheric ozone depleting compounds.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of the lower VOC limits. Such changes are expected to have no impact on stratospheric ozone depletion.

D. OTHER POTENTIAL ENVIRONMENTAL IMPACTS

1. Impacts of Proposed Amendments on Solid Waste Disposal

Consumer products contribute to the solid waste stream by the nature of their packaging, such as containers used to deliver the products. Therefore, we evaluated the potential impacts of the proposed amendments on solid waste disposal.

a. Proposed VOC Standards

In the case of Double Phase Aerosol Air Freshener products, we do not expect an adverse impact on solid waste disposal from the proposed amendments relating to VOC limits. This is because we do not anticipate any changes in packaging or disposal due to the amendments.

In the case of Multi-purpose Solvent and Paint Thinner products, reformulation options include increasing production of existing complying products, using water-based formulations, or replacing VOC solvents with VOC exempt ingredients. Other reformulation options that could be used by manufacturers include exploring emerging technologies such as soy-based products. None of these reformulation options are expected to alter the current methods of packaging or disposal.

We believe that one of the most likely reformulation pathways is replacing solvents used currently in Multi-purpose Solvent and Paint Thinner products with acetone. Some stakeholders have asserted that this will result in an increase in the amount of Multi-purpose Solvent and Paint Thinner products used because of the faster evaporation rate of acetone. Hence more packaging, due to increased product use for the same task, could occur. While acetone does evaporate faster than the solvents it is predicted to replace, an increase in product use would be likely only if the lid of the product container is removed, or the product is transferred to a container with a large surface area and is exposed to open air for significant periods of time. Therefore, the increase, if any, is expected to be relatively small. According to the Institute for Research and Technical Assistance (IRTA) report titled “Assessment, Development, and Demonstration of Low-VOC Cleaning Systems for SCAQMD Rule 1171,” several facilities tested reported they used about ten percent more acetone than their current cleaning solvent (IRTA, 2003). We believe this small percentage increase in solvent use would not significantly increase sales such that there would be a significant increase in the generation of solid waste.

To further reduce the potential adverse impacts on solid waste disposal, we are proposing to temporarily allow small containers (eight fluid ounces or less) of Paint Thinner products to exceed the 30 percent by weight VOC limit until December 31, 2013. It was brought to our attention that consumers may have significant quantities of previously purchased solvent-borne paint, that is either in quart containers that are not subject to low VOC limits, or are larger sizes that were manufactured prior to the effective date of lower VOC limits. If consumers are unable to

thin these products, and they do not perform as expected, the products may be discarded. Consequently, the temporary small size exemption for Paint Thinner is intended to mitigate a possible increase of solid waste disposal that could also affect water quality in the instance where discarded solvents, from solvent-borne paint, leach into ground water.

We also note that most air district architectural coatings rules continue to include an exemption from compliance with VOC limits for one liter (1.057 quart) or less containers of solvent-borne coatings. There are also a number of paint categories in air district rules that have high enough VOC limits that allow for solvent-borne coatings. Exempting small sizes of Paint Thinner from the 30 percent by weight limit allows these paints to continue to be used. In addition, the proposed small container exemption allows manufacturers time to develop low VOC products that are compatible with solvent-borne coatings.

b. Proposed New or Modified Definitions and Clarifying Language

We expect a negligible increase in waste disposal from the proposed special reporting and labeling requirements for Multi-purpose Solvent and Paint Thinner products. Depending upon how manufacturers choose to name their flammable products, additional paper waste could be generated. However, the improvement in public safety that would result from the labeling outweighs this negligible increase in waste generation.

In the case of the proposed modifications related to Automotive Windshield Washer Fluid products, we expect a benefit to waste disposal as the proposed amendment would allow additional smaller sizes of dilutable products to be manufactured and sold which should result in reduced product weights.

Other proposed new and modified definitions and clarifying language should have no impact on solid waste. These language modification proposals are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposal to prohibit the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products should have no impact on solid waste disposal. This is because the amount of packaging waste to be disposed of would not change with or without this proposal. This proposed prohibition on use of the chlorinated TAC solvents should ensure that there is no increased hazardous waste disposal.

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in reformulated Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products is expected to

have no impact on waste disposal. Implementing this proposal does not cause a change in the manner in which products are to be disposed.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of the lower VOC limits. Such changes are not expected to have any impact on waste disposal.

2. Impacts of Proposed Amendments on Water Quality

Because of how consumer products are used and disposed of, there are potential water quality impacts. Therefore, we evaluated the impacts of the proposed amendments on water quality.

a. Proposed VOC Standards

Reducing VOCs should have no impact on water quality and could ultimately result in a positive impact if more water-based products are used. As products are reformulated to meet the proposed VOC limits, to a limited extent, water may replace VOCs in some products. This would have a positive impact on water quality by reducing the quantity of VOCs that might be introduced to the water supply.

In the case of Double Phase Aerosol Air Freshener products, we do not expect an adverse impact on water quality. Because these products are designed to be sprayed in indoor air environments, the emissions of these products after reformulation would continue to have an air fate and would be unlikely to enter the water system. It is possible that some reformulations could result in slightly increasing the use of water.

In the case of Multi-purpose Solvent and Paint Thinner products, reformulation options include increasing production of existing complying products, using water-based formulations, or replacing VOC solvents with VOC exempt ingredients. While we expect no impact on water quality from implementing the first tier and second tier limits of this proposal, it is possible that more water will be used to meet the limits. We are not proposing to mitigate the potential increased use of water because the amount of increase is uncertain given the variety of reformulation options. We also believe the air quality benefits of the proposal outweigh this potential impact. We will continue to monitor implementation of the regulation and the potential impacts on water quality.

b. Proposed New or Modified Definitions and Clarifying Language

We expect no impact on water quality resulting from the proposed new and modified definitions and clarifying language. These language modification proposals are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposal to prohibit in the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products should have a positive impact on water quality by ensuring that these TACs will not enter the water system and subsequently effect influent and effluent at publicly owned treatment works (POTW).

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products is expected to have no impact on water quality. We are not aware of compounds with GWP values greater than 150 that could lead to improving water quality if they were to be used in formulations. Therefore, we expect no significant adverse impacts from this proposed limit.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of the lower VOC limits. Such changes are expected to have no impact on water quality.

3. Impacts of Proposed Amendments on Energy

Use of energy to produce and sell various consumer products primarily comes from the manufacturing process and distribution of the products to the point of sale. Therefore, we considered whether the proposed amendments would impact energy use.

a. Proposed VOC Standards

Reformulation of products to meet the proposed VOC limits should have no impact on energy use because we do not expect the manufacturing processes or shipping practices to be changed. We also do not expect the manufacture of compounds used in reformulations to result in energy use above the current situation because the types of chemicals predicted to be used are similar to those to be replaced.

b. Proposed New or Modified Definitions and Clarifying Language

Proposed modifications related to Automotive Windshield Washer Fluid products should result in reduced energy usage. The proposals would allow additional smaller sizes of dilutable products to be used, which, in turn, should result in reduced product weights. Thus, we would expect less energy costs related to transportation. We expect no impact on energy use resulting from the other proposed new and modified definitions, and clarifying language. These language modification proposals are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposed prohibition on use of perchloroethylene, methylene chloride, and trichloroethylene in Multi-purpose Solvent and Paint Thinner products is expected to have negligible, or no impact on energy use. We are not aware of how these compounds could be used in Multi-purpose Solvent and Paint Thinner products such that there would be an appreciable change in energy use or savings. We also note that no use of these compounds was reported in the Survey Update.

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in aerosol Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products is expected to have no impact on energy use. In the absence of this provision we are not aware of compounds that could be used in reformulations that would result in less energy consumption.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are needed to enhance the enforceability of the lower VOC limits. Such changes are expected to have no impact on energy consumption.

4. Impact on Public Safety

As Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products are reformulated to meet the proposed VOC limits, the ingredients used or proposed prohibition of certain compounds, could render the reformulated products more or less flammable than existing products.

Because we expect the proposals related to Double Phase Aerosol Air Freshener products to reduce the flammability of these products, the focus of this section will be on potential impacts from use of Multi-purpose Solvent and Paint Thinner products.

a. Proposed VOC Standards

To meet the proposed VOC limits (especially the future effective 3 percent by weight VOC limit) for Multi-purpose Solvent and Paint Thinner products, increased use of acetone is a likely, cost-effective compliance path, because it is an exempt VOC compound. However, staff, as well as stakeholders, has expressed safety concerns related to increased use of acetone. The use of greater than 1 percent acetone in a product meets the federal definition of an “extremely flammable” product. “Extremely flammable” is defined as a substance with a flashpoint at or below 20 degrees Fahrenheit (^{o}F). The flashpoint of acetone is -4 ^{o}F. This flashpoint means that at a temperature of -4 ^{o}F, vapors of acetone will ignite and quickly propagate. Thus,

incorrect handling of acetone can create a fire hazard. Appendix F contains information related to flammability and other characteristics of a variety of solvents that are currently used, or could be used in Multi-purpose Solvent and Paint Thinner products.

Pure acetone has been widely used as an ingredient in a variety of consumer products and is readily available for sale as a stand-alone solvent. However, acetone has not been widely used by consumers in containers labeled "Paint Thinner" or "Paint Clean-up." Currently available Paint Thinner products are generally formulated with hydrocarbon solvents such as mineral spirits and naphthas. Flash points for these products generally range from 80-120 ^{o}F. Products with flash points in this temperature range still present hazards if used incorrectly, however the risk of fire is not as great as acetone-containing products. Many Paint Thinner products in commerce meet the federal definition of a "combustible" product. "Combustible" is defined as a substance with a flashpoint at or above 100^{o}F to an including 150^{o}F.

When ARB began the public process of developing the VOC limits for Multi-purpose Solvent and Paint Thinner products, the SCAQMD concurrently proposed Rule 1143. This rule and ARB staff's proposal are similar, with respect to VOC limits, but differ in effective dates for the limits. As proposals were being developed, safety concerns were raised by the Office of the State Fire Marshal, local fire departments and industry stakeholders that very low VOC limits would necessitate increased use of acetone. This increased use of acetone could increase fire hazards. The concerns relate to the significant difference in the flash points between "typical" products labeled as "Paint Thinner," which are generally formulated with hydrocarbon solvents, and "reformulated" products labeled as "Paint Thinner," which may utilize acetone to meet the proposed VOC limits. Although the reformulated, acetone-containing products would be labeled as "extremely flammable," a typical consumer may not notice the designation, and may handle the reformulated product in the same manner as the former product. Thus, a potential increase in fire hazards could occur.

We agree that this is a potential safety issue. To address this issue, we worked with the stakeholders mentioned above on approaches to notify the household consumer, for a period of time adjacent to the effective dates of the proposed VOC limits, that they are purchasing a more flammable product with different use instructions. As a result, we are proposing additional requirements for certain Multi-purpose Solvent and Paint Thinner products, which are required under federal law, to be labeled "Flammable" or "Extremely Flammable."

In new subsection 94512(e), beginning December 31, 2010, until December 31, 2015, we are proposing to prohibit manufacturers from placing general product names on the principle display panel of "Flammable," or "Extremely Flammable" Multi-purpose Solvent and Paint Thinner products. The general product names used on products currently in commerce include, "Paint Thinner," "Multi-purpose Solvent," "Clean-up Solvent," "Paint Clean-up."

The proposed prohibition includes two alternatives that manufacturers may choose from to continue selling generally named “Flammable,” or “Extremely Flammable” Multi-purpose Solvents and Paint Thinners. The first alternative includes providing a “hang tag” or “sticker” affixed to the product that includes the statement “Formulated to meet California VOC limits, see warnings on label.” Manufacturers may also choose to display the common name of the chemical that results in the product meeting the criteria for “Flammable” or “Extremely Flammable,” in a font as large as or larger, than any of the words on the principle display panel.

The proposed prohibition does not apply to products named “Lacquer Thinner.” Many currently available Lacquer Thinners are “Extremely Flammable” because they contain greater than 1 percent acetone. We, and the interested stakeholders, believe consumers are already aware of the hazards associated with these products and it is not necessary to extend the proposed labeling requirement to these products.

Additionally, to potentially reduce the increased fire hazard from reliance on highly flammable Multi-purpose Solvent and Paint Thinner products, we have proposed an effective date for the 3 percent by weight limit of December 31, 2013. This additional compliance time should allow for development of additional, less flammable products.

Also, to assess progress on products being developed to comply with the proposed 3 percent by weight VOC limit, as proposed in new subsection 94513(g), manufacturers must submit data for reformulated products sold in calendar year 2011 by June 30, 2012. Data required includes product formulation, sales, flammability, and VOC and reactivity content. Based on data received from the 2012 reporting requirement, we will reassess the feasibility of the proposed 3 percent by weight VOC limit. Depending upon the outcome of this review, we may modify the requirements for Multi-purpose Solvent and Paint Thinner products.

b. Proposed New or Modified Definitions and Clarifying Language

We expect a net benefit on safety resulting from the labeling proposal for “Flammable,” or “Extremely Flammable” Multi-purpose Solvent and Paint Thinner products. Other proposals are language modifications and are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

We are proposing a prohibition on the use of perchloroethylene, trichloroethylene, and methylene chloride in Multi-purpose Solvent and Paint Thinner products. Use of perchloroethylene and methylene chloride could reduce product flammability. However, because these are TACs designated as potential human carcinogens, we believe preventing the public’s exposure to these compounds outweighs the potential reduction in flammability.

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in the reformulation of Multi-purpose Solvent and Paint Thinner products is expected to have no impact on safety. In the absence of this limit there is a remote potential that some solvents with higher GWP values could be used in product reformulations, and potentially lower the flammability of products. This will be further evaluated as part of the technical assessment in 2012.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are clarifications needed to enhance the enforceability of the lower VOC limits. The changes themselves are expected to have no impact on safety.

5. Impact on Agricultural Resources

As discussed in Chapter VI, one of the reformulation options manufacturers may choose to comply with the proposed limits for Multi-purpose Solvents and Paint Thinners is the use of soy methyl esters.

a. Proposed VOC Standards

Soy methyl esters are LVP-VOC solvents that have been shown to be useful as ingredients in Multi-purpose Solvent and Paint Thinner products. However, we believe that not all manufacturers will choose this option, because of the relatively high cost of soy methyl esters. For those manufacturers that do choose to formulate with soy methyl esters, we believe most will formulate with mixtures of soy and other compounds because mixtures containing less than 5 percent soy by weight, have been shown to function as Multi-purpose Solvents and Paint Thinners for some applications (IRTA, 2007). Because soy methyl esters are a possible reformulation, below, we provide our analysis on the potential impact our proposal could have on worldwide soy production.

It is estimated that about 230 million acres worldwide are dedicated to soybean production, and each acre of soy beans is estimated to yield approximately 460 pounds of soy oil (USDA, 2009; Maier *et al.*, 1998). If we assume that as a worst case scenario, the entire 15.5 tons per day of Multi-purpose Solvent and Paint Thinner products sold were reformulated with 100 percent of soy methyl esters, we predict an increase demand of soy oil of about 11.4 million pounds per year. Using the above soy oil per acre data, it would take approximately 24,600 acres to produce the soy oil needed for Multi-purpose Solvent and Paint Thinner products in California. This represents an increased demand of about 0.01 percent of worldwide soybean production. We, therefore, believe that the impacts on soy production and any environmental impacts associated with it are negligible.

b. Proposed New or Modified Definitions and Clarifying Language

We expect no impact on agricultural resources from the proposed new and modified definitions and clarifying language. These language modifications and are necessary to clarify regulatory provisions, or implement the new VOC limits.

c. Proposed Toxics Prohibition

The proposed prohibition on use of perchloroethylene, methylene chloride, and trichloroethylene in Multi-purpose Solvent and Paint Thinner products is expected to have negligible, or no impact on agricultural resources. We note that no use of these compounds was reported in the Survey Update.

d. Proposed Global Warming Potential Limits

The proposed GWP limit of 150 for compounds used in the reformulation of Multi-purpose Solvent and Paint Thinner products is expected to have no impact on agricultural resources. This is because compounds with GWPs greater than 150 are not likely reformulation options. Therefore, impacts on agricultural resources are unchanged by this proposal.

e. Proposed Changes to Method 310

The proposed changes to Method 310 are clarifications to analytical methods already being used and/or are clarifications needed to enhance the enforceability of the lower VOC limits. The changes themselves are expected to have no impact on agricultural resources.

E. ANALYSIS OF NEED FOR REASONABLY FORESEEABLE MITIGATION MEASURES

As part of our obligations under CEQA and AB 32, ARB staff is required to evaluate and mitigate potential adverse environmental impacts resulting from regulatory proposals. Also, pursuant to Health and Safety Code section 39650 *et seq*., the ARB is required to identify and control TACs. The Health and Safety Code defines a TAC as "...an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health." Moreover, in accordance with section 39666 of the Health and Safety Code, for TACs for which no safe exposure threshold has been established, the ARB is required to "…. reduce emissions to the lowest level achievable through application of best available control technology or a more effective control method…."

1. Proposed Mitigation Measure Related to Use of Flammable and Extremely Flammable Multi-purpose Solvent and Paint Thinner Products

In the categories of Multi-purpose Solvent and Paint Thinner, a likely reformulation pathway would be to replace VOC solvent with acetone, an exempt VOC solvent. Because acetone is an extremely flammable solvent, due to its low flashpoint, we have evaluated the need for mitigation measures related to its use.

As discussed at length previously, see Section D, number 4 of this chapter, and in accordance with CEQA, we are proposing additional labeling for Multi-purpose Solvent and Paint Thinner products that, in accordance with federal law, are labeled as "flammable" or "extremely flammable." This measure is designed to inform the public that they may be using a reformulated product and use instructions should be noted. This proposal is contained in new subsection 94512(e).

Further, we are proposing a small container (eight fluid ounces) exemption for Paint Thinner products, until December 31, 2013, to allow consumers to purchase small amounts of thinners to be used with previously purchased solvent-borne paints that may require thinning. This measure also could mitigate an increased fire hazard by allowing less flammable products to continue to be used for a short period of time.

2. Proposed Mitigation Measure Related to Greenhouse Gas Emissions

We are proposing new or lower VOC limits for Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products. To comply with these limits, some manufacturers could choose to replace all or a portion of their VOC hydrocarbon propellant in Double Phase Aerosol Air Freshener products with the exempt VOC propellants HFC-152a or HFC-134a. In addition, it is possible that manufacturers could use solvents with high GWP values in reformulated Multi-purpose Solvent and Paint Thinner products. Increased use, or new use of compounds with high GWP would have adverse impacts on climate change.

AB 32 requires GHG emissions to be reduced to 1990 levels by 2020, and also requires that increased use of these gases be minimized. Therefore, we are proposing a measure to minimize the use of GHGs in Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products. As proposed, and contained in subsection 94509(u), Double Phase Aerosol Air Freshener, Multi-purpose Solvent and Paint Thinner products could not contain compounds that have GWP values greater than 150. To determine the GWP of compounds, the Second Assessment Report 100 year values contained in the Fourth Assessment Report of the IPPC are to be used (IPPC, 2007).

Reformulation options for aerosol Double Phase Aerosol Air Freshener products include the use of the exempt VOC propellants HFC-152a and HFC-134a to meet the proposed

20 percent by weight VOC limit. The proposed GWP limit of 150 would allow use of HFC-152a, with a GWP of 140, but would preclude use of the propellant HFC-134a, which has a GWP of 1,300. While the proposal allows use of HFC-152a, we do not expect it to be used extensively, if at all. In determining a feasible limit for Double Phase Aerosol Air Freshener products, staff considered the impacts of a VOC limit on climate change. To balance reductions in ground level ozone and increasing GHG emissions, we proposed a VOC limit that is feasible without use of these GHGs. This balance means that we are potentially forgoing additional VOC reductions.

We also note that in discussions with some major manufacturers of Double Phase Aerosol Air Freshener products, it was indicated that they intend to comply with the proposal without the use of HFCs. We are aware of manufacturers with internal environmental polices precluding the use of HFCs. Finally, HFC-152a is quite expensive relative to VOC hydrocarbon propellants currently in commerce. For all of these reasons we do not expect much, if any, HFC-152a to be used.

In the categories of Multi-purpose Solvent and Paint Thinner, no use of compounds with GWP values above 150 was reported in the Survey Update. Therefore, chemical compounds that have a GWP greater than 150 are not critical to the formulation of Multi-purpose Solvent and Paint Thinner products. We would expect a negligible, or no, additional ozone reduction benefit if compounds with higher GWPs could be used. The main reformulation options such as use of water, odorless mineral spirits, acetone, and other exempt VOC compounds reported in the Survey Update, have GWP values that are below 150, or are not listed by the Fourth Assessment Report of the IPCC (IPPC, 2007).

Although we do not expect increased use of GHGs with high GWP values to be used in these products, to prevent this possibility, in accordance with AB 32, we are proposing a prohibition on the use of any compound with a GWP value of 150 or greater in Double Phase Aerosol Air Freshener, Multi-purpose Solvent and Paint Thinner products as a mitigation measure.

F. RISK ASSESSMENT FOR REDUCED EXPOSURE TO OZONE AND TACS

The health risks associated with ozone exposure have been known for many years and are discussed in further in Chapter IV. Studies have shown that when inhaled, even at relatively low levels, ozone can impact lung tissue and lung function. The greatest risk is to those who are more active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Exposure to levels of ozone above the current ambient air standard leads to lung inflammation and lung tissue damage, and a reduction in the amount of air inhaled into the lungs. Recent evidence has, for the first time, linked the onset of asthma to exposure to elevated ozone levels in exercising children (McConnell *et al.*, 2002).

The actual lowering of health risks from reducing VOC emissions, if the proposal is adopted, is not quantified in this report. However, it has been estimated that about

630 fewer people would die prematurely each year in California from exposure to ozone if the State were to attain the ozone standard (Ostro et al., 2006). In a 2008 report, "Estimating Mortality Risk Reduction and Economic Benefits from Controlling Ozone Air Pollution," the National Research Council's (NRC), Committee on Estimating Mortality Risk Reduction Benefits from Decreasing Tropospheric Ozone Exposure, of the Board on Environmental Studies and Toxicology in the Division on Earth and Life Studies, concluded that it is appropriate for regulatory agencies to used mortality risk to analyze cost and benefits in setting ozone standards (NRC, 2008).

About 93 percent of California residents live in areas where ozone levels exceed State and federal ambient air quality standards. Qualitatively, we conclude that reducing VOC emissions, because of their role as ozone precursors, will result in incremental improvement of the public's health – whether it is in fewer incidences of asthma or hospitalizations, improvement in lung function, or fewer premature deaths.

The VOC reductions from the proposed amendments are designed as partial fulfillment of the State Strategy for California's 2007 State Implementation Plan. Thus, one can conclude that increments of progress towards attainment improve the public's health. As shown in Table VIII-1, the proposed amendments to the Regulation are designed to achieve the maximum feasible VOC emission reduction from the categories proposed for regulation at this time. When fully effective, adopting the amendments would result in a VOC emissions reduction of about 14.7 tons per day. The impacts of our proposal on SOA formation are not clear, although we do not expect a disbenefit.

The proposal for Multi-purpose Solvent and Paint Thinner products that would limit the amount of aromatic VOC hydrocarbon solvents to no more than 1 percent by weight is designed to reduce ground level ozone concentrations. However, as an ancillary benefit, this proposal will also reduce exposure to xylenes, ethyl benzene, and toluene. These compounds are identified TACs (OEHHA, 2000, 2005). Xylenes cause central nervous system effects in humans and irritation of the eyes, nose, and throat. Ethyl benzene is a development toxicant (OEHHA, 2005). Toluene is a reproductive toxicant (OEHHA, 2005).

In addition, the proposed prohibition on the use of methylene chloride , trichloroethylene, and perchloroethylene in Multi-purpose Solvent and Paint Thinner products will prevent public exposure to these TACs (ARB, 1989b, 1990d and 1991b) resulting in public health protection.

In summary, our health risk analysis shows that the proposed amendments would reduce health risks posed by emissions of Double Phase Aerosol Air Freshener, Multi-purpose Solvent, and Paint Thinner products by lowering ground level ozone concentrations and by reducing or preventing exposure to TACs.

G. ALTERNATIVE MEANS OF COMPLIANCE

Two alternative means of compliance with the Consumer Products Regulation have been developed. A current compliance alternative for manufacturers of consumer products is the Alternative Control Plan (ACP). The ACP Regulation (see title 17, CCR, sections 94540-94555), is a voluntary emissions averaging program. Under the ACP, an overall limit on the VOC emissions from a group of products in the ACP is determined. To be approved, an ACP must demonstrate that the total VOC emissions within the ACP would not exceed the emissions that would have resulted had the products been formulated to meet the VOC limit established for each product category. In other words, some products in the ACP could exceed the established VOC limits in the Consumer Products Regulation as long as those increased emissions were offset by additional products that over-comply with the established VOC limits. The ACP provides manufacturers with flexibility, but preserves the overall environmental benefits of emission reductions.

Another compliance alternative that is available for manufacturers is the Innovative Products Provision (see title 17, CCR, section 94511). This provision allows a manufacturer to formulate products that exceed the mass-based VOC limit specified in the Consumer Products Regulation for a particular product category. The manufacturer must demonstrate that, through some characteristic of the higher VOC product, its use will result in less VOC emissions compared to a representative complying product. This alternative is also specifically designed to allow manufacturers flexibility, while preserving the emission benefits of the Consumer Products Regulation.

Absent use of either of these alternatives, staff is not aware of any additional compliance means, other than direct compliance with the proposed amendments.

H. ENVIRONMENTAL JUSTICE

State law defines environmental justice as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. The ARB is committed to evaluating community impacts of proposed regulations, including environmental justice concerns.

Consumer products are considered area sources. This is because their use is fairly uniform across the State, tracking with housing units, and their emissions are spread over the course of a day, rather than concentrated at a particular time of day. For these reasons, we do not believe that people of any given race, culture, or income would be more impacted than any others would. All Californians should benefit equally from the reduction in VOC emissions from the consumer product categories proposed for regulation.

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IX. FUTURE AND ONGOING ACTIVITIES

In this chapter, we describe future and ongoing activities related to the consumer products program. These activities are directed at developing proposals to further reduce volatile organic compounds (VOC), air toxic, and greenhouse gas emissions from consumer products. As always, our rulemaking activities will be conducted using a transparent process, allowing for stakeholder input. Major activities are summarized below.

A. CONSUMER PRODUCT EMISSIONS REDUCTION COMMITMENTS IN THE STATE IMPLEMENTATION PLAN

As described in Chapter I, in the current SIP, the State Strategy for California's 2007 State Implementation Plan (Strategy), ARB committed to achieving a further 30 to 40 tons per day VOC emissions reduction from consumer products statewide by 2014. Initial measures were adopted in the 2007 to 2008 timeframe, with emission reductions achieved by 2010. Additional measures to achieve the overall reduction commitment are to be adopted between 2010 and 2012 with implementation within the 2012 to 2014 timeframe. The majority of the 5.8 tons per day of VOC reductions approved by the Board at its June 26, 2008, hearing constituted the first increment in meeting this commitment. About 1.3 tons per day of the 5.8 tons per day achieved will actually occur in 2015, and would be credited toward VOC reductions commitments in the post-2014 timeframe. The 14.7 tons per day VOC reduction that would occur from adoption of the amendments proposed in this rulemaking, mark further progress toward meeting the consumer products commitment in the Strategy. Table IX-1 shows our progress toward meeting the consumer products commitment in the Strategy.

Table IX-1
Consumer Product VOC Reductions Accredited Toward SIP Commitment

Consumer Products Rulemaking	VOC Reductions (tons per day)
June 2008 Amendments	4.5
September 2009 Amendments (this proposal)	14.7
2010 Cleaning Products Amendments (under development)	5 – 8
Additional Reductions from 2006 Survey Product Categories	5.8 – 12.8
Totals Reductions by January 1, 2014	**30 – 40**

We are continuing the review of data from the 2006 Consumer and Commercial Products Survey as a further basis for identifying and evaluating additional categories for emission reduction opportunities. This survey was designed to collect 2006 calendar year product sales and formulation data for a variety of consumer products including aerosol coatings; personal care products; other cleaning products; lubricants; pesticides; and others. Some categories such as hobby, sporting, and party products

were specifically surveyed to evaluate the use of GHGs. If feasible, additional proposals would be brought for consideration before the Board in 2010.

ARB staff proposes to revise the Strategy as may be appropriate in a 2010 mid-course update: to reflect the emission benefits of newly adopted regulations; provide more detail on the State's intended actions to fulfill the commitment to achieve emission reductions in total by specific dates; update as necessary the emissions inventories for federal ozone and $PM_{2.5}$ non-attainment areas; and revise as necessary other plan aspects, including motor vehicle emissions budgets. The 2010 mid-course review may show the need for additional emission reductions from consumer products.

On March 12, 2008, U.S. EPA reduced the eight-hour "primary" ozone standard to a level of 0.075 ppm. U.S. EPA also strengthened the secondary eight-hour ozone standard to the level of 0.075 ppm, making it identical to the revised primary standard. The final rule became effective on May 27, 2008. These changes will require that new State Implementation Plans (SIP) be drafted. A complete new state strategy will be developed for 2013. The 2013 SIP will likely require more VOC reductions from consumer products.

B. GREENHOUSE GAS REDUCTIONS FROM CONSUMER PRODUCTS

As described in Chapter I, the California Global Warming Solutions Act of 2006 (AB 32) specifies that Discrete Early Action Measures are to be adopted and implemented by 2010. Greenhouse gas (GHG) reductions from consumer products have been designated as a Discrete Early Action Measure. The overall estimate is that greenhouse gas emissions from consumer products could be reduced by 0.25 MMT CO_2e per year. The Pressurized Gas Duster proposal, approved by the Board on June 26, 2008, will achieve approximately 0.20 MMT CO_2e per year in 2010, and 0.23 MMT CO_2e per year by 2020. From information we have gathered from consumer product surveys, we are currently evaluating whether GHG emissions reductions from Tire Sealants and Inflators and Chewing Gum Removers is feasible. We also intend to continue to evaluate data collected on other categories to determine if GHG emission reductions are technologically feasible and cost-effective to implement.

C. 2006 CONSUMER AND COMMERCIAL PRODUCTS SURVEY DATA SUMMARIES

We are continuing the review of data from the 2006 Consumer and Commercial Products Survey. Over 500 surveys have been received. We expect to release non-confidential data summaries in the summer of 2009. These data summaries will serve as the basis for additional VOC and GHG emissions reduction proposals.

D. NAIL COATINGS EXPOSURE ASSESSMENT

Stakeholders have expressed concerns regarding the use of the toxic compounds xylenes; toluene; dibutyl phthalate; and formaldehyde in nail coating formulations. We are actively evaluating these concerns to determine if use of these compounds in nail coatings pose a health hazard in the outdoor ambient air around nail salons. We are modeling emissions of these toxic compounds from an individual business, as well as cumulative emissions from multiple facilities. The goal of these analyses is to assess the potential risk posed to people living in close proximity to these emission sources. Should an adverse health impact in the outdoor ambient air be identified, we would evaluate mitigation strategies under our authority to reduce Toxic Air Contaminants.

E. DRY CLEAN ONLY SPOT REMOVERS

Based on comments from stakeholders, we are currently evaluating spot remover formulas used in commercial dry cleaning facilities. A survey was sent out to dry cleaning chemical manufacturers on January 14, 2009, to gather sales and formulation data on Dry Clean Only Spot Removers. The data received from this survey are currently under review.

The Bay Area Air Quality Management District (BAAQMD) adopted amendments to District Regulation 11, Rule 16 and Regulation 8, Rule 17 which pertain to Dry Cleaning Operations. The BAAQMD rules prohibit the use of halogenated solvents, such as perchloroethylene and trichloroethylene in spotting solutions. We will evaluate the feasibility of regulating Dry Clean Only Spot Removers once the survey data are compiled.

F. PAINT REMOVERS/ STRIPPERS

The Paint Remover/Stripper category will also be evaluated for potential VOC and Toxic Air Contaminant reductions upon the completion of the 2006 Consumer and Commercial Products Survey Data Summaries.

G. CLEANING PRODUCTS

Non-aerosol General Purpose Cleaners, General Purpose Degreasers, Glass Cleaners, and aerosol Furniture Maintenance Products are under evaluation for further regulation. Part of this evaluation is to determine if potential adverse impacts would result from the use of predicted reformulations used to comply with proposed lower VOC limits. We are working with Office of Environmental Health Hazard Assessment staff who are developing health values for various low vapor pressure-VOC glycol ethers that could be used in reformulated products. In accordance with State law, any new health values will need to undergo scientific peer review. Concomitant with this work, exposure scenarios are being developed to simulate usage of cleaning products in household and institutional settings. Air concentrations resulting from modeling these scenarios will be

compared to health values to determine if adverse health impacts would result from use of potential reformulations.

We are also working with State Water Resources Control Board staff to evaluate water quality impacts from use of cleaning products. Of particular concern is a family of surfactants, the alkylphenol ethoxylates. Evidence indicates these surfactants are toxic to aquatic organisms, with the main concern being the estrogenic effects of their degradation products.

If these assessments indicate that there is a potential for adverse environmental impacts from the proposals to establish lower VOC limits for these categories, then mitigation measures will need to be evaluated. During this continued evaluation, stakeholders will be given the opportunity to comment and provide input on specific proposals. Upon completion of this evaluation, we intend to propose to the Board in 2010, new limits for these categories, which we expect to achieve 5 – 8 tons per day VOC reductions toward the consumer products commitment in the Strategy.

Appendix B

Proposed Amendments to the Regulation for Reducing Emissions from Consumer Products and Revisions to Test Method 310

[Note: Proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions.]

Proposed Amendments to the REGULATION FOR REDUCING EMISSIONS FROM CONSUMER PRODUCTS

SUBCHAPTER 8.5 CONSUMER PRODUCTS

Amend title 17, California Code of Regulation, sections 94508, 94509, 94510, 94512, 94513, and 94515 to read as follows:

Article 2. Consumer Products

94507. Applicability.

Except as provided in Sections 94509(i) and 94510, this article shall apply to any person who sells, supplies, offers for sale, or manufactures consumer products for use in the state of California.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

§ 94508. Definitions.

(a) For the purpose of this article, the following definitions apply:

(1) "Adhesive" means any product that is used to bond one surface to another by attachment. "Adhesive" does not include products used on humans and animals, adhesive tape, contact paper, wallpaper, shelf liners, or any other product with an adhesive incorporated onto or in an inert substrate. For "Contact Adhesive," "Construction, Panel, and Floor Covering Adhesive," and "General Purpose Adhesive" only, "adhesive" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. This limitation does not apply to aerosol adhesives.

(2) "Adhesive Remover" means a product designed to remove adhesive from either a specific substrate or a variety of substrates. "Adhesive Remover" does not include products that remove adhesives intended for use on humans or animals.

For the purpose of this definition and "Adhesive Remover" subcategories (A-D), the term "adhesive" shall mean a substance used to bond one or more materials.

Adhesive includes, but is not limited to: caulks; sealants; glues; or similar substances used for the purpose of forming a bond.

(A) "Floor ~~t~~or Wall Covering Adhesive Remover" means a product designed or labeled to remove floor or wall coverings and associated adhesive from the underlying substrate.

(B) "Gasket or Thread Locking Adhesive Remover" means a product designed or labeled to remove gaskets or thread locking adhesives. Products labeled for dual use as a paint stripper and gasket remover and/or thread locking adhesive remover are considered "Gasket or Thread Locking Adhesive Remover."

(C) "General Purpose Adhesive Remover" means a product designed or labeled to remove cyanoacrylate adhesives as well as non-reactive adhesives or residue from a variety of substrates. "General Purpose Adhesive Remover" includes, but is not limited to, products that remove thermoplastic adhesives; pressure sensitive adhesives; dextrine or starch-based adhesives; casein glues; rubber or latex-based adhesives; as well as products that remove stickers; decals; stencils; or similar materials. "General Purpose Adhesive Remover" does not include "Floor or Wall Covering Adhesive Remover."

(D) "Specialty Adhesive Remover" means a product designed to remove reactive adhesives from a variety of substrates. Reactive adhesives include adhesives that require a hardener or catalyst in order for the bond to occur. Examples of reactive adhesives include, but are not limited to: epoxies; urethanes; silicones. "Specialty Adhesive Remover" does not include "Gasket or Thread Locking Adhesive Remover."

(3) "Aerosol Adhesive" means any adhesive packaged as an aerosol product in which the spray mechanism is permanently housed in a nonrefillable can designed for hand-held application without the need for ancillary hoses or spray equipment. Aerosol adhesives include special purpose spray adhesives, mist spray adhesives, and web spray adhesives.

(4) "Aerosol Cooking Spray" means any aerosol product designed either to reduce sticking on cooking and baking surfaces or to be applied on food, or both.

(5) "Aerosol Product" means a pressurized spray system that dispenses product ingredients by means of a propellant contained in a product or a product's container, or by means of a mechanically induced force. "Aerosol Product" does not include "Pump Spray."

(6) “Agricultural Use” means the use of any pesticide or method or device for the control of pests in connection with the commercial production, storage or processing of any animal or plant crop. “Agricultural Use” does not include the sale or use of pesticides in properly labeled packages or containers which are intended for: (A) Home use, (B) Use in structural pest control, or (C) Industrial or Institutional use. For the purposes of this definition only:

“Home use” means use in a household or its immediate environment.

“Structural pest control” means a use requiring a license under Chapter 14 (commencing with Section 8500), Division 3, of the Business and Professions Code.

“Industrial use” means use for or in a manufacturing, mining, or chemical process or use in the operation of factories, processing plants, and similar sites.

“Institutional use” means use within the confines of, or on property necessary for the operation of buildings such as hospitals, schools, libraries, auditoriums, and office complexes.

(7) “Air Freshener” means any product including, but not limited to, sprays, wicks, wipes, diffusers, powders, and crystals, designed or labeled for the purpose of masking odors, or freshening, cleaning, scenting, or deodorizing the air. “Air Freshener” includes dual purpose air freshener/disinfectant products. “Air Freshener” does not include products that are used on the human body, products that function primarily as cleaning products as indicated on a product label, “Odor Remover/Eliminator,” or “Toilet/Urinal Care Product.”

(8) “All Other Carbon-Containing Compounds” means all other compounds which contain at least one carbon atom and are not a “Table B” or a “LVP-VOC.”

(9) “All Other Forms” means all consumer product forms for which no form-specific VOC standard is specified. Unless specified otherwise by the applicable VOC standard, “all other forms” include, but are not limited to, solids, liquids (which includes the liquid containing or liquid impregnated portion of the cloth or paper wipes (towelettes), wicks, powders, and crystals.

(10) “Antimicrobial Hand or Body Cleaner or Soap” means a cleaner or soap which is designed to reduce the level of microorganisms on the skin through germicidal activity, and is regulated as an over-the-counter drug by the U.S. Food and Drug Administration. “Antimicrobial Hand or Body Cleaner or Soap” includes, but is not limited to, (A) antimicrobial hand or body washes/cleaners, (B) foodhandler hand washes, (C) healthcare personnel hand washes, (D) pre-operative skin preparations and (E) surgical scrubs. “Antimicrobial Hand or Body Cleaner or Soap” does not include prescription drug products, antiperspirants,

"Astringent/Toner," deodorant, "Facial Cleaner or Soap," "General-use Hand or Body Cleaner or Soap," "Hand Dishwashing Detergent" (including antimicrobial), "Heavy-duty Hand Cleaner or Soap," "Medicated Astringent/Medicated Toner," and "Rubbing Alcohol."

(11) "Anti-Static Product" means a product that is labeled to eliminate, prevent, or inhibit the accumulation of static electricity. "Anti-Static Product" does not include "Electronic Cleaner," "Floor Polish or Wax," "Floor Coating," and products that meet the definition of "Aerosol Coating Product" or "Architectural Coating."

(12) "Architectural Coating" means a coating applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.

(13) "Aromatic Compound" means a VOC that contains one or more benzene or equivalent heterocyclic rings.

(14) "Artist's Solvent/Thinner" means any liquid product, labeled to meet ASTM D4236 – 95 (March 1, 2005) Standard Practice for Labeling Art Materials for Chronic Health Hazards, which is incorporated by reference herein, and packaged in a container equal to or less than 32 fluid ounces, labeled to reduce the viscosity of, and or remove, art coating compositions or components.

(15)~~(13)~~"ASTM" means ~~the American Society for Testing and Materials~~ ASTM International.

(16)~~(14)~~"Astringent/Toner" means any product designed or labeled to be applied to the skin for the purpose of cleaning or tightening pores. This category also includes clarifiers and substrate-impregnated products. This category does not include any hand, face, or body cleaner or soap product, "Medicated Astringent/Medicated Toner," cold cream, lotion, antiperspirant, or any Astringent/Toner product regulated as a drug by the United States Food and Drug Administration (FDA).

(17)~~(15)~~"Automotive Hard Paste Wax" means an automotive wax or polish which is: (A) designed to protect and improve the appearance of automotive paint surfaces; and (B) a solid at room temperature; and (C) contains 0% water by formulation.

(18)~~(16)~~"Automotive Instant Detailer" means a product designed for use in a pump spray that is applied to the painted surface of automobiles and wiped off prior to the product being allowed to dry.

(19)~~(17)~~"Automotive Rubbing or Polishing Compound" means a product designed primarily to remove oxidation, old paint, scratches or "swirl marks," and other defects from the painted surfaces of motor vehicles without leaving a protective barrier.

(20)~~(18)~~"Automotive Wax, Polish, Sealant or Glaze" means a product designed to seal out moisture, increase gloss, or otherwise enhance a motor vehicle's painted surfaces. "Automotive Wax, Polish, Sealant or Glaze" includes, but is not limited to, products designed for use in autobody repair shops and "drive-through" car washes, as well as products designed for the general public. "Automotive Wax, Polish, Sealant or Glaze" does not include "Automotive Rubbing or Polishing Compound," automotive wash and wax products, surfactant-containing car wash products, and products designed for use on unpainted surfaces such as bare metal, chrome, glass, or plastic.

(21)~~(19)~~"Automotive Windshield Washer Fluid (Dilutable)" means any liquid which meets the following criteria:

(A) the product is sold either in a container with a capacity of ~~55~~ 10 gallons or more, or a container with a capacity of one quart or less; and

(B) the product is designed or labeled for use in a motor vehicle windshield washer fluid system either as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Dilutable)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

(22)~~(20)~~"Automotive Windshield Washer Fluid (Pre-Mixed)" means any liquid which meets the following criteria:

(A) the product is sold in a container with a capacity that is greater than one quart, but less than ~~55~~ 10 gallons; and

(B) the product is designed or labeled for use in a motor vehicle windshield washer fluid system as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Pre-Mixed)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

(23)~~(21)~~"Bathroom and Tile Cleaner" means a product designed or labeled to clean tile or surfaces in bathrooms. "Bathroom and Tile Cleaner" does not include "Toilet/Urinal Care Product."

(24)~~(22)~~"Brake Cleaner" means a cleaning product designed or labeled to remove oil, grease, brake fluid, brake pad material or dirt from motor vehicle brake mechanisms.

(25)~~(23)~~"Bug and Tar Remover" means a product labeled to remove either or both of the following from painted motor vehicle surfaces without causing damage to the finish: (A) biological-type residues such as insect carcasses and tree sap and, (B) road grime, such as road tar, roadway paint markings, and asphalt.

(26)~~(24)~~"California Sales" means the sales (net pounds of product, less packaging and container, per year) in California for either the calendar year immediately prior to the year that the information required by the Executive Officer pursuant to section 94513 (required information) is due or, if that data is not available, any consecutive 12 month period commencing no earlier than 2 years prior to the due date of the required information. If direct sales data for California is not available, sales may be estimated by prorating national or regional sales data by population.

(27)~~(25)~~"Carburetor or Fuel-Injection Air Intake Cleaner" means a product designed or labeled to remove fuel deposits, dirt, or other contaminants from a carburetor, choke, throttle body of a fuel-injection system, or associated linkages. "Carburetor or Fuel-injection Air Intake Cleaner" does not include products designed or labeled exclusively to be introduced directly into the fuel lines or fuel storage tank prior to introduction into the carburetor or fuel injectors, or products designed or labeled exclusively to be introduced during engine operation directly into air intake vacuum lines by using a pressurized sprayer wand.

(28)~~(26)~~"Carpet/Upholstery Cleaner" means a cleaning product designed or labeled for the purpose of eliminating dirt or stains on rugs, carpeting, or objects upholstered or covered with fabrics such as wool, cotton, nylon or other synthetic fabrics. "Carpet/Upholstery Cleaner" includes, but is not limited to, products used on household furniture, the interior of motor vehicles, and products that make "Fabric Protectant" claims. "Carpet/Upholstery Cleaner" does not include "Spot Remover," vinyl or leather cleaners, "Dry Cleaning Fluid~~s~~," or products designed exclusively for use at industrial facilities engaged in furniture or carpet manufacturing.

(29)~~(27)~~"Charcoal Lighter Material" means any combustible material designed to be applied on, incorporated in, added to, or used with charcoal to enhance ignition. "Charcoal Lighter Material" does not include any of the following: (A) electrical starters and probes, (B) metallic cylinders using paper tinder, (C) natural gas, (D) propane, and (E) fat wood.

(30)~~(28)~~"Colorant" means any pigment or coloring material used in a consumer product for an aesthetic effect, or to dramatize an ingredient.

(31)~~(29)~~"Construction, Panel, and Floor Covering Adhesive" means any non-aerosol, one-component adhesive that is designed or labeled for the installation, remodeling, maintenance, or repair of: (A) structural and building components that include, but are not limited to, beams, trusses, studs, paneling (drywall or drywall laminates, fiberglass reinforced plastic (FRP), plywood, particle board,

insulation board, pre-decorated hardboard or tileboard, etc.), ceiling and acoustical tile, molding, fixtures, countertops or countertop laminates, cove or wall bases, and flooring or subflooring; or (B) floor or wall coverings that include, but are not limited to, wood or simulated wood covering, carpet, carpet pad or cushion, vinyl-backed carpet, flexible flooring material, nonresilient flooring material, mirror tiles and other types of tiles, and artificial grass. "Construction, Panel, and Floor Covering Adhesive" does not include "Floor Seam Sealer."

(32)~~(30)~~"Consumer" means any person who seeks, purchases, or acquires any consumer product for personal, family, household, or institutional use. Persons acquiring a consumer product for resale are not "consumers" for that product.

(33)~~(31)~~"Consumer Product" means a chemically formulated product used by household and institutional consumers including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products*;* but does not include other paint products, furniture coatings, or architectural coatings. As used in this article, the term "consumer product" shall also refer to aerosol adhesives, including aerosol adhesives used for consumer, industrial, and commercial uses.

(34)~~(32)~~"Contact Adhesive" means a non-aerosol adhesive that: (A) is designed for application to both surfaces to be bonded together, and (B) is allowed to dry before the two surfaces are placed in contact with each other, and (C) forms an immediate bond that is impossible, or difficult, to reposition after both adhesive-coated surfaces are placed in contact with each other, and (D) does not need sustained pressure or clamping of surfaces after the adhesive-coated surfaces have been brought together using sufficient momentary pressure to establish full contact between both surfaces. "Contact Adhesive" does not include rubber cements that are primarily intended for use on paper substrates. "Contact Adhesive" also does not include vulcanizing fluids that are designed and labeled for tire repair only.

(35)~~(33)~~"Contact Adhesive - General Purpose" means any contact adhesive that is not a "Contact Adhesive - Special Purpose."

(36)~~(34)~~"Contact Adhesive - Special Purpose" means a contact adhesive that: (A) is used to bond melamine-covered board, unprimed metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber, high pressure laminate or wood veneer 1/16 inch or less in thickness to any porous or nonporous surface, and is sold in units of product, less packaging, that contain more than eight fluid ounces, or (B) is used in automotive applications that are (1.) automotive under-the-hood applications requiring heat, oil or gasoline resistance, or (2.) body-side molding, automotive weatherstrip or decorative trim.

(37)~~(35)~~"Container/Packaging" means the part or parts of the consumer or institutional product which serve only to contain, enclose, incorporate, deliver, dispense, wrap or store the chemically formulated substance or mixture of substances which is solely responsible for accomplishing the purposes for which the product was designed or intended. "Container/Packaging" includes any article onto or into which the principal display panel and other accompanying literature or graphics are incorporated, etched, printed or attached.

(38)~~(36)~~"Crawling Bug Insecticide" means any insecticide product that is designed for use against ants, cockroaches, or other household crawling arthropods, including, but not limited to, mites, silverfish or spiders. "Crawling Bug Insecticide" does not include products designed to be used exclusively on humans or animals, or any house dust mite product. For the purposes of this definition only:

"House dust mite product" means a product whose label, packaging, or accompanying literature states that the product is suitable for use against house dust mites, but does not indicate that the product is suitable for use against ants, cockroaches, or other household crawling arthropods.

"House dust mite" means mites which feed primarily on skin cells shed in the home by humans and pets and which belong to the phylum Arthropoda, the subphylum Chelicerata, the class Arachnida, the subclass Acari, the order Astigmata, and the family Pyroglyphidae.

(39)~~(37)~~"Deodorant Body Spray" means:

(A) for products manufactured before January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance.

(B) for products manufactured on or after January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance, that is designed for application all over the human body to provide a scent. A "Deodorant Body Spray" product that indicates or depicts on the container or packaging, or on any sticker or label affixed thereto, that it can be used on or applied to the human axilla, is a "Deodorant" as defined in section 94501(d).

(40)~~(38)~~"Device" means any instrument or contrivance (other than a firearm) which is designed for trapping, destroying, repelling, or mitigating any pest or any other form of plant or animal life (other than man and other than bacteria, virus, or other microorganism on or in living man or other living animals); but not including equipment used for the application of pesticides when sold separately therefrom.

(41)~~(39)~~"Disinfectant" means a product that is labeled as a "disinfectant", or is labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is

registered as a “disinfectant” under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). Products that are labeled as both a “sanitizer” and a “disinfectant” are considered disinfectants. “Disinfectant” does not include any of the following: (A) products labeled solely for use on humans or animals, (B) products labeled solely for agricultural use, (C) products labeled solely for use in swimming pools, therapeutic tubs, or hot tubs, (D) products which are labeled to be used on heat sensitive critical or semi-critical medical devices or medical equipment surfaces, (E) products which are pre-moistened wipes or towelettes sold exclusively to medical, convalescent, or veterinary establishments, (F) products which are labeled to be applied to food-contact surfaces and are not required to be rinsed prior to contact with food, or (G) products which are labeled as “Bathroom and Tile Cleaners,” “Glass Cleaners,” “General Purpose Cleaners,” “Toilet/Urinal Care Products,” “Metal Polishes,” “Carpet Cleaners,” or “Fabric Refreshers” that may also make disinfecting or anti-microbial claims on the label.

(42)(40)“Distributor” means any person to whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce, except that manufacturers, retailers, and consumers are not distributors.

(43)(41)“Double Phase Aerosol Air Freshener” means an aerosol air freshener with the liquid contents in two or more distinct phases that requires the product container be shaken before use to mix the phases, producing an emulsion.

(44)(42)“Dry Cleaning Fluid” means any non-aqueous liquid product designed and labeled exclusively for use on: (1) fabrics which are labeled “for dry clean only,” such as clothing or drapery; or (2) “S-coded” fabrics. “Dry Cleaning Fluid” includes, but is not limited to, those products used by commercial dry cleaners and commercial businesses that clean fabrics such as draperies at the customer’s residence or work place. “Dry Cleaning Fluid” does not include “Spot Remover” or “Carpet/Upholstery Cleaner.” For the purposes of this definition, S-coded fabric means an upholstery fabric designed to be cleaned only with water-free spot cleaning products as specified by the Joint Industry Fabric Standards Committee.”

(45)(43)“Dual Purpose Air Freshener/Disinfectant” means an aerosol product that is represented on the product container for use as both a disinfectant and an air freshener, or is so represented on any sticker, label, packaging, or literature attached to the product container.

(46)(44)“Dusting Aid” means a product designed or labeled to assist in removing dust and other soils from floors and other surfaces without leaving a wax or silicone based coating. “Dusting Aid” does not include “Pressurized Gas Duster.”

(47)(45)“Electrical Cleaner” means a product labeled to remove heavy soils such as grease, grime, or oil from electrical equipment, including, but not limited

to, electric motors, armatures, relays, electric panels, or generators. Electrical Cleaner does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Electronic Cleaner," "Energized Electrical Cleaner," "Pressurized Gas Duster," "Engine Degreaser," "Anti-Static Product," or products designed to clean the casings or housings of electrical equipment.

(48)~~(46)~~"Electronic Cleaner" means a product labeled for the removal of dirt, moisture, dust, flux, or oxides from the internal components of electronic or precision equipment such as circuit boards, and the internal components of electronic devices, including but not limited to, radios, compact disc (CD) players, digital video disc (DVD) players, and computers. "Electronic Cleaner" does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Pressurized Gas Duster," "Engine Degreaser," "Electrical Cleaner," "Energized Electrical Cleaner," "Anti-Static Product," or products labeled to clean the casings or housings of electronic equipment. "Electronic Cleaner" does not include any product that meets both of the following criteria:

1) the product is labeled to clean and/or degrease electronic equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component;

2) the product label clearly displays the statements: "Energized Electronic Equipment use only."

(49)~~(47)~~"Energized Electrical Cleaner" means a product that meets both of the following criteria:

1) the product is labeled to clean and/or degrease electrical equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component such as a capacitor;

2) the product label clearly displays the statements: "Energized Equipment use only. Not to be used for motorized vehicle maintenance, or their parts."

"Energized Electrical Cleaner" does not include "Electronic Cleaner."

(50)~~(48)~~"Engine Degreaser" means a cleaning product designed or labeled to remove grease, grime, oil and other contaminants from the external surfaces of engines and other mechanical parts.

(51)~~(49)~~"Executive Officer" means the Executive Officer of the Air Resources Board, or his or her delegate.

(52)~~(50)~~"Existing Product" means any formulation of the same product category and form sold, supplied, manufactured, or offered for sale in California prior to the

following dates, or any subsequently introduced identical formulation:

(A) October 21, 1991, for all products listed in section 94509(a) that have initial effective dates of January 1, 1993, or January 1, 1994;

(B) January 6, 1993, for all products listed in section 94509(a) that have initial effective dates of January 1, 1995, or January 1, 1997, and charcoal lighter materials subject to section 94509(h);

(C) August 16, 1998, for all products listed in section 94509(a) that have initial effective dates of January 1, 2001, January 1, 2002, January 1, 2003, or January 1, 2005;

(D) November 19, 2000, for all products in the following product categories listed in section 94509(a): "Non-aerosol General Purpose Degreaser," "Sealant and Caulking Compound," and "Tire Sealant and Inflator."

(E) July 20, 2005, for all products listed in section 94509(a) that have an effective date of December 31, 2006, December 31, 2008, or December 31, 2009; and

(F) December 8, 2007, for all products listed in section 94509(a) that have an initial effective date of December 31, 2008, or December 31, 2010 for Brake Cleaner, Carburetor or Fuel-Injection Air Intake Cleaner, Aerosol Engine Degreaser, Resilient Flooring Material, Nonresilient Flooring Material, Aerosol General Purpose Degreaser, and Aerosol Temporary Hair Color.

(G) July 18, 2009, for all products listed in section 94509(a) that have an initial effective date of December 31, 2010, or December 31, 2012, December 31, 2013, or December 31, 2014.

(53)~~(51)~~"Fabric Protectant" means:

(A) for products manufactured before December 31, 2008: a product designed or labeled to be applied to fabric substrates to protect the surface from soiling from dirt and other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include "Waterproofers," products designed for use solely on leather, or products designed for use solely on fabrics which are labeled "for dry clean only" and sold in containers of 10 fluid ounces or less.

(B) for products manufactured on or after December 31, 2008: a product designed or labeled to be applied to fabric substrates to protect the surface from soiling from dirt or other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include "Waterproofers," or products labeled for use solely on leather. "Fabric Protectant" does not

include pigmented products that are designed or labeled to be used primarily for coloring, products used for construction, reconstruction, modification, structural maintenance or repair of fabric substrates, or products that renew or restore fabric and qualifying as either “Clear Coating” or “Vinyl/Fabric/Leather/Polycarbonate Coating” under section 94521(a).

(54)~~(52)~~“Fabric Refresher” means a product labeled to neutralize or eliminate odors on non-laundered fabric including, but not limited to, soft household surfaces, rugs, carpeting, draperies, bedding, automotive interiors, footwear, athletic equipment, clothing and/or on household furniture or objects upholstered or covered with fabrics such as, but not limited to, wool, cotton, or nylon. “Fabric Refresher” does not include “Anti-static Product,” “Carpet/Upholstery Cleaner,” “Footwear or Leather Care Product,” “Spot Remover,” or “Disinfectant,” or products labeled for application to both fabric and human skin.

(55)~~(53)~~“Fabric Softener-Single Use Dryer Product” means a laundry care product designed or labeled for single use in the clothes dryer to impart softness to, or control static cling of, a load of washable fabrics; and may impart a fragrance or scent. For the purpose of this definition only, “single use” means a product that is intended for one time use during a single drying cycle and is removed after completion of the drying cycle. A “load” is the amount of washable fabrics in a single drying cycle. “Fabric Softener-Single Use Dryer Product” includes treated nonwoven sheets which are typically packaged in boxes with a multiple number of sheets. “Fabric Softener-Single Use Dryer Product” does not include products applied to washable fabrics prior to placing the washable fabrics in the clothes dryer.

(56)~~(54)~~“Facial Cleaner or Soap” means a cleaner or soap designed primarily to clean the face. “Facial Cleaner or Soap” includes, but is not limited to, facial cleansing creams, semisolids, liquids, lotions, and substrate-impregnated forms. “Facial Cleaner or Soap” does not include prescription drug products, “Antimicrobial Hand or Body Cleaner or Soap,” “Astringent/Toner,” “General-use Hand or Body Cleaner or Soap,” “Medicated Astringent/Medicated Toner,” or “Rubbing Alcohol.”

(57)~~(55)~~“Fat Wood” means pieces of wood kindling with high naturally-occurring levels of sap or resin which enhance ignition of the kindling. “Fat wood” does not include any kindling with substances added to enhance flammability, such as wax-covered or wax-impregnated wood-based products.

(58)~~(56)~~“Flea and Tick Insecticide” means any insecticide product that is designed for use against fleas, ticks, their larvae, or their eggs. “Flea and Tick Insecticide” does not include products that are designed to be used exclusively on humans or animals and their bedding.

(59)~~(57)~~“Floor Coating” means an opaque coating that is labeled and designed for application to flooring, including but not limited to, decks, porches, steps, and

other horizontal surfaces which may be subject to foot traffic.

(60)~~(58)~~"Floor Maintenance Product" means any product designed or labeled to restore, maintain, or enhance a previously applied floor finish. "Floor Maintenance Product" includes, but is not limited to, products that are labeled as Spray Buff products or Floor Maintainers or Restorers. "Floor Maintenance Product" does not include floor polish products, products designed solely for the purpose of cleaning, products designed or labeled exclusively for use on marble floors, or coatings subject to architectural coatings regulations.

(61)~~(59)~~"Floor Polish or Wax" means a product designed or labeled to polish, wax, condition, protect, temporarily seal, or otherwise enhance floor surfaces by leaving a protective finish that is designed or labeled to be periodically replenished. "Floor Polish or Wax" does not include "Floor Maintenance Products," "Floor Wax Stripper," or coatings subject to architectural coatings regulations.

"Floor Polish or Wax" is divided into three subcategories: products for resilient flooring materials, products for nonresilient flooring materials and wood floor wax. For the purposes of this article:

(A) "Resilient Flooring Material" means flexible flooring material including but is not limited to, asphalt, cork, linoleum, no-wax, rubber, seamless vinyl, and vinyl composite flooring.

(B) "Nonresilient Flooring Material" means flooring of a mineral content which is not flexible. "Nonresilient Flooring material" includes but is not limited to terrazzo, marble, slate, granite, brick, stone, ceramic tile, and concrete.

(C) "Wood Floor Wax" means any wax-based product~~s~~ designed or labeled for use solely on wood floors. "Wood Floor Wax" does not include products that make the claim to "clean and wax" or "clean and polish."

(62)~~(60)~~"Floor Seam Sealer" means any product designed and labeled exclusively for bonding, fusing, or sealing (coating) seams between adjoining rolls of installed flexible sheet flooring.

(63)~~(61)~~"Floor Wax Stripper" means a product designed to remove natural or synthetic floor polishes or waxes through breakdown of the polish or wax polymers, or by dissolving or emulsifying the polish or wax. "Floor Wax Stripper" does not include aerosol floor wax strippers or products designed to remove floor wax solely through abrasion.

(64)~~(62)~~"Flying Bug Insecticide" means any insecticide product that is designed for use against flying insects or other flying arthropods, including but not limited to flies, mosquitoes, moths, or gnats. "Flying Bug Insecticide" does not include "wasp

and hornet insecticide," products that are designed to be used exclusively on humans or animals, or any moth-proofing product. For the purposes of this definition only, "moth-proofing product" means a product whose label, packaging, or accompanying literature indicates that the product is designed to protect fabrics from damage by moths, but does not indicate that the product is suitable for use against flying insects or other flying arthropods.

(65)~~(63)~~"Footwear or Leather Care Product" means any product designed or labeled to be applied to footwear or to other leather articles/components, to maintain, enhance, clean, protect, or modify the appearance, durability, fit, or flexibility of the footwear or leather article/component. Footwear includes both leather and non-leather foot apparel. "Footwear or Leather Care Product" does not include "Fabric Protectant," "General Purpose Adhesive," "Contact Adhesive," "Vinyl/Fabric/Leather/Polycarbonate Coating," as defined in section 94521(a), "Rubber/Vinyl Protectant," "Fabric Refresher," products solely for deodorizing, or sealant products with adhesive properties used to create external protective layers greater than 2 millimeters thick.

(66)~~(64)~~"Fragrance" means a substance or complex mixture of aroma chemicals, natural essential oils, and other functional components with a combined vapor pressure not in excess of 2 mm of Hg at 20^{o}C, the sole purpose of which is to impart an odor or scent, or to counteract a malodor.

(67)~~(65)~~"Furniture Maintenance Product" means a wax, polish, conditioner, or any other product labeled for the purpose of polishing, protecting or enhancing finished wood surfaces other than floors, and other furniture surfaces including but not limited to acrylics, ceramic, plastics, stone surfaces, metal surfaces, and fiberglass. "Furniture Maintenance Product" does not include "Dusting Aid~~s~~," "Wood Cleaner~~s~~," and products designed solely for the purpose of cleaning, or products designed to leave a permanent finish such as stains, sanding sealers and lacquers.

(68)~~(66)~~"Furniture Coating" means any paint designed for application to room furnishings including, but not limited to, cabinets (kitchen, bath and vanity), tables, chairs, beds, and sofas.

(69)~~(67)~~"Gel" means a colloid in which the disperse phase has combined with the continuous phase to produce a semisolid material, such as jelly.

(70)~~(68)~~"General Purpose Adhesive" means any non-aerosol adhesive designed for use on a variety of substrates. "General Purpose Adhesive" does not include (A) contact adhesives, (B) construction, panel, and floor covering adhesives, (C) adhesives designed exclusively for application on one specific category of substrates (i.e., substrates that are composed of similar materials, such as different types of metals, paper products, ceramics, plastics, rubbers, or vinyls), or (D) adhesives designed exclusively for use on one specific category of articles

(i.e., articles that may be composed of different materials but perform a specific function, such as gaskets, automotive trim, weather-stripping, or carpets).

(71)~~(69)~~"General Purpose Cleaner" means a general purpose cleaning product labeled for use on a variety of hard surfaces, including small appliances. "General Purpose Cleaner" includes, but is not limited to, products designed or labeled for general floor cleaning, kitchen, countertop, or sink cleaning, and cleaners designed or labeled to be used on a variety of hard surfaces such as stovetops, cooktops, or microwaves.

(72)~~(70)~~"General Purpose Degreaser" means any product labeled to remove or dissolve grease, grime, oil and other oil-based contaminants from a variety of substrates, including automotive or miscellaneous metallic parts. "General Purpose Degreaser" does not include "Engine Degreaser," "General Purpose Cleaner," "Adhesive Remover," "Electronic Cleaner," "Electrical Cleaner," "Energized Electrical Cleaner," "Metal Polish/Cleanser," products used exclusively in "solvent cleaning tanks or related equipment," or products that are (A) sold exclusively to establishments which manufacture or construct goods or commodities; and (B) labeled "not for retail sale." "Solvent cleaning tanks or related equipment" includes, but is not limited to, cold cleaners, vapor degreasers, conveyorized degreasers, film cleaning machines, or products designed to clean miscellaneous metallic parts by immersion in a container.

(73)~~(71)~~"General-use Hand or Body Cleaner or Soap" means a cleaner or soap designed to be used routinely on the skin to clean or remove typical or common dirt and soils. "General-use Hand or Body Cleaner or Soap" includes, but is not limited to, hand or body washes, dual-purpose shampoo-body cleaners, shower or bath gels, and moisturizing cleaners or soaps. "General-use Hand or Body Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "Facial Cleaner or Soap," "Hand Dishwashing Detergent" (including antimicrobial), "Heavy-duty Hand Cleaner or Soap," "Medicated Astringent/Medicated Toner," or "Rubbing Alcohol."

(74)~~(72)~~"Glass Cleaner" means a cleaning product designed or labeled primarily for cleaning surfaces made of glass. "Glass Cleaner" does not include products designed or labeled solely for the purpose of cleaning optical materials used in eyeglasses, photographic equipment, scientific equipment and photocopying machines.

(75)~~(73)~~ "Global Warming Potential (GWP)" means the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of carbon dioxide over a given period of time.

(76)~~(74)~~"Global Warming Potential Value" or "GWP Value" means the global warming potential value of a chemical or compound as specified in the IPCC: 1995 Second Assessment Report (SAR), Table 2.14, in Climate Change 2007: The

Physical Sciences Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, which is incorporated by reference herein.

If Table 2.14 does not contain a SAR 100-year GWP Value for a specific chemical or compound, then the 100-year GWP Value in Table 2.14 for that chemical or compound shall be used. If there is no 100-year GWP Value for a chemical or compound listed in Table 2.14 or GWP Value listed in Table 2.15, then the GWP Value is assumed to be equal to the GWP limit of the applicable product category.

(77)~~(75)~~"Graffiti Remover" means a product labeled to remove spray paint, ink, marker, crayon, lipstick, nail polish, or shoe polish, from a variety of non-cloth or non-fabric substrates. "Graffiti Remover" does not include "Paint Remover or Stripper," "Nail Polish Remover," or "Spot Remover." Products labeled for dual use as both a paint stripper and graffiti remover are considered "Graffiti Removers."

(78)~~(76)~~"Hair Mousse" means a hairstyling foam designed to facilitate styling of a coiffure and provide limited holding power.

(79)~~(77)~~"Hair Shine" means any product designed for the primary purpose of creating a shine when applied to the hair. "Hair Shine" includes, but is not limited to, dual-use products designed primarily to impart a sheen to the hair. "Hair Shine" does not include "Hair Spray," "Hair Mousse," "Hair Styling Product," "Hair Styling Gel," or products whose primary purpose is to condition or hold the hair.

(80)~~(78)~~"Hair Styling Gel" means a consumer product manufactured before December 31, 2006, that is a high viscosity, often gelatinous, product that contains a resin and is designed for the application to hair to aid in styling and sculpting of the hair coiffure.

(81)~~(79)~~"Hair Spray" means:

(A) for products manufactured before December 31, 2006: a consumer product designed primarily for the purpose of dispensing droplets of a resin on and into a hair coiffure which will impart sufficient rigidity to the coiffure to establish or retain the style for a period of time, and

(B) for products manufactured on or after December 31, 2006: a consumer product that is applied to styled hair, and is designed or labeled to provide sufficient rigidity, to hold, retain and/or (finish) the style of the hair for a period of time. "Hair Spray" includes aerosol hair sprays, pump hair sprays, spray waxes; color, glitter, or sparkle hairsprays that make finishing claims; and products that are both a styling and finishing product. "Hair Spray" does not include spray products that are intended to aid in styling but do~~es~~ not

provide finishing of a hairstyle.

For the purposes of this subchapter, “finish” or “finishing” means the maintaining and/or holding of previously styled hair for a period of time.

For the purposes of this subchapter, “styling” means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

(82)~~(80)~~”Hair Styling Product” means a consumer product manufactured on or after December 31, 2006, that is designed or labeled for the application to wet, damp or dry hair to aid in defining, shaping, lifting, styling and/or sculpting of the hair. “Hair Styling Product” includes, but is not limited to hair balm, clay, cream, creme, curl straightener, gel, liquid, lotion, paste, pomade, putty, root lifter, serum, spray gel, stick, temporary hair straightener, wax, spray products that aid in styling but do not provide finishing of a hairstyle, and leave-in volumizers, detanglers and/or conditioners that make styling claims. “Hair Styling Product” does not include “Hair Mousse,” “Hair Shine,” “Hair Spray,” or shampoos and/or conditioners that are rinsed from the hair prior to styling.

For the purposes of this subchapter, “finish” or “finishing” means the maintaining and/or holding of previously styled hair for a period of time.
For the purposes of this subchapter, “styling” means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

(83)~~(81)~~“Heavy-Duty Hand Cleaner or Soap” means a product designed to clean or remove difficult dirt and soils such as oil, grease, grime, tar, shellac, putty, printer’s ink, paint, graphite, cement, carbon, asphalt, or adhesives from the hand with or without the use of water. “Heavy-duty Hand Cleaner or Soap” does not include prescription drug products, “Antimicrobial Hand or Body Cleaner or Soap,” “Astringent/Toner,” “Facial Cleaner or Soap,” “General-use Hand or Body Cleaner or Soap,” “Medicated Astringent/Medicated Toner” or “Rubbing Alcohol.”

(84)~~(82)~~“Herbicide” means a pesticide product designed to kill or retard a plant’s growth, but excludes products that are: (A) for agricultural use, or
(B) restricted materials that require a permit for use and possession.

(85) “High-Temperature Coating” means a high performance coating labeled and formulated for application to substrates exposed continuously or intermittently to temperatures above 204^{o}C (400^{o}F).

(86)~~(83)~~“Household Product” means any consumer product that is primarily designed to be used inside or outside of living quarters or residences that are occupied or intended for occupation by individuals, including the immediate surroundings.

(87) “Industrial Maintenance Coating” means a high performance architectural coating, including primers, sealers, undercoaters, intermediate coats, and

topcoats formulated for application to substrates, including floors, exposed to one or more of the following extreme environmental conditions listed below and labeled “For industrial use only” or “For professional use only.”

(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, or chemical mixtures or solutions; or

(C) Frequent exposure to temperatures above 121^{o}C (250^{o}F); or

(D) Frequent heavy abrasion, including mechanical wear and frequent scrubbing with industrial solvents, cleansers, or scouring agents; or

(E) Exterior exposure of metal structures and structural components.

(88)~~(84)~~“Insect Repellent” means a pesticide product that is designed to be applied on human skin, hair or attire worn on humans in order to prevent contact with or repel biting insects or arthropods.

(89)~~(85)~~“Insecticide” means a pesticide product that is designed for use against insects or other arthropods, but excluding products that are: (A) for agricultural use, or (B) for a use which requires a structural pest control license under Chapter 14 (commencing with Section 8500) of the Business and Professions Code, or (C) restricted materials that require a permit for use and possession.

(90)~~(86)~~“Insecticide Fogger” means any insecticide product designed to release all or most of its content, as a fog or mist, into indoor areas during a single application.

(91)~~(87)~~“Institutional Product” or “Industrial and Institutional (I&I) Product” means a consumer product that is designed for use in the maintenance or operation of an establishment that: (A) manufactures, transports, or sells goods or commodities, or provides services for profit; or (B) is engaged in the nonprofit promotion of a particular public, educational, or charitable cause. “Establishments” include, but are not limited to, government agencies, factories, schools, hospitals, sanitariums, prisons, restaurants, hotels, stores, automobile service and parts centers, health clubs, theaters, or transportation companies. “Institutional Product” does not include household products and products that are incorporated into or used exclusively in the manufacture or construction of the goods or commodities at the site of the establishment.

(92)~~(88)~~“Label” means any written, printed, or graphic matter affixed to, applied to, attached to, blown into, formed, molded into, embossed on, or appearing upon any consumer product or consumer product package, for purposes of branding,

identifying, or giving information with respect to the product or to the contents of the package.

(93)~~(89)~~"Laundry Prewash" means a product that is designed for application to a fabric prior to laundering and that supplements and contributes to the effectiveness of laundry detergents and/or provides specialized performance.

(94)~~(90)~~"Laundry Starch/Sizing/Fabric Finish Product" means a product that is labeled for application to a fabric, either during or after laundering, to impart and prolong a crisp, fresh look and may also act to help ease ironing of the fabric. "Laundry Starch/Sizing/Fabric Finish Product" includes, but is not limited to, starch, sizing, and fabric finish.

(95)~~(91)~~"Lawn and Garden Insecticide" means an insecticide product labeled primarily to be used in household lawn and garden areas to protect plants from insects or other arthropods. Notwithstanding the requirements of section 94512(a) aerosol "Lawn and Garden Insecticide" may claim to kill insects or other arthropods.

(96)~~(92)~~"Liquid" means a substance or mixture of substances which is capable of a visually detectable flow as determined under ASTM D-4359-90 (May 25, 1990) Standard Test Method for Determining Whether a Material Is a Liquid or a Solid, which is incorporated by reference herein. "Liquid" does not include powders or other materials that are composed entirely of solid particles.

(97)~~(93)~~"Lubricant" means a product that reduces friction, heat, noise, or wear between moving parts, or loosens rusted or immovable parts or mechanisms. "Lubricant" does not include automotive power steering fluids; products for use inside power generating motors, engines, and turbines, and their associated power-transfer gearboxes; two cycle oils or other products designed to be added to fuels; products for use on the human body or animals or products that are (1) sold exclusively to establishments which manufacture or construct goods or commodities, and (2) labeled "not for retail sale."

(98)~~(94)~~"LVP-VOC" means a chemical "compound" or "mixture" that contains at least one carbon atom and meets one of the following:

(A) has a vapor pressure less than 0.1 mm Hg at 20^{o}C, as determined by ARB Method 310; or

(B) is a chemical "compound" with more than 12 carbon atoms, or a chemical "mixture" comprised solely of "compounds" with more than 12 carbon atoms, as verified by formulation data, and the vapor pressure and boiling point are unknown; or

(C) is a chemical "compound" with a boiling point greater than 216^{o}C, as determined by ARB Method 310; or

(D) is the weight percent of a chemical "mixture" that boils above 216^{o}C, as determined by ARB Method 310.

For the purposes of the definition of LVP-VOC, chemical "compound" means a molecule of definite chemical formula and isomeric structure, and chemical "mixture" means a substance comprised of two or more chemical "compounds."

(99)~~(95)~~"Manufacturer" means any person who imports, manufactures, assembles, produces, packages, repackages, or relabels a consumer product.

(100)~~(96)~~"Medicated Astringent/Medicated Toner" means any product regulated as a drug by the Food and Drug Administration (FDA) which is applied to the skin for the purpose of cleaning or tightening pores. "Medicated Astringent/Medicated Toner" includes, but is not limited to, clarifiers and substrate-impregnated products. "Medicated Astringent/Medicated Toner" does not include hand, face, or body cleaner or soap products, "Personal Fragrance Product," "Astringent/Toner," cold cream, lotion, antiperspirants, or products that must be purchased with a doctor's prescription.

(101)~~(97)~~"Metal Polish/Cleanser" means any product designed primarily to improve the appearance of finished metal, metallic, or metallized surfaces by physical or chemical action. To "improve the appearance" means to remove or reduce stains, impurities, or oxidation from surfaces or to make surfaces smooth and shiny. "Metal Polish/Cleanser" includes, but is not limited to, metal polishes used on brass, silver, chrome, copper, stainless steel and other ornamental metals. "Metal Polish/Cleanser" does not include "Automotive Wax, Polish, Sealant or Glaze," Tire or Wheel Cleaner," "Paint Remover or Stripper," products designed and labeled exclusively for automotive and marine detailing, or products designed for use in degreasing tanks.

(102)~~(98)~~ "Mist Spray Adhesive" means any aerosol adhesive which is not a "Special Purpose Spray Adhesive" and which delivers a particle or mist spray, resulting in the formation of fine, discrete particles that yield a generally uniform and smooth application of adhesive to the substrate.

(103)~~(99)~~ "Motor Vehicle Wash" means a product designed or labeled to wash, wash and wax, wash and shine, or wash and/or clean the exterior surface of motor vehicles. "Motor Vehicle Wash" includes, but is not limited to, products for use in commercial, fleet, hand, and "drive through" car washes; commercial truck washing or large vehicle washing stations; vehicle dealers and repair shops as well as products intended for household consumer use. "Motor Vehicle Wash" does not include "Bug and Tar Remover," "Glass Cleaner," "Tire or Wheel Cleaner," and products labeled for use exclusively on locomotives or aircraft.

(104)~~(100)~~"Multi-purpose Dry Lubricant" means any lubricant which is: (A) designed or labeled to provide lubricity solely by depositing a thin film of graphite, molybdenum disulfide ("moly"), or polytetrafluoroethylene or closely related fluoropolymer ("teflon") on surfaces, and (B) designed or labeled for general purpose lubrication, or for use in a wide variety of applications.

(105)~~(101)~~"Multi-purpose Lubricant" means any lubricant designed or labeled for general purpose lubrication, or a lubricant labeled for use in a wide variety of applications. "Multi-purpose Lubricant" does not include "Multi-purpose Dry Lubricant," "Penetrant," or "Silicone-based Multi-Purpose Lubricant."

(106)~~(102)~~"Multi-purpose Solvent" means:

(A) for products manufactured before January 1, 2008: any organic liquid designed to be used for a variety of purposes, including cleaning or degreasing of a variety of substrates, or thinning, dispersing or dissolving other organic materials. "Multi-purpose Solvent" includes solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories. "Multi-purpose Solvent" does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines, or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment.

(B) for products manufactured on or after January 1, 2008: any liquid product designed or labeled to be used for dispersing, ~~or~~ dissolving, or removing contaminants or other organic materials. "Multi-purpose Solvent" also includes: ~~(A)~~(1) products that do not display specific use instructions on the product container or packaging, ~~(B)~~(2) products that do not specify an end-use function or application on the product container or packaging, ~~and (C)~~(3) solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories~~.~~, (4) "Paint Clean-up" products, and (5) products labeled to prepare surfaces for painting. "Multi-purpose Solvent" does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines, solvents labeled exclusively for the clean-up of application equipment used for polyaspartic and polyurea coatings, or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment. "Multi-purpose Solvent" also does not include any product making any representation that the product may be used as, or is suitable for use as a consumer product which qualifies under another definition in section 94508; such products are not Multi-purpose Solvents and are subject to the "Most Restrictive Limit" provision of section 94512.

(107)~~(103)~~"Nail Polish" means any clear or colored coating designed for application to the fingernails or toenails and including but not limited to, lacquers, enamels, acrylics, base coats and top coats.

(108)~~(104)~~"Nail Polish Remover" means a product designed to remove nail polish and coatings from fingernails or toenails.

(109)~~(105)~~"Non-Carbon Containing Compound" means any compound which does not contain any carbon atoms.

(110)~~(106)~~"Non-Selective Terrestrial Herbicide" means a terrestrial herbicide product that is toxic to plants without regard to species.

(111)~~(107)~~ "Odor Remover/Eliminator" means a product that is designed or labeled to be applied exclusively to hard surfaces to inhibit the ability of soils to create malodors, or functions to entrap, encapsulate, neutralize, convert or eliminate malodor molecules. "Odor Remover/Eliminator" does not include products designed or labeled for use in cleaning soils from hard surfaces, laundering, softening, de-wrinkling or cleaning fabrics, or dishwashing, or products that are defined as "Air Freshener," "Bathroom and Tile Cleaner," "Carpet/Upholstery Cleaner," "Fabric Refresher," "General Purpose Cleaner," "Toilet/Urinal Care Product," "Disinfectant," or "Sanitizer."

(112)~~(108)~~"Oven Cleaner" means any cleaning product designed or labeled to clean and to remove dried or baked on food deposits from oven walls.

(113)~~(109)~~"Paint" means any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate in a thin layer which is converted to an opaque solid film after application and is used for protection, decoration or identification, or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics.

(114) "Paint Clean-up" means any liquid product labeled for cleaning oil-based or water-based paint, lacquer, varnish, or related coatings from, but not limited to, painting equipment or tools, plastics, or metals.

(115)~~(110)~~"Paint Remover or Stripper" means any product designed to strip or remove paints or other related coatings, by chemical action, from a substrate without markedly affecting the substrate. "Paint Remover or Stripper" does not include "Multi-purpose Solvent," paint brush cleaners, products designed and labeled exclusively as "Graffiti Remover," and hand cleaner products that claim to remove paints and other related coatings from skin.

(116)~~(111)~~"Paint Thinner" means any liquid product used for reducing the viscosity of coating compositions or components, that prominently displays the term "Paint

Thinner," "Lacquer Thinner," "Thinner," or "Reducer" on the front panel of its packaging. "Paint Thinner" does not include thinners labeled for the thinning of Industrial Maintenance Coatings, Zinc-Rich Primers, and High Temperature Coatings. "Paint Thinner" also does not include products labeled and used exclusively as a component in a specific coating. "Paint Thinner" also does not include "Artist's Solvent/Thinner."

(117)~~(112)~~"Penetrant" means a lubricant designed or labeled primarily to loosen metal parts that have bonded together due to rusting, oxidation, or other causes. "Penetrant" does not include "Multi-purpose Lubricant" that claim to have penetrating qualities, but are not labeled primarily to loosen bonded parts.

(118)~~(113)~~"Person" shall have the same meaning as defined in Health and Safety Code Section 39047.

(119)~~(114)~~ "Personal Fragrance Product" means any product which is applied to the human body or clothing for the primary purpose of adding a scent or masking a malodor, including, but not limited to, cologne, perfume, aftershave, toilet water, lotion, powder, body mist, and body spray. "Personal Fragrance Product" does not include: (A) Deodorant, as defined in section 94501(d); (B) medicated products designed primarily to alleviate fungal or bacterial growth on feet or other areas of the body; (C) mouthwashes, breath fresheners and deodorizers; (D) lotions, moisturizers, powders or other skin care products designed or labeled to be used primarily to alleviate skin conditions such as dryness and irritations; (E) products designed exclusively to be applied to human genitalia areas, undergarments, and any paper products, napkins or other products that are affixed to undergarments, such as sanitary pads; (F) soaps, shampoos, and products primarily used to clean the human body; and (G) fragrance products designed to be used exclusively on non-human animals.

(120)~~(115)~~"Pesticide" means and includes any substance or mixture of substances labeled, designed, or intended for use in preventing, destroying, repelling or mitigating any pest, or any substance or mixture of substances labeled, designed, or intended for use as a defoliant, desiccant, or plant regulator, provided that the term "pesticide" will not include any substance, mixture of substances, or device which the United States Environmental Protection Agency does not consider to be a pesticide.

(121)~~(116)~~"Pressurized Gas Duster" means a pressurized product labeled to remove dust from a surface solely by means of mass air or gas flow, including surfaces such as photographs, photographic film negatives, computer keyboards, and other types of surfaces that cannot be cleaned with solvents. "Pressurized Gas Duster" does not include "Dusting Aid," "General Purpose Cleaner," "Electrical Cleaner," "Electronic Cleaner," "Energized Electrical Cleaner," or "Anti-Static Product." Pressurized Gas Duster does not include products labeled exclusively to remove dust from equipment where dust removal is accomplished when: electric current exists; residual electrical potential from a component such as a

capacitor exists; or an open flame exists, as long as the “Principal Display Panel” clearly displays the statement: “Energized Equipment use only.”

(122)~~(117)~~“Principal Display Panel or Panels” means that part, or those parts of a label that are so designed as to most likely be displayed, presented, shown or examined under normal and customary conditions of display or purchase. Whenever a principal display panel appears more than once, all requirements pertaining to the “principal display panel” shall pertain to all such “principal display panels.”

(123)~~(118)~~“Product Brand Name” means the name of the product exactly as it appears on the principal display panel of the product.

(124)~~(119)~~“Product Category” means the applicable category which best describes the product as listed in this Section 94508.

(125)~~(120)~~“Product Form,” for the purpose of complying with Section 94513 only, means the applicable form which most accurately describes the product's dispensing form as follows:

A = Aerosol Product
S = Solid
P = Pump Spray
L = Liquid
SS = Semisolid
O = Other

(126)~~(121)~~ “Propellant” means a liquefied or compressed gas that is used in whole or in part, such as a cosolvent, to expel a liquid or any other material from the same self-pressurized container or from a separate container.

(127)~~(122)~~ “Pump Spray” means a packaging system in which the product ingredients within the container are not under pressure and in which the product is expelled only while a pumping action is applied to a button, trigger or other actuator.

(128)~~(123)~~ “Responsible Party” means the company, firm or establishment which is listed on the product's label. If the label lists two companies, firms or establishments, the responsible party is the party which the product was “manufactured for” or “distributed by,” as noted on the label.

(129)~~(124)~~”Restricted Materials” means pesticides established as restricted materials under Title 3, California Code of Regulations, section 6400.

(130)~~(125)~~”Retailer” means any person who sells, supplies, or offers consumer products for sale directly to consumers.

(131)~~(126)~~"Retail Outlet" means any establishment at which consumer products are sold, supplied, or offered for sale directly to consumers.

(132)~~(127)~~"Rubber/Vinyl Protectant" means:

(A) for products manufactured before December 31, 2008: any product designed to protect, preserve or renew vinyl, rubber, and plastic on vehicles, tires, luggage, furniture, and household products such as vinyl covers, clothing, and accessories. "Rubber/Vinyl Protectant" does not include products primarily designed to clean the wheel rim, such as aluminum or magnesium wheel cleaners, and tire cleaners that do not leave an appearance-enhancing or protective substance on the tire.

(B) for products manufactured on or after December 31, 2008: any product labeled to protect, preserve or renew vinyl, or rubber on vehicles, tires, luggage, furniture, and/or household products such as vinyl covers, clothing, or accessories. "Rubber/Vinyl Protectant" does not include: products labeled to clean the wheel rim, such as aluminum or magnesium wheel cleaners; tire cleaners that do not leave an appearance-enhancing or protective substance on the tire; pigmented products designed or labeled to be used primarily for coloring; products used for construction, reconstruction, modification, structural maintenance or repair of rubber or vinyl substrates; or products, other than those labeled to be used on vehicle tires, qualifying as either "Clear Coating" or "Vinyl/Fabric/Leather/Polycarbonate Coating" under section 94521(a).

(133)~~(128)~~"Rubbing Alcohol" means any product containing isopropyl alcohol (also called isopropanol) or denatured ethanol and labeled for topical use, usually to decrease germs in minor cuts and scrapes, to relieve minor muscle aches, as a rubefacient, and for massage.

(134)~~(129)~~"Sanitizer" means a product that is labeled as a "sanitizer," or is labeled to reduce, but not necessarily eliminate, microorganisms in the air, on surfaces, or on inanimate objects, and whose label is registered as a "sanitizer" under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA; 7 U.S.C. section 136 et seq.). Products that are labeled as both a "sanitizer" and a "disinfectant" are considered disinfectants. "Sanitizer" does not include (A) "Disinfectant," (B) products labeled solely for use on humans or animals, (C) products labeled solely for agricultural use, (D) products labeled solely for use in swimming pools, therapeutic tubs, or hot tubs, (E) products which are labeled to be used on heat sensitive critical or semi-critical medical devices or medical equipment surfaces, (F) products which are pre-moistened wipes or towelettes sold exclusively to medical, convalescent or veterinary establishments (G) products which are labeled to be applied to food-contact surfaces and are not required to be rinsed prior to contact with food, or (H) products which are labeled as "Bathroom and Tile Cleaner," "Glass Cleaner," "General Purpose Cleaner," "Toilet/Urinal Care

Product," "Metal Polish," "Carpet Cleaner," or "Fabric Refresher" that may also make sanitizing or anti-microbial claims on the label.

(135)~~(130)~~"Sealant or Caulking Compound" means any product with adhesive properties that is designed to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces. "Sealant or Caulking Compound" does not include roof cements and roof sealants; insulating foams; removable caulking compounds; clear/paintable/water resistant caulking compounds; floor seam sealers; products designed exclusively for automotive uses; or sealers that are applied as continuous coatings. "Sealant or Caulking Compound" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. For the purposes of this definition only:

"Removable caulking compounds" means a compound which temporarily seals windows or doors for three to six month time intervals.

"Clear/paintable/water resistant caulking compounds" means a compound which contains no appreciable level of opaque fillers or pigments; transmits most or all visible light through the caulk when cured; is paintable; and is immediately resistant to precipitation upon application.

"Sealant or Caulking Compound" is divided into two subcategories:

(A) "Chemically Curing Sealant or Caulking Compound" means any "Sealant or Caulking Compound" which achieves its final composition and physical form through a chemical curing process, where product ingredients participate in a chemical reaction in the presence of a catalyst that causes a change in chemical structure and leads to the release of chemical byproducts. "Chemically Curing Sealant or Caulking Compound" includes, but is not limited to, products that utilize silicone, polyurethane, silyl-terminated polyether, or silyl-terminated polyurethane reactive chemistries. "Chemically Curing Sealant or Caulking Compound" does not include products which are not solely dependent on a chemically curing process to achieve the cured state.

(B) "Non-Chemically Curing Sealant or Caulking Compound" means any "Sealant or Caulking Compound" not defined under "Chemically Curing Sealant or Caulking Compound."

(136)~~(131)~~"Semisolid" means a product that, at room temperature, will not pour, but will spread or deform easily, including but not limited to gels, pastes, and greases.

(137)~~(132)~~"Shaving Cream" means an aerosol product which dispenses a foam lather intended to be used with a blade or cartridge razor, or other wet-shaving system, in the removal of facial or other bodily hair. "Shaving Cream" does not include "Shaving Gel."

(138)~~(133)~~ “Shaving Gel” means an aerosol product which dispenses a post-foaming semi-solid designed to be used with a blade, cartridge razor, or other shaving system in the removal of facial or other bodily hair. “Shaving Gel” does not include “Shaving Cream.”

(139)~~(134)~~”Silicone-based Multi-purpose Lubricant” means any lubricant which is:

(A) designed and labeled to provide lubricity primarily through the use of silicone compounds including, but not limited to, polydimethylsiloxane, and

(B) designed and labeled for general purpose lubrication, or for use in a wide variety of applications. “Silicone-based Multi-purpose Lubricant” does not include products designed and labeled exclusively to release manufactured products from molds.

(140)~~(135)~~“Single Phase Aerosol Air Freshener” means an aerosol air freshener with the liquid contents in a single homogeneous phase and which does not require that the product container be shaken before use.

(141)~~(136)~~“Solid” means a substance or mixture of substances which, either whole or subdivided (such as the particles comprising a powder), is not capable of visually detectable flow as determined under ASTM D-4359-90 (May 25, 1990) Standard Test Method for Determining Whether a Material Is a Liquid or a Solid, which is incorporated by reference herein.

(142)~~(137)~~“Special Purpose Spray Adhesive” means an aerosol adhesive that meets any of the following definitions:

(A) “Mounting Adhesive” means an aerosol adhesive designed to permanently mount photographs, artwork, and any other drawn or printed media to a backing (paper, board, cloth, etc.) without causing discoloration to the artwork.

(B) “Flexible Vinyl Adhesive” means an aerosol adhesive designed to bond flexible vinyl to substrates. Flexible vinyl means a nonrigid polyvinyl chloride plastic with at least five percent, by weight, of plasticizer content. A plasticizer is a material, such as a high boiling point organic solvent, that is incorporated into a vinyl to increase its flexibility, workability, or distensibility, and may be determined using ASTM Method E260-91 (Jan. 25, 1991) Standard Practice for Packed Column Gas Chromatography, which is incorporated by reference herein, or from product formulation data.

(C) “Polystyrene Foam Adhesive” means an aerosol adhesive designed to bond polystyrene foam (e.g. Styrofoam®, expanded polystyrene foam, etc.) to substrates.

(D) "Automobile Headliner Adhesive" means an aerosol adhesive designed to bond together layers in motor vehicle headliners.

(E) "Polyolefin Adhesive" means an aerosol adhesive designed to bond polyolefins (e.g. polyethylene, polypropylene, etc.) to substrates.

(F) "Laminate Repair/Edgebanding Adhesive" means an aerosol adhesive designed for:

(1) the touch-up or repair of items laminated with high pressure laminates (e.g. lifted edges, delaminations, etc.), or for
(2) the touch-up, repair, or attachment of edgebanding materials, including, but not limited to, other laminates, synthetic marble, veneers, wood moulding, and decorative metals.

For the purposes of this definition "high pressure laminate" means sheet materials which consist of paper, fabric, or other core material that have been laminated at temperatures exceeding 265 degrees F, and at pressures between 1,000 and 1,400 psi.

(G) "Automotive Engine Compartment Adhesive" means an aerosol adhesive designed for use in motor vehicle under-the-hood applications which require oil and plasticizer resistance, as well as high shear strength, at temperatures of 200-275^{o} F.

(143)~~(138)~~ "Spot Remover" means any product labeled to clean localized areas, or remove localized spots or stains on cloth or fabric such as drapes, carpets, upholstery, or clothing, that does not require subsequent laundering to achieve stain removal. "Spot Remover" does not include "Dry Cleaning Fluid," "Laundry Prewash," or aerosol products labeled solely for gum removal.

(144)~~(139)~~"Spray Buff Product" means a product designed to restore a worn floor finish in conjunction with a floor buffing machine and special pad.

(145)~~(140)~~"Table B Compound" means any carbon-containing compound listed as an exception to the definition of VOC in Section 94508.

(146)~~(141)~~"Temporary Hair Color" means any product that applies color, glitter, or UV-active pigments to hair, wigs, or fur and is removable when washed. "Temporary Hair Color" includes hair color mousses and products labeled to add texture or thickness to cover thinning/balding areas. "Temporary Hair Color" does not include "Hair Spray," "Hair Styling Product," or "Hair Mousse."

(147)~~(142)~~"Terrestrial" means to live on or grow from land.

(148)~~(143)~~"Tire or Wheel Cleaner" means a product designed or labeled exclusively to clean either tires, wheels, or both. "Tire or Wheel Cleaner" includes, but is not limited to, products for use in commercial, fleet, hand, and "drive-through" car washes; commercial truck washing or large vehicle washing stations; vehicle dealers and repair shops, as well as household consumer products. "Tire or Wheel Cleaner" does not include products labeled for use exclusively on locomotives or aircraft.

(149)~~(144)~~"Tire Sealant and Inflator" means any pressurized product that is designed to temporarily inflate and seal a leaking tire.

(150)~~(145)~~"Toilet/Urinal Care Product" means any product designed or labeled to cleanand/or to deodorize toilet bowls, toilet tanks, or urinals. Toilet bowls, toilet tanks, or urinals includes, but is not limited to, toilets or urinals connected to permanent plumbing in buildings and other structures, portable toilets or urinals placed at temporary or remote locations, and toilet or urinals in vehicles such as buses, recreational motor homes, boats, ships, and aircraft. "Toilet/Urinal Care Product" does not include "Bathroom and Tile Cleaner" or "General Purpose Cleaner."

(151)~~(146)~~"Type A Propellent" means a compressed gas such as CO_2, N_2, N_2O, or compressed air which is used as a propellent, and is either incorporated with the product or contained in a separate chamber within the product's packaging.

(152)~~(147)~~"Type B Propellent" means any halocarbon which is used as a propellent including chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs).

(153)~~(148)~~ "Type C Propellent" means any propellent which is not a Type A or Type B propellent, including propane, isobutane, n-butane, and dimethyl ether (also known as dimethyl oxide).

(154)~~(149)~~ "Undercoating" means any aerosol product designed to impart a protective, non-paint layer to the undercarriage, trunk interior, and/or firewall of motor vehicles to prevent the formation of rust or to deaden sound. "Undercoating" includes, but is not limited to, rubberized, mastic, or asphaltic products.

(155)~~(150)~~"Usage Directions" means the text or graphics on the product's principal display panel, label, or accompanying literature which describes to the end user how and in what quantity the product is to be used.

(156)~~(151)~~"Volatile Organic Compound (VOC)" means any compound containing at least one atom of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and excluding the following:

(A) methane,
methylene chloride (dichloromethane),
1,1,1-trichloroethane (methyl chloroform),
trichlorofluoromethane (CFC-11),
dichlorodifluoromethane (CFC-12),
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113),
1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114),
chloropentafluoroethane (CFC-115),
chlorodifluoromethane (HCFC-22),
1,1,1-trifluoro-2,2-dichloroethane (HCFC-123),
1,1-dichloro-1-fluoroethane (HCFC-141b),
1-chloro-1,1-difluoroethane (HCFC-142b),
2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124),
trifluoromethane (HFC-23),
1,1,2,2-tetrafluoroethane (HFC-134),
1,1,1,2-tetrafluoroethane (HFC-134a),
pentafluoroethane (HFC-125),
1,1,1-trifluoroethane (HFC-143a),
1,1-difluoroethane (HFC-152a),
ethoxy-nonafluorobutane (HFE 7200),
cyclic, branched, or linear completely methylated siloxanes,
the following classes of perfluorocarbons:

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

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

acetone,
ethane,
methyl acetate,
parachlorobenzotrifluoride (1-chloro-4-trifluoromethyl benzene),
perchloroethylene (tetrachloroethylene).

(157)~~(152)~~"VOC Content" means the total weight of VOC in a product expressed as a percentage of the product weight (exclusive of the container or packaging), as determined pursuant to sections 94515(a) and (b).

(158)~~(153)~~"Wasp and Hornet Insecticide" means any insecticide product that is designed for use against wasps, hornets, yellow jackets or bees by allowing the

user to spray from a distance a directed stream or burst at the intended insects, or their hiding place.

(159)~~(154)~~"Waterproofer" means a product designed and labeled exclusively to repel water from fabric or leather substrates. "Waterproofer" does not include "Fabric Protectant."

(160)~~(155)~~"Wax" means a material or synthetic thermoplastic substance generally of high molecular weight hydrocarbons or high molecular weight esters of fatty acids or alcohols, except glycerol and high polymers (plastics). "Wax" includes, but is not limited to, substances derived from the secretions of plants and animals such as carnuba wax and beeswax, substances of a mineral origin such as ozocerite and paraffin, and synthetic polymers such as polyethylene.

(161)~~(156)~~"Web Spray Adhesive" means any aerosol adhesive which is not a "Mist Spray Adhesive" or "Special Purpose Spray Adhesive."

(162)~~(157)~~ "Windshield Water Repellent" means a product designed or labeled exclusively to repel water from motor vehicle exterior automotive glass surfaces. "Windshield Water Repellent" does not include "Automotive Windshield Washer Fluid."

(163)~~(158)~~"Wood Cleaner" means a product labeled to clean wooden materials including but not limited to decking, fences, flooring, logs, cabinetry, and furniture. "Wood Cleaner" does not include "Dusting Aid," General Purpose Cleaner," "Furniture Maintenance Product," "Floor Wax Stripper," "Floor Polish or Wax," or products designed and labeled exclusively to preserve or color wood.

(164) "Zinc-Rich Primer" means a coating that meets all the following specifications: (A) coating contains at least 65 percent metallic zinc powder or zinc dust by weight of total solids; and (B) coating is formulated for application to metal substrates to provide a firm bond between the substrate and subsequent applications of coatings; and (C) coating is intended for professional use only and labeled "For Professional Use Only."

NOTE: Authority cited: Sections 38501, 38510, 38560, 38560.5, 38562, 38580, 39601, 39601, and 41712, Health and Safety Code. Reference: Sections 38501, 38510, 38560, 38560.5, 38562, 38580, 39002, 39600, 40000, and 41712, Health and Safety Code.

§ 94509. Standards for Consumer Products.

(a) Except as provided in Sections 94510 (Exemptions), 94511 (Innovative Products), 94514 (Variances), 94540 through 94555 (Alternative Control Plan), and 94567(a)(1) (Hairspray Credit Program), Title 17, California Code of Regulations, no person shall sell, supply, offer for sale, or manufacture for sale in California any consumer product which, at the time of sale or manufacture, contains volatile organic compounds in excess of the limits specified in the following Table of Standards after the specified effective dates.

Table of Standards
Percent Volatile Organic Compound by Weight

Product Category	Effective Date [1]	VOC Standard [2]
Adhesive *:		
Aerosol**	1/1/95	75
Mist Spray Adhesive**	1/1/2002	65
Web Spray Adhesive**	1/1/2002	55
Special Purpose Spray Adhesive**		
Mounting, Automotive Engine Compartment, and Flexible Vinyl Adhesive	1/1/2002	70
Polystyrene Foam and Automobile Headliner Adhesive	1/1/2002	65
Polyolefin and Laminate Repair/Edgebanding Adhesive	1/1/2002	60
[**See 94509(i), 94512(d), and 94513(d) for additional requirements that apply to aerosol adhesive.]		
Construction, Panel, and Floor Covering#	1/1/95 12/31/2002 12/31/2008	40 15 7
[#See section 94509(k) for the effective date of the VOC limit for certain types of “Construction, Panel, and Floor Covering Adhesive, and section 94509(p) for additional requirements that apply to Construction, Panel, and Floor Covering Adhesive.]		
Contact##	1/1/95	80
Contact Adhesive – General Purpose	12/31/2006	55
Contact Adhesive – Special Purpose	12/31/2006	80

[##See sections 94509(m) and 94512(d) for additional requirements that apply to Contact Adhesive.]		
General Purpose	1/1/95	10
*See section 94510(i) for an exemption that applies to adhesives sold in containers of one fluid ounce or less.		
Adhesive Remover*:		
Floor or Wall Covering Adhesive Remover	12/31/2006	5
Gasket or Thread Locking Adhesive Remover	12/31/2006	50
General Purpose Adhesive Remover	12/31/2006	20
Specialty Adhesive Remover	12/31/2006	70
[*See sections 94509(n) and 94512(d) for additional requirements that apply to Adhesive Remover.]		
Aerosol Cooking Spray	1/1/95	18
Air Freshener*:		
Double Phase Aerosol	1/1/93 12/31/2004 <u>12/31/2012</u>	30 25 <u>20</u>
<u>[*See section 94509(t) for additional requirements that apply to Double Phase Aerosol Air Freshener.]</u>		
Single Phase Aerosol	1/1/93 1/1/96	70 30
Dual Purpose Air Freshener/Disinfectant aerosol	1/1/94	60
liquid/pump spray	1/1/93	18
solid/semisolid	1/1/93	3
[*See sections 94510(f) and 94510(g)(2) for exemptions that apply to certain Air Fresheners, and 94509(o) for additional requirements that apply to Air Freshener.]		
Anti-static Product:		
aerosol	12/31/2008	80
non-aerosol	12/31/2006	11
Astringent/Toner (Non-FDA regulated)	12/31/2010	35
Automotive Rubbing or Polishing Compound	1/1/2005	17

Automotive Wax/Polish/Sealant/Glaze: all other forms	1/1/2005	15
hard paste wax	1/1/2005	45
instant detailer	1/1/2001	3
Automotive Windshield Washer Fluid: Type “A” areas*****	1/1/93 12/31/2008	3<u>5</u> 25
All other areas ~~(all forms)~~ ~~Dilutable and Pre-Mixed~~**	1/1/93 12/31/2002	10 1
See section 94508(a)(19), section 94508(a)(20), and section 94509(l) for provisions that apply to Automotive Windshield Washer Fluid. *** Type “A” areas include only the following: Del Norte, Shasta and Trinity Counties; the Great Basin Valley, Lake Tahoe, Mountain Counties, and Northeast Plateau Air Basins, as defined in Title 17, California Code of Regulations, Sections 60105, 60108, 60111, and 60113.		
Bathroom and Tile Cleaner*: aerosol	1/1/94	7
all other forms	1/1/94	5
non-aerosol	12/31/2008	1
[*See section 94509(p) for additional requirements that apply to Bathroom and Tile Cleaner.]		
Brake Cleaner~~s~~	1/1/97 12/31/2002 12/31/2008 12/31/2010	50 45 20 10
Bug and Tar Remover	1/1/2002	40
Carburetor or Fuel-injection Air Intake Cleaner *	1/1/95 12/31/2002 12/31/2008 12/31/2010	75 45 20 10
*See section 94509(k) for the effective date of the VOC limit for Carburetor or Fuel-injection Air Intake Cleaner.		

Carpet /Upholstery Cleaner*: aerosol non-aerosol (dilutable) non-aerosol (ready-to-use) [*See section 94509(q) for additional requirements that apply to Carpet/Upholstery Cleaner]	 1/1/2001 12/31/2010 1/1/2001 1/1/2001 12/31/2010	 7 5 0.1 3 1
Charcoal Lighter Material	See Section 94509(h)	
Disinfectant: aerosol non-aerosol	 12/31/2008 12/31/2008	 70 1
Dusting Aid: aerosol non-aerosol	 1/1/95 1/1/97 12/31/2010 1/1/95 12/31/2010	 35 25 17 7 3
Electrical Cleaner* [*See sections 94509(n) and 94512(d) for additional requirements that apply to Electrical Cleaner.]	12/31/2006	45
Electronic Cleaner* [*See sections 94509(m) and 94512(d) for additional requirements that apply to Electronic Cleaner.]	12/31/2007	75
Engine Degreaser: aerosol non-aerosol	1/1/93 1/1/96 12/31/2004 12/31/2010 12/31/2004	75 50 35 10 5

Fabric Protectant* aerosol non-aerosol [*See section 94509(q) for additional requirements that apply to Fabric Protectant]	1/1/95 1/1/97 1/1/95 1/1/97 12/31/2010	75 60 75 60 1
Fabric Refresher: aerosol non-aerosol	12/31/2006 12/31/2006	15 6
Fabric Softener – Single Use Dryer Product	See Section 94509(s)	
Floor Maintenance Product	12/31/2010	1
Floor Polish or Wax: Resilient Flooring Material Nonresilient Flooring Material Wood Floor Wax	1/1/94 12/31/2010 1/1/94 12/31/2010 1/1/94 12/31/2010	7 1 10 1 90 70
Floor Wax Stripper: non-aerosol	See Section 94509(j)	
Footwear or Leather Care Product*: aerosol solid all other forms [*See section 94509(m) for additional requirements that apply to Footwear or Leather Care Product.]	12/31/2006 12/31/2006 12/31/2006	75 55 15
Furniture Maintenance Product: aerosol all other forms (except solid/paste forms) non-aerosol (except solid/paste forms)	1/1/94 12/31/2004 1/1/94 12/31/2008	25 17 7 3

General Purpose Cleaner*: aerosol and non-aerosol aerosol non-aerosol [*See section 94509(p) for additional requirements that apply to General Purpose Cleaner.]	 1/1/94 12/31/2008 12/31/2004	 10 8 4
General Purpose Degreaser*: aerosol non-aerosol [*See section 94509(m) for additional requirements that apply to General Purpose Degreaser.]	 1/1/2002 12/31/2008 12/31/2010 12/31/2004	 50 20 10 4
Glass Cleaner: aerosol non-aerosol	 1/1/93 12/31/2012 1/1/93 1/1/96 12/31/2004	 12 10 8 6 4
Graffiti Remover*: aerosol non-aerosol [*See section 94509(n) for additional requirements that apply to Graffiti Remover.]	 12/31/2006 12/31/2006	 50 30
Hair Mousse	1/1/94 12/31/2002	16 6
Hair Shine	1/1/2005	55
Hair Spray	1/1/93 6/1/99	80 55
Hair Styling Gel	1/1/94	6
Hair Styling Product: aerosol and pump spray all other forms	 12/31/2006 12/31/2006	 6 2
Heavy-duty Hand Cleaner or Soap	1/1/2005	8
Insect Repellent: aerosol	 1/1/94	 65

Insecticide*: Crawling Bug Insecticide (all forms): aerosol Flea and Tick Insecticide Flying Bug Insecticide (all forms): aerosol Fogger Lawn and Garden Insecticide (all forms) non-aerosol Wasp and Hornet Insecticide *See sections 94510(g)(1) and 94510(k) for exemptions that apply to certain insecticides.	 1/1/95 1/1/98 12/31/2004 1/1/95 1/1/95 12/31/2003 1/1/95 1/1/95 12/31/2003 1/1/2005	 40 20 15 25 35 25 45 20 3 40
Laundry Prewash: aerosol/solid all other forms	1/1/94 1/1/94	22 5
Laundry Starch/Sizing/Fabric Finish Product:	1/1/95 12/31/2008	5 4.5
Metal Polish/Cleanser	1/1/2005	30
Motor Vehicle Wash non-aerosol	12/31/10	0.2
Multi-purpose Lubricant: (excluding solid or semisolid products) [*See sections 94509(q) and 94513(f) for additional requirements that apply to Multi-purpose Lubricant]	1/1/2003 12/31/2013 12/31/2015	50 25 10
Multi-purpose Solvent [*See sections 94509(u), 94512(e), and 94513(g) for additional requirements that apply to Multi-purpose Solvent.]	12/31/2010 12/31/2013	30 3

Nail Polish Remover	1/1/94 1/1/96 12/31/2004 12/31/2007	85 75 0 1
Non-selective Terrestrial Herbicide: non-aerosol	1/1/2002	3
Odor Remover/Eliminator aerosol non-aerosol	12/31/2010 12/31/2010	25 6
Oven Cleaner*: aerosol/pump spray liquid non-aerosol (including pump spray and liquid) [*See section 94509(p) for additional requirements that apply to Oven Cleaner.]	1/1/93 1/1/93 12/31/2008	8 5 1
Paint Remover or Stripper	1/1/2005	50
Paint Thinner [*See sections 94509(u), 94510(m), 94512(e), and 94513(g) for additional requirements that apply to Paint Thinner.]	12/31/2010 12/31/2013	30 3
Penetrant* [*See section 94509(q) and 94513(f) for additional requirements that apply to Penetrant]	1/1/2003 12/31/2013	50 25
Personal Fragrance Product*: products with 20% or less fragrance products with more than 20% fragrance *See sections 94510(h), 94510(j), and 94510(l) for exemptions and requirements that apply to Personal Fragrance Products.	1/1/95 1/1/99 1/1/95 1/1/99	80 75 70 65
Pressurized Gas Duster* [*See section 94509(r) and 94510(c) for additional provisions that apply to Pressurized Gas Duster]	12/31/2010	1

Rubber /Vinyl Protectant: aerosol non-aerosol	1/1/2005 1/1/2003	10 3
Sanitizer: aerosol non-aerosol	12/31/2008 12/31/2008	70 1
Sealant or Caulking Compound* all forms Chemically Curing non-aerosol Non-chemically Curing non-aerosol [*See sections 94509(q) and 94512(d) for additional requirements that apply to Sealant or Caulking Compound]	12/31/2002 12/31/2012 12/31/2010	4 3 1.5
Shaving Cream	1/1/94	5
Shaving Gel	12/31/2006 12/31/2009	7 4
Silicone-based Multi-purpose Lubricant: (excluding solid or semisolid products)	1/1/2005	60
Spot Remover*: aerosol non-aerosol [*See section 94509(q) for additional requirements that apply to Spot Remover]	1/1/2001 12/31/2010 1/1/2001 12/31/2010	25 15 8 3
Temporary Hair Color: aerosol	12/31/2010	55
Tire or Wheel Cleaner aerosol non-aerosol	12/31/2010 12/31/2010	8 2
Tire Sealant and Inflator	12/31/2002	20

Toilet/Urinal Care Product:* aerosol non-aerosol [*See section 94509(o) for additional requirements that apply to Toilet/Urinal Care Product]	12/31/2006 12/31/2006	10 3
Undercoating: aerosol	1/1/2002	40
Windshield Water Repellent	12/31/2010	75
Wood Cleaner: aerosol non-aerosol	12/31/2006 12/31/2006	17 4

[1] See section 94509(d) for the effective date of the VOC standards for products registered under FIFRA, and section 94509(c) and (d) for the "sell-through" allowed for products manufactured prior to the effective date of standards.

[2] See section 94510(c) for an exemption that applies to fragrances in consumer products, and section 94510(d) for an exemption that applies to LVP-VOCs.

(b) *Products that are diluted prior to use*

(1) Except for "Automotive Windshield Washer Fluid (Dilutable)," for consumer products for which the label, packaging, or accompanying literature specifically states that the product should be diluted with water or non-VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the minimum recommended dilution has taken place. For purposes of this subsection (b), "minimum recommended dilution" shall not include recommendations for incidental use of a concentrated product to deal with limited special applications such as hard-to-remove soils or stains.

(2) For consumer products for which the label, packaging, or accompanying literature states that the product should be diluted with any VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the maximum recommended dilution has taken place.

(3) For "Automotive Windshield Washer Fluid~~s~~ (Dilutable)" for which the ~~label, packaging, or accompanying literature~~ front panel of the product label specifically states that the product should be diluted ~~with water or non-VOC solvent~~ (e.g. identified as a "concentrate") prior to use;

(A) the VOC limits specified in section 94509(a) shall apply to the product only after the minimum recommended dilution has taken place;

(B) for the purpose of complying with the VOC limits specified in section 94509(a), different dilution instructions for "Type A areas" and other areas of California

may be specified on the product label if the dilution instructions meet the following criteria:

1. The instructions are readily visible, and

2. The instructions can be easily understood by the consumer, and

3. The instructions clearly specify the recommended dilutions to apply in “Type A areas” and in other areas of California, and

If the dilution instructions specified on the product label meet these criteria, the VOC limits specified in section 94509(a) shall apply to the product only after the minimum recommended dilution has taken place for the area in which the product is sold, supplied, or offered for sale.

(4) For products sold in pump spray containers, the VOC limits specified in section 94509(a) shall apply to the product prior to any minimum recommended dilution.

(c) *Sell-through of products.*

(1) *Sell-through period*. Notwithstanding the provisions of Section 94509(a) or 94509(j), a consumer product manufactured prior to each of the effective dates specified for that product in the Table of Standards may be sold, supplied, or offered for sale for up to three years after each of the specified effective dates. This subsection (c) does not apply to:

(A) any consumer product that does not display on the product container or package the date on which the product was manufactured, or a code indicating such date, or

(B) any consumer product on which the manufacturer has used a code indicating the date of manufacture that is different than the code specified in section 94512(b)(2), but an explanation of the code has not been filed with the ARB Executive Officer by the deadlines specified in section 94512(c)(1) or section 94512(c)(2), or

(C) Solid “Air Fresheners” and “Toilet/Urinal Care Product” that contain para-dichlorobenzene; these products are subject to the one-year sell-through period specified in section 94509(o).

(D) Products contained in multi-unit packages, as specified below:

1. Subsection (c)(1) does not apply to any individual consumer products unit contained within a multi-unit package that is produced or assembled after January 1, 2006, where the multi-unit package does not display the date(s) or date-code(s) of the individual product units, or display the date of

assembly, such that the displayed information is not readily observable without irreversibly disassembling any portion of the container or packaging.

2. For the purposes of this section, “date of assembly” means the date that the individual product units are assembled into the finished multi-unit package.

3. For multi-unit packages that display the “date of assembly” instead of the date(s) or date-code(s) of the individual product units, the “date of assembly” shall be the “date of manufacture” for all of the product units contained within the multi-unit package. In other words, all of the product units shall be deemed to have been manufactured on the date these units are assembled into the multi-unit package, even if the individual product units show different date(s) or date-code(s).

(2) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product subject to the Table of Standards in section 94509 must notify the purchaser of the product in writing of the date on which the sell-through period for that product will end, provided, however, that this notification must be given only if all of the following conditions are met:

(A) the product is being sold or supplied to a distributor or retailer;

(B) the sell-through period for the product will expire 6 months or less from the date the product is sold or supplied;

(C) the product does not comply with the lowest VOC standard that applies on the date the sell-through period ends; and

(D) the product is subject to a VOC standard with an effective date on or after December 31, 2004.

(d) *Products registered under FIFRA.* For those consumer products that are registered under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA; 7 U.S.C. Section 136-136y), the effective date of the VOC standards specified in subsection (a) is one year after the date specified in the Table of Standards. For those consumer products that are registered under FIFRA, the three year period provided in subsection (c) shall also begin one year after the date specified in the Table of Standards.

(e) *Products containing ozone-depleting compounds.* For any consumer product for which VOC standards are specified under subsection (a), no person shall sell, supply, offer for sale, or manufacture for sale in California any consumer product which contains any of the following ozone-depleting compounds:

CFC-11 (trichlorofluoromethane),
CFC-12 (dichlorodifluoromethane),

CFC-113 (1,1,1-trichloro-2,2,2-trifluoroethane),
CFC-114 (1-chloro-1,1-difluoro-2-chloro-2,2-difluoroethane),
CFC-115 (chloropentafluoroethane), halon 1211 (bromochlorodifluoromethane),
halon 1301 (bromotrifluoromethane), halon 2402 (dibromotetrafluoroethane),
HCFC-22 (chlorodifluoromethane),
HCFC-123 (2,2-dichloro-1,1,1-trifluoroethane),
HCFC-124 (2-chloro-1,1,1,2-tetrafluoroethane),
HCFC-141b (1,1-dichloro-1-fluoroethane),
HCFC-142b (1-chloro-1,1-difluoroethane), 1,1,1-trichloroethane, and carbon tetrachloride.

(f) The requirements of section 94509 (e) shall not apply to any existing product formulation that complies with the Table of Standards or any existing product formulation that is reformulated to meet the Table of Standards, provided the ozone depleting compound content of the reformulated product does not increase.

(g) The requirements of section 94509 (e) shall not apply to any ozone depleting compounds that may be present as impurities in a consumer product in an amount equal to or less than 0.01% by weight of the product.

(h) *Requirements for charcoal lighter materials.* The following requirements shall apply to all charcoal lighter material products as defined in section 94508(a):

(1) *Regulatory Standards*

(A) In all areas of California except the South Coast Air Quality Management District, no person shall sell, supply, or offer for sale after January 1, 1993 any charcoal lighter material product unless at the time of the transaction:

1. the manufacturer or distributor of the charcoal lighter material has been issued a currently effective certification pursuant to subsection (h)(2).

2. the charcoal lighter material meets the formulation criteria and other conditions specified in the applicable Executive Order issued pursuant to subsection (h)(2).

3. the product usage directions for the charcoal lighter material are the same as those provided to the Executive Officer pursuant to subsection (h)(2)(C).

(B) In the South Coast Air Quality Management District, the regulatory standards specified in subsection (h)(1)(A) shall be applicable upon the effective date of this subsection.

(2) *Certification Requirements*

(A) No charcoal lighter material formulation shall be certified under this subsection unless the applicant for certification demonstrates to the Executive Officer's satisfaction that the VOC emissions from the ignition of charcoal with the charcoal lighter material are less than or equal to 0.020 pound of VOC per start, using the procedures specified in the South Coast Air Quality Management District Rule 1174 Ignition Method Compliance Certification Protocol, dated February 27, 1991 (the "SCAQMD Rule 1174 Testing Protocol"). The provisions relating to LVP-VOC in sections 94508(a) and 94510(d) shall not apply to any charcoal lighter material subject to the requirements of sections 94509(a) and (h).

(B) The Executive Officer may approve alternative test procedures which are shown to provide equivalent results to those obtained using the SCAQMD Rule 1174 Testing Protocol.

(C) A manufacturer or distributor of charcoal lighter material may apply to the Executive Officer for certification of a charcoal lighter material formulation in accordance with this subsection (h)(2). The application shall be in writing and shall include, at a minimum, the following:

1. the results of testing conducted pursuant to the procedures specified in SCAQMD Rule 1174 Testing Protocol.

2. the exact text and/or graphics that will appear on the charcoal lighter material's principal display panel, label, and any accompanying literature. The provided material shall clearly show the usage directions for the product. These directions shall accurately reflect the quantity of charcoal lighter material per pound of charcoal that was used in the SCAQMD Rule 1174 Testing Protocol for that product, unless:

   i) the charcoal lighter material is intended to be used in fixed amounts independent of the amount of charcoal used, such as certain paraffin cubes, or

   ii) the charcoal lighter material is already incorporated into the charcoal, such as certain "bag light," "instant light," or "match light" products.

3. For a charcoal lighter material which meets the criteria specified in subsection (h)(2)(C)(2.)(i), the usage instructions provided to the Executive Officer shall accurately reflect the quantity of charcoal lighter material used in the SCAQMD Rule 1174 Testing Protocol for that product.

4. Any physical property data, formulation data, or other information required by the Executive Officer for use in determining when a product modification has occurred and for use in determining compliance with the conditions specified on the Executive Order issued pursuant to section (h)(2).

(D) Within 30 days of receipt of an application, the Executive Officer shall advise the applicant in writing either that it is complete or that specified additional information is required to make it complete. Within 30 days of receipt of additional information, the Executive Officer shall advise the applicant in writing either that the application is complete, or that specified additional information or testing is still required before it can be deemed complete.

(E) If the Executive Officer finds that an application meets the requirements of this subsection (h)(2), then he or she shall issue an Executive Order certifying the charcoal lighter material formulation and specifying such conditions as are necessary to insure that the requirements of this subsection (h) are met. The Executive Officer shall act on a complete application within 90 days after the application is deemed complete.

(3) *Notice of Modifications*

For any charcoal lighter material for which certification has been granted pursuant to subsection (h)(2), the applicant for certification shall notify the Executive Officer in writing within 30 days of: (i) any change in the usage directions, or (ii) any change in product formulation, test results, or any other information submitted pursuant to subsection (h)(2) which may result in VOC emissions greater than 0.020 pound of VOC per start.

(4) *Revocation of Certification*

If the Executive Officer determines that any certified charcoal lighter material formulation results in VOC emissions from the ignition of charcoal which are greater than 0.020 pound of VOC per start, as determined by the SCAQMD Rule 1174 Testing Protocol and the statistical analysis procedures contained therein, the Executive Officer shall revoke or modify the certification as is necessary to assure that the charcoal lighter material will result in VOC emissions of less than or equal to 0.020 pound of VOC per start. The Executive Officer shall not revoke or modify the prior certification without first affording the applicant for the certification an opportunity for a hearing in accordance with the procedures specified in Title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 1, Article 4 (commencing with section 60040), to determine if the certification should be modified or revoked.

(5) Notwithstanding any other provision of this subsection 94509(h), charcoal lighter material products manufactured prior to January 1, 1993, may be sold, supplied,

or offered for sale until July 1, 1994, in all areas of California except the South Coast Air Quality Management District. Charcoal lighter material products subject to SCAQMD Rule 1174 and sold, supplied, or offered for sale in the South Coast Air Quality Management District shall meet the requirements of section 94509(h) upon the effective date of this subsection, regardless of the date on which the products were manufactured.

(i) *Requirements for aerosol adhesives* (as defined in sections 94508(a)(1) and 94508(a)(3)).

(1) As specified in Health and Safety Code section 41712(h)(2), the standards for aerosol adhesives apply to all uses of aerosol adhesives, including consumer, industrial, and commercial uses. Except as otherwise provided in sections 94509(c), 94510, 94511, and 94514, no person shall sell, supply, offer for sale, use or manufacture for sale in California any aerosol adhesive which, at the time of sale, use, or manufacture, contains VOCs in excess of the specified standard.

(2)(A) In order to qualify as a "Special Purpose Spray Adhesive" the product must meet one or more of the definitions for "Special Purpose Spray Adhesive" specified in section 94508(a), but if the product label indicates that the product is suitable for use on any substrate or application not listed in one of the definitions for "Special Purpose Spray Adhesive," then the product shall be classified as either a "Web Spray Adhesive" or a "Mist Spray Adhesive."

(B) If a product meets more than one of the definitions specified in section 94508(a) for "Special Purpose Spray Adhesive," and is not classified as a "Web Spray Adhesive" or "Mist Spray Adhesive" under subsection (2)(A), then the VOC limit for the product shall be the lowest applicable VOC limit specified in section 94509(a).

(3) Effective 1/1/2002, no person shall sell, supply, offer for sale, or manufacture for use in California any aerosol adhesive which contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene, except that an aerosol adhesive manufactured before 1/1/2002 may be sold, supplied, or offered for sale until 1/1/2005, so long as the ~~product container or package displays the date on which the product was manufactured, or a code indicating such date~~ <u>product complies with product dating requirements in section 94512(b)</u>.

(4) All aerosol adhesives must comply with the labeling requirements specified in section 94512(d), and all manufacturers and responsible parties for aerosol adhesives must comply with the special reporting requirements specified in section 94513(d).

(j) *Requirements for Floor Wax Strippers.* After an effective date of January 1, 2002, no person shall sell, supply, offer for sale, or manufacture for use in California any floor wax stripper unless the following requirements are met:

(1) The label of each non-aerosol floor wax stripper must specify a dilution ratio for light or medium build-up of polish that results in an as-used VOC concentration of 3 percent by weight or less.

(2) If a non-aerosol floor wax stripper is also intended to be used for removal of heavy build-up of polish, the label of that floor wax stripper must specify a dilution ratio for heavy build-up of polish that results in an as-used VOC concentration of 12 percent by weight or less.

(3) The terms "light build-up," "medium build-up" or "heavy build-up" are not specifically required, as long as comparable terminology is used.

(k) *Effective dates of the VOC limits for* "*Carburetor or Fuel-injection Air Intake Cleaners*" *and* "*Construction, Panel, and Floor Covering Adhesives.* " "The definitions for the product categories of "Carburetor or Fuel-injection Air Intake Cleaners" and "Construction, Panel, and Floor Covering Adhesives" were modified as part of the "Mid-term Measures II" rulemaking action that was considered by the Board in October 1999. As a result of these modifications, certain types of consumer products were included in these definitions that had not previously been included. For those consumer products that were included in these definitions for the first time as a result of the "Mid-term Measures II" rulemaking action, the VOC limits (in section 94509(a)) applicable to these newly included products shall not become legally effective until December 31, 2002.

(l) *Automotive Windshield Washer Fluids.* The provisions of subsection 94509(b)(1) shall not apply to "Automotive Windshield Washer Fluid (Pre-Mixed)" as defined in section 94508(a).

(m) *Requirements for Contact Adhesives, Electronic Cleaners, Footwear or Leather Care Products, and General Purpose Degreasers.*

(1) Except as provided below in sections 94509(m)(2) and (m)(4), effective December 31, 2005, no person shall sell, supply, offer for sale, or manufacture for use in California any Contact Adhesive, Electronic Cleaner, Footwear or Leather Care Product, or General Purpose Degreaser that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products*. Contact Adhesives, Electronic Cleaners, Footwear or Leather Care Products, and General Purpose Degreasers that contain

methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2005, may be sold, supplied, or offered for sale until December 31, 2008, so long as the ~~product container or package displays the date on which the product was manufactured, or a code indicating such date~~ product complies with product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(m)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2008, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2008.

(4) *Impurities*. The requirements of section 94509(m)(1) and (m)(3) shall not apply to any Contact Adhesive, Electronic Cleaner, Footwear or Leather Care Product, or General Purpose Degreaser containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(n) *Requirements for Adhesive Removers, Electrical Cleaners, and Graffiti Removers.*

(1) Except as provided below in sections 94509(n)(2) and (n)(4), effective December 31, 2006, no person shall sell, supply, offer for sale, or manufacture for use in California any Adhesive Remover, Electrical Cleaner, or Graffiti Remover that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products*. Adhesive Removers, Electrical Cleaners, and Graffiti Removers that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2006, may be sold, supplied, or offered for sale until December 31, 2009, so long as the ~~product container or package displays the date on which the product was manufactured, or a code indicating such date~~ product complies with product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(n)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2009, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2009.

(4) *Impurities*. The requirements of section 94509(n)(1) and (n)(3) shall not apply to any Adhesive Remover, Electrical Cleaner, or Graffiti Remover containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(o) *Requirements for Solid Air Fresheners and Toilet/Urinal Care Products.*

(1) Effective December 31, 2005, no person shall sell, supply, offer for sale, or manufacture for use in California any Solid Air Fresheners or Toilet/Urinal Care Products that contain para-dichlorobenzene, except ~~that~~those Solid Air Fresheners and Toilet/Urinal Care Products that contain para-dichlorobenzene and were manufactured before December 31, 2005 may be sold, supplied, or offered for sale until December 31, 2006, so long as the product container or package displays the date on which the product was manufactured, or a code indicating such date.

(2) *Notification for products sold during the sell-through period.* Any person who sells or supplies any Solid Air Freshener or Toilet/Urinal Care Product that contains para-dichlorobenzene must notify the purchaser of the product in writing that the sell-through period for the product will end on December 31, 2006, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2006.

(p) *Requirements for Bathroom and Tile Cleaners, Construction, Panel, and Floor Covering Adhesives, electronic cleaners labeled as energized electronic equipment use only, General Purpose Cleaners, and Oven Cleaners.*

(1) Except as provided below in sections 94509(p)(2) and (p)(4), effective December 31, 2008, no person shall sell, supply, offer for sale, or manufacture for use in California any Bathroom and Tile Cleaner, Construction, Panel, and Floor Covering Adhesive, electronic cleaners labeled as energized electronic equipment use only, General Purpose Cleaner, or Oven Cleaner that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products.* Bathroom and Tile Cleaners, Construction, Panel, and Floor Covering Adhesives, electronic cleaners labeled as energized electronic equipment use only, General Purpose Cleaners, and Oven

Cleaners that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2008, may be sold, supplied, or offered for sale until December 31, 2011, so long as the product complies with the product dating requirements in section 94512(b)

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(p)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2011, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2011.

(4) *Impurities*. The requirements of section 94509(p)(1) and (p)(3) shall not apply to any Bathroom and Tile Cleaner, Construction, Panel, and Floor Covering Adhesive, electronic cleaner labeled as energized electronic equipment use only, General Purpose Cleaner, or Oven Cleaner containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(q) *Requirements for Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, and Spot Remover.*

(1) Except as provided below in sections 94509(q)(2), (q)(4), and (q)(5), effective December 31, 2010, no person shall sell, supply, offer for sale, or manufacture for use in California any Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, or Spot Remover that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products.* Carpet/Upholstery Cleaners, Fabric Protectants, Multi-Purpose Lubricants, Penetrants, Sealant or Caulking Compound and Spot Removers that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2010, may be sold, supplied, or offered for sale until December 31, 2013, so long as the product complies with the product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(q)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2013, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2013.

(4) *Impurities.* The requirements of section 94509(q)(1) and (q)(3) shall not apply to any Carpet/Upholstery Cleaner, Fabric Protectant, Multi-Purpose Lubricant, Penetrant, Sealant or Caulking Compound, or Spot Remover containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(5) The requirements of this section 94509(q) shall not apply to "Penetrant" products used on equipment when electrical current exists; residual electrical potential from a component exists; or an open flame exists, as long as the "Principal Display Panel" clearly displays the statement: "Non-flammable: For use on energized equipment only."

(r) *Requirements for Pressurized Gas Duster.*

(1) Except as provided below in sections 94509(r)(2) and (r)(3), effective December 31, 2010, no person shall sell, supply, offer for sale, or manufacture for use in California any Pressurized Gas Duster product that contains methylene chloride, perchloroethylene, or any chemical compound that has a Global Warming Potential (GWP) Value of 150 or greater.

(2) *Sell-through of Products.* Pressurized Gas Duster products that contain any chemical compound that has a GWP Value greater than 150, and were manufactured before December 31, 2010, may be sold, supplied, or offered for sale until December 31, 2011, so long as the product complies with the product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a Pressurized Gas Duster identified above in section 94509(r)(2) must notify the purchaser of the product, in writing, that the sell-through period for that product will end on December 31, 2011, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2011.

(4) The provisions relating to fragrance in section 94510(c) shall not apply to any Pressurized Gas Duster subject to the requirements of this subsection 94509(r).

(5) *Impurities.* The requirements of section 94509(r)(1), (r)(2), and (r)(3) shall not apply to any ~~Pressurized Gas Duster containing any~~ chemical compound that

is present as an impurity in a combined amount equal to or less than 0.1% by weight.

(s) *Requirements for Fabric Softener – Single Use Dryer Product.*

(1) Effective December 31, 2010, Fabric Softener – Single Use Dryer Product shall not contain more than 0.05 grams of VOC per use. Compliance with the VOC limit shall be determined per sheet, or equivalent delivery substrate, based on the minimum recommended use for a single drying cycle specified on the product packaging or label. In other words, if one sheet is the minimum recommended use for a single drying cycle, then the VOC limit applies per sheet. If two sheets are the minimum recommended use for a single drying cycle, then the VOC limit applies to the aggregate VOC content in two sheets. For purposes of this subsection, "minimum recommended use" shall not include recommendations for incidental use of additional sheets, or equivalent delivery substrate, for limited applications such as for extra large or double loads of washable fabrics in large capacity clothes dryers.

(2) The provisions relating to fragrance in section 94510(c) shall not apply to Fabric Softener – Single Use Dryer Product subject to the requirements of this subsection 94509(s)(1).

(t) *Requirements for Double Phase Aerosol Air Freshener.*

(1) Except as provided below in sections 94509(t)(2) and (t)(4), effective December 31, 2012, no person shall sell, supply, offer for sale, or manufacture for use in California any Double Phase Aerosol Air Freshener that contains any chemical compound that has a Global Warming Potential (GWP) Value of 150 or greater.

(2) *Sell-through of Products.* Double Phase Aerosol Air Fresheners that contain any chemical compound that has a GWP Value of 150 or greater, and were manufactured before December 31, 2012, may be sold, supplied, or offered for sale until December 31, 2015, so long as the product complies with the product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a Double Phase Aerosol Air Freshener identified above in section 94509(t)(2) must notify the purchaser of the product, in writing, that the sell-through period for that product will end on December 31, 2015, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2015.

(4) *Impurities.* The requirements of section 94509(t)(1), (t)(2), and (t)(3) shall not apply to any chemical compound that is present as an impurity in a combined amount equal to or less than 0.1% by weight.

(u) *Requirements for Multi-purpose Solvent and Paint Thinner.*

(1) Except as provided below in sections 94509(u)(2) and (u)(4), effective December 31, 2010, no person shall sell, supply, offer for sale, or manufacture for use in California any Multi-purpose Solvent or Paint Thinner that contains any of the following:

(A) chemical compounds that have a Global Warming Potential (GWP) Value of 150 or greater;

(B) methylene chloride, perchloroethylene, or trichloroethylene;

(C) greater than 1% "Aromatic Compounds" by weight.

(2) *Sell-through of Products.* Multi-purpose Solvents and Paint Thinners that contain any chemical compound that has a GWP Value of 150 or greater; methylene chloride, perchloroethylene, or trichloroethylene; or greater than 1% "Aromatic Compounds" by weight; and were manufactured before December 31, 2010, may be sold, supplied, or offered for sale until December 31, 2013, so long as the product complies with the product dating requirements in section 94512(b).

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(u)(2) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2013, provided, however, this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2013.

(4) *Impurities.* The requirements of section 94509(u)(1), (u)(2) and (u)(3) shall not apply to any Multi-purpose Solvent, or Paint Thinner that contains any of the following:

(A) chemical compounds that have a Global Warming Potential (GWP) Value of 150 or greater and are present as impurities in a combined amount equal to or less than 0.1% by weight;

(B) methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

NOTE: Authority cited: Sections 38500, 38501, 38510, 38560, 38560.5, 38562, 38580, 39600, 39601, 39650, 39658, 39659, 39666, and 41712, Health and Safety Code. Reference: Sections 38505, 39002, 39600, 39650, 39655, 39656, 39658, 39659, 39666, 40000, and 41712, Health and Safety Code.

§ 94510. Exemptions.

(a) This article shall not apply to any consumer product manufactured in California for shipment and use outside of California.

(b) The provisions of this article shall not apply to a manufacturer or distributor who sells, supplies, or offers for sale in California a consumer product that does not comply with the VOC standards specified in Section 94509, as long as the manufacturer or distributor can demonstrate both that the consumer product is intended for shipment and use outside of California, and that the manufacturer or distributor has taken reasonable prudent precautions to assure that the consumer product is not distributed to California. This subsection (b) does not apply to consumer products that are sold, supplied, or offered for sale by any person to retail outlets in California.

(c) Except for Fabric Softener – Single Use Dryer Product and Pressurized Gas Duster, the VOC limits specified in Section 94509(a) shall not apply to fragrances up to a combined level of 2 percent by weight contained in any consumer product.

(d) The VOC limits specified in Section 94509(a) shall not apply to any LVP-VOC.

(e) The requirements of Section 94512(b) shall not apply to consumer products registered under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA; 7 U.S.C. Section 136-36y).

(f) The VOC limits specified in Section 94509(a) shall not apply to air fresheners that are comprised entirely of fragrance, less compounds not defined as VOCs under Section 94508 or exempted under Section 94510(d).

(g) The VOC limits specified in Section 94509(a) shall not apply to:

(1) insecticides containing at least 98% para-dichlorobenzene.

(2) Until December 30, 2006, the VOC limits specified in Section 94509(a) shall not apply to solid air fresheners containing at least 98% para-dichlorobenzene. On or after December 31, 2006, the provisions of section 94509(o) apply to solid air fresheners containing para-dichlorobenzene.

(h) Except as specified in 94510(h)(3) below, the VOC limits specified in Section 94509(a) shall not apply to:

(1) existing personal fragrance products or personal fragrance products in development on or before April 1, 1992, provided that both (i) the registration data specified in section 94513 is submitted for every such product by the date specified in section 94513(a), or prior to July 1, 1993, whichever date occurs later, and (ii) such product is sold in California prior to January 1, 1994. For the purposes of this subsection, a product "in development" means:

(A) a product which a fragrance materials manufacturer is designing at the request of a personal fragrance product manufacturer, or

(B) a product which is the subject of a written marketing profile or other documentation authorizing the creation and marketing of the product.

(2) personal fragrance products in development may be registered to qualify for this exemption under hypothetical trade names or pseudonyms, provided that the actual trade name is supplied to the Executive Officer within 30 days of marketing such products, or January 1, 1994, whichever occurs first.

(3) Effective December 31, 2014, subsections 94510(h)(1) and 94510(h)(2) shall no longer apply to any "Personal Fragrance Product" that contains 20 percent or less fragrance. Products manufactured before December 31, 2014 may be sold, supplied, or offered for sale until December 31, 2017, so long as the product complies with the product dating requirements in Section 94512(b).

(i) The VOC limits specified in Section 94509(a) shall not apply to adhesives sold in containers of 1 fluid ounce or less.

(j) The VOC limits specified in Section 94509(a) shall not apply to any VOC which is a fragrance in a personal fragrance product.

(k) The VOC limits specified in Section 94509(a) shall not apply to bait station insecticides. For the purpose of this section, bait station insecticides are containers enclosing an insecticidal bait that is not more than 0.5 ounce by weight, where the bait is designed to be ingested by insects and is composed of solid material feeding stimulants with less than 5 percent (%) active ingredients.

(l) Except as specified in 94510(l)(1), the 1/1/99 VOC limits specified in Section 94509(a) for personal fragrance products shall not apply to such products which have been sold in California prior to 1/1/99.

(1) On or after December 31, 2014, the 75 percent by weight VOC limit shall apply to any "Personal Fragrance Product" that contains 20 percent or less fragrance.

Products manufactured before December 31, 2014 may be sold, supplied, or offered for sale until December 31, 2017, so long as the product complies with the product dating requirements in Section 94512(b).

(m) Until December 31, 2013, the VOC limits specified in Section 94509(a), and the prohibition of Aromatic Compounds listed in section 94509(u)(5), shall not apply to Paint Thinners that are packaged in containers with a capacity less than or equal to 8 fluid ounces.

NOTE: Authority cited: Sections 39600, 39601 and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

§ 94511. Innovative Products.

(a) The Executive Officer shall exempt a consumer product from the VOC limits specified in Section 94509(a) if a manufacturer demonstrates by clear and convincing evidence that, due to some characteristic of the product formulation, design, delivery systems or other factors, the use of the product will result in less VOC emissions as compared to:

(1) the VOC emissions from a representative consumer product which complies with the VOC limits specified in Section 94509(a), or

(2) the calculated VOC emissions from a noncomplying representative product, if the product had been reformulated to comply with the VOC limits specified in section 94509(a). VOC emissions shall be calculated using the following equation:

$$E_R = E_{NC} \times VOC_{STD} \div VOC_{NC}$$

where:

E_R = The VOC emissions from the noncomplying representative product, had it been reformulated.

E_{NC} = The VOC emissions from the noncomplying representative product in its current formulation.

VOC_{STD} = the VOC limit specified in 94509(a).

VOC_{NC} = the VOC content of the noncomplying product in its current formulation.

If a manufacturer demonstrates that this equation yields inaccurate results due to some characteristic of the product formulation or other factors, an alternative method which accurately calculates emissions may be used upon approval of the Executive Officer.

(b) For the purposes of this section, “representative consumer product” means a consumer product which meets all of the following criteria:

(1) the representative product shall be subject to the same VOC limit in Section 94509(a) as the innovative product.

(2) the representative product shall be of the same product form as the innovative product, unless the innovative product uses a new form which does not exist in the product category at the time the application is made.

(3) the representative product shall have at least similar efficacy as other consumer products in the same product category based on tests generally accepted for that product category by the consumer products industry.

(c) A manufacturer shall apply in writing to the Executive Officer for any exemption claimed under subsection (a). The application shall include the supporting documentation that demonstrates the reduction of emissions from the innovative product, including the actual physical test methods used to generate the data and, if necessary, the consumer testing undertaken to document product usage. In addition, the applicant must provide any information necessary to enable the Executive Officer to establish enforceable conditions for granting the exemption including the VOC content for the innovative product and test methods for determining the VOC content. All information submitted by a manufacturer pursuant to this section shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022.

(d) Within 30 days of receipt of the exemption application the Executive Officer shall determine whether an application is complete as provided in section 60030(a), Title 17, California Code of Regulations.

(e) Within 90 days after an application has been deemed complete, the Executive Officer shall determine whether, under what conditions, and to what extent, an exemption from the requirements of Section 94509(a) will be permitted. The applicant and the Executive Officer may mutually agree to a longer time period for reaching a decision, and additional supporting documentation may be submitted by the applicant before a decision has been reached. The Executive Officer shall notify the applicant of the decision in writing and specify such terms and conditions that are necessary to ~~insure~~ensure that emissions from the product will meet the emissions reductions specified in subsection (a), and that such emissions reductions can be enforced.

(f) In granting an exemption for a product the Executive Officer shall establish conditions that are enforceable. These conditions shall include the VOC content of the innovative product, dispensing rates, application rates~~, application rates~~, and any other parameters determined by the Executive Officer to be necessary. The Executive Officer shall also specify the test methods for determining conformance to

the conditions established. The test methods shall include criteria for reproducibility, accuracy, and sampling and laboratory procedures.

(g) For any product for which an exemption has been granted pursuant to this section, the manufacturer shall notify the Executive Officer in writing within 30 days of any change in the product formulation or recommended product usage directions, and shall also notify the Executive Officer within 30 days if the manufacturer learns of any information which would alter the emissions estimates submitted to the Executive Officer in support of the exemption application.

(h) If the VOC limits specified in Section 94509(a) are lowered for a product category through any subsequent rulemaking, all innovative product exemptions granted for products in the product category, except as provided in this subsection (h), shall have no force and effect as of the effective date of the modified VOC standard. This subsection (h) shall not apply to those innovative products which have VOC emissions less than the applicable lowered VOC limit and for which a written notification of the product's emissions status versus the lowered VOC limit has been submitted to and approved by the Executive Officer at least 60 days before the effective date of such limits.

(i) If the Executive Officer believes that a consumer product for which an exemption has been granted no longer meets the criteria for an innovative product specified in subsection (a), the Executive Officer may modify or revoke the exemption as necessary to assure that the product will meet these criteria. The Executive Officer shall not modify or revoke an exemption without first affording the applicant an opportunity for a public hearing held in accordance with the procedures specified in Title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 1, Article 4 (commencing with Section 60040), to determine if the exemption should be modified or revoked.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

§ 94512. Administrative Requirements.

(a) *Most Restrictive Limit*.

(1) *Products Manufactured Before January 1, 2007, and FIFRA-registered Insecticides Manufactured Before January 1, 2008.* Notwithstanding the definition of “Product Category” in Section 94508, if anywhere on the principal display panel of any consumer product manufactured before January 1, 2007, *or any FIFRA-registered insecticide manufactured before January 1, 2008*, any representation is made that the product may be used as, or is suitable for use as a consumer product for which a lower VOC limit is specified in Section 94509(a), then the lowest VOC limit shall apply. This requirement does not apply to general purpose cleaners and insecticide foggers.

(2) *Products Manufactured on or After January 1, 2007, and FIFRA-registered Insecticides Manufactured on or After January 1, 2008.* Notwithstanding the definition of "product category" in Section 94508, if anywhere on the container or packaging of any consumer product manufactured on or after January 1, 2007, *or any FIFRA-registered insecticide manufactured on or after January 1, 2008,* or on any sticker or label affixed thereto, any representation is made that the product may be used as, or is suitable for use as a consumer product for which a lower VOC limit is specified in Section 94509(a), then the lowest VOC limit shall apply. This requirement does not apply to general purpose cleaners and insecticide foggers.

(3) *Rules that Apply when a Product Category Definition Excludes Other Product Categories.*

If a definition of a regulated product category in section 94508(a) states that the product category "does not include" one or more other product categories, the "most restrictive limit" provisions of section 94512(a) apply to regulated products that meet the definition of the regulated product category and also make any representation that the regulated product may be used as (or is suitable for use as) a product that falls within one or more of the excluded product categories. Notwithstanding the foregoing above, this provision does not apply to "Disinfectant"/"Sanitizer" products labeled as "Bathroom and Tile Cleaners," "Glass Cleaners," "General Purpose Cleaners," "Toilet/Urinal Care Products," "Metal Polishes," "Carpet Cleaners," or "Fabric Refreshers" that may also make disinfecting/sanitizing or anti-microbial claims on the label.

For example, if the definition for Regulated Product Category A states that it "does not include" Regulated Product Category B, then the "most restrictive limit" provisions apply to a regulated product that meets the definition of Regulated Product Category A, but also makes a representation that it may be used as (or is suitable for use as) Regulated Product Category B. In other words, if the regulated product makes any representation that it may be used as (or is suitable for use as) Regulated Category Product B, then the regulated product would be subject to the lowest VOC limit specified in section 94509(a) for either Product Category A or Product Category B.

For the purposes of this section:

"Regulated product" means a consumer product for which a VOC standard is specified in section 94509(a), and

"Representation" has the same meaning as used above in subsections 94512(a)(1) and 94512(a)(2) (i.e., what statements qualify as a "representation" depends on the date the product was manufactured and whether the statements appear on the "principal display panel" or other parts of the product container or packaging.)

(b) *Product Dating*.

(1) Each manufacturer of a consumer product subject to Section 94509 shall clearly display on each consumer product container or package, the day, month, and year on which the product was manufactured, or a code indicating such date. Codes that represent a sequential batch number, or that otherwise cannot be attributed to a specific day, month, and year, do not satisfy this requirement.

(2) A manufacturer who uses the following code to indicate the date of manufacture shall not be subject to the requirements of section 94512(c)(1), if the code is represented separately from other codes on the product container so that it is easily recognizable:

YY DDD = year year day day day

Where: "YY" = two digits representing the year in which the product was manufactured, and

"DDD" = three digits representing the day of the year on which the product was manufactured, with "001" representing the first day of the year, "002" representing the second day of the year, and so forth (i.e. the "Julian date").

(3) This date or code shall be displayed on each consumer product container or package no later than twelve months prior to the effective date of the applicable standard specified in Section 94509.

(4) Except as otherwise provided in subsection (b)(5), for products manufactured on or after January 1, 2006, the date or code shall be displayed on the product container such that it is readily observable without irreversibly disassembling any portion of the product container or packaging. For the purposes of this subsection, information may be displayed on the bottom of a container as long as it is clearly legible without removing any product packaging.

(5) *Products Sold in Multi-unit Packages.*

(A) Products sold, supplied, or offered for sale in multi-unit packages are not required to comply with subsection (b)(4).

(B) If a multi-unit package does not comply with subsection (b)(4), the "sell-through" provisions of section 94509(c)(1) shall not apply to the individual product units contained within the multi-unit package. In other words, if any multi-unit package produced or assembled after January 1, 2006, does not display the date(s) or date-code(s) of the product units, such that the displayed information is readily observable without irreversibly disassembling any portion of the container or packaging, the

individual product units shall be subject to the VOC standards in effect when the multi-unit package is sold, supplied, or offered for sale, regardless of the date on which the product units were manufactured.

(C) A multi-unit package may comply with subsection (b)(4) by displaying the date of assembly instead of the date(s) or date-code(s) of the individual product units, so long as the date of assembly is readily observable without irreversibly disassembling any portion of the container or packaging. The "date of assembly" means the date that the individual product units are assembled into the finished multi-unit package. If the date of assembly is displayed instead of the individual date(s) or date-code(s), the "date of assembly" shall be the "date of manufacture" for all of the product units contained within the multi-unit package. In other words, all of the product units shall be deemed to have been manufactured on the date these units are assembled into the multi-unit package, even if the individual product units show different date(s) or date-code(s), and the "date of assembly" shall be "date of manufacture" of each product unit for the purposes of applying the "sell-through" provisions of section 94509(c).

(6) The requirements of this subsection (b) shall not apply to:

(A) personal fragrance products of 2 milliliters or less, which are offered to consumers free of charge for the purpose of sampling the product; or

(B) products containing no VOCs (as defined in section 94508), or containing VOCs at 0.10% by weight or less.

(c) *Additional Product Dating Requirements*.

(1) If a manufacturer uses a code indicating the date of manufacture, for any consumer product subject to section 94509 an explanation of the code must be filed with the Executive Officer of the ARB no later than twelve months prior to the effective date of the applicable standard specified in section 94509. Thereafter, manufacturers using a code must file an explanation of the code with the Executive Officer on an annual basis, beginning in 2006. The explanation of the code must be received by the Executive Officer on or before January 31st of each year, with the first explanation due on or before January 31, 2006.

(2) If a manufacturer changes any code indicating the date of manufacture for any consumer product subject to subsection (c)(1), an explanation of the modified code must be received by the Executive Officer before any products displaying the modified code are sold, supplied, or offered for sale in California.

(3) No person shall erase, alter, deface, or otherwise remove or make illegible any date or code indicating the date of manufacture from any regulated product container without the express authorization of the manufacturer.

(4) Codes indicating the date of manufacture are public information and may not be claimed as confidential.

(d) *Additional Labeling Requirements for Aerosol Adhesive, Adhesive Remover, Electronic Cleaner, Electrical Cleaner, Energized Electrical Cleaner, Contact Adhesive, and Sealant or Caulking Compound (non-aerosol).*

(1) In addition to the requirements specified in subsections (a), (b), and (c), both the manufacturer and responsible party for each aerosol adhesive, adhesive remover, electronic cleaner, electrical cleaner, energized electrical cleaner, contact adhesive product, and sealant or caulking compound (non-aerosol) subject to this article shall ensure that all products clearly display the following information on each product container which is manufactured on or after the effective date for the category specified in section 94509(a), except that for non-chemically curing sealant or caulking compound (non-aerosol), the effective date of this requirement is December 31, 2010, and for chemically curing sealant or caulking compound (non-aerosol), the effective date of this requirement is December 31, 2012:

(A) The product category as specified in section 94509(a) or an abbreviation of the category shall be displayed;

(B) 1. The applicable VOC standard for the product that is specified in section 94509(a), except for Energized Electrical Cleaner, expressed as a percentage by weight, shall be displayed unless the product is included in an alternative control plan approved by the Executive Officer, as provided in Article 4, Sections 94540-94555, Title 17, California Code of Regulations, and the product exceeds the applicable VOC standard;

2. If the product is included in an alternative control plan approved by the Executive Officer, and the product exceeds the applicable VOC standard specified in section 94509(a), the product shall be labeled with the term “ACP” or “ACP product;”

(C) If the product is classified as a special purpose spray adhesive, the applicable substrate and/or application or an abbreviation of the substrate/application that qualifies the product as special purpose shall be displayed;

(D) If the manufacturer or responsible party uses an abbreviation as allowed by this subsection 94512(d)(1)(A), an explanation of the abbreviation must be filed with the Executive Officer before the abbreviation is used.

(2) The information required in section 94512(d)(1), shall be displayed on the product container such that it is readily observable without removing or disassembling any portion of the product container or packaging. For the purposes of this subsection, information may be displayed on the bottom of a container as long as it is clearly legible without removing any product packaging.

(3) No person shall remove, alter, conceal, or deface the information required in section 94512(d)(1) prior to final sale of the product.

(e) *Additional Requirements for Multi-purpose Solvent and Paint Thinner.*

(1) In addition to the requirements specified in section 94512(a), (b), and (c), both the manufacturer and responsible party for each Multi-purpose Solvent and Paint Thinner sold or offered for sale in areas of California outside the South Coast Air Quality Management District shall ensure that all products manufactured on or after the effective date for the category specified in section 94509(a), meet the following requirements:

(A) Each product container must clearly display the VOC content in percent by weight as determined from actual formulation data.

(B) The information required by this subsection 94512(e)(1), shall be displayed on the product container such that it is readily observable without removing or disassembling any portion of the product container or packaging.

(C) No person shall remove, alter, conceal, or deface the information required by this subsection 94512(e)(1) prior to final sale of the product.

(2) In addition to the requirements specified in section 94512(a), (b), (c), and (e)(1):

(A) Except as provided below in section 94512(e)(2)(B), effective December 31, 2010, until December 31, 2015, no person shall sell, supply, offer for sale, or manufacture for use in California any “Flammable” or “Extremely Flammable” Multi-purpose Solvent or Paint Thinner named, on the Principle Display Panel as “Paint Thinner,” “Multi-purpose Solvent,” “Clean-up Solvent,” or “Paint Clean-up.”

(B) Section 94512(e)(2)(A) does not apply to products that meet any of the following criteria:

1. Products which include an attached “hang tag” or sticker that displays, at a minimum, the following statement: “Formulated to

meet California VOC limits; see warnings on label."

2. Products where the Principle Display Panel displays, in a font size as large as or larger than the font size of any other words on the panel, the common name of the chemical compound (e.g., "Acetone," "Methyl acetate," etc.) that results in the product meeting the criteria for "Flammable" or "Extremely Flammable."

(C) For the purposes of this subsection (e)(2), a product is "Flammable" or Extremely Flammable" if it is labeled as "Flammable" or "Extremely Flammable" on the product container, or if the product meets the criteria for these terms specified in title16, Code of Federal Regulations, section 1500.3(c)(6).

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

§ 94513. Reporting Requirements.

(a) Upon 90 days written notice, the Executive Officer may require any responsible party to report information for any consumer product or products the Executive Officer may specify including, but not limited to, all or part of the information: specified in the following subsections (a)(1) through (a)(12). If the responsible party does not have or does not provide the information requested by the Executive Officer, the Executive Officer may require the reporting of this information by the person that has the information, including, but not limited to, any formulator, manufacturer, supplier, parent company, private labeler, distributor, or repackager.

(1) the company name, address, telephone number, and designated contact person;

(2) any claim of confidentiality made pursuant to Title 17, California Code of Regulations, Section 91011;

(3) the product brand name for each consumer product and the product label;

(4) the product category to which the consumer product belongs;

(5) the applicable product form(s) listed separately;

(6) an identification of each product brand name and form as a "Household Product," "I&I Product," or both;

(7) separate California sales in pounds per year, to the nearest pound, and the method used to calculate California sales for each product form;

(8) for information submitted by multiple companies, an identification of each company which is submitting relevant data separate from that submitted by the responsible party. All information from all companies shall be submitted by the date specified in Section 94513(a);

(9) for each product brand name and form, the net percent by weight of the total product, less container and packaging, comprised of the following, rounded to the nearest one-tenth of a percent (0.1%):

(A) Total Table B Compounds
(B) Total LVP-VOCs that are not fragrances
(C) Total All Other Carbon-Containing Compounds that are not fragrances
(D) Total All Non-Carbon-Containing Compounds
(E) Total Fragrance
(F) For products containing greater than two percent by weight fragrance, but excluding "personal fragrance products":
(i) the percent of fragrance that are LVP-VOCs, and
(ii) the percent of fragrance that are all other carbon-containing compounds
(G) For "personal fragrance products," the density of the fragrance
(H) Total Para-dichlorobenzene

(10) for each product brand name and form, the identity, including the specific chemical name and associated Chemical Abstract Services (CAS) number, of the following:

(A) Each Table B Compound
(B) Each LVP-VOC that is not a fragrance

(11) if applicable, the weight percent comprised of propellant for each product;

(12) if applicable, an identification of the type of propellant (Type A, Type B, Type C, or a blend of the different types);

(b) In addition to the requirements of section 94513(a)(10), the responsible party shall report or shall arrange to have reported to the Executive Officer the net percent by weight of each ozone-depleting compound which is (1) listed in section 94509(e) and (2) contained in a product subject to reporting under section 94513(a) in any amount greater than 0.1 percent by weight.

(c) All information submitted by any person pursuant to Section 94513 shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022.

(d) *Special Reporting Requirements for Aerosol Adhesives*

On or before March 31, 2004, all responsible parties for aerosol adhesives shall

report to the Executive Officer the following information for products sold or offered for sale in California:

(1) data regarding product sales and composition for the year 2003, including the information listed in Section 94513(a), and any other information that the Executive Officer may specify; and

(2) a written update of the research and development efforts undertaken to achieve VOC limits lower than the limits specified in section 94509(a). The written update must include detailed information about the raw materials (solvents, propellants, resins, and polymers) and hardware (valves, actuators, cans) used in product reformulation, the testing protocols used, the results of the testing, and the cost of reformulation efforts.

(3) On or before December 31, 2003, the Executive Officer shall notify responsible parties in writing that they are to submit aerosol adhesive product and research data by March 31, 2004.

(e) *Special Reporting Requirements for Consumer Products that Contain Perchloroethylene or Methylene Chloride*:

(1) The requirements of this subsection shall apply to all responsible parties for:

(A) consumer products that are subject to section 94509(a) and contain perchloroethylene or methylene chloride, and

(B) Energized Electrical Cleaners as defined in section 94508(a), that contain perchloroethylene or methylene chloride. For the purposes of this subsection, a product "contains perchloroethylene or methylene chloride" if the product contains 1.0 percent or more by weight (exclusive of the container or packaging) of either perchloroethylene or methylene chloride.

(2) For each consumer product that contains perchloroethylene or methylene chloride, the responsible party shall report the following information for products sold in California during each calendar year, beginning with the year 2000, and ending with the year 2010.

(A) the product brand name and a copy of the product label with legible usage instructions;

(B) the product category to which the consumer product belongs;

(C) the applicable product form(s) (listed separately);

(D) for each product form listed in (C), the total sales in California during the calendar year to the nearest pound (exclusive of the container or packaging),

and the method used for calculating the California sales;

(E) the weight percent, to the nearest 0.10 percent, of perchloroethylene and methylene chloride in the consumer product.

(3) The information specified in subsection 94513(e)(2) shall be reported for each calendar year by March 1 of the following year. The first report shall be due on March 1, 2001, for calendar year 2000. A new report is due on March 1 of each year thereafter, until March 1, 2011, when the last report is due.

(4) Upon request, the Executive Officer shall make the perchloroethylene information submitted pursuant to this subsection available to publicly owned treatment works in California, in accordance with the procedures for handling of confidential information specified in Title 17, California Code of Regulations, sections 91000-91022.

(A) On or before July 1, 2002, the Executive Officer shall evaluate the information, along with data on influent and effluent levels of perchloroethylene as reported by publicly-owned treatment works personnel and any other relevant information, to determine if it is likely that publicly-owned treatment works are experiencing increased levels of perchloroethylene, relative to 1996 levels, that can be attributed to consumer products which contain perchloroethylene.

(B) If the Executive Officer determines that it is likely that increased perchloroethylene levels at the publicly-owned treatment works are caused by increased levels of perchloroethylene in consumer products subject to this regulation, then the Executive Officer shall, in conjunction with the publicly-owned treatment works and other appropriate parties, implement measures which are feasible, appropriate, and necessary for reducing perchloroethylene levels at the publicly-owned treatment works.

(f) Special Reporting Requirements for Multi-purpose Lubricant and Penetrant products

(1) On or before March 31, 2012, all responsible parties for Multi-purpose Lubricant and Penetrant products shall report to the Executive Officer the following information for products sold or offered for sale in California:

(A) data regarding product sales and composition for the year 2011, including the information listed in section 94513(a), ~~and~~ the entire product label; and

(B) a written update of the research and development efforts undertaken to achieve the 25 percent VOC limits specified in section 94509(a). The written update must include detailed information about the raw materials evaluated for use, maximum incremental reactivity (MIR) values for any VOC or LVP-VOC used or evaluated, the function of the raw material evaluated, hardware

used in product reformulation, the testing protocols used, the results of the testing, and the cost of reformulation efforts.

(2) On or before March 31, 2014, all responsible parties for Multi-purpose Lubricant products shall report to the Executive Officer the following information for products sold or offered for sale in California:

(a) data regarding product sales and composition for the year 2013, including the information listed in Section 94513(a), ~~and~~ the entire product label; and

(b) a written update of the research and development efforts undertaken to achieve the 10 percent VOC limit specified in section 94509(a). The written update must include detailed information about the raw materials evaluated for use, MIR values for any VOC or LVP-VOC used or evaluated, the function of the raw material evaluated, hardware used in product reformulation, the testing protocols used, the results of the testing, and the cost of reformulation efforts.

(g) *Special Reporting Requirements for Multi-purpose Solvent and Paint Thinner products*

(1) On or before June 30, 2012, all responsible parties for Multi-purpose Solvent and Paint Thinner products shall report to the Executive Officer the following information for products sold or offered for sale in California:

(a) data regarding product sales and composition for the year 2011, including the information listed in section 94513(a), and the entire product label; and

(b) a written update of the research and development efforts undertaken to achieve the 3 percent VOC limits specified in section 94509(a). The written update must include detailed information about the raw materials evaluated for use; maximum incremental reactivity (MIR) values for any VOC or LVP-VOC used or evaluated; the function of the raw material evaluated; the testing protocols used; the results of the testing; and the cost of reformulation efforts.

NOTE: Authority cited: Sections 39600, 39601, 41511, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, 41511, and 41712, Health and Safety Code.

§ 94514. Variances.

(a) *Applications for variances.* Any person who cannot comply with the requirements set forth in Section 94509, because of extraordinary reasons beyond the person's reasonable control may apply in writing to the Executive Officer for a variance. The

variance application shall set forth:

(1) the specific grounds upon which the variance is sought;

(2) the proposed date(s) by which compliance with the provisions of Section 94509 will be achieved;

(3) a compliance report reasonably detailing the method(s) by which compliance will be achieved, and

(4) for applicants requesting a variance from the June 1, 1999, 55 percent VOC standard for hairspray products, the variance application shall also include a plan describing how the applicant will mitigate the excess VOC emissions that would be emitted during the period of the variance.

(b) *Notices and public hearings for variances.* Upon receipt of a variance application containing the information required in subsection (a), the Executive Officer shall hold a public hearing to determine whether, under what conditions, and to what extent, a variance from the requirements in Section 94509 is necessary and will be permitted. A hearing shall be initiated no later than 75 days after receipt of a variance application. Notice of the time and place of the hearing shall be sent to the applicant by certified mail not less than 30 days prior to the hearing. Notice of the hearing shall also be submitted for publication in the California Regulatory Notice Register and sent to every person who requests such notice, not less than 30 days prior to the hearing. The notice shall state that the parties may, but need not be, represented by counsel at the hearing. At least 30 days prior to the hearing, the variance application shall be made available to the public for inspection. Interested members of the public shall be allowed a reasonable opportunity to testify at the hearing and their testimony shall be considered.

(c) *Treatment of confidential information.* Information submitted to the Executive Officer by a variance applicant may be claimed as confidential, and such information shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022. The Executive Officer may consider such confidential information in reaching a decision on a variance application.

(d) *Necessary findings for granting variances.* No variance shall be granted unless all of the following findings are made:

(1) that, because of reasons beyond the reasonable control of the applicant, requiring compliance with Section 94509 would result in extraordinary economic hardship.

(2) that the public interest in mitigating the extraordinary hardship to the applicant by issuing the variance outweighs the public interest in avoiding any increased emissions of air contaminants which would result from issuing the variance.

(3) that the compliance report proposed by the applicant can reasonably be implemented, and will achieve compliance as expeditiously as possible.

(e) *Variance orders.* Any variance order shall specify a final compliance date by which the requirements of Section 94509 will be achieved. Any variance order shall contain a condition that specifies increments of progress necessary to assure timely compliance, and such other conditions that the Executive Officer, in consideration of the testimony received at the hearing, finds necessary to carry out the purposes of Division 26 of the Health and Safety Code.

(f) *Situations in which variances shall cease to be effective.* A variance shall cease to be effective upon failure of the party to whom the variance was granted to comply with any term or condition of the variance.

(g) *Modification and revocation of variances.* Upon the application of any person, the Executive Officer may review, and for good cause, modify or revoke a variance from requirements of Section 94509 after holding a public hearing in accordance with the provisions of subsection (b).

(h) *Special conditions in variance orders for hairspray products.*

In imposing conditions in variance orders granted from the June 1, 1999, 55 percent VOC standard for hairspray products, the Executive Officer, in addition to any other conditions that may be imposed, shall require the applicant to mitigate the excess VOC emissions that would be emitted during the period of the variance. If this mitigation requirement would result in an extraordinary economic hardship to the applicant, or if other good cause exists, the Executive Officer may waive all or part of this requirement.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

§ 94515. Test Methods.

(a)(1) *VOC* and GWP compound *content determination using ARB Method 310*. Testing to determine compliance with the requirements of this article, shall be performed using Air Resources Board Method 310, Determination of Volatile Organic Compounds (VOC) in Consumer Products, adopted September 25, 1997 and as last amended on [Date of Amendment] ~~May 5, 2005~~, which is incorporated herein by reference. Alternative methods which are shown to accurately determine the concentration of VOCs in a subject product or its emissions may be used upon approval of the Executive Officer.

(2) In sections 3.5, 3.6, and 3.7 of Air Resources Board (ARB) Method 310, a process is specified for the “Initial Determination of VOC Content” and the “Final

Determination of VOC Content". This process is an integral part of testing procedure set forth in ARB Method 310, and is reproduced below:

Sections 3.5, 3.6, and 3.7 of Air Resources Board Method 310

3.5 *Initial Determination of VOC Content.* The Executive Officer will determine the VOC content pursuant to sections 3.2 and 3.3. Only those components with concentrations equal to or greater than 0.1 percent by weight will be reported.

3.5.1 Using the appropriate formula specified in section 4.0, the Executive Officer will make an initial determination of whether the product meets the applicable VOC standards specified in ARB regulations. If initial results show that the product does not meet the applicable VOC standards, the Executive Officer may perform additional testing to confirm the initial results.

3.5.2 If the results obtained under section 3.5.1 show that the product does not meet the applicable VOC standards, the Executive Officer will request the product manufacturer or responsible party to supply product formulation data. The manufacturer or responsible party shall supply the requested information. Information submitted to the ARB Executive Officer may be claimed as confidential; such information will be handled in accordance with the confidentiality procedures specified in Title 17, California Code of Regulations, sections 91000 to 91022.

3.5.3 If the information supplied by the manufacturer or responsible party shows that the product does not meet the applicable VOC standards, then the Executive Officer will take appropriate enforcement action.

3.5.4 If the manufacturer or responsible party fails to provide formulation data as specified in section 3.5.2, the initial determination of VOC content under this section 3.5 shall determine if the product is in compliance with the applicable VOC standards. This determination may be used to establish a violation of ARB regulations.

3.6 Determination of the LVP-VOC status of compounds and mixtures. This section does not apply to antiperspirant and deodorants or aerosol coating products because there is no LVP-VOC exemption for these products.

3.6.1 Formulation data. If the vapor pressure is unknown, the following ASTM methods, which are incorporated by reference herein, may be used to determine the LVP-VOC status of compounds and mixtures: ASTM D 86-01 (Aug. 10, 2001), ASTM D 850-00 (Dec. 10, 2000), ASTM D 1078-01 (June 10, 2001), ASTM D 2879-97 (April 10, 1997), as modified in Appendix B to this Method 310, ASTM D 2887-01 (May

10, 2001) and ASTM E 1719-97 (March 10, 1997).

3.6.2 LVP-VOC status of "compounds" or "mixtures." The Executive Officer will test a sample of the LVP-VOC used in the product formulation to determine the boiling point for a compound or for a mixture. If the boiling point exceeds 216^{o}C, the compound or mixture is an LVP-VOC. If the boiling point is less than 216^{o}C, then the weight percent of the mixture which boils above 216^{o}C is an LVP-VOC. The Executive Officer will use the nearest 5 percent distillation cut that is greater than 216^{o}C as determined under 3.6.1 to determine the percentage of the mixture qualifying as an LVP-VOC.

3.6.3 Reference method for identification of LVP-VOC compounds and mixtures. If a product does not qualify as an LVP-VOC under 3.6.2, the Executive Officer will test a sample of the compound or mixture used in a product's formulation utilizing one or both of the following: ASTM D 2879-97 (April 10, 1997), as modified in Appendix B to this Method 310, and ASTM E 1719-97 (March 10, 1997), to determine if the compound or mixture meets the requirements of Title 17, CCR, section 94508(a)(94)(A).

3.7 *Final Determination of VOC Content*. If a product's compliance status is not satisfactorily resolved under sections 3.5 and 3.6, the Executive Officer will conduct further analyses and testing as necessary to verify the formulation data.

3.7.1 If the accuracy of the supplied formulation data is verified and the product sample is determined to meet the applicable VOC standards, then no enforcement action for violation of the VOC standards will be taken.

3.7.2 If the Executive Officer is unable to verify the accuracy of the supplied formulation data, then the Executive Officer will request the product manufacturer or responsible party to supply information to explain the discrepancy.

3.7.3 If there exists a discrepancy that cannot be resolved between the results of Method 310 and the supplied formulation data, then the results of Method 310 shall take precedence over the supplied formulation data. The results of Method 310 shall then determine if the product is in compliance with the applicable VOC standards, and may be used to establish a violation of ARB regulations.

(b) VOC content determinations using product formulation and records. Testing to determine compliance with the requirements of this article may also be demonstrated through calculation of the VOC content from records of the amounts of

constituents used to make the product pursuant to the following criteria:

(1) Compliance determinations based on these records may not be used unless the manufacturer of a consumer product keeps accurate records for each day of production of the amount and chemical composition of the individual product constituents. These records must be kept for at least three years.

(2) For the purposes of this section 94515(b), the VOC content shall be calculated according to the following equation:

$$\text{VOC Content} = \frac{B - C}{A} \times 100$$

where,

A = total net weight of unit (excluding container and packaging)

B = total weight of all VOCs, as defined in Section 94508(a), per unit

C = total weight of VOCs exempted under Section 94510, per unit

(3) If product records appear to demonstrate compliance with the VOC limits, but these records are contradicted by product testing performed using ARB Method 310, the results of ARB Method 310 shall take precedence over the product records and may be used to establish a violation of the requirements of this article.

(c) Determination of liquid or solid. Testing to determine whether a product is a liquid or solid shall be performed using ASTM D4359-90 (May 25, 1990), which is incorporated by reference herein.

(d) Compliance determinations for charcoal lighter material products. Testing to determine compliance with the certification requirements for charcoal lighter material shall be performed using the procedures specified in the South Coast Air Quality Management District Rule 1174 Ignition Method Compliance Certification Protocol (February 28, 1991), which is incorporated by reference herein.

(e) Testing to determine distillation points of petroleum distillate-based charcoal lighter materials shall be performed using ASTM D86-01 Aug. 10, 2001, which is incorporated by reference herein.

(f) Fragrance content determinations for personal fragrance products. Testing to determine the percent by weight of fragrance in personal fragrance products shall be performed according to the Association of Official Analytical Chemists (AOAC) Official Method of Analysis No. 932.11, 1990, “Essential Oil in Flavor Extracts and Toilet Preparations, Babcock Method” (AOAC Official Methods of Analysis, 15th Edition, 1990), which is incorporated by reference herein.

(g) No person shall create, alter, falsify, or otherwise modify records in such a way that the records do not accurately reflect the constituents used to manufacture a product, the chemical composition of the individual product, and any other test, processes, or records used in connection with product manufacture.

(h) *VOC and Aromatic compound content determination for Multi-purpose Solvent and Paint Thinner products using ARB Method 310*.

(1) *VOC content:*
Testing to determine compliance with the requirements of this article, shall be performed using Air Resources Board Method 310, Determination of Volatile Organic Compounds (VOC) in Consumer Products, adopted September 25, 1997 and as last amended on [Date of Amendment], which is incorporated herein by reference. Alternative methods which are shown to accurately determine the concentration of VOCs in a subject product or its emissions may be used upon approval of the Executive Officer.

(2) *Aromatic compound content:*
Testing to determine aromatic compound content shall be conducted using ARB Method 310 in conjunction with product formulation data.

(A) Upon written notification from the Executive Officer, the Multi-purpose Solvent or Paint Thinner responsible party or manufacturer shall have 10 working days to provide to the Executive Officer, in writing, formulation data as specified in part (i) for products selected for compliance testing:

(1) The weight fraction to the nearest 0.1 percent of each ingredient including: water, VOC, LVP-VOC, total inorganic compounds, and any compound specified in section 94508(a)(152). For hydrocarbon solvents the BIN number as listed in section 94701 (a) or (b), and the initial boiling point and dry point of the solvent shall be specified. Individual compounds present in an amount less than 0.1 percent by weight, are not required to be reported.
(2) By March 1, 2010, and each year thereafter the responsible party shall provide to the Executive Officer contact information for the person who is to receive the letter.
(3) For the purpose of this subsection a Material Safety Data Sheet does not meet the requirement for formulation data.

(B) A violation is established if:

(1) the formulation data supplied by the responsible party or manufacturer shows that the product does not meet the applicable VOC or aromatic content standard; and/or
(2) the responsible party or manufacturer fails to respond to the

notice and provide formulation data with the 10 day specified time frame specified in this subsection.

NOTE: Authority cited: Sections 39600, 39601, 39607, 41511, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 39607, 40000, 41511, and 41712, Health and Safety Code.

94516. Severability.

Each part of this article shall be deemed severable, and in the event that any part of this article is held to be invalid, the remainder of this article shall continue in full force and effect.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94517. Federal Enforceability.

For purposes of federal enforceability of this article, the Environmental Protection Agency is not subject to approval determinations made by the Executive Officer under Sections 94511, 94514, and 94515. Within 180 days of a request from a person who has been granted an exemption or variance under Section 94511 or 94514, an exemption or variance meeting the requirements of the Clean Air Act shall be submitted by the Executive Officer to the Environmental Protection Agency for inclusion in the applicable implementation plan approved or promulgated by the Environmental Protection Agency pursuant to Section 110 of the Clean Air Act, 42 U.S.C., Section 7410. Prior to submitting an exemption granted under Section 94511 as a revision to the applicable implementation plan, the Executive Officer shall hold a public hearing on the proposed exemption. Notice of the time and place of the hearing shall be sent to the applicant by certified mail not less than 30 days prior to the hearing. Notice of the hearing shall also be submitted for publication in the California Regulatory Notice Register and sent to the Environmental Protection Agency, every person who requests such notice, and to any person or group of persons whom the Executive Officer believes may be interested in the application. Within 30 days of the hearing the Executive Officer shall notify the applicant of the decision in writing as provided in Section 94511(f). The decision may approve, disapprove, or modify an exemption previously granted pursuant to Section 94511.

NOTE: Authority cited: Section 39600, 39601, 39602, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 39602, 40000, and 41712, Health and Safety Code.

California Environmental Protection Agency

Air Resources Board

METHOD 310

DETERMINATION OF VOLATILE ORGANIC COMPOUNDS (VOC) IN CONSUMER PRODUCTS AND REACTIVE ORGANIC COMPOUNDS IN AEROSOL COATING PRODUCTS

(Including Appendices A and B)

Adopted: September 25, 1997
Amended: September 3, 1999
Amended: July 18, 2001
Amended: May 5, 2005
Amended: ****

DISCLAIMER: Mention of any trade name or commercial product in Method 310 does not constitute endorsement or recommendation of this product by the Air Resources Board.

2009 Proposed Amendments

METHOD 310

DETERMINATION OF VOLATILE ORGANIC COMPOUNDS (VOC) IN CONSUMER PRODUCTS AND REACTIVE ORGANIC COMPOUNDS IN AEROSOL COATING PRODUCTS

1 APPLICABILITY

1.1 This method (Method 310) applies to the determination of the percent by weight of:

(1) volatile organic compounds (VOC) in consumer products, antiperspirant and deodorant products, and aerosol coatings products as those terms are defined in Title 17, California Code of Regulations (CCR), Division 3, Chapter 1, Subchapter 8.5 (Consumer Products), commencing with section 94500, and

(2) low vapor pressure-volatile organic compounds (LVP-VOC) as that term is defined in section 94508(a), and

(3) the reactive organic compounds (ROC) contained in aerosol coating products, as that term is defined in Title 17, CCR, section 94521.

1.2 Method 310 determines the total volatile material in a product and the presence of any compounds prohibited by ARB regulations ("prohibited compounds"). Components of the product that do not meet the definition of a VOC or are exempted by ARB regulations for a specific product category ("exempt compounds") are subtracted from the total volatile material to determine the final VOC content for the product. Method 310 is also used to determine the percent by weight of the ROCs contained in aerosol coating products, for the purpose of determining compliance with the Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions, Title 17, CCR, sections 94520 to 94528 (the "Aerosol Coatings Regulation").

1.3 Method 310 does not apply to the determination of the composition or concentration of fragrance components in products.

1.4 The term "Executive Officer" as used in this document means the Executive Officer of the Air Resources Board or his or her authorized representative.

2 TEST METHODS

Method 310 incorporates by reference the following American Society for Testing and Materials (ASTM) International, National Institute for Occupational Safety and Health (NIOSH), and United States Environmental Protection Agency (US EPA) analytical test methods:

2.1 ASTM D 2369-01: Standard Test Method for Volatile Content of Coatings (January 10, 2001).

2.2 ASTM D 1426-98: Standard Test Methods for Ammonia Nitrogen in Water (December 10, 1998).

2.3 ASTM D 4017-96a: Standard Test Method for Water in Paints and Paint Materials by the Karl Fisher Titration Method (July 10, 1996).

2.4 ASTM D 3792-99: Standard Test Method for Water Content of Water-Reducible Paints by Direct Injection Into a Gas Chromatograph (May 10, 1999).

2.5 ASTM D 859-00: Standard Test Method for Silica in Water (determination of polymethylsiloxanes after digestion) (June 10, 2000).

2.6 ASTM D 3074-94: Standard Test Methods for Pressure in Metal Aerosol Containers (November 15, 1994) with the modifications found in Appendix A to this Method 310.

2.7 ASTM D 3063-94: Standard Test Methods for Pressure in Glass Aerosol Bottles (November 15, 1994) with the modifications found in Appendix A to this Method 310.

2.8 ASTM D 3064-97: Standard Terminology Relating to Aerosol Products (September 10, 1997).

2.9 NIOSH: Method 1400 Alcohols I (analysis of acetone and ethanol by gas chromatography). NIOSH Manual of Analytical Methods, Volume 1 (August 1994).

2.10 Gas Chromatography/Mass Spectrometry for Volatile Organics (analysis of exempt and prohibited compounds in the product by headspace/gas chromatography/mass spectrometry).

2.10.1 US EPA Method 8240B, September 1994, Revision 2, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Test Methods for Evaluating Solid Waste, Volume 1 B, Chapter 4, Section 4.3.2: Laboratory Manual Physical/Chemical Methods, SW-846, September 1994.

2.10.2 US EPA Method 8260B, December 1996, Revision 2, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), Test Methods for Evaluating Solid Waste, Volume 1 B, Chapter 4, Section 4.3.2: Laboratory Manual Physical/Chemical Methods, SW-846, December 1996.

2.11 US EPA Reference Method 24, Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings: 40 Code of Federal Regulations (CFR) Part 60, Appendix A, as it existed on September 11, 1995.

2.12 US EPA Reference Method 24A, Determination of Volatile Matter Content and Density of Printing Inks and Related Coatings: 40 CFR Part 60, Appendix A, as it existed on July 1, 1994.

2.13 US EPA Reference Method 18, Measurement of Gaseous Organic Compound Emissions by Gas Chromatography: 40 CFR Part 60, Appendix A, as it existed on September 25, 1996.

2.14 US EPA Method 300.7, March 1986. Dissolved Sodium, Ammonium, Potassium, and Calcium in Wet Deposition by Chemically Suppressed Ion Chromatography.

2.15 ASTM D 86-01: Standard Test Methods for Distillation of Petroleum Products (August 10, 2001).

2.16 ASTM D 850-00: Standard Test Methods for Distillation of Industrial Aromatic Hydrocarbons and Related Materials (December 10, 2000).

2.17 ASTM D 1078-01: Standard Test Methods for Distillation Range of Volatile Liquids (June 10, 2001).

2.18 ASTM D 2879-97: Standard Test Method for Vapor-Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteniscope (April 10, 1997) with the modifications found in Appendix B to this Method 310.

2.19 ASTM D 2887-01: Standard Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography (May 10, 2001).

2.20 ASTM E 1719-97: Standard Test Method for Vapor Pressure of Liquids by Ebulliometry (March 10, 1997).

3 CONSUMER PRODUCTS TESTING PROCEDURE

3.1 The testing begins when the Executive Officer selects a product for analysis by Method 310. The Executive Officer will maintain sample chain of custody throughout the selection and analytical process.

3.2 Initial Testing of Aerosol Products

If the sample is an aerosol product, the aerosol propellant is separated from the non-propellant portion of the product by using ASTM D 3074-94 (as modified in Appendix A

for metal aerosol container) or ASTM D 3063-94 (as modified in Appendix A for glass aerosol container). The propellant portion is analyzed for exempt or prohibited compounds by using US EPA Reference Method 18. The remaining non-propellant portion of the product is then analyzed as specified in section 3.3.

3.3 Initial Testing of Non-Aerosol Products and the Non-Propellant Portion of Aerosol Products

The non-aerosol product or non-propellant portion of an aerosol product is analyzed to determine the total volatile material present in the sample and to determine the presence of any exempt or prohibited compounds. This analysis is conducted by performing the following tests:[1]

3.3.1 Gravimetric analysis of samples to determine the weight percent of total volatile material, using US EPA Reference Methods 24/24A, ASTM D 2369-01.

3.3.2 Determination of sample water content. For determination of water content either ASTM D 4017-96a, or ASTM D 3792-99 may be used, or results from both procedures may be averaged and that value reported.

3.3.3 Determination of ammonium content using ASTM D 1426-98 or US EPA Method 300.7.

3.3.4 Determination of ketones and alcohol content using NIOSH Method 1400.

3.3.5 Analysis of exempt and prohibited compounds, if present (US EPA Reference Method 18, US EPA Method 8240B, US EPA Method 8260B, ASTM D 859-00, NIOSH Method 1400).

3.3.6 If LVP-VOC status is claimed or the analysis indicates the presence of an LVP-VOC component and the percent VOC is not in compliance, the Executive Officer will request formulation data as specified in Section 3.5.2.

3.3.7 <u>For low level VOC content samples, direct determination using US EPA Reference Method 18, US EPA Method 8240B, US EPA Method 8260B, ASTM D 859-00, NIOSH Method 1400.</u>

3.4 Prohibited Compounds

If the sample is found to contain compounds prohibited by ARB regulations (i.e., ozone-depleting compounds) at concentrations equal to or exceeding 0.1 percent by weight, the Executive Officer will reanalyze the sample for confirmation.

[1] Alternate test methods may be used, as provided in section 7.0

3.5 Initial Determination of VOC Content

The Executive Officer will determine the VOC content pursuant to sections 3.2 and 3.3. Only those components with concentrations equal to or greater than 0.1 percent by weight will be reported.

3.5.1 Using the appropriate formula specified in section 4.0, the Executive Officer will make an initial determination of whether the product meets the applicable VOC standards specified in ARB regulations. If initial results show that the product does not meet the applicable VOC standards, the Executive Officer may perform additional testing to confirm the initial results.

3.5.2 If the results obtained under section 3.5.1 show that the product does not meet the applicable VOC standards**,** the Executive Officer will request the product manufacturer or responsible party to supply product formulation data. The manufacturer or responsible party shall supply the requested information. Information submitted to the ARB Executive Officer may be claimed as confidential; such information will be handled in accordance with the confidentiality procedures specified in Title 17, California Code of Regulations, sections 91000 to 91022.

3.5.3 If the information supplied by the manufacturer or responsible party shows that the product does not meet the applicable VOC standards, then the Executive Officer will take appropriate enforcement action.

3.5.4 If the manufacturer or responsible party fails to provide formulation data as specified in section 3.5.2, the initial determination of VOC content under this section 3.5 shall determine if the product is in compliance with the applicable VOC standards. This determination may be used to establish a violation of ARB regulations.

3.6 Determination of the LVP-VOC status of compounds and mixtures. This section does not apply to antiperspirants and deodorants or aerosol coatings products because there is no LVP-VOC exemption for these products.

3.6.1 Formulation data. If the vapor pressure is unknown, the following ASTM methods may be used to determine the LVP-VOC status of compounds and mixtures: ASTM D 86-01, ASTM D 850-00, ASTM D 1078-01, ASTM D 2879-97, as modified in Appendix B to this Method 310, ASTM D 2887-01 and ASTM E 1719-97.

3.6.2 LVP-VOC status of “compounds” or “mixtures.” The Executive Officer will test a sample of the LVP-VOC used in the product formulation to determine the boiling point for a compound or for a mixture. If the boiling point exceeds 216^{o}C, the compound or mixture is an LVP-VOC. If the boiling point is less than 216^{o}C, then the weight percent of the mixture which boils above 216^{o}C is an LVP-VOC. The

Executive Officer will use the nearest 5 percent distillation cut that is greater than 216^{o}C as determined under 3.6.1 to determine the percentage of the mixture qualifying as an LVP-VOC.

3.6.3 Reference method for identification of LVP-VOC compounds and mixtures. If a product does not qualify as an LVP-VOC under 3.6.2, the Executive Officer will test a sample of the compound or mixture used in a product's formulation utilizing one or both of the following: ASTM D 2879-97, as modified in Appendix B to this Method 310, and ASTM E 1719-97, to determine if the compound or mixture meets the definition of LVP-VOC as specified in Title 17, CCR, section 94508(a).

3.7 Final Determination of VOC Content

If a product's compliance status is not satisfactorily resolved under sections 3.5 and 3.6, the Executive Officer will conduct further analyses and testing as necessary to verify the formulation data.

3.7.1 If the accuracy of the supplied formulation data is verified and the product sample is determined to meet the applicable VOC standards, then no enforcement action for violation of the VOC standards will be taken.

3.7.2 If the Executive Officer is unable to verify the accuracy of the supplied formulation data, then the Executive Officer will request the product manufacturer or responsible party to supply information to explain the discrepancy.

3.7.3 If there exists a discrepancy that cannot be resolved between the results of Method 310 and the supplied formulation data, then the results of Method 310 shall take precedence over the supplied formulation data. The results of Method 310 shall then determine if the product is in compliance with the applicable VOC standards, and may be used to establish a violation of ARB regulations.

4 CALCULATION OF VOC CONTENT

This section specifies the procedure for determining the final VOC content of a product, which is reported as percent by weight of VOC.

4.1 Aerosol Products

4.1.1 For aerosol products, except those containing LVP-VOC, the percent VOC content shall be calculated using the following equation:

$$\%\ VOC = \frac{WL\,(TV - A - H - EL) + WP - EP}{WL + WP} \times 100$$

Where[2]:

WL = weight (gm) of the non-propellant portion, excluding container and packaging.

TV = weight fraction of non-propellant total volatile material.

A = weight fraction of ammonia (as NH_4) in the non-propellant portion.

H = weight fraction of water in the non-propellant portion.

EL = weight fraction of exempt compounds in the non-propellant portion.

WP = weight (gm) of propellant.

EP = weight (gm) of exempt compounds in propellant.

4.1.2 For aerosol products containing LVP-VOC, the percent VOC shall be calculated using the following equation:

$$\%\ VOC = \frac{WL\left[(1 - H) \times (1 - LVP) - EL\right] + (WP - EP)}{WL + WP} \times 100$$

Where:

LVP = weight fraction of LVP-VOC compounds and/or mixtures in the non-propellant, non-aqueous portion.

1 – H = weight <u>fraction</u> of the non-propellant portion that does not contain water.

1 – LVP= weight <u>fraction</u> of the non-propellant, non-aqueous portion that is volatile.

4.2 Non-Aerosol Products

[2]Alternate test methods, as provided in section 7.0, or appropriate approved methods from section 2.0 may be used.

4.2.1 For non-aerosol products, except those containing LVP-VOC, the percent VOC content shall be calculated using the following equation:

$$\% \text{ VOC} = (\text{TV} - \text{A} - \text{H} - \text{EL}) \times 100$$

4.2.2 For non-aerosol products containing LVP-VOC, the percent VOC shall be calculated using the following equation:

$$\% \text{ VOC} = [(1 - \text{H}) \times (1 - \text{LVP}) - \text{EL}] \times 100$$

4.3 Consumer products subject to low VOC limits (below 5.0%) may have their VOC content characterized by a low level direct determination.

4.3.1 For aerosol products the percent VOC content may be calculated using the following equation:

$$\% \, VOC = \frac{WL \left[\sum V_n \right] + WP - EP}{WL + WP} \times 100$$

Where:

V = weight fraction of non-exempted volatile organic compounds in the non-propellant portion.

n = number of non-exempted volatile organic compounds in the non-propellant portion.

WL = weight (gm) of the non-propellant portion, excluding container and packaging.

WP = weight (gm) of propellant.

EP = weight (gm) of exempt compounds in propellant.

4.3.2 For non-aerosol products the percent VOC content shall be calculated using the following equation:

$$\% \, VOC = \left[\sum V_n \right] \times 100$$

5 TESTING TO DETERMINE REACTIVE ORGANIC COMPOUNDS IN AEROSOL COATING PRODUCTS

This section specifies the procedure for determining the percent by weight of the reactive organic compounds contained in aerosol coating products, for the purpose of determining compliance with the Aerosol Coatings Regulation.

5.1 The testing begins when the Executive Officer selects a product for analysis. The Executive Officer will maintain sample chain of custody throughout the selection and analytical process. When a product is selected for testing, the Executive Officer will request the product manufacturer or responsible party to supply the product formulation data specified in Title 17, CCR, section 94526(b)(2). The manufacturer or responsible party shall supply the requested information within 10 working days. Information submitted to the Executive Officer may be claimed as confidential; such information will be handled in accordance with the confidentiality procedures specified in sections 91000 to 91022, Title 17, CCR.

5.2 Initial Testing of the Propellant Portion of Aerosol Coating Products

The aerosol propellant is separated from the non-propellant portion of the product by using ASTM D 3074-94 (as modified in Appendix A for metal aerosol container) or ASTM D 3063-94 (as modified in Appendix A for glass aerosol container). The propellant portion is analyzed for reactive organic compounds and other compounds by using US EPA Reference Method 18. The remaining non-propellant portion of the product is then analyzed as specified in section 5.3.

5.3 Initial Testing of the Non-Propellant Portion of Aerosol Coating Products

The non-propellant portion of the product sample is analyzed to determine the reactive organic compounds in the sample, including the presence of any prohibited compounds. This analysis is conducted by performing the following tests:[3]

5.3.1 Gravimetric analysis of samples to determine the weight percent of total volatile material, using US EPA Reference Methods 24/24A, ASTM D 2369-01.

5.3.2 Determination of sample water content. For determination of water content either ASTM D 4017-96a, or ASTM D 3792-99 may be used, or results from both procedures may be averaged and that value reported.

5.3.3 Determination of ammonium content using ASTM D 1426-98 or US EPA Method 300.7.

[3] Alternate test methods may be used, as provided in section 7.0

5.3.4 Determination of ketones and alcohol content using NIOSH Method 1400.

5.3.5 Analysis of reactive organic compounds and, if present, prohibited compounds (US EPA Reference Method 18, US EPA Method 8240B, US EPA Method 8260B, ASTM D 859-00, NIOSH Method 1400).

5.4 Prohibited Compounds

If the sample is found to contain compounds prohibited by the Aerosol Coatings Regulation (e.g., ozone-depleting compounds) at concentrations equal to or exceeding 0.1 percent by weight, the Executive Officer will reanalyze the sample for confirmation.

5.5 Initial Determination and Verification of Reactive Organic Compound Content

The Executive Officer will determine the reactive organic compound content by verifying formulation data pursuant to sections 5.2 and 5.3. Only those components with concentrations equal to or greater than 0.1 percent by weight will be reported.

5.5.1 Based on manufacturers formulation data and the analysis conducted under section 5, the Executive Officer will make an initial determination of whether the product meets the applicable requirements specified in the Aerosol Coatings Regulation. If initial results show that the product does not meet the applicable requirements, the Executive Officer may perform additional testing to confirm the initial results.

5.6 Final Determination of Reactive Organic Compound Content

If a product's status is not satisfactorily resolved under section 5.1 - 5.5, the Executive Officer may conduct additional analyses and testing as necessary to verify the formulation data.

5.6.1 If the Executive Officer is unable to verify the accuracy of the supplied formulation data, then the Executive Officer will request the product manufacturer or responsible party to supply additional information to explain the discrepancy.

5.6.2 If the additional information supplied by the manufacturer or responsible party shows that the product does not meet the applicable requirements, then the Executive Officer will take appropriate enforcement action.

5.6.3 If the manufacturer or responsible party fails to provide additional information as specified in section 5.6.1, the initial determination of reactive organic compound content under section 5.1 – 5.5 shall determine if the product is in compliance with the applicable reactive organic compound limits. This determination may be used to establish a violation of the Aerosol Coatings Regulation.

5.6.4 If there exists a discrepancy that cannot be resolved between the results of Method 310 and the formulation data or additional information supplied by the manufacturer or responsible party, then the results of Method 310 shall take precedence over the supplied formulation data or additional information. The results of Method 310 shall then determine if the product is in compliance with the applicable requirements, and may be used to establish a violation of the Aerosol Coatings Regulation.

6 METHOD PRECISION AND ACCURACY

6.1 The precision of Method 310 for determining VOC content was evaluated using seven representative products with known volatile organic compound (VOC) contents ranging from 6.2 to 81.2 percent VOC by weight. Each sample was divided into six portions, and each portion was separately analyzed to determine the VOC content. Based on the results of this analysis, the 95 percent confidence interval for Method 310 is 3.0 percent by weight (Wt/Wt%).

6.2 For determining the percent by weight of the individual ingredients in aerosol coating products, the precision and accuracy of the determination for each ingredient is governed by the precision and accuracy of the test method used to ascertain the percent by weight of each ingredient.

7 ALTERNATE TEST METHODS

Alternative test methods which are shown to accurately determine the concentration of VOCs or constituent components in antiperspirant/deodorants, consumer products, or aerosol coating products (or their emissions) may be used upon written approval of the Executive Officer.

Method 310 - Appendix A

PROPELLANT COLLECTION PROCEDURES

1 APPLICATION

The procedure applies to modify ASTM D 3074-94 and D 3063-94 to allow collection of the propellant for analysis and density measurement for metal aerosol containers and glass aerosol containers, respectively. These modified procedures also retain the aerosol standard terminology listed in ASTM D 3064-97.

2 LIMITATIONS

Nitrogen analysis: Nitrogen may be used as a component of the propellant system. Ambient air is 78 percent nitrogen and may be present as a contaminate in the system prior to sample collection. This is eliminated by sweeping out any connecting lines to the Tedlar bag with product before starting sample collection. This procedure will eliminate or reduce nitrogen contamination to less than 0.1% by weight of the sample and the analysis of the propellant gas will be unaffected.

3 APPARATUS AND MATERIALS

3.1 Propellant Collection System: See Figure 1 (metal containers) and Figure 3 (glass containers).

3.2 Tedlar Bags equipped with slip valve and septum

3.3 Density Measurement

3.3.1 250 mL gas dilution bulb, or

3.3.2 Density/Specific gravity meter meeting the following minimum specifications:

3.3.2.1 Measurement Range: 0 – 3 +/- 0.00001 g/cm^3

3.3.2.2 Measurement Temperature Range: $4^oC \sim 70^oC$.

3.4 Balance, capable of accurately weighing to 0.1 mg

3.5 Sample Venting Platform. See Figure 2 (metal containers)[1] and Figure 4 (glass containers)[2].

3.6 Platform Shaker, equivalent to Thermolyne M49125

3.7 Cork Rings, 80 x 32 mm

4 PROCEDURE

4.1 Propellant Collection for Metal Aerosol Containers

4.1.1 Close valves on Propellant Collection System (see Figure 1).

4.1.2 Remove the actuator from valve on the aerosol can and weigh can to the nearest 0.01 g.

4.1.3 Place the can in an inverted position onto the Sample Venting Platform, stabilized by cork rings.

4.1.4 Slowly raise the hydraulic jack until the can is pierced. Note the pressure of the can.

4.1.5 Vent the can until propellant is seen flowing from output 1. Collect the propellant in the Tedlar bag from output 1. Density is determined from this same Tedlar bag, as necessary.

4.1.6 After the propellant is collected, close and remove the Tedlar bag and vent the remainder of the propellant.

4.1.7 After the flow ceases from the can, it is removed from the assembly and allowed to vent overnight on a platform shaker, to vent the remainder of the propellant.

4.1.8 Reweigh the can to the nearest 0.01 gm and record weight loss (total gms propellant). The can may now be opened for analysis of the non-propellant portion of the sample.

4.2 Propellant Collection for Glass Aerosol Containers

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[1] The metal piercing adaptor is available from Mid-West Screw Products, Inc., 3523 North Kenton Ave., Chicago, IL 60641. Interim Part Number: 8013A-3/4 45TAPER REV. The gasket is available from Alltech Associate 2051 Waukegan road, Deerfield, IL 60015, part number 80-16.

[2] The glass aerosol tapered adaptor is available from Armstrong Technologies, Inc. 12780 Earhart Ave., Auburn, CA 95602.

4.2.1 Remove the actuator from valve of the aerosol glass container and weigh container to the nearest 0.01 gm.

4.2.2 With container in an inverted position place the valve onto the tapered adaptor.

4.2.3 Pressurize the air cylinder to actuate the sample container valve onto the tapered adaptor. Note the pressure of the sample container.

4.2.4 Open the sample valve and collect propellant sample into the Tedlar bag. Density is determined from this same Tedlar bag, as necessary.

4.2.5 After the propellant is collected, close and remove the Tedlar bag and vent the remainder of the propellant.

4.2.6 Continue to vent the container on the platform assembly until no pressure registers on the sample gauge and there in no visable propellant flowing from the sampling tube.

4.2.7 Remove the container from the platform.

4.2.8 Loosen and remove the container valve assembly.

4.2.9 Place the container on a platform shaker to vent the remainder of the propellant.

4.2.10 Reweigh the container and valve assembly to the nearest 0.01 gm and record weight loss (total gms propellant). The non-propellant portion of the sample is ready to be analyzed.

FIGURE 1

PROPELLANT COLLECTION SYSTEM
METAL AEROSOL CONTAINER

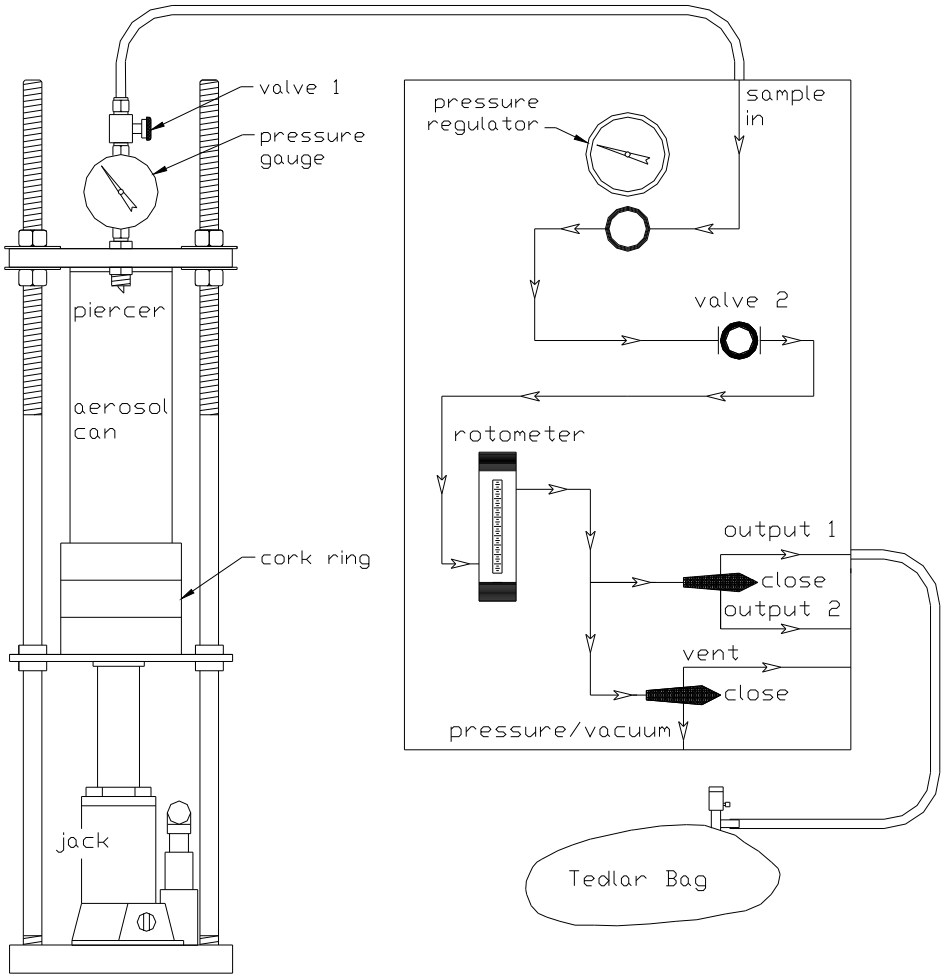


FIGURE 2

SAMPLE VENTING PLATFORM
METAL AEROSOL CONTAINER

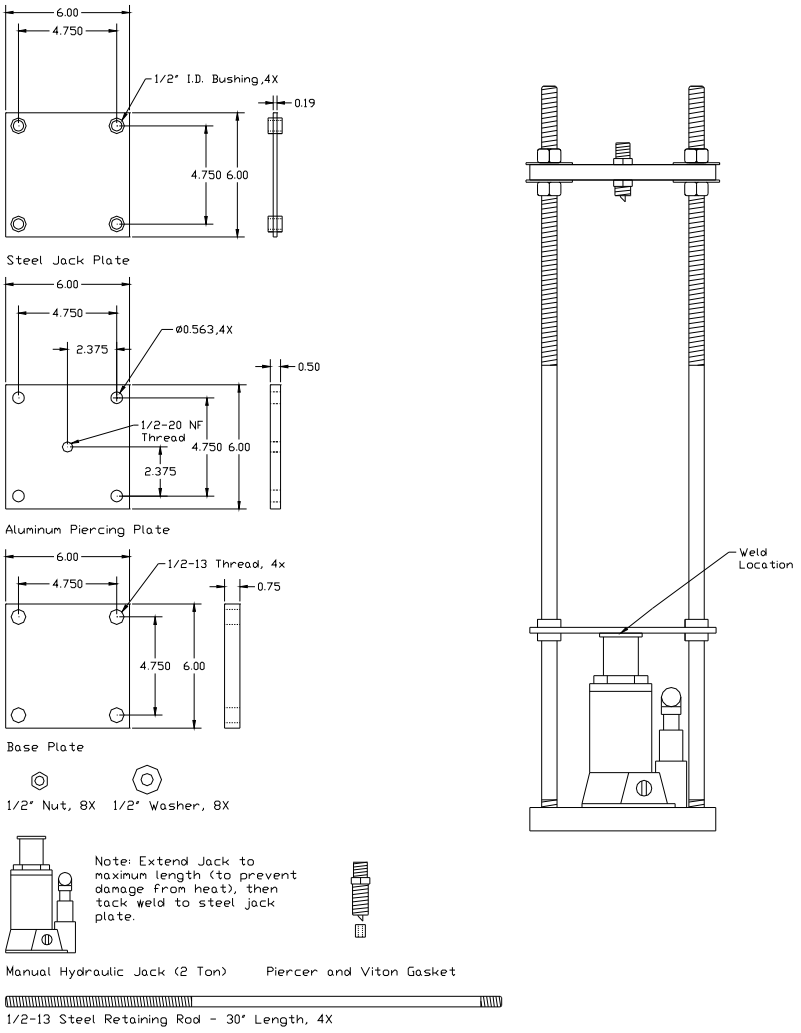


FIGURE 3

PROPELLANT COLLECTION SYSTEM
GLASS AEROSOL CONTAINER

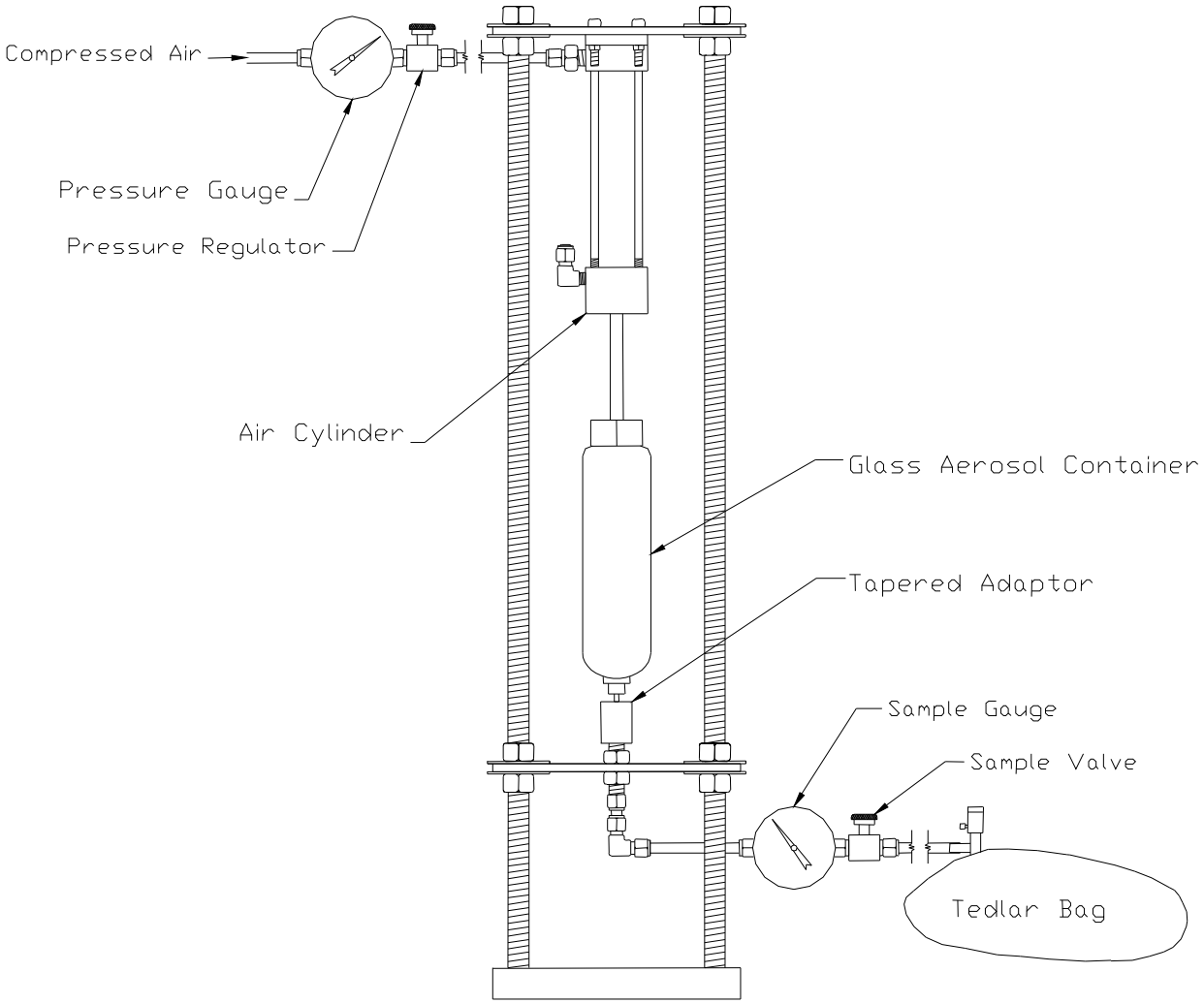
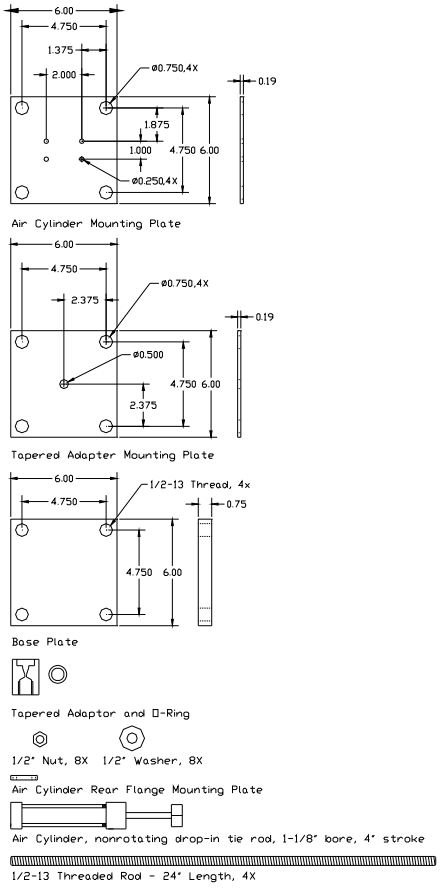
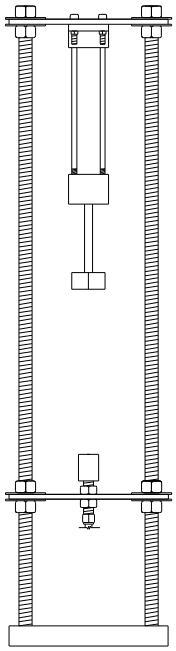


FIGURE 4

SAMPLE VENTING PLATFORM
GLASS AEROSOL CONTAINER





Method 310 - Appendix B

MODIFICATIONS to ASTM D-2879-97

This procedure modifies ASTM D-2879-97 as follows:

1. Modifications to the isoteniscope apparatus include:

    a. capacitance manometers and digital readout
    b. manifold system made of stainless steel and modified in design
    c. Ultra-torr fittings and Ultra-torr flex-lines
    d. ballast on the vacuum side of the isoteniscope manifold as depicted in ASTM D 2879-97 schematics, has been removed.
    e. stainless steel liquid nitrogen trap (Cold Trap)
    f. stainless steel high vacuum valves
    g. recirculating cooling system (required for extremely low pressure work only)
    h. diffusion pump (required for extremely low pressure work only)
    i. hot ion cathode vacuum gauges (required for extremely low pressure work only)

2. A purge and degassing procedure consisting of lower pressures and a liquid nitrogen bath replaces the step of lightly boiling the sample as outlined in ASTM D 2879-97.

3. Purge and Degassing Cycle

    a. With the U-tube connected, the system is evacuated to approximately 1.0 mm Hg. This readily removes most of the higher volatility gases from the sample.

    b. The stainless steel, liquid nitrogen cold trap is filled. The manifold is now brought to approximately 300 mm Hg with the purified nitrogen, regulated through the needle valve.

    c. The isoteniscope tube is carefully placed into a Dewar of liquid nitrogen. The ½ atmosphere pressure of nitrogen prevents the sample from splashing while being frozen. After the sample freezes, the system is evacuated to 0.05 mm Hg.

    d. The U-tube is removed from the Dewar, secured and allowed to warm to room temperature. The U-tube bulb head should be angled so the dissolved gases will be readily evacuated as the frozen sample starts to melt. When gases build up, it may be necessary to tilt the U-tube to release the gases.

    e. Repeat the freeze and degas process once, reducing pressure each time to less than 0.05 mm Hg. After the sample has returned to room temperature, close valve #3. There

should be minimal dissolved gases left once the frozen sample starts to melt. Tilt the tube to release any gas pockets (if necessary). Do not push nitrogen into the evacuated space between the sample in the arm and the sample in the reservoir. At this point, if the sample is properly degassed, a "natural break" should form in the sample. This creates a vapor space as the liquid level in the bulb leg of the manometer falls to a quasi-equilibrium position, usually with the fluid level higher in the long manometer leg. If there is no pendulum effect, and the liquid level in the long leg of the manometer is significantly higher than the level in the short leg (> 2 mm), degassing is probably incomplete, and the degassing procedure should be repeated.

4. Data Evaluation

The regression based on the plot of Log P vs. 1/T as outlined in ASTM D 2879-97 has been removed and replaced with a nonlinear regression to generate the coefficients for an Antoine equation. The data analysis procedure assumes that the measured pressure is the sum of the compound's vapor pressure and a residual fixed gas pressure. The vapor pressure's dependence on absolute temperature is represented by an Antoine expression, and the fixed gas as pressure is directly proportional to absolute temperature as outlined in ASTM 2879. This leads to the model equations:

$$P_{model} = P_{vapor} + P_{fixed\ gas}$$

$$P_{model} = B0 * 10^{(B1/(T+B2))} + B3 * T$$

where T is the absolute temperature (K) and B0, B1, B2 and B3 are coefficients to be determined via a nonlinear regression which minimizes the sum of squares $\sum (P_{meas} - P_{model})^2$ for all experimental data points. The vapor pressure at 20^o C is then calculated as:

$$P_{vapor}\ (293.15\ K) = B0 * 10^{(B1/(293.15+B2))}$$

With a set of pressure vs. temperature measurements, the nonlinear regression can be performed using a statistical software packages. The following constraints are imposed to obtain meaningful Antoine equation coefficients for low vapor pressure samples:

a. Pressures shall be measured at temperatures ranging from room temperature to about 180^{o} C. Narrower ranges will not provide sufficient information to determine the Antoine curvature, i.e., B2 coefficient. Wider ranges can lead to experimental difficulties maintaining the vapor space in the isoteniscope. A minimum of 12 points is necessary to provide ample degrees of freedom for the calculations.

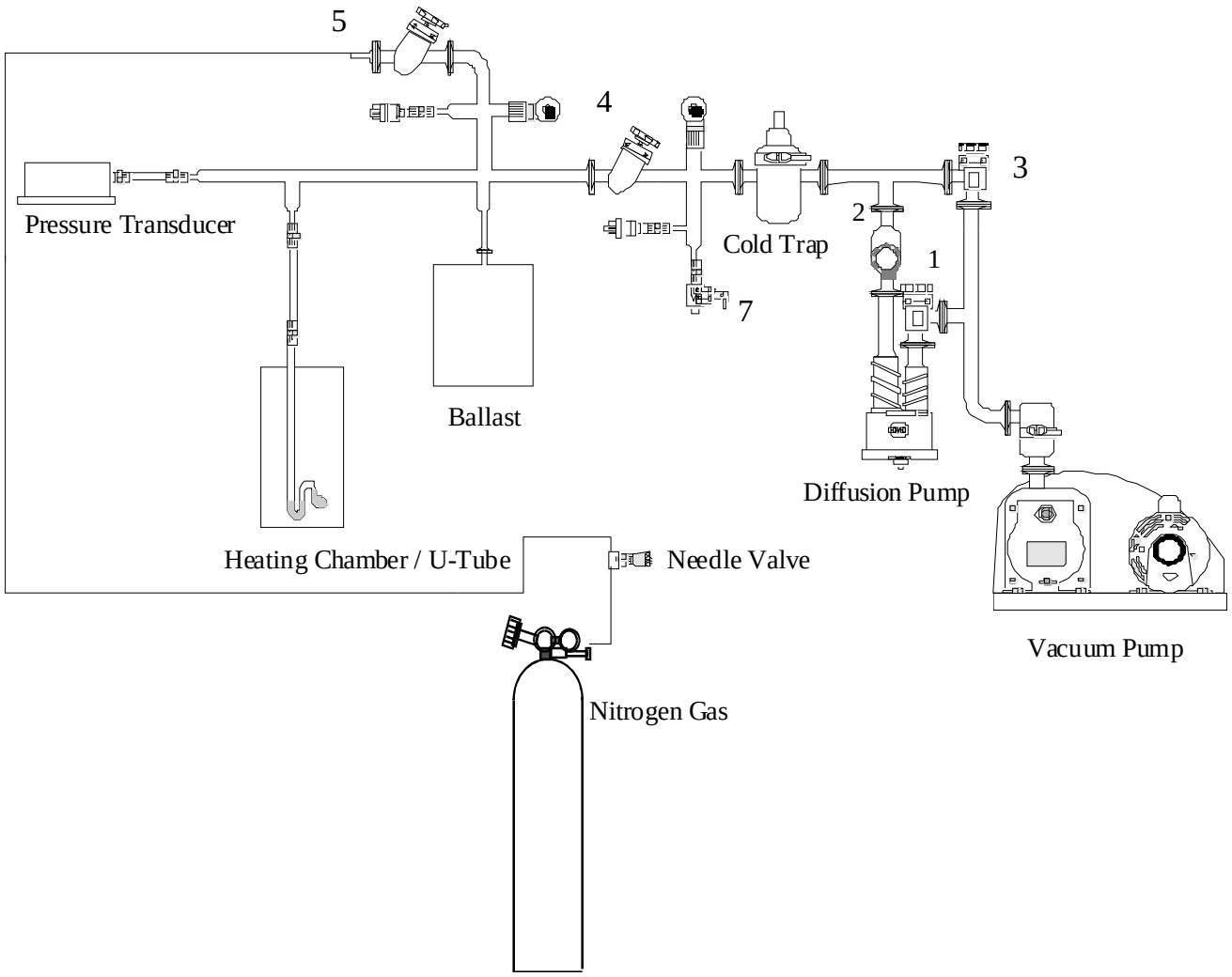
b. Initial pressures at room temperature shall be less than 1 mm Hg. Higher values are indicative of significant levels of dissolved fixed gases. These will vaporize during the course of the experiment as temperature is increased and invalidate the model's assumption for the fixed gas contribution.

c. $-235 \leq B\ 2 \leq 0$. Positive values of B2 imply that the heat of vaporization of the substance increases with increasing temperature. Thermodynamic data for many compounds suggests this is unrealistic. Large negative values can lead to unrealistically low vapor pressure values coupled with excessive fixed gas contributions. The -235(K) bound is chosen to be consistent with literature values of B2 for many pure compounds. For hydrocarbons in the LVP-VOC range, $B2 \geq -100$ provides reasonable agreement between measured and literature vapor pressures.

d. The fixed gas coefficient, B3, should normally be ≥ 0.

Figure 1

ISOTENISCOPE VAPOR PRESSURE MEASUREMENT APPARATUS



Appendix C

Summary of Consumer Products Regulatory Actions

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
6/16/89	Consumer Products Control Plan.	N/A	First Board action on consumer products. Board approved overall plan to fulfill H&SC Section 41712 mandate and a goal of achieving a 50 percent reduction in VOC emissions from consumer products.
11/8/89/ (2/27/91)	Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	Article 2, Sections 94500-94506, Title 17, CCR.	First consumer product regulation adopted pursuant to the CCAA. Established VOC content limits for aerosol and non-aerosol antiperspirants and deodorants.
6/15/90	Regulation for Reducing VOC Emissions from Consumer Products in the Bay Area AQMD.	Article 2, Consumer Products, Sections 94520-94527, Title 17, CCR.	This regulation was adopted to reduce VOC emissions from consumer products in the Bay Area AQMD and establishes VOC limits for 6 consumer products.
10/11/90/ (10/21/91)	Regulation for Reducing VOC Emissions from Consumer Products - Phase I.	Article 2, Consumer Products, Sections 94507-94516 and 94503.5, Title 17, CCR Amendments to Article 2, Section 94505, Title 17, CCR	Establishes VOC limits for 16 consumer products, repeals the Bay Area consumer product regulation, and amends the AP/DO regulation to include an innovative product provision and a revised variance procedure.
1/9/92/ (1/6/93)	Adoption of Amendments to the Regulation for Reducing VOC Emissions from Consumer Products - Phase II.	Article 2, Consumer Products, Sections 94507-94517, Title 17, CCR.	Establishes standards for 10 additional categories of consumer products and several amendments to the existing regulation for clarification and improvement.
9/22/94/ (9/9/95)	Adoption of the Alternative Control Plan Regulation for Consumer Products.	Article 4, Sections 94540-94555, Title 17, CCR.	A voluntary market-based regulation which supplements the existing consumer products regulation by providing manufacturers with additional flexibility for formulating products.
11/15/94/ (2/14/95)	Approval of the California State Implementation Plan for Ozone.	N/A	Board approval of Ozone SIP which includes consumer products element comprised of near, midterm, and long term measures.
3/23/95/ (1/8/96)	Regulation for Reducing VOC Emissions from Aerosol Coating Products and Amendments to the Alternative Control (ACP) Plan.	Article 3, Sections 94520-94528, Title 17, CCR Amendments to Article 4, Sections 94540 to 94543, 94547, 94550, 94551, and 94553, Title 17, CCR.	Establishes VOC content limits for 35 categories of aerosol paints. Amendments to ACP to incorporate aerosol coating products.

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
9/28/95/ (2/29/96)	Amendments to the California Regulations for Reducing VOC Emissions from Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products.	Amendments to Article 1, Sections 94500-94504, Title 17, CCR, Article 2, Section 94508(a)(90), Title17, CCR, and Article 3, Section 94521(a)(62), Title 17, CCR.	The amendments to the AP/DO regulation address fairness concerns, preserves projected emission reductions required by the SIP, ensures that manufacturers will continue their efforts to develop zero percent products and provides a vehicle to monitor progress and to make the VOC definition more consistent with EPA's VOC definition. The consumer products regulation and the aerosol coatings regulation is modified to revise the VOC definition consistent with EPA's.
11/21/96/ (11/18/97)	Amendments to the California Regulations for Reducing VOC Emissions from Consumer Products and Aerosol Coating Products.	Amendments to Article 2; Sections 94508, 94515 94517 and Article 3; Section 94521, Title 17, CCR.	The amendments to the consumer products regulation address postponement of the 25 percent standard for aerosol adhesives, modification to the VOC definition, amendment of various regulatory provisions to enhance clarity and compliance, and amendment to the test methods sections. The proposed amendments also modify the VOC definition in the aerosol coatings regulation.
3/27/97/ (8/24/98)	Amendments Pertaining to Hairspray in the California Consumer Products Regulation.	Amendments to Article 2, Sections 94509, 94513, and 94514,Title 17, CCR.	Postpones the hairspray 55 percent VOC standard from 1/1/98 to 6/1/99, require plans demonstrating progress toward compliance from manufacturers selling hairspray not meeting the 55 percent VOC standard from 1/1/98 to 6/1/99, and modifies the variance provision to include a requirement for VOC emissions mitigation when granting a variance request for hairsprays from the 6/1/99 standard.
7/24/97/ (7/1/98)	Amendments to the Consumer Products Regulation, Mid-term Measures I.	Amendments to Article 2, Sections 94508, 94509, 94510, 94512, 94513, and 94514, Title 17, CCR.	All VOC standards with 1/1/2000, effective dates were extended to 1/1/2001; First tiers of the two-tiered VOC standards and additional reporting requirements for four product categories were eliminated; Effective dates of the VOC standard were changed for five product categories.
11/19/98/ (6/24/99)	Amendments to the Aerosol Coating Products, the Antiperspirants and Deodorants Regulation, and the Consumer Products Regulation.	Amendments to Article 3, Section 94521, 94522, and 94524, Title 17, CCR; Article 1, Section 94501, Title 17, CCR; and to Article 2, Section 94508(a)(124), Title 17, CCR.	Relaxation of the second-tier VOC limits of the Aerosol Coating Products Regulation. Exemption of methyl acetate from the VOC definition in the Antiperspirants and Deodorants Regulation, the Consumer Products Regulation, and the Aerosol Coating Products Regulation.

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
10/28/99/ 11/19/2000	Amendments to the Consumer Products Regulation, Mid-term Measures II.	Amendments to Article 2, Section 94508, 94509, and 94513.	Amends the Consumer Products Regulation by adding product category definitions, VOC limits for two new categories, more stringent VOC limits for fifteen existing categories, and adding subcategories for some of the existing product categories with separate VOC limits for each subcategory. New or modified VOC limits become effective from 12/31/2000, to 12/31/2004. Amendments consolidates and expands the existing reporting requirements for products containing methylene chloride or perchloroethylene.
5/25/2000/ (5/18/2001)	Amendments to the Consumer Products Regulation relating to Aerosol Adhesives.	Amendments to Article 1, Sections 94508, 94509, 94512, and 94513, Title 17, CCR.	Amendments eliminate the 25 percent VOC limit and establish new VOC limits for three new categories of aerosol adhesives, effective January 1, 2002. Amendments also include labeling and other requirements to facilitate compliance and enforcement of the new standards. Effective 1/1/2002, amendments also prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene, which are toxic air contaminants, in aerosol adhesives manufactured for use in California.
6/22/2000/ (7/18/2001)	Consumer Products Relating to Aerosol Coating Products, Proposed Tables of Maximum Incremental Reactivity (MIR) Values, and Amendments to Method 310.	Amendments to Article 3, Sections 94521, 94522, 94523, 94524, and 94526. Added new sections 94700 and 94701, to Title 17, CCR.	Amendments replace the second tier mass-based VOC limits for 35 product categories with equivalent reactivity-based limits. In addition, a new subchapter, Subchapter 8.6, in title 17, CCR was adopted. New Subchapter 8.6, in sections 94700 and 94701, contains Tables of MIR Values that are used to set reactivity-based limits and determine compliance.
10/26/2000/ (4/24/2001)	Amendments to the Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	Amendments to Article 2, Sections 94502 and 94504, Title 17, CCR.	Amendments increased the HVOC limit for aerosol antiperspirants to 40 percent from the current zero percent limit, beginning 1/1/2001. The MVOC limit of 10 percent remains unchanged.
6/24/2004/ (7/20/2005) Continues next page	Amendments to the Consumer Products, Test Method 310, Antiperspirants and Deodorants, Aerosol Coating Products, and an Airborne Toxic Control Measure (ATCM) for Para-	Amendments to sections 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, title 17, California Code of Regulations (CCR) and adoption of	Amendments established new VOC limits for 15 product categories. Regulatory action also prohibited the use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in seven product categories. The ATCM prohibits the use of para-dicholorobenzene in toilet/urinal care products and solid air fresheners. Amendments also modified and updated Method 310 used to determine the

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
Continued	Dichlorobenzene	amendments to ARB Method 310, which is incorporated by reference in sections 94506, 94515, and 94526, title 17, CCR.	percent by weight of reactive organic compounds in aerosol coating products and VOCs in consumer products and AP/DO products.
6/24/2004/ (7/20/2005)	Amendments to the Consumer Products, Test Method 310, Antiperspirants and Deodorants, Aerosol Coating Products, and an Airborne Toxic Control Measure (ATCM) for Para-Dichlorobenzene	Amendments to sections 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, title 17, California Code of Regulations (CCR) and adoption of amendments to ARB Method 310, which is incorporated by reference in sections 94506, 94515, and 94526, title 17, CCR.	Amendments established new VOC limits for 15 product categories. Regulatory action also prohibited the use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in seven product categories. The ATCM prohibits the use of para-dicholorobenzene in toilet/urinal care products and solid air fresheners. Amendments also modified and updated Method 310 used to determine the percent by weight of reactive organic compounds in aerosol coating products and VOCs in consumer products and AP/DO products.
11/16/2006/ (12/08/2007)	Amendments to the Aerosol Coating Products Regulation and the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94513, and 94523 to title 17, California Code of Regulations (CCR). Non-substantial or solely grammatical changes are also proposed to sections 94507, 94511, 94512, 94514, 94515, 94516, and 94517.	Consumer Products Regulation amended by adding and modifying product category definitions and by establishing new VOC limits for 16 product categories. For some of the categories, separate VOC limits are specified for different product forms. New or modified VOC limits become effective on December 31, 2008, remainder become effective on December 31, 2010. Regulatory action also prohibits use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in the following products categories: “Bathroom and Tile Cleaner,” “Construction, Panel, and Floor Covering Adhesive,” “General Purpose Cleaner,” and “Oven Cleaner.” Amendment was also adopted to section 94523 (Exemptions) of the Aerosol Coatings Regulation. Amendment clarifies several product categories are exempt from regulation under the Aerosol Coatings Regulation.

Summary of Consumer Products Regulatory Actions

Action Date/ (Effective Date)	Regulatory Action	Site	Comments
11/16/2006/ (12/08/2007)	Amendments to the Aerosol Coating Products Regulation and the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94513, and 94523 to title 17, California Code of Regulations (CCR). Non-substantial or solely grammatical changes are also proposed to sections 94507, 94511, 94512, 94514, 94515, 94516, and 94517.	Consumer Products Regulation amended by adding and modifying product category definitions and by establishing new VOC limits for 16 product categories. For some of the categories, separate VOC limits are specified for different product forms. New or modified VOC limits become effective on December 31, 2008, remainder become effective on December 31, 2010. Regulatory action also prohibits use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in the following products categories: "Bathroom and Tile Cleaner," "Construction, Panel, and Floor Covering Adhesive," "General Purpose Cleaner," and "Oven Cleaner." Amendment was also adopted to section 94523 (Exemptions) of the Aerosol Coatings Regulation. Amendment clarifies several product categories are exempt from regulation under the Aerosol Coatings Regulation.
6/26/2008/ (7/18/2009)	Amendments to the Consumer Products Regulation	Amendments to sections 94508, 94509, 94510, 94512, 94513, and 94515 to title 17, California Code of Regulations.	Regulation was amended by adding and modifying product category definitions and by establishing new or lower VOC limits for 19 product categories. A mass limit was adopted for fabric softener products used in clothes dryers. An additional amendment removed the "grandfather" clause that pertains to Personal Fragrance Products with 20 percent or less fragrance. Removal of this clause requires all Personal Fragrance Products with 20 percent or less fragrance to meet a single VOC limit. The new or modified VOC limits become effective between December 31, 2010 and December 31, 2015. This action also prohibits the use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in the following product categories: "Carpet/Upholstery Cleaner," "Fabric Protectant," "Multi-Purpose Lubricant," "Penetrant," "Sealant or Caulking Compound," and "Spot Remover." Use of methylene chloride and perchloroethylene are also prohibited in "Pressurized Gas Duster" products. To partially fulfill the Discrete Early Action Measure for consumer products, the amendments will reduce the use of compounds with high GWP in Pressurized Gas Duster products. These products can only use compounds with GWP factors below 150. The

Continues next page

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Site	Comments
Continued			GWP values used to determine compliance are those set forth in the Intergovernmental Panel on Climate Change, Second Assessment Report. The Board also adopted a modification to the definition of VOC. This modification excludes hydrofluoroether 7200 from the definition based on its negligible impacts on ground-level ozone formation.

Appendix D

Summary of Ingredient Reformulation Costs

Methodology of Recurring Cost Research and Analysis

For each category proposed for regulation staff evaluates formulations of complying and non-complying products. These formulations are then used to develop example, non-confidential formulas that are representative of the category. These representative complying and non-complying formulas are used to estimate the cost of raw materials to produce each formulation. The difference in cost between a pound of complying and noncomplying formula is then calculated. Next, the average unit size is used to calculate the cost to comply per unit. The average unit size is the predominant unit size in a category as reported in the survey.

To assign costs, distributor-level ingredient prices from *ICIS Chemical Business* website (ICIS, 2008), and chemical materials distributors were used to calculate the baseline and compliant material costs for these formulations. Low and high cost scenarios are calculated for each category. In the low cost scenario, the cost per pound of product is calculated using the low end estimate of the cost of each raw material. In the high cost scenario, the high end of the raw material price range is used. Other than compounds that were to be quantified, the 2006 Survey did not ask for specific ingredient details for exempt compounds, fragrance materials, some low vapor pressure VOCs, and inorganic compounds. Therefore, unspecified ingredients or ingredients for which prices were unknown were grouped into an "all others" classification and assigned a default low and high cost of $3.50 and $7.00 per pound, respectively (ARB, 1997c), low and high cost for fragrance materials were estimated at $5.00 and $10.00 per pound respectively. Inorganic compounds were assigned a low and high cost of $0.09 and $0.91 per pound, respectively, based on the costs found of the most common inorganic compounds found in the product categories.

In some cases, the compliant formula is less expensive than the typical non-compliant formula. This is true, for example, when some amount of VOC solvent is replaced with water. Also, if the high cost estimate of the solvent is significantly higher than the low cost estimate, the net savings to reformulate will *increase* in the high cost scenario, because the cost per pound of the water did not increase in the high cost scenario.

The costs calculated here are then copied into Table VII-1a in Chapter VII, Economic Impacts and used to determine total costs of the proposed amendments.

Air Freshener: Double Phase Aerosol

Category:	Air Freshener
Subcategory	Aerosol – Double Phase
Typical non-compliant:	24.5 % by weight
Proposed Limit:	20 % by weight
Average Unit Size	9.00 wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	72.80	0.00	77.80	0.00
HC Propellant	0.700	24.00	0.17	19.00	0.13
Alcohol	0.457	1.00	0.00	1.00	0.00
Glycols	0.620	1.00	0.01	1.00	0.01
Inorganics	0.090	0.50	0.00	0.50	0.00
Fragrance	5.000	0.70	0.04	0.70	0.04
		Total Cost, $/pound:	0.22		0.18
		Total Cost, $/Unit:	0.12		0.10
				Cost increase to comply, $/unit:	(0.02)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant		VOC Compliant	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Water	0.002	72.80	0.00	77.80	0.00
HC Propellant	1.050	24.00	0.25	19.00	0.20
Alcohol	0.940	1.00	0.01	1.00	0.01
Glycols	0.960	1.00	0.01	1.00	0.01
Inorganics	0.910	0.50	0.00	0.50	0.00
Fragrance	10.000	0.70	0.07	0.70	0.07
		Total Cost, $/pound:	0.35		0.29
		Total Cost, $/Unit:	0.20		0.17
				Cost increase to comply, $/unit:	(0.03)

Multi-purpose Solvent/Paint Thinner – Tier 1

Category:	Multi-purpose Solvent/Paint Thinner
Subcategory	Non-aerosol
Typical non-compliant:	100 % by weight
Proposed Limit:	30 % by weight
Average Unit Size	93.40 wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant		VOC Compliant TIER 1 – 30%	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon solvent	0.540	100.00	0.54	25.00	0.13
Water	0.002	0.00	0.00	37.00	0.00
VOC Glycol Ether	1.150			5.00	0.06
Acetone	0.402			25.00	0.10
Exempt Compound	2.000			5.00	0.10
Non-solvent LVP	3.500			3.00	0.11
		Total Cost, $/pound:	0.54		0.50
		Total Cost, $/Unit:	3.15		2.91
				Cost increase to comply, $/unit:	(0.24)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant		VOC Compliant TIER 1 – 30%	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon solvent	0.800	100.00	0.80	25.00	0.20
Water	0.002	0.00	0.00	37.00	0.00
VOC Glycol Ether	1.200			5.00	0.06
Acetone	0.459			25.00	0.12
Exempt Compound	3.000			5.00	0.15
Non-solvent LVP	7.000			3.00	0.21
		Total Cost, $/pound:	0.80		0.74
		Total Cost, $/Unit:	4.67		4.29
				Cost increase to comply, $/unit:	(0.38)

Multi-purpose Solvent/Paint Thinner – Tier 2

Category:	Multi-purpose Solvent/Paint Thinner
Subcategory	Non-aerosol
Typical non-compliant:	30 % by weight
Proposed Limit:	3 % by weight
Average Unit Size	93.40 wt. oz.

LOW COST

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant		VOC Compliant TIER 2 – 3%	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon solvent	0.540	25.00	0.13	0.00	0.00
Water	0.002	37.00	0.00	0.00	0.00
VOC Glycol Ether	1.150	5.00	0.06	0.00	0.00
Acetone	0.402	25.00	0.10	0.00	0.00
Exempt Compound	2.000	5.00	0.10	0.00	0.00
Non-solvent LVP	3.500	3.00	0.11	0.00	0.00
VOC Mixture	0.845	0.00	0.00	3.00	0.03
Exempt/LVP Emulsion	0.461	0.00	0.00	97.00	0.45
		Total Cost, $/pound:	0.50		0.47
		Total Cost, $/Unit:	2.91		2.76
				Cost increase to comply, $/unit:	(0.16)

HIGH COST

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant		VOC Compliant TIER 2 – 3%	
		Wt. % (C)	Cost (B)x(C)/100	Wt. % (D)	Cost (B)x(D)/100
Hydrocarbon solvent	0.800	25.00	0.20	0.00	0.00
Water	0.002	37.00	0.00	0.00	0.00
VOC Glycol Ether	1.200	5.00	0.06	0.00	0.00
Acetone	0.459	25.00	0.12	0.00	0.00
Exempt Compound	3.000	5.00	0.15	0.00	0.00
Non-solvent LVP	7.000	3.00	0.21	0.00	0.00
VOC mixture	1.000	0.00	0.00	3.00	0.03
Exempt/LVP emulsion	0.816	0.00	0.00	97.00	0.79
		Total Cost, $/pound:	0.74		0.82
		Total Cost, $/Unit:	4.29		4.80
				Cost increase to comply, $/unit:	0.50

REFERENCES

1. Air Resources Board. Initial Statement of Reasons for Proposed Amendments Pertaining to Hairspray in the California Consumer Products Regulation. February 7, 1997. (ARB, 1997c)

2. ICIS. ICIS Chemical Business. http://icispricing.com. April 11, 2008. (ICIS, 2008)

Appendix E

Nonrecurring Costs Calculations

Appendix E contains the methodology and costs staff used to assign nonrecurring costs for each category. Nonrecurring costs are those associated with research and development to reformulate complying products and are independent of, and in addition to, the costs of ingredients to produce a product. For each category proposed for regulation, staff estimated a low cost and a high cost.

For both low and high cost scenarios, the initial statement of development goals to final delivery of the new product to the marketplace shelves was divided into eight phases. The phases are: product development, including reformulation and development of a new delivery system if necessary; stability testing; efficacy testing; safety testing; labeling modification; registration with regulatory agencies, if necessary; manufacturing change; and marketing.

A detailed description of each of the nonrecurring cost factors listed on the tables follows:

Product Development
Given a set of new product requirements, develop a laboratory prototype for product evaluation and testing. This includes formulating the contents and specifying the packaging and raw materials. New packaging and chemical formula components might need to be sourced.

Stability Testing
Stability testing ensures that the newly formulated chemical composition and/or package are compatible with each other and with product function for a reasonable period of time. FDA and EPA regulated products require extra steps to ensure the stability of active ingredients and kill claims of products such as disinfectant for bacteria and germs, for example.

Efficacy testing
Efficacy testing seeks to ensure that the product maintains the ability to perform label claims and to meet customer expectations. For EPA registered products (for example, those which make bacterial kill claims) this will require extensive testing by a specialized laboratory (most likely not the manufacturer's own laboratory). The testing must be documented with and meet the approval of the EPA.

Safety Test
This includes testing of the new product to ensure safety to manufacturing personnel during fabrication, logistics personnel during transit and to consumers during use and storage.

Labeling Modifications
Labeling modifications are required when product qualities or use instructions change.

Registration Fees
Registration expenses are incurred for products requiring EPA registration or FDA regulation whenever changes are made to the label or formula.

Marketing
The factors for marketing include: focus group testing, conducting surveys, advertising and design and publication of print and internet materials.

Manufacturing
This includes technology and infrastructure required to mass-produce a product. A new VOC limit which must be met by changes to these production requirements will incur a manufacturing cost proportional to the magnitude of the change. Manufacturing cost to comply with proposed standards can include 'pilot plant' testing and/or retooling of production lines or construction of completely new facilities.

A pilot plant test is a small scale version of full scale production which is large enough to approximate the physical characteristics and challenges which will be encountered in the full-scale version. A pilot test run consumes considerably less resources and raw materials than a full scale run to produce a batch of product which will not necessarily be ready or suitable for a commercial market.

Literature
Literature costs are incurred when new sales and marketing and/or technical literature need to be developed and distributed in order to inform customers of the attributes of a new product.

Since 1999, a set of per product reformulation costs in 1991 dollars had been established for each phase of bringing a reformulated product into the market. The costs are adjusted to 2008 dollars using a well-established method of rationing chemical engineering plant cost indices as follows (Peters and Timmerhaus, 1980):

$$\text{Non - Recurring Costs (in 2008 dollars)} = \text{Non - Recurring Costs (in 1991 dollars)} \times \frac{\text{C.E. 2008 Index}}{\text{C.E. 1991 Index}}$$

where,

C.E. 2008 index = 2008 Chemical Engineering Plant Cost Index = 592.0 (Chemical Engineering, 2009).

C.E. 1991 index = 1991 Chemical Engineering Plant Cost Index = 361.3 (Chemical Engineering, 1997).

Table Appendix E-1 shows the cost assigned to each phase for the low and high cost scenario for a "household product." Both categories in this rulemaking are considered "household products".

To develop the costs shown in Table Appendix E-1, personnel costs are assigned. Beyond personnel costs, additional cost elements were considered at each phase and added as appropriate. These cost elements are facility; equipment; tool; jig; fixture and miscellaneous materials handling equipment; purchased material; packaging; distribution; warehousing; technical data; research studies and tests; promotional literature; residual inventory and disposal; consumer tests; general and administrative expense; patent; registration fees; and computer support. The result of these considerations is a per-product cost for developing a reformulated product and bringing it to market.

The length of time in each phase was estimated based on an industry analysis of 80 new product innovations. Most of the phases occur in sequence; however, there is some time overlap in each phase.

Next, estimated personnel resources were allocated against each phase considering the most probable types of skills needed including general engineering; technician; drafting; packaging engineering; specification engineering; model making; chemical engineering; technical publication; production support; quality assurance; marketing; warehousing; word processing; and clerical. For high cost elements, additional personnel were allocated to each phase.

Staff used different assumptions for the low and high cost analyses, and considered the specific likelihood that each of the cost elements would occur for each product category individually.

Table Appendix E-1
Assigned Costs for Product Development
Generic Per Product Reformulation Costs (low and high cost approach)

Household	Low Cost	High Cost
Product Development Material	$163.85	$819.26
Computer Support	$163.85	$983.12
Personnel/Formulation	$6,062.55	$20,809.30
Personnel/Delivery System	$0.00	$26,544.15
Prototype Equipment	$0.00	$1,638.53
Testing Material	$491.56	$491.56
Computer Support	$0.00	$491.56
Personnel/Stability Test	$1,310.82	$7,373.37
Personnel/Efficacy Test	$1,310.82	$6,062.55
Personnel/Safety Test	$3,277.06	$10,978.13
Labeling Modifications Material	$163.85	$327.71
Technical Data	$327.71	$983.12
Personnel	$983.12	$5,898.70
Registration/Fees	$327.71	$491.56
Personnel	$655.41	$4,915.58
Manufacturing Equipment	$0.00	$40,963.19
Technical Data	$163.85	$819.26
Computer Support	$0.00	$163.85
Other	$0.00	$1,146.97
Personnel	$1,474.67	$33,753.67
Marketing Studies	$327.71	$1,638.53
Literature	$163.85	$819.26
Inventory	$0.00	$3,277.06
Computer Support	$0.00	$163.85
Personnel	$327.71	$13,435.93
TOTAL	**$17,696.10**	**$184,989.77**

2008 C.E. Plant Cost Index =	592	(Final Oct. '08)
1991 C.E. Plant Cost Index =	361.3	

i. Low Cost Scenario

In the low cost scenario it is assumed that only minor modification to the current formulation is necessary to come into compliance. Therefore, for the low cost analysis no major costs were added for changing delivery systems or other product attributes.

In addition, it is common that large companies having significant market share and broad product lines offer both low VOC complying products and higher VOC non-complying products. In many cases, relatively low costs would be incurred where these companies could increase sales and distribution of complying products and discontinue non-complying products.

If products do not change significantly, it is assumed that major retooling of manufacturing equipment would not be required, technical data changes would be minor, and the change in marketing costs would be small. It was also assumed that these reformulated products would be marketed nationally.

ii. High Cost Scenario

Each category was analyzed individually to determine which of the elements, discussed above, and shown in Table Appendix E-1, manufacturers would likely include in their reformulation efforts. High costs for specific steps of the reformulation process were only included in the cost analysis where staff believed they were likely to occur. If staff believed a markedly different product would be needed to comply with the proposed limit, such as a new delivery system, then high personnel and capital resources, especially in product development and manufacturing changes, were assumed. In addition, a new delivery system would require investment for prototypes, new filling machines training, and technical data, so these high costs were also included in these scenarios. Additional costs were also added for packaging, distribution and warehousing. In areas where it was expected that little or no reformulation would occur, or that the cost of reformulation would be minimal, the value for low cost was used.

For especially challenging limits, it was assumed for the high cost approach that, because of a markedly different product, there would also be additional marketing costs, including research studies and tests, promotional literature, and consumer tests. These costs vary by the type of product, however the household products being proposed for further regulation typically having a larger expense in this area. The cost analysis did not include the costs for an extensive advertising campaign. New products are regularly brought onto the market, and the advertising for a new product, whether reformulated or not, would replace the advertising for the existing product, and would be a normal cost. It was assumed that the new product would be marketed nationally.

The staff also recognized that development of a new product does not occur in isolation. Few companies have only one product line; for those that have more than one product line, the product lines can be very similar. Development and production tasks, from the initial concept through marketing, would be proceeding simultaneously on more than

one product line, with a transfer of information and work-sharing between the products. For these companies, this “technology transfer” would substantially reduce the cost of developing and marketing a new product on a per product basis. For categories where the majority of products were held by a few companies it was assumed that this “technology transfer” would occur, and high costs adjusted accordingly.

iii. Other Assumptions

Staff considered only nonrecurring costs that are likely to occur on a per category basis. Costs are adjusted from those determined in 1991 by using the Chemical Engineering Plant Cost Index. If it was determined that for a majority of products in the category, the most likely scenario was that only minor changes to the product’s reformulation were necessary to comply with the new proposed limit then only the lower end of the nonrecurring cost was included. For some categories, it was appropriate, based on the variety of products and reformulation approaches needed to meet the proposed limit, that certain high cost factors be included in the analysis, but not others, on a case-by-case basis. We believe that this approach gives a more realistic estimate of the costs of a given limit

The high and low nonrecurring cost assumptions for each category are shown in Tables Appendix E-2, E-3, and E-4.

Table Appendix E-2
Air Freshener Per Product Reformulation Costs (low and high cost approach)

Household	Low Cost	High Cost
Product Development	$163.85	$409.63
Material		
Computer Support	$0.00	$0.00
Personnel/Formulation	$6,062.55	$10,404.65
Personnel/Delivery System	$0.00	$13,272.07
Prototype Equipment	$0.00	$819.26
Testing	$245.78	$245.78
Material		
Computer Support	$0.00	$0.00
Personnel/Stability Test	$1,310.82	$3,686.69
Personnel/Efficacy Test	$1,310.82	$3,031.28
Personnel/Safety Test	$0.00	$0.00
Labeling Modifications	$0.00	$0.00
Material		
Technical Data	$0.00	$0.00
Personnel	$0.00	$0.00
Registration/Fees	$0.00	$0.00
Personnel	$0.00	$0.00
Manufacturing	$0.00	$0.00
Equipment		
Technical Data	$163.85	$409.63
Computer Support	$0.00	$0.00
Other	$0.00	$0.00
Personnel	$1,474.67	$16,876.83
Marketing	$327.71	$819.26
Studies		
Literature	$0.00	$0.00
Inventory	$0.00	$0.00
Computer Support	$0.00	$0.00
Personnel	$163.85	$163.85
TOTAL	**$11,223.90**	**$50,138.93**

2008 C.E. Plant Cost Index =	592	(Final Oct. '08)
1991 C.E. Plant Cost Index =	361.3	

Table Appendix E-3
Multi-purpose Solvent and Paint Thinner –
Tier 1 Per Product Reformulation Costs (low and high cost approach)

Household	Low Cost	High Cost
Product Development	$163.85	$819.26
Material		
Computer Support	$163.85	$983.12
Personnel/Formulation	$6,062.55	$20,809.30
Personnel/Delivery System	$0.00	$0.00
Prototype Equipment	$0.00	$0.00
Testing	$491.56	$491.56
Material		
Computer Support	$0.00	$491.56
Personnel/Stability Test	$1,310.82	$7,373.37
Personnel/Efficacy Test	$1,310.82	$6,062.55
Personnel/Safety Test	$3,277.06	$10,978.13
Labeling Modifications	$163.85	$327.71
Material		
Technical Data	$327.71	$983.12
Personnel	$983.12	$5,898.70
Registration/Fees	$0.00	$0.00
Personnel	$0.00	$0.00
Manufacturing	$0.00	$0.00
Equipment		
Technical Data	$0.00	$0.00
Computer Support	$0.00	$0.00
Other	$0.00	$0.00
Personnel	$0.00	$0.00
Marketing	$327.71	$1,638.53
Studies		
Literature	$163.85	$819.26
Inventory	$0.00	$3,277.06
Computer Support	$0.00	$163.85
Personnel	$327.71	$13,435.93
TOTAL	**$15,074.46**	**$74,553.01**

2008 C.E. Plant Cost Index =	592
1991 C.E. Plant Cost Index =	361.3

Table Appendix E-4
Multi-purpose Solvent and Paint Thinner –
Tier 2 Per Product Reformulation Costs (low and high cost approach)

Household	Low Cost	High Cost
Product Development	$163.85	$819.26
Material		
Computer Support	$163.85	$983.12
Personnel/Formulation	$6,062.55	$20,809.30
Personnel/Delivery System	$0.00	$0.00
Prototype Equipment	$0.00	$0.00
Testing	$491.56	$491.56
Material		
Computer Support	$0.00	$491.56
Personnel/Stability Test	$1,310.82	$7,373.37
Personnel/Efficacy Test	$1,310.82	$6,062.55
Personnel/Safety Test	$3,277.06	$10,978.13
Labeling Modifications	$163.85	$327.71
Material		
Technical Data	$327.71	$983.12
Personnel	$983.12	$5,898.70
Registration/Fees	$0.00	$0.00
Personnel	$0.00	$0.00
Manufacturing	$0.00	$0.00
Equipment		
Technical Data	$0.00	$0.00
Computer Support	$0.00	$0.00
Other	$0.00	$0.00
Personnel	$0.00	$0.00
Marketing	$327.71	$1,638.53
Studies		
Literature	$163.85	$819.26
Inventory	$0.00	$3,277.06
Computer Support	$0.00	$163.85
Personnel	$327.71	$13,435.93
TOTAL	**$15,074.46**	**$74,553.01**

2008 C.E. Plant Cost Index =	592
1991 C.E. Plant Cost Index =	361.3

REFERENCES

1. Chemical Engineering magazine. Chemical Engineering Plant Cost Index. February, 2009. (Chemical Engineering, 2009)

2. Chemical Engineering magazine. Chemical Engineering Plant Cost Index. April, 1997. (Chemical Engineering, 1997)

3. Peters, M. S. and Timmerhaus, K. D. Plant Design and Economics for Chemical Engineers. 3rd Edition, McGraw-Hill Book Company, 1980, pp. 159-162 (Peters and Timmerhaus, 1980)

Appendix F

Chemical Characteristics of Conventional and Potential Replacement Solvents/Products

Conventional Solvents Sold Today – Phased Out with Rule Implementation							
Chemical Compound	M.W. [a]	Boiling Point (@760 mmHg, °F)	Evaporation Rate (@25 °C)	Flash Point (°F)	LEL/UEL [b] (% by Vol.)	Auto-ignition Temperature (°C)	Vapor Pressure (mmHg @ 20 °C)
Denatured Alcohol (Ethanol)	46	78	2.3	56	3.3/19	435	44
Isopropyl Alcohol	60	180	2.3	53	2/12.7	399	33
Lacquer Thinner [f]	--	212.6	2.7	7.4	2/18.4	238	97.7
MEK	72	80	4.0	25	1.8/11.5	474	8.7
Mineral Spirits (Stoddard)	144	154-188	0.1	109-113	1.0 / 7	232	1.1
Paint Thinner [g]	--	299.6	1.4	81- 117	1.0 / 7.3	229	2
Toluene	92	111	2.0	41	1.3 / 7	538	22
Turpentine	136	323.7	0.7	94.3	0.8/ n/a	253	5
VM&P Naphtha	87	266.9	1.2	53.1	1.2/6	288	20
Xylene	106	139	0.8	81	1.0/6.6	499	6
Exempt Solvents Used Today, with possible increase in use							
Chemical Compound	M.W. [a]	Boiling Point (@760 mmHg, °F)	Evaporation Rate (@25 °C)	Flash Point (°F)	LEL/UEL [b] (% by Vol.)	Auto-ignition Temperature (°C)	Vapor Pressure (mmHg @ 20 °C)
Acetone	58	56	6.1	-4	2.6/12.8	538	180
Methyl Acetate	74	56	5.3	15	3/16	501	171
PCBTF [h]	181	282	0.9	109	0.9/10.5	97	5.3
Other Technologies Used Today, with possible increase in use							
Chemical Compound	M.W. [a]	Boiling Point (@760 mmHg, °F)	Evaporation Rate (@25 °C)	Flash Point (°F)	LEL/UEL [b] (% by Vol.)	Auto-ignition Temperature (°C)	Vapor Pressure (mmHg @ 20 °C)
Aqueous Based - Ethoxylates		211.7	1.0	208			
Soy-Based Products		516.2	2.0	254.9			

[a] Molecular Weight

[b] Lower Explosive Limit / Upper Explosive Limit

[f] Lacquer thinner is manufactured from petroleum distillates and blended with other solvents, such as xylene, toluene, isopropyl alcohol, acetone, methanol, and light aliphatic solvent naphtha. Exact blending ratios vary widely.

[g] While paint thinner is predominantly referred to as “mineral spirits” or “Stoddard solvent” (listed elsewhere in this table, paint thinner is broadly described as being manufactured from petroleum distillates and can be a blend of multiple solvents, including but not limited to, mineral spirits, naphtha, nonanes (mixture), 1,2,4-trimethyl benzene, ethyl benzene, diacetone alcohol, n-butyl acetate, methyl isobutyl ketone, cumene and xylene.

[h] Source: OxyChem Specialty Business Group

*Table Derived from SCAQMD Final Environmental Assessment for: Proposed Rule 1143

REFERENCES

1. South Coast Air Quality Management District (SCAQMD). Final Environmental Assessment for Proposed Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents. February 2009.